

**Evaluating the Health and Wellbeing Benefits Associated with
Outdoor Interventions: Informing the Development of Natural
Health Services**

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Abstract

Outdoor interventions are proposed as effective health and wellbeing interventions and include activities, such as horticultural therapy, conservation volunteering and walking programmes. An array of outdoor interventions are currently being delivered in the UK to improve health and wellbeing with varying definitions, delivery and evaluation frameworks. A multitude of health and wellbeing outcomes have been associated with outdoor interventions (e.g. improved physical fitness, reduced symptoms associated with long-term conditions, improved wellbeing and social interaction). Less is known, however, about *how* these outcomes are gained, so that outdoor interventions can be delivered to influence these outcomes, and how these associated outcomes can be sustained long-term. This thesis extends beyond the current knowledge and understanding of outdoor interventions through a series of consecutive studies, exploring the definitions, delivery frameworks, associated health and wellbeing outcomes and evaluation protocols to capture such outcomes. Findings gained will inform the future design, delivery and evaluation of the Mersey Forest's Natural Health Service and similar outdoor interventions to improve health and wellbeing.

Study 1 interviewed 14 sector leaders (N=14) with policymaking, funding and research roles from outdoors, health, physical activity and therapy perspectives within outdoor interventions. Thematic analysis (TA) revealed unique insight into sector leaders knowledge of *what is* currently delivered in the UK (generically targeted, inclusive and accessible outdoor interventions with diverse psychosocial outcomes associated) as opposed to what they proposed *should be* delivered (specifically targeted and tailored

outdoor interventions to those in greatest need, i.e. those with mental health conditions). Key delivery components within outdoor interventions, suggested to positively influence associated health and wellbeing outcomes, included the appropriate settings of outdoor interventions, the individual differences of participants, as well as the duration and difficulty of activities. Whereas mixed methods evaluation protocols were proposed to gain rigorous and robust data surrounding the effectiveness of outdoor interventions as health and wellbeing interventions, while enabling the further exploration of key delivery components, to inform future delivery.

Study 2 interviewed 16 facilitators (N=16), who were currently delivering outdoor therapy interventions to examine how Study 1 findings, from sector leaders, translated into current practice. TA themes highlighted challenges faced by facilitators in defining their own outdoor therapy practice and positioning their work within the broad scope of outdoor therapy interventions delivered in the UK. Findings emphasised the impact of the lack of clarity within the literature surrounding the definitions of outdoor therapy interventions, on those delivering and participating in them, as a consequence. Insight into participant demographics (e.g. those who were ‘stuck’ and experiencing difficult life challenges) and components within the delivery of outdoor therapy interventions (e.g. the skills and competencies of the facilitators, opportunities to engage with nature and the perceived escape from stress) suggested to influence therapeutic outcomes (including improved mood, reduced stress and increased self-beliefs) were revealed. Facilitators also demonstrated innovative solutions to combine rigorous and robust evaluation protocols,

while remaining flexible to outdoor therapy interventions, by adapting validated therapy measures to suit an outdoor therapy context.

Finally, a mixed-methods study (Study 3) evaluated the effectiveness of outdoor interventions in improving health and wellbeing outcomes in 144 participants (N=144). Participant's health and wellbeing was assessed across three time points, before their first session (time 0), at the end of twelve weekly sessions (time 1) and twelve weeks after completing the sessions (time 2) using validated questionnaire measures (SF36v2, WEMWBS, POMS and the RSES). Associated outcomes included improved self-reported health, wellbeing, and physical activity ratings (e.g. improved vitality, physical fitness, improved mood). Whereas TA themes from a sample of participants (n=8) and facilitators (n=3), who were interviewed after engaging in and delivering Nature4Health interventions, strengthened the quantitative health and wellbeing outcomes. Themes also identified that participants perceived autonomy, afforded though the voluntary nature of the Nature4Health interventions, the choices of activities (e.g. choice of tasks or routes walked) and levels of engagement (e.g. solitary tasks to engaging in group tasks) further promoted engagement and positively associated health and wellbeing outcomes, having important implications for future delivery.

These PhD findings will therefore inform and encourage the successful delivery of a Natural Health Service and similar outdoor interventions, by effectively engaging those who would benefit most (e.g. those experiencing loss, challenging circumstances), utilising key delivery components linked to engagement (e.g. enabling choice, positive relationships with facilitators, with outdoor interventions conducted in appropriate settings) and

improving health and wellbeing (e.g. improved physical fitness, decreased anxiety, increased self-esteem). The mapping of key delivery components onto relevant behaviour change models (e.g. the COM-B, BCW and TDF) and corresponding behaviour change techniques (e.g. restructuring the physical environment, overcoming barriers and implementation interventions), extends beyond the theoretical literature to date, with implications to apply these findings to the delivery of a Natural Health Service and similar outdoor interventions delivered within a wider context. Future evaluation protocols should seek to further specify key delivery components, which influence the desired health and wellbeing outcomes, to continue to inform and develop the Natural Health Service and similar outdoor intervention's successful delivery.

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Declaration

I declare that the work contained within this thesis is entirely my own. No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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Chapter One: Introduction

Chapter One: Introduction

1.1. Health and wellbeing Statistics in the UK

Over 15 million people in England have a long-term health condition (LTC) (Nuffield Trust, 2020). LTC's are incurable but controllable health conditions, which include high blood pressure, dementia and arthritis, as well as mental health conditions (The Kings Fund, 2020). LTCs have accounted for 64% of all outpatient appointments, as well as 75% of primary care costs for people living with two or more conditions (Stafford, Stevenson, Thorlby, Fisher, Turton & Deen, 2018). The prevalence of LTCs has remained consistent throughout the duration of this PhD with associated increases in NHS expenditure (House of Common's Health Committee, 2014, The Kings Fund, 2020). Furthermore, an estimated one in six people aged sixteen years or over are reported to have a mental health condition, including anxiety and depression (House of Commons Library, 2020). Such conditions are predicted to be responsible for over £13 million of NHS spending (NHS Mental Health Dashboard, 2020). The introduction of the national Improving Access to Psychological Therapies (IAPT) scheme in 2008 has encouraged greater accessibility to psychological therapies (NHS England, 2020). There is considerable variation, however, in IAPT service accessibility and effectiveness, with waiting times ranging from four to sixty-one days (House of Commons Library, 2020).

1.2. Potential Solutions to the UK's Health and Wellbeing Crisis

The publication of the National Health Service's Long Term Plan (2019), which commenced within the writing up period of this PhD thesis, recognised the increasing

prevalence of physical and mental health conditions and their associated detrimental impact to the economy. This plan was influenced by the NHS's frontline staff, patient groups and national experts in a bid to progress and sustain the NHS throughout the next ten years. These strategies propose changes to the NHS to meet the challenges of people living longer (NHS, 2020). One key approach is to encourage and empower people to manage their own health and wellbeing, by utilising social support, community resources, and social prescribing, discussed next.

1.2.1. Social Prescribing

In light of the varied and diverse social, economic and environmental factors, influencing an individual's health and wellbeing, social prescribing adopts a holistic approach (The Kings Fund, 2017). Individuals targeted within social prescribing include people with mild to moderate mental health conditions, vulnerable groups, people who are socially isolated, and those frequently attending primary or secondary health care services (Kimberlee, Ward, Jones & Powell, 2014). Social prescribing links primary care patients to community-based support services, which include advice, signposting, physical activity and befriending (Bickerdike, Booth, Wilson, Farley & Wright, 2017; The Kings Fund, 2017). Although Social Prescribing can be linked back to 1984 (The Bromley By Bow Centre, 1984) this strategy has become increasingly pertinent in recent years with the launch of the NHS Long Term Plan (2019) discussed previously. The plan has announced the funding of one-thousand Social Prescribing Link Workers within primary care in 2020-2021 (NHS England, 2020). Social Prescribing Link Workers, based in GP surgeries, connect patients with long-term health conditions to local community interventions,

depending upon their needs and preferences (NHS England, 2020). Social prescribing has previously been associated with initial improved health and wellbeing ratings with varying levels of effectiveness (e.g. Bickerdike et al., 2017; Woodall et al., 2018). A recent realist review identified that participants were more likely to enrol on social prescribing programmes if the referral was presented in an acceptable way, was perceived to meet their needs and expectations, and the activity was accessible to them. Adherence was positively associated with skilled and knowledgeable facilitators, who were sensitive to changes in the participant's conditions or symptoms, which could otherwise negatively impact on their attendance (Husk et al., 2019). More evidence is required, however, to infer effectiveness of any particular models of social prescribing.

1.2.2. Exercise Referral

Similarly, the NICE-accredited Exercise Referral Scheme seeks to improve health and wellbeing outcomes via physical activity promotion (NICE, 2014). Exercise referral schemes target sedentary individuals or those with specific health conditions (e.g. cancer). After an initial assessment with a health professional, a referral is then made to a physical activity specialist or service, who conducts an assessment and creates a physical activity programme tailored to the individual's needs. The effectiveness of exercise referral is unknown, however, as not all schemes monitor patient progress long-term, and attendance and adherence rates to schemes are low (Kelly et al., 2016; Morgan et al., 2016). Reported barriers to attendance and adherence include the timing of sessions, associated cost, location, intimidating gym atmosphere and a lack of confidence in operating gym equipment (Morgan et al., 2016). Studies have attempted to identify and overcome such

barriers (e.g. Martin-Borras et al., 2018; Rowley, Mann, Steele, Horton & Jimenez, 2018). Martin-Borras et al (2018) demonstrated that increased social support from facilitators could promote adherence to exercise referral schemes. Furthermore, recent systematic review findings (Rowley et al., 2018) illustrated that schemes with durations of twenty weeks or more, produced greater health outcomes and adherence than those shorter duration schemes.

1.3. Outdoor Interventions and their Definitions within the Context of this PhD

Outdoor interventions propose an alternative means of promoting independence in managing or improving health and wellbeing through activities in the outdoors. Outdoor interventions include a vast array of activities in the outdoors across a diverse spectrum, with varying aims and delivery frameworks (e.g. outdoor recreation, outdoor education, outdoor physical activity interventions, outdoor therapy etc.). Outdoor recreation is described as:

“free time activity that occurs in the outdoors and embraces the interaction of people with the natural environment” (Plummer, 2009, p.1.)

For outdoor recreation, there is an expectation of interaction between the participant and nature in some way, in which nature plays an important role (e.g. mountain climbing).

Formal outdoor interventions are often educational, developmental, psychological or aimed at improving health and wellbeing and targeted to specific groups or populations. In the context of this thesis, the term ‘outdoor interventions’ has been used to describe those activities which aim to improve health and wellbeing through various delivery formats.

While some of the outdoor interventions are more akin to those defined as ‘nature-based interventions’ (e.g. ecotherapy, horticultural therapy) with more emphasis on connecting with nature to improve wellbeing, other outdoor interventions aim to improve health and wellbeing through physical activity-orientated activities (e.g. conservation volunteering, Nordic walking, health walks). These outdoor interventions use natural settings to promote and facilitate physical activity while influencing health and wellbeing outcomes associated with engaging in the natural environment, discussed within the literature review (Chapter 2). While a myriad of terms already exist to describe these types of outdoor interventions (e.g. ecotherapy, green exercise, nature-based interventions), the term ‘outdoor interventions’ within this PhD allows brevity without exclusivity to any particular type of outdoor intervention. The use of the term ‘intervention’ further distinguishes outdoor *interventions* from outdoor *recreation*. While outdoor recreation is defined as activity occurring in the outdoors while embracing the interaction of people with the natural environment, outdoor interventions within this thesis, relates to those more specifically aimed at improving health and wellbeing. For example, Park Run (2020), an outdoor recreational activity is described as:

“free, weekly, 5km timed runs around the world. They are open to everyone, free, and are safe and easy to take part in. These events take place in pleasant parkland surroundings and we encourage people of every ability to take part; from those taking their first steps in running to Olympians; from juniors to those with more experience”
(Park Run, 2020)

The Park Run definition describes running for outdoor recreation, the parkland surroundings in which they take place and their accessible nature, accommodating a variety of ages and abilities for the purpose of encouraging people to run. Whereas Walking for Health (2020) is described as:

“over 350 active walking schemes, helping people across the country lead a more active lifestyle... improving the mental and physical well-being of thousands of people.” (Walking for Health, 2020)

Health walks are defined as the activity of walking while specifying the aims of encouraging physical activity and improving health and wellbeing. This thesis therefore includes outdoor activities completed in a variety of outdoor settings (e.g. parks, green spaces, woodlands) encouraging an interaction with nature, which aim to improve health and wellbeing.

The terms ‘health’ and ‘wellbeing’ are used consistently, throughout this PhD, to describe the outcomes associated with outdoor interventions. The World Health Organization defines health as:

“a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 1948, p.100).

This definition of health and wellbeing is advantageous, as it is holistic and inclusive of physical, mental and social domains. However, this description is also argued to be impractical as “complete health” would render most of the population as unhealthy most of the time (Jadad & O’Grady, 2008; Smith, 2008) as it essentially declares people with long-

term conditions as “without health”. The definition also underestimates the human potential to respond, cope and adapt to everchanging health, wellbeing, and social challenges. A preferred view of health may therefore be:

“the ability to adapt and self-manage” (Huber et al., 2011, p. 236)

Whereas wellbeing is described as:

‘a state where everyone is able to realize their potential, can cope with the normal stresses of life, can work productively and fruitfully and is able to make a contribution to their community’ (WHO, 2014).

Similarly, the definitions of wellbeing and mental illness form a broad spectrum, as illustrated by the Dual Factor Continuum of Mental Health and Mental Illness Model (Keyes, 2002). This model proposes two distinct dimensions of wellbeing and mental health on a cross-axis. On the Y axis, the terms ‘healthy’ or ‘flourishing’ refers to a state where individuals have a combined high level of wellbeing with optimal psychological and social functioning. On the opposing side, wellbeing can also be described as ‘languishing’ where wellbeing levels are low (Keyes, 2002). Similarly, on the X axis, individuals may or may not have a diagnosable mental health condition (e.g. anxiety, depression etc.), but may still be highly functional with high levels of wellbeing. However, people with mental ill health can also have low wellbeing and be languishing. Similarly, just as individuals may have no mental health conditions and be flourishing with high levels of wellbeing, individuals may have no mental health conditions but exhibit low levels of wellbeing and therefore be unable to thrive, possibly as a consequence of life events, social isolation etc.

The researcher is therefore mindful of the problematic nature of the definitions of health and wellbeing. The terms “health and wellbeing” are therefore adopted consistently throughout the thesis to refer to individuals self-reported feelings to cope and adapt both physically and mentally to physical, mental, emotional and social change and thrive. The terms “health and wellbeing” are also used in conjunction with each other, in recognition of their ability to interact and influence one another, while also maintaining that it is possible to have one element without the other. When reporting outcomes, “health” outcomes refer to those physical health self-reported measures (e.g. fatigue, bodily pain), whereas wellbeing outcomes refer to those wellbeing measures (e.g. anxiety, self-esteem). Due to the geographical location of the research, outdoor interventions evaluated within this PhD have taken place in urbanised natural environments or green spaces defined as:

"Undeveloped land with natural vegetation... for example, parks, forests, playing fields and river corridors" (Mitchell & Popham, 2008, p 655)

These spaces provide access to nature within urban environments. For people living in urban environments, these environments are argued to be their only accessible contact with nature (Hillsdon, Massey, Roberts & Logan, 2015). The settings, therefore, enable participants to engage with nature to varying degrees, dependent upon the actual setting of the outdoor intervention (e.g. trees, plants, wildlife), while encouraging accessibility. Accessibility includes having close proximity to residential areas, public transport links, with parking facilities and accessible paths. The majority of these interventions within this PhD are delivered by those in the environmental sector (e.g. Greenspace Rangers) or the

voluntary and community sector (e.g. Community Officers) with varying skills, training and experience in facilitating outdoor interventions, sometimes in conjunction with health professionals (e.g. referring GPs, mental health professionals).

Such partnerships of the health and environmental sector, in delivering outdoor interventions, have become increasingly popular in the UK as a means to improve people's health and wellbeing (Bloomfield, 2017). Case studies include the piloting of nature-based interventions on GP referral as a way to tackle poor health and wellbeing (e.g. Dose of Nature, 2017). More recently, The Wildlife Trust's (2020) projects run nationwide, encouraging people within local communities to access their nature reserves and engage in nature-based health projects. Regardless of intended aims, these outdoor interventions have been associated with varied and diverse health and wellbeing outcomes, as detailed within the literature review (Chapter 2). Furthermore, a recent social return on investment (SROI) analysis estimated a value of £6.88 of savings for every £1 invested for people with low wellbeing and £8.50 for those with average to high wellbeing engaged in The Wildlife Trust nature-based programmes (Bagnall, Freeman, Southby & Brymer, 2019).

1.4. The Mersey Forest

The Mersey Forest, <https://www.merseyforest.org.uk/>, the match-funders of this PhD alongside Liverpool John Moores University, is a local provider of outdoor interventions. The Mersey Forest is the current largest Community Forest, covering over 500 square miles of Merseyside and North Cheshire. The Mersey Forest's 'more from trees' philosophy brings environmental, economic and health benefits by engaging the local

community in their future development plans. The Mersey Forest's Natural Health Service, <https://naturalhealthservice.org.uk>, aims to improve health and wellbeing, reduce health inequalities and provide commissioning bodies with a single point of access to evidence-based outdoor interventions. The Natural Health Service also strives to reduce the financial burden on the NHS and local authority resources. The Mersey Forest provides the settings of woodlands for physical and mental health benefits, this was the aim of The Mersey Forest's latest project, 'Nature4Health', <https://www.nature4health.org.uk>. The Nature4Health project was a three-year project, which ran from June 2015 to June 2018, funded by The Big Lottery's Reaching Communities Intervention. Nature4Health aimed to utilise the power of nature to improve people's health and wellbeing, as well as tackle health inequalities in targeted communities across The Mersey Forest deemed most in need. Nature4Health sought to provide health-promoting, enjoyable group activities in a green and therapeutic environment. Nature4Health's outdoor interventions included walking interventions, known as woodland walks, therapeutic gardening, and conservation activities, or 'Green Gyms'. This PhD evaluated the health and wellbeing outcomes associated with these outdoor interventions within its final studies (Study 3a- chapter 6 and Study 3b- chapter 7).

1.5. Thesis Structure

Due to the variety of outdoor interventions being delivered to improve health and wellbeing with varying aims, outcomes and delivery formats, this thesis organises outdoor interventions into the following areas or perspectives of 'outdoors', 'health', 'physical activity' and 'therapy'. Each perspective refers to aims, delivery components, policy

makers and stakeholders' perspectives, facilitators viewpoints, academic disciplines and areas of study to name a few. These four perspectives provide a framework of exploration and analysis within the PhD to encourage greater insight into the current landscape across a range of disciplines. It also enables a greater understanding of The Mersey Forest's Natural Health Service's outdoor interventions and similar outdoor interventions delivered across the UK. Exploring outdoor interventions from an 'outdoors' perspective, within this PhD, surrounds those interventions which aim to increase access and engagement in the outdoors. 'Health' includes those outdoor interventions aiming to improve health. 'Physical Activity' is concerned with physical activity-orientated outdoor interventions, whereas 'therapy' considers those outdoor interventions, which seek to gain psychological therapeutic outcomes. Each perspective is discussed within the literature review in terms of definitions, delivery, associated health and wellbeing outcomes and evaluation protocols to capture such outcomes. These perspectives also interact, e.g. health and physical activity. For example, outdoor interventions may have aims to improve health, which may be achieved through physical activity-orientated outdoor interventions (e.g. health walks). This PhD explores each perspective, with some areas becoming more prominent and others less so, to enable the full exploration of research questions throughout.

This thesis collected and analysed data from January 2015 to January 2018 with a writing up period from January 2018 to July 2020. The PhD therefore commences with a review of the literature to date surrounding outdoor interventions, including key literature which has influenced the research within this PhD and those which contextualise the PhD findings within the more contemporary academic literature and policy making. The literature review

outlines the health and wellbeing outcomes associated and the delivery and evaluation of outdoor interventions within the UK and internationally. The literature review encompasses the four perspectives of ‘outdoors’, ‘health’, ‘physical activity’ and ‘therapy’, which are subsequently carried throughout this PhD. A methodology chapter follows, which details and discusses all the methodological approaches utilised throughout the entire PhD, with justifications given and strategies adopted to ensure rigour and trustworthiness. The initial study (Study 1) forms the next chapter, which explored sector leaders, policymakers and academics perspectives of outdoor interventions from an outdoors, health, physical activity and therapy perspective. Study 2 followed, which examined how Study 1 findings were translated into the current practice of outdoor therapy interventions from a facilitator’s perspective. Facilitators of outdoor therapy were chosen within this study to contain the study, as it was not feasible to interview facilitators from each perspective within the scope of the PhD. This approach incorporated the remaining areas of ‘outdoors’, ‘health’ and physical activity’ as outdoor interventions studied aimed to be therapeutic, both mentally and physically, allowing the inclusion of ‘health’. Furthermore, the delivery of outdoor interventions usually included ‘physical activity’ to varying degrees within an ‘outdoor’ setting. Study 2, therefore, remained inclusive of all these areas. Study 1 and Study 2 comprised qualitative studies, using one-to-one semi-structured telephone interviews. The final study (Study 3) adopted a mixed-methods sequential design with an initial quantitative (Study 3a) and subsequent qualitative phase (Study 3b). Study 3a adopted quantitative questionnaire measures to evaluate the health and wellbeing outcomes associated with outdoor interventions provided by The Mersey

Forest and similar outdoor interventions delivered within the locality. Subsequently, Study 3b utilised semi-structured interviews, exploring the experiences of participants and facilitators engaged in Nature4Health outdoor interventions and identified key delivery components responsible for perceived health and wellbeing outcomes. Each of the four studies in this thesis are introduced with a thesis study map, outlining the aims and key findings of each study. The thesis maps visually demonstrate how each study contributes to the overall thesis. All qualitative findings were analysed using thematic analysis (TA) (Braun & Clarke, 2006). The combined findings from each study will inform the future design, delivery and evaluation of The Mersey Forest's Natural Health Service and similar outdoor interventions. Finally, an overall synthesis chapter summarises key findings derived from all studies. This final chapter further highlights methodological strengths and weaknesses of the PhD and suggests implications for the future delivery and evaluation of a Natural Health Service before presenting a conclusion. Figure 1 illustrates a visual map of the PhD.

Chapters 1 and 2: Introduction and review of literature on outdoor interventions
Chapter 3 Methodology: Methodological approaches utilised throughout Studies 1, 2, 3a and 3b
<p>Chapter 4: Study 1: Exploring Outdoor Interventions from a Sector Leaders Perspective</p> <ol style="list-style-type: none"> 1. To explore definitions of outdoor interventions from an outdoors, health, physical activity and therapy perspective 2. To examine perceived design and delivery of outdoor interventions from each perspective 3. To determine how outdoor interventions are perceived to or have improved people’s health and wellbeing 4. To explore proposed evaluation frameworks to capture perceived health and wellbeing outcomes
<p>Chapter 5: Study 2: Gaining Insight into the Delivery of Outdoor Therapy Interventions from those Currently Facilitating Them</p> <ol style="list-style-type: none"> 1. To examine how outdoor therapy interventions are defined by those currently facilitating them 2. To explore how outdoor therapy interventions are perceived to be therapeutic 3. To consider how outdoor therapy interventions are currently designed and delivered 4. To gain insight into how outdoor therapy interventions are evaluated to capture perceived therapeutic outcomes
<p>Chapter 6: Study 3a: Evaluating the Health and Wellbeing Benefits of Outdoor Interventions</p> <ol style="list-style-type: none"> 1. To investigate associated health and wellbeing outcomes associated with outdoor interventions 2. To assess the sustainability of health and wellbeing outcomes after completion of outdoor interventions
<p>Chapter 7: Study 3b: Exploring the Experiences of Participants and Facilitators of Nature4Health Outdoor Interventions</p> <ol style="list-style-type: none"> 1. To explore the participants perceived health and well-being outcomes associated with engaging in outdoor interventions 2. To identify key components of outdoor interventions, which may influence health and wellbeing outcomes 3. To examine whether participants maintain behaviour change and sustain health and wellbeing outcomes
Chapter 8 Synthesis: Summary and synthesis of overall outcomes and implications for future design, delivery and evaluation of a Natural Health service and wider outdoor interventions.

Figure 1.1. Visual Representation of Thesis

Chapter Two: Literature Review

Chapter Two: Literature Review

2.1. Introduction

This chapter reviews outdoor interventions from an ‘outdoors’, ‘health’, ‘physical activity’ and ‘therapy’ perspective, with associated delivery and evaluation frameworks, as well as associated health and wellbeing outcomes. Local and national initiatives also demonstrate how the evidence outlined to date has influenced changes in policymaking. Case studies of schemes and initiatives prior to this PhD are highlighted demonstrating their influence on this research, whereas those initiated after the research had being completed emphasise the currency of findings. Theoretical explanations and proposed psychological processes also offer potential explanations to the health and wellbeing outcomes associated with engaging in the outdoors.

2.2. Access and Engagement in the Outdoors

Research evidence has shown that simply viewing the outdoors through a window has been associated with psychological benefits (Kaplan, 2001; Maas, Verheij, Groenewegen, De Vries & Spreeuwenberg, 2006). Street trees have been shown to demonstrate restorative effects and improved attention (Lin, Tsai, Sullivan Chang, & Chang, 2014) with higher street tree density associated with decreased antidepressant prescription rates (Taylor, Wheeler, White, Economou & Osbourne, 2015; Helbich, Klein, Roberts, Hagedoorn & Groenewegen, 2018). Findings must be taken in context, however, as Lin et al’s (2014) study relied on images of street trees, with the experiment conducted within laboratory settings. Whereas Taylor et al (2015) reported antidepressant prescription rates as

outcomes, therefore neglecting those participants receiving alternate treatments (e.g. counselling). A recent study by Hunter, Gillespie and Chen (2019) examined the duration of nature experiences and physiological biomarkers of stress (salivary cortisol and alpha-amylase) in thirty-six healthy city-dwelling participants. Each participant engaged in three nature experiences within a setting, duration and time of their choice with saliva samples taken before and after each experience. Results demonstrated a significant drop in salivary cortisol (21.3% per hour) and alpha-amylase (28.1% per hour) with the most significant improvement attributed to 20-30 minute durations. The affordance given to participants to choose their setting, duration and timing of nature experience within their everyday lives, combined with the results revealing the most efficient duration to be 20-30 minutes, implicates nature experiences as an effective form of self-care. However, due to the small sample size, larger sample sizes are required with outcomes measured over a longer study duration to test the true effectiveness of nature experiences on stress.

Access to the outdoors is also argued to tackle health and socioeconomic inequalities (Mitchell & Popham, 2008; Mitchell, Richardson, Shortt & Pearce, 2015; Rigolon, Browning & Jennings, 2018; Wood & Smyth, 2020). Mitchell et al., (2015) revealed reduced socioeconomic inequality in wellbeing in residents who reported to have greater access to the outdoors. Studies collected data from large sample sizes and revealed closer proximity to outdoor spaces was associated with greater health and fewer socioeconomic inequalities. As observed with aforementioned studies, however, socioeconomic status was not controlled for, which is argued to be a confounding factor for health and wellbeing (Alder, 2013). Socioeconomic status may also influence where individuals may choose to

live, for example, individuals within higher socioeconomic status groups may choose to live in greener environments. Variations in socioeconomic status may therefore have accounted for increases in health and wellbeing, rather than access to the outdoors. Additionally, while these studies measure proximity to outdoor spaces, they did not capture the frequency of visits or duration of time spent in outdoor spaces meaning that it cannot be ascertained as to whether these people visit these nearby outdoor spaces and whether this influences findings.

Actual engagement in the outdoors, including visiting the outdoors, using the outdoors for recreation, social opportunities or physical activity, is linked to improved wellbeing (Buchecker & Degenhardt, 2015; Carrus et al., 2015; Tomao, Secondi, Corona, Carrus, & Agrimi, 2016; White, Pahl, Wheeler, Depledge, & Fleming, 2017, Olafsdottir, 2020). The latest Monitor of Engagement with the Natural Environment (MENE) survey (2018/2019), measures how people use the outdoors. The survey is funded by Natural England (2020) supported by Defra (2020). According to their latest survey (2018-2019) more people are visiting the outdoors than ever before, with an estimated increase from 54% to 65% of adults visiting the outdoors at least once a week over the last decade. Interestingly, health and physical activity is stated as the most common reason for visits (MENE, 2018/2019). Boyd, White, Bell and Burt (2018) analysed the first six waves of the data from the MENE study from 2009/2010 to 2015/2016 and reported that time constraints, contextual factors, such as poor health and bad weather, level of preference to be outdoors and a lack of interest predicted infrequent utilisation of the outdoors. Similarly, pooled data from a clinical trial of seventy-eight families engaged in park prescriptions (Razani, Hills,

Thompson & Rutherford, 2020) demonstrated that knowledge of nearby parks, valuing nature, and the time and money available to visit a park, predicted the likelihood of park visits. Studies have implications for those designing outdoor interventions to promote engagement in those who are not currently engaged yet benefit the most (e.g. those in poor health). Findings also uncover an ideal target population of those individuals most likely to engage in outdoor interventions and therefore reap the benefits. For example, those individuals who have more time available, are unemployed and have an intrinsic interest in the outdoors may form an ideal target population. Additionally, insight into knowledge attitudes and perceived barriers can inform future interventions to promote access to outdoor spaces. However, the studies reviewed within this section were reliant on self-reports, making them prone to bias, findings must therefore be interpreted with caution. Despite methodological limitations, research demonstrating the positive health and wellbeing outcomes associated with access and engagement in the outdoors has been influential in policymaking. Recent changes in policy range from local pilot projects to national government schemes (e.g. The Northern Forest, 2020 case study, table 2.1). The Northern Forest initiative contributes to the Government's New 25 Environment Plan (2018) (table 2.2). On a local level, Liverpool City Region builds upon the Government's 25 Year Environment Plan with the recent launch of Liverpool's Year of the Environment 2019 (yoe2019lcr, 2020) table 2.3). These schemes initiated since the data collection and analysis within this PhD, demonstrate the currency of the PhD's findings and its importance in informing local to wider national policy making. Although varied, in terms of aims and scope, each initiative shares key objectives of improving the health and

wellbeing of the population, from a community to a national level, by encouraging accessibility and engagement in the natural environment. However, there are no suggestions as to how the increased accessibility will promote the use of the outdoors and overcome barriers to promote health and wellbeing. Furthermore, there are no proposed measures to evaluate the impact of these schemes on the health and wellbeing of the surrounding communities or results to date regarding impact. The success of these initiatives cannot therefore be interpreted at this stage. In light of the multitude of health and wellbeing outcomes associated with engagement in the outdoors, it is perhaps not surprising that many outdoor interventions are specifically levered to produce positive health outcomes (e.g. increased physical fitness, alleviating symptoms associated with LTCs) discussed next.

<p>Table 2.1. <i>Case Study of Evidence Influencing Policy: The Northern Forest</i></p> <p><u>Aims</u></p> <ol style="list-style-type: none"> 1) To plant 50 million trees in and around cities of Liverpool, Manchester, Leeds, Sheffield and Hull 2) Provide economic benefits through biomass and timber production, creating attractive places to live, work and invest 3) Improve health and wellbeing through street trees to decrease incidences of childhood asthma and respiratory diseases as well as improving physical activity with greater access to woodland areas 4) To provide opportunities for recreation, tourism and leisure <p><u>Partnerships and Collaborations:</u> Community forests including The Mersey Forest, White Rose Forest, City of Trees and HEYwoods work in partnership with The Woodland Trust</p> <p><u>Funding:</u> £50 million investment over 25 years. Support to come from a range of sources, including the community forests and the Woodland Trust. The government’s support is included in Defra’s new 25-year plan for the environment in the UK of £5.7 million.</p> <p><u>Evaluation Results:</u> No evaluation results to date but social, economic and environmental benefits are estimated to generate £2.5bn of positive outcomes and a predicted return of five times on investment.</p> <p><u>Strengths:</u> The scheme utilises a range of evidence to date spanning a range of disciplines to inform development. The initiative seeks expertise from partners to deliver the Northern Forest across local communities and address the wider determinants of health</p> <p><u>Limitations:</u> There is no evidence to date surrounding positive outcomes. It emphasises that although green space is conducive to physical activity leading to improved health and wellbeing, barriers exist (e.g. inaccessibility, safety fears) yet does not propose solutions to overcoming them.</p> <p><u>Relevance to Nature4Health Interventions:</u> The Mersey Forest is working with the Woodland Trust to create and deliver The Northern Forest. The scheme utilises the local woodland areas and green spaces through promoting engagement their Nature4Health interventions to influence proposed health and wellbeing benefits</p> <p><u>Website Link:</u> https://www.woodlandtrust.org.uk/about-us/woodland-creation/the-northern-forest-our-vision/</p>
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Table 2.2.

Case Study of Evidence Influencing Policy: The Government's New 25 Environment Plan

Aims

- 1) Improving air, water quality, plants and wildlife
- 2) Reducing the risk of harm from environmental hazards (e.g. flooding, drought)
- 3) Utilising resources from nature more sustainably and efficiently
- 4) Enhancing the beauty, heritage and engagement with the natural environment.

Partnerships and Collaborations: Larger environmental delivery bodies in the Defra Group have taken responsibility for 14 areas with their own Area Integrated Plan (a joint statement of intent between the Environment Agency, Natural England and the Forestry Commission) proposed to develop into natural capital plans. These plans will be aligned with the 25 Year Environment Plan.

Funding: Funding has been resourced through subsidies and grants from government and the EU, the Heritage Lottery Fund (HLF) and philanthropic foundations, as well as local authorities, environmental organisations and private sector investment.

Evaluation Results: No data is available to date but an integrated monitoring and evaluation framework is proposed to assess the impact of the plan. Reflexive learning environments are proposed to influence knowledge frameworks acquiring evidence from current interventions to inform future ones.

Strengths: Collaborates with a wide range of partner organisations to address multiple aims and seeks to evaluate progress and impact to influence the plan's future delivery

Limitations: Fails to address how physical and mental health outcomes will be evaluated

Relevance to Nature4Health Interventions: The plan recognises the impact of The Mersey Forest's tree planting schemes, argued to encourage more people to access the natural environment. The Nature4Health programme helps to facilitate engagement via outdoor interventions it provides. The plan's commitment to connect people with the environment to improve health and wellbeing includes a focus on linking mental health services with environmental therapies in green spaces, a shared aim of The Mersey Forest with their Natural Health Service in Cheshire.

Website Link: <https://www.gov.uk/government/publications/25-year-environment-plan>

Report Link:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

Table 2.3.

Case Study of Evidence Influencing Policy: Liverpool's Year of the Environment 2019

Aims

- 1) To leave a better environment for the next generation to inherit
- 2) To make Liverpool one of the best places in the country to live, work and flourish
- 3) Support the National Year of Action and deliver the Greenest UK city region
- 4) Highlight the economic contribution the environment provides
- 5) Increase children and young people's connection to nature
- 6) Use 2019 as a catalyst for ongoing positive environmental behaviour

Partnerships, Collaborations and Funding: Partners and funders include Nature Connected, Liverpool City Region, The Environment Agency, Natural England, The Mersey Forest, Liverpool John Moores University and local councils to name a few.

Evaluation Results No evaluations conducted to date.

Strengths: Plan hosts local events to include local residents within the plan and promotes the adoption of pledges for local residents to contribute individually to The Year of Environment.

Limitations: The plan fails to provide information on evaluation of impact.

Relevance to Nature4Health Interventions: The Year of Environment promotes the Natural Health Service and the use of Nature4Health programmes as a way to improve people's health and wellbeing.

Website Link: <http://yoe2019lcr.org.uk/>

Report Link: <http://yoe2019lcr.org.uk/index.php/mdocuments-library/>

2.3. Outdoor Interventions Targeted Towards Improving Health

A diverse array of positive health outcomes are associated with engaging in the outdoors, as previously discussed. This evidence has influenced changes within policy to encourage engagement in the outdoors as a means to promote people's health. In Natural England's Links between Natural Environments and Physiological Health Evidence Briefing (2016), evidence surrounding the outdoors and health benefits was reviewed in conjunction with statistics surrounding the nation's declining health, having implications for future policy and decision-making. The briefing emphasises the importance of good quality outdoor spaces provided close to residential areas to encourage physiological health improvements.

The briefing further encourages planners and developers to consider the role of outdoor natural spaces on physiological health outcomes. However, policy changes influencing the provision of outdoor spaces, is not confined to residential areas. Over the last decade the Centre for Sustainable Healthcare has recognised the potential for outdoor spaces in improving health in clinical health settings, leading to the development of the NHS Forest, which began in 2009 (table 2.4).

<p>Table 2.4. <i>Case Study of Evidence Influencing Policy: NHS Forest (2009)</i></p> <p><u>Aims</u></p> <ol style="list-style-type: none"> 1) To improve the health and wellbeing of staff, patients and the surrounding communities through increasing access to green space within and around NHS land 2) Encourage social cohesion between NHS sites and surrounding communities 3) Deliver projects to encourage collaboration between professionals and volunteers and utilise woodland for art, food crops, reflective or exercise spaces 4) Encourage the use of green space for therapeutic purposes <p><u>Partnerships, Collaborations and Funding:</u> The NHS Forest is coordinated by the Centre for Sustainable Healthcare (2019) and sponsored and funded by The Forestry Commission (2019) and Natural England (2019). Delivery partners include The Conservation Volunteers (TCV, 2019) and The Wildlife Trusts (2019).</p> <p><u>Evaluation Results:</u> The NHS Forest collates and highlights research findings from existing studies of the positive health and wellbeing outcomes of engaging in the outdoors. No specific outcomes on the NHS Forest scheme are reported to date however.</p> <p><u>Strengths:</u> The green Health Routes programme collaborates with healthcare practitioners to encourage patients to access local greenspaces. The initiative combines maps, leaflets, walking groups to be offered as a ‘green prescription’.</p> <p><u>Limitations</u> A lack of accompanying evaluation studies means that the effectiveness of the NHS Forest cannot be determined:</p> <p><u>Relevance to Nature4Health Interventions:</u> The scheme seeks to target the general population with a particular interest in targeting the vulnerable and ‘hard to reach’ groups. It encourages the involvement the multidisciplinary input from facilitators and health professionals to get involved in the delivery of the outdoor interventions</p> <p><u>Website Link:</u> https://nhsforest.org/</p>
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While the utilisation of outdoor spaces holds promise in improving people’s health, the provision of outdoor spaces do not predict their utilisation for health purposes in all cases (e.g. Boyd et al, 2018). This is where formally delivered and targeted outdoor intervention schemes to improve health are warranted. The Local Government Association (LGA)

(2020) has piloted ‘green prescriptions’ across local authorities within the UK, examples include ‘A Dose of Nature’ (table 2.5).

<p>Table 2.5. <i>Case Study of Evidence Influencing Policy: A Dose of Nature (2015-2016)</i></p> <p><u>Aims</u> 1) To identify ways in which nature can be utilised to benefit people with LTCs 2) To collaborate with health professionals to achieve the previous aim</p> <p><u>Partnerships, Collaborations and Funding:</u> The scheme is funded by the Natural Environmental Research Council (2019) and the Valuing Nature Programme (2019) and further supported by Cornwall Council (2019). The scheme involved six pilot projects involving partnerships with GP surgeries and communities to provide nature-based activities to patients to improve their health and wellbeing A consortium of partners are involved in delivering the outdoor interventions. Outdoor interventions range from art in nature, games, physical activity, group sharing and carrying out conservation tasks. All activities have a common emphasis of facilitating deeper engagement with nature.</p> <p><u>Evaluation Results</u> The scheme reported 64 patient referrals, 48 patients completing 10 to 12 weeks of nature-based activities and an average increase of 69% of self-reported wellbeing.</p> <p><u>Strengths:</u> Evaluation results have informed best practice guidelines for Nature Prescriptions for Chronic Health Conditions (2015) Guidelines inform future practice based on real examples of outdoor interventions</p> <p><u>Limitations:</u> While such evidence is promising, this pilot study involved a small sample size meaning that findings cannot be generalised</p> <p><u>Relevance to Nature4Health Interventions:</u> The pilot adopts a collaborative approach between healthcare providers and a consortium of outdoor intervention delivery partners to achieve positive health and wellbeing outcomes. The pilot also utilises evaluation findings from initial pilot studies to inform and develop best practice guidelines.</p> <p><u>Report Link:</u> https://docs.wixstatic.com/ugd/0fad7c_5434cbe18dfa415daec0907c8724ae13.pdf</p>

A Dose of Nature provided eight nature-based interventions for health and wellbeing across Bristol, Exeter and locations throughout Cornwall. GPs referred patients to 12 weekly 2-3 hour nature-based interventions from 2015-2016. Initial findings have revealed improved wellbeing and reduced anxiety. Participants also signed up for future activities

on completion of the 12 weeks of nature-based activities. Successful delivery components included the effective engagement of the health and environmental sector partners, flexible delivery formats tailored to all stakeholders and participants needs and the skills of the practitioner relevant to the group taking part (Bloomfield, 2017). These initiatives allow General Practitioners to prescribe nature-based interventions to improve and maintain patient's health and wellbeing. Green prescriptions, therefore, form a method of social prescribing, interlinking with national strategies, such as the more recent NHS Long Term Plan (NHS, 2019) allowing patients to take control of their own health and wellbeing by utilising the natural environment and links within the community. Advantages of such schemes include improved health and wellbeing, the reduction of health inequalities and ultimately alleviating the financial burden faced by the NHS (Robinson & Breed, 2019). While the evidence surrounding positive health and wellbeing outcomes associated with engaging in outdoor interventions is plentiful, there has been less clarity as to why and how these outcomes have been achieved. Future studies need to ascertain what works best for whom, in what context, where and when (Lovell, Depledge & Maxwell, 2018).

This section has discussed outdoor interventions targeted at improving health through facilitating access to outdoor spaces and delivering programmes targeted to those with poor health. Many outdoor interventions aiming to improve health do this through engaging people in physical activity in the outdoors, discussed throughout the next section.

2.4. Physical Activity in the Outdoors

Physical activity is defined as:

‘any bodily movement produced by skeletal muscles that requires energy expenditure.’

(Caspersen, Powell & Christenson, 1985, p.126).

According to the Chief Medical Officer (2019) recommendations, adults should aim for 150 minutes of moderate intensity physical activity (e.g. brisk walking or cycling) or 75 minutes of vigorous physical activity (e.g. running) or a combination of both each week. The guidelines further suggest being physically active every day and breaking up sedentary time with physical activity when possible (Department of Health and Social Care, 2019). Engaging in physical activity is associated with an array of well-documented health outcomes. Associated outcomes include the reduced risk of cardiovascular diseases (e.g. Dohrn, Kwak, Oja, Sjöström, & Hagströmer, 2018, Oja et al., 2018; Stamatakis et al., 2018; Verboven et al., 2019; Ismail et al., 2020), diabetes (e.g. Garcia, Cox, & Rice, 2017; Yerramalla et al., 2020) and certain cancers (e.g. Motkova et al., 2019; Verboven et al., 2019; Matthews et al., 2020). The inclusion of physical activity in outdoor interventions therefore provides a potential mechanism to explain the associated health and wellbeing outcomes gained. This type of physical activity, is often referred to as ‘green exercise’ as it often takes place in green spaces or within the natural environment, defined as *‘activity in the presence of nature.’* (Barton & Pretty, 2010, p. 3947). Green exercise is argued to break down perceived barriers, including intimidating gym atmospheres and lack of confidence in operating gym equipment (Barton & Pretty, 2010). The outdoor spaces in which green exercise takes place also offers an informal setting for physical activity and

increases opportunities for social interaction (Barton & Pretty, 2010). Outdoor spaces are also suggested to promote, facilitate and enhance the health and wellbeing benefits of physical activity in a number of ways, discussed within the next subsections.

2.4.1. Outdoor Spaces Promote Physical Activity

Firstly, it is well documented that access to the outdoors has been found to promote physical activity (White et al., 2016; Sugiyama, Carver, Koocharsi & Veitch, 2018). Calgouri and Elliot (2017) examined the motivations of 2168 Norwegian adults engaging in physical activity in the outdoors. The convenience of using outdoor spaces was reported as the most common motivation for physical activity in the outdoors, while experiencing nature was rated as the second priority. The preference for experiencing nature was particularly prevalent among older adults. It is important to understand such motivations to engage in physical activity in the outdoors for its future promotion. Findings must also be viewed in context, however, as Norwegians are renowned for their enthusiasm for the outdoors (Calgouri, 2016), which may explain the high importance attributed to nature experiences within this sample.

2.4.2. Lower Perceived Effort Associated with Physical Activity in the Outdoors

In addition to promoting physical activity, evidence suggests that engaging in physical activity in the outdoors is perceived as easier than physical activity in indoor environments (Focht, 2009; Akers, 2012). Akers (2012) explored the impact that colour has upon mood and perceived exertion when exercising in the natural environment. Within this study,

participants cycled for five minutes in three different simulation conditions. In one condition, cyclists were required to cycle while viewing an unedited video (predominantly showing green foliage). The second condition showed the same video with a red filter and the third condition contained no colour. Although the video images were identical apart from the colour, the rate of perceived exertion decreased and mood ratings increased in the normal, non-filtered image, compared to the other two conditions. The results suggested that the colour 'green' might be a vital factor in the positive outcomes associated with 'green exercise'. However, due to the studies completion in laboratory settings, resulting in limited ecological validity, findings cannot be applied to real world settings.

2.4.3. Wider Psychosocial Outcomes Associated with Physical Activity in the Outdoors

Finally, physical activity in the outdoors has been found to demonstrate greater and more diverse health and wellbeing outcomes than exercise conducted in alternate environments (e.g. urban, indoor) (Aspinall, Mavros, Coyne & Roe, 2015; Fruhauf et al., 2016; Araujo et al., 2019; Manfredelli et al., 2019). Fruhauf et al., (2016) compared experiences of outdoor exercise, indoor exercise and sedentary behaviour in patients with mild to moderate depression. Findings illustrated significantly greater improved mood following outdoor physical activity compared to indoors and sedentary conditions. Targeting outdoor interventions and evaluating their effectiveness in those who may benefit more (e.g. those with mental health conditions) is vital in demonstrating how outdoor interventions may improve such conditions. A variety of outdoor interventions are provided to improve health

and wellbeing through physical activity, walking outdoor interventions provide some key examples.

2.4.4. Walking Interventions

Walking is recommended as one of the best forms of exercise (NHS, 2020) due to its ease, accessibility, cost-effectiveness and abundant positive health and wellbeing benefits.

Walking ranges from recreational walking, as a means to commute, to walking interventions designed to target specific health and wellbeing outcomes. Recreational walking can be undertaken individually or delivered in groups through organisations (e.g. Ramblers, 2020). Targeted walking interventions include ‘health walk’ schemes, e.g. Walking for Health (2020) which began in 2000 (table 2.6). A systematic review by Hanson and Jones (2015) found that walking groups were associated with wide-ranging health benefits. Physiological measures showed significant reductions in mean difference for systolic and diastolic blood pressure, resting heart rate, body fat, body mass index (BMI) and cholesterol. Significant increases in VO₂max and self-reported physical functioning scores were also reported. The delivery of tailored walking interventions targeting specific populations’ (e.g. young mothers, those with LTC’s have also been found to bring people together who have shared interests as well as encouraging social support (e.g. McInnes, Dickson & Barclay, 2017). Targeting these populations also allows facilitators to tailor their delivery of interventions to gain outcomes perceived as most helpful to those engaged. However, a lack of socioeconomic information of participants means that less is known about the social characteristics of those accessing those groups. It could therefore be argued that these groups may be accessed by more affluent groups, both

in social and health aspects, meaning that health inequalities are inadvertently increased (Marmot, Allen & Goldblatt, 2010).

<p>Table 2.6. <i>Case Study: Evidence Influencing Policy: Health Walk Schemes: Walking for Health (2000)</i></p>
<p><u>Aims</u></p> <ol style="list-style-type: none">1) To promote active lifestyles and enable people to prevent and manage long-term physical and mental health conditions2) To provide accessible, walks suit all abilities and targeted to those people with more sedentary behaviour and LTC's3) To tailor and target walks to those affected by specific LTC's, such as cancer, as a means to support recovery <p><u>Partnerships, Collaborations and Funding:</u> England's largest network of health walk schemes is run in partnership with the Ramblers (Ramblers, 2020) and Macmillan Cancer Support (Macmillan Cancer Support, 2020).</p> <p><u>Evaluation Results:</u> France et al., (2016) reported significant short-term overall increase in levels of weekly physical activity among participants at baseline. The psychosocial impact of the scheme included improved general wellbeing, less feelings of loneliness, and improved social interaction. Physical activity was not sustained at 8-month follow-up Social aspects and the opportunity to socially interact were also reported as important factors for participants</p> <p><u>Strengths:</u> The scheme utilises independently conducted evaluations to examine the effectiveness of walking interventions as well as evaluating long-term effectiveness via 8-month follow-ups.</p> <p><u>Limitations:</u> Initial data was collected after the first session rather than prior to initiation of the scheme meaning a true baseline score of participant's health and wellbeing could not be gained</p> <p><u>Relevance to Nature4Health Interventions</u></p> <p>Walking for Health outdoor interventions form one of the outdoor interventions delivered within the Nature4Health project.</p> <p><u>Website Link:</u> https://www.walkingforhealth.org.uk/</p> <p><u>Report Link:</u> http://www.walkingforhealth.org.uk/sites/default/files/HCP_walkingworks_download.pdf</p>

2.4.5. Nordic Walking

More specifically, Nordic walking groups have become an increasingly popular way to improve health, with organisations such as Nordic Walking UK (Nordic Walking UK, 2020) and British Nordic Walking (2020). Nordic Walking involves using poles, stated to mobilise the upper body muscles and propel the walker forward. Greater physical endurance is associated with this activity and the support given by the poles means that

walkers perceive the activity to be easier (Nordic Walking UK, 2020). Qualitative studies have shown a number of psychosocial benefits of Nordic walking (e.g. Fischer et al., 2015; O'Donovan & Kennedy, 2015; Zurawick, 2020). Nordic walking has also been beneficial when targeted to elderly populations (Bullo et al., 2018; Gomeñuka et al., 2020). Nordic Walking is also effective as an adjunct intervention for those with specific health conditions, such as rheumatic diseases (Domaille et al., 2019), Parkinson's disease (Cugusi et al., 2015; Monteiro et al., 2017; Warlop et al., 2017; Zhou, Gougeon & Nantel., 2018), cancer (Fields, Richardson, Hopkinson, & Fenlon, 2016; Fischer et al., 2015; Cunningham, Weaver, Lemonde, Dogra & Nonoyama, 2020), type 2 diabetes (Sentinelli et al., 2015) and arthritis (O'Donovan & Kennedy, 2015; Balazova & Cernakova, 2018). A systematic review by Bullo et al (2018) examined the effects of Nordic Walking on physical fitness, body composition, and quality of life in the elderly. Results demonstrated improved dynamic and functional balance, as well as increased muscle strength of upper and lower limbs. Participants also gained increased aerobic capacity and improved cardiovascular outcomes. Study findings support Nordic Walking as a safe and accessible form of aerobic exercise for the elderly population, which is effective in improving cardiovascular outcomes, muscle strength, balance ability, and quality of life. Such findings hold promising implications for falls prevention interventions in the frail elderly populations. Falls are a common and serious health issue for older people in England, with around a third of people aged 65 and over and approximately half of people aged 80 or over experiencing at least one fall a year (Public Health England, 2018). The causes of falls are multifactorial but include muscle weakness and poor balance (Public Health England,

2018), both found to have improved with through Nordic walking, highlighting this as a potential preventative adjunct intervention for this population within falls prevention services. However, careful consideration must be taken into the settings and accessibility of Nordic Walking sessions, so that the location of the sessions is accessible to those with poor mobility.

2.4.6. Conservation Volunteering and Green Gyms

Conservation volunteering, or environmental volunteering, has been found to improve health and wellbeing through physical activity in the outdoors (e.g. Lovell, Husk, Cooper, Stahl-Timmins, & Garside, 2015; Molsher & Townsend, 2016; Sánchez, Macías and Galdós, 2016; Coventry, Neale, Dyke, Pateman, & Cinderby, 2019; Gagliardi et al., 2020). Conservation volunteering encourages participants to be physically active, connect with nature and socialise (Gooch, 2005). Conservation volunteering covers a range of activities, including environmental monitoring, ecological restoration as well as educating others about the natural environment. The Conservation Volunteers (TCV) are the largest provider of conservation volunteering in the UK, facilitating ‘Green Gym’ interventions. The TCV’s Green Gyms have become increasingly widespread, with a 500% increase since 2011 in urban areas (table 2.7). However, a systematic review by Lovell et al (2015) argued that studies evaluating conservation activities contain inadequate detail of the interventions been studied, meaning that findings cannot be attributed to the delivery style

or specific components within the sessions. These findings emphasise the need for transparency and more detailed reporting of interventions delivered. While positive wellbeing outcomes are frequently associated with access, engagement and physical activity in the outdoors, the subsequent section outlines those outdoor interventions specifically designed and delivered to target and improve wellbeing, often known as ‘outdoor therapy’.

<p>Table 2.7. <i>Conservation Volunteering: TCV Green Gyms (2011)</i></p> <p><u>Aims</u></p> <ol style="list-style-type: none"> 1) To promote health and wellbeing by connecting people with green spaces 2) To deliver lasting positive outcomes for the natural environment and people 3) To encourage social cohesion, combatting loneliness and enhancing employment prospects 4) Deliver practical solutions to the ‘real-life’ challenges people face 5) Providing people with a sense of purpose and belonging 6) Empowering people to take control of their lives and outdoor spaces for the benefit of all. 7) Adopting an inclusive approach <p><u>Partnerships, Collaborations and Funding:</u> The TCV is supported by local and national government, lotteries, private organisations, charities, trusts and landowners.</p> <p><u>Evaluation Results:</u> Sánchez, Macías and Galdós (2016) found improvements in those with significant mental health conditions, including personal growth and increasing environmental awareness, after 6 months of engaging in conservation volunteering</p> <p><u>Strengths:</u> Valued by General Practitioners, who prescribe Green Gyms to patients</p> <p><u>Limitations:</u> Studies contain inadequate detail of the interventions being studied, meaning that findings cannot be attributed to the delivery style or components within the delivery. Limitation emphasis the need for transparency and more detailed reporting of interventions delivered.</p> <p><u>Relevance to Nature4Health Interventions</u> Utilises one outdoor intervention adopted within the delivery of the Nature4Health project</p> <p><u>Website Link:</u> https://www.tcv.org.uk/greengym</p>

2.5. Outdoor Interventions Aiming to Improve Wellbeing

The broad scope of outdoor ‘therapy’ interventions or those aiming to be therapeutic range from preventative wellbeing interventions through to more specifically targeted treatment interventions. Preventative outdoor interventions are usually aimed at improving wellbeing and reducing risk factors of mental illness (e.g. poverty, neglect, isolation) and enhancing

protective factors, positively associated with wellbeing (e.g. physical activity, social interaction). Prevention strategies include universal, as well as specific targeted approaches (Mental Health Foundation, 2016). While universal interventions target the entire population, targeted treatment approaches address those groups deemed to be at high risk or those showing early signs of specific mental health conditions (Regan et al., 2016). Interventions aimed at improving wellbeing range from those found to improve wellbeing as secondary outcomes (e.g. allotments/community gardening) to those with clearly defined therapeutic aims, specifically targeted at those who would benefit most, with defined delivery and evaluation frameworks (e.g. Ecotherapy, Outdoor Therapy, Adventure Therapy, Wilderness Therapy). This section outlines the variety of outdoor therapy interventions across this spectrum.

2.5.1. Ecotherapy

Ecotherapy is described as:

"the healing and the growth that is nurtured by healthy interaction with the earth"

(Clinebell, 1996, p. xxi)

Ecotherapy seeks to reconnect the individual with the natural environment, considered central to wellbeing. Ecotherapy focuses on nature's ability to nurture us, through contact with nature, and an individual's ability to reciprocate this healing connection through our ability to 'nurture nature' (Jordan, 2015). Definitions of Ecotherapy and their delivery formats can differ greatly depending upon context. For example, ecotherapy practice in America is typically delivered by a practicing clinician and is described as healing the

human-nature relationship (Buzzell & Chalquist, 2009). In the UK, however, the mental health charity, 'Mind's' Ecotherapy project known as 'Ecominds' defines Ecotherapy as:

'a natural, free and accessible treatment that boosts our mental wellbeing.'

(Mind, 2007, p. 4)

Ecominds was a five-year Lottery-funded scheme running from 2009-2014. Ecominds interventions mainly consisted of group activities with trained professionals with participants, who may or may not have mental health conditions. While some ecotherapy sessions followed a set format, with structured psychological treatments, such as cognitive behavioural therapy (CBT), others were less formal and could not be defined as 'therapy' in terms of their delivery but 'therapeutic' due to their effectiveness in improving wellbeing (Mind, 2007) (table 2.8). Ecotherapy has also been shown to enable participants to feel more integrated within their local community, learn new skills and develop new interests (Bragg, Wood, & Barton, 2013), as well as increase confidence and self-esteem (Wilson, 2009, Wilson et al. 2011). Although a variety of positive health and wellbeing outcomes are associated with Ecotherapy, the varying descriptions of the Ecotherapy practice within each study pose challenges in collating evidence surrounding the effectiveness of Ecotherapy in a robust scientific way (e.g. in a systematic review).

More specifically targeted schemes include 'Branching Out' (Wilson, 2009) piloted by Forestry Commission Scotland in 2007, provided conservation and outdoor spaces, on referral for adults with mental health conditions in the Greater Glasgow area. Branching Out utilised a targeted and tailored approach, while combining expertise of those in the

environmental sector with mental health professionals to inform delivery and gain specific wellbeing outcomes (see table 2.9).

<p>Table 2.8. <i>Ecotherapy Interventions: Ecominds (2009- 2014)</i></p> <p><u>Aims</u></p> <ol style="list-style-type: none">1) To improve confidence, self-esteem, overall well-being and resilience through ecotherapy interventions2) To provide an accessible, cost-effective and natural addition to existing treatment options, using ecotherapy interventions <p><u>Partnerships, Collaborations and Funding:</u> Through the management of Ecominds (a £7.5 million Big Lottery Fund supported open grant scheme) Mind funded 130 ecotherapy projects including ecotherapy and walking groups.</p> <p><u>Evaluation Results:</u> Ecominds is delivered across England through the Big Lottery Fund. Ecominds interventions have been found to improve physical and wellbeing and increase physical activity. For example, they have been found to enable participants to feel more integrated within their local community, learn new skills and develop new interests (Bragg, Wood, & Barton, 2013).</p> <p><u>Strengths:</u> Reports demonstrate wide-ranging impact with estimates of supporting 12,071 people living with mental health conditions, to engage in outdoor interventions to improve their physical and wellbeing.</p> <p><u>Limitations:</u> A lack of detail is provided, in terms of the design and delivery of outdoor interventions funded through the Ecominds scheme, therefore making evaluation results difficult to attribute to specific delivery components.</p> <p><u>Relevance to the Natural Health Service:</u> Ecominds was also funded by The Big Lottery and funding projects similarly to Nature4Health through their open grants scheme.</p> <p><u>Report Links:</u> https://www.mind.org.uk/media/354166/Ecominds-effects-on-mental-wellbeing-evaluation-report.pdf https://www.mind.org.uk/media/338566/The-Economic-Benefits-of-Ecominds-report.pdf</p>
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Table 2.9.

Ecotherapy Interventions: Branching Out (2007)

Aims

- 1) To improve the quality of life for adults experiencing long term mental health problems and common mental health issues in Greater Glasgow and Clyde.
- 2) To offer greenspace, on referral, as an option to patients and users of mental health services
- 3) To encourage the development of effective partnership working between forestry and health, social care and voluntary service providers

Activities are adapted to suit the client group, site and time of year, and include physical activity (e.g. health walks and tai chi, conservation activities, bush craft and environmental art)

Partnerships, Collaborations and Funding: Branching Out works in partnership with Forestry Commission Scotland, Glasgow City Council, Glasgow and Clyde Valley Green Network Partnership, NHS Greater Glasgow and Clyde, Glasgow Centre for Population Health.

Evaluation Results: Improved health and wellbeing, as well as more specific mental health outcomes, such as increased confidence and self-esteem, have been demonstrated (Wilson, 2009, Wilson et al. 2011). Study demonstrated effectiveness in participants with poorer mental health and lower vitality scores at baseline, showing greater improvements in these scores at follow-up.

Strengths: Branching Out collaborates with the environmental sector and mental health professionals to specifically target and tailor outdoor interventions to those with mental health conditions.

Limitations: Evaluations of Branching Out do not include control groups and so outcomes cannot be compared to more traditional treatments (e.g. talking therapies, drug treatments).

Relevance to the Natural Health Service: Adopts a more specific targeted and tailored approach within Branching Out to target those with mental health conditions rather than the more generic recruitment strategies adopted within Nature4Health.

Website Link: <https://forestry.gov.scot/forests-people/health-strategy/branching-out>

Report Link: <https://forestry.gov.scot/images/corporate/pdf/branching-out-report-2016.pdf>

2.5.2. Horticultural Therapy

Similarly to ‘Ecotherapy’, definitions and delivery formats of horticultural therapy differ considerably depending upon context. In the US, American Horticultural Therapy Association (AHT) defines horticultural therapy as:

“the engagement of a person in gardening and plant-based activities, facilitated by a trained therapist, to achieve specific therapeutic treatment goals”

(AHTA, 2012, p.1.).

Horticultural therapy is therefore an active process, occurring within an established treatment plan, whereby the progression itself is considered to be therapeutic rather than the end outcome. In the UK, however, horticultural therapy is defined as:

“the use of plants and garden work to meet clinically defined goals (a treatment strategy)” (Parr, 2007, p.539)

Key delivery components of horticultural therapy include collective garden work, enacted through social-welfare projects, enabling gardeners to participate in processes of consumption, production and social interaction. Outcomes associated with horticultural therapy, include improved wellbeing in those with mental health conditions (Vujcic, Tomicevic-Dubljevic, Gurbic, Lecic-Tosevski, Vukovic, & Toskovic, 2017; Howarth, Rogers, Withnell & McQuarrie, 2018; Oh, Park & Ahn, 2018; Chu, Chen, Tsai & Chan, 2019; Sui, Kam & Mok, 2020). Horticultural Therapy has also been found to reduce stress (Adevi & Martensson, 2013; Han, Park, & Ahn, 2018), particularly among veterans suffering from Post-Traumatic Stress Disorder (PTSD) (Detweiler et al., 2015; Stowell, Owens & Burnett, 2018). However, studies fail to identify those components within the delivery of interventions, which may account for positive outcomes. Longer-term follow-ups would also be helpful in exploring the sustainability of those reported outcomes.

2.5.3. Nature-Based/Nature Assisted Therapy

In contrast to other approaches mentioned, nature-based or nature assisted therapy specifies nature to have a key role in the therapeutic process, whereby it is a live and dynamic partner within the therapeutic work as well as the setting of the intervention (Berger, 2006; Berger & McLeod, 2006). The shared space of the natural environment is argued to promote a more democratic space to traditional indoor therapy, positively influencing the therapist-client relationship, including greater therapeutic alliance (Berger, 2006). Nature-based (or nature-assisted) therapies are defined as:

“an intervention with the aim to treat, hasten recovery, and/or rehabilitate patients with a disease or a condition of ill health, with the fundamental principle that the therapy involves plants.” (Annerstedt & Wahrborg, 2011, p.372)

Following a similar trend to the above-mentioned outdoor therapy interventions, there is no distinct definition of nature-based or nature-assisted therapy accepted throughout the field (Sahlin, Matuszczyk, Ahlborg, & Grahn, 2012). Nature-assisted or nature-based therapy involves an interaction between a specially designed or specially chosen place and therapeutic intervention with a multi-professional team specifically selected for the target group (Stigsdotter, Palsdottir, Burls, Chermaz, Ferrini, & Grahn, 2011). This approach suggests a more tailored and targeted approach, unlike previous more generic definitions of ecotherapy and horticultural therapy. In Sweden, the use of nature-based therapy is a well-established treatment for patients with mental health conditions (Adams & Morgan, 2018), stress-related illness (Sahlin et al., 2015). Nature-based therapy has also been effective in

increasing general wellbeing in those with health conditions (Trostrup, Christiansen, Stolen, Nielson, & Stelter, 2019).

2.5.4. Adventure Therapy

In contrast, Adventure therapy is:

“the prescriptive use of adventure experiences provided by mental health professionals, often conducted in natural settings that kinaesthetically engage clients on cognitive, affective and behavioural levels” (Gass, Gillis, & Russell, 2012, p.1).

It is difficult, however, to provide a definition that incorporates all the work considered ‘adventure therapy’ as a continuum exists between therapeutic adventure and adventure therapy. Adventure therapy is closely related to a variety of other terms, including wilderness therapy (discussed next), wilderness adventure therapy, adventure based counselling and outdoor behavioural healthcare to name a few (Bowen & Neill, 2013). Key characteristics which differentiate adventure therapy from other outdoor therapy interventions include the emphasis on learning through experience, the presence of, and interaction with nature. Adventure therapy also utilises perceived risk to heighten arousal and to create positive responses to stress, meaningful engagement and a solution-based focus on positive change (Bowen & Neill, 2013). Adventure therapy has gained the most evidence when targeted to young people perceived to be ‘at risk’ or displaying ‘delinquent’ behaviour (Gass & Gillis, 2010; Van Rensburg & Reynek, 2019), those with behavioural or emotional issues (Dobud, 2016), or affected by abuse (Norton, Tucker, Farnham-Stratton, Borroel & Pelletier, 2019). Due to this targeting of adventure therapy

interventions, the aims, design and evaluation can be tailored according to the target population and adapted to their needs. A consequence of such specific target groups, however, means that the applicability of adventure therapy cannot be generalised to wider populations. A meta-analytic review of 197 adventure therapy studies sought to identify empirical outcome studies and analyse the short and long-term effects compared to alternative and control groups (no treatment group) and examine the relationships between participant outcomes (Bowen & Neill, 2013). The review also aimed to identify possible sample, programme, and participant moderators. The results demonstrated adventure therapy to be moderately effective in facilitating positive short-term change in psychological, behavioural, emotional, and interpersonal domains, which appeared to be maintained in the longer-term. These effect sizes for adventure therapy were greater compared to alternate treatment and control groups across three time comparisons (base-pre, pre-post, and post-follow-up). Age positively predicted these outcomes with greater outcomes associated with older participants. Overall, the findings provide the most robust meta-analysis of the effects of adventure therapy with an effect size of approximately .5, advised to be adjusted according to the age group. Limitations of this meta-analysis, however, include the fact that while the majority of studies utilised psychometrically validated assessment tools, several studies used less well-developed measures. These inconsistencies are likely to limit the reliability and validity of findings. Psychometrically validated assessment tools should therefore be adopted and reported in future studies to better understand the considerable variability in adventure therapy outcomes.

2.5.5. Wilderness Therapy

Similarly to adventure therapy, wilderness therapy has been successfully targeted towards at-risk youths or those displaying delinquent behaviour (Paquette & Vitaro, 2014) and substance abuse (Margalit & Ben-Ari, 2014; Conlon, Wilson, Gaffney & Stoker, 2018). Wilderness therapy is a group treatment modality in mental health care aiming to enhance the restorative qualities of nature, combined with structured and intentional individual and group-based therapeutic work (Berman & Berman, 2008). Wilderness therapy has been associated with improved wellbeing (Bettmann, Tucker, Behrens, & Vanderloo, 2017; Gabrielsen & Harper, 2018) and increased self-esteem and self-efficacy (Margalit & Ben-Ari, 2014). However, few studies measure long-term outcomes (Margalit & Ben-Ari, 2014; Paquette & Vitaro, 2014). The effectiveness of the intervention cannot therefore be extended to when participants have left the structured and supportive wilderness therapy environment and returned to their everyday lives.

2.5.6. Reported Wellbeing Outcomes Influencing Policy

In light of the multitude of positive wellbeing outcomes, the ‘Links between Natural Environments and Mental Health: Evidence Briefing’ (2016) proposed larger studies with longer-term follow-ups to evaluate the effectiveness of outdoor interventions as wellbeing interventions. The report also argues a need to better understand the causal pathways and mechanisms influencing such outcomes. Natural England report NECR228 (Bragg & Leck, 2017) suggests nature, health and wellbeing sector organisations (e.g. Green Care Coalition, TCV, Care Farming UK, Thrive and Groundwork) should collaborate to support

the expansion of nature-based interventions within social prescribing. The report calls for organisations to develop promotional resources for CCGs, social prescribing services, link workers and patients, while encouraging nature-based interventions utilisation in social prescribing and the healthcare sector.

It is clear that a vast array of health, wellbeing and social outcomes have been associated with engagement in the outdoors. Positive outcomes are associated with a broad spectrum of engagement styles, from the mere presence of the outdoors to accessing or engaging in the outdoors. Engagement can include outdoor recreation to participating in targeted outdoor interventions aimed at promoting physical activity, improving health or wellbeing. Less is known, however, about the reasons or underlying mechanisms responsible for the vast array of health and wellbeing outcomes associated with engaging in the outdoors. The following section highlights theoretical explanations as well as those underlying mechanisms potentially involved in gaining associated health and wellbeing outcomes.

2.6. Theoretical Explanations for Health and Wellbeing Outcomes Associated with the Outdoors

Several theories have claimed how connecting with nature and the outdoors is essential for human survival and driven by an evolutionary process within our brain chemistry (Jordan, 2015). A popular theory is the Biophilia Hypothesis (Wilson, 1984), which argues that humans have an innate affiliation and need for connection with nature. This theory suggests that humanity has been shaped cognitively and emotionally over time through interactions with nature (Gullone, 2000) leading to a need and desire to affiliate with life or

lifelike processes (Kellert & Wilson, 1995; Kahn, 1997). This unconsciously expressed emotional bond leads to respect of nature, incorporating awe and wonder, creating a love for life and the complexity of nature (Perkins, 2010).

Nature connectedness, on the other hand, is a subjective and multidimensional construct, formed through individual experiences (Zelenski & Nisbet, 2012; Zhang, Howell & Iyer, 2014), influenced by personal and social factors (Clayton, 2012). The human-nature relationship is guided through perceptions of self and how we form part of the wider natural environment (Vining, Merrick & Price, 2008). Nature Connectedness creates a sense of belonging to the wider natural environment (Mayer, Frantz, Bruehlman-Senecal & Dolliver, 2009) with an appreciation and value of all life (Nisbet et al., 2009). This positive relationship is argued to lead to repeated engagement and fostering of nature connectedness, with associated health and wellbeing outcomes for the individual and the natural environment. This theory is strengthened by the findings reported throughout this review as well as those specifically examining nature connectedness and wellbeing (e.g. Richardson & Sheffield, 2017; Lumber, Richardson & Sheffield, 2018; Richardson & McEwan; Richardson, McEwan & Garnip, 2018; Richardson & Sheffield, 2019). Research surrounding nature connectedness has also led to the development of a mobile app, ‘Shmapped’, designed to collect live wellbeing and location data and promote users to notice nature (McEwan, Richardson & Brindley, 2019). In a recent randomised controlled trial 582 adults used the Shmapped app to notice urban nature or built spaces for seven days (McEwan et al., 2019). Results revealed significant improvements in wellbeing and quality of life in a one-month follow-up, with clinically significant benefits demonstrated

in those with mental health conditions. Enhanced improvements were apparent for those in the urban nature condition, implicating engagement in urban nature as an effective adjunct mental health intervention to clinical treatments (e.g. talking therapies). Limitations of this study included low retention rates at the one-month follow-up. Longer follow-ups would be required to examine the sustainability of wellbeing improvements.

Alternatively, the Psycho-Evolutionary Stress Reduction Theory hypothesises that interacting with nature promotes recovery from stress (Ulrich, 1981) due to positive distractions from stress and encouraging more positive feelings of interest (Ulrich, 1981, 1984). This theory is supported by contemporary literature showing reductions in physiological stress measures (e.g. Song et al., 2014; South, Kondo, Cheney & Branas, 2015).

Whereas the Attention Restoration Theory (Kaplan & Kaplan, 1989; Kaplan 1995) argues for a process, through which humans recover from attentional fatigue through being immersed in the natural environment. The theory defines two types of attention, directed attention and involuntary attention. Directed attention requires mental effort and concentration, which can lead to fatigue over time. The natural environment encourages the use of involuntary attention, which provides opportunities for recovery from mental fatigue (Rogerson & Barton, 2015). Essentially, humans feel connected when their attention is drawn towards something unconsciously while finding it fascinating and/or beautiful. When humans feel connected, they experience positive emotions and the feelings of connectedness, which can grow to change an individual's concept of self to believe that they are merging with an external event, object or place. This theory argues that this

experience leaves humans feeling restored and ready to return to more complex urban environments (Jordan, 2015). This is a philosophy shared within ecotherapy approaches discussed earlier. A systematic review by Ohly et al (2016), however, suggested uncertainty of which aspects of attention may be affected by exposure to natural environments, calling for further studies to clarify mechanisms involved as well as potential key elements responsible.

2.7. Underlying Mechanisms and Processes Underpinning Engagement in Nature

Theoretical explanations are extremely helpful and insightful in understanding the automatic, and predominantly biological processes involved in gaining positive health and wellbeing outcomes through engagement with nature. Further attempts to ascertain how such outcomes are influenced have focused on the complex psychological processes and potential mechanisms involved. Hartig, Mitchell, De Vries and Frumkin (2014) argued that multiple pathways are responsible for the positive health and wellbeing outcomes associated with engaging in the outdoors. Proposed pathways include air quality, physical activity, social cohesion and stress reduction. This research claims that engaging in the outdoors involves all of these pathways, engaged simultaneously. For example, people engaging in the outdoors for restoration must undertake some form of physical activity to do so. Therefore, being active yields greater health benefits over and above the benefits of physical activity in other environments. This argument is strengthened by previously mentioned physical activity outdoor intervention studies, with a range of psychosocial outcomes. This explanation does not dispute earlier theoretical explanations offered. On the contrary, this argument strengthens previous theories, for example, the Attention

Restoration Theory (Kaplan & Kaplan, 1989; Kaplan 1995) implying their involvement in the multiple processes combined.

A review by Husk, Lovell, Cooper, Stahl-Timmins and Garside (2015) reviewing quantitative and qualitative studies and examining the positive health and wellbeing outcomes of environmental enhancement and conservation activities, led to the development of a conceptual framework. The conceptual framework illustrates the range of interlinked mechanisms through which people believe they potentially achieve health and wellbeing outcomes. This framework proposed interlinked mechanisms were responsible for how participants perceived associated positive health and wellbeing outcomes. These interlinked mechanisms included changes in personal or social identity, achievement or contribution, knowledge acquisition, social contact, being away from stressors, restoration or recuperation and physical activity. Additional aspects related to the participants themselves and types of activity, resulting in variations in these mechanisms and perceived outcomes (e.g. type of engagement). Motivation was also emphasised as a separate component and a key factor in explaining how people approached and experienced outcomes, previously neglected to date.

More recently, Cleary, Fielding, Bell, Murray and Roiko (2017) examined the mechanisms between nature connection and 'eudaimonic' wellbeing using the Self-Determination Theory (SDT) as a framework (Ryan & Deci, 2000). The SDT is a macro theory explaining human motivation and personality. According to the SDT, relatedness, competence and autonomy are basic psychological needs. Environments, which support these needs, enhance integrity and eudaimonic wellbeing (Deci & Ryan, 2008).

Eudaimonic wellbeing is concerned with prime psychological functioning, self-realisation and living life in a full and purposeful way (Deci & Ryan, 2008). The first mechanism within the Basic Psychological Needs Theory concerns the potential for nature connection to satisfy the psychological need of relatedness. The second mechanism based within the Goal Contents Theory, explores how nature connection may foster an intrinsic value orientation and gain associated wellbeing outcomes. This theory is strengthened by the finding that nature relatedness has been found to significantly predict wellbeing (Zelenski & Nisbet, 2014) while controlling for other types of connectedness (e.g. family, culture). This theory suggests that nature connectedness may form a type of relatedness, which promotes eudaimonic wellbeing. The Goals Contents Theory of the SDT is concerned with value-orientations and aspirations, providing a further potential mechanism through which nature connection influences wellbeing. Nature connectedness is positively associated with a variety of intrinsic aspirations (e.g. humanitarianism) (Nisbet et al., 2008), kindness (Leary, Tipsord, & Tate, 2008) and empathetic concern (Zhang, Piff et al., 2014). Nature connectedness has also been linked to behaviours indicative of intrinsic aspiration, such as relational emotions, such as love and care (Vinning et al., 2008). This suggests that value orientations and aspirations may also be implicated in the relationship between eudaimonic wellbeing and nature connection.

These more recent explanations begin to consider individual agency in the behaviour of engagement in nature and the psychological processes involved influencing the health and wellbeing outcomes gained. Understanding such behaviour change, mechanisms and

psychological processes is vital to influence engagement in outdoor interventions and encourage positive outcomes.

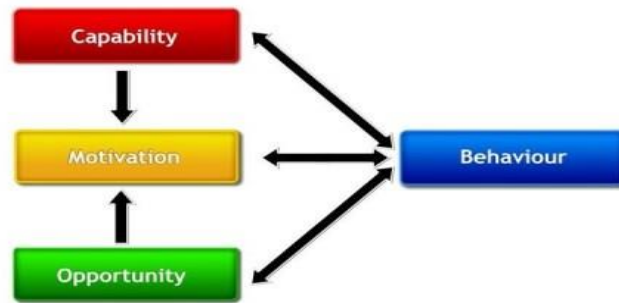
According to the COM-B model, behaviour change is influenced by an individual's assessment of their capability, motivation and opportunities to enable behaviour change (Michie Van Stralen & West, 2011). Capability, opportunity and motivation are argued to be three essential conditions required to facilitate behaviour change. Capability is concerned with the individual's psychological and physical capacity to engage in the behaviour. Motivation relates to the processes, which direct behaviour, including habitual processes, emotional responding and analytical decision-making. This includes reflective processes (evaluations and plans) and automatic processes (emotions and impulses). Whereas opportunity is concerned with all of the external factors, which prompt or make the behaviour possible (Michie Van Stralen & West, 2011). This includes the physical opportunity afforded by the environment as well as the social opportunity. An intervention may therefore change one or more components in the COM-B model. It is therefore essential to firstly understand the behaviour to be changed, in this case attending outdoor interventions, connecting with nature and participating in physical activity to some degree, to then design appropriate outdoor interventions and policy making to support this behaviour by targeting those essential conditions within the COM-B. See figure 2.1 for a diagram of the COM-B Model with arrows illustrating causal links between the components.

The COM-B model is central to the Behaviour Change Wheel (BCW) (Michie Van Stralen & West, 2011). The BCW was formed through a systematic search of electronic databases

and consultation with behaviour change experts, where nineteen frameworks of behaviour change were identified. These frameworks covered nine intervention functions and seven policy categories, which could enable interventions, surrounding the COM-B model. See figure 2.2 of the BCW surrounding the COM-B model.

The BCW asks, what conditions (including internal to individuals and those within their social and physical environment) need to be in place for a specified behavioural target to be achieved and provide a basis for designing interventions targeted towards behaviour change (Michie et al., 2011). More specifically, the model asks what intervention functions need to be in place to change the COM-B conditions and influence behaviour change and which policy categories are required to enable these interventions to occur. The framework also discourages policy makers and intervention designers from neglecting important options, which may be relevant to the behaviour change target. The BCW increases awareness of a full range of interventions and policies important for intervention design, as well as providing a systematic analysis on how to select the appropriate interventions and policies (Michie et al., 2011).

The COM-B model of behaviour



Michie et al (2011) Implementation Science

3

Figure 2.1. The COM-B Model (Michie et al., 2011)

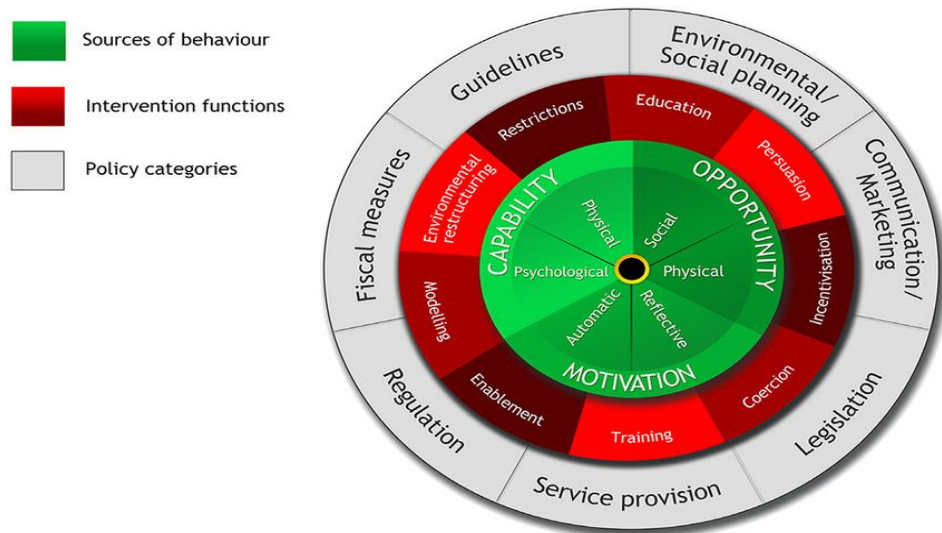


Figure 2.2. The Behaviour Change Wheel (BCW) (Michie et al., 2011)

Similarly, the Theoretical Domains Framework (TDF) also surrounds the COM-B model and provides a more granular understanding of psychological capability and reflective motivational processes. The framework was derived from thirty-three commonly used

behavioural theories containing 128 psychological constructs (Cane et al., 2012). The results identified twelve theoretically distinct domains, each composed of conceptually similar psychological constructs, later altered to fourteen domains (Cane, Connor & Michie, 2012). The TDF was initially developed for implementation research to investigate influences on health professional behaviour related to implementation of evidence-based recommendations (Michie et al., 2005). The TDF provides a theoretical lens to view the cognitive, affective, social and environmental influences on behaviour (Michie et al., 2005). See figure 2.3 for the TDF mapped onto the COM-B Model. The TDF can also be used to identify barriers and facilitators to behaviour change, therefore having further important implications for the design and delivery of outdoor interventions.

Intervention functions and policy categories from the BCW, and domains from the TDF, can be linked to more specific behaviour change techniques (BCTs). BCTs are the observable and replicable components, or active ingredients within the delivery of interventions aimed at changing behaviour (Michie et al., 2011). BCTs include, who delivers the intervention, to whom, in what context, in what format and for how long. Identification of these BCTs is vital to understand how interventions and policy changes influence health related behaviour. A lack of descriptions of these BCTs, however, makes it difficult to synthesise data regarding intervention effectiveness (Michie et al., 2011). The APEASE criteria for designing and evaluating interventions can then be utilised to support the prediction of an intervention's effectiveness. This criteria encourages the intervention designer/evaluator to consider the affordability, practicability, effectiveness and cost-effectiveness, acceptability, side-effects/safety, and equity of an intervention.

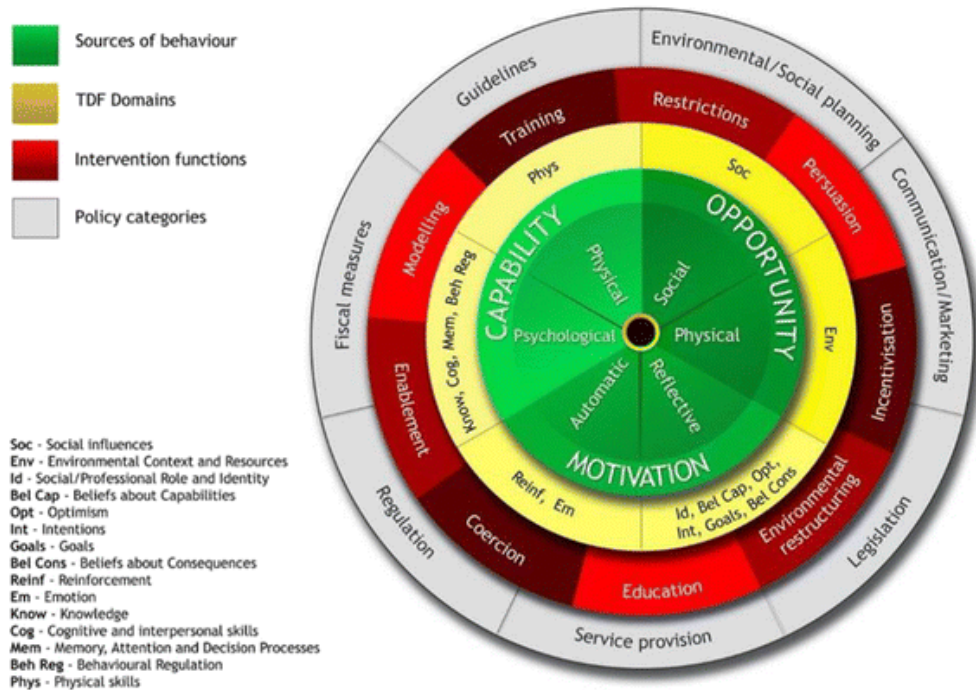


Figure 2.3. The Theoretical Domains Framework (TDF) (Cane et al., 2012)

This PhD does not utilise any of these particular models to *fully* inform the future design, delivery and evaluation of Natural Health Service interventions and subsequent outdoor interventions. This PhD, instead, combines the knowledge and expertise of these behaviour change theories, alongside study findings, to assist with informing the future design, delivery and evaluation of outdoor interventions within a Natural Health Service. The PhD findings were therefore mapped onto the relevant models, where possible, and linked to behaviour change techniques, which *may* influence associated health and wellbeing outcomes. These findings informed future delivery and evaluation, which would target the desired behaviour change (engagement in outdoor interventions) and influence associated health and wellbeing outcomes. Behaviour change techniques were also highlighted, which are effective but neglected to date within outdoor interventions studied.

2.8. Rationale for Current Research

The evidence reviewed illustrates that the outdoors is associated with a multitude of positive health (e.g. improved physical fitness, alleviating symptoms associated with LTCs), wellbeing (e.g. improved mood, decreased anxiety and depression ratings) and social outcomes (e.g. decreased feelings of isolation, increased social interaction). Such outcomes have been linked to a broad spectrum of aims and corresponding delivery frameworks within a vast array of outdoor interventions. These positive outcomes have been gleaned from merely the presence of the outdoors to accessing or engaging in the outdoors through recreation or participating in specifically targeted outdoor interventions. Theoretical explanations (e.g. the Biophilia Hypothesis, the Psycho-evolutionary Stress Reduction Theory, the Attention Restoration Theory and Nature Connectedness) and proposed causal mechanisms and psychological processes offered (e.g. Hartig, Mitchell & Frumkin, 2014; Husk, Lovell, Cooper, Stahl- Timmins & Garside, 2015; Cleary, Fielding, Bell, Murray & Roiko, 2017) provide potential explanations as to *why* and *how* these outcomes are experienced. Research evidence to date surrounding the positive health and wellbeing outcomes associated with outdoor interventions has been vital in informing future policy. Policy changes to date range from local initiatives which contribute to wider national policy schemes, as demonstrated within the case studies throughout this review. However, a lack of clarity exists in the variety of terms and definitions used to describe outdoor interventions within the literature. In addition, a lack of detail is available defining the delivery of outdoor interventions and key delivery components involved, which are addressed within this PhD. Furthermore, while evaluations to date have supported outdoor

interventions as effective in improving health and wellbeing, a lack of consensus in appropriate research protocols has posed challenges. Such inconsistencies result in challenges in collating evidence demonstrating the effectiveness of outdoor interventions in improving health and wellbeing. Furthermore, a lack of detail in the descriptions of the delivery of outdoor interventions evaluated, causes difficulties in identifying key delivery components, potentially linked to positive health and wellbeing outcomes and consequent success of outdoor interventions. Therefore, while evidence supporting the health and wellbeing outcomes associated with engagement with the outdoors is plentiful, less is known to date about *how* people achieve these outcomes, and indeed, which delivery components of outdoor interventions are attributed to positive health and wellbeing outcomes. Gaining greater insight into these questions will inform the future design, delivery and evaluation of The Mersey Forest's Natural Health Service and similar outdoor interventions delivered more widely, encouraging future engagement and influencing positive health and wellbeing outcomes.

Chapter Three: Methodology

Chapter Three: Methodology

3.1. Chapter Overview

This chapter outlines the methodology used throughout the PhD and begins with considerations of epistemological and ontological positions adopted. The research setting, the researcher and supervision team's perspectives, as well as the partnerships and funders involved, are subsequently discussed, in regards to their influence upon the research. The methodological approaches are then outlined for all studies, with justifications provided for their utilisation. Finally, ethical considerations are emphasised.

3.2. Epistemological and Ontological Considerations

Epistemology is concerned with the study of the nature, scope, and justification of knowledge. Willig (2013) describes epistemology as the "*How, and what can we know?*" (p. 4). Epistemology therefore influences research methodology and "*modifies methodology, and justifies and evaluates the knowledge produced*" (Carter & Little, 2007, p. 1317). Whereas ontological positions specify the relationship between the world and our human interpretations and practices (Bryman, 2015). Ontology therefore effects the research conducted to study reality, or whether we think it cannot be separated from human practice (Bryman, 2015). It must be noted, however, that research is not necessarily determined by epistemological or ontological positions. Positions are tendencies rather than definitive connections. Research methods can therefore be entwined with different methodological approaches (Bryman, 2015), as within this PhD. Practical considerations should also be considered, such as timing and financial constraints. The connection

between research strategies and epistemological and ontological commitments is therefore not deterministic (Bryman, 2015). Platt (1996, p275) argues:

“frequently methodological choices are steered by quite other considerations, some of a highly practical nature, and there are independent methodological traditions with their own channels of transmission... In many cases general theoretical aspirations, not guidelines with clear implications that are followed in practice.”

Instead, there is a tendency for quantitative and qualitative research to be associated with certain epistemological and ontological positions (Bryman, 2015). Quantitative research can sometimes engage with an interpretivist stance, whereas qualitative research may exhibit features normally associated with a natural science model (Bryman, 2015).

However, approaches can be combined, such as mixed methods, as adopted within this PhD, discussed later in this section (Bryman, 2015). The researchers own epistemological position has been transient in nature throughout, embracing varied epistemological and ontological positions, and consequent methodological approaches to fully address the research questions within each phase of the PhD’s development. The researcher began with a post-positivism stance in Study 1 (chapter 4) and Study 2 (chapter 5). The researcher acquired knowledge, within this phase, in answering the research questions and attempting to control or remove subjective influences as much as possible. In this approach, the researcher acknowledges the influence their contexts have within the research (Braun & Clarke, 2013, Creswell & Poth, 2018) (see section 3.3), as well as research methodologies detailed throughout this chapter and attempts to achieve trustworthiness (see section 3.7). Post-positivism was also evident through the use of Thematic Analysis (Braun & Clarke,

2006), seeking patterns and themes within the data to analyse qualitative findings throughout the PhD. Whereas, a more pragmatic approach, utilising a variety of research tools, adopting deductive and objective techniques was utilised in Study 3a (Chapter 6) (Creswell & Poth, 2018) in collecting and analysing quantitative data. From an ontological perspective, the researcher identifies as a ‘critical realist’. Critical realist positions seek a real and knowledgeable world, which sits behind the subjective knowledge a researcher can access (Bryman, 2015). This position is reflected in the use of both quantitative and qualitative methodologies adopted throughout this PhD and mixed methods approaches, utilising strengths from both. Critical realist positions are commonly adopted through qualitative approaches and underpin some forms of Thematic Analysis (TA) (Braun & Clarke, 2006) used throughout this PhD thesis.

3.3. Research Setting: The Mersey Forest

In keeping with a post-positive stance and acknowledging the influences that contextual factors may have within the research, this section discusses the influence that the setting of the research, including the researcher and supervision team perspectives, and funding may have upon this research. This PhD was match funded by Liverpool John Moores University and The Mersey Forest. The Mersey Forest provided the research setting for the collection of data, whereas Liverpool John Moores University’s facilities and expertise were utilised to analyse and report the research findings. The Mersey Forest was designated in the early 1990s when 12 areas of England were chosen as Community Forests to deliver a range of public benefits through the creation of community woodlands. The interventions were designed to improve the environment, wildlife and the economy, as well as to benefit the

people residing in the surrounding communities. The Mersey Forest is currently the largest Community Forest, spanning over 500 square miles of Merseyside and North Cheshire. The Mersey Forest was created by a partnership of seven local authorities (Cheshire West and Chester, Halton, Knowsley, Liverpool, Sefton, St Helens and Warrington), landowners, the Forestry Commission, Natural England, Environment Agency, businesses and local communities. The Mersey Forest is not one single forest, but a mosaic of woodlands, greenspaces, street trees and other greenery close to people and spread across Merseyside and North Cheshire. The Mersey Forest includes visitor places of interest, such as Formby's pine woods, and regenerated green spaces, including Sutton Manor and Forest Schools to help children reconnect with nature. The Mersey Forest's 'more from trees' philosophy, brings environmental, economic and health benefits, while engaging the local community in the design of The Mersey Forest. Recognised nationally and internationally, The Mersey Forest is a continuing champion in providing green infrastructure to improve the lives of those within the surrounding community. The Mersey Forest's health policy aims to promote the health and wellbeing benefits of trees and woodlands, for individual health, as well as the wider wellbeing of communities. For example, the Natural Choices intervention, conducted in partnership with Liverpool National Health Service and Access to Nature, mapped green infrastructure resources to target and deliver outdoor interventions to areas within The Mersey Forest in order to tackle health inequalities (The Mersey Forest Plan, 2014).

3.3.1. The Natural Health Service

The Mersey Forest has adopted various strategies to improve the health of the surrounding community, through their Natural Health Service. The Natural Health Service aims to improve people's health and wellbeing, reduce health inequalities and provide commissioning bodies with a single point of access to evidence-based outdoor interventions. The Natural Health Service also strives to reduce the financial burden on the NHS and local authority resources (Natural Health Service, 2020). A consortium of landowners, delivery organisations, policy and academic partners manage The Mersey Forest, co-ordinating activity and investing in its long-term development. The Mersey Forest provides the settings of woodlands for improved physical and mental health outcomes, this is the primary purpose of Mersey Forest's latest project, 'Nature4Health'. This match funded PhD aimed to evaluate the Mersey Forest's Natural Health Service from 2015 to 2018 and inform future policy surrounding the delivery and evaluation of The Mersey Forest's Natural Health Service and similar outdoor interventions.

3.3.2. Nature4Health

The Mersey Forest's Nature4Health project was a three-year project running from June 2015 to June 2018 funded by The Big Lottery's Reaching Communities grant. Nature4Health aimed to use the power of nature to improve health and wellbeing, as well as tackling health inequalities in targeted communities across The Mersey Forest. The intervention provided health-promoting, enjoyable group activities in a green, therapeutic environment. The outdoor interventions consisted of woodland walks, therapeutic

gardening, conservation activities and mindfulness in nature, as well as Forest Schools for children and families. All interventions described were evaluated within the PhD, with the exception of Forest Schools and Mindfulness in Nature interventions. Forest School sessions were excluded as they recruited child participants, who therefore failed to meet the inclusion criteria for this PhD of adults aged 18 years or over. Mindfulness in Nature interventions were also excluded due to their specific target demographic, of clinical populations and corporate organisations, and delivery format, making them incompatible with the remaining outdoor interventions studied, due to their differing aims, intended outcomes, target samples and consequent delivery frameworks.

To summarise, woodland walks consisted of walking interventions, including health walks and Nordic Walking. These walking interventions were tailored to individual needs and designed to increase physical activity levels whilst improving wellbeing. Therapeutic gardening involved horticulture and food growing interventions in a social setting.

Therapeutic gardening interventions sought to promote wellbeing and encourage a sense of purpose and achievement within participants. The group delivery format of therapeutic gardening was also considered conducive to social interaction and community cohesion.

Finally, conservation activities designed to increase participant's physical fitness through nature-based conservation projects were studied. Conservation volunteering sought to develop skill acquisition and improve confidence, while encouraging social interaction.

These outdoor interventions were accessible to any age, ability or fitness level. The Mersey Forest collaborated with a range of partners within the health and environmental sector (e.g. The Conservation Volunteers, The Richmond Fellowship and Merseycare) to deliver

these outdoor interventions. During the time of data collection, analysis and partial writing up this PhD thesis, the researcher (myself) was the Research Assistant for the Nature4Health project on a part-time basis alongside PhD commitments from 2015 to 2018.

3.4. The Researcher and Supervision Team

The researcher comes from a psychology (BSc) and health psychology (MSc) academic background. The researcher therefore holds a foundation of knowledge in psychology, health and wellbeing-related topics. Due to the researcher's academic background within health psychology, the researcher views the outdoor interventions studied within this PhD as behaviour change interventions, as opposed to mere health or physical activity outdoor interventions. The researcher therefore recognises that engaging in the outdoor interventions within this PhD requires behaviour change, in this instance, attending outdoor interventions and engaging in nature-based activities. Without these behaviours, participants would be unable to achieve the positive health, wellbeing and social outcomes associated. As argued by Michie et al (2014), while the consequence of behaviours is regarded as the end-point within health interventions, the importance of the behaviour cannot be overstated. This is particularly important as a variety of influences can intervene and diminish the link between the behaviour and the outcome (DiMatteo, Haskard-Zolnierek & Martin, 2012). The researcher therefore understands the importance of identifying the delivery components and related behaviour change techniques, within outdoor interventions, which may influence the desired target behaviour and therefore bring about associated health and wellbeing outcomes. PhD findings are therefore mapped

onto the COM-B model, the BCW and the TDF (Michie et al., 2011; Michie et al., 2014) to attempt to identify behaviour change techniques to positively influence behaviour change (engagement in outdoor interventions) and associated outcomes (positive health and wellbeing outcomes) and therefore successful delivery of future natural health services. Furthermore, opportunities to complete a variety of Research Assistant posts within university settings, in psychology and health subjects, has meant that the researcher has experience in a variety of research methodologies. Most recently, research conducted with The Mersey Forest and The Physical Activity Exchange at Liverpool John Moores University evaluated the effectiveness of Forest School sessions as a physical activity intervention for children. This work provided the researcher with the opportunity to conduct a mixed-methods study collecting quantitative, qualitative and objective data from a sport and exercise perspective. This role enabled insight into the challenges associated in conducting research in community settings, such as recruitment difficulties, participant dropout and ethical issues. More specific practical barriers associated with interventions in the outdoors, such as challenging weather conditions, were also commonplace. Challenges were resolved by developing innovative strategies to overcome barriers, as well as working in partnership with different organisations successfully while appreciating differing perspectives.

This PhD study continues the collaboration between The Mersey Forest and Liverpool John Moores University. The research combines the knowledge and expertise of supervisors from health psychology, sport psychology, outdoor education and psychotherapy disciplines. The interdisciplinary nature of the supervisory team has

therefore enabled the exploration of the PhD and four core areas and perspectives maintained throughout in relation to outdoor interventions (outdoors, health, physical activity and therapy) all vital to the scope and the research questions within this PhD. This interdisciplinary approach was considered a major strength in supporting the exploration of a broad range of viewpoints, encouraging the creation of new knowledge (Yegros-Yegros, Rafols & D'Este, 2015) as well as deeper exploration of specific areas.

3.5. Partnership and Funding Influences

As a consequence of the researcher's employment by The Mersey Forest at the time of study, the researcher could be argued to have had greater awareness and therefore attentiveness to the partner's perspectives and needs. This awareness is highlighted, due to its potential to influence decisions within the PhD. For example, within the data collection in Study 3a (Chapter 6), The Mersey Forest were required by the funders of the Nature4Health project, The Big Lottery, to report changes in wellbeing using the Warwick-Edinburgh Mental Wellbeing Scale (Tennant et al., 2007) and physical activity levels using the International Physical Activity Questionnaire (Craig et al., 2003). This funding stipulation prompted the measures inclusion within the PhD, alongside the PhD research data. Moreover, in recognition that The Mersey Forest was also required to collect demographic data, these demographic questions were discounted from the PhD questionnaires. Streamlining questions in this way meant that participants were not required to answer the same questions more than once, which limited participant burden. These demographic details were securely gained through The Mersey Forest's database and matched to participants within the PhD study. In acknowledgement of potential bias, a

variety of strategies were adopted to address rigor and trustworthiness within the research, discussed later in this chapter (section 3.7).

3.6. Methodological Approaches for Qualitative Studies

A range of approaches were considered to analyse the qualitative studies within this PhD. Interpretative phenomenological analysis (IPA) (Smith, Jarman & Osborn, 1999; Smith & Osborn, 2003) was firstly considered due to its ability to provide detailed explanations of a person's experience and examine complex topics (Smith & Osborn, 2015). However, due to its focus on exploring experiences rather than the conditions which may have triggered them (Willig, 2008), this was deemed inappropriate for this PhD. IPA is also less suitable for heterogeneous samples (Smith & Osborn, 2007), making it incompatible for the studies within this PhD.

Similarly, Grounded Theory (GT) (Strauss & Corbin, 1994) was also contemplated for its ability to construct and generate theory from the data (Glaser and Strauss, 1967), which would suit the formative nature of this PhD. However, criticisms of GT's inability to recognise the embeddedness of the researcher and their agency in the data construction and interpretation (Creswell, 2007), contrasted with the researcher's post-positivism stance. GT was also argued to be challenging to adopt when attempting to manage large amounts of data and less successful when utilised by those less skilled in GT analysis (Bryant & Charmaz, 2007). Due to the researcher's plans to collect large qualitative data sets for each study and lack of prior experience in GT analysis, the researcher disregarded GT analysis for the qualitative studies within this PhD.

Thematic Analysis (Braun & Clarke, 2006) (TA) was selected to analyse Study 1, Study 2 and Study 3b findings. TA is a qualitative method described by (Braun & Clarke, 2006, p.79.) as:

'a method for identifying, analysing and reporting patterns (themes) within data. It minimally organizes and describes your data set in (rich) detail'.

Themes are argued to be key characters in a story, with their own psychological makeup and motivations about the data, each with a core concept that underpins and unites the observations (Clarke & Braun, 2018). Initially developed by Holton in the 1970s (Merton, 1975), TA has only recently been recognised as a distinctive method of qualitative analysis with a clearly outlined set of procedures in social sciences (Braun & Clarke, 2006). Prior to this, qualitative researchers had written about TA (e.g. Aronson, 1995; Joffe, Yardley & Marks, 2004) and thematic coding, (e.g. Patton, 1990). Numerous authors were also argued to be conducting TA, but describing it as something else (e.g. grounded theory or discourse analysis) (Braun & Clarke, 2006). To resolve this lack of clarity, TA was named within psychology and became increasingly popular (Braun & Clarke, 2006). TA was selected for the qualitative studies within this PhD partly due to its flexibility, as it does not prescribe methods of data collection, theoretical positions, epistemological or ontological frameworks. TA can therefore be used to answer a variety of research questions and analyse any type of data (Braun & Clarke, 2013). More importantly, within the context of this PhD, TA can be successfully adopted in instances where academia extends into policy and practice, as it provides a robust analysis of qualitative data, with the ability to present findings in a way which is readily accessible to those who are not situated within academia

(Braun & Clarke, 2014). Therefore, TA was considered suitable for the formative nature of the PhD, influencing those within academia (e.g. researchers) and from different professional perspectives (e.g. policy-makers, funders, facilitators). TA has also been used in previous similar studies (e.g. Wilson, 2009; Milton, Kelly, & Foster, 2009; Brooker et al., 2015; Raine, Roberts, Callaghan, Sydenham, & Bannigan, 2016; Lumber et al., 2018; Masel et al., 2018). Analysis occurs in several phases, as advised by Braun & Clarke (2006).

3.7. Trustworthiness in Qualitative Research

The most common criteria used to evaluate qualitative research are those purported by Guba and Lincoln (1985). These four criteria are credibility, dependability, confirmability and transformability. In 1994, Guba and Lincoln added the fifth criterion, authenticity. Williams and Morrow (2009) revised and outlined the categories of trustworthiness to reflect the important paradigmatic foundations critical in the trustworthiness of qualitative data and increase the possibility of achieving a consensus on shared language and approaches to establishing quality or authenticity (Guba & Lincoln, 1989). Three major categories of trustworthiness are argued that all qualitative researchers must adhere to, these are (1) the integrity of data, (2) balance between reflexivity and subjectivity, and (3) clear communication of findings. The integrity of data refers to the adequacy (Morrow, 2005) or the dependability (Patton, 2002) of the data, or how researchers know they have achieved integrity of data in a qualitative study. Firstly, a clear articulation of procedures, Patton (2002, p. 546) referred to “*a systematic process systematically followed*”. The background, qualifications and experience of the researcher are argued to be particularly

important in qualitative research, with the researcher forming the major instrument of data collection and analysis (Patton, 1990). Some argue that trust in the researcher is of equal importance to the adequacy of procedures themselves (Alkin, Daillak & White 1979). Maykut, Maykut and Morehouse (1994) recommend including any personal and professional information relevant to the phenomenon under study. Patton (1990) also stipulates that arrangements by which the investigator is funded should also be addressed, as discussed previously in this chapter (section 3.5). Whereas detailed methodological procedures, such as recruitment and data collection protocols are clearly outlined within this chapter and chapters of each study. A clearly articulated analytical strategy (Williams & Morrow, 2009) has also been included in this PhD thesis to encourage integrity of data. Furthermore, the researcher recruited a diverse sample of participants, within each qualitative phase of the PhD thesis to encourage rich data.

Triangulation is encouraged to address reliability (Shenton, 2004; Morrow, 2005; Williams & Morrow, 2009). This usually involves two researchers or more comparing codes within qualitative analysis until consensus or agreement is reached (Campbell, Quincy, Osseman & Pederson, 2013). Recent criticisms, however, have argued against this strategy as a means of encouraging reliability on the basis that researchers cannot produce theory-free knowledge (Smith & McGannon, 2018). When conducted within an academic context with PhD students and supervisory teams, power differences are also argued to bias results, which may cause students to feel pressured to conform to supervisors' views (Smith & McGannon, 2018). Such criticisms strengthened the 'critical friends' approach adopted, whereby the researcher met with members of the supervisory team at least every two

weeks to discuss codes and themes in contrast to agreeing or disagreeing to achieve consensus (Smith & McGannon, 2018). This strategy occurred over several sessions, during which, amends were made and reviewed to achieve theoretical saturation.

Theoretical saturation is the technique of redundancy when researcher reaches a point at which no new information is gained with the introduction of additional data.

Having a team of researchers and at least one external auditor is argued as critical to ensuring trustworthiness (Hill et al., 2005). As mentioned previously, regular supervision meetings to review data and to gain researcher's perspectives, who were not involved in this PhD, were adopted and deemed good practice for early career researchers (Shenton, 2004). Peer scrutiny of the research project by colleagues, peers and academics allowed assumptions of the researcher to be challenged. This approach also encourages the researcher to refine methods, develop a greater explanation of the research design and strengthen arguments in line with comments (Shenton, 2004). The researcher has embraced this with various presentations of studies at conferences, which provided opportunities for feedback, as well as a transfer viva procedure from the first to the second year of the PhD. Within the transfer viva, an external researcher was able to question techniques used and provide constructive feedback. This approach served as devil's advocate, proposing alternative interpretations to those of the investigator (Morrow, 2005).

3.8. Mixed Methods: Study 3a and Study 3b

Study 3, a mixed methods study, utilised quantitative (Study 3a) and qualitative (Study 3b) research methodologies, whereby the quantitative and qualitative data are mutually

insightful and illuminating (Bryman, 2015). The design of this study was an explanatory sequential design, whereby the quantitative data (Study 3a) was collected within the first phase. Quantitative results were then analysed to inform the questions asked in the qualitative phase (Study 3b). Qualitative data collection in Study 3b then helped to explain the quantitative results. Within this design, two distinct phases of research build upon each other (Creswell & Clark, 2017). See Figure 3.1 illustrating how this process was utilised in Study 3. In this approach, supplementary qualitative data is collected after a quantitatively evaluated intervention. This method explores how participants are experiencing an intervention, informing the development of procedures and seeking a greater understanding of the results and why the intervention was effective (Creswell & Clark, 2017). Mixed methods approaches were therefore intentionally integrated to combine quantitative and qualitative methodologies and draw upon the strengths of each (Creswell & Clark, 2017). The researcher combined statistical trends (quantitative data) with stories and personal experiences of engaging in outdoor interventions (qualitative data), this collective strength provided a better understanding of the research problem than either form of data alone (Creswell & Clark, 2017). The rationale behind the mixed methods methodology in study 3 was to enable a more comprehensive view of the data than either a quantitative or qualitative perspective alone. More specifically, the qualitative data enhanced the quantitative information, with details about the setting, place and context of personal experiences of engaging in outdoor interventions (Creswell & Clark, 2017). A primary advantage of adopting mixed methods within this study was its ability to tease out the important features of outdoor interventions, extending beyond the limitations of

quantitative research (Farquhar, Ewing & Booth, 2011). This insight will inform the future design, delivery and evaluation of the Natural Health Service and similar outdoor interventions to maximise health and wellbeing outcomes and capture these results.

3.8.1. Quantitative Phase: Study 3a

Quantitative methodologies were utilised in Study 3a to evaluate the perceived health and wellbeing outcomes in those participants engaged in outdoor interventions. Validated questionnaire measures assessed perceived health and wellbeing outcomes of participants engaged in The Mersey Forest's Nature4Health outdoor interventions and similar outdoor interventions from external providers in Merseyside. See appendix 3.6 for table of outdoor interventions, settings, delivery styles, key components, facilitators, group sizes, participant demographics, etc. Questionnaires were distributed to participants attending outdoor interventions for 12 weekly sessions, each lasting approximately 2 hours in length. Questionnaires were given to participants at three time points, before the first session (Time 0), after the final session at week 12 (Time 1) and 12 weeks after finishing the sessions (Time 2). Questionnaires assessed changes in health and wellbeing outcomes from beginning the interventions at week 1 to completion at week 12 and 12 weeks post intervention. This enabled long-term health outcomes to be examined, addressing limitations of previous research failing to attain this (as illustrated in Literature Review, Chapter 2). Questionnaires at each time point contained a variety of validated health and wellbeing measures. The SF36v2 Health Survey (Ware et al., 2008) formed the primary outcome measure. Additional measures included the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) (Tennant et al., 2007), The Profile of Mood States (POMS)

(Grove & Prapavessis, 1992), The Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965) and the International Physical Activity Questionnaire (IPAQ) Short Form (Craig et al., 2003). See appendix 3.7 for details of questionnaire measures adopted. Questionnaire data was inputted into SPSS version 24 and analysed using a Friedman ANOVA to compare self-reported health and wellbeing outcome measures from time 0, time 1 and time 2.

3.8.2. Qualitative Phase: Study 3b

Study 3b explored participants and facilitator's experiences and perceptions of engaging in or delivering Nature4Health outdoor interventions. This study enabled the further exploration of perceived associated health and wellbeing outcomes and what participants attributed to outcomes gained. While underlying mechanisms, processes and pathways have been explored to date (e.g. Hartig et al., 2014; Lovell et al., 2015; Cleary et al., 2017), interviews within this phase also encouraged reflections on key components within the outdoor interventions from a participant engagement perspective and a facilitator's delivery perspective. These key components may have determined the outdoor interventions effectiveness or lack of impact, informing the future design and delivery of outdoor interventions. TA (Braun & Clarke, 2006) was adopted, as previously mentioned, to analyse the qualitative phase (Study 3b) findings. The Branching Out (Wilson, 2009) study's questions were adapted and included to provide introductory questions with permission from the author. Questions were chosen due to the similarities of the programmes evaluated to the outdoor interventions within this study. While participant demographics are different, as Branching Out participants were recruited through mental

health referrals, the questions were generalisable to the Nature4Health outdoor interventions within this study. Research protocols and procedures for each study are described fully within each study's corresponding chapter (Study 1: chapter 4, Study 2: chapter 5, Study 3a: chapter 6 and Study 3b: chapter 7).

3.9. Ethical Considerations

All studies were approved by the Liverpool John Moores University Ethics Committee (Ethics Registration No: 15/EHC/102, see appendix 3.8). Each participant provided informed written consent before data collection was commenced. All data was anonymised when referring to each participant, when referring to verbatim quotes as evidence within the analysis and within the written results to maintain anonymity. Participants were made aware of the voluntary nature of the study and their right to withdraw until analysis of the interview data commenced. All participants were debriefed upon completing the study and signposted to further support if appropriate (e.g. The Samaritans). Ethical considerations were particularly important due to the sensitive nature of these studies in regards to discussing health and wellbeing, which may have caused upset or distress in participants when reflecting upon their feelings. As this PhD recruited participants through mental health partnerships delivering outdoor interventions (e.g. The Cass Foundation, The Richmond Fellowship), the researcher recognised that these participants may have pre-existing mental health conditions. Ethical procedures, such as making participants aware of their right to withdraw, the voluntary nature of the research and signposting to further support, if required, were therefore essential in ensuring participants did not experience any negative impact to their physical or wellbeing. Throughout the studies, ethical issues

did arise, which were dealt with sensitively and efficiently while following university protocol. Subsequent changes were also made to respond to ethical issues. These challenges and solutions are reflected upon within the synthesis chapter (Chapter 8).

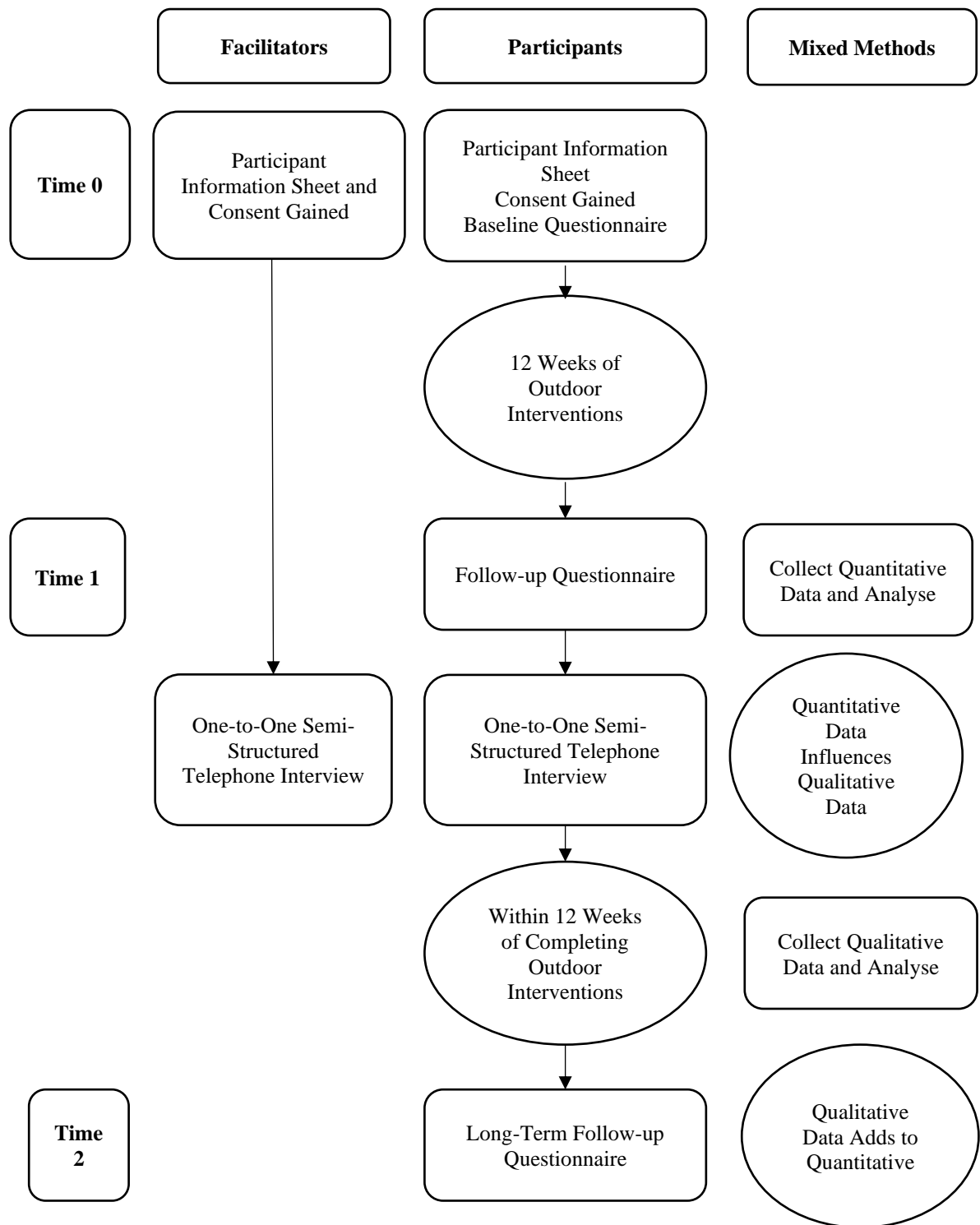


Figure 3.1. Procedural Diagram for Study 3

Chapter Four: Study 1:

Exploring Outdoor Interventions from a Sector Leaders Perspective

Table 4.1. Thesis Study Map: Study One

<p>Study 1: Exploring Outdoor Interventions from a Sector Leaders Perspective</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. To explore outdoor interventions from sector leaders within a policymaking, funding or research perspective within the areas of outdoors, health, physical activity and therapy 2. To examine definitions of outdoor interventions and differences from an outdoors, health, physical activity and therapy perspective and identify their delivery components 3. To investigate how outdoor interventions are perceived to or have improved people’s health and wellbeing 4. To consider how outdoor interventions are and should be designed and delivered to improve health and wellbeing and evaluated to capture associated outcomes
<p>Study 2: Gaining Insight into the Delivery of Outdoor Therapy Interventions from those Currently Facilitating Them</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. To examine how outdoor therapy interventions are defined by facilitators 2. To explore how outdoor therapy interventions are perceived to be therapeutic by facilitators delivering them 3. To explore how outdoor therapy interventions are currently designed and delivered 4. To assess how outdoor therapy interventions are evaluated to examine perceived therapeutic outcomes
<p>Study 3a: Evaluating the health and wellbeing outcomes of outdoor interventions</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. To evaluate the health and wellbeing benefits of outdoor interventions 2. To examine the sustainability of behaviour change and associated health and wellbeing outcomes following completion of outdoor interventions
<p>Study3b: Exploring the Experiences of Participants and Facilitators of Nature4Health Outdoor Interventions</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. To gain insight into the experiences of participants and facilitators engaged in and delivering Nature4Health outdoor interventions 2. To explore perceived health and well-being outcomes associated with engaging in each outdoor intervention 3. To explore evidence of key delivery components within outdoor interventions which may influence health and wellbeing outcomes 4. To assess the long-term sustainability of behaviour change and associated health and wellbeing outcomes

4.1. Introduction

Sector leaders working within the scope of outdoor interventions include funders, researchers and policy makers from an array of organisations (e.g. Defra, Natural England, and The Woodland Trust) to name a small selection of those more prominent establishments. Commonalities within each of these organisations include their shared aims to facilitate access and engagement to the outdoors to improve the population's health and wellbeing. Leaders within these organisations consist of multidisciplinary teams (e.g. policy makers, funders, scientists, researchers). Leaders work across the UK and utilise the latest evidence to inform policy with local, national and even global implications in some cases.

Evidence influencing policy include The University of Exeter's European Centre for Environment and Human Health, who conduct ongoing research surrounding the natural environment and associated health outcomes. This interdisciplinary team collaborates with an array of partners to conduct rigorous and robust evaluations. Similarly, the University of Essex's Green Exercise Research Team explores physical activity in the outdoors and associated health and wellbeing outcomes. While the University of Derby's Nature Connectedness Research Group aims to understand people's sense of their relationship with nature. The group creates everyday interventions to improve nature connectedness, influence associated health and wellbeing outcomes and promote conservation behaviour. The collation of such evidence has informed future policy, which promotes health through outdoor interventions, involving partnership work with health experts (e.g. NHS Forest).

Whereas therapeutic outcomes associated with engaging in the outdoors (see Chapter 2, section 2.5) have adopted the combined expertise of the environmental and mental health sector, to deliver initiatives on a national level, to promote wellbeing through engagement in the outdoors (e.g. Ecominds, Branching Out). See tables 2.1. to 2.9. for case studies of these schemes within the Literature Review (Chapter 2).

It is vital to gain sector leaders perspectives from organisations, such as those described, who are tasked with influencing funding and policymaking within such schemes and initiatives. Insight will enable an understanding of how these perspectives influence, filter down and translate into outdoor intervention facilitation (as explored in Study 2, Chapter 5). In turn, this will influence how outdoor interventions are consequently delivered and experienced by participants and facilitators within local pilot projects (evaluated in Study 3a, Chapter 6 and Study 3b, Chapter 7). Knowledge gleaned from sector leaders will also enable insight into how outdoor interventions are commissioned and evaluated to measure effectiveness and encourage future funding. From a behaviour change perspective, ‘policy categories’ support the delivery of ‘intervention functions’, which may then target the desired behaviour change components (Michie, et al., 2011; Michie et al., 2014). This initial study is therefore concerned with those ‘policy categories’ within the BCW. The results will provoke a review across definitions, delivery, associated outcomes and proposed evaluation frameworks. This will enable recommendations to be made regarding next steps for policymakers, practitioners and researchers to enhance the effectiveness, design/delivery and evaluation of a Natural Health Service and similar outdoor interventions.

4.2. Aims and Objectives

This study aimed to explore sector leader's perspectives of outdoor interventions from an outdoors, health, physical activity and therapy standpoint. Sector leaders were defined as having expertise in outdoor interventions from one or more of the following areas of outdoors, health, physical activity or therapy and spanned research, funding and policy roles.

1. To explore definitions of outdoor interventions from an outdoors, health, physical activity and therapy perspective
2. To examine the perceived design and delivery of outdoor interventions from each perspective
3. To determine how outdoor interventions are perceived to, or have improved people's health and wellbeing
4. To explore proposed evaluation frameworks to capture perceived health and wellbeing outcomes

4.3. Methodology

4.3.1. Study Design and Participants

This qualitative study utilised semi-structured telephone interviews with 14 sector leaders (N=14). Sector leaders had expertise of outdoor interventions across the areas of outdoors, health, physical activity and therapy perspectives (i.e. active in their field and engaged in evaluating, designing and/or informing policy on outdoor interventions from an outdoors,

health, physical activity or therapy perspective). Participants had expertise in one or more of these areas (e.g. outdoors and health). This study examined their perspectives of outdoor interventions from each of these areas. Sector leaders were identified via a systematic internet search, detailed below, and assessed for suitability. Participant suitability was based upon their knowledge of outdoor interventions from an outdoors, health, physical activity or therapy perspective and experience of evaluating, designing or informing policy on outdoor interventions. All participants worked in the UK. Of the fourteen sector leaders, ten participants were female. The researcher categorised participants into one or more perspective categories, firstly depending upon the search terms used to find them within the systematic search, detailed in the next section. The researcher then sought participants professional profiles (e.g. via Linked In or website profile pages) for further clarity. For example, if a researcher mainly focused on work regarding physical activity, they would be categorised as belonging to the ‘physical activity’ category. The researcher then asked those participants recruited, within the first phase of the interview to define their role and professional experience prior, allowing further confirmation of their areas of expertise. For full details on participant positions, affiliations and areas they represent, see table 4.2.

4.3.2. Recruitment Procedures

The study recruited participants using the following methods:

i. Pre-Existing Contacts

Firstly, the researcher approached existing professional contacts made through the university and The Mersey Forest connections, who fulfilled the recruitment

criteria. The researcher approached relevant professional contacts of the supervisory team and those within The Mersey Forest's networks. Nine participants (n=9) of the sample were recruited in this way.

ii. **Systematic Search of Contacts**

The researcher conducted a systematic internet search with the following keywords to gain recruits from each perspective, detailed in Table 4.3. This method increased the appropriateness of each participant and allowed wide outreach to different populations within a geographically dispersed area, enabling the recruitment of a variety of leaders across the UK (Hamilton & Bowers, 2006; Robinson, 2014). Caution was taken when using such recruitment methods to avoid potential bias in a sample gained using the same search terms, who may consequently have similar views on an area, making the data less generalisable. A systematic approach therefore ensued, where chosen search terms were tested to gain the most appropriate results. Truncations were also adopted, as used in systematic literature searches. Search terms were then agreed with the supervisory team, seeking to gain a sample of participants relevant to each perspective. For example, to gain participants from a health perspective, the search terms 'health*' and 'wellbeing' were added. See table 4.3 for all search terms and truncations used.

Results were filtered to capture the most relevant organisations, in terms of those contacts affiliated with policymakers, funding or academic institutions, and the following terms were added to each category in a second systematic

search, these were, '*research**', '*fund**' and '*polic**'. This identified relevant contacts within the organisations, including those with knowledge of outdoor interventions from a research, funding or a policymaking perspective. Contacts from each perspective were filtered by examining their professional profiles available online, to find the most relevant potential recruits. A final contacts list was compiled with leaders from outdoor, health, physical activity and therapy perspectives. Five participants (n=5) were recruited in this way via email invitation.

iii. **Snowball Affect**

Finally, a 'snowball' recruitment strategy was applied, whereby each participant was asked if they could recommend another colleague from another organisation, whom they thought might also be suitable to take part in the study.

4.3.3. Interview Materials

The semi-structured interview schedule was devised via discussions with the supervisory team and informed through previous research. The schedule covered the following topics of the meaning of outdoor interventions, their delivery, associated health and wellbeing outcomes and relevant evaluation protocols to capture these outcomes. Example questions and supporting prompts are provided in Table 4.4.

Table 4.2.

Study 1 Participant Roles and Affiliations

<u>Participant Number</u>	<u>Affiliation</u>	<u>Position</u>	<u>Areas Covered</u>
1	University	Research Fellow in Health and Wellbeing in the Outdoors	Outdoors, Health and Therapy
2	Public Health	Consultant in Outdoors and Health Outcomes	Outdoors and Health
3	Government Advisors	Senior Specialist in Access to Outdoors and Health	Outdoors and Health
4	University	Senior Research Fellow in Outdoors and Health	Outdoors and Health
5	Health Promotion and Greenspace	Programme Lead in Outdoor Provision and Health	Outdoors and Health
6	Government Funded Body	Policy and Advice Officer in Outdoors and Health Outcomes	Outdoors and Health
7	Public Health	Principal Physical Activity Promotion Specialist	Outdoors and PA
8	University	Researcher in Outdoor Physical Activity 'Green Exercise'	Outdoors, Health and Therapy
9	Private Therapy Practice	Psychotherapist Teaching Adventure Therapy	Outdoors and Therapy
10	University	Senior Lecturer in Outdoors and Health Benefits	Outdoors and Health
11	Research Agency	Social Scientist in Outdoors and Health Benefits	Outdoors and Health
12	Charity	Director of Outdoor Health Intervention Scheme	Outdoors, Health and Therapy
13	University	Research Coordinator in Outdoor Studies	Outdoor Education
14	Research Agency	Head Researcher in Physical Activity in the Outdoors	Outdoors, Health and PA

4.3.4. Procedure

Participants were approached via an email invitation, inviting them to take part in a one-to-one telephone interview with a participant information sheet attached. Interested participants were sent a participant consent form to sign and return. One-to-one semi-structured telephone interviews could then be arranged at the most convenient time for the participant (see appendix 3.1 for interview schedule). Interviews commenced with a short introduction to explain the purpose of the interview and gain ethical consent from participants to take part. Each interview lasted approximately one hour (mean=1 hour, 9 minutes). The researcher thanked participants and provided debriefing information at the end of the interviews. The researcher also offered participants the opportunity to ask any questions about the research. All interviews were digitally recorded using a Dictaphone. See Methodology (Chapter 3, section 3.9) for ethical considerations.

Table 4.3.

Search Terms Adopted to Recruit Sector Leaders in a Systematic Internet Search

<u>Terms</u>	<u>Search terms used: (* denotes truncations used)</u>
Outdoor	outdoor*' natur* green* forest* woodland* environment* eco* wilderness adventur*
Health	outdoor*' natur* green* forest* woodland* environment* eco* wilderness adventur* health* wellbeing
Physical Activity	outdoor*' natur* green* forest* woodland* environment* eco* wilderness adventur* exercise physical* activ*
Therapy	outdoor*' natur* green* forest* woodland* environment* eco*wilderness adventur* therap* psycho*

Table 4.4.

Examples of Research Questions with Corresponding Interview Questions and Prompts

<u>Research Questions</u>	<u>Interview Questions</u>	<u>Prompt</u>
To explore the meaning of outdoor interventions and how they are located within broader outdoor-based theories and practices	<i>‘What is your understanding of outdoor interventions from an outdoor/ health/ physical activity/ therapy perspective?’</i>	<i>‘Do these definitions differ according to each perspective?’</i>
To identify delivery components of outdoor interventions and how these have perceived to / have improved people’s health and wellbeing	<i>‘What does (or should) taking part in these interventions involve?’</i>	<i>‘What should a service user expect when attending outdoor interventions?’</i>
To assess how outdoor interventions be designed and delivered to be effective at improving health and wellbeing	<i>‘How do you think outdoor interventions should be designed to improve health?’</i>	<i>‘Should they be designed to meet the needs of service users?’ ‘If so, how?’</i>
To identify how outdoor interventions should be evaluated to assess changes in health and wellbeing	<i>‘How should services be evaluated to effectively assess associated health benefits?’</i>	<i>‘What advice would you give to me, as a researcher, in order for me to prepare an appropriate evaluation protocol to assess health benefits of outdoor interventions?’</i>

4.3.5. Analytical Procedure

The digitally recorded interviews were transcribed verbatim and imported into NVivo10 software (Richards, 1999). Thematic analysis (Braun & Clarke, 2006) was adopted to analyse the interview data. The TA approach was both inductive and deductive. The study aimed for the themes to be linked to the data themselves, rather than the specific questions asked or the researcher's theoretical interests. Data was therefore coded with attempts made not to fit the data into a pre-existing framework. However, the researcher also recognised that it is impossible to be free from theoretical commitments and previous theoretical knowledge. This was particularly important considering the semi-structured interview schedule used to answer specific aims and research questions, meaning that the study was also deductive in its approach. See Methodology (chapter 3, section 3.7) for full details, phases involved and strategies adopted to encourage trustworthiness. Table 4.5 details each phase of thematic analysis with extracts taken from the transcripts to illustrate.

Table 4.5.

Study 1 Thematic Analysis Process

<u>Transcript</u>	<u>Generating Initial Codes</u>	<u>Searching for Themes</u>	<u>Final Theme</u>
<i>“because you're doing activities... you'll start to feel better about yourself, so it's increasing self-esteem, which we know is related to all sorts of different aspects of health”</i>	Different aspects of health within associated with outdoor interventions	Wide and Diverse Associated Outcomes	Multifaceted Psychosocial Outcomes Associated with Outdoor Interventions
<i>“the type of environment they actually do their intervention in. Is it a park? Is it a woodland? If its adventure therapy, is it up a mountain... So all of those things potentially can have an impact”</i>	Environment and type of intervention impacts upon outcomes experienced	Environmental Setting as Important Factor	Importance of Environmental Setting in Achieving Outcomes
<i>“the small T [therapeutic interventions] are the ones that are intrinsic to just being out there, so the sense of improved self-esteem through problem-solving, of completing a task through experiencing yourself pushing the comfort zone ... The big T [therapy interventions] is where the experiences are processed in a focused and self-aware manner, and the lessons learnt are integrated into the self, and both forms the self-construct of change”</i>	Differences between outdoor therapy and therapeutic interventions	Defining Therapy and Therapeutic Outdoor Interventions	Therapy/ Therapeutic Debate

4.4. Results

Thematic analysis (Braun & Clarke, 2006) revealed three themes and thirteen sub-themes. The themes were, 1) Proposed Aims and Outcomes of Outdoor Interventions and Delivery Implications, 2) Factors Influencing Outcomes Associated within Outdoor Interventions and 3) Challenges and Debates to Consider. Each theme encompassed four to five contributing sub-themes, see Figure 4.1. The themes and contributing sub-themes are discussed with patterns and trends revealed throughout. Supporting extracts are provided from the interview transcripts to support findings.

4.4.1. Theme 1: Proposed Aims and Outcomes of Outdoor Interventions and Delivery Implications

The first theme surrounded proposed aims and outcomes of outdoor interventions and consequent implications for their delivery.

Sub-theme 1.1. Holistic Concept of Health

Firstly, when asked to define what health meant to them, it was clear that participants had a holistic concept of health:

“it's [health] not just absence of illness, it's the more positive aspects to do with the quality of life ... I think that holistic aspect is very, very important.”

(Participant 10, Senior Lecturer in Outdoors and Health Benefits)

Many participants referenced the WHO (1948) definition of health, demonstrating that participants viewed health as a much wider concept, which included physical, mental and

social wellbeing. This holistic concept of health is a recurrent theme running throughout the following sub-themes regarding the aims and outcomes of outdoor interventions, discussed next.

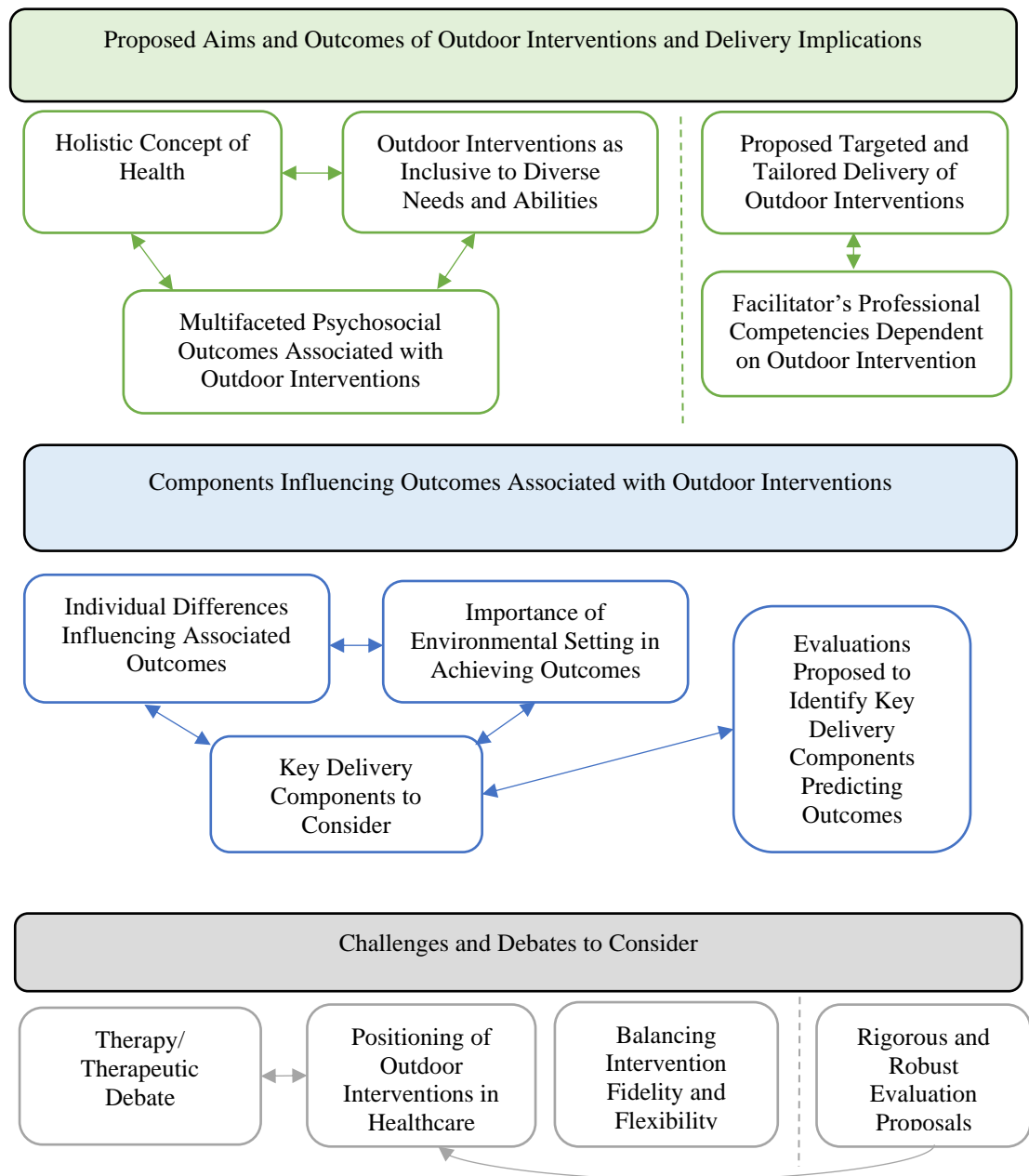


Figure 4.1. Study 1 Themes and Sub-Theme

Sub-theme 1.2. Outdoor Interventions as Inclusive to Diverse Needs and Abilities

Outdoor interventions were argued to be inclusive and accessible to a diverse array of ages, needs and abilities:

“There are generally interventions that support you in every stage of fitness. You could be wielding a machete, clearing ground for conservation or doing light-weight duties while in a wheelchair”

(Participant 8, Researcher in Outdoor Physical Activity)

Sub-theme 1.3. Multifaceted Psychosocial Outcomes Associated with Outdoor Interventions

In keeping with the holistic concept of health and the inclusivity of outdoor interventions, participants argued that outdoor interventions addressed all aspects of health with multifaceted psychosocial outcomes associated with engagement:

“because you're doing activities, and the fact that you're there with other people, you'll start to feel better about yourself, so it's increasing self-esteem, which we know is related to all sorts of different aspects of health”

(Participant 8, Researcher in Outdoor Physical Activity)

“Outdoor activity and green exercise projects and programmes benefit the whole person across a breadth of physical, mental and social health issues”

(Participant 6, Policy and Advice Officer in Outdoors and Health)

Sub-theme 1.4. Proposed Targeted and Tailored Delivery of Outdoor Interventions

In contrast to the previous themes, where participants argued outdoor interventions to be inclusive to a variety of abilities and health needs, with multifaceted psychosocial outcomes associated, participants proposed a more specifically targeted and tailored delivery of outdoor interventions:

“So I think mental health just has to be one of the most important things which we target.”

(Participant 1, Research Fellow covering areas of Outdoors, Health and Therapy)

This theme suggests targeting outdoor interventions to those most in need, whereby wellbeing is deemed a priority, followed by a tailored approach to meet the needs of the target group:

“I think it's based on a very careful assessment of individual needs and capacities and abilities, so assessment is vital to meet the needs of the individual.”

(Participant 9, Psychotherapist within Outdoor Therapy).

Targeted and tailored proposals for the delivery of outdoor interventions sit in stark contrast to the former holistic concepts of health and inclusivity to a diverse range of people with a variety of psychosocial outcomes associated. Findings therefore suggest a conflict of what sector leaders believe *is* being delivered to what they propose *should be* delivered.

Sub-theme 1.5. Facilitator's Professional Competencies Dependent on Outdoor Interventions

In line with more specific approaches to the delivery of outdoor interventions, participants further argued that the facilitator's professional competencies should be dependent on the type of outdoor intervention being delivered. Careful consideration of the relevant professionals involved according to the needs of participants were argued:

"I think you need to be trained and know what you're doing and be able to deliver an intervention in a way that is coherent in how it should be delivered. But it would depend on the intervention itself and what characteristics they'd [facilitators] would need to have themselves."

(Participant 3, Specialist in Access to Outdoors and Health Outcomes)

This prescribed approach included scope for partnership working with those from the environmental and health sector, collaborating in designing and delivering outdoor interventions:

"I think there needs to be, for people who are in the environment sector, who won't have any health background, then that's why partnering with health sector could be quite important."

(Participant 14, Head Researcher in Physical Activity in the Outdoors)

These proposals reflect previous successful partnerships of the health and environmental sector (e.g. Branching Out) where both sectors combine to utilise the skills of the

environmental sector, to deliver the outdoor interventions, while gaining expertise from those within the health sector, who may have referred participants onto the outdoor interventions with an understanding of their health and wellbeing needs. Such an approach may therefore encourage engagement from these participants within these specific groups and achievement of specific health and wellbeing outcomes deemed important to those participants.

4.4.2. Theme 2: Components Influencing Outcomes Associated with Outdoor Interventions

Factors influencing health and wellbeing outcomes, which were associated with outdoor interventions comprised three subthemes, these were the individual differences of the participant involved, the environmental setting of the outdoor intervention, and key components within the delivery of outdoor interventions. Calls for evaluations to identify the key delivery components responsible for health and wellbeing outcomes formed the final theme.

Sub-theme 2.1. Individual Differences Influencing Associated Outcomes

Participants stated that individual differences influenced associated outcomes, whereby the individual differences of participants engaged in outdoor interventions, influenced the associated health and wellbeing outcomes they went on to experience:

“different experiences and different types of environment will suit different people differently and so for one person might be hugely therapeutic, another person might

find really threatening, and that's really important” (Participant 4, Senior Researcher covering areas of Outdoors and Health)

“it depends on your group... Some people love mountains, some people like hills, some people wouldn't really want to go out in big nature, but they're quite happy in a garden. It depends on the person.”

(Participant 9, Psychotherapist within Outdoor Therapy)

Participant 9 emphasises the importance of tailoring outdoor interventions and the delivery components (i.e. settings) according to participants preferences.

Sub-theme 2.2. Importance of Environmental Setting in Achieving Outcomes

Similarly, the importance of the environmental setting regarding associated health and wellbeing outcomes was emphasised:

“the type of environment they actually do their intervention in. Is it a park? Is it a woodland? If it's adventure therapy, is it up a mountain? ... So all of those things potentially can have an impact”

(Participant 14, Head Researcher in Physical Activity in the Outdoors)

Sub-theme 2.3. Key Delivery Components to Consider

Key delivery components to consider were detailed within the delivery of outdoor interventions and their influence on health and wellbeing outcomes gained:

“I think the length of the intervention, I think potentially is really important”

(Participant 14, Head Researcher in Physical Activity in the Outdoors)

“It depends on the level of the difficulty, doesn't it? And if the difficulty's overwhelming, that can be therapeutically beneficial, because people have to learn to handle failure... But it can also have a bad outcome”

(Participant 9, Psychotherapist within Outdoor Therapy)

The difficulty and duration of outdoor interventions were considered particularly important in influencing health and wellbeing outcomes. If the difficulty was considered to be too challenging, this was suggested to overwhelm participants, whereas if activities were too easy, participants would not be challenged and may therefore disengage and not acquire as significant health and wellbeing outcomes. Similarly, with the duration of outdoor interventions, they must be long enough in duration to be beneficial, but if they were too time consuming, they may not be as accessible to all participants who may have other commitments (e.g. work, childcare).

Sub-theme 2.4. Evaluations Proposed to Identify Key Delivery Components

Predicting Outcomes

Consequently, participants stated that evaluations should seek to identify these key delivery components within outdoor interventions, which influence or predict associated health and wellbeing outcomes:

“I think if we've got good evidence for what works and what doesn't, then it makes sense that they are delivered in a way that gives it the best chance of working as possible”

(Participant 4, Senior Researcher covering areas of Outdoors and Health)

Findings gained were argued to then inform the future delivery of outdoor interventions by leveraging these key delivery components to enhance engagement and encourage effectiveness.

4.4.3. Theme 3: Challenges and Debates to Consider

Several challenges and conflicting ideas emerged regarding the role of therapy in outdoor interventions and how outdoor interventions are positioned within healthcare. Challenges in gaining some form of intervention fidelity while also being flexible to participants needs were also discussed. Finally, rigorous and robust evaluations were proposed to evaluate outdoor interventions and positioning them as an effective health and wellbeing intervention.

Sub-theme 3.1. Therapy/Therapeutic Debate

A therapy/therapeutic debate emerged around the use of the term ‘therapy’ within outdoor interventions. Whereas some participants defined therapy and therapeutic outdoor interventions as distinctly different types of interventions. For example:

“the small T [therapeutic interventions] are the ones that are intrinsic to just being out there, so the sense of improved self-esteem through problem solving, of completing a task through experiencing yourself pushing the comfort zone, through being in a group doing a group activity, and again, the impact of nature... The big T [Therapy interventions] is where the experiences are processed in a focused and self-aware manner, and the lessons learnt are integrated into the self, and both forms the self-construct of change”

(Participant 9, Psychotherapist within Outdoor Therapy)

In contrast, other participants argued that there were no distinct differences between therapy and therapeutic outdoor interventions and that the use of the term ‘therapy’ was justifiable due to the therapeutic wellbeing outcomes perceived to be gained from outdoor interventions. For example:

“The cynical part of me says it's all about language and people hijacking the terminology for their own ends really, but at the same time it's recognising that the health benefit's so evident when it comes to being active outdoors.”

(Participant 7, Principal Physical Activity Promotion Specialist)

Those participants from a therapy background defined outdoor therapy as having specific therapy delivery frameworks, with consciously processed experiences resulting in psychological change. Participants without a therapy background believed that the term ‘therapy’ should not be exclusive to specific therapy practice and that outdoor interventions may be defined as ‘therapy’ due to the perceived therapeutic wellbeing outcomes.

Sub-theme 3.2. Positioning of Outdoor Interventions in Healthcare

Further challenges surrounded the positioning of outdoor interventions in healthcare and the need for robust and rigorous evidence to enable this:

“we can't prove it to the level of evidence satisfaction required to publish something in the New England Journal of Medicine, or something of this sort, which of course is one of the issues when you're talking about nature-based interventions and so on, is how do

you get the evidence base to a standard that the medical profession will accept, and this is the big challenge which we recognise, but we haven't overcome yet.”

(Participant 10, Senior Lecturer in Outdoors and Health Benefits)

Participants recognised the need for more rigorous and robust research into the effectiveness of outdoor interventions in improving health and wellbeing. Participants further stated that the current evidence does not currently meet the required standard from a medical perspective in terms of what would be considered robust within this context. However, these themes also suggested that the medical profession may also need to be challenged to reconsider what constitutes robust findings in a holistic and experiential context.

Sub-theme 3.3. Balancing Intervention Fidelity and Flexibility

Balancing intervention fidelity and flexibility to ensure consistent quality across outdoor interventions, while maintaining flexibility to participants needs, was also expressed as a challenge:

“they [outdoor interventions] can and should be very different, because one size doesn't fit all, and if it's going to be kind of community-led, communities are very different...so there's some halfway house there, that there's some synergy of systems of monitoring, of referral, and there is a known brand that people trust, that it has all that behind it.”

(Participant 2, Consultant in Outdoors and Health Outcomes)

Participants acknowledged the differing needs of participants and consequent flexibility needed within the delivery of outdoor interventions to meet these needs. However, participants also recognised the need to balance this flexibility with some level of fidelity of interventions, to ensure quality in their delivery and enable them to be measured in terms of their effectiveness.

Sub-theme 3.4. Rigorous and Robust Evaluation Proposals

Rigorous and robust evaluation protocols were proposed to enable outdoor interventions to be appropriately positioned within mainstream healthcare:

“something that has to be considered is getting better at evaluation, and particularly if we're talking about things like an actual health service. If we want clinical commissioners to invest in this as a form of prevention, which means disinvesting from things like traditional secondary care, we have to be able to demonstrate those outcomes.” (Participant 2, Consultant in Outdoors and Health Outcomes)

“You need to get the right measures, you need to use robust tools and instruments”
(Participant 7, Principal Physical Activity Promotion Specialist).

Rigorous and robust methodologies may not, however, lend themselves to those more flexible delivery frameworks previously proposed. These findings therefore support a level of intervention fidelity to be upheld within the delivery of outdoor interventions to enable rigorous and robust data to be collected.

4.5. Discussion

The present study explored sector leader's perceptions of outdoor interventions from an outdoors, health, physical activity and therapy perspective. This study gained insight into sector leader's definitions, proposed delivery, associated outcomes and evaluation protocols regarding outdoor interventions. Participants held a holistic concept of health with outdoor interventions addressing diverse needs and abilities of participants. Participants definitions of outdoor interventions were described, in regards to their wide-reaching aims to target a diverse demographic with differing ages, abilities and needs. Definitions were consistent with multifaceted psychosocial outcomes argued to be associated with engagement in outdoor interventions. On the contrary, participants proposed the tailored and targeted delivery of outdoor interventions towards those in greatest need. These proposals were in stark contrast to the broader and inclusive outdoor interventions they described as currently been delivered and provided unique insight into the leader's contradictions of what they believed was *currently being* delivered and what they propose *should be* delivered. Key considerations for the future delivery of outdoor interventions included ensuring facilitators have the relevant professional requirements to the type of outdoor intervention and the participants they work with. Participants further highlighted the importance of the environmental setting of the outdoor interventions, participant's individual differences, as well as the duration of outdoor interventions and difficulty of the activities within them. Rigorous and robust evaluation protocols were proposed to capture associated health and wellbeing outcomes with further calls to gain

greater insight into the key delivery components responsible for associated health and wellbeing outcomes.

4.5.1. Exploring Perspectives and Definitions of Sector Leaders

Participant's definitions of outdoor interventions as inclusive to a variety of needs and abilities were consistent to population level outdoor interventions delivered in the UK (e.g. Ecominds, Walking for Health, TCV Green Gyms). Findings demonstrated an awareness of outdoor interventions delivered on the ground by sector leaders, who were charged with influencing funding or policy making to support or enable the delivery of such interventions. The inclusive and accessible 'service provision' described by leaders within the 'policy categories' of the BCW (Michie et al., 2011) links to the 'enablement' intervention function, described as increasing means or reducing barriers to increase 'capability' and 'opportunity' within the COM-B model. Participants are therefore argued to have greater psychological and physical 'capacity' and 'opportunity' to engage in outdoor interventions, therefore increasing the likelihood of engagement. This enablement suggests the utilisation of BCT's 'overcoming barriers' (Abraham & Michie, 2008) within outdoor interventions. For example, the inclusive nature of Walking for Health to a range of abilities, ages and health conditions, increases the physical capability and opportunities of participants being able to engage and therefore make participation more likely.

Likewise, the psychological capability afforded through facilitators adopting a '*leave the diagnosis at the gate*' (p.69.) philosophy, in recruiting participants onto Ecominds schemes, breaks down psychological barriers to attending outdoor interventions, by reducing the stigma surrounding mental health, potentially apparent in attending wellbeing

interventions labelled as such (Bragg et al., 2013). Definitions are therefore in-keeping with the current successful and widespread inclusive and accessible delivery of outdoor interventions in the UK (e.g. Walking for Health, Ecominds, TCV etc.). Whereas the mapping of the current study's findings onto the relevant BCW constructs and relevant BCTs, illustrates new potential for designing, delivering and evaluating a Natural Health Service to capitalise on these BCTs, encourage engagement and positively influence associated health and wellbeing outcomes. Delivery implications of such findings are further outlined in the synthesis chapter (See Figure 8.1, Chapter 8).

Conflicting viewpoints surrounding the term 'therapy' was indicative, however, of a long-term debate surrounding appropriate definitions within the outdoor therapy literature (e.g. Crisp, 1998; Berman & Berman, 2008; Revell, Duncan & Cooper, 2014; Richards, 2015). This debate has attempted to distinguish between deliberate intentional psychotherapeutic outdoor interventions, which target specific therapeutic outcomes, to those which bring about therapeutic outcomes, without specific delivery frameworks. The latter, 'therapeutic' definition reflects the majority of outdoor therapy interventions delivered in the UK (e.g. Ecominds). Ecominds has employed evidence-based approaches, through frameworks such as the Five Ways to Wellbeing (New Economics Foundation, 2008) in the delivery of its schemes. For example, including physical activity, skill acquisition and social interaction, to encourage broad and diverse biopsychosocial outcomes, such as improved health and wellbeing, increased physical activity levels and greater feeling of integration within the local community (Bragg et al., 2013). While such findings fail to glean new knowledge

surrounding outdoor therapy definitions, they illuminate the long-standing debates within the literature to date and argue their currency.

4.5.2. Recommended Delivery of Outdoor Interventions and Key Components

As mentioned previously, sector leader's *inclusive* and *accessible* definitions of outdoor interventions conflicted with their proposed *tailored* and *targeted* outdoor interventions towards those in greatest need. While targeted and tailored outdoor interventions do not currently reflect the majority of outdoor interventions in the UK, as demonstrated in the previous section. The effectiveness of outdoor interventions targeted towards those with particular needs have been shown to be effective in gaining specified health (e.g. Phelps et al., 2015) and wellbeing outcomes (e.g. Wilson et al. 2011; Detweiler et al., 2015).

Findings therefore suggest calls for more targeted and tailored approaches in delivering outdoor interventions in the UK in the future to replicate the effectiveness demonstrated within the literature. Advantages of this approach include the ability to bring together people with shared experiences, increasing social opportunities and the ability for facilitators to tailor outdoor interventions explicit to the groups' specific needs to maximise outcomes (e.g. Fruhauf et al., 2016). Disadvantages, however, include the likelihood of neglecting other individuals, who may also benefit, or further stigmatising marginalised or vulnerable groups and inadvertently increasing health inequalities (Marmott et al., 2010). Caution must therefore be taken when proposing to include such findings in the future delivery of outdoor interventions.

Proposed targeted and tailored delivery of outdoor interventions is consistent with calls for facilitators with relevant professional requirements dependent upon the type of outdoor intervention being delivered. Findings support the 'Program-Perspective Model' within outdoor leadership (Shooter, Sibthorp & Paisley, 2009). This model was proposed as a guide to decision making around the suitability of facilitators with an integration of technical, interpersonal skills, judgement and decision-making based on the programme's unique aims. The model considers programme goals or aims in regards to the specific outdoor leadership skills of facilitators (Shooter, Sibthorp & Paisley, 2009). Findings support the philosophy within more contemporary literature within outdoor leadership arguing that good leadership is the capacity to move others towards a shared goal, with a focus on competency, which participants would not achieve on their own (Smith & Penney, 2010). These intervention-specific skills, argued to be essential in those facilitating outdoor interventions, also relates to the 'knowledge' (including knowledge about the condition and procedural knowledge), 'skills' (practical skills and interpersonal skills) and 'social/professional role and identity' (professional identity and confidence, professional boundaries, group identity, leadership) components within the TDF (Cane, O'Connor & Michie, 2012). These components target the physical and psychological 'capability' and the automatic and reflective 'motivation' within the COM-B model (Michie et al., 2011). When these factors are considered and tailored to the intervention and the group targeted, this will increase facilitator's motivation and competency to deliver specifically targeted outdoor interventions and the participant's competency to engage. This theme around competencies of facilitators also included the scope for partnership

working, e.g. with relevant health experts and outdoor/environmental practitioners relevant to the outdoor intervention being delivered and target demographic. While collaboration between the environmental sector and health leaders is nothing new, this finding is supported by the effectiveness of successful partnerships in outdoor interventions (e.g. Ecominds, Branching Out, MacMillan and Ramblers) and supports the need for further similar collaborations. Findings are further strengthened by suggestions that psychologists and other behavioural scientists should contribute to the design, development, delivery and evaluation of interventions, which aim to change behaviour and influence positive health and wellbeing outcomes (Michie et al., 2011; Michie et al., 2014).

Similarly, considerations surrounding the difficulty of tasks highlights the importance of enhancing the participant's 'beliefs about capabilities' (Cane, O'Connor & Michie, 2012) to influence their 'reflective motivation' to engage in behaviour change and therefore achieve desired health and wellbeing outcomes (Michie, Van Stralen and West, 2011).

Behaviour change techniques to support this may involve 'verbal persuasion to boost self-efficacy' by facilitators and 'focusing on past success' (Michie et al., 2013; Michie et al., 2014). These recommendations are further strengthened by Bandura (1986) self-efficacy theory whereby feedback is argued to increase self-efficacy, recently implicated in the Proposed Path Model within outdoor leadership, where feedback, alongside mentoring and goal attainments, increases self-efficacy and further engagement in outdoor leadership developmental activities (Propst & Koesler, 1998).

Further considerations within the delivery, such as the environmental setting and the individual differences of participants also illustrate the importance of the 'environmental

context and resources' within the TDF (Cane et al., 2012) to encourage the 'physical opportunities' within the COM-B model (Michie, Van Stralen & West, 2011). For example, the Stress Restorative Theory suggests that more restorative outdoor environments are those that provide perceived escape from urban stress and the stress of people's everyday lives (Ulrich, 1983). Insight gained from this study therefore extends beyond previous theory, by combining theoretical knowledge, to the current study's findings and implicating the future use of BCTs within the delivery of a Natural Health Service, such as 'restructuring the physical environment' to allow participants a perceived escape from the stress of their urban everyday lives. Careful consideration surrounding the duration of outdoor interventions was also supported by literature claiming that a dose of 20- 30 minutes or more has been found to have a positive impact on health and wellbeing (Frühauf et al., 2016; Hunter et al., 2019). Future outdoor interventions must therefore enable this suggested dose-response to be met to encourage effectiveness while ensuring that this duration is short enough so that outdoor interventions are not burdensome for participants. The literature is unclear when discussing the influence that the duration of sessions has on effectiveness of community interventions, with shorter duration interventions observed to be more effective than longer interventions for health behaviour outcomes (O'Mara-Eves et al., 2015). More research is therefore required to establish a dose-response regarding outdoor interventions and associated health and wellbeing outcomes.

Further inductive findings suggest a need to balance intervention fidelity, to ensure quality across outdoor interventions delivered, with flexibility to participant's needs to enhance

effectiveness presented a challenge to sector leaders. Themes reflect the ‘fidelity-adaptation’ tension with two competing aims to develop universal interventions, implement them with a level of fidelity and to design interventions that are responsive to the needs of participants (Castro, Berrera, Martinez, 2004). This issue is considered to be particularly evident when different facilitators with different levels of expertise are implementing interventions in different contexts (Glasgow, Lichenstein, & Marcus, 2003). Attempts to balance these two competing aims has led to the development of ‘build in’ adaptations to enhance the tailoring of interventions to participants needs while also maximizing fidelity of implementation and intervention effectiveness (Castro et al., 2004). Within recent policy, such adaptations have already been utilised by the Cornwall Nature on Referral Plan (2014), where a two-tiered model is adopted. This two-tiered model delivers interventions with the fundamental characteristics that they all have in common (e.g. engaging in nature and physical activity to differing degrees) defined as ‘Nature Interventions’ and tailoring these to participants specific needs in ‘Nature+ Interventions’. A lack of evidence surrounding the effectiveness of this model reduces the ability to make recommendations for the wider adoption of this strategy within outdoor intervention delivery. Findings do, however, suggests a potential solution to balancing the intervention fidelity and flexibility challenge emphasised by participants within this study.

4.5.3. Perceived Health and Wellbeing Outcomes Associated with Outdoor Interventions

The multifaceted psychosocial outcomes associated with outdoor interventions are in line with a dearth of literature demonstrating the effectiveness of outdoor interventions, as

apparent throughout the literature review (Chapter 2). Findings support the Biopsychosocial Model (Engel, 1977) of health, implying that thoughts, feelings and behaviours may influence health as well as psychological and social factors. Findings also support theoretical knowledge regarding the acquisition of positive health and wellbeing outcomes through engaging in nature. Multifaceted outcomes are in keeping with the simultaneous multiple pathways responsible for health and wellbeing outcomes associated with engagement in the outdoors (e.g. physical activity, air quality, social cohesion) (Hartig, Mitchell, De Vries & Frumkin, 2014). Findings also reflect the interlinked mechanisms through which people believe they potentially achieve health and well-being outcomes. This framework proposed interlinked mechanisms were responsible for how participants perceived associated positive health and wellbeing outcomes as proposed by Husk, Lovell, Cooper, Stahl-Timmins and Garside (2015). Proposed mechanisms included changes in personal or social identity, achievement or contribution, knowledge acquisition, social contact, being away from stressors, restoration or recuperation and physical activity with variations related to the participants themselves and types of activity influencing perceived outcomes. Findings surrounding outcomes affirm that leader's perceptions are consistent with theoretical explanations and current evidence surrounding outdoor interventions within the literature review (Chapter 2).

4.5.4. Proposed Evaluation Protocols to Capture Associated Outcomes

Proposed rigorous and robust evaluation protocols to capture perceived outcomes associated with outdoor interventions, as well as calls to identify key delivery components, which may be responsible for associated health and wellbeing outcomes, suggests the

adoption of mixed methods evaluations. Mixed methods evaluations enable rigorous and robust data to be collected within the quantitative phase, with rich and detailed qualitative data within the qualitative phase drawing upon the strengths of both (Creswell et al, 2017). The adoption of mixed methodologies would therefore provide greater insight into potential causal pathways, mechanisms and key components within the intervention involved in outcomes gained (Farquhar, Ewing & Booth, 2011; Creswell & Clark, 2017). Key components may then be interpreted with relevant behaviour change theory (e.g. BCW, TDF) in an attempt to identify why an intervention has successfully achieved its desired goal or failed to do this and improve the future evaluation of outdoor interventions (Michie et al., 2014). Suggested evaluation proposals are supported by policy statements (e.g. Environments and Mental Health: Evidence Briefing, 2016) arguing for greater insight to be gleaned into causal pathways and mechanisms influencing health and wellbeing outcomes associated with outdoor interventions. Mixed methodology would also remain flexible to the proposed *targeted* and *tailored* delivery of outdoor interventions, while including *rigorous* and *robust* evaluation protocols by its ability to suit each approach.

4.5.5. Conclusion

This was the first study to gain sector leaders perspectives of outdoor interventions from outdoors, health, physical activity and therapy perspectives. This gleaned unique insight into sector leaders' definitions, delivery, associated health and wellbeing outcomes and proposed evaluation frameworks to capture outcomes associated with outdoor interventions. Unique findings revealed sector leaders perceived outdoor interventions to

be broad and all-encompassing in their definitions and aims, in contrast to proposed targeted and tailored delivery formats. While findings revealed unique knowledge surrounding the discrepancies between *what is perceived* to be delivered and *what should be delivered*, the following study (Study 2, Chapter 5) will explore *what is actually being delivered* from those currently delivering outdoor interventions. Key delivery components (e.g. appropriate settings, facilitator competencies, difficulty and duration of sessions) were consistent with the academic literature, policy and behaviour change theory (Michie et al., 2005; Michie et al., 2011) and have novel implications to lever behaviour change techniques within the future delivery of a Natural Health Service to encourage engagement and enhance associated health and wellbeing outcomes. Evaluation proposals to combine rigorous and robust evaluation frameworks, alongside strategies to identify these key delivery components, suggested the adoption of mixed-methods methodology. Mixed methodology would remain flexible to the targeted and tailored delivery of outdoor interventions, while enabling robust and rigorous research protocols to demonstrate the effectiveness of outdoor interventions in improving health and wellbeing.

Chapter Five: Study Two:

Gaining Insight into the Delivery of Outdoor Therapy Interventions from those Currently Facilitating Them

Table 5.1. Thesis Study Map: Study Two

<p>Study 1: Exploring Outdoor Interventions from a Sector Leaders Perspective</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To explore outdoor interventions from sector leaders within a policymaking, funding or research perspective within the areas of outdoors, health, physical activity and therapy 2. To examine definitions of outdoor interventions and differences from an outdoors, health, physical activity and therapy perspective and identify their delivery components 3. To investigate how outdoor interventions are perceived to or have improved people's health and wellbeing 4. To consider how outdoor interventions are and should be designed and delivered to improve health and wellbeing and evaluated to capture associated outcomes 	<p>Key Findings:</p> <ul style="list-style-type: none"> • Inclusive and accessible outdoor interventions described, inclusive to diverse needs and abilities • Contrasting proposals for targeted and tailored delivery of outdoor interventions • The duration and difficulty of activities, environmental setting, individual differences of participants, as well as facilitator's knowledge and skills argued as key delivery components • Mixed methods research evaluations proposed to demonstrate the effectiveness of outdoor interventions and identify key delivery components, which may influence positive health and wellbeing outcomes
<p>Study 2: Gaining Insight into the Delivery of Outdoor Therapy Interventions from those Currently Facilitating Them</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To examine how outdoor therapy interventions are defined by facilitators 2. To explore how outdoor therapy interventions are perceived to be therapeutic by facilitators delivering them 3. To explore how outdoor therapy interventions are currently designed and delivered 4. To assess how outdoor therapy interventions are evaluated to examine perceived therapeutic outcomes 	
<p>Study 3a: Evaluating the health and wellbeing outcomes of outdoor interventions</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To evaluate the health and wellbeing benefits of outdoor interventions 2. To examine the sustainability of behaviour change and associated health and wellbeing outcomes following completion of outdoor interventions 	
<p>Study 3b: Exploring the Experiences of Participants and Facilitators of Nature4Health Outdoor Interventions</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To gain insight into the experiences of participants and facilitators engaged in and delivering Nature4Health outdoor interventions 2. To explore perceived health and well-being outcomes associated with engaging in each outdoor intervention 3. To explore evidence of key delivery components within outdoor interventions which may influence health and wellbeing outcomes 4. To assess the long-term sustainability of behaviour change and associated health and wellbeing outcomes 	

5.1. Introduction

This study explored the perspectives and experiences of facilitators currently delivering outdoor therapy interventions. The study specifically examined current outdoor therapy facilitator's definitions, delivery, perceived health and wellbeing outcomes, as well as evaluation frameworks utilised to capture such outcomes within their outdoor therapy interventions. While it would be advantageous to recruit facilitators delivering outdoor interventions from each area (outdoors, health, physical activity and therapy), adopting such a wide scope was not feasible within the time and funding constraints of this PhD. Facilitators of outdoor therapy interventions were therefore recruited to contain this study, while maintaining the in-depth exploration of this area. This approach allowed scope to address the four areas of outdoors, health, physical activity and therapy. For example, the area of the 'outdoors' is threaded through the entire PhD due to the outdoor setting of *outdoor* interventions. Similarly, the multifaceted nature of outdoor therapy interventions, demonstrating physically therapeutic outcomes, as well as psychological benefits, allows the theme of 'health' to be continued throughout. For example, horticultural therapy demonstrated effectiveness in patients with brain damage (Soderback, Soderstrom, & Schalander, 2004; Mizuno-Matamoto, Kobashi, Hata, Ishikawa, & Asano, 2008), those engaged in cardiac rehabilitation (Wichrowski, Whiteson, Haas, Mola, & Rey, 2005) and individuals undergoing pain management interventions (Verra et al., 2012). Additionally, outdoor therapy interventions all contain some element of 'physical activity'. For example, adventure therapy is usually carried out with some other form of adventurous physical activity, such as canoeing, rock climbing or high ropes work (Peel & Richards, 2005) also

enabling ‘physical activity’ to be explored throughout this study. Furthermore, the multifaceted and interactive nature of outdoor therapy interventions, or those aiming to promote wellbeing, is also reflective of the Five Ways to Wellbeing (New Economics Foundation, 2008), which promotes evidence-based strategies designed to be accessible to everyone to engage in to improve their wellbeing, see table 5.2.

Table 5.2. <i>Five Ways to Wellbeing (New Economics Foundation, 2008).</i>	
1. Connect	Connecting with people (e.g. family, friends, colleagues and neighbors) and investing time in developing them.
2. Be Active	Physical activity (e.g. walking, running, gardening etc.) to suit current level of physical activity
3. Take Notice	Being mindful of surroundings, e.g. changing seasons, sights and sounds
4. Keep Learning	Trying something new, setting challenges and achieving goals
5. Give	Doing something for someone else or volunteer your time, which is rewarding and builds connections with others

Outdoor therapy interventions contain elements of each of these strategies. The group format of outdoor therapy interventions enables participants to ‘connect’ with other participants. All outdoor therapy interventions incorporate physical activity to varying degrees, as mentioned, encouraging participants to ‘be active’. The natural surroundings of outdoor interventions also support participants to ‘take notice’ of their environment. For example, the practice of ecotherapy entails facilitating contact with natural surroundings to support healing (Jordan, 2015). Skill attainment is usually a component within outdoor

interventions, whereby participants are encouraged to ‘keep learning’. For example, within the Ecominds evaluation (Bragg et al., 2013), skill acquisition was outlined as a key outcome, alongside improved health and wellbeing, as well as encouraging participants to be more physically active and integrated within their local community. Finally, many outdoor interventions involve participants engaging in pro-environmental behaviours or conservation, enabling them to ‘give’ back to the natural environment or local community (e.g. Wilson, 2011). The broad scope of outdoor therapy interventions also allows the exploration of those targeted at the general population (e.g. Ecominds, 2020), as well as those specifically targeted at those with specific mental health conditions (e.g. Branching Out, 2020) and designed and delivered accordingly.

The current study gained insight from facilitators currently delivering ecotherapy, horticultural therapy, adventure therapy and wilderness therapy (see Chapter 2, Literature Review for full descriptions of each of these outdoor therapy interventions, their delivery and associated outcomes). This study contributed to the former study’s findings (Study 1, Chapter 4), which gained the insight of sector leaders, responsible for funding, policy making and research regarding outdoor interventions, from an outdoors, health, physical activity and therapy perspective. The current study therefore investigated whether Study 1 findings are translated into the current delivery of outdoor interventions from an outdoor therapy perspective. From a behaviour change standpoint, this study investigated whether the *proposed* ‘service delivery’ and ‘intervention functions’ by sector leaders has enabled or supported those *actual* intervention functions within current outdoor therapy interventions (Michie et al., 2011).

5.2. Aims and Objectives

To explore perspectives and experiences of facilitators currently delivering outdoor therapy interventions

1. To examine how outdoor therapy interventions are defined by those currently facilitating them
2. To explore how outdoor therapy interventions are perceived to be therapeutic
3. To consider how outdoor therapy interventions are currently designed and delivered
4. To gain insight into how outdoor therapy interventions are evaluated to capture perceived therapeutic outcomes

5.3. Methodology

5.3.1. Study Design and Participants

This study adopted a qualitative methodology, as in Study 1 (Chapter 4) using qualitative semi-structured telephone interviews. Participants comprised of sixteen outdoor therapy facilitators (N=16) who delivered eco-therapy, outdoor therapy, adventure therapy, or wilderness therapy. Participants were located and recruited using the same protocol as Study 1 (Chapter 4, section 4.3.2.). To summarise, this process involved approaching pre-existing professional contacts of the researcher and the supervision team, who fulfilled the recruitment criteria. The recruitment criteria within this study were those facilitators currently delivering eco-therapy, outdoor therapy, adventure therapy, or wilderness therapy. A systematic search was then conducted,

similarly to Study 1 (Chapter 4, section 4.3.2.) using relevant keywords within an internet search (Table 5.3.).

The following terms were added to each perspective, or term in table 5.3. to gain outdoor facilitators possibly using different terms to describe their role:

psycho train* practi* facilit* counsel**

Finally, at the end of each interview, the researcher asked participants whether they could recommend any colleagues from different organisations to their own, who they thought may also be suitable to take part in the study. A final contacts list included a diverse list of contacts who delivered various ‘types’ of therapy. Table 5.4. illustrates participant characteristics.

Table 5.3.	
<i>Search Terms Utilised to Recruit Outdoor Therapy Facilitators in a Systematic Internet Search</i>	
<u>Terms</u>	<u>Search terms used: (* denotes truncations used)</u>
Eco-Therapy	outdoor* therap* natur* green* forest* woodland* environment* eco*
Outdoor Therapy	outdoor* therap* natur* green* forest* woodland* environment*
Adventure Therapy	outdoor* therap* natur* green* forest* woodland* environment* adventur*
Wilderness Therapy	outdoor* therap* natur* green* forest* woodland* environment* wilderness

5.3.2. Interview Materials

As in Study 1 (Chapter 4), one-to-one semi-structured telephone interviews were conducted with facilitators to address the study's specific research questions. Interviews included a short introduction to explain the context of the PhD, the purpose of the interview and to gain ethical consent from participants to take part in the study, lasting approximately 5-10 minutes. The research questions were then addressed with additional questions and prompts to gain more information and detail, and ultimately achieve saturation of data. Examples of questions and prompts used to address research questions in each study are presented in Table 5.4.

5.3.3. Procedure

The researcher contacted participants via email with an invitation to take part in the study. If participants did not respond within 1 week of the email sent, a second email was sent. If participants did not respond to the second email, participants were not contacted again. Interested participants were encouraged to reply to the researcher via email to express their interest in taking part in the study, at which point, they were sent a participant information sheet to inform them of the nature of the study and a consent form to sign to indicate their consent to participate. The researcher then arranged convenient times to conduct the telephone interviews. Interview times lasted a mean time of 1 hour, 15 minutes (mean=1 hour and 15 minutes). Interviews were recorded using a Dictaphone and transcribed verbatim. Transcripts were imported into NVivo10 software and analysed using Thematic Analysis (Braun & Clarke, 2006). The first 2-4 interviews were used as pilot studies,

allowing the interview schedule to be reworked to elicit more in-depth data. Changes included the addition of the following questions to the interview schedule:

'Do you have any counselling/therapy qualifications?'

How are they accredited?'

'Are they accredited by a professional body?'

What are they?'

'Do you have any outdoor qualifications?'

'What are they?'

'Are they accredited by a professional body?'

'Do you have any other qualifications/ training related to your role?'

The researcher was able to determine those participants which were accredited therapists and those who were not. These questions also allowed for further exploration of the service deliverer's background regarding training and qualifications in both therapy and outdoor skills.

5.3.4. Analytical Procedure

Thematic analysis (Braun &Clarke, 2006) was used to analyse interview transcripts, transcribed verbatim. The same sequence occurred in Study 1 data analysis (Chapter 4, section 4.3.5.) with guidelines provided by Braun & Clarke (2006).

Table 5.4.

Participant Roles, Affiliations and Accreditations

<u>Participant Number</u>	<u>Affiliation</u>	<u>Position and Accreditation</u>	<u>Area</u>
1	NHS and University	Psychotherapist and Honorary Researcher	Eco-Therapy
2	Own business	Ecotherapist	Eco-Therapy
3	Own business	Mountain Leader/Healer (BACP)	Eco-Therapy
4	Charity	Nature-Based Practice	Eco-Therapy
5	Own practice	Nature-based Psychotherapist (BACP)	Eco-Therapy
6	Own practice	Ecotherapist	Eco-Therapy
7	Outdoor Adventure Delivery Organisation	Director and Adventure Therapist	Outdoor Adventure Therapy
8	Own business	Wilderness and Eco Psychologist (UKCP)	Wilderness Therapy
9	Community Woodland and Social Enterprise	Health Coordinator	Eco-Therapy
10	Outdoor Adventure Rehabilitation Delivery Organisation	Adventure Therapist	Outdoor Adventure Therapy
11	Community Interest Group and NHS	Psychiatrist- Green Care (BACP)	Eco-Therapy
12	Own practice	Psychotherapist (BACP)	Outdoor Adventure Therapy
13	Own practice	Counsellor and Psychotherapist- Nature Therapy (BACP)	Eco-Therapy
14	Eco-Therapy Provider	Facilitator- Eco-Therapy Facilitator	Eco-Therapy
15	NHS	Counsellor and Psychotherapist- Eco Psychologist and Green Care	Eco-Therapy
16	Own practice	Counsellor (BACP)	Outdoor Adventure Therapy

Table 5.5.

Examples of Research Questions with Corresponding Interview Questions and Prompts

<u>Research Questions</u>	<u>Interview Questions</u>	<u>Prompt</u>
How are outdoor therapy interventions defined by those currently facilitating them?	<i>'In what ways are you familiar with the term 'outdoor therapy', 'adventure therapy' or 'nature therapy'?</i>	<i>'What do you think this includes?'</i>
How outdoor therapy interventions perceived to be therapeutic?	<i>'How are people affected by taking part in these activities?'</i>	<i>'What are the associated outcomes?'</i>
How are outdoor therapy interventions currently designed and delivered?	<i>'How has your service been designed to have these benefits?'</i>	<i>'Is this informed by theoretical knowledge or in conjunction with relevant experts?'</i>
How are outdoor therapy interventions evaluated to capture perceived therapeutic benefits?	<i>'How are or should services be evaluated to effectively assess associated benefits?'</i>	<i>'Do you currently use any evaluation frameworks?'''</i>

5.4. Results

Three themes were identified, each containing three to six subthemes using TA (Braun & Clarke, 2006). Themes were 1) Outdoor Therapy Definitions and Translation into Own Practice, 2) Experiences in Outdoor Therapy, and 3) The Role of Therapy in Outdoor Therapy, see Figure 5.1. Themes and sub-themes are illustrated with extracts taken from interview transcripts to support findings. Patterns and relationships are also discussed throughout.

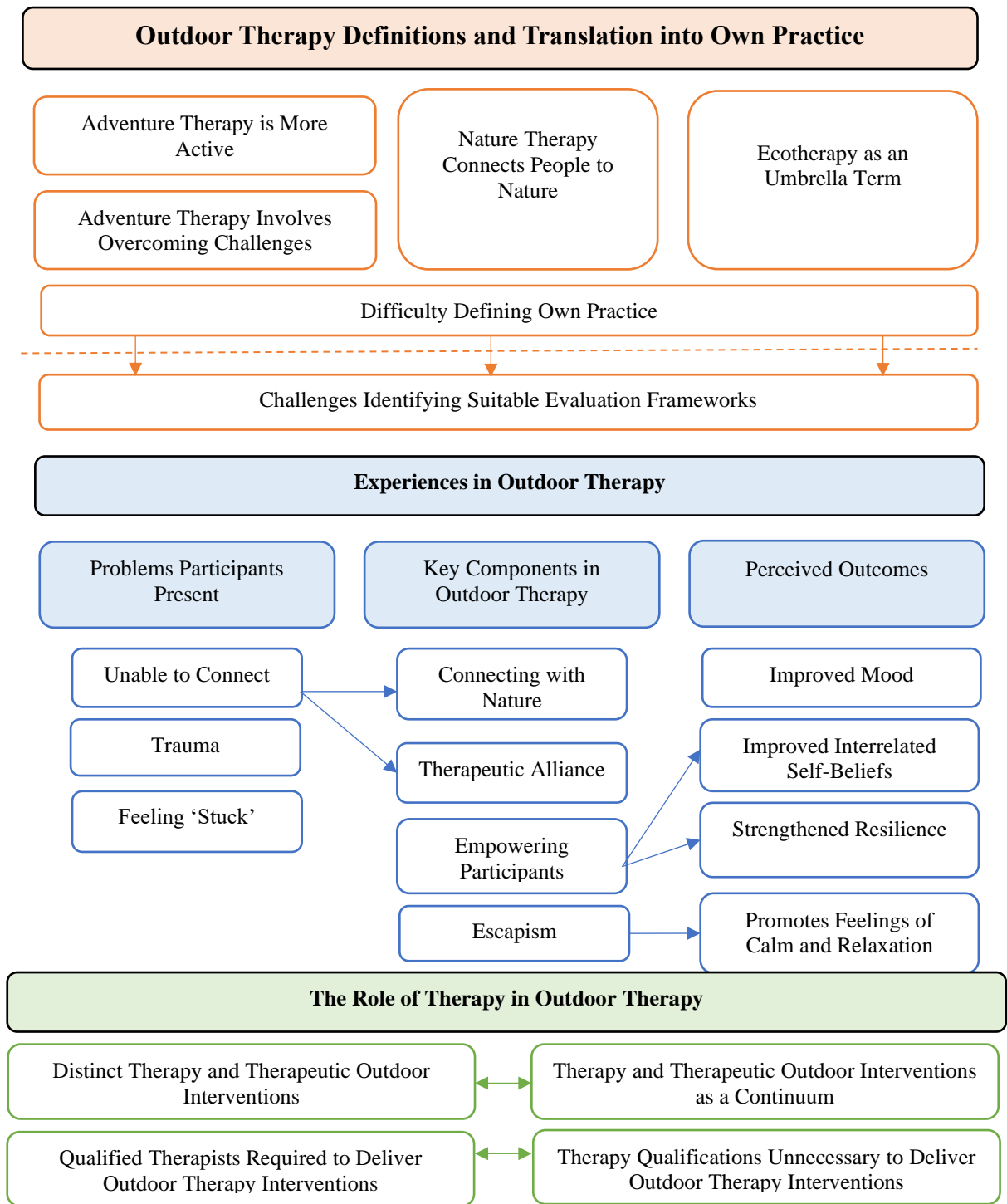


Figure 5.1. Study 2 Themes and Sub-Themes

5.4.1. Theme 1: Outdoor Therapy Definitions and Translation into Own Practice

Sub-theme 1.1. Adventure Therapy is More Active

Facilitators perceived adventure therapy to be more physical activity orientated:

“I think it's [adventure therapy] not activity-focused, or when I say activity, being active. That's my association.” (Participant 5, Nature-Based Psychotherapist)

Sub-theme 1.2. Adventure Therapy Involves Overcoming Challenges

As well as being more active, facilitators agreed that adventure therapy involved overcoming challenges:

“adventure would be about overcoming quite a few challenges, I suspect, would be where I would see it. So it would be much more of a challenging environment, and probably its process is to test out your resources in quite extreme environments.”

(Participant 1, Psychotherapist and Honorary Researcher in Ecotherapy)

Interestingly, the majority of facilitators who stated this were qualified therapists. It could therefore be argued that these facilitators were more familiar with these elements and used these principles to inform their practice.

Sub-theme 1.3. Nature Therapy Connects People to Nature

Whereas facilitators agreed that nature therapy was concerned with connecting people to nature:

“I see nature as more actually just connecting people with nature, so sitting, being, touching, feeling, knowing nature, not trying to control it, not trying to change it, not trying to manipulate it.” (Participant 10, Adventure Therapist)

Sub-theme 1.4. Ecotherapy as an Umbrella Term

Ecotherapy, however, was perceived as an umbrella term for a whole range of outdoor therapy interventions:

“sort of like green care, green exercise, walking in nature, green gym, all that stuff.” (Participant 8, Wilderness and Eco Psychologist)

Those facilitators who suggested that Ecotherapy was an umbrella term were those who were not qualified therapists, possibly reflective of the current practice of Ecotherapy within a UK context. These interventions include a variety of outdoor interventions which are not necessarily therapy and the more recent definition of Eco-therapy, referring simply to the ‘delivery of interventions in the outdoors’, (Jordan, 2015, p.4.). Ideas are in-keeping with broad descriptions of Eco-therapy (Clinebell, 1996; Buzzell & Chalquist, 2009) where it is described as *‘the healing and the growth that is nurtured by healthy interaction with the earth’* Clinebell (1996, p. xxi).

Sub-theme 1.5. Difficulty Defining Own Practice

However, participants experienced difficulties defining their own outdoor therapy practice:

“It's [his outdoor adventure intervention] not definable, I don't think, because each person, they give you slightly different reasons, they give you different explanations for why they think it has benefitted them.” (Participant 10, Adventure Therapist)

Sub-theme 1.6. Challenges Identifying Suitable Evaluation Frameworks

In light of the former findings, surrounding the difficulties facilitators experienced in defining their own practice, it is perhaps not surprising that participants also expressed challenges in identifying suitable evaluation frameworks to evaluate them:

“I don't actually know of evaluation things that would be applicable. I would say evaluation would be quite difficult, but probably if there are standard things that evaluate psychotherapy, those might be applicable to the outdoors, but perhaps with a bit of adaption where there is a need”

(Participant 3, Mountain Leader and Healer in Ecotherapy).

Participant 3 emphasises the difficulty in evaluating outdoor therapy interventions and proposes adapting existing psychotherapy measures for use in an outdoor therapy setting.

5.4.2. Theme 2. Experiences in Outdoor Therapy

Sub-theme 2.1. Problems Participants Present: Unable to Connect

Participants engaging in outdoor therapy were argued to be facing a range of issues, including being unable to connect and seeking support for relationship issues:

“we've lost the ability to connect with ourselves and others in a sort of natural, simplistic way.” (Participant 7, Director and Adventure Therapist)

Sub-theme 2.2. Problems Participants Present: Trauma

Participants also presented a range of mental and emotional issues, with trauma being a consistent theme:

“I mean, over the years we've seen childhood trauma issues resolved... physical abuse, sexual abuse, psychological abuse in childhood, through these processes, abandonment issues.” (Participant 6, Eco Therapist)

Sub-theme 2.3. Problems Participants Present: Unable to Connect

Further commonalities, revealed in participant demographics, described by facilitators, was participants who attended outdoor interventions, being described as feeling ‘stuck’:

“What I have seen with a few of the clients we've worked with, say they're in a treatment centre, or they're in the YMCA, and they're a bit stuck in this kind of institution, as it were.” (Participant 7, Director and Adventure Therapist)

This also referred to being stuck in the NHS’s mental health system, and implied dissatisfaction with advice sought elsewhere or being unable to make important life decisions and requiring some assistance with this to enable them to move forward. Sub-themes suggested that participants seeking help were not necessarily those with diagnosable mental health conditions, but those who required assistance in navigating through difficult periods in their life (e.g. relationship problems, a traumatic event, and/or

being 'stuck' finding appropriate support they would usually access if they did have a mental health diagnosis).

Sub-theme 2.4. Key Components in Outdoor Therapy: Connecting with Nature

Key components within the delivery of outdoor therapy interventions which was perceived to enable participants to try to resolve the problems presented, included connecting with nature:

“if you're connected with nature, you're more in tune with yourself, and actually your benefits for health will come through, mental and physical.”

(Participant 6, Eco Therapist)

Participant 6 states that by connecting with nature, individuals can become more in touch with their feelings, which influence both positive mental and health outcomes.

Sub-theme 2.5. Key Components in Outdoor Therapy: Therapeutic Alliance

The importance of an effective and safe relationship with the facilitator and participant was also a prominent sub-theme:

“my work is focused around relationship, and I think that's the most important aspect, to be with the therapist, but can hold the right conditions to create a

relationship that is safe for the client to explore in”. (Participant 7, Director and Adventure Therapist)

This relationship was argued to enable safe exploration of feelings. Interestingly, all those participants who emphasised this were qualified therapists themselves. These views were possibly influenced by training and the strong emphasis placed on therapeutic alliance within therapy guidelines, training and practice.

Sub-theme 2.6. Key Components in Outdoor Therapy: Empowering Participants

Outdoor therapy was argued to empower participants, who may not have previously experienced this. This was achieved through allowing choice and participant-led sessions:

“When we're both outside [facilitator and the client], it feels like much more of a shared space that has a much wider perspective on it... So, one client, I worked with really liked the sort of sense that it was a more democratic equal relationship outside, and she felt more empowered outside.”

(Participant 13, Counsellor and Psychotherapist in Nature Therapy).

These vital components were argued to positively influence the perceived outcomes of improved confidence, self-esteem and self-efficacy, as discussed later.

Sub-theme 2.7. Key Components in Outdoor Therapy: Escapism

Outdoor therapy interventions were also described as providing feelings of escapism for participants:

“That's what I would say outdoor therapy is. It's just being away from the human constraints”. (Participant 7, Director and Adventure Therapist)

Sub-theme 2.8. Perceived Outcomes: Improved Mood

Perceived outcomes included an array of psychological benefits, participants were argued to experience improved mood:

“you get that sense of uplifting, which I think most people get it if they're taken to somewhere really beautiful. You just kind of feel a sense of wellbeing”

(Participant 14, Eco-Therapy Facilitator)

Sub-theme 2.9. Perceived Outcomes: Improved Interrelated Self-Beliefs

Additional sub-themes of perceived outcomes included increased confidence, self-esteem and self-efficacy, arguing for improvements in participant's interrelated self-beliefs, argued to be a vital component to positive wellbeing:

“It's more about moving on and this idea of self-actualisation and self-efficacy... they see themselves differently, they find value in themselves, and they can move

that into their everyday settings.” (Participant 4, Nature Based Practitioner in Ecotherapy)

Sub-theme 2.10. Perceived Outcomes: Strengthened Resilience

Participants were also perceived to experience strengthened resilience as an outcome of engaging in outdoor therapy:

“the sort of eco-therapy model and stuff can be used in terms of building up adolescent resilience and maintaining their mental health”

(Participant 9, Ecotherapy Health Co-ordinator)

Sub-theme 2.11. Perceived Outcomes: Promotes Feeling of Calm and Relaxation

Feelings of calm and relaxation were further highlighted as outcomes experienced by participants engaged in outdoor therapy:

“So I think being in nature just allows people, it calms those thoughts, it calms the feelings.” (Participant 10, Adventure Therapist)

5.4.3. The Role of Therapy in Outdoor Therapy

Despite the perceived therapeutic outcomes described, contrasting perspectives emerged in terms of the role of therapy in outdoor therapy and whether all outdoor interventions with therapeutic outcomes should be defined as ‘therapy’. Consequently, this also led to sub-

themes surrounding differing views on the appropriate qualifications for facilitators to enable them to deliver outdoor therapy interventions.

Sub-theme 3.1. The Role of Therapy in Outdoor Therapy: Distinct Therapy and Therapeutic Outdoor Interventions

The majority of participants believed that knowledge and understanding of therapy were required to deliver interventions defined as outdoor ‘therapy’ and made distinctions between outdoor therapy and therapeutic interventions:

“capital T therapy is someone who's a qualified therapist nowadays. They'd have to have a recognised counselling qualification that's recognised by somebody like BACP ... or the UKCP, something... But at MIND, we have a lot of befrienders that are trained to work outdoors with clients. Now they're not trained counsellors, so we say they work therapeutically, small t. So they're not trained therapists, they work therapeutically.” (Participant 16, Counsellor and Outdoor Adventure Therapist)

Sub-theme 3.2. The Role of Therapy in Outdoor Therapy: Therapy and Therapeutic Outdoor Interventions as a Continuum

On the contrary, other participants argued that therapy and therapeutic interventions ran on a continuum ranging from outdoor *therapeutic* interventions to outdoor *therapy* interventions:

“So it's a continuum. It sort of varies between therapeutic and the start of therapy, I suppose.” (Participant 3, Mountain Leader and Healer in Ecotherapy)

Sub-theme 3.3 .The Role of Therapy in Outdoor Therapy: Qualified Therapists Required to Deliver Outdoor Therapy Interventions

Conflicting views also emerged when discussing the required professional competencies to deliver outdoor therapy interventions with some participants stating that *therapy* and *therapeutic* interventions were distinct entities and that qualified therapists were therefore required to deliver outdoor therapy interventions:

“I mean, I certainly would, if something's being billed as therapy, then yes, it does need people who have the appropriate qualifications to manage that and guide it and deal with it.”

(Participant 15, Counsellor and Psychotherapist in Ecopsychology and Green Care)

Sub-theme 3.4. The Role of Therapy in Outdoor Therapy: Qualifications Unnecessary to Deliver Outdoor Therapy Interventions

Contrasting themes, however, argued that therapy qualifications were unnecessary when delivering outdoor therapy interventions:

“No, I think you can over-professionalise these things, and I think you obviously need to be able to understand some of the health and safety issues to make sure that people

are safe, you need to make sure that all that's being dealt with properly and professionally.” (Participant 14, Ecotherapy Facilitator)

It was agreed by the majority of participants that professional therapy knowledge and experience was required to work within outdoor interventions, which are described as therapy, yet a minority of participants suggested that therapy qualifications were not necessary to do this work. Those participants suggesting the latter were not qualified therapists themselves.

5.5. Discussion

This study was the first study to date to explore perspectives and experiences of facilitators currently delivering an array of outdoor therapy interventions within a UK context. The study specifically identified definitions used by facilitators to describe outdoor therapy interventions, how outdoor therapy interventions are designed, delivered and evaluated, as well as how outdoor therapy interventions are perceived to be therapeutic. Themes demonstrated participant’s definitions of outdoor therapy interventions were reflective of the literature to date describing them (see Chapter 2, Literature Review, sections 2.5). Despite this observed clarity when defining outdoor therapy interventions, difficulty was apparent when facilitators attempted to define their own work and position their work within the broad spectrum of outdoor therapy interventions. A recurrent theme from the previous study (Study 1, Chapter 4) also illustrated contrasting views on the role of therapy within outdoor therapy interventions, as to whether therapy is distinct from those outdoor interventions purely defined as such, due to the perceived therapeutic outcomes associated

with its practice. In regards to target populations, facilitators described their participants as sharing mental and emotional ‘issues’ and feeling ‘stuck’ when trying to find solutions to these problems. Key delivery components within outdoor therapy interventions included the opportunity to engage with nature and a positive relationship with the facilitator, both argued to be essential in gaining therapeutic outcomes. Further re-emerging themes from Study 1 included the importance of the skills and competencies of the facilitator and the environmental setting of outdoor therapy interventions, which should allow participants the opportunity to escape from everyday stress. Associated outcomes from outdoor therapy interventions included improved self-confidence, self-esteem, self-efficacy, yet facilitators expressed challenges in selecting suitable evaluation frameworks to measure these outcomes.

5.5.1. Definitions Adopted to Define Outdoor Therapy Practice

Participant’s definitions of outdoor therapy interventions were reflective of the literature to date surrounding them (see Chapter 2, Literature Review, sections 2.5). For example, participants perceived adventure therapy to be more activity-orientated, involving the opportunity to overcome challenges. Definitions were consistent with the literature describing adventure therapy as adventurous activity with participants involved in situations in which they must take some form of action to cope with their unique surroundings (Peel & Richards, 2005). Similarly, descriptions of nature therapy, purporting that this practice aims to connect people with nature, further replicated the literature to date, arguing nature to be a live and dynamic partner within the therapeutic work (Berger, 2006) with a key role in instigating and mediating the therapeutic process, as well as the

therapeutic setting of the intervention (Berger & McLeod, 2006). Finally, definitions of ecotherapy as an ‘umbrella term’ also aligned with descriptions of ecotherapy (e.g. Buzzel & Chalquist, 2009), as well as definitions adopted within a UK context (e.g. Ecominds). Less clarity was apparent, however, when defining facilitator’s own delivery of outdoor therapy interventions, leading to difficulties positioning their own work within the broad spectrum of outdoor therapy interventions they had previously described with apparent ease. Interestingly, facilitators who expressed difficulty in defining their work consisted of those who were not qualified therapists. While debates surrounding the appropriate terms for outdoor therapy interventions are well documented within the literature (e.g. Richards, Carpenter & Harper., 2011; 2015; Pryor, Carpenter, Norton & Kirchner, 2012) and policy documents (Bragg & Atkins, 2016). The current findings are unique, in that they emphasise the currency of such challenges and consequent impact on current delivery of outdoor therapy interventions in the UK today. Findings therefore emphasise that challenges surrounding outdoor therapy definitions are not merely an academic matter, but a challenge, which consequently impacts upon the current delivery of outdoor therapy, and ultimately how they are perceived and experienced by participants. These challenges are further highlighted by the re-emerging themes from Study 1 surrounding the debates of the role of therapy. While some facilitators stated that outdoor interventions can be defined as *therapeutic*, due to their therapeutic wellbeing outcomes on one end of the spectrum, to outdoor interventions defined as *therapy* on the latter end of the spectrum, which have clearly defined psychotherapeutic aims and delivery frameworks. The opposing argument, however, emphasised that outdoor *therapeutic* interventions and those that are outdoor

therapy are distinct and separate due to their unique delivery frameworks, processes and targeted outcomes. Findings are supported by the literature Bragg & Atkins (2016), calling for clarity when differentiating between outdoor interventions specifically designed and commissioned for individuals with a defined need and those population-level, generically targeted outdoor interventions.

Given the previous themes discussed, it is perhaps not surprising that contrasting themes also extended to facilitators suitability to deliver outdoor therapy interventions. Conflicting themes were observed between participant's suggestions that outdoor therapy interventions should only be delivered by qualified therapists, to those stating that such qualifications were not necessary to facilitate outdoor therapy interventions and influence therapeutic outcomes. The majority of those participants, stating that qualifications were essential, were qualified therapists themselves, who were currently delivering outdoor therapy. This contextual information regarding the professional background of the facilitators must be taken into consideration when interpreting findings, as this may reflect the desire for qualified therapists delivering outdoor therapy interventions to protect their area of work. This distinction echoes arguments within outdoor leadership literature, with Ringer's (2014) more recently proposed "role clusters", consisting of a set of named roles, within outdoor leadership/therapy, and the corresponding competencies required. Ringer (2014) distinguishes the role of "Clinician" as separate to recreational/educational outdoor leadership and emphasises that clinician's required competencies are vital to engage vulnerable participants and maximise therapeutic potential within all activities. Findings are further strengthened by the TDF model (Cane et al., 2012), whereby the constructs of

‘knowledge’ and ‘social/professional role and identity’ of the facilitator, influence facilitator’s ‘psychological capability’ and ‘reflective motivation’ to influence behaviour change within the COM-B model (Michie et al., 2011). Similarly, within implementation research (The Improved Clinical Effectiveness through Behavioural Research Group, 2006) the relationship between facilitators and participants, the experts training knowledge and experience, as well as the patient's vulnerability, can all influence the positive or negative outcomes for the patient. According to this theory, the target population, facilitator competencies and the desired outcomes need to be considered and managed to ensure positive outcomes. Findings therefore highlight the importance of recruiting suitable facilitators, within outdoor therapy interventions, to engage participants and achieve desired therapeutic outcomes.

5.5.2. Current Design and Delivery of Outdoor Interventions

The consensus among facilitators that participants engaged on their outdoor therapy interventions shared mental and emotional issues, specifically trauma, suggested outdoor therapy interventions were targeted at those individuals who possess low levels or *languishing* wellbeing. Findings therefore position the outdoor therapy interventions within this study as preventative wellbeing interventions rather than having a specific treatment focus. Furthermore, the shared sense of being ‘stuck’ among participants and being unable to find answers that they sought to gain was reflective of Richards’ (2015) suggestion that participants seeking help are not necessarily those with diagnosable mental health conditions but those requiring assistance in navigating through difficult periods in their lives. Participants therefore hold a ‘reflective motivation’ within the COM-B model

(Michie et al., 2011) to gain support in navigating through difficult circumstances and prevent mental ill-health. These motivations are self-conscious intentions to engage in a behaviour to achieve these desired outcomes. This motivation links to the TDF domains (Cane et al., 2012) whereby the participants hold optimism and the ‘beliefs about consequences’ that engaging in outdoor therapy interventions will support them through these difficult circumstances. Behaviour change techniques such as ‘providing health consequences’ (e.g. providing participants with information on the associated wellbeing outcomes of a particular outdoor intervention) could further enhance participants reflective motivation to engage, whereas utilising ‘feedback on behaviour’ (e.g. monitoring changes in wellbeing throughout and providing participants with feedback on improvements) could encourage participants to continue to engage.

Proposed key components within the delivery of outdoor therapy interventions, including the opportunity to engage with nature, are also consistent with the literature to date. For example, ecotherapy aims to reconnect people with the natural environment, argued as fundamental to wellbeing (Jordan, 2015). Whereas having a positive relationship with the facilitator, or *therapeutic alliance*, has positively predicted treatment outcomes within wilderness therapy (e.g. Harper, 2009; Hoag, Massey, Roberts & Logan, 2013). The recurrent theme surrounding the skills of the facilitator, highlighted as a vital component within Study 1, in encouraging behaviour change and achieving desired outcomes whereby the ‘social and professional role’ and ‘identity and professional confidence’ participants perceive within the facilitator enhances their ‘motivation’ to engage. Furthermore, the ‘interpersonal skills’ of the facilitator enhance participant’s psychological capability to

engage in outdoor therapy interventions and continue to attend if they are open, approachable and engaging (Michie et al., 2004).

Similarly, themes carried through from Study 1 to the current study highlight the importance of the environmental setting of the outdoor therapy intervention. The current study specifically emphasises that the setting should allow participants the opportunity to escape from stress, away from human constraints, allowing participants to feel more empowered. These themes relate to the ‘environmental context and resources’ domain within the TDF (Cane et al., 2012) and more specifically to the elimination of ‘environmental stressors’, managing ‘barriers and facilitators’ and encouraging a positive ‘person environment interaction’ to promote engagement and positively influence desired health and wellbeing outcomes. The Stress Recovery Theory supports these findings where more restorative environments are those that provide relief and escape from everyday stressors (Ulrich, 1983). Such findings surrounding the importance of having skilled facilitators and the appropriate environmental setting, continued from Study 1 into the current study, illustrate that proposed key delivery components highlighted by sector leaders were currently being implemented in the facilitation of outdoor therapy interventions that they delivered.

5.5.3. Outcomes Associated with Outdoor Therapy Interventions

Outcomes associated with outdoor therapy interventions, such as improved self-confidence, self-esteem, self-efficacy, support previous outdoor therapy literature (e.g. Wilson, 2009; Wilson et al., 2011; Bragg et al., 2013; Margalit & Ben-Ari, 2014). These

perceived associated outcomes suggest improvements in a set of interrelated set of self-beliefs (Loos, 2003), often jeopardised when individuals are exposed to adverse situations (Milani & Loureiro, 2009). Findings further strengthen the notion of outdoor therapy providing a preventative intervention, targeting those exhibiting poor wellbeing, rather than a treatment intervention, for those with diagnosed mental health conditions. Participants proposed outcomes, such as the feelings of calm and relaxation and strengthened resilience is supported by the literature, with reduced stress reported in participants taking part in horticultural therapy (e.g. Adevi & Mathensson, 2013) and nature-based therapy (Sahlin et al., 2014; Palsdottir, Persson, Persson & Grahn, 2014; Sahlin et al., 2015).

5.5.4. Evaluation Protocols Utilised to Capture Proposed Therapeutic

Outcomes

Challenges facilitators experienced in selecting suitable evaluation frameworks to assess outdoor therapy interventions, reflected their difficulty they described in defining their outdoor interventions, previously discussed. Evaluation challenges also reflected difficulties expressed by leaders in Study 1 (Chapter 4) in conducting rigorous and robust evaluation protocols required to position outdoor interventions within healthcare (e.g. RCTs), which were deemed unsuitable for outdoor interventions due to flexible delivery styles. The facilitators within this study, however, proposed an innovative solution to this challenge by adopting measures already well established and utilised within indoor therapy interventions (e.g. psychotherapy) and adapting them to outdoor settings. Such adaptations have been adopted within the literature (e.g. Revell et al., 2014) whereby aspects of

outdoor therapy experiences were combined with the Helpful Aspects of Therapy scale (Llewelyn, 1988) to identify the key helpful or hindering events. This approach suggests a compromise to enable rigorous and robust evaluations, through the adoption of validated questionnaire measures, while remaining appropriate to the flexible delivery of outdoor therapy interventions. Such findings have implications for future evaluation frameworks to evaluate outdoor interventions, communicate their effectiveness and position outdoor therapy within mainstream mental health provision.

5.5.5. Conclusion

The current study aimed to explore the perspectives of facilitators currently delivering outdoor therapy interventions regarding the definitions, delivery, associated therapeutic outcomes and evaluation protocols utilised to capture such outcomes. Findings demonstrated participant's definitions of a range of outdoor therapy interventions were consistent with the descriptions within the outdoor therapy literature to date, yet they had difficulty in defining their own practice. Conflict surrounding the role of therapy in outdoor therapy interventions also re-emerged as a theme from previous study 1 findings. The continuing conflict surrounding the role of therapy within the current study provides unique research findings surrounding the currency of this issue and impact on current outdoor therapy practice and those participants engaged, rather than being purely an academic matter. Participant demographics, described as individuals who were struggling with mental or emotional issues, dealing with trauma or generally feeling 'stuck' positioned the outdoor therapy interventions within this study as preventative outdoor interventions rather specifically treatment-focused. Key components within the delivery of

outdoor therapy interventions were consistent with those suggested by sector leaders in Study 1, for example, the environmental setting, facilitators knowledge, skills and professional role, demonstrating how delivery components which are considered as vital by sector leaders are been implemented in the current facilitation of outdoor therapy. In contrast to the multifaceted psychosocial outcomes suggested within Study 1, facilitators of outdoor therapy interventions defined outcomes as improved self-values alongside feelings of calm and relaxation. Participants resolved challenges they had experienced, in selecting suitable evaluation frameworks, by adapting more widely used measures within traditional therapy to use in outdoor settings. While this study gained facilitators perspectives of outdoor therapy interventions in terms of how they are defined, delivered and evaluated and what their associated outcomes are. The following study will gain quantitative outcomes of those participants actually engaged in outdoor interventions. The final study will then explore participant and facilitator's unique experiences of engaging in or delivering outdoor interventions while identifying key delivery components that may have been attributed to the associated health and wellbeing outcomes gained.

Chapter Six: Study 3a:

Evaluating the Health and Wellbeing Benefits of Outdoor Interventions

Table 6.1. Thesis Study Map: Study 3a

<p>Study 1: Exploring Outdoor Interventions from a Sector Leaders Perspective</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To explore outdoor interventions from sector leaders within a policy-making, funding or research perspective within the areas of outdoors, health, physical activity and therapy 2. To examine definitions of outdoor interventions and differences from an outdoors, health, physical activity and therapy perspective and identify their delivery components 3. To investigate how outdoor interventions are perceived to or have improved people's health and wellbeing 4. To consider how outdoor interventions are and should be designed and delivered to improve health and wellbeing and evaluated to capture associated outcomes 	<p>Key Findings:</p> <ul style="list-style-type: none"> • Inclusive and accessible outdoor interventions described, inclusive to diverse needs and abilities • Contrasting proposals for targeted and tailored delivery of outdoor interventions • The duration and difficulty of activities, environmental setting, individual differences of participants, as well as facilitator's knowledge and skills argued as key delivery components • Mixed methods research evaluations proposed to demonstrate the effectiveness of outdoor interventions and identify key delivery components, which may influence positive health and wellbeing outcomes
<p>Study 2: Gaining Insight into the Delivery of Outdoor Therapy Interventions from those Currently Facilitating Them</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To examine how outdoor therapy interventions are defined by facilitators 2. To explore how outdoor therapy interventions are perceived to be therapeutic by facilitators delivering them 3. To explore how outdoor therapy interventions are currently designed and delivered 4. To assess how outdoor therapy interventions are evaluated to examine perceived therapeutic outcomes 	<p>Key Findings:</p> <ul style="list-style-type: none"> • Outdoor therapy definitions consistent with the literature to date, yet challenges expressed by facilitators defining their own practice • Key delivery components included the environmental setting, facilitator's knowledge and skills, consistent with Study 1's findings • Participants demographics included those with mental or emotional issues, dealing with trauma or generally feeling 'stuck' and hold 'beliefs about consequences' that engaging in outdoor therapy interventions will help them to navigate through these challenges • Associated outcomes included improved self-belief values and reduced stress • Evaluation challenges in selecting 'suitable' evaluation were resolved by adapting existing validated questionnaires to an outdoor context

Study 3a: Evaluating the health and wellbeing outcomes of outdoor interventions

Objectives:

1. To evaluate the health and wellbeing benefits of outdoor interventions
2. To examine the sustainability of behaviour change and associated health and wellbeing outcomes following completion of outdoor interventions

Study3b: Exploring the Experiences of Participants and Facilitators of Nature4Health Outdoor Interventions

Objectives:

1. To gain insight into the experiences of participants and facilitators engaged in and delivering Nature4Health outdoor interventions
2. To explore perceived health and well-being outcomes associated with engaging in each outdoor intervention
3. To explore evidence of key delivery components within outdoor interventions which may influence health and wellbeing outcomes
4. To assess the long-term sustainability of behaviour change and associated health and wellbeing outcomes

6.1. Introduction

This study evaluated the health and wellbeing outcomes of participants, who attended The Mersey Forest's Nature4Health outdoor interventions (see Chapter 1 for details). Outdoor interventions included Nordic walking, health walks, therapeutic gardening and conservation volunteering held in parks and local green spaces across Merseyside and Cheshire. Nature4Health ran interventions from June 2015 to June 2018 and data was collected from March 2016 to December 2016. Sessions were delivered weekly, each lasting 2 hours, carried out over a 12-week period.

In a bid to gain a broader perspective of outdoor interventions delivered locally, rather than a Nature4Health case study, as well as encouraging a greater sample size for this quantitative phase of Study 3, this study also evaluated external providers of outdoor interventions. These external providers were those organisations delivering similar outdoor interventions (e.g. those providing Nordic walking, health walks, therapeutic gardening and conservation volunteering) within the same geographical area (Merseyside and Cheshire). External providers included local authority health ranger schemes delivered in local parks (e.g. Knowsley Council Green Space Ranger Activities, 2020) and local providers of wider schemes (e.g. Nordic Walking UK, 2020; British Nordic Walking, 2020; Walking for Health, 2020). Providers also included community groups, who met regularly due to shared backgrounds and cultures and set up their own outdoor interventions within their group (e.g. Liverpool Irish Centre). As each of these external groups were already running at the start of data collection, facilitators were asked to assist the researcher by recruiting new starters only for the current study. Facilitators were

therefore required to alert the researcher to new intakes of participants and allow the researcher to visit the group to recruit them before they commenced their first session. This allowed a true baseline score to be gained across all participants (time 0). The researcher then tracked these participants so that data could be collected at their 12-week time point (time 1).

Each outdoor intervention studied had an array of positive health, wellbeing and social outcomes associated (see Literature Review, Chapter 2). However, a major criticism of the literature to date has surrounded the lack of transparency and detailed reporting of the delivery of the outdoor interventions studied (e.g. Lovell et al., 2015). The lack of transparency and detailed reporting makes it impossible to identify key delivery components within the outdoor interventions, which may influence behaviour change (engagement in outdoor interventions) and associated health and wellbeing outcomes as a consequence. Such insight is argued as vital in informing the design of future interventions, which seek to change behaviour and encourage health outcomes (Michie et al., 2011; Atkins., 2017). In recognition of inadequate reporting throughout the literature to date, the current study included a table of outdoor interventions (see appendix 3.6) detailing the settings, delivery styles, key delivery components, facilitators, group sizes, participant demographics, etc. This strategy adopted reflects the complexities of this study, in terms of the different groups, settings, facilitators and consequent delivery styles, which may influence findings. A further methodological limitation of the majority of studies to date includes the lack of long-term follow-ups (see Literature Review, Chapter 2) and studies consequently failing to evaluate the long-term impact of outdoor interventions on

participant's everyday lives. The current study addressed this limitation by evaluating the health and wellbeing outcomes associated with outdoor interventions over a six-month period. This study also utilised the proposed rigorous and robust evaluation protocols suggested by sector leaders in Study 1 (Chapter 4) by adopting validated health and wellbeing measures within questionnaires. The sequential mixed-methods study allows a foundation of quantitative results to be gained, which inform the further exploration and identification of participants and facilitators experiences of participation and key delivery components attributed to quantitative health and wellbeing outcomes. The subsequent study (Study 3b, Chapter 7) will consequently inform key stakeholders and service providers in the direction and future development of Nature4Health interventions and similar outdoor interventions been delivered.

6.2. Aims and Objectives

Evaluating the health and wellbeing outcomes associated with outdoor interventions

1. To investigate associated health and wellbeing outcomes associated with outdoor interventions
2. To assess the sustainability of health and wellbeing outcomes after completion of outdoor interventions

6.3. Methodology

6.3.1. Study Design and Participants

The present study (Study 3a) formed the initial quantitative phase of a mixed-methods study (see Chapter 3 section 3.8 for an overview). The following chapter (Chapter 7, Study 3b) describes the qualitative element. The current quantitative study utilised a repeated measures design with three time points. The sample consisted of 144 participants, both male and female, attending The Mersey Forest's Nature4Health outdoor interventions and similar outdoor interventions provided locally. The inclusion criteria for the study was that participants were aged 18 or over and English speaking. Participants completed questionnaires measuring their health and wellbeing before completing the outdoor interventions (time 0), after completing 12 weeks of outdoor interventions (time 1) and 12 weeks following their completion (time 2). New participants due to engage in similar outdoor interventions delivered by local external providers were approached before completing sessions (time 0) and after 12 weeks of sessions (time 1) only. As sessions were ongoing and continued after 12 weeks, external groups could not be assessed for health and wellbeing benefits 12 weeks after completing sessions (time 2).

6.3.2. Research Materials

Firstly, a gatekeeper information sheet was distributed to facilitators delivering the outdoor interventions informing them of the nature of the study and asking for their consent and assistance in recruiting participants. Facilitators signed a gatekeeper consent form to participate in the research. Once consent had been gained, facilitators were provided with

attendance registers to monitor participants' weekly attendance on outdoor interventions. Participant recruitment packs were distributed to participants at the beginning of their first session (see appendix 6.1). Recruitment packs contained a participant information sheet, providing a brief overview of the present study, the purpose of the study, what was required from participants should they choose to take part and what taking part in the study would involve. Contact details of the researcher and the director of studies were also given, if any additional information was required. Participants were required to read this information before giving consent to take part in the study. Participants could detach the participant information sheet from the recruitment pack and keep it for their records. The subsequent page contained a participant consent form to sign to agree to participate. By signing the consent forms, participants confirmed that they understood the nature of the study, that their participation was voluntary, meaning that they could withdraw from the study at any time without having to give a reason. The consent form further confirmed participant's understanding that their results would remain confidential and anonymous, and thereby agreeing to take part. The baseline (time 0) questionnaire began on the subsequent page containing validated health and wellbeing measures. After giving consent to take part, participants were required to complete the baseline questionnaire before their first session of 12 weeks of outdoor interventions.

Follow-up (time 1) questionnaires were distributed at the end of the final session of interventions at week 12 to assess any changes in health and wellbeing measures. Finally, time 2 questionnaires were posted to participants within the Nature4Health outdoor interventions provided by The Mersey Forest, who consented to be contacted 12 weeks

after completion (time 1). Questionnaires assessed whether any changes in health and wellbeing had been maintained.

A support sheet was also distributed to participants after completing the questionnaires. This sheet signposted participants to additional support if they felt that they had been negatively affected by the research. It gave contact details of their local Mind charity, The Samaritans, and Talk Liverpool IAPT service. It also advised that participants see their GP if they had any physical or mental health concerns.

All questionnaires, at each time point, contained a variety of validated measures. The SF36v2 Health Survey (Ware et al., 2008) formed the primary outcome measure. Further measures adopted were the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) (Tennant et al., 2007) to measure wellbeing. The Profile of Mood States (POMS) (Grove & Prapavassis, 1992) abbreviated version assessed changes in mood states. The Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965) measured self-esteem. Finally, the International Physical Activity Questionnaire-Short Form (IPAQ) (Craig et al., 2003) was adopted to measure physical activity frequency and intensity. All questionnaire measures contained high reliability and validity and had been adopted in previous similar studies. Each measure is described fully in appendix 3.7.

6.3.3. Procedure

Participants were approached by the researcher on the first session of the 12-week intervention (time 0) and informed about the study, what the study involved and were presented with a recruitment pack. Participants indicated their consent by signing the

consent form and completing the baseline questionnaire within the recruitment pack. Participants in the Nature4Health outdoor interventions were also asked consent to take part in a semi-structured telephone interview after they had completed the 12 weeks of sessions. The Nature4Health participants were then asked consent for an additional questionnaire to be sent to their address twelve weeks after completing the sessions (time 2). Participants indicated their consent by ticking a box for each of these and providing relevant contact details.

The researcher returned to the group twelve weeks later to complete the follow-up questionnaires (time 1) with those participants who had completed the questionnaires at baseline. The researcher also used attendance registers to assess attendance of participants. Any participants who had missed more than 3 sessions out of the 12 (over 25%) were discounted from the follow-up data. This enabled effects reported within the results to be informally attributed to the sessions. These participants were sent 'drop-out' postcards asking participants to state why they had not attended the sessions and what the barriers were. Finally, 12 weeks after completing the intervention, those participants who gave consent to be contacted by post were sent a further questionnaire (time 2) with a stamped addressed envelope provided for its return. Participants were debriefed with a support sheet after each time point. For details of ethical procedure, see methodology chapter (Chapter 3, section 3.9). See figure 6.1 for a flow chart illustration of the procedure.

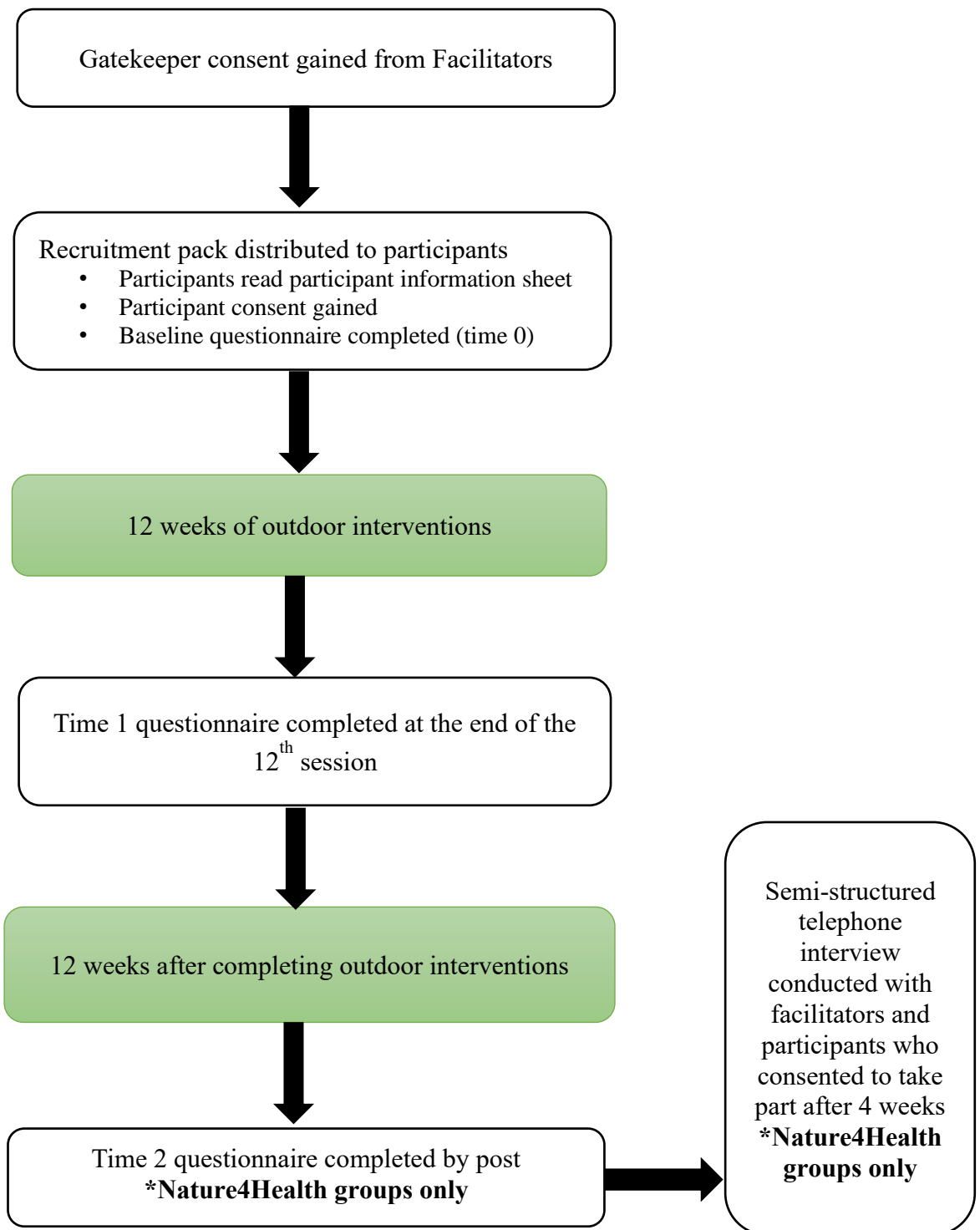


Figure 6.1. Flow Chart Illustration of Study 3 Procedure

6.4. Results

6.4.1. Dropout Rate

144 participants took part at time 0 (n=144), 80 remained until time 1 (n=80) and 31 engaged at time 2 (n=31). There was a dropout rate of 64 participants (n=64) from time 0 to time 1. 49 participants (n=49) dropped out from time 1 to time 2.

6.4.2. Demographics

The majority of the sample were female (n=76) and 67 were male (n=67) and 1 participant (n=1) did not disclose. The mean age of the sample was 49 years old (mean=49.22, SD=16.19). In regards to employment status, 28 participants (n=28) were employed, 26 (n=26) participants were unemployed, 58 participants (n=58) were retired, 7 were in education (n=7), 1 participant was a carer (n=1) and 24 participants (n=24) did not disclose their employment status. Health problems of participants included arthritis (n=3), high blood pressure (n=3), asthma (n=2), back problems (n=1), cardiomyopathy (n=1), chronic fatigue syndrome (n=1), diabetes (n=1), general poor health (n=1), poor mobility (n=1) and visual impairment (n=1). Three participants disclosed that they experienced 'mental health' conditions (n=3), two participants had anxiety and depression (n=2), two participants stated they had anxiety (n=2), four participants reported having depression (n=4) and one participant had schizophrenia (n=1). Seven participants had learning difficulties (n=7). Thirty-one participants stated that they had no physical or mental health conditions (n=31) and seventy-nine participants did not disclose (n=79). There were no significant

differences, in terms of demographics, for participants across time points. See appendix 6.2. for demographics of all participants included in each time point.

6.4.3. Descriptive Statistics

The median scores and interquartile ranges of the SF-36v2 Health Survey (Ware et al., 2007), the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) (Tennant et al., 2007), the Profile of Mood States (POMS) (Grove & Prapavessis, 1992) abbreviated version, the Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965), the International Physical Activity Questionnaire-Short Form (IPAQ) (Craig et al., 2003) are reported in appendix 6.3. for all participants at each time point. Appendix 6.4 illustrates median scores and interquartile ranges of the outcome measures for those participants who remained engaged across all three time points (n=31). An analysis of difference found there were no significant differences in Time 0 measures between those participants who completed the outdoor interventions (n=80) from Time 0 to Time 1 and those who did not (n=64), see appendix 6.5.

6.4.4. Assumptions

Values of skewness and kurtosis were examined to assess normality. A combination of both positive and negative skewness and kurtosis was observed across outcome measures. Non-parametric tests were conducted, as recommended where skewed data was apparent and a normal distribution of data cannot be assumed (Pallant, 2013).

6.4.5. Analysis: Friedman ANOVA

A Bonferroni correction $0.05/26 = 0.00192308$, $p < 0.002$ was also applied to control for Type 1 errors. A Friedman ANOVA was conducted to compare self-reported health and wellbeing outcome measures from time 0, 1 and 2.

6.4.6. Friedman ANOVA Results for the SF36v2 Health Survey

There were no statistically significant differences in the SF-36v2 scores, including physical functioning subscale 2, $\chi^2(2) = 1.910$, $p = 0.385$, role physical, 2, $\chi^2(2) = 0.758$, $p = 0.685$, bodily pain, 2, $\chi^2(2) = 5.556$, $p = 0.062$, general health, $\chi^2(2) = 0.575$, $p = 0.750$, vitality, $\chi^2(2) = 0.636$, $p = 0.72$, social functioning, $\chi^2(2) = 0.038$, $p = 0.981$, role emotional, 2, $\chi^2(2) = 0.265$, $p = 0.876$, mental health, $\chi^2(2) = 2.194$, $p = 0.334$, physical components summary, $\chi^2(2) = 1.444$, $p = 0.486$ or the mental components summary between time 0, time 1 and time 2, $\chi^2(2) = 0.333$, $p = 0.846$.

6.4.7. Friedman ANOVA Results for the Warwick-Edinburgh Mental Wellbeing Scale

There were no statistically significant differences in the Warwick-Edinburgh Mental Wellbeing Scale scores between time 0, time 1 and time 2, $\chi^2(2) = 0.141$, $p = 0.932$.

6.4.8. Friedman ANOVA Results for the Profile of Mood States

There were statistically significant differences in the esteem-related affect subscale of the Profile of Mood States between time 0, time 1 and time 2, $\chi^2(2) = 12.452$, $p = 0.002$. A Post hoc analysis with Wilcoxon signed-rank tests was conducted with a Bonferroni

correction applied, resulting in a significance level set at $p < 0.017$. There were no significant differences in esteem-related affect between time 0 and time 1 scores ($Z = -.999$, $p = 0.318$) or between the time 0 and time 2 ($Z = -2.070$, $p = 0.038$). However, there was a statistically significant decrease in esteem-related affect in time 1 to time 2 ($Z = -3.109$, $p = 0.002$). There were no statistically significant differences in the tension, $\chi^2(2) = 2.000$, $p = 0.368$, anger, $\chi^2(2) = 3.376$, $p = 0.185$, fatigue, $\chi^2(2) = 0.179$, $p = 0.914$, depression, $\chi^2(2) = 4.628$, $p = 0.099$, vigour, $\chi^2(2) = 1.826$, $p = 0.401$, confusion, $\chi^2(2) = 6.156$, $p = 0.046$, the negative subscales, $\chi^2(2) = 3.521$, $p = 0.172$, the positive subscales, $\chi^2(2) = 6.213$, $p = 0.045$ or the total mood disturbance of the Profile of Mood States between time 0, time 1 and time 2, $\chi^2(2) = 9.264$, $p = 0.010$.

6.4.9. Friedman ANOVA Results for the Rosenberg Self-Esteem Scale

There were no statistically significant differences in the self-esteem between time 0, time 1 and time 2, $\chi^2(2) = 3.841$, $p = 0.147$ measured by the Rosenberg Self-Esteem Scale.

6.4.10. Friedman ANOVA Results for the International Physical Activity

Questionnaire

There were no statistically significant differences in vigorous physical activity MET Minutes, $\chi^2(2) = 3.887$, $p = 0.143$, $\chi^2(2) = 3.139$, $p = 0.208$ or total physical activity MET Minutes between time 0, time 1 and time 2, $\chi^2(2) = 2.487$, $p = 0.288$ measured by the International Physical Activity Questionnaire.

6.5. Discussion

This study was unique in its ability to evaluate a diverse array of outdoor interventions, delivered by various organisations across Merseyside and Cheshire, assessing associated health and wellbeing outcomes throughout a twelve-week period. The scope to capture health and wellbeing outcomes twelve weeks after participants had completed the sessions, enabled the sustainability of these outcomes to be explored. While the majority of findings were non-significant from a statistical perspective, trends demonstrated non-significant improvements in self-reported health outcomes across all three time points (time 0, time 1 and time 2). Non-significant increases were illustrated in role physical, general health, vitality and physical components summary subscales from the SF36v2 questionnaire measures from time 0 to time 1, with slight decreases from time 1 to time 2. Similar patterns were observed for self-reported wellbeing ratings across all time points, apart from the positive subscales of the Profile of Mood Scale ratings, with a statistically significant reduction from time 1 to time 2, with lower self-esteem recorded at time 2 than those at time 1. Similarly, self-reported physical activity ratings showed non-significant increases across all International Physical Activity Questionnaire subscales from time 0 to time 1, with non-significant decreases from time 1 to time 2. Findings therefore supported the effectiveness of outdoor interventions as a means to improve health and wellbeing, with long term non-significant increases demonstrated for the majority of health and wellbeing outcomes. These findings will be discussed throughout the following sections.

6.5.1. Health Outcomes Associated with Outdoor Interventions

The non-significant improvements in self-reported health outcomes, including bodily pain from the SF36v2, as well as fatigue and vigour from the POMS, across all three time points demonstrated that participants reported less bodily pain and fatigue and higher levels of vigour from beginning the outdoor interventions to their completion. These patterns continued after six weeks of leaving the outdoor interventions for those engaged in Nature4Health. Although these findings are non-significant, they contribute to the current literature (e.g. Verra et al., 2012; Fields et al., 2016) and support outdoor interventions as an effective way to increase health in the long-term. Findings further support the Attention Restoration Theory (Kaplan & Kaplan, 1989; Kaplan 1995) arguing that people recover from attentional fatigue through engaging in the natural environment through the use of involuntary attention, which provides opportunities for recovery from mental fatigue, which enables them to feel restored (Rogerson & Barton, 2015). More specifically, the slight improvements in energy levels, less fatigue and bodily pain have implications for outdoor interventions as an effective adjunct health intervention for those with health conditions where these symptoms are a common feature (e.g. arthritis, chronic fatigue syndrome, fibromyalgia, thyroid problems, certain cancers, diabetes, depression and anxiety) (NHS, 2020). These findings are not surprising, given that physical activity has been found to be beneficial in decreasing pain for those with chronic conditions (e.g. Vanti et al., 2016; Greene et al., 2017; Shiri, Coggon, Falah-Hassani, 2018). Furthermore, exposure to green spaces has also been linked to lower perceived pain (Stanhope, Breed & Weinstein, 2020). Findings must be taken with caution, however, as due to the fluctuating

nature of symptoms for those with chronic conditions, the self-reported decreases in pain could be due to participants symptoms lessening naturally during this period (Helgeson & Zajdel, 2017),. Alternatively, decreases in perceived pain could also be influenced by other interventions, participants may be engaging in, alongside the Nature4Health interventions (e.g. drug treatments, physiotherapy).

Due to the small sample size, drop-out rates and non-significant results within the current study, more research would be required with larger sample sizes so that findings can be generalised. However, the lack of significant differences in time 0 scores between those who completed the outdoor interventions and those who dropped out suggests that those who completed the outdoor intervention are representative of those who started them. Non-significant increases in role physical, general health, vitality and physical components summary subscale scores from the SF36v2 from time 0 to time 1, with slight decreases from time 1 to time 2, demonstrate the short-term effectiveness of outdoor interventions in improving these health outcomes. Whereas slight improvements in health outcomes are consistent with previous studies within the literature regarding similar outdoor interventions, e.g. health walks (e.g. Hanson & Jones, 2015), Nordic walking (e.g. Fisher et al., 2015), conservation volunteering (Lovell et al, 2015) and therapeutic gardening (e.g. Bragg, 2013). The initial quality of life improvements also reflect the 12-week follow up findings of Wilson et al (2009, 2011) studies using the shortened versions of the SF36v2, the SF12 and SF6D. Continued improvements are consistent with Wilson's (2011) three-month post-intervention follow-up data, demonstrating higher scores for the majority of SF6D scores. However, it is difficult to compare specific outcomes of this study to others

within the literature due to differing participant demographics. For example, France et al's (2015) study was an intervention targeted at women with breast cancer. Additionally, a lack of long-term follow-ups, meant that time 2 findings within the current study cannot be compared across similar studies. The trends surrounding the health outcomes support outdoor interventions as effective in improving health. While outcomes demonstrating improvements six weeks after completion, suggests outdoor interventions are effective in gaining long-term sustainable health outcomes. This supports the implementation of a Natural Health Service as a means of individuals being enabled to manage their long-term conditions with less demands for medical intervention. Such findings are particularly relevant in Merseyside, where in Liverpool alone 33.7% of the population are estimated to have a long-term condition and 15% with multimorbidities. Furthermore, an estimated 30% of all deaths are due to cancer, 20% are from cardiovascular disease and 15% resulting from respiratory disease, with an estimated 1,800 dying prematurely (before the age of 75) with 1,000 of these deaths considered to be preventable (Liverpool.gov.uk, 2020). Findings within this local context highlight implications for a Natural Health Service to prevent and manage long-term conditions and reduce pressure on the NHS, as outlined in the final synthesis chapter (Chapter 8). However, due to the small sample size within this study, and non-significant findings, more studies with larger sample sizes would need to be completed to demonstrate the true effectiveness of outdoor interventions.

6.5.2. Wellbeing Improvements

Similarly to the health outcomes reported, non-significant increases shown across all time points within the wellbeing self-reported outcomes further support outdoor interventions

effectiveness in gaining long-term wellbeing outcomes. Long-term effectiveness was demonstrated within the WEMWBS questionnaire ratings and the tension, anger, depression, confusion and negative subscales of the POMS questionnaire, with non-significant increases across each time point. These improvements were also reported in the mental health, role emotional and mental components summary from the SF36v2 measure, with a much more dramatic increase in the mental components summary from completion to twelve weeks later. Similarly to the health findings, the lack of significant differences in time 0 wellbeing scores of between participants who completed the interventions and those who did not, support that participants who completed the outdoor interventions were representative of all participants who started them. However, the initial increase of the positive subscales of POMS from time 0 to time 1 and decrease from time 1 to time 2 demonstrate that participants improved in these ratings from beginning the outdoor interventions to their completion but worsened from completion to the 12 weeks following. Short-term slight increases in wellbeing reflect previous outdoor interventions within the literature (e.g. Bragg 2013; Lovell et al., 2015, Bloomfield 2017) as well as longer-term improvements in wellbeing (e.g. Sanchez, Macias & Galdos, 2016). However, Sanchez et al's (2016) study was a targeted outdoor intervention towards participants with mental health conditions making it incomparable to the heterogeneous sample within the current study. In general, however, findings support the effectiveness of outdoor interventions in improving wellbeing and sustaining wellbeing outcomes. Within a local context, findings support the delivery of a Natural Health Service in Merseyside, where, in Liverpool alone, an estimated 49,000 people have a depression diagnosis and nearly 8,000 reported to have

some form of mental health condition, outlined in the final synthesis chapter (Chapter 8). Whereas limitations, within the current study and previous research, supports calls within policy (Links between Natural Environments and Mental Health: Evidence Briefing, 2016) to implement larger studies with longer-term follow-ups to support the development of outdoor interventions (Bragg & Leck, 2017). However, as is evident in the prevention, treatment and management of mental health conditions, greater insight needs to be gained into the key delivery components responsible for the behaviour change required and the causal pathways and mechanisms influencing wellbeing outcomes associated with engagement in the outdoors (Bragg & Leck, 2017). This study merely reports the health and wellbeing self-reported quantitative outcomes. The following qualitative study (Study 3b, Chapter 7), however, helps to identify what participants and facilitators, within the outdoor interventions, attribute to their improved or decreased wellbeing ratings. Furthermore, the detailed reporting of outdoor interventions included (appendix 3.6) enables examples of potential behaviour change techniques to be identified within the outdoor interventions, so that they can be replicated in future delivery (Michie et al., 2014).

6.5.3. Patterns in Self-Esteem Outcomes

The observed increase in esteem-related affect ratings, measured by the Profile of Mood Scales, from time 0 to time 1 and significant reduction from time 1 to time 2 to lower than those at time 0 are concerning. Findings implicate that participants were actually worse off twelve weeks after completing the sessions, regarding their self-esteem, to when they started. Increased self-esteem has been demonstrated in participants engaging in similar outdoor interventions, such as green care (e.g. Elings & Hassink, 2008) and the Forestry

Commission's Branching Out intervention, targeted at those with poor wellbeing (Wilson et al, 2009, 2011). The drop in time 2 scores cannot be compared with these studies, however, as they do not include long-term follow-ups at six months. The significant decrease in self-esteem from time 1 to time 2, however, suggests that the lack of weekly outdoor interventions were a key contributor to this decline. It could therefore be argued that the decrease in self-esteem levels were due to the lack of opportunities to socialise with others, gain social support and encouragement while completing outdoor interventions and tasks within these. Alternatively, it may be that the Nature4Health interventions did not form a curative or treatment intervention, but a much-needed respite or reprieve from participant's poor wellbeing, which would support the associated short-term improvements gained. The delivery of the outdoor interventions is therefore examined within the next study (Study 3b, Chapter 7) to examine this further and identify any support or strategies provided towards the end of the outdoor interventions to enable participants to sustain engagement in similar activities (e.g. TCV, Walking for Health, Nordic Walking UK) and continue to improve their self-esteem. The continued engagement in activities to maintain health and wellbeing outcomes may also consist of a more informal process than joining further outdoor interventions. Continued engagement may also involve a group of participants meeting up after the group has finished and continuing to engage in activities introduced to them. Such informal group meeting may be particularly effective if strong friendships have been gained throughout the sessions. Alternatively, participants could be encouraged to utilise skills acquired within the sessions in a way that is meaningful to them and relevant within their everyday lives (e.g. walking,

gardening) enabling them to take ownership and continually maintain their own health and wellbeing independently. BCTs, such as ‘implementation intentions’ could potentially be utilised, where planning prompts are made to guide participants to consider when, where, and how they will continue to carry out their intentions to continue to engage in the health behaviours and utilise skills acquired within the sessions when they are no longer running (Gollwitzer, 1999; Abraham & Michie, 2008). Such implications are discussed in the synthesis chapter (Chapter 8).

6.5.4. Self- Reported Physical Activity Ratings

Initial non-significant increases in self-reported physical activity across all IPAQ subscales from time 0 to time 1 demonstrated outdoor interventions as successful in promoting physical activity over a short-term period. Decreased physical activity levels from time 1 to time 2 illustrated that participants were unable to maintain their levels of physical activity while engaged in weekly structured outdoor interventions to after the sessions had been completed. It could be argued, however, that a decrease in self-reported physical activity is inevitable, as participants ceased engaging in Nature4Health outdoor interventions. The observed rise and decline of self-reported physical activity levels measured through the IPAQ are consistent with a population study (France et al., 2016) evaluating the Walking for Health programme (Walking for Health, 2020). This study included a much larger sample size and gained significant increases in walking and moderate physical activity subscales of the IPAQ (Craig et al., 2003) after four months of an average 2.5 days per month attending the Walking for Health intervention. Physical activity showed a decrease at eight months to levels reported immediately after participants’ first session. It is difficult

to interpret reasons for decreased physical activity long-term when making comparisons with this study. The Walking for Health intervention was provided continuously on a weekly basis, whereas Nature4Health interventions within the current study finished after twelve weeks. As France et al (2016) suggests, participants may have lost interest in Walking for Health and walking along the same routes. The Nature4Health participants, however, did not have the opportunity to engage in any further formally delivered sessions in the long-term but results imply that participants did not replace the physical activity undertaken in the sessions with alternate forms of exercise when leaving. Again, this suggests that more effective signposting is required when participants complete the sessions in the future delivery of outdoor interventions to discourage such trends in future cohorts. This may involve signposting to similar long-term outdoor interventions, enabling participants to sustain their physical activity levels and gain associated benefits discussed previously. For example, participants attending the Nature4Health walking interventions could be signposted to Walking for Health (2020) or Ramblers (2020) or similar local providers. Similarly, there are Nordic walking providers throughout the UK (e.g. British Nordic Walking, 2020; Nordic Walking UK, 2020) and Green Gyms (e.g. TCV, 2020) for participants who have benefitted from the conservation volunteering sessions, further discussed in the synthesis chapter (Chapter 8).

Increases in physical activity while participants were engaged on outdoor interventions may also present a causal mechanism for the improved health and wellbeing outcomes reported from beginning the interventions to their completion. Participants may have gained the health and wellbeing outcomes discussed, partly as a result of being physically

active within the sessions. Increased physical activity, combined with improved health and wellbeing outcomes within this study support physical activity as one component in ‘multiple pathways’ (Hartig et al., 2014) and ‘interlinked mechanisms’ (Husk et al., 2015) argued to influence associated outcomes. Whereas decreased scores extend beyond these theories, demonstrating the consequences of when engagement in outdoor interventions is not sustained. The decreased physical activity upon completion of outdoor interventions may therefore have influenced those decreases in health, wellbeing and self-esteem reported. This study therefore supports outdoor interventions as effective in promoting physical activity levels in the short-term. However, caution must be taken when interpreting self-report measures of physical activity as they rely on participants’ recall ability and are influenced by external factors, such as social desirability (Sylvia, Bernstein, Hubbard, Keating & Anderson, 2014). The following qualitative study (Study 3b, Chapter 7) explores participant’s health behaviours since completing outdoor interventions and whether they have continued to engage in physical activity. It is essential to explore these health behaviours as outcomes to gain greater insight into the complex causal chain of events leading to health outcomes (Michie & Johnston, 2012; Michie et al., 2014).

6.5.5. Conclusion

The current study evaluated the health and wellbeing outcomes of outdoor interventions across three time points. Results demonstrated improved self-reported outcomes across the majority of health and wellbeing outcomes, supporting outdoor interventions as effective health and wellbeing interventions and the development of a Natural Health Service.

However, significant declines in self-esteem and physical activity at time 2, implies a need

for more effective exit strategies, which enable participants to continue health behaviours, utilise skills attained and maintain associated health and wellbeing outcomes gained. The quantitative nature of this study means that it is limited to self-reported outcomes with a lack of context given as to the participants' experience of engaging in the outdoor interventions, what delivery components or BCTs were perceived to be associated with their engagement and acquired outcomes. The following study (Study 3b, Chapter 7) therefore addresses these deficits by adopting a qualitative approach to gain the participant's and facilitator's perspectives of engaging in or delivering Nature4Health outdoor interventions. The following study will therefore highlight important key components within the delivery of the outdoor interventions, which may be attributed to the quantitative findings within this current study. Findings will therefore inform the future delivery and evaluation of the Natural Health Service and similar outdoor interventions by capitalising on key delivery components and BCTs which promote engagement in outdoor interventions and maximise associated health and wellbeing outcomes.

Chapter 7: Study 3b

Exploring the Experiences of Participants and Facilitators of Nature4Health Outdoor Interventions

Table 7.1. Thesis Study Map: Study 3b

<p>Study 1: Exploring Outdoor Interventions from a Sector Leaders Perspective</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To explore outdoor interventions from sector leaders within a policy-making, funding or research perspective within the areas of outdoors, health, physical activity and therapy 2. To examine definitions of outdoor interventions and differences from an outdoors, health, physical activity and therapy perspective and identify their delivery components 3. To investigate how outdoor interventions are perceived to or have improved people's health and wellbeing 4. To consider how outdoor interventions are and should be designed and delivered to improve health and wellbeing and evaluated to capture associated outcomes 	<p>Key Findings:</p> <ul style="list-style-type: none"> • Inclusive and accessible outdoor interventions described, inclusive to diverse needs and abilities • Contrasting proposals for targeted and tailored delivery of outdoor interventions • The duration and difficulty of activities, environmental setting, individual differences of participants, as well as facilitator's knowledge and skills argued as key delivery components • Mixed methods research evaluations proposed to demonstrate the effectiveness of outdoor interventions and identify key delivery components, which may influence positive health and wellbeing outcomes
<p>Study 2: Gaining Insight into the Delivery of Outdoor Therapy Interventions from those Currently Facilitating Them</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To examine how outdoor therapy interventions are defined by facilitators 2. To explore how outdoor therapy interventions are perceived to be therapeutic by facilitators delivering them 3. To explore how outdoor therapy interventions are currently designed and delivered 4. To assess how outdoor therapy interventions are evaluated to examine perceived therapeutic outcomes 	<p>Key Findings:</p> <ul style="list-style-type: none"> • Outdoor therapy definitions consistent with the literature to date, yet challenges expressed by facilitators defining their own practice • Key delivery components included the environmental setting, facilitator's knowledge and skills, consistent with Study 1's findings • Participants demographics included those with mental or emotional issues, dealing with trauma or generally feeling 'stuck' and hold 'beliefs about consequences' that engaging in outdoor therapy interventions will help them to navigate through these challenges • Associated outcomes included improved self-belief values and reduced stress • Evaluation challenges in selecting 'suitable' evaluation were resolved by adapting existing validated questionnaires to an outdoor context

Study 3a: Evaluating the health and wellbeing outcomes of outdoor interventions

Objectives:

1. To evaluate the health and wellbeing benefits of outdoor interventions
2. To examine the sustainability of behaviour change and associated health and wellbeing outcomes following completion of outdoor interventions

Key Findings

- Improved health and wellbeing outcomes across all three time points
- Decreased self-esteem and self-reported physical activity ratings 12 weeks after completion of sessions
- Findings implicate for more effective support and signposting for participants to maintain behaviour change and associated health and wellbeing outcomes

Study3b: Exploring the Experiences of Participants and Facilitators of Nature4Health Outdoor Interventions

Objectives:

1. To gain insight into the experiences of participants and facilitators engaged in and delivering Nature4Health outdoor interventions
2. To explore perceived health and well-being outcomes associated with engaging in each outdoor intervention
3. To explore evidence of key delivery components within outdoor interventions which may influence health and wellbeing outcomes
4. To assess the long-term sustainability of behaviour change and associated health and wellbeing outcomes

7.1. Introduction

The current study provides a follow-on qualitative phase to the former quantitative study (Study 3a, Chapter 6) within a mixed-methods evaluation (see Methodology, Chapter 3 for full details). Study 3a (Chapter 6) adopted quantitative methodologies to evaluate the health and wellbeing outcomes associated with outdoor interventions across three time points. The previous study measured participants before commencing sessions (time 0), after twelve weeks of outdoor interventions had been completed (time 1) and twelve weeks following the end of these sessions (time 2) using validated questionnaire measures. This current qualitative study interviewed participants and facilitators six weeks after completing Nature4Health outdoor interventions to gain participants and facilitator's unique experiences of engaging in and delivering outdoor interventions. This study also revisited quantitative self-reported health and wellbeing outcomes demonstrated within study 3a and gained insight into what participants and facilitators attributed to these outcomes.

Previous qualitative studies to date, pertinent to this study, have enabled insight into key components within the delivery of outdoor interventions. These prior studies have highlighted key delivery components that participants have deemed helpful and attributed to positive health and wellbeing outcomes experienced. Key components highlighted to date have included the opportunity to engage in physical activity and the restorative elements nature provides within outdoor interventions (Flett, Moore, Pfeiffer, Bolonga & Navarre, 2010). Flexible delivery styles (Sahlin et al., 2012) and social support provided

(Fischer et al., 2015; O'Donovan & Kennedy, 2015) were also deemed particularly helpful to participants engaged in similar outdoor interventions.

The adoption of a mixed methods study within study 3 has enabled the researcher to draw on both quantitative and qualitative research methodologies and combine the strengths of both (Bryman, 2015; Creswell et al., 2017). The explanatory sequential design, of study 3 has enabled rigorous and robust quantitative data to be collected in the first phase (study 3a) to inform the questions asked within the second qualitative phase (study 3b). This sequential design therefore allowed the researcher to tease out the important features of outdoor interventions, extending beyond the limitations of quantitative research to date (Farquhar, Ewing & Booth, 2011). This methodological design has also allowed study 3b findings to explain the quantitative results in study 3a. This has enabled the researcher to present quantitative findings to participants and facilitators gained within study 3a and gain their unique insight into their own interpretations of these outcomes. This will also enable the researcher to gain an understanding of what may have contributed to associated outcomes (e.g. health and wellbeing outcomes showing an increase across time points).

The study can also question whether participants and facilitators agree with the declining scores (e.g. self-esteem, physical activity) and what may be attributed to them, either within the delivery of outdoor interventions or external life events. Further understanding was also gleaned into participant's behaviour after the Nature4Health interventions had completed and whether engaging in outdoor interventions has led to continued behaviour change and sustained health outcomes. From a behaviour change perspective, such insight into key delivery components within outdoor interventions is vital. As supported by the

literature surrounding behaviour change, such as the Behaviour Change Wheel (Michie et al, 2011) and more specifically the Theoretical Domains Framework (Cane et al., 2012) arguing that interventions that target behaviour change comprise multiple interacting components. By identifying components linked to success and those explaining shortcomings, these components can be reconfigured to influence behaviour change, and therefore influence outcomes. Therefore, by uncovering key components influencing outcomes within Nature4Health outdoor interventions means that such insight can be combined with behaviour change theoretical knowledge and influence the future delivery of a Natural Health Service and similar outdoor interventions in future.

7.2. Aims and Objectives

To explore the experiences of participants and facilitators of Nature4Health outdoor interventions

1. To explore the participants perceived health and well-being outcomes associated with engaging in outdoor interventions
2. To identify key delivery components of the outdoor interventions, which may influence health and wellbeing outcomes
3. To examine whether participants sustain behaviour change and maintain health and wellbeing outcomes

7.3. Methodology

7.3.1. Design and Participants

This study explored the experiences and perceived health and wellbeing outcomes of participants, who attended outdoor interventions within The Mersey Forest's Nature4Health programme. The study also gained insight into the experiences of the facilitators delivering these outdoor interventions. Nature4Health outdoor interventions included Nordic walking, health walks, therapeutic gardening and conservation volunteering held in parks and green spaces across Merseyside and Cheshire. Nature4Health outdoor interventions were delivered weekly, each session lasting 2 hours, carried out over a twelve-week period. See appendix 3.6 for a detailed overview of each outdoor intervention with details of activities, delivery components, locations, and times of year etc.

Participants (N= 11) included eight participants (n=8) attending the Nature4Health outdoor interventions and three facilitators (n=3) who had delivered them, see Table 7.2.

Nature4Health outdoor interventions ran from June 2015 to June 2018. Ninety-four participants took part in Nature4Health outdoor interventions during the quantitative data collection phase (Study 3b, see Chapter 6) from March 2016 to May 2017. Qualitative data was collected from participants within sessions running from March 2016 to December 2016. Participants were therefore those who consented to be contacted after completing the sessions (n=40) and agreed to take part in the interview at this time (n=11) from the sessions running from March to December 2016. Participants were eligible for the study if they were aged 18 or over, had completed/delivered the Nature4Health outdoor

interventions and had consented to participate in the research. Of those forty participants contacted by the researcher, eleven (n=11) consented to be interviewed and took part. Eight participants were those who had engaged in the Nature4Health outdoor interventions (n=8), (four males/ four females) with a mean age of 52 years old (Mean= 52.25). See appendix 7.1. for the median and interquartile range scores of outcome measures across each time point for participants (n=8) who took part in the interviews. Three participants were facilitators, who had delivered the Nature4Health outdoor interventions (n=3), (one male/ two females). Reasons for refusal to take part when contacting participants were due to interviews interfering with work commitments, as well as illness and family commitments, while other participants did not answer the phone or respond to voicemails left by the researcher.

7.3.2. Debriefing

The researcher debriefed participants at the end of the interview by asking a series of questions. Questions sought to ensure participants had not experienced any negative effects from discussing sensitive topic areas around their health and wellbeing. See interview schedule in Appendix 3.3. for details. Regardless of participants responses to debriefing questions asked, the researcher distributed a debriefing sheet to all participants. The debriefing sheet contained details of organisations where they could receive health, wellbeing and emotional support if required (e.g. Samaritans, details of local IAPT services). This was posted to participants' preferred contact address.

7.3.3. Interview Materials

Semi-structured telephone interviews were conducted with participants between 2-6 weeks following the completion of their intervention to allow participants time to reflect on their experience. A semi-structured interview schedule was designed for participants based on previous qualitative literature (Flett, Moore, Pfeiffer, Bolonga & Navarre, 2010; Wilson et al., 2011; Sahlin et al., 2012; Fischer et al., 2015; O'Donovan & Kennedy, 2015), discussions amongst the supervisory team and qualitative and quantitative findings within the PhD. Participants, who had engaged in Nature4Health outdoor interventions received feedback on their own health and wellbeing ratings scores gathered from Study 3a (see Chapter 6 for details of the measures included). See Appendix 3.3 and 3.4 for full interview schedules for participants and facilitators. Interviews were then conducted to answer 4 broad research questions (see table 7.3. for details).

Potential participants were approached at the beginning of the first outdoor intervention session. Participants were given information about the research study to read and digest before providing initial consent to be contacted again by the researcher. Participants then took part in a semi-structured telephone interview six weeks after completing the Nature4Health outdoor interventions. All interviews began with the interviewer introducing herself and reminding participants about the context of the study and ethical considerations (such as the voluntary nature of the interview and confidentiality). At the end of the interview, participants were provided with debrief information and were given an opportunity to ask any relevant questions. See Methodology (Chapter 3, section 3.9) for ethical considerations.

7.3.5. Analytical Procedure

All interviews were audio recorded using a Dictaphone and transcribed verbatim. Interview transcripts were imported into NVivo 10 software (Richards, 1999) and analysed using thematic analysis (Braun & Clarke, 2006). See Methodology (Chapter 3) for full details of thematic analysis and strategies adopted to ensure trustworthiness.

<u>Intervention</u>	<u>Setting</u>	<u>Participant</u> <i>*P= Participant</i> <i>*F= Facilitator</i>	<u>Gender</u>	<u>Age</u>	<u>Pre-existing health conditions</u>
Nordic Walking	Park	P1	F	43	Fibromyalgia
		P2	F	70	None
		F1	F	Not disclosed	None disclosed
Men's Health Walks	Greenspaces and Woodlands	P3	M	70	Mental health
		P4	M	62	Mobility
		F2	M	Not disclosed	None disclosed
Nature's Therapy (Horticultural Therapy)	Park	P5	F	47	Chronic Fatigue Syndrome
		P6	F	43	General health
		F3	F	Not disclosed	None disclosed
Green Allotment (Conservation Volunteering)	Community Allotment	P7	M	50	Depression
		P8	M	38	Asthma

Table 7.3.

Examples of Research Questions with Corresponding Interview Questions for Facilitators and Participants of Nature4Health Outdoor Interventions

<u>Research Questions</u>	<u>Interview Questions</u>
<u>Facilitators</u>	
To gain the facilitator's experience of delivering the outdoor interventions	<i>“What did you think about the programmes you delivered?”</i>
Gaining insight into facilitators perceptions of participants changes in health and wellbeing while engaging in outdoor interventions	<i>“We measured participants’ wellbeing from week 1 to 12. Put simply; this is feeling good and functioning well... Did you notice any changes in participants in relation to any of these?”</i>
To identify components may have influenced associated health and wellbeing outcomes	<i>“Of the events which occurred on the programme, which one do you feel was the most helpful/important for participants?”</i>
To explore whether changes in behaviour and health and wellbeing are likely to be sustained	<i>“Do you think anything changed/will change in participant’s behaviour since completing the programme?”</i>
<u>Participants</u>	
To explore the perceived health and wellbeing benefits of outdoor interventions	<i>“We measured your functional health and wellbeing. Put simply; this is feeling good and functioning well. We noticed your ratings improved/ stayed the same/ decreased from week 1-12... Can you tell me any more about this?”</i>
To identify components that may have influenced associated health and wellbeing outcomes	<i>“Of the events which occurred on the programme, which one do you feel was the most helpful/important for you personally?”</i>
To explore whether changes in behaviour and health and wellbeing are likely to be sustained	<i>“Has the programme motivated you to do other things?”</i>

7.4. Results

This study explored the experiences of participants and facilitators, who had engaged in or delivered Nature4Health outdoor interventions. Quantitative self-reported health and wellbeing outcomes were further explored and key components within the delivery of outdoor interventions were identified, which may have attributed or influenced these outcomes. The sustainability of health behaviours and associated health and wellbeing outcomes were also examined after Nature4Health outdoor interventions had been completed. Thematic analysis (Braun & Clarke, 2006) uncovered five themes and twelve sub themes from semi-structured interviews with participants and facilitators, see figure 7.1. Themes included 1) Loss, 2) Perceived Autonomy, 3) Perceived Physical Outcomes, 4), Psychosocial Outcomes and 5) Sustainability of Behaviour Change and Outcomes. Each theme and contributing sub-themes are disseminated within this section.

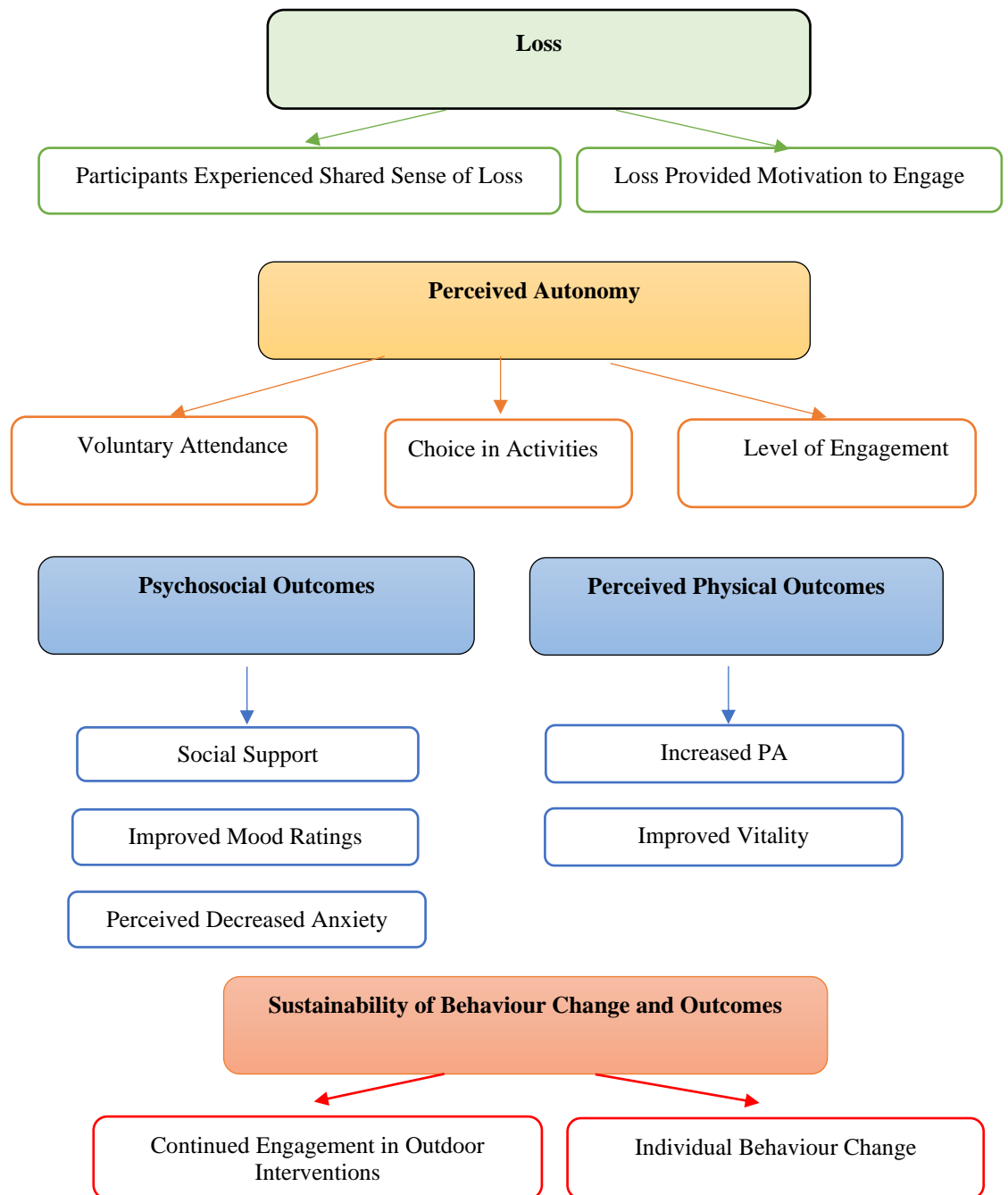


Figure 7.1. Study 3b Themes and Sub-Themes

7.4.1. Theme 1: Loss

Sub-theme 1.1. Participants Experienced Shared Sense of Loss

The first theme identified surrounded a shared ‘loss’ that participants reported to experience before completing the Nature4Health interventions. This sense of loss was represented in a variety of ways and included loss of health, either physical or mental health, loss of employment through redundancy, inability to work or significant changes in employment, such as moving into retirement. Loss also included physical loss, such as experiencing a bereavement. This was highlighted by facilitators delivering the interventions, as Facilitator 2 comments below, and participants, see Participant 2 comments, both from different interventions:

“talking about this group [Men’s Health Walk Group], [participants] who maybe had structure, had work, had family, had a partner, potentially now do not.”

(Facilitator 2)

“Because I’d worked at the hospice for twenty-one years, very aware of keeping fit and healthy, and I wanted to retire. My husband’s retired as well. Pretty bad year last year. I lost my Dad; my Mum fell, my daughter wasn’t well. Everything’s turned around; everything’s fine. I lost my Dad, but again, you cannot retire and think, “Right, I’m doing nothing” (Participant 2)

Sub-theme 1.2. Loss as a Motivation to Engage

This sense of loss experienced by participants also provided a motivation to engage in Nature4Health outdoor interventions, as the sessions were perceived as a means to regain

some structure within their lives. Participant 2 goes on to describe how she perceived loss of structure as a motivation to try something new and regain structure:

“You've got to have that [thought] in your mind, "Right, it's a new adventure, new beginnings. What am I going to do?" And finding that thing to do, which was the walking, you know. I've always walked, but not like the way [the facilitator] showed us to walk.” (Participant 2)

In contrast, this participant describes been made redundant and suffering from low moods and decided to attend the intervention as something new to try and fill the spare time she had:

“I was just made redundant, and I had a bit of time on my hands, and I was feeling a bit low, so I thought I'd try something.” (Participant 1)

Participants' loss formed a motivation to attend the outdoor interventions. Loss of physical activity was due to loss of health or changes in employment, such a redundancy or retirement. Loss of previous structure may also mean that individuals are, or are at an increased risk of becoming sedentary, low in mood and socially isolated. Therefore, the perceived psychosocial outcomes may have been particularly attractive to these individuals as a way to socially interact with people and improve their fitness and mood.

7.4.2. Theme 2: Perceived Autonomy

Participant's perceived autonomy within sessions, included the voluntary nature of their attendance to the Nature4Health interventions, the choice of activities afforded within the sessions and their freedom surrounding their level of engagement. When participants

exhibited control within these components, this appeared to facilitate engagement as well as positively encouraging health and wellbeing outcomes.

Sub-theme 2.1. Voluntary Attendance

All participant's attendance was voluntary. Therefore participants had the control about whether to attend the Nature4Health interventions or not. Some interventions had the option for participants to turn up and meet the group and choose whether they wished to engage in the intervention or remain at the meeting place. Interventions with these choices appeared to influence greater attendance, engagement and associated health and wellbeing outcomes experienced. The following quote taken from a facilitator illustrates this:

"they [participants] came to the session, we met, the weather was torrential, and they said, "Do you know what? I'm not going to come today because I don't feel confident on my feet to walk down slippery paths through woods...Those that wanted to stay behind could stay behind and do some writing and have a brew at the centre."

(Facilitator 2)

The Men's Health Walks intervention provided an indoor meeting place where participants could socially interact and get a hot drink. The provision of this indoor space provided the group with an initial meeting place, as well as an alternative space to meet and socialise if they chose not to attend the walk itself.

Sub-theme 2.2. Choice in Activities

Participant's perceived control was also reflected in the activity preferences during the Nature4Health outdoor interventions. Participants appeared to prefer Nature4Health interventions whereby choice was available in the activities that participants engaged in. Flexible delivery styles, where participants had a choice of the location and settings of the sessions, as well as the duration of the walks, also appeared to be preferred and decreased anxiety. Greater control facilitated a sense of ownership within the Nature4Health interventions, increasing engagement and improved health and wellbeing outcomes:

"Where beforehand, I felt like I had to go the dole, I have to do this, I have to do that. And then you come here, and it's like, "Would you like to do this, would you like to do that?" And you can think about things, and you're taken away from all that, so everything just lifts. Your mood lifts, your energy lifts, everything does."

(Participant 7)

Participant 7, attending the green allotment interventions, describes the choices afforded within the sessions, which he had not previously experienced when unemployed. He goes onto suggest how this has lifted his mood and energy levels. Similarly, the facilitator of the men's health walks discusses providing participants with choices of locations for their walks:

"They [participants] chose which spaces they wanted to go to and why, built a really nice creative element to the engagement with the open air spaces, because I brought a photo licitation project to the men and said, "OK, if we're going to go to these places

you're identifying, why you want to take me here? Why do we want to go here as a group?" (Facilitator 2)

These choices of location encouraged feelings of empowerment in participants and gave them more ownership of the intervention. The places chosen by participants also encouraged more meaningful and potentially more beneficial experiences.

Sub-theme 2.3. Level of Engagement

Participants also benefitted from choosing their levels of engagement, as well as choosing the actual activities themselves, as illustrated by this quote from a facilitator conducting a Nature's Therapy (horticultural therapy) intervention:

"I think having the space to just, you know, if they were feeling a bit anxious or they weren't into, they could have space to go away, and then re-join the group. That was really helpful for the likes of [participant] and his anxiety. He would go and do a task by himself, but re-join the group, and come and go as he felt he could do."

(Facilitator 3)

When participants were afforded the choice of *how* they engaged, this appeared to encourage engagement, decrease anxiety and positively influence health and wellbeing.

This quote, taken from a facilitator, describes how allowing a participant the opportunity to choose whether they engaged in individual tasks or engaged in the group had decreased their anxiety and positively influenced their engagement.

7.4.3. Theme 3: Perceived Physical Outcomes

Sub-theme 3.1. Increased Physical Activity

In terms of physical outcomes, participants reported experiencing increased physical activity and fitness:

“with all the physical activity I’m doing, I’m getting fitter.” (Participant 7)

Sub-theme 3.2. Improved Vitality

Improved vitality and energy levels were also frequently reported; this participant describes how the walking group and social interaction involved has improved his energy levels:

“Your mind's thinking somewhere else, you're having a laugh with the lads, and so you feel more energy, you feel like you want to do things instead of feeling like you have to do them” (Participant 8)

Similarly, the facilitators describe the increased energy levels observed in participants, F1 specifically observed an increase in energy levels of participants, possibly due to the invigorating nature of the walking:

“I could see in the other lads it was like, “Well, now I've got more energy, I can get involved with more”” (Facilitator 2)

“I would say some of them, their energy levels were a bit low at first... they seemed to be a lot more, I suppose awake and active, following the session... but I think it really sort of wakes you up and invigorates you.” (Facilitator 1)

7.4.4. Theme 4: Psychosocial Outcomes

Sub-theme 4.1. Social Support

Participants reported that the social support experienced within the Nature4Health interventions to be particularly helpful in gaining positive wellbeing outcomes:

“Because my group of friends were my work friends, I realised, in the daytime, that I had, when my husband's at work and the kids are older, but there was no one really to talk to at home. So it was nice to get out and have an adult conversation, you know.” (Participant 1)

“besides my mates outside of work, and having a pint and a laugh with them, I'd say that's the only thing on the outside that's lifted me.” (Participant 6)

Sub-theme 4.2. Improved Mood Ratings

Both participants (Participant 1 and Participant 7) describe the interventions they attended as a unique opportunity to go out and socially interact with other adults. Participant 7 from the green allotment intervention described their perceived instant increase in their mood as they arrived:

“As soon as you walk through them gates your day just brightens up.”
(Participant 7)

While Participant 1, from the Nordic walking interventions, describes a general improvement in wellbeing as a result of not allowing herself to become sedentary and isolate herself:

“Just to help me, mental health-wise, really, because I knew I was getting a bit down, and I know that if I just sit in, that's the worst thing for me.” (Participant 1)

Sub-theme 4.3. Perceived Decreased Anxiety

Facilitators and participants also reported decreased perceived anxiety levels associated with taking part in the Nature4Health outdoor interventions, the facilitator from Nature's Therapy discusses how one participant has gradually been able to gain these benefits throughout the sessions:

“B [participant] found the meditation, particularly outdoors, really helpful, and he said that he would feel relaxed for several days after the meditation. He also said he slept better as well after it, and that he hadn't needed to access his mental health team.” (Facilitator 2)

Whereas a participant attending the men's health walks describes how the social interaction during the intervention had helped him to relax prior to the walk:

“we got a good banter going, and it relaxes me, and then we go out walking, and when we got out walking I'm already relaxed.” (Participant 4)

7.4.5. Theme 5: Sustainability

Sustainability was an emergent theme from both a formal delivery standpoint, involving the long-term provision of Nature4Health outdoor interventions, as well from an individual behaviour change perspective, with participants continuing to engage in similar health behaviours on an individual basis.

Sub-theme 5.1. Continued Engagement in Outdoor Interventions

Participants from the Nordic Walking groups expressed wishes for the sessions to continue running:

“I would have liked it to have been longer” (Participant 1)

“I was quite sad when it finished, you know, because we thought it’d be quite nice to carry on” (Participant 2)

Whereas facilitators expressed concerns about the sustainability of the programme in terms of the time and finances required:

“I think if you’re actually going to encourage lifestyle change, then you need to carry on for a longer period, even if it’s the point where they start paying for it. ... three hours of transport to and from every session, before you even make a penny. It’s just not feasible.” (Facilitator 1)

Whereas the facilitator of the men’s health walks expressed concern about whether the participants on his walks would be able to have the opportunity to attend further similar interventions in the winter months and maintain the perceived health and wellbeing outcomes experienced to date:

“some of the stuff they came back to me as kind of feedback from some of the lads was, “We’re coming into a time of year, and the weather, and it goes dark earlier”, and a lot of these guys get really affected by that, and they hunker down and sort of go back to where they were... So there was something in that for me about staying active through the winter months.” (Facilitator 2)

Such anxieties expressed by facilitators of outdoor interventions, although perceived to reflect the participant's views, must be considered in context, as facilitators had financial incentives to formally deliver the programme long-term and therefore need to demonstrate a need for its future provision to commissioners.

Sub-theme 5.2. Individual Behaviour Change

In contrast, other facilitators provided skills to participants, encouraging them to be resilient in the long-term, on an individual basis, or signposted them to similar groups. Participants described how they had been able to independently carry out similar health behaviours and continue to experience the benefits they perceived to gain to date after the Nature4Health intervention had finished. This participant from the Nordic walking intervention describes how she had enrolled onto a running club since the Nordic walking sessions had finished:

“Yes, I went on to joining a running group for women as well...which I wouldn't have done... I absolutely love it. I've done my first 10k a few weeks ago... I've never run that far in my life before I ran that day... The woman who runs it has asked me to go on a runners' leaders' course as well.” (Participant 1)

Whereas another participant from the same group describes how she uses the techniques she learned while Nordic walking to do this on a daily basis while walking her dog:

“I hadn't done Nordic walking before, and to walk every day the way J [facilitator] showed me, I'm still doing that with the dog.... You stride out, you walk straight. It's just given me a new lease of life, really.” (Participant 2)

7.5. Discussion

This study gained insight into the experiences of participants and facilitators, who had engaged in or delivered Nature4Health outdoor interventions. The unique mixed-methods design enabled the further exploration of the quantitative findings of the health and wellbeing outcomes reported from the previous study (Study 3a, Chapter 6) and to identify key delivery components of outdoor interventions, attributed to these findings. This study also examined the sustainability of health behaviours and health and wellbeing outcomes gained. Findings revealed commonalities among the demographics of participants engaged in the Nature4Health interventions regarding a shared experience of loss (e.g. bereavement, loss of employment, loss of health), which appeared to motivate participants to engage in Nature4Health interventions to regain structure and gain perceived associated health and wellbeing outcomes. Key delivery components within the Nature4Health interventions included perceived autonomy experienced by participants, including the voluntary nature of attending the sessions, the choice of activities provided, as well as their choice over their levels of engagement, encouraging further engagement in the sessions and improved wellbeing outcomes (e.g. decreased anxiety). The diverse psychosocial outcomes reported by participants and observed by facilitators within this study complimented the quantitative outcomes gained in Study 3a (Chapter 6), including improved mood, decreased anxiety and improved vitality. Sustainability of health behaviours was also illustrated in participants continuing to participate in similar outdoor interventions. Participants also utilised the skills they had acquired within Nature4Health interventions into their everyday lives to

continue to maintain their health and wellbeing outcomes. These findings will be discussed throughout this section.

7.5.1. Participant Demographics and Motivations to Engage in Outdoor

Interventions

Insight into the participant demographics experiencing a sense of loss and motivations to attend outdoor interventions to regain structure supported findings by Lovell et al (2015) whereby the structure of outdoor interventions was described as a benefit within itself. A prime example was a recent bereavement of a participant's father. Bereavement is a key event for any individual, argued to be one of the most traumatic life events (Clark & Georgellis, 2013) and linked to severe stress and increased risk of depression and anxiety (Alexopoulos, 2005). Findings therefore support Nature4Health interventions as preventative wellbeing interventions, a continuing theme from Study 2 (Chapter 5). Results are not surprising given findings from walking interventions within the literature, which have also attracted and benefitted individuals facing similar loss (Le Mesurier & Northmore 2003; Fischer et al., 2015). Similarly, loss of employment, due to redundancy can have a detrimental impact on health and wellbeing to individuals (Navarro-Abal, Climent-Rodriguez, Lopez-Lopez & Gomez-Salgado, 2018). Even planned loss of work, due to retirement, represents a major change and life event, whereby an individual's perceived control is positively related to their adjustment to this change (Van Solinge & Henkens, 2005; 2008). Evidence is further supported by the self-determination theory whereby feelings of control over one's life is argued to be essential to wellbeing (Deci & Ryan, 1985). Engagement in leisure activities, as an adjustment strategy to cope with

retirement, has been purported to predict continued health and wellbeing (Henning, Lindwall & Johansson, 2016). Similarly, people who have lost their physical abilities, due to illness or disability, have fewer opportunities to socialise, negatively impacting on their quality of life and wellbeing (Tough et al., 2017; 2018). Husk, Lovell, Cooper, Stahl-Timmins and Garside (2015) study demonstrated that motivations to attend outdoor interventions to regain structure in those with mental health conditions, formed a key factor in how outdoor interventions were perceived and experienced by participants. This study extends this theory to those experiencing loss, in addition to those with mental health conditions. Within the COM-B model, loss, in this case, involves an automatic motivation, responding to an emotional event with a need and desire to fill this sense of loss with something positive. Loss could also be argued to be a reflective process, whereby participants perceived ‘beliefs about consequences’ and intend to engage in outdoor interventions as a way to gain these perceived desired health and wellbeing outcomes (Cane et al., 2012; Michie et al., 2014). Participants are therefore optimistic that these goals will be attained (Cane et al., 2012). These unique findings have new implications for recruitment to target future Nature4Health and similar outdoor interventions at those people experiencing loss as a strategy to regain structure, this will be further explored within the synthesis chapter (Chapter 8). However, due to the timings of sessions, with the majority of sessions delivered during the day on weekdays, it could be argued that these sessions would inevitably target those who are retired, unemployed or not working due to loss of physical or mental health. Considerations, must therefore be given, as to whether outdoor interventions held on weekends or evenings may target a different demographic.

Future delivery of outdoor interventions should provide a range of times accessible to wider demographics, to remain inclusive to other populations who may also benefit (e.g. those in full-time employment, those with family responsibilities).

7.5.2. Key Delivery Components

The perceived autonomy experienced by participants, was gained through the voluntary nature of the outdoor interventions, the choice of activities and levels of engagement complimented previous qualitative findings (Sahlin et al., 2012; Lovell et al., 2015). Sahlin et al., (2012) showed the ability to take breaks when needed was also considered particularly important in participants with stress-related mental health conditions in a nature-based therapeutic programmes. Therefore highlighting the relevance of flexibility for this heterogeneous sample, as well as those suffering from stress. Whereas findings by Lovell et al., (2015) demonstrated that the relaxed nature of the activities, the freedom that participants had to work at their own pace and choose their roles was considered beneficial and in stark contrast to the ‘stress’ of their everyday urban lives when participating in conservation activities. This perceived empowerment and ‘enablement’ facilitated through reduced psychological barriers to engage, resulted in perceived autonomy. This perceived autonomy increased participants physical and psychological ‘capability’ and ‘opportunities’ to engage in a way that they felt able (Michie et al., 2011; Cane et al., 2012). Such findings are also further strengthened by the Self-Determination Theory (Deci & Ryan, 1985), where higher autonomy is linked to a greater likelihood of participants engaging in behaviour change, in this case, engaging in Nature4Health interventions. Therefore, while such findings are nothing new, they support utilisation of related BCTs,

such as facilitators fostering and encouraging a culture of ‘social support’ within Nature4Health interventions to encourage feelings of autonomy. Additionally, behaviour change techniques, such as ‘problem solving’ and ‘overcoming barriers’ to engage could also be adopted to encourage ‘opportunity’ and ‘capability’ to engage and therefore influence positive health and wellbeing outcomes (Michie et al., 2013; Michie et al., 2014). Such implications for the delivery of outdoor interventions within a Natural Health Service will be further outlined in the synthesis chapter (Chapter 8).

7.5.3. Clarifying Associated Health and Wellbeing Outcomes

Findings surrounding psychosocial outcomes perceived by participants are not unique, yet emphasise the findings surrounding outdoor interventions reported within the literature. The social interaction gained within the Nature4Health interventions is reflective of studies evaluating similar interventions (e.g. Milton et al., 2009; Brooker et al., 2015; Fischer et al., 2015; Lovell et al., 2015; O'Donovan & Kennedy, 2015; France et al., 2016). In addition to perceived improved mood (e.g. Song et al, 2014; Fischer et al., 2015; O'Donovan & Kennedy, 2015; France et al., 2016; Raine et al., 2016) and decreased anxiety (e.g. Sahlin et al., 2015). Perceived health outcomes also strengthen previous findings (e.g. Hanson & Jones, 2015; France et al., 2016). Themes also clarify increased health and wellbeing ratings within questionnaire data from the previous study (Study 3a, Chapter 6). The quantitative outcome measures reported across each time point in Study 3a for the participants interviewed within this study (appendix 7.1) both reflect and support these qualitative themes. The clarification of these reported quantitative outcomes by interview participants also suggest that the questionnaire measures were effective in

measuring health and wellbeing within this sample. This was a major strength associated with this sequential mixed-methods design, whereby the researcher was also able to feedback the quantitative results to participants in the qualitative phase, clarify the results and gain more insight into why participants scored in the way that they did.

Less insight was gained, however, into the decreases found in health and wellbeing outcomes shown in Study 3a (Chapter 6), particularly the significant decline in self-esteem found six weeks after participants had completed the outdoor interventions. Greater insight into these negative outcomes would be both beneficial and constructive in evaluating Nature4Health interventions, designing future ones and influencing the delivery of outdoor interventions on a wider scale. However, insight into the demographics of participants, as experiencing loss, may offer a potential explanation to the decreased self-esteem scores at time 2. Social support is argued to boost self-esteem (Thoits, 1995) in those experiencing loss, with more effective social networks enabling greater feelings of control (Van Bararsen, 2002), meaning that meeting groups of likeminded people is an ideal coping resource in this instance. Therefore, when these social support networks are no longer available, through structured weekly sessions, individuals self-esteem may then consequently decline.

Additionally, participants within this qualitative sample were those who had continually engaged in the Nature4Health interventions and were self-selecting, as they chose to participate in the telephone interview. It could be argued that these participants perhaps had a more positive experience of the Nature4Health interventions and had gained more positive outcomes, hence their willingness to share this experience. The current study

therefore failed to gain the perspectives of those who had either a negative experience of the intervention, had disengaged or had failed to gain the positive outcomes that they wished to achieve, therefore biasing the findings. Such shortcomings need to be addressed and have future implications when evaluating a Natural Health Service, as outlined in the synthesis chapter (Chapter 8).

7.5.4. Sustainability of Behaviour Change and Perceived Health and Wellbeing

Outcomes

Findings surrounding sustainability of behaviour change and associated health and wellbeing outcomes involved a variety of implications. Some participants demonstrated continued behaviour change from an individual and personal level, where they continued to use the skills they had acquired within the Nature4Health interventions. For example, one participant explained how she used the Nordic walking skills she had gained within the Nordic walking sessions and continued to adopt these techniques on daily walks.

Contrastingly, other participants were signposted to alternate formally delivered outdoor interventions after the Nature4Health sessions had finished by the facilitator. For example, one participant, who enjoyed the health walks had consequently joined Park Run interventions within her local area. Whereas some facilitators and participants expressed concern over how they could continue to gain the perceived health and wellbeing outcomes that they had perceived to have gained to date once the Nature4Health sessions had finished. The observed differences in participants, who were able to continue to engage in health behaviours and those who experienced challenges without the formal delivery of the Nature4Health interventions in place, suggests a need for facilitators to consider exit

strategies and signpost participants to similar outdoor interventions where appropriate. Such findings surrounding sustainability are reflective of the diverse definitions of sustainability within the literature. Lennox, Maher and Reed (2018) differentiate sustainability into continued programme activities, continued benefits, capacity building, further adaption and recovering costs. The current study's findings highlight a need to enable continued benefits (associated health and wellbeing outcomes) when outdoor interventions are not available, as within the Nature4Health twelve-week outdoor interventions. Firstly, the journey of participants changing behaviour and acquiring positive health and wellbeing outcomes, described as the 'impact journey' needs to be recognised as a turbulent journey rather than a linear one with multiple challenges at each stage, unique to each individual (Sridharan, Jones, Caudill, & Nakaima, 2016). Interventions therefore need to be designed while considering the temporalities involved in affecting 'capacities', 'motivations', and 'opportunities' (Michie, 2015) within such journeys, while providing support for different stages of this process (Mayne, 2017). Strategies suggested including 'skills training'. Examples where skills training is already adopted includes the Nordic walking interventions where specific Nordic walking techniques are taught with participants reporting their adoption within their everyday lives. Skills training could be more specific to problem solving and relapse prevention, however, enabling participants to address problems that may interfere with their long-term adoption (e.g. time restrictions, competing commitments), enabling participants to plan when they intend to use their skills attained and perform that behaviour and tailoring activities to individual's own preferences and schedules (Michie et al., 2011; Middleton, Anton &

Perri, 2013). Additionally, social support within the group could also be utilised to encourage the maintenance of health behaviours, which could be extended to family members or friends, by allowing participants to invite others to engage and share associated health and wellbeing outcomes. Such social support may encourage long-term health behaviours when participants no longer have the support of the facilitator or participants within the intervention. Multicomponent strategies are argued to be most successful in sustaining behaviour change (Middleton et al., 2013) and so strategies to promote sustainability of behaviour change and associated outcomes may involve a variety of behaviour change techniques. Implications of exit strategies are further outlined within the synthesis chapter (Chapter 8).

7.5.5. Conclusion

This study gained insight into the experiences of participants engaged in, and facilitators delivering Nature4Health interventions. Findings revealed unique insight into loss as a shared characteristic among participants motivations to attend Nature4Health interventions, as a desire to regain structure, highlighting a new target sample for recruitment. The choice afforded to participants and flexible delivery styles was argued to encourage a sense of autonomy and positively influence health and wellbeing outcomes, and decreased anxiety more specifically. These findings have emphasised the importance of choice and suggested key components and BCTs within the delivery of Nature4Health interventions and similar outdoor interventions to promote engagement and positively influence health and wellbeing outcomes (Michie et al., 2011; Cane et al., 2012). The perceived psychosocial outcomes contributed to the literature to date, as well as

reaffirming those quantitative health and wellbeing outcomes gained in Study 3a. Findings surrounding sustainability emphasised the need to adopt a multifaceted approach, which enables clients to develop skills and pre-empt challenges and barriers to their continued behaviour change and to enable them to maintain associated health and wellbeing outcomes. The current study's findings, in conjunction with behaviour change theory therefore have unique design and delivery implications for a future Natural Health Service, which lever behaviour change techniques to support behaviour change, and encourage positive health and wellbeing outcomes (Chapter 8).

Chapter 8: Synthesis

Table 8.1. Thesis Study Map

<p>Study 1: Exploring Outdoor Interventions from a Sector Leaders Perspective</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To explore outdoor interventions from sector leaders within a policy-making, funding or research perspective within the areas of outdoors, health, physical activity and therapy 2. To examine definitions of outdoor interventions and differences from an outdoors, health, physical activity and therapy perspective and identify their delivery components 3. To investigate how outdoor interventions are perceived to or have improved people's health and wellbeing 4. To consider how outdoor interventions are and should be designed and delivered to improve health and wellbeing and evaluated to capture associated outcomes 	<p>Key Findings:</p> <ul style="list-style-type: none"> • Inclusive and accessible outdoor interventions described, inclusive to diverse needs and abilities • Contrasting proposals for targeted and tailored delivery of outdoor interventions • The duration and difficulty of activities, environmental setting, individual differences of participants, as well as facilitator's knowledge and skills argued as key delivery components • Mixed methods research evaluations proposed to demonstrate the effectiveness of outdoor interventions and identify key delivery components, which may influence positive health and wellbeing outcomes
<p>Study 2: Gaining Insight into the Delivery of Outdoor Therapy Interventions from those Currently Facilitating Them</p>	
<p>Objectives:</p> <ol style="list-style-type: none"> 1. To examine how outdoor therapy interventions are defined by facilitators 2. To explore how outdoor therapy interventions are perceived to be therapeutic by facilitators delivering them 3. To explore how outdoor therapy interventions are currently designed and delivered 4. To assess how outdoor therapy interventions are evaluated to examine perceived therapeutic outcomes 	<p>Key Findings:</p> <ul style="list-style-type: none"> • Outdoor therapy definitions consistent with the literature to date, yet challenges expressed by facilitators defining their own practice • Key delivery components included the environmental setting, facilitator's knowledge and skills, consistent with Study 1's findings • Participants demographics included those with mental or emotional issues, dealing with trauma or generally feeling 'stuck' and hold 'beliefs about consequences' that engaging in outdoor therapy interventions will help them to navigate through these challenges • Associated outcomes included improved self-belief values and reduced stress • Evaluation challenges in selecting 'suitable' evaluation were resolved by adapting existing validated questionnaires to an outdoor context

Study 3a: Evaluating the health and wellbeing outcomes of outdoor interventions

Objectives:

1. To evaluate the health and wellbeing benefits of outdoor interventions
2. To examine the sustainability of behaviour change and associated health and wellbeing outcomes following completion of outdoor interventions

Key Findings:

- Improved health and wellbeing outcomes across all three time points
- Decreased self-esteem and self-reported physical activity ratings 12 weeks after completion of sessions
- Findings implicate for more effective support and signposting for participants to maintain behaviour change and associated health and wellbeing outcomes

Study3b: Exploring the Experiences of Participants and Facilitators of Nature4Health Outdoor Interventions

Objectives:

1. To gain insight into the experiences of participants and facilitators engaged in and delivering Nature4Health outdoor interventions
2. To explore perceived health and well-being outcomes associated with engaging in each outdoor intervention
3. To explore evidence of key delivery components within outdoor interventions which may influence health and wellbeing outcomes
4. To assess the long-term sustainability of behaviour change and associated health and wellbeing outcomes

Key Findings:

- Participant motivation to attend Nature4Health interventions was identified as a shared experience of loss and a need to regain structure
- Perceived autonomy afforded to participants via intervention design allowing choice and autonomy increased capability and motivation to engage in Nature4Health outdoor interventions
- Participants perceived psychosocial outcomes including improved mood, decreased anxiety and social support, was supported by previous quantitative outcomes gained and previous literature
- Sustainability included requests for additional formally delivered Nature4Health interventions, as well as self-initiated, individual behaviour change, utilising the skills gained within the sessions to maintain associated health and wellbeing outcomes

8. Synthesis

8.1. Introduction

This PhD evaluated the health and wellbeing outcomes associated with outdoor interventions to inform the future design, delivery and evaluation of The Mersey Forest's Natural Health Service and similar outdoor interventions. The PhD firstly gained qualitative insight into the definitions, delivery, associated outcomes and evaluation protocols of outdoor interventions from sector leader's perspectives. Sector leaders were professionals, who had active roles in policy making, funding and researching outdoor interventions from an outdoors, health, physical activity and therapy standpoint. The consecutive study then explored *if* and *how* these perspectives were translated into current practice by facilitators delivering outdoor therapy interventions. The final studies evaluated the health and wellbeing outcomes associated with outdoor interventions in participants engaged in conservation volunteering, horticultural therapy, health walks and Nordic walking, as delivered through The Mersey Forest's Nature4Health programme and by external providers within the locality. The final qualitative phase then explored the experiences of participants and facilitators, who had been engaged in or delivered the Mersey Forest's Nature4Health interventions to gain insight into their unique experiences and identify key delivery components attributed to their reported health and wellbeing outcomes. This final synthesis chapter will therefore commence with an overview of the key findings gained within this PhD before discussing how these findings have contributed to, as well as extended, beyond the theoretical literature to date. The implications of the PhD findings from a local and national policy making perspective will then be outlined,

followed by the design, delivery and research implications for a Natural Health Service and similar outdoor interventions. The researcher's reflections of the PhD's strengths, limitations and challenges also further inform the future evaluation of outdoor interventions before a conclusion is provided to finalise this chapter and PhD as a whole.

8.2. Overview of Key Findings

Sector leader's perspectives of outdoor interventions, reported as inclusive and accessible to a diverse array of ages, needs and abilities, with a range of psychosocial outcomes associated (e.g. improved health, wellbeing and opportunities for social interaction) were consistent with the principles of those generic, population-level outdoor interventions currently delivered in the UK. For example, the principles of accessibility and inclusivity of Ramblers to:

“Improve access to the outdoors, protecting rights of way and securing more open access land so that more people can enjoy the benefits of being outdoors”

A further example includes the accessible approach to the delivery and intended psychosocial outcomes of Walking for Health (2020) outdoor interventions:

“Walking for Health overcomes a recognised barrier to becoming more active by providing opportunities for social contact. This is the top motivator for many participants and a mental health benefit in itself.”

These generically targeted, inclusive and accessible definitions of outdoor interventions contrasted with sector leader's proposed design and delivery of future outdoor interventions, where a more targeted and tailored approach to those populations, towards

those who would benefit most (e.g. those with mental health conditions) was favoured.

While outdoor practice has successfully targeted and tailored outdoor interventions to those deemed most in need, with specific delivery goals, intended outcomes and evaluation frameworks (e.g. adventure therapy, wilderness therapy), the majority of outdoor interventions comparable to those evaluated within this PhD (e.g. therapeutic gardening, walking interventions and conservation volunteering) align with those more generic, population-level outdoor interventions (e.g. Ecominds, Walking for Health, Nordic Walking UK, TCV etc.). These discrepancies revealed contrasts between what *is* available and what *should be* available, according to the stakeholders in this PhD, regarding outdoor interventions, forming a novel finding within this PhD. These unique findings suggested a desired shift from policy makers in the future direction of the delivery of outdoor interventions in the UK, from those more widely available outdoor interventions designed to be accessible to a diverse array of individuals with differing abilities and health needs, to a more specifically targeted and tailored approach to those more vulnerable groups (e.g. those with poor wellbeing). In retrospect, these particular themes uncovered within the study's TA analysis in 2015-2016, may be reflective of sector leaders pre-empting the more recent changes in policy, where social prescribing has become more prevalent to address the nation's health and wellbeing issues. This is supported by the recent piloting of outdoor interventions on prescription (e.g. A Dose of Nature, 2019; The Wildlife Trust's Nature-Based Programmes, 2019) whereby leaders are highlighting outdoor interventions as an instrumental component in improving health and wellbeing within a social prescribing model, if targeted to health and wellbeing needs effectively. These implications

to the wider policy making perspective are discussed further in the following section (see section 8.4).

Furthermore, themes from Study 2 and Study 3b, revealing the demographics of participants engaged on outdoor interventions as those who were ‘stuck’ (e.g. stuck within the NHS mental health system and unable to find the solutions to challenges), facing difficult life circumstances (e.g. relationship breakdown, experiencing trauma, bereavement, loss of health or loss of employment) highlighted an ideal target sample. This sample represents those participants, who have engaged on outdoor therapy or Nature4Health interventions, and continued to engage and benefit from them. Furthermore, the improved psychosocial outcomes gained through Study 3a and 3b, such as social interaction, increased health and fitness ratings and improved wellbeing, including self-esteem, further highlight implications for a Natural Health Service, which recruits participants through social prescribing channels. This strategy would effectively target those participants who require support in managing their health, preventing mental ill-health and navigating through difficult life circumstances, as discussed later in this chapter (see section 8.5.1.).

Challenges were also revealed by sector leaders in Study 1, regarding the delivery of outdoor interventions and the ability to achieve a level of intervention fidelity, while maintaining flexibility to participants needs. This flexibility would include the voluntary nature of outdoor interventions, a choice of activities for participants to complete with varying levels of engagement (e.g. solitary activities/group activities) found to be vital key components amongst those participants engaging and benefitting from Nature4Health

interventions in Study 3b. Proposed solutions to address these challenges are outlined within the delivery implications (see section 8.5).

The broad and diverse psychosocial outcomes perceived to be associated with outdoor interventions by sector leaders within Study 1, such as improved health, increased physical activity levels, improved wellbeing, including self-esteem and social interaction, were clarified by the self-reported quantitative measures in Study 3a (patterns of slight increases in health, physical activity, wellbeing, and self-esteem ratings). Additionally, qualitative themes surrounding associated outcomes (e.g. improved physical fitness, increased vitality and improved mood) further clarified these quantitative trends. All outcomes reported throughout the PhD's studies, were also consistent with the broad and diverse psychosocial outcomes outlined within the literature (see Literature Review, Chapter 2). However, decreased self-esteem (-2.49 points within the esteem-related affect subscale) of the Profile of Mood Scale (Grove & Prapavessis, 1992) and physical activity ratings (-1389.74 total METmins) from International Physical Activity Questionnaire (Craig et al., 2003), from the completion of sessions to twelve weeks after the sessions had ended, called for more effective support and signposting within sessions, to enable participants to sustain these outcomes, as outlined in section 8.5.

In regard to evaluation protocols, the proposed rigorous and robust methodologies, utilising validated questionnaire measures, within study designs, such as randomised-controlled trials, were suggested to communicate the effectiveness of outdoor interventions and position them within mainstream healthcare. Such findings reflect calls for more effective evaluation protocols within policy documentation (e.g. Bragg & Leck, 2017).

Whereas challenges surrounding the compatibility of the rigorous and robust evaluation protocols proposed with the flexible and varied delivery of outdoor interventions called for the adoption of mixed methods research. Mixed methods research was proposed to evaluate future outdoor interventions, enable the collection of quantitative, statistically significant data, using validated questionnaire measures, while also gaining rich and in-depth qualitative data. Qualitative data collection would then enable key components of the delivery of outdoor interventions to be attributed to quantitative health and wellbeing outcomes and explain why the outdoor interventions are effective (Creswell & Clark, 2017) as achieved in Study 3a and 3b of this PhD.

8.3. Theoretical Contributions of Findings

Findings gleaned throughout the studies, within this PhD, support theoretical positions to date, regarding the acquisition of positive health and wellbeing outcomes, through engagement in the outdoors (e.g. the Psycho-evolutionary Stress Reduction Theory, Ulrich, 1981; the Attention Restoration Theory, Kaplan & Kaplan, 1989; Kaplan 1995). The current study's results also extend beyond the more recently proposed pathways and mechanisms believed to be responsible in influencing health and wellbeing outcomes through participation in outdoor interventions (Hartig, Mitchell, De Vries & Frumkin, 2014; Husk, Lovell, Cooper, Stahl-Timmins & Garside, 2015).

Furthermore, the mapping of PhD findings onto relevant behaviour change models, such as the COM-B (Michie Van Stralen & West, 2011), the BCW (Michie Van Stralen & West, 2011), the TDF (Cane et al., 2012) with corresponding BCTs (Michie et al., 2011)

demonstrate the novel theoretical application of findings, combined with behaviour change theory, in the design and delivery of a Natural Health Service. See Figure 8.1 of PhD findings mapped onto the BCW (Michie Van Stralen & West, 2011) and the TDF (Cane et al., 2012) influencing participants capability, opportunity and motivation to engage in outdoor interventions within the COM-B model (Michie Van Stralen & West, 2011). Corresponding behaviour change techniques (BCTs) (Michie et al., 2011) are suggested as ways to further encourage behaviour change.

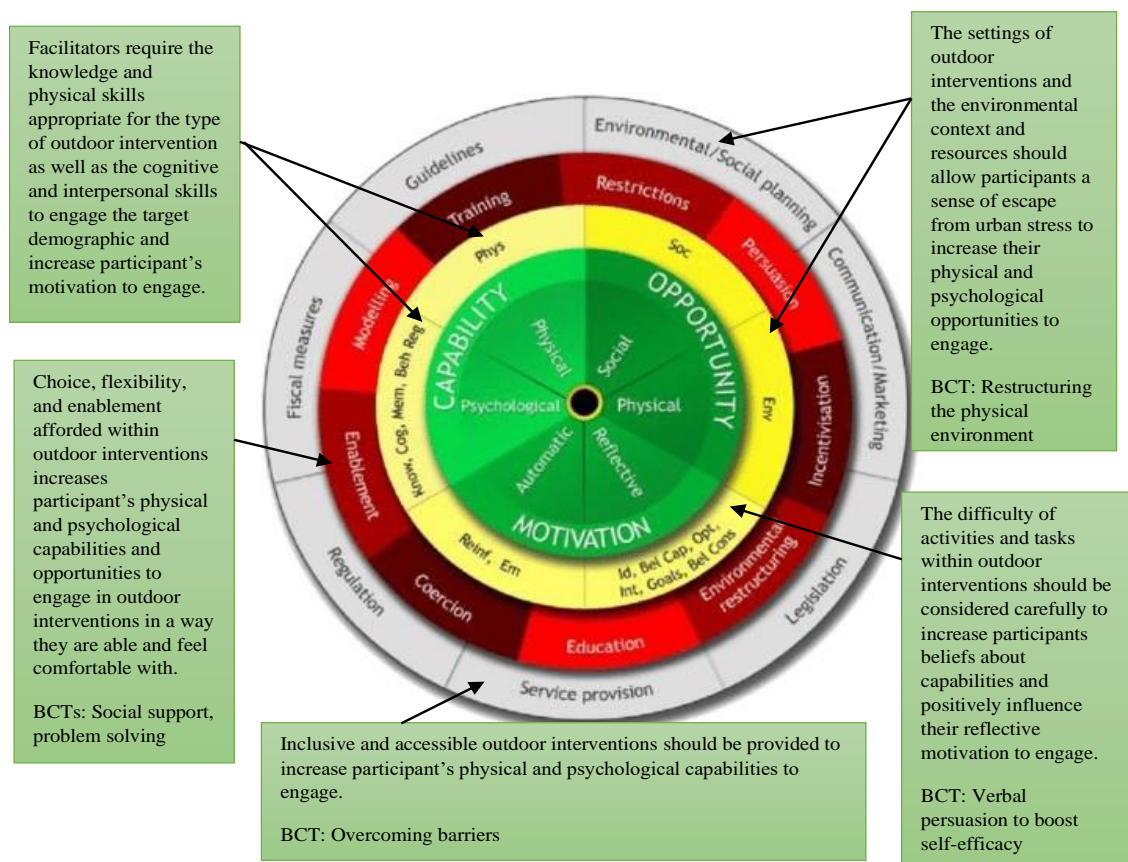


Figure 8.1. PhD Study Findings Mapped onto the Behaviour Change Wheel and the Theoretical Domains Framework with Associated Behaviour Change Techniques (Michie et al., 2011; Cane et al., 2012)

Firstly, the inclusive and accessible ‘service provision’ increases participants ‘physical’ and ‘psychological’ ‘capabilities’ to engage in outdoor interventions, as emphasised by sector leaders in Study 1 (Chapter 4). Behaviour change techniques, such as ‘overcoming barriers’ (e.g. delivering outdoor interventions in accessible locations for those with limited mobility or lack of access to their own vehicle) would further enhance this. Sector leaders in Study 1 (Chapter 4) and facilitators in Study 2 (Chapter 5) also argued for outdoor interventions to be delivered by facilitators with the relevant ‘knowledge’ and ‘physical skills’ according to the type of outdoor intervention as well as the ‘cognitive and interpersonal skills’ needed for the participant demographics to increase their ‘motivation’ to engage and gain associated health and wellbeing outcomes. The choice, flexibility and ‘enablement’ afforded within Nature4Health interventions was also found to increase Study 3b (Chapter 7) participants’ ‘physical’ and ‘psychological’ ‘capabilities’ to engage in the sessions in a way that they felt able and comfortable with. Behaviour change techniques, such as ‘social support’ by facilitators and other participants and ‘problem solving’ strategies could be further utilised to encourage this. Additionally, considerations surrounding the difficulty of tasks or activities within outdoor interventions should increase participants ‘beliefs about capabilities’ and enhance their ‘reflective’ ‘motivation’ to engage in outdoor interventions. Facilitators could also adopt behaviour change techniques, such as ‘verbal persuasion to boost self-efficacy’ and ‘focusing on past success’ to further encourage participant engagement. Finally, careful consideration of the ‘environmental/social planning’ and the ‘environmental context and resources’ of outdoor interventions, argued by sector leaders in Study 1 (Chapter 4) and outdoor therapy

facilitators in Study 2 (Chapter 5) supports the importance of the type and quality of environment proposed by Hartig, Mitchell, De Vries and Frumkin (2014) as a key contributor to acquiring health and wellbeing outcomes. These findings also were also strengthened by the Stress Restorative Theory (Ulrich, 1983), suggesting that more restorative outdoor environments are those which provide perceived escape from urban stress and people's everyday lives. Considering the 'environmental and social planning' and the 'environmental context and resources' therefore increases participants' 'physical' and 'psychological' 'opportunities' to engage in outdoor interventions. These findings extended beyond this theoretical knowledge to date by implicating the utilisation of behaviour change techniques to 'restructure the physical environment' to foster a perceived escape from stress, within the design and delivery of a Natural Health Service, further outlined in section 8.5 (Michie et al., 2011; Cane et al., 2012).

More specifically, insight gained from Study 3b (Chapter 7) regarding the demographics of participants and their motivations to attend the Nature4Health outdoor interventions, as those who had experienced loss and attended the sessions as a way to regain structure, reflected Husk, Lovell, Cooper, Stahl-Timmins and Garside (2015) findings. Within this study, structure appeared to be both a motivation to attend sessions, as well as a benefit in itself, for conservation volunteers and environmental enhancement participants, who had mental health conditions. The current study's results extend beyond these findings to include those participants experiencing loss to engage in a range of outdoor interventions (including walking interventions and horticultural therapy), in addition to conservation volunteering within the Nature4Health programmes. These theoretical extensions,

surrounding motivations to engage in outdoor interventions, combined with behaviour change theory (Michie Van Stralen & West, 2011; Cane et al., 2012) have implications for the recruitment strategies to target these participants, discussed in section 8.5.1. Findings therefore provide insight into those who benefits from outdoor interventions, how they can be successfully targeted and recruited, encouraged to engage and acquire positive associated outcomes, within a Natural Health Service. These implications are discussed in the subsequent section and throughout the following section with more specific design and delivery implications for a Natural Health Service.

Furthermore, the non-significant trends of increased physical activity in Study 3a (Chapter 6) strengthen the multiple pathways and interlinked mechanisms purported to be involved in engagement in outdoor interventions (Hartig, Mitchell, De Vries and Frumkin, 2014; Husk, Lovell, Cooper, Stahl-Timmins & Garside, 2015) whereby physical activity is argued to be a key mechanism in gaining psychosocial benefits. Whereas decreased physical activity levels reported after participants had completed the Nature4Health sessions, extend beyond these more recent theories, demonstrating the detrimental impact on acquired health and wellbeing outcomes, particularly self-esteem, when participants can no longer access these structured sessions, which for many provided a key motivation to engage. Findings, therefore, emphasise the need for utilising relevant behaviour change techniques (Michie et al., 2011), which encourage sustained behaviour change in order for participants to maintain acquired health and wellbeing outcomes (e.g. overcoming barriers, implementation interventions), also discussed within the next section.

Multifaceted outcomes proposed in Study 1 and demonstrated in studies 3a and 3b are also in keeping with the simultaneous multiple pathways responsible for health and wellbeing outcomes associated with engagement in the outdoors. Key examples of pathways include the physical activity, air quality, social cohesion argued by Hartig, Mitchell, De Vries and Frumkin (2014) and the changes in personal or social identity, achievement or contribution, knowledge acquisition, social contact, being away from stressors, restoration or recuperation and physical activity, as proposed by Husk, Lovell, Cooper, Stahl-Timmins and Garside (2015). Whereas previous reviews of evaluations of outdoor interventions (e.g. Husk, Lovell, Cooper, Stahl-Timmins & Garside, 2015) have demonstrated that the quantitative outcomes reported have not reflected the qualitative outcomes, this was not the case for the current research. The quantitative psychosocial outcomes within Study 3b (Chapter 7) reflected the qualitative outcomes proposed within studies 1 and 2 (Chapter 4 and Chapter 5) and clarified the self-reported quantitative outcomes in Study 3a (Chapter 6). This novel insight was enabled by the carefully considered research design and methodologies employed within the concurrent studies, allowing each study to influence and build upon the next, encouraging new knowledge and was considered a key strength within this PhD, as discussed further in section 8.6. New knowledge has responded to previous gaps defined within previous studies (Hartig, Mitchell, De Vries & Frumkin, 2014; Husk, Lovell, Cooper, Stahl-Timmins and Garside, 2015) calling for greater insight as to who benefits from outdoor interventions, when, where, how they benefit and in what context. Beginning to address these questions throughout the studies within this PhD and combining these findings with relevant behaviour change theory (Michie Van Stralen &

West, 2011; Michie et al., 2011; Cane et al., 2012) and corresponding behaviour change techniques (Michie Van Stralen & West, 2011), provides new delivery implications to target *who* benefits most, *when* and *where* this occurs, *how* they prefer to engage and experience outcomes and *in what context* this is most effective. This insight will inform new design and delivery implications of a Natural Health Service, as discussed in section 8.5.

8.4. Implications of Findings from a Policy Making Perspective

The effectiveness of the Nature4Health outdoor interventions in improving health and wellbeing within this PhD have immediate implications for local initiatives in the North West. The Northern Forest (2020) initiative seeks to increase opportunities for people to access the natural environment for recreation and leisure and gains expertise from The Mersey Forest to deliver outdoor interventions to improve the health and wellbeing of the surrounding communities. Knowledge gained, within this PhD, regarding the effectiveness of Nature4Health interventions will therefore enable the wider delivery of similar outdoor interventions, with specified delivery implications to encourage engagement and maximise associated health and wellbeing outcomes for residents within the surrounding communities. On a wider perspective, the Government's 25 Year Plan outlined in 2019 continues to acquire evidence surrounding the impact of engaging with the natural environment on human health and wellbeing, specifically mental health. The findings of the current PhD will therefore contribute to this evidence base being collated and begin to address how outdoor interventions can be effectively designed and delivered to engage those with physical or mental health needs and influence desired wellbeing outcomes.

Furthermore, when this PhD research commenced in 2015, outdoor interventions were perceived within the literature and policy reports (e.g. Links between Natural Environments and Mental Health: Evidence Briefing, 2016), as an alternative solution to tackle poor physical and mental ill health. However, with the increasing prevalence of social prescribing interventions and launch of The NHS Long Term Plan (2019) whereby social prescribing plays a pivotal role, outdoor interventions have more recently been proposed to align with these strategies, with the piloting of outdoor interventions on prescription (e.g. A Dose of Nature, 2019; The Wildlife Trust's Nature-Based Programmes, 2019). The PhD findings therefore combine with the results of these preliminary pilot studies, in demonstrating the effectiveness of outdoor interventions as social prescribing interventions, more prevalent today. Results also highlight the role that social prescribing can play within the recruitment of participants into the Natural Health Service, as well as a potential source of funding, discussed specifically in section 8.5.1.

Finally, due to recent events of the COVID-19 pandemic, it could also be argued that people have a greater appreciation of the natural environment and health and wellbeing benefits associated. As lockdown restrictions initially meant that people were limited to one bout of daily exercise, without the availability of gyms and leisure centres, more people utilised the natural environment to exercise and maintain their health and wellbeing during uncertain times (Chief Medical Officer, 2020). In recognition of the important role that the natural environment plays and the low risk of infection associated within these areas, parks and greenspaces have remained open to the public, alongside government guidance, informing people on how they can stay safe in these areas (Natural England,

2020). The Mersey Forest encouraged residents within their local communities to visit the nearby woodlands and greenspaces and requested that they shared their photographs of these visits via their social media platforms (e.g. Facebook, Twitter). Similarly, The University of Derby's Nature Connectedness Research Group began a 'Friendship with Nature' movement, asking people to notice and record 'Good Things in Nature' (University of Derby, 2020). The group also adopted innovative strategies to enable people, who were self-isolating or unable to go outdoors, to connect with nature via audio nature meditations and virtual nature walks in the countryside provided on their webpage. Similar efforts have been made by A Dose of Nature (2020) to 'bring outdoors indoors' through the use of nature writing and art and nature workshops via online programmes. A Dose of Nature (2020) interventions are also due to hold a series of 'Outdoor Nature Prescriptions' in a bid to assist and support people in the UK's transition out of lockdown.

8.5. Implications for the Design and Delivery of a Natural Health Service

As outlined within the PhD findings, discussed so far, several key implications for the design and delivery of a Natural Health Service and similar outdoor interventions were apparent and will be discussed within this section to effectively target individuals, who may benefit.

8.5.1. Target Population for a Natural Health Service and Proposed Recruitment Strategies

Study 3b themes clarified the proposed demographics of those engaging in outdoor therapy interventions as 'stuck' in Study 2 and revealed a target demographic of those enduring

difficult life circumstances and experiencing loss with resulting poor wellbeing. Targeting this demographic (i.e. those with poor or languishing wellbeing due to difficult life events) to prevent mental ill health could be effectively carried out by working alongside Social Prescribing Link workers within GP surgeries. NHS England (2020) is currently recruiting over one thousand Social Prescribing Link Workers to work in GP surgeries throughout England. This strategy is part of the NHS Long Term Plan (2019) in a bid to reduce the workload for GPs, by encouraging those with non-medical needs to increase their resilience and manage their own health and wellbeing through community-based support. This strategy is argued to be particularly effective for those experiencing loneliness, isolation and even mild mental health conditions, whereby social prescribing link workers can support them to identify ways to manage their health and wellbeing and enable access to local solutions (e.g. community groups) (NHS 2019). Recruitment strategies for future Natural Health Services could therefore interlink with this national strategy by collaborating with Social Prescribing Link Workers in signposting and introducing potential participants to Nature4Health interventions. Similar recruitment strategies may also involve targeting those on IAPT waiting lists, which currently range from four to sixty-one days (House of Commons Library, 2020), this would serve participants, who may not have any foreseeable treatment options and prevent their wellbeing deteriorating further. More specific targeting to those experiencing 'loss' found within Study 3b may also involve recruiting through relevant organisations such as Cruse Bereavement Care (2020), for those facing bereavement, with Nature4Health interventions providing an adjunct intervention to bereavement counselling. Similarly, participants could be recruited

through The Job Centre Plus (2020) by working in collaboration with Work Coaches, for those experiencing loss of employment to support them to regain structure within their week, acquire new skills, provide new opportunities for social interaction and improve their wellbeing.

8.5.2. Implications for a Natural Health Service Which Maintains

Intervention Fidelity While Remaining Flexible to Participants Needs

Solutions to the challenges of balancing intervention fidelity while enabling flexibility to participants needs, revealed in Study 1, may involve the adoption of ‘build in’ adaptations. In practice, this would involve ensuring outdoor interventions meet a set of essential criteria, argued as vital within this PhD (e.g. with evidence based outdoor interventions designed to improve participants health and wellbeing by connecting them to nature, facilitated by appropriately qualified and experienced facilitators and delivered in appropriate settings) while allowing flexibility to participants needs. This flexibility would include the voluntary nature of outdoor interventions, a choice of activities for participants to complete with varying levels of engagement (e.g. solitary activities/group activities), found to be key delivery components in influencing engagement and the acquisition of health and wellbeing outcomes, by participants and facilitators within the Nature4Health interventions.

In order to effectively balance the flexibility to participants needs, intervention fidelity should reflect proposals from Study 1. This initial study’s findings called for facilitators delivering outdoor interventions to be appropriately matched to participants needs, aligning

with previous findings within outdoor leadership of facilitators with intervention-specific skills (Smith & Penney, 2010). Whereas Study 2 findings revealed conflicting themes regarding the required competencies of facilitators delivering outdoor interventions and whether they should be qualified mental health professionals (e.g. Psychologists or Therapists with experience in working with those with mental health conditions) was reflective of the literature proposing that competencies within the role of a ‘Clinician’ were vital to engage vulnerable groups. Themes suggest facilitator’s ‘knowledge’ and ‘skills’ (including their ability competence and professional skills) influence their ‘capability’ and their ‘social professional role and identity’ (including their professional confidence) is linked to their motivation to deliver outdoor interventions to a specific target sample (Cane et al., 2012). Emphasis should also be given to facilitator’s interpersonal skills and their ability to connect with participants, as stated in Study 2, by facilitators and supported by wilderness therapy literature, whereby a positive alliance has predicted treatment outcomes (e.g. Harper, 2009; Hoag et al., 2013). Findings therefore suggest the implication of separate generic outdoor interventions and specifically tailored and targeted outdoor interventions proposed. Within generic outdoor interventions, advanced psychological or health backgrounds would not be necessary, with facilitators having the ability to explain, describe or animate nature, while making it relevant and having the ability to manage simple group dynamics (Bloomfield’s, 2017). While practical criteria (e.g. insurance, relevant DBS checks, first aid) would also need to be considered as well as skills specific to the outdoor intervention itself, for example, facilitators delivering Nordic Walking would therefore require the necessary Nordic Walking Instructor qualifications provided

by British Nordic Walking (2020) or Nordic Walking UK (2020). Whereas specifically tailored and targeted outdoor interventions would reflect the findings by Ringer (2014) where a ‘Clinician’ role is required, where facilitators would have the competencies to engage vulnerable participants and maximise therapeutic outcomes according to their needs. Effective partnership work from those referring these participants (e.g. mental health professionals, GPs, or Social Prescribing Link Workers) would therefore be vital in ensuring outdoor interventions are targeted, tailored and delivered effectively.

The settings where outdoor interventions would also require careful consideration, as highlighted within Study 1 and complemented by Study 2 findings of facilitators arguing that the setting of their outdoor therapy interventions were instrumental in allowing participants to connect with nature, enabling them the ability to escape from perceived everyday urban stress. Such implications are supported within the literature (e.g. Roe & Aspinall, 2011) and behaviour change theory (Michie et al., 2005) highlighting the ‘environmental context and resources’ within interventions, as key components within any intervention to encourage both physical and psychological opportunities and motivate participants to engage and gain desired outcomes. Bloomfield (2017) states:

“nature-based interventions can occur in urban parks, farms, gardens or any common green space, as well as in relatively ‘wild’ spaces set aside for nature; and a community willing to work together to try new ideas and help each other. There is no evidence that a nature-on referral intervention such as the one described in this paper has any greater or lesser impact whether it is developed in an urban or in a rural

setting... with some form of 'green' or natural space being accessible even in the world's biggest cities" (p.84)

The current study's findings contradict Bloomfield's findings, as environments must allow a sense of escape, more suitable environments would therefore be away from the sight or sound of traffic, people in the towns and cities to allow participants to experience a sense of escape from their urban everyday lives. However, as Bloomfield (2017) states, these spaces can be accessible even in city environments. Accessibility would be essential to people with limited transport options or mobility problems, and must therefore be close to public transport links, places to park and have wheelchair friendly accessible footpaths. 'By 'restructuring the physical environment' (Michie et al., 2011) to allow a sense of escape from stressors, by delivering outdoor interventions in setting within more remote settings or urban greenspaces, which provide tree cover to limit visual and audio cues of urban surrounding (e.g. people, buildings, traffic) would therefore encourage this sense of escape while remaining accessible to participants.

In order to remain flexible to participant's needs, delivery implications are discussed, based on the findings from those delivering and engaging in Nature4Health outdoor interventions (Study 3b, Chapter 7). Choice would be afforded to participants by providing an initial meeting place for participants to socially interact when arriving. One facilitator delivering the Men's Health Walks found this to be particularly helpful to participants:

"they [participants] came to session, we met, the weather was torrential, and they said, "Do you know what? I'm not going to come today, because I don't feel confident in the

chair, I don't feel confident on my feet to walk down slippery paths through woods"... and then those that wanted to, could. Those that wanted to stay behind could stay behind and do some writing and have a brew at the centre." (F2)

Participants are therefore provided with an initial first step to engagement, while gaining social interaction opportunities, found by participants and facilitators to be particularly helpful in Study 3b. These adaptations would increase participant's feelings of autonomy and their motivation to engage (Deci & Ryan, 2010). This meeting place would allow participants the option to attend outdoor interventions with the option to stay there and socialise if their physical or mental health prevented them from engaging in the activities, therefore increasing participant's autonomy, decreasing anxiety and making them more likely to engage (Michie et al., 2011; Ryan & Deci, 2000). Choices in activities and tasks afforded within outdoor interventions in Study 3b were also found to increase participant's perceived autonomy, positively influence engagement and improve health and wellbeing, as argued by one participant attending the Green Allotment Nature4Health intervention:

"Where beforehand, I felt like I had to go the dole, I have to do this, I have to do that. And then you come here, and it's like, "Would you like to do this, would you like to do that?" And you can think about things, and you're taken away from all that, so everything just lifts" (P7)

Choices in the levels of engagement provided should also be offered, this ranged from completing solitary tasks within Nature's Therapy interventions, if feeling anxious about

engaging in group tasks, to participating in or leading the group activities planned for that session:

“they [participants] could have space to go away, and then re-join the group. That was really helpful for the likes of [participant] and his anxiety. He would go and do a task by himself, but re-join the group, and come and go as he felt he could do” (F3)

By increasing participant’s means of engaging in a way in which they felt comfortable and reducing barriers to engage, such as anxiety and mobility problems, this also increased participant’s capability and opportunity to engage in outdoor interventions (Michie et al., 2011). Therefore, maximising these BCTs already utilised by facilitators in some of the Nature4Health interventions, such as encouraging a culture of ‘social support’ within the group, enabling ‘problem solving’ and ‘overcoming barriers’ to engagement, would encourage greater feelings of ‘enablement’ within participants and increase the likelihood of future engagement.

The physical and mental difficulty of activities must also be carefully designed to encourage feelings of autonomy, while still providing challenge to participants and influencing feelings of accomplishment:

“the intensity of the activity... You wouldn't want people to be thrown into the deep end, as it were... the intensity of the activity needs to be built up just like anything else. If it's a new experience and a new kind of treatment, you don't start on level ten, you start on level two.” (Sector Leader 11)

This incremental strategy could be achieved by providing easier activities initially, while gradually encouraging the difficulty (e.g. walking shorter distances during initial sessions and slowly increasing the distance as participant's levels of fitness and confidence increase).

8.5.3. The Duration of Sessions within a Natural Health Service and Strategies to Encourage Sustainability of Behaviour Change and Associated Outcomes

In terms of the duration of the actual sessions within the interventions, previous findings have reported a dose of 30 minutes or more, is needed, to have a positive impact on depression and blood pressure (e.g. Frühauf et al., 2016). As each outdoor intervention studied within studies 3a and 3b lasted two hours in length, these current findings confirm that positive impacts continue to be associated when this dose is extended to two hours. In regards to the running time, outdoor interventions would ideally be delivered long-term, such as other national schemes in the UK (e.g. Walking for Health, Nordic Walking UK, TCV Green Gyms). Long-term delivery of outdoor interventions would allow participants the opportunity to continually engage and gain associated health and wellbeing outcomes. This proposed sustained formal delivery of Nature4Health sessions was requested by some facilitators and participants within Study 3b, who expressed anxieties about whether participants would maintain the psychosocial benefits they had gained when the sessions were no longer running.

Alternatively, an ideal package of long-term support for future outdoor intervention delivery would be to supplement the twelve week outdoor interventions with the delivery of ongoing ‘drop-in’ sessions. Drop-in sessions would include those more preventative outdoor interventions, generically targeted to be accessible to a diverse array of needs and abilities to improve and maintain health and wellbeing, as well as those more targeted and tailored outdoor interventions, to populations with specific health and wellbeing needs (e.g. those with mental health conditions). Drop-in outdoor interventions would be delivered weekly with the option for participants to attend when they feel they need to. This would allow participants the autonomy to maintain their health and wellbeing, utilising outdoor interventions they have previously benefited from. This would be particularly important within this sample, where autonomy, choice and empowerment were vital in their engagement in outdoor interventions and acquisition of health and wellbeing outcomes. Drop-in or ‘extended care’ sessions have also demonstrated effectiveness in sustaining health and wellbeing outcomes in other health interventions, such as weight management (e.g. Middleton, Patidar, & Perri, 2011) and physical activity interventions (e.g. Müller-Riemenschneider, Reinhold, Nocon & Willich, 2008).

However, where long-term provision of outdoor interventions is not feasible (e.g. lack of funding or resources), facilitators must support participants to maintain the associated health behaviours from their sessions and continue to experience the associated health and wellbeing benefits. This support by facilitators should involve signposting participants to similar organisations where appropriate (e.g. TCV, Walking for Health, Nordic Walking UK) when exiting outdoor interventions. This strategy proved to be successful in Study 3b

where participants engaged in archery and running clubs, following completion of the Nature4Health sessions. Alternatively, facilitators could utilise behaviour change techniques, such as implementation intentions (Gollwitzer, 1999), to support participants to plan when, where and how they will use the skills acquired within the outdoor interventions in their everyday lives to encourage long-term behaviour change. For example, after participants have attained skills, (e.g. learning the Nordic walking technique) or connected with nature for wellbeing purposes (e.g. used mindfulness meditations while paying attention to sights and sounds in nature), facilitators could support participants to complete implementation interventions where they write down when, where and how they will continue such behaviours in their everyday lives. The feasibility of this approach is supported by Study 3b themes of participants continuing to engage in self-initiated health behaviours (e.g. one participant taking part in Nordic walking interventions reported using the Nordic walking techniques she had learned in the sessions when she walked her dog daily) and findings by Hunter et al., (2019) where ‘urban-dwellers’ successfully engaged in connecting with nature for 20-30 minutes, three times per week, described as ‘taking a nature pill’ resulting in reduced stress.

The prediction of the Natural Health Services ability to utilise these suggested behaviour change techniques has been assessed according to the APEASE criteria. This criteria encourages the consideration of the affordability, practicability, effectiveness and cost-effectiveness, acceptability, side-effects/safety, and equity of an intervention. The recommended behaviour change techniques appear to meet the APEASE criteria, as they are affordable, practicable within the context of outdoor interventions, as demonstrated by

evidence of their utilisation within some of the Nature4Health interventions studied so far, and have also been shown to demonstrate effectiveness in engaging participants and influencing desired outcomes. The acceptability of the behaviour change techniques has not yet been determined by facilitators but this would be discussed upon the dissemination of findings to facilitators and all stakeholders involved within the future delivery of the Natural Health Service. The behaviour change techniques are also safe, with no known side effects, yet, from the current study's findings, they have been linked to effective engagement and the acquisition of positive health and wellbeing outcomes for participants. The suggested delivery implications and corresponding behaviour change techniques therefore appear to meet the APPEASE criteria, which is promising for their future utilisation.

8.6.Strengths, Limitations and Challenges Associated with Current Research and Recommendations for Future Evaluations

This PhD possessed a variety of methodological strengths. The methodology adopted within this PhD and the design of the consecutive studies, enabled unique insight into sector leaders' perspectives of what outdoor interventions *should be*, according to their definitions, delivery, outcomes and evaluation protocols (Study 1), before gaining insight into *what is* actually being delivered by current facilitators (Study 2). Finally, this research was able to gain a sense of how outdoor interventions *are actually* experienced by those delivering and participating in them, in terms of their health and wellbeing outcomes (Study 3a), unique experiences and attributions to these outcomes (Study 3b).

Furthermore, the systematic search adopted in Study 1 and 2 to recruit participants from specific backgrounds, included those from diverse areas of interest and enabled a more representative sample of sector leaders from an outdoors, health, physical activity and therapy perspective in the UK. Similarly, Study 2 allowed insight into the combined experiences of facilitators delivering ecotherapy, adventure therapy, outdoor therapy and wilderness therapy.

The greatest challenge in studies 1 and 2 surrounded gaining an adequate qualitative sample for both studies, considered to provide a good representation of each area.

Generalisability is often used to define quantitative research in positive ways, in achieving reliable results from a representative sample of participants, which can be applied to a wider population or different contexts. Qualitative research, however, is only argued to lack generalisability when it is understood from a statistical-probabilistic stance. This viewpoint is problematic when applied to qualitative research due to the ontological and epistemological assumptions that inform the majority of qualitative research (Smith, 2018). As qualitative research is about examining people's lives in rich detail, and to achieve that goal, small numbers of people are often chosen through purposeful sampling strategies (Braun & Clarke, 2013, Sparkes & Smith, 2014). Rich knowledge gained through small purposefully chosen samples are therefore unique strengths of qualitative research, not weaknesses. Furthermore, there are no definitive guidelines for adequate sample sizes in thematic analysis, although sample sizes have increased over the past fifteen years and there are negative ethical implications in interviewing more participants than required,

such as participant burden (Bacchetti, Wolf, Segal, & McCulloch, 2005). Therefore, it was not possible to get an equal balance of leaders across backgrounds, as attempted, for example, there was a majority of leaders from a health professional background within Study 1 and facilitators delivering ecotherapy within Study 2. However, this sample was reflective of the current landscape of outdoor interventions within in a UK context. The use of semi-structured interviews throughout Studies 1, 2 and 3b also allowed the researcher to explore answers given in more depth and gain more insight into potential new themes emerging (Brinkmann, Jacobson & Kristianson, 2014) as well as flexibility to explore individual responses further (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). Conducting individual interviews also allowed the researcher to uncover participants' attitudes, beliefs, opinions, experience and understanding, which elicited more detail, rather than focus groups, which may have restricted such exploration due to confidentiality concerns, disclosure to others and power relations (Bullock, 2016).

Ideally, evaluation would be carried out by a researcher, who is independent from the delivery of outdoor interventions, to limit the bias and burden on those delivering outdoor interventions, as within this PhD. However, where an independent researcher is not feasible, outdoor intervention facilitators would be required to fulfil this role and therefore must feel confident in their ability to collect the necessary data, comply with participant confidentiality, and understand the importance of collecting data to evaluate outdoor interventions. However, challenges with the quantitative data collection across each time point demonstrated a lack of capacity for facilitators of outdoor interventions to support participants to engage in the research. Further difficulties were demonstrated in the ability

to create an atmosphere conducive to the research in allowing participants the time and space to complete the questionnaires. These issues were partly due to facilitators own pressures of delivering the outdoor interventions and additional responsibilities.

Additional recruitment barriers were more specific to conducting research in the outdoors, including lack of indoor facilities for participants to sit and fill questionnaires in (e.g. shelter, chairs and tables). The researcher overcame this barrier by distributing clipboards, as well as the usual research materials needed (e.g. pens, questionnaires). Future research should therefore ensure that an appropriate sheltered space is provided within outdoor intervention settings for participants to engage in the research (e.g. somewhere indoors or sheltered with seating and questionnaires and pens provided). Adequate time allocated for completing the research (e.g. twenty minutes at the beginning of session 1) should be enabled to introduce participants to the evaluation element of the intervention, the importance of this process and completing the research questionnaires, with support from facilitators. Equally, participants would then require the same time put aside after the final session to complete the follow-up questionnaires with the same support provided. High drop-out rates within the outdoor interventions studies, due to illness or other commitments for participants, also meant that it was hard to gain a good sample size at the twelve-week follow-up (time 1). To overcome this, a dropout postcard was sent to participants who had dropped out, why they no longer attended the interventions and what the barriers were to them engaging in the sessions. However, no participants, who had dropped out, returned the dropout postcards. A systematic review, exploring adherence on community exercise interventions (Farrance, Tsofliou & Clark, 2016) identified that social connectedness,

participant perceived benefits, programme design with accessible locations, structure and the content of the sessions relevant to individuals, positively predicted adherence. The current study supports these findings, with empowering instructors and social support, positively predicting engagement within the Nature4Health interventions. Findings suggest that adherence may therefore be promoted by implementing the current study's findings within the future delivery of the Natural Health Service, encouraging a greater sample size for future evaluations.

To enable a greater sample size to be recruited within Study 3a, a further ethical amend was made to allow the researcher to recruit participants from those external local organisations delivering similar outdoor interventions to The Mersey Forest's Nature4Health outdoor interventions. This amend was in response to a small sample size gained in Study 3a when evaluating the Nature4Health interventions alone. This amendment enabled a greater sample size and gave a broader perspective on the health and wellbeing outcomes associated with outdoor interventions, not merely The Mersey Forest's Nature4Health interventions. While a small sample size may have influenced the non-significant results within Study 3a, many other factors should also be considered. One example is the statistical phenomenon of the 'regression towards the mean' whereby if a measure is either extreme or an outlier, the same measurement at a different time point is more likely to be closer to the mean score (Bland & Altman, 1994). Another explanation for lack of significant findings may be the lack of suitability of questionnaire measures, for example, the Warwick-Edinburgh Mental Wellbeing Scale (Tennant et al., 2008) was originally designed to be adopted for population-level studies, and although it has

demonstrated reliability at an individual level, this is only significant with changes of three or more points, which the current study did not meet. Similarly, the Rosenberg Self-Esteem Scale (Rosenberg, 1965) demonstrates less reliability amongst negatively worded items (Tinakon & Nahathai, 2012). Self-reported physical activity measures, such as the International Physical Activity Questionnaire (Craig et al., 2003) within this PhD, also illustrate less reliability than objective physical activity measures (Steen-Johannssen et al., 2015). These validated measures may therefore be preferred by commissioners but lack suitability for participants within the outdoor interventions studied. Interestingly, the Warwick-Edinburgh Mental Wellbeing Scale (Tennant et al., 2008) is suggested to be utilised on an individual level to enable conversations about wellbeing. All of the questionnaire scores at each time point were used in this way to provide feedback to those individuals in Study 3b within their one-to-one interviews, a successful strategy which enabled conversation and further discussion and insight about their scores. These individual interviews and review of scores also showed that when scores are viewed on an individual basis, greater changes were observed with the qualitative results enabling the researcher to see the personal significance of the results rather than from a statistical perspective.

Similarly, caution must also be given when interpreting trends and patterns of improvements in participants health and wellbeing ratings, as external events to the outdoor interventions may also be responsible. This may include the nature of participants' long-term conditions, which may fluctuate and improve over time (Helgeson & Zajdel,

2017), or life events, such as new opportunities (e.g. a new job) or a new relationship, which may improve a person's wellbeing.

Some facilitators and participants, who consented to participate in this phase during Study 3a data collection, failed to give consent at the time of the interview or failed to keep their arranged interview time. The researcher tried to re-contact these participants and on some occasions was able to interview them, but was not always successful, meaning a lower than anticipated sample size was gained. The researcher, therefore, continued to interview service facilitators and service users from subsequent interventions until data saturation had been reached within the qualitative data collection phase. Data saturation was defined as 'information redundancy' whereby no new themes and codes emerge as interpreted by the researcher (Clarke, 2020).

8.7. Implications for Future Research Protocols to Evaluate a Natural Health Service

In addition to the constructive responses to research challenges discussed previously, findings gained throughout the studies within this PhD have implications for evaluating a Natural Health Service and outdoor interventions provided throughout the UK.

Firstly, the proposed robust and rigorous evaluation protocols required to evaluate outdoor interventions and position them as effective health and wellbeing interventions within the health sector, were argued by sector leaders within Study 1. Recommended validated questionnaire measures, based on their successful utilisation in previous similar studies and the researcher's own reflections of their effectiveness in Study 3a, would be the SF36v2

(Ware et al., 2008) and the International Physical Activity Questionnaire (Craig et al., 2003). In addition to being a reliable and valid questionnaire measure to assess changes in functional health and wellbeing, the SF36v2 is generic to all aspects of health and wellbeing and is practical and easy to complete. Whereas the International Physical Activity Questionnaire has good reliability and validity and is helpful to examine the role that physical activity plays in achieving associated health and wellbeing outcomes. This measure is also able to measure a variety of physical activities, as well as their intensity and duration. To limit participant burden, the researcher would not recommend utilising the Warwick Edinburgh Mental Wellbeing Scale (Tennant et al., 2008), the Profile of Mood States (Grove & Prapavessis, 1992) or the Rosenberg Self-Esteem Scale (Rosenberg, 1965) as many of the measures (e.g. self-esteem, mental health) were already incorporated within the SF36v2 and so discounting these from future studies would therefore limit participant burden and encourage greater recruitment rates while measuring a variety of aspects of functional health and wellbeing. Additionally, the challenges expressed by facilitators in selecting appropriate evaluation protocols to evaluate their outdoor therapy interventions and strategies to overcome them, suggest the utilisation of validated health and wellbeing measures, such as those aforementioned, and adapting them to use within the context of outdoor interventions.

Furthermore, importance was also placed upon the ability to identify the key delivery components within outdoor interventions to examine what works, for whom, where, when, and in what context by sector leaders in Study 1. In an attempt to combine these competing needs of providing rigorous and robust evidence as well as those key delivery components

attributed to associated wellbeing outcomes, mixed methods designs were proposed, used successfully within this study and considered a key methodological strength, as discussed previously.

This PhD further mapped key delivery components identified within qualitative themes and mapped them onto relevant behaviour change theory (Michie Van Stralen & West, 2011; Michie et al., 2011; Cane et al., 2012) and corresponding behaviour change techniques (Michie et al., 2011), see Figure 8.1. This enabled the identification of intervention content, found to be effective in influencing engagement and improving health outcomes, so that this can be replicated in future delivery to encourage future successful delivery of outdoor interventions.

In addition, to enable greater transparency and more detailed reporting of outdoor interventions, argued to be lacking in previous studies (Husk et al, 2016), outdoor intervention content should be described in evaluations using behaviour change techniques as a common language (Michie et al., 2014). This strategy would enable descriptions of the content of outdoor interventions to be described, which may contribute to their effectiveness, as well as identify the functions played by behaviour change techniques, explore their associated processes of change and the fidelity of outdoor interventions (Michie et al., 2014). The table of outdoor interventions (appendix 3.6) begins this process for the outdoor interventions studied within this PhD.

However, behaviour change theory (Michie Van Stralen & West, 2011; Michie et al., 2011; Cane et al., 2012) can be further utilised to investigate the functions played by

behaviour change techniques (Michie et al., 2011), test their theoretical underpinnings and understand the processes of change and assess the fidelity of outdoor interventions within a Natural Health Service (Michie, Atkins & West, 2014). In order to specifically identify intervention content, found to be effective within outdoor interventions, a rigorous process of coding must take place to record the presence, location and frequency of behaviour change techniques (Michie Van Stralen & West, 2011) in the delivery of outdoor interventions. The behaviour change techniques (Michie et al., 2011) associated with effectiveness of outdoor interventions can then be identified and linked to intervention functions. Insight acquired from this process would allow further delivery implications more specifically, as this PhD has begun to achieve.

Utilisation of behaviour change theory within the evaluation of a Natural Health Service would also enable the intervention fidelity of outdoor interventions to be assessed, which was emphasised as important by sector leaders in Study 1. Behaviour change techniques already utilised within the delivery of a Natural Health Service could therefore be identified, as well as those which have been neglected, enabling the barriers of their implementation to be investigated further (Michie et al., 2011). Additional behaviour change techniques were utilised, which were not previously specified, could also be identified within the delivery protocol (Michie, Atkins & West, 2014). Intelligence gained from this process would ensure a level of intervention fidelity is gained, within outdoor interventions delivered within a Natural Health Service, encouraging quality of outdoor interventions to be maintained throughout all outdoor interventions being delivered, by

ensuring they are utilising behaviour change techniques found to encourage associated outcomes.

8.8. Researcher's Reflections

In review of the strengths, limitations and challenges associated with completing this PhD (section 8.6) and the recommendations for future evaluations (section 8.7), I (the researcher) have had the opportunity to reflect on my learning throughout. Firstly, I have gained much greater independence as a researcher, as I have progressed from the role of a Research Assistant to a PhD Researcher with the autonomy to make methodological decisions and justify them throughout the research process. Prior to this, my research experience mainly involved quantitative research, meaning that this predominantly qualitative PhD has enabled me to develop my confidence as a qualitative researcher. On a more personal note, I previously been extremely critical of my own work and found it challenging to respond constructively to mistakes. I have learned throughout this process that mistakes are an inevitable part of the research journey and can be learned from in a constructive way. If I was to complete this research again, I would prepare by allowing more time for unforeseen external events, which may impact on the research (e.g low participant recruitment onto sessions). I would also spend more time with facilitators, and participants, when possible, to inform the research process (e.g. agreeing questionnaire measures). I would also enlist the help of other interested students, to assist with the data collection, as I have gained a great deal of interest in this area since beginning this research. Student involvement in this PhD would therefore support the research as well as

the students' own research development. I hope this insight from my own experience may be useful to those wishing to embark on similar research projects.

8.9. Conclusion

This thesis provided a novel exploration of outdoor interventions to identify their definitions, and delivery, as well as examining their associated health and wellbeing outcomes and evaluation protocols to capture such outcomes, through a series of consecutive studies. Studies within this thesis enabled unique insight to be gained from a sector leader's perspective, to explore what they believe outdoor interventions *should* consist of (Study 1, Chapter 4) followed by the exploration of *what actually is* being delivered by current outdoor therapy facilitators (Study 2, Chapter 5) and how these findings influence the way in which outdoor interventions are experienced by those engaged in/delivering them (Study 3a, Chapter 6 and Study 3b, Chapter 7). Contrasting findings apparent in leader's knowledge of generic, inclusive and widely accessible outdoor interventions, currently being delivered, to their proposed targeted and tailored future delivery frameworks revealed a shift in policy to target the outdoor interventions at those more vulnerable groups (e.g. those with mental health conditions). The identification of groups already engaging and benefiting from outdoor interventions within this PhD (e.g. those experiencing low wellbeing or experiencing loss) provided an ideal target populations for future outdoor interventions and implications for effective recruitment strategies, through social prescribing and collaboration with health professionals. Furthermore, key delivery components, within outdoor interventions, identified as instrumental in encouraging engagement and positively influencing associated health and

wellbeing outcomes (e.g. skilled facilitators, appropriate settings, choice and autonomy afforded to participants regarding their engagement), were mapped onto behaviour change models and corresponding behaviour change techniques (Michie et al., 2011; Michie et al., 2005; Michie et al., 2011; Cane et al., 2012). Further utilisation of behaviour change techniques outlined, will therefore enable the continued development of a Natural Health Service, which recruits participants who would benefit most, engages them effectively within the outdoor interventions delivered and positively influences associated health and wellbeing outcomes, which can be sustained long-term. Future evaluation protocols should seek to collate rigorous and robust health and wellbeing outcomes, using validated questionnaire measures, while enabling the further identification of effective behaviour change techniques, within outdoor interventions, linked to their success. Greater transparency and more detailed descriptions, regarding the delivery of outdoor interventions, would also provide a shared language for funders, policy makers, researchers and those facilitating outdoor interventions and allow a clearer understanding of what works, for whom and how to implement these strategies within the future delivery of outdoor interventions.

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Appendices

Appendix 3.1.

Study 1 Sector Leaders Interview Schedule



Sector Leaders Interview Schedule

Introduction (5 minutes)

Thank you for taking part in this study.

I'm currently working on a PhD with Liverpool John Moores University and The Mersey Forest investigating the health benefits of outdoor interventions to inform the development of natural health services.

For this first stage of my PhD, I would like gain an understanding of outdoor interventions and associated health benefits from you, as a sector expert, from an outdoor, health, physical activity and therapy perspective.

This interview will therefore ask you for your opinions in terms of how you define outdoor interventions from an outdoor, health, physical activity and therapy perspective, what you believe the components of these interventions are and how these might improve people's health. I will then ask how you think these outdoor interventions should be designed to improve health and how they should be evaluated to capture these improvements.

There are no right or wrong answers as I am interested in your opinions surrounding these questions.

If you do not understand a question I have asked, please let me know so that I can repeat or rephrase it and you do not have to answer any questions you do not wish to.

These are the 4 main research questions which will be explored during this interview and will take approximately 10-15 minutes each to discuss. The interview should take around 50 minutes to an hour to complete. If you wish to take a break at any time, please let me know and we can stop.

Sometimes in interviews, such as this one, conversations can easily be steered off topic, which is completely normal. However, due to the limited amount of time we have to cover all the questions, I may ask you to come back to the discussion point if this happens so that we are able to cover all the questions I would like to ask you.

I will be recording our conversation on the Dictaphone.

Please refer to the Participant Information Sheets for further information about the study and sign the consent form if you are happy to participate. The study is completely voluntary, therefore you do not have to take part if you do not wish to and you may withdraw from the study at any time without having to give a reason why.

Research Questions	Main Question	Additional Questions/ Probes
<p>Introductory Question: I would like to start by asking about your professional and personal background in relation to the outdoors:</p> <ul style="list-style-type: none"> • What is your job title? • What does your role involve? • How would you describe your service? • Tell me more about your professional background and your history? • What personal interests do you have in relation to the outdoors? • How do you think the outdoors influences your own health? • What influence does the outdoors have upon your life in general? 		
<p>Firstly I am going to ask you some questions regarding the definitions of outdoor interventions from an outdoor, health, physical activity and therapy perspective...</p>		
<p>1. What is meant by outdoor interventions and how are they located with broader outdoor based theories and practices?</p> <p>(10-15 minutes)</p>	<p>I'd firstly like to ask you to tell me what you know about what outdoor interventions?</p> <p>Why do you think they are important?</p> <p>Can you give me an example of an outdoor intervention?</p> <p>In what ways are you familiar with the broad term 'outdoor therapy' and what do you think this includes?</p> <p>What is your understanding of outdoor interventions from an...</p> <ul style="list-style-type: none"> • Outdoor • Health • Physical Activity • Therapy <p>...perspective?</p> <p>How do those interventions translate to your own practice/ practice generally?</p> <p>How would you define/ understand outdoor interventions from an educational perspective?</p> <p>What should outdoor interventions include to meet the understandings described?</p> <ul style="list-style-type: none"> • Outdoor • Health • Physical Activity • Therapy <p>What are the aims or end goals of outdoor interventions from the following perspectives:</p> <ul style="list-style-type: none"> • Outdoor • Health • Physical Activity • Therapy 	<p>Do these definitions differ according to each perspective?</p> <p>Do any frameworks exist?</p> <p>Is there a criteria that they must follow?</p>

<p>You have just described outdoor interventions from an outdoors, health, physical activity and therapy perspective and how these definitions differ according to each viewpoint. So I am now going to ask some questions about what you think the components of outdoor interventions should be and how they improve health...</p>		
<p>2. What are the components of outdoor interventions and how these have perceived to / have improved people's health?</p> <p>(10-15 minutes)</p>	<p>What does the term 'health' mean to you? What does it imply/include? What does it mean to be healthy?</p>	
	<p>What does an outdoor intervention mean to you from the purpose of health?</p>	
	<p>What does (or should) taking part in these interventions involve?</p>	<p>What should a service user expect when attending outdoor interventions?</p> <p>What should be included within interventions?</p>
	<p>How do you think people's health is affected by taking part in these types of activities?</p>	<ul style="list-style-type: none"> • Health (health) <ul style="list-style-type: none"> ○ Fitness? • Wellbeing (mental health) <ul style="list-style-type: none"> ○ Therapeutic benefits?
	<p>Why are these benefits experienced? i.e. what are the therapeutic elements of outdoor interventions?</p>	<p>Processes of change?</p> <p>Therapy with big T/ little t (due to associated outcomes)?</p>
	<p>Are they a preventative or a treatment focused intervention?</p>	
	<p>Do affects experienced differ depending on type, setting, difficulty or duration of activity?</p>	<p>What role does nature play in this process?</p> <p>How important is this factor in improving health and wellbeing?</p>
<p>You have just discussed what you believe outdoor interventions should include to improve health. I would now like to ask how you think outdoor interventions should be designed and delivered in order for people to gain these associated health benefits...</p>		
<p>3. How should these outdoor interventions be designed and delivered to be effective at improving health?</p> <p>(10-15 minutes)</p>	<p>If there was a provision of a "Natural Health Service" what do you think this should include?</p>	
	<p>How do you think outdoor interventions should be designed to improve health?</p>	<p>Should this be informed by theoretical knowledge or in conjunction with relevant experts?</p> <p>If so, how?</p> <p>Should they be designed to meet the needs of service users?</p> <p>If so, how?</p>
	<p>How should outdoor interventions be delivered to improve health?</p>	<p>Are there any defining guidelines or frameworks?</p> <p>Are therapeutic approaches adopted within the service delivery?</p> <p>If so, please describe...</p> <p>How important is fidelity across services?</p>

		How should the changing needs of the service user influence the delivery of the service?
	Who should deliver these outdoor interventions for them to be effective at improving health?	<p>What professional competencies should practitioners delivering outdoor interventions hold?</p> <p>What personal characteristics are essential/ desirable in these services?</p> <p>How important is the practitioner's input and relationship with the service user in influencing health improvements?</p>
	We have talked about what characteristics that you believe the practitioners should have, but who do you think are the target population for these kinds of activities should be in terms of service users?	<p>Demographics?</p> <p>Health and wellbeing profiles?</p>
	What do you think the issues (challenges/barriers) in delivering outdoor interventions?	
<p>You have talked about outdoor interventions in terms of how they are defined, their components and how they improve people's health and how you think they should be designed and delivered in order to achieve this. This is the last part the interview and I would like ask now about how you think outdoor interventions should be evaluated to capture the associated health benefits we have discussed...</p>		
4.	If there was a provision of outdoor interventions, how should they be evaluated to assess changes in health?	If so, what are they?
	(10-15 minutes)	<p>How should services be evaluated to effectively assess associated health benefits?</p> <p>If there was a gold standard research protocol, what would this be? Or what would this include?</p> <p>What advice would you give to me, as a researcher, in order for me to prepare an appropriate evaluation protocol to assess health benefits of outdoor interventions?</p>
	What do you think the issues (challenges/barriers) in evaluating outdoor interventions?	
<p>Close: That is the end of all my questions. Thank you very much for participation. I really enjoyed our discussion.</p> <p>Are there any questions you would like to ask or is there anything you feel I have not covered during this discussion which you feel is important?</p> <p>If you would like any further information about the study, please feel free to ask me any questions or if you think of anything later you can contact me on my details given on the participant information sheet. Thank you again for your participation.</p>		

Appendix 3.2

Study 2 Facilitators Interview Schedule



Facilitators Interview Schedule

Introduction (5 minutes)

Thank you for taking part in this study.

I'm currently working on a PhD with Liverpool John Moores University and The Mersey Forest investigating the health benefits of outdoor interventions to inform the development of natural health services.

For this stage of my PhD, I would like to gain an understanding of outdoor interventions, in terms of their rationale, and their delivery from a therapy or therapeutic perspective from your own knowledge and experience as a facilitator.

This interview will therefore ask you for your opinions in terms of how you define outdoor interventions from a therapy or therapeutic perspective, what the components of your own interventions are and how they improve people's health. I will then ask you some questions around the design and the delivery of your interventions.

There are no right or wrong answers as I am interested in your opinions surrounding these questions.

If you do not understand a question I have asked, please let me know so that I can repeat or rephrase it and you do not have to answer any questions you do not wish to.

These are the 4 main research questions which will be explored during this interview and will take approximately 10-15 minutes each to discuss. The interview should take around 50 minutes to an hour to complete. If you wish to take a break at any time, please let me know and we can stop.

Sometimes in interviews, such as this one, conversations can easily be steered off topic, which is completely normal. However, due to the limited amount of time we have to cover all the questions, I may ask you to come back to the discussion point if this happens so that we are able to cover all the questions I would like to ask you.

I will be recording our conversation on the Dictaphone.

Please refer to the Participant Information Sheets for further information about the study and sign the consent form if you are happy to participate. The study is completely voluntary, therefore you do not have to take part if you do not wish to and you may withdraw from the study at any time without having to give a reason why.

Research Questions	Main Question	Additional Questions/ Probes
Introductory Question: I would like to start by asking about your professional and personal background in relation to the outdoors:		
<ul style="list-style-type: none"> • What is your job title? • What does your role involve? • How would you describe your service? • Tell me more about your professional background and your history? • What personal interests do you have in relation to the outdoors? • How do you think the outdoors influences your own health? • What influence does the outdoors have upon your life in general? 		
Firstly I am going to ask you some questions regarding the definitions of outdoor interventions from a therapy perspective...		
5. What is meant by outdoor interventions and how are they located with broader outdoor based theories and practices? (10-15 minutes)	I'd firstly like to ask you to tell me what you know about what outdoor interventions?	
	In what ways are you familiar with outdoor interventions from a therapy/therapeutic perspective?	
	Why do you think they are important?	
	What terms are used across this area of work?	
	How do you understand these terms?	
	In what ways are you familiar with the term 'outdoor therapy', 'adventure therapy' or 'nature therapy'?	<p>What do you think this includes?</p> <p>What does the term 'outdoor therapy' mean to you?</p> <p>What does the term 'adventure therapy' mean to you?</p> <p>What does the term 'nature therapy' mean to you?</p> <p>Do you use these terms?</p>
	What other terms can you describe?	
	How do you use these terms?	Tell me about the interventions you deliver?
	What do your outdoor therapy/therapeutic interventions include?	<p>Are they informed by guidance?</p> <p>Do they follow any given criteria?</p>
	What are the aims or end goals of your outdoor therapy/therapeutic interventions?	
You have just described your outdoor therapy/therapeutic interventions. So I am now going to ask some questions about their components and their associated therapeutic benefits...		

6.	What are the components of outdoor interventions and how these have perceived to / have improved people's health? (10-15 minutes)	What does taking part in these interventions involve?	What should a service user expect when attending outdoor interventions? What is included within interventions?
		How are people affected by taking part in these activities?	What are the associated outcomes? <ul style="list-style-type: none"> • Health benefits? • Psychological benefits? • Social benefits? • Economic benefits? Are there any barriers/ negative outcomes? If so, what are they?
		Why are these benefits experienced?	What are the therapeutic elements of outdoor interventions? Processes of change? Therapy with big T/ little t (due to associated outcomes)?
		Are your services preventative, treatment or adjunctive treatment interventions?	
		Do affects experienced differ depending on type, setting, difficulty or duration of activity?	What role does nature play in this process? How important is this factor in facilitating therapeutic change?
		What else could outdoor therapy/therapeutic interventions be used for?	
		You have just discussed what your outdoor interventions include and how they have therapeutic-health benefits. I would now like to ask you some questions surrounding the design and the delivery of these interventions...	
7.	How are outdoor interventions designed and delivered to be have these benefits? (10-15 minutes)	How has your service been designed to have these benefits?	Is this informed by theoretical knowledge or in conjunction with relevant experts? If so, how? Is it designed to meet the needs of service users? If so, how?
		How are your outdoor interventions delivered to have these benefits?	Do you follow any defining guidelines or frameworks? Are therapeutic approaches adopted within the service delivery? If so, please describe...

		<p>How important is fidelity across your services?</p> <p>How do the changing needs of the service user influence the delivery of the service?</p>	
	Who delivers these outdoor interventions?	<p>What professional competencies do you hold, which enable you to deliver these interventions?</p> <p>What personal characteristics do you hold, which you feel are needed in delivering your services?</p> <p>What input do you have with the service user in influencing therapeutic change?</p>	
	We have talked about your characteristics as a service provider, but who are the target population for these kinds of activities in terms of service users?	<p>What are the current demographics of those engaged on your services?</p> <p>What are the health and wellbeing profiles of those attending services?</p> <p>Who do you target?</p>	
	How do you receive referrals or recruit service users?		
	How do service users perceive outdoor therapy/therapeutic interventions?	Are there any challenges/barriers they experience?	
	What are the issues (challenges/barriers) in delivering your interventions?		
8.	If there was a provision of a "Natural Health Service" what do you think this should include?	<p>What must be considered in designing a Natural Health Service?</p> <p>How should it be designed?</p> <p>What should it provide?</p> <p>What should its main principles include?</p>	
<p>You have talked about outdoor interventions in terms of how they are defined, their components and how they influence therapeutic-health change and how they are designed and delivered in order to achieve this. This is the last part the interview and I would like ask now about how your outdoor interventions are currently or should be evaluated to capture the associated benefits we have discussed...</p>			
9.	If there was a provision of outdoor interventions, how should they be evaluated to assess the	What evaluation frameworks currently exist to assess the associated benefits of your outdoor interventions?	
		How are or should services be evaluated to effectively	

associated therapeutic-health benefits? (10-15 minutes)	assess associated benefits?	
	What are the issues (challenges/barriers) in evaluating outdoor interventions?	
Final Questions	Do you have any counselling/therapy qualifications? What are they? How are they accredited? Are they accredited by a professional body?	
	Do you have any outdoor qualifications? What are they? Are they accredited by a professional body?	
	Do you have any other qualifications/ training related to your role?	
<p>Close: That is the end of all my questions. Thank you very much for participation. I really enjoyed our discussion.</p> <p>Are there any questions you would like to ask or is there anything you feel I have not covered during this discussion which you feel is important?</p> <p>If you would like any further information about the study, please feel free to ask me any questions or if you think of anything later you can contact me on my details given on the participant information sheet. Thank you again for your participation.</p>		

Appendix 3.3.

Study 3b Interview Schedule for Participants



Participants Interview Schedule

Introduction (5 minutes)

Thank you for taking part in this study.

I'm currently working on a PhD with Liverpool John Moores University and The Mersey Forest investigating the health benefits of outdoor interventions to inform the development of natural health services.

I would like to gain an understanding of how the Nature4Health programme...

1. May or may not have impacted on your health and wellbeing (exploring impact further)
2. What elements of the programme were helpful or unhelpful in this process (therapeutic elements) and when these changes occurred (process of change)
3. Whether changes have been sustained

This interview will therefore ask you for your thoughts and feelings about the programme and how it has affected you. So there are no right or wrong answers.

If you do not understand a question I have asked, please let me know so that I can repeat or rephrase it and you do not have to answer any questions you do not wish to.

The interview should take around an hour to complete. If you wish to take a break at any time, please let me know and we can stop.

Sometimes in interviews, such as this one, conversations can easily be steered off topic, which is completely normal. However, due to the limited amount of time we have to cover all the questions, I may ask you to come back to the discussion point if this happens so that we are able to cover all the questions I would like to ask you.

Everything you say in this interview will be anonymised. However, if you do disclose information during the interview that makes me think you may be in danger of harming yourself or others, I may need to disclose this information to others so I can get you the necessary support. I will be recording our conversation on the Dictaphone.

For one part of the interview, you may wish to make some notes, so you may like to have a pen and paper handy.

Please refer to the Participant Information Sheets for further information about the study. The study is completely voluntary, therefore you do not have to take part if you do not wish to and you may withdraw from the study at any time without having to give a reason why. Your results will also remain confidential.

Introductory questions	
I am firstly just going to ask you a few introductory questions...	
Which programme did you attend?	
When was this?	Did you attend all sessions? Did you miss any sessions? If so, why?
Where was the programme held?	
What made you decide you would like to take part in the programme?	
What do you about the activities you have taken part in?	What activities have you liked the most? What activities have you liked the least?
1. Exploring impact further...	
I am now going to ask you some questions about how you think the programme impacted on your health and wellbeing and I will then be asking some you some further questions about some of the scores on the questionnaires you completed...	
What did you hope to gain from the programme?	
What have you gained that you expected from the programme?	Physically? Psychologically? Socially?
What have you gained that you didn't expect from the programme?	Physically? Psychologically? Socially?
What haven't you gained, which you may have expected to gain?	
Has attending the programme affected your day to day life in any way?	If yes, in what ways... Physically? Psychologically? Socially?
Questionnaire Measures	
Short Form 36 version 2 (SF36v2)	
We measured your functional health and wellbeing, this includes,	
<ul style="list-style-type: none"> • physical functioning • work function • bodily pain • general health • vitality (energy or fatigue) • social functioning • limitations in work due to emotions • mental health 	
We noticed your ratings <u>improved</u> on..... from week 1-12	
We noticed your ratings <u>stayed the same</u> on...from week 1-12	
We noticed your ratings <u>decreased</u> on..... from week 1-12	

- Can you tell me any more about any of these?
- Can you tell me how you understand that/ what does that mean to you?
- What did this mean to you before you started the programme?
- Do you know why that might have happened?
- Do you feel that you have/ can you tell me what your experience is in relation to this?
- How significant was this?
- When do you think these changes occurred?
 - Were there any particular incidents?
- Is there anything else which may explain these changes/lack of changes?
- How much of this do you ascertain to the programme and how much are due to other life events?

Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS)

We measured your functional health and wellbeing. Put simply, this is feeling good and functioning well. We noticed your ratings improved/ stayed the same/ decreased from week 1-12.

- Can you tell me any more about this?
- Can you tell me how you understand that/ what does that mean to you?
- What did this mean to you before you started the programme?
- Do you know why that might have happened?
- Do you feel that you have/ can you tell me what your experience is in relation to this?
- How significant was this?
- When do you think these changes occurred?
 - Were there any particular incidents?
- Is there anything else which may explain these changes/lack of changes?
- How much of this do you ascertain to the programme and how much are due to other life events?

Profile of Mood States (POMS)

We measured moods, which includes

- Tension
- Depression
- Fatigue
- Vigour
- Confusion
- Anger
- Esteem-related affect/ self-esteem

We noticed your ratings improved on...from week 1-12

We noticed your ratings stayed the same on...from week 1-12

We noticed your ratings decreased on..... from week 1-12

- Can you tell me any more about any of these?
- Can you tell me how you understand that/ what does that mean to you?
- What did this mean to you before you started the programme?
- Do you know why that might have happened?
- Do you feel that you have/ can you tell me what your experience is in relation to this?

<ul style="list-style-type: none"> • How significant was this? • When do you think these changes occurred? <ul style="list-style-type: none"> ○ Were there any particular incidents? • Is there anything else which may explain these changes/lack of changes? • How much of this do you ascertain to the programme and how much are due to other life events? 	
Rosenberg Self-Esteem Scale (RSES) We measured your functional health and wellbeing. We noticed your ratings <u>improved/ stayed the same/ decreased</u> from week 1-12.	
<ul style="list-style-type: none"> • Can you tell me any more about this? • Can you tell me how you understand that/ what does that mean to you? • What did this mean to you before you started the programme? • Do you know why that might have happened? • Do you feel that you have/ can you tell me what your experience is in relation to this? • How significant was this? • When do you think these changes occurred? <ul style="list-style-type: none"> ○ Were there any particular incidents? • Is there anything else which may explain these changes/lack of changes? • How much of this do you ascertain to the programme and how much are due to other life events? 	
Have you any other comments you would like to make about the programme and how it has affected you?	
2. Exploring key delivery components of programmes	
Of the events which occurred on the programme, which one do you feel was the most helpful/important for you personally?	
Please describe what made this event helpful/important and what you got out of it?	
Is there anything within those that was particularly helpful?	
Did anything else happen during the programme which was not helpful?	
3. Have benefits/health behaviours been sustained?	
For this final section of the interview, I would like to ask about whether you think that the programme will have a lasting impact and whether you see this continuing in the future...	
Have the changes we discussed been maintained to now?	<ul style="list-style-type: none"> • Which ones? • Why?
How do you see these been maintained in the future?	Are there any barriers to maintaining them?
Is there any support you would like to be put into place to help you maintain any changes made?	If so... <ul style="list-style-type: none"> • What would this involve? • Why would you benefit from this/what would this mean to you?
If possible, would you like to continue with the programme?	
Would you like to do something similar? E.g. exercise, the outdoors	
Has anything changed in your behaviour since completing the programme?	<ul style="list-style-type: none"> • Have you put anything in place? (e.g. joined groups/ volunteered?)

	<ul style="list-style-type: none"> Do you do anything different? (e.g. exercise, visit the outdoors)
Has the programme motivated you to do other things?	<ul style="list-style-type: none"> Now or in the future? If so, what?
Would you be happy for me to send you a follow-up questionnaire to see how things are in 3 months' time?	
Closing questions	
Is there anything you think could be done to improve the programme?	If so, what?
Is there anything you think I have not covered that you think might be important?	
How do you feel about the interview you have just taken part in?	
Interviews such as this can sometimes have potential to cause distress. Were there any questions that caused you any distress or that you felt negatively about?	
I have a range of contacts I can signpost you to if you would like to talk about anything that may have had a negative impact on you, would you be interested in any of these?	
If not, you can always contact me afterwards if you change your mind and I can signpost you to any support you may wish to access	
Would you be happy to send you some of the preliminary results of this interview for you to check how accurate this is?	If so, how would you like to receive this? Post/email?

Close

That is the end of all my questions. Thank you very much for participation.

I really enjoyed our discussion. Is there anything you would like to ask?

If you would like any further information about the study, please feel free to ask me any questions or if you think of anything later you can contact me on my details given on the participant information sheet.

Your results will remain confidential.

Thank you again for your participation.

Appendix 3.4.

Study 3b Interview Schedule for Facilitators



Facilitators Interview Schedule

Introduction (5 minutes)

Thank you for taking part in this study.

I'm currently working on a PhD with Liverpool John Moores University and The Mersey Forest investigating the health benefits of outdoor interventions to inform the development of natural health services.

I would like to gain an understanding of ...

4. Your experience of delivering the Nature4Health programme
5. What outcomes you perceive participants to have gained (exploring impact further)
6. What elements of the programme were helpful or unhelpful (therapeutic elements) in facilitating change and when participants might have/not gained these outcomes and whether you considered adapting services at any point
7. Whether you think changes have been/will be sustained and whether you've put anything in place to support this

This interview will therefore ask you for your own experience of delivering the programme, so there are no right or wrong answers.

If you do not understand a question I have asked, please let me know so that I can repeat or rephrase it and you do not have to answer any questions you do not wish to.

The interview should take around an hour to complete. If you wish to take a break at any time, please let me know and we can stop.

Sometimes in interviews, such as this one, conversations can easily be steered off topic, which is completely normal. However, due to the limited amount of time we have to cover all the questions, I may ask you to come back to the discussion point if this happens so that we are able to cover all the questions I would like to ask you.

Please refer to the Participant Information Sheets for further information about the study. The study is completely voluntary, therefore you do not have to take part if you do not wish to and you may withdraw from the study at any time without having to give a reason why. Your results will also remain confidential.

Introductory questions	
Firstly, I'd like to ask you some introductory questions...	
Which programme did you deliver?	
When was this?	
Where was the programme held?	
2. Experience of delivering the Nature4Health programmes	
I'd now like to ask you some questions about your experience of delivering the Nature4Health programme...	
What made you decide you would like to deliver the programme?	Have you had previous experience in delivering this programme/similar programmes?
What did you personally hope to gain from delivering the programme?	
What did you think about the programmes you delivered?	What was your own experience of this as a facilitator?
What elements of delivering the programme did you like the most?	
What elements of delivering the programme did you like the least?	
3. Exploring impact further...	
I would like to ask some questions surrounding the impact of the programme upon the participants...	
What feedback have you received from participants in relation to your programme?	
What did you expect participants to gain from taking part in the programme?	Was this the case?
Are you aware of any changes (either positive or negative) to clients as a result of attending the programme?	Physically? Psychologically? Socially?
What have participants gained that you didn't expect from the programme?	Physically? Psychologically? Socially?
What haven't participants gained, which you may have expected them to gain?	
Was the programme well attended?	
Were there any barriers/motivations for participants attending the programme?	<ul style="list-style-type: none"> • What were they? • How do you think any barriers could be overcome?
Questionnaire Measures	
Short Form 36 version 2 (SF36v2)	
We measured participants' functional health and wellbeing from week 1 to 12. This includes physical functioning, work function, bodily pain, general health, vitality (energy or fatigue), social functioning, limitations in work due to emotions and mental health.	

- Did you notice any changes in participants in relation to any of these?
 - Were there any particular participants?
- Can you tell me how you understand that/ what does that mean to you?
- How significant do you think this was?
- When do you think these changes occurred?
 - Were there any particular incidents?
- Do you know why this might have happened?
- Is there anything else which may explain these changes/lack of changes in participants?
- How much of this do you ascertain to the programme and how much are due to other life events of participants?

Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS)

We measured participants' mental wellbeing from week 1 to 12. Put simply, this is feeling good and functioning well.

- Did you notice any changes in participants in relation to any of these?
 - Were there any particular participants?
- Can you tell me how you understand that/ what does that mean to you?
- How significant do you think this was?
- When do you think these changes occurred?
 - Were there any particular incidents?
- Do you know why this might have happened?
- Is there anything else which may explain these changes/lack of changes in participants?
- How much of this do you ascertain to the programme and how much are due to other life events of participants?

Profile of Mood States (POMS)

We measured participants' moods from week 1 to 12. This includes tension, depression, fatigue, vigour, confusion, anger and esteem-related affect/ self-esteem.

- Did you notice any changes in participants in relation to any of these?
 - Were there any particular participants?
- Can you tell me how you understand that/ what does that mean to you?
- How significant do you think this was?
- When do you think these changes occurred?
 - Were there any particular incidents?
- Do you know why this might have happened?
- Is there anything else which may explain these changes/lack of changes in participants?
- How much of this do you ascertain to the programme and how much are due to other life events of participants?

Rosenberg Self-Esteem Scale (RSES)

We measured participants' self-esteem from week 1 to 12.

- Did you notice any changes in participants in relation to any of these?
 - Were there any particular participants?
- Can you tell me how you understand that/ what does that mean to you?
- How significant do you think this was?
- When do you think these changes occurred?

<ul style="list-style-type: none"> ○ Were there any particular incidents? ● Do you know why this might have happened? ● Is there anything else which may explain these changes/lack of changes in participants? ● How much of this do you ascertain to the programme and how much are due to other life events of participants? 	
Have you any other comments you would like to make about the programme and how it has affected participants?	
4. Exploring therapeutic elements of programmes and process of change	
Of the events which occurred on the programme, which one do you feel was the most helpful/important for participants?	
Please describe what made this event helpful/important and what you think they got out of it?	
How helpful was this particular event?	
Did you notice any significant time points where you noticed any positive or negative changes in participants?	<ul style="list-style-type: none"> ● If so, when was this? ● Did you consider making any changes?
Did you feel at any time point that participants were not responding/ receiving the benefits of the programme?	<ul style="list-style-type: none"> ● If so, when was this? ● Did you consider making any changes?
Did anything else particularly helpful happen during this programme?	
Did anything else happen during the programme which may not have been helpful?	<ul style="list-style-type: none"> ● Please can you describe this event?
5. Have benefits/health behaviours been sustained...	
For this final section, I would like to ask some questions about whether you think participants are likely to sustain the impact of programmes we discussed and maintain health behaviours...	
Do you think that the changes we discussed in participants will have been maintained to now?	<ul style="list-style-type: none"> ● Which ones? ● Why?
How do you see these been maintained in the future?	Are there any barriers to maintaining them?
Do you think anything changed/will change in participant's behaviour since completing the programme?	<ul style="list-style-type: none"> ● Do you think that the programme has motivated them to do other things now or in the future? ● If so, what?
Do you think that participants need support in maintaining these health and wellbeing and behaviour changes?	<p>If so...</p> <ul style="list-style-type: none"> ● What would this involve? ● Why would participants benefit from this/what would this mean to them?
Have you put anything in place for participants for when they leave the programme? E.g. signposting to similar programmes?	<p>If so...</p> <ul style="list-style-type: none"> ● What does involve? ● Do participants benefit from this/what does this mean to them?

Closing questions	
Is there anything you think could be done to improve the programme?	If yes, what?
Is there any way in which you think your delivery of the programme could be improved?	
Is there anything you think I have not covered that you think might be important?	Are there any other comments you would like to make about your service/ Nature4Health programme?

Close

That is the end of all my questions. Thank you very much for participation. I really enjoyed our discussion. Is there anything you would like to ask?

If you would like any further information about the study, please feel free to ask me any questions or if you think of anything later you can contact me on my details given on the participant information sheet.

Your results will remain confidential.

Thank you again for your participation.

Appendix 3.5
Thematic Analysis Process

Appendix 3.5

Thematic Analysis Process

Phase 1: Familiarization with the Data

The TA process commenced with the researcher reading and re-reading the interview transcripts and noting initial ideas on hard copies of the transcripts. This immersion in the data allowed the familiarisation with the data set while also highlighting aspects relevant to the research questions. During this process, conceptual ideas surrounding the data were observed and more concrete and specific issues were noted. While these initial notes enriched the analysis process, they also reflect the researchers own positionality and what this brings to the data analysis. For this reason, the researcher was cautious of using these initial notes as the main foundation of developing the analysis, as they were not yet based in the systematic engagement of the data. Instead, items noted during this stage were argued to be the items which were most obvious or those that were prominent to the researcher (Braun & Clarke, 2013).

Phase 2: Generation of Initial Codes

This process involved using NVivo 10 software to code interesting features and seeking patterns systematically across the whole data set and collecting data relevant to each code followed. The researcher used a method of ‘complete coding’ to identify anything and everything of interest to answering the research questions. Codes during this phase provided a label for a feature of the data potentially relevant to answering the research questions. Codes were, therefore, a word or a brief phrase capturing the essence of why a particular part of data may be useful (Braun & Clarke, 2013). The codes were data-derived semantic codes during this phase, providing a succinct summary of the explicit content of the data, without interpretation of the data during this phase. This was completed in an inclusive manner, coding everything relevant to addressing the research questions.

Phase 3: Searching for Themes

Codes from phase 2 were then organised into relevant themes. Themes were domain summaries or fully realised themes. Whereas domain summaries are a summary or an overview of what participants have said in relation to the research questions and as a very surface level data, these are not fully worked up themes and require deeper analysis, argued as vital in gaining actionable outcomes (Psych.auckland.ac.nz, 2020). Themes were firstly analysed in this way. A deeper analysis followed, whereby fully realised themes were uncovered by asking what the theme really meant, what was underpinning the concrete themes and explaining large portions of the data.

Phase 4: Reviewing Themes

Themes developed in phase 3 were checked for relevance to the coded extracts and entire data set. This firstly involved reviewing coded data to ensure each theme worked in relation to the codes given. This also enabled the researcher to check whether anything had been missed during this phase. Themes were reoriented and coded data were repositioned around various themes until there was an apparent fit. Themes were collapsed during this phase into one theme or split into separate themes (Braun & Clarke, 2013). The entire uncoded data set was then revisited and reread to ensure that the themes captured the meaning of the data set in relation to the research question. This phase ended with a set of distinctive, coherent themes which fit together telling an overall story about the data, a thematic ‘map’ of the analysis was then created to illustrate findings. A thematic map was then presented for Study 1, Study 2 and Study 3b.

Phase 5: Defining and Naming Themes

Analysis continued to refine each theme, and the overall story of the analysis, aiming to create clear definitions for each theme (Braun & Clarke, 2013). Clear definitions and names for each theme were created. Meetings were followed by the researcher where themes were questioned and challenged by the supervisory team, which encouraged and the researcher considered alternative perspectives in relation to themes and amended findings accordingly.

Phase 6: Producing the Report

The analysis was finalised, and examples of interview extracts were provided within the results of each study. Reviews and amends were made to the written-up report until the researcher and the supervisory team were satisfied.

Appendix 3.6

Table of Outdoor Interventions

The Mersey Forest's Nature4Health Outdoor Interventions									
*Each lasting 2 hours in length *All sessions delivered 1 x weekly *All sessions running for 12 weeks in total									
Outdoor Intervention	Facilitator	Settings	Participant Demographics	Group Size	Time of Year Delivered	Time of Sessions	Description of Sessions and Key Delivery Components	BCTs in Taxonomy V1	Intervention Functions
1. Nordic Walking	Community Engagement Officer with British Nordic Walking Leaders Qualification and Forest School Leader Qualification with experience in community engagement events and delivering nature-based interventions .	Park offering sporting activities and regular community events. Areas of the park promote native flora and fauna, three ponds, grassland and small woodland areas. Located near the local leisure centre.	Age ranges from 43-65 Male and Female In education, employed, unemployed or retired Health conditions listed included arthritis, high blood pressure, previous cancer diagnosis	8	March-May 2016	Weekday Mornings	The Nordic Walking sessions were advertised as varied ability, open to all and suitable for those with medical conditions with permission from their GP. Information was provided at chemists at point of prescription, libraries, local community centres, churches and shopping malls. The Nordic Walks began with a warm-up exercise, demonstration of the Nordic Walking technique to then walking through footpaths throughout the park with shorter distances in the initial sessions gradually increasing them longer walks. Each walk ended with optional refreshments in the local café.	<ul style="list-style-type: none"> • Social Support • Instruction on how to perform the behaviour • Demonstration of the behaviour • Graded tasks 	<ul style="list-style-type: none"> • Training • Enablement
2. Health Walks	Project Community	A modern park on a	Age ranges from 55-63	12	April-June 2016	Weekday Mornings	Health walks aimed at those defined as physically inactive.	<ul style="list-style-type: none"> • Goal setting • Graded tasks 	<ul style="list-style-type: none"> • Enablement

	Engagement Officer working within the voluntary sector promoting the relationship between people's environment and their physical and mental health.	historic site with grasslands and hills with views of the city and canal towpaths. Accessible to the community via public transport as well as parking facilities.	Male and female All unemployed or retired Health conditions listed included depression, anxiety or bipolar disorder				Walks began were adapted to suit the health needs of participants with shorter walks within initial sessions with gradual increases in distance covered.	<ul style="list-style-type: none"> • Social Support 	
3. Men's Health Walks	Health Promotion Officer with experience and expertise in promoting men's mental health with experience in promoting physical activity to men with physical and mental health conditions.	A historic park and Grade II listed Mansion House with wild flower meadows and footpaths through ancient woodlands. Has sheltered meeting spaces and cafes within the park. Accessible to the community via public transport as well as parking facilities.	Age ranges from 43-70 All male All unemployed or retired Health conditions listed included arthritis, type 2 diabetes, mobility problems, anxiety and depression	16	June-August 2016	Weekday Mornings	Aimed to support isolated males within the local community. The health walks were captured and documented through and associated photography project which also involved aspects of creative writing, motivational/aspirational life planning and promoting active minds and active bodies. All the work produced by the group showed their personal approach to their positive lifestyle choices. An online space was produced to promote the journey, their progression and the creativity from the work produced around the weekly activities. Choices were provided in routes taken with options for the men to remain at the community centre if they did	<ul style="list-style-type: none"> • Goal setting • Graded tasks • Problem solving • Social Support • Verbal persuasion on capability • Focus on past success 	<ul style="list-style-type: none"> • Enablement • Environmental Restructuring

							not feel able to engage in the walk.		
4. Therapeutic Gardening (Horticultural Therapy)	See Outdoor Intervention 2	See Outdoor Intervention 2	Age ranges from 36-72 Male and female All unemployed Health conditions listed, anxiety, depression, schizophrenia and bipolar disorder	8	June-August 2016	Weekday Afternoons	Horticultural therapy aimed at participants who were experiencing mental health conditions. Activities included building raised planting beds out of pallets, grow herbs and flowers, tidy shrubs, prune trees and clear the pond.	<ul style="list-style-type: none"> • Instruction on how to perform the behaviour • Demonstration of the behaviour • Social support • Focus on past success 	<ul style="list-style-type: none"> • Education • Training
5. Natures Therapy (Horticultural Therapy)	Project Manager for voluntary sector organisation specialising in environmental project development , projects management with an interest in the health benefits of greenspace, community engagement and horticultural therapy.	500 acre country park offering woodland, pastures, ponds and streams and nature trails. Surrounded by woodland, grazing livestock and traditional cottages. Facilities include outdoor gym equipment and indoor meeting places. Accessible	Age ranges from 35-72 Male and female Working, unemployed or retired Health conditions listed included chronic fatigue syndrome, mobility problems, anxiety and stress related illness	12	July-September 2016	Weekday Mornings	Horticultural therapy sessions aimed at participants with mental or health conditions. Participants met and made a hot drink on the camp fire and completed gardening and conservation tasks. Participants also completed crafting and cooking activities using natural materials found. Participants were given a choice in which activity they wanted to complete and the opportunity to take breaks by themselves if they felt unable to participate in group tasks.	<ul style="list-style-type: none"> • Instruction on how to perform the behaviour • Demonstration of the behaviour • Social support • Focus on past success • Problem solving • Restructuring the social environment 	<ul style="list-style-type: none"> • Training • Enablement

		and close to the city centre. Awarded Green Flag status in 2007, 2008 and 2009/10.							
6. Horticultural Therapy	Project Manager for Drug and Alcohol Charity with interest and experience in delivering allotment projects to improve health and wellbeing.	Allotment within a housing estate with a three poly tunnels and sheltered spaces and facilities to make hot drinks.	Age ranges from 35-57 Male and female Working or unemployed Health conditions listed included visual impairments, addiction to drugs and alcohol and anxiety and depression	9	October-December 2017	Weekday Mornings	Horticultural therapy aimed at those identified as being in social need, in recovery from substance misuse, suffering anxiety, depression or dual diagnosis. Participants learned how to grow and maintain organic products, plants and poultry. The sessions were also supported by themes of healthy eating, recycling, producing jams, honey and making hanging baskets. A celebration BBQ at the end also offered a social event that encouraged wider community involvement.	<ul style="list-style-type: none"> • Instruction on how to perform the behaviour • Demonstration of the behaviour • Social support • Focus on past success 	<ul style="list-style-type: none"> • Training • Education
7. Health Walks	Project Officer working for national charity encouraging access and engagement to nature for health and wellbeing outcomes.	Park surrounded by ancient woodlands, botanical gardens, ornamental gardens, a lake and a café. Accessible via public transport and has car parking facilities.	Age ranges from 30-55 Male and female Working or retired No health conditions listed	10	October-December 2017	Sunday Mornings	A family intervention with an initial meeting and a children's story book followed by a walk around the surrounding park where participants were given the opportunity to learn about their natural surroundings and animal habitats and complete sensory activities. Each session ended with refreshments within an indoor meeting area.	<ul style="list-style-type: none"> • Graded tasks • Social Support • Verbal persuasion on capability 	<ul style="list-style-type: none"> • Education

8. Green Allotments (Horticultural Therapy)	Managing Director of community engagement charity working to involve the community in allotment projects.	Allotment attached to a local community centre with a large poly tunnel and outdoor seating, close to the community centre which was used as a meeting point.	Age ranges from 36-66 Male and female Unemployed, retired or carers Health conditions listed included asthma, arthritis, epilepsy and depression	12	February-April 2017	Weekday Mornings	Horticultural therapy aimed at adults, with mild to moderate mental illnesses, with a choice of activities. Participants met at a local community centre for refreshments before commencing activities. Activities included learning how to plant and harvest fruit and vegetables, as well as how to create habitat suitable for insects, birds and wildlife, e.g. bug mansion and bird boxes.	<ul style="list-style-type: none"> • Instruction on how to perform the behaviour • Demonstration of the behaviour • Social support • Focus on past success • Problem solving • Restructuring the social environment 	<ul style="list-style-type: none"> • Education • Training
9. Green Gyms (Conservation Volunteering)	TCV Green Gyms Leader with experience and expertise in engaging volunteers in conservation volunteering with a particular interest in mental health outcomes associated.	Oak woodland surrounded by heathland with footpaths and grasslands and a car park and visitors centre.	Age ranges from 25-68 Male and female Unemployed or retired Health conditions listed included high blood pressure, arthritis, anxiety and depression	7		Weekday Mornings	Participants met at a local visitors centre and completed an initial warm up. Activities included tree planting, pond maintenance, wildflower planting and creating habitats for wildlife. Each session was broken up with food, refreshments, and time for the group to socialise.	<ul style="list-style-type: none"> • Instruction on how to perform the behaviour • Demonstration of the behaviour • Social support 	<ul style="list-style-type: none"> • Education • Training
10. Nordic Walking	See Outdoor Intervention 2	See Outdoor Intervention 5	Age ranges from 49-72 Male and female	11	February-April 2017	Weekday Afternoons	See Outdoor Intervention 1	<ul style="list-style-type: none"> • Social Support • Instruction on how to perform the behaviour 	<ul style="list-style-type: none"> • Training • Enablement

			Working, unemployed or retired Health conditions listed included arthritis, underactive thyroid, Asperger's syndrome, anxiety and depression					<ul style="list-style-type: none"> • Demonstration of the behaviour • Graded tasks 	
11. Health Walks	See Outdoor Intervention 2	See Outdoor Intervention 5	Age ranges from 38-61 Male and female Working, unemployed or retired Health conditions listed included angina, high blood pressure, cardiomyopathy , anxiety and depression	8	February-April 2017	Weekday Mornings	See Outdoor Intervention 2	<ul style="list-style-type: none"> • Graded tasks • Social Support • Verbal persuasion on capability 	<ul style="list-style-type: none"> • Training • Enablement
12. Therapeutic Gardening	See Outdoor Intervention 2	See Outdoor Intervention 5	Age ranges from 27- 62 Male and female Working or unemployed	10	February-May 2017	Weekday Mornings	See Outdoor Intervention 4	<ul style="list-style-type: none"> • Instruction on how to perform the behaviour • Demonstration of the behaviour • Social support 	<ul style="list-style-type: none"> • Education • Enablement

			Health conditions listed included fibromyalgia, back problems, mobility problems, anxiety and depression					<ul style="list-style-type: none"> • Focus on past success • Problem solving • Restructuring the social environment 	
13. Health Walks	See Outdoor Intervention 7	See Outdoor Intervention 7	Age ranges from 33-41 Male and female All working full-time No health conditions listed	16	February-May 2017	Weekday Mornings	See Outdoor Intervention 7	<ul style="list-style-type: none"> • Graded tasks • Social Support • Verbal persuasion on capability 	<ul style="list-style-type: none"> • Training
<p>External Providers of Outdoor Interventions</p> <p>*Each lasting 2 hours in length</p> <p>*All sessions delivered 1 x weekly</p> <p>*All sessions provided continuously</p>									
Outdoor Intervention	Facilitator	Settings	Participant Demographics	Group Size	Time of Year Delivered	Time of Sessions	Description of Sessions and Key Delivery Components	BCTs in Taxonomy V1	Intervention Functions
14. Nordic Walking	Community Project Volunteer with British Nordic Walking Leadership Qualification and experience in leading Nordic	Group meets at community centre and walks within rural accessible footpaths through fields, woodlands and residential areas.	Age ranges from 64- 77 Male and female All retired Health conditions listed included arthritis, cardiomyopathy	16	Research collected March-May 2017	Weekday Afternoons	Nordic Walking scheme where participants meet at a local community centre for refreshments before completing a walk of their choice. A short walk, which takes at least 30 minutes, and a longer walk lasting up to 90 minutes led by Nordic Walking Leaders. Walks are completed along surrounding accessible footpaths.	<ul style="list-style-type: none"> • Social Support • Instruction on how to perform the behaviour • Demonstration of the behaviour • Graded tasks 	<ul style="list-style-type: none"> • Training • Enablement

	walking groups in the local community.		, type 2 diabetes and mobility problems						
15. Health Walks	Ranger for local council with experience in leading health walk interventions and conservation volunteering within local greenspaces in the community.	A park covering 220 acres of land and includes meadow, woodland and pond habitats, set amongst a network of footpaths with a visitors centre for people to meet up and have refreshments.	Age ranges from 42-78 Male and female Unemployed or retired Health conditions listed included previous heart conditions, angina, arthritis, COPD, type 2 diabetes and depression	10	Research collected March-May 2017	Weekday Mornings	Participants meet at an indoor meeting area and walk approximately 3-4 miles around footpaths and woodland areas with options to complete longer duration and distance walks if participants feel able.	<ul style="list-style-type: none"> • Graded tasks • Social Support • Verbal persuasion on capability • Problem solving 	<ul style="list-style-type: none"> • Enablement
16. Green Volunteers (Conservation Volunteering)	See Outdoor Intervention 15	Playground and Cycleway for walking, cycling and conservation clubs with accessible routes. Includes wildflower, wetland and woodland habitats. An environmental centre forms an indoor meeting area.	Age ranges from 63-79 Male and female All retired Health conditions listed included arthritis, type 2 diabetes, anxiety and depression	7	Research collected March-May 2017	Weekday Afternoons	Participants meet at an environmental centre for refreshments and are provided with a choice of conservation activities including tree planting, wildflower planting, and making wildlife habitats. Participants are signposted to local 'Friends of...' groups if they show an interest for further volunteering opportunities.	<ul style="list-style-type: none"> • Instruction on how to perform the behaviour • Demonstration of the behaviour • Social support 	<ul style="list-style-type: none"> • Education • Enablement

17. Health Walks	See Outdoor Intervention 15	See Outdoor Intervention 16	Age ranges from 60- 74 Male and female All retired Health conditions listed included arthritis, COPD, type 2 diabetes, anxiety and depression	9	Research collected April- June 2017	Weekday Mornings	See Outdoor Intervention 15	<ul style="list-style-type: none"> • Graded tasks • Social Support • Verbal persuasion on capability • Problem solving 	<ul style="list-style-type: none"> • Enablement
18. Health Walks	Project Officer for local charity providing activities for families with specific catering for children and adults with special needs.	See Outdoor Intervention 2	Age ranges from 21-30 Male and female All working or in education Health conditions listed included learning difficulties, Asperger's syndrome, mobility problems, anxiety and depression	14	Research collected April- June 2017	Weekday Afternoons	This group meets up at a local community centre for refreshments. During this time, participants are given the opportunity to choose a walking route within the local park before completing the walk. Specialist mobility aids are borrowed for those with mobility problems.	<ul style="list-style-type: none"> • Graded tasks • Social Support • Verbal persuasion on capability • Problem solving 	<ul style="list-style-type: none"> • Enablement
19. Health Walks	Project planner with experience of working for a third sector	Park is located within 10 minutes of the town centre. Listed on the National	Age ranges from 64- 78 Male and female All retired	8	Research collected April- June 2017	Weekday Mornings	Participants meet at a local centre for refreshments and to discuss events in the community. The walks take place in the local park and are	<ul style="list-style-type: none"> • Social Support • Verbal persuasion on capability 	<ul style="list-style-type: none"> • Enablement

	organisation and skilled in health and wellbeing, fundraising and event management . Has qualifications in health, exercise and nutrition.	Register of Historic Parks and Gardens. Facilities include play areas, playing fields and grassland with accessible paths throughout.	Health conditions listed included arthritis, COPD, type 2 diabetes, anxiety and depression				described as a ‘fun, social walk for all ages and abilities’		
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Appendix 3.7.

Descriptions of Questionnaire Measures

Validated Questionnaire Measures Adopted in Study 3a

Primary Outcome Measure

SF-36v2
Health
Survey
(Ware et al.,
2008)

The SF-36v2 Health Survey measures functional health and wellbeing and considered to be a reliable and valid measure of physical and mental health. It was also practical and easily completed in five to ten minutes and suitable for adults aged 18 and over. This measure was chosen as the primary measure, as it is generic health survey as opposed to a disease-specific health survey. It also provides an all-encompassing assessment of physical and mental health. It contains 36 questions and provides questions for each of the eight health domains, including physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health, and provides an overall physical components summary and mental components summary score. Internal consistency is a Cronbach's alpha score between 0.80 and 0.95 across subscales (Jenkinson, Stewart-Brown, Petersen, & Paice, 1999). The questionnaire boasts good construct validity to derive physical components summaries and mental components summaries between -0.036 and 0.460 (Jenkinson, Stewart-Brown, Petersen, & Paice, 1999). The measure was therefore considered appropriate due to its ability to measure health and wellbeing improvement or decline and has been used in various similar studies (Hawkins et al., 2011; Wilson, 2011; Verra et al., 2012; Richardson et al., 2013; Fisher et al., 2015; Lovell et al., 2015; Dolling, Nilsen & Lundell, 2017).

Secondary Outcome Measures

The
Warwick-
Edinburgh
Mental
Wellbeing
Scale
(WEMWBS)
(Tennant et
al., 2008)

The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS) is a measure of mental wellbeing in adults. It contains 14 items measuring mental wellbeing, including subjective wellbeing and psychological functioning. Each item is worded positively and addresses aspects of positive wellbeing, for example, *'I've been feeling optimistic about the future'*. Each item is scored on a 1 to 5 Likert scale, ranging from 1 'none of the time' to 5 'all of the time'. This scale was already agreed to be utilised by The Mersey Forest, as their funders (The Big Lottery) requested evaluation feedback using this scale. This was included within the PhD due to its appropriateness in measuring mental wellbeing as well as psychological functioning, considered a vital component of mental wellbeing. This measure contains good content validity and Cronbach's alpha score of 0.89 (Stewart-Brown et al., 2011) and has been used in previous similar studies (Wilson, 2011; Bragg, 2013; France et al., 2016).

The Profile of
Mood States
(POMS)
(Grove &
Prapavessis,
1992)

The Profile of Mood States (POMS) abbreviated version adopted to assess changes in mood states. Comprising 40 adjectives to measure tension, depression, fatigue, vigour, confusion, anger, and esteem-related affect, the scale was selected due to its ability to assess more specific and transient mood states. This measure was therefore considered useful in identifying more specific changes. Cronbach's alphas range from .664 to .954 with a mean of .798 and high construct validity (Grove & Prapavessis, 1992). The scale has also been used in previous similar studies (Wichrowski et al., 2005; Hine, Peacock & Pretty, 2008; Bragg, 2013; Barton, Griffin & Pretty, 2012; Song et al., 2014; Ochiai et al., 2015).

The Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965)

The Rosenberg Self-Esteem Scale (RSES) measures global self-worth by assessing both positive and negative feelings about the self. The measure consists of 10 items, for example, *'On the whole, I am satisfied with myself.'* Participants are required to state their agreement with each statement on a 4-point Likert scale ranging from 'strongly agree' to 'strongly disagree'. Cronbach coefficient was 0.91 (Sinclair et al., 2010). The measure was considered appropriate to measure self-esteem, as a determinant of good wellbeing (e.g. Crocker & Park, 2004). This scale has also been adopted successfully in previous similar studies (Hine, Peacock & Pretty, 2008; Barton, Griffin & Pretty, 2012; Bragg, 2013).

The International Physical Activity Questionnaire (IPAQ) Short Form (Craig et al., 2003)

The International Physical Activity Questionnaire-Short Form (IPAQ) assessed changes in physical activity. Measuring physical activity undertaken across three domains, including leisure time, domestic and gardening activities and work-related and transport-related activity, questions assess three types of activity within these domains. Types of physical activity include walking, moderate-intensity activities and vigorous intensity activities. Types of activity are measured in terms of their frequency, measured by days per week, and duration, measured by time spent per day. Scores are totalled in terms of the duration (in minutes) multiplied by frequency (days per week) for each type of activity. Scores are then converted into MET-minutes (Multiples of the Resting Metabolic Rate) by weighting each type of activity by energy requirements defined in METS. Already agreed and utilised to measure physical activity by The Mersey Forest for the Nature4Health project due to funders requests, this was included within the PhD to account for the 'physical activity' perspective of the PhD. More specifically, this measure was adopted to identify the role physical activity may have in associated health and wellbeing outcomes, as well as measuring physical activity as an outcome in its own right. IPAQ correlations are approximately 0.80 for reliability and 0.30 for validity (Craig et al., 2003). The questionnaire has also been used in previous similar studies (Milton, Kelly & Foster, 2009; Hawkins et al., 2011; France et al., 2016).

Appendix 3.8

Ethical Approval

Dear Clare

With reference to your application for Ethical Approval

15/EHC/102 - Clare Austin, (PhD) - Evaluating the health and wellbeing benefits associated with outdoor interventions and informing the development of natural health services (Kaye Richards)

Liverpool John Moores University Research Ethics Committee (REC) has considered the above application and I am pleased to inform you that ethical approval has been granted and the study can now commence.

Approval is given on the understanding that:

- any adverse reactions/events which take place during the course of the project are reported to the Committee immediately;
- any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately;
- the LJMU logo is used for all documentation relating to participant recruitment and participation e.g. poster, information sheets, consent forms, questionnaires. The LJMU logo can be accessed at <http://www.ljmu.ac.uk/corporatecommunications/60486.htm>

Where any substantive amendments are proposed to the protocol or study procedures further ethical approval must be sought.

Applicants should note that where relevant appropriate gatekeeper / management permission must be obtained prior to the study commencing at the study site concerned.

For details on how to report adverse events or request ethical approval of major amendments please refer to the information provided at <http://www.ljmu.ac.uk/RGSO/93205.htm>

Please note that ethical approval is given for a period of five years from the date granted and therefore the expiry date for this project will be January 2021. An application for extension of approval must be submitted if the project continues after this date.

Yours sincerely



Mandy Williams, Research Support Officer

**(Research Ethics and Governance)
Research and Innovation Services**

Kingsway House, Hatton Garden, Liverpool L3 2AJ

t: 01519046467 e: a.f.williams@ljmu.ac.uk

Appendix 6.1.

Participant Recruitment Pack



LIVERPOOL JOHN MOORES UNIVERSITY AND THE MERSEY FOREST

PARTICIPANT INFORMATION SHEET- SERVICE USERS

Title of Project: Evaluating the health and wellbeing benefits associated with outdoor interventions and informing the development of natural health services

Name of Researcher and School/Faculty:

PhD Student: Clare Austin, Physical Activity Exchange, Liverpool John Moores University
Director of Studies: Dr Kaye Richards, Faculty of Education, Health and Community, Liverpool John Moores University

We would you to take part in our project that is looking at your experiences of the following interventions that the Nature 4 Health programme offers including Nordic walking, walking for health, therapeutic gardening and conservation activities.

1. What is the purpose of the study?

We would like to find out how you might benefit from the programmes that Nature 4 Health offers, in terms of your health and wellbeing and find out which elements of the programmes you found to be therapeutic.

We would also like to find out how successfully the Nature 4 Health programme was delivered and which elements were associated with its success.

2. Why are we doing this project?

We are hoping to find out how the Nature 4 Health programme might benefit you and how, so that it can be developed further and made available to more people who may also benefit.

3. What is The Nature 4 Health project?

This project is a wide variety of programmes taking place in the natural environment designed to improve health and wellbeing provided by The Mersey Forest. For more information about the Mersey Forest and the Nature 4 Health project, go to www.merseyforest.org.uk.

4. Do I have to take part?

You can choose whether or not you would like to be involved. It is **voluntary**. **You can also withdraw from the research project at any time** without having to give a reason why.

5. What will taking part involve?

If you do wish for your service users to take part in this research, you will be asked to sign a **Participant Consent Form**.

Questionnaire.

This will examine your current health and wellbeing using a range of validated health measures and will be completed before and after you have completed the programme. These will take around 10-15

minutes to complete. You will also be asked on the consent form, if you would be happy to receive a follow-up questionnaire 12 weeks after completing the programme through the post. A stamped addressed envelope will be provided with the questionnaire, so that you can return this to the researcher confidentially.

Semi-structured telephone interview

You will be asked on the consent form if you would like to take part in a semi-structured telephone interview so that we can gain more detail about your experience of the Nature 4 Health activities. This will be an in-depth telephone interview and will take around an hour to complete. It will be arranged at a time which is convenient for you. You will then be asked if you would be happy to have the preliminary results of the interviews sent to you to be checked for their accuracy through post or email.

6. What are the benefits of taking part in the project?

- You will benefit in terms of physical and wellbeing from the interventions that the Nature 4 Health project has to offer
- You will be able to share your experience of taking part in the Nature 4 Health project. This will shape its future development and make it more widely available so that more people can benefit
- Those who complete the baseline and follow-up questionnaire will have the opportunity to be entered into the prize draw for the chance to win £100 worth of Go Outdoors vouchers

7. If I take part, what is expected of me?

- a. Take part in the questionnaire at the beginning of sessions, the end of 12 weeks and 12 weeks after completion of the programme.
- b. Take part in a telephone interview at the end of Nature 4 Health programme.

8. Will anyone know I am taking part?

Information collected will be stored securely at Liverpool John Moores University, and only people working on this project will have access to the information generated. No names will be used when we talk about the project with others or when we write reports.

Questionnaire data be stored securely and only viewed by those working on the study. You will be provided with a participant number to be used on questionnaires, so you do not need to give your name.

Telephone interview data will also be stored securely and accessed by those working on the study. Data will be kept confidential by using pseudonyms in transcripts and written reports to help protect the identity of individuals and organisations.

9. I want to take part. What should I do now?

That's great! You will need to:

- Sign the **Participant Consent Form** provided and return to the leader of your group.

If you want to know more, just ask us...

Clare Austin

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Liverpool John Moores University and The
Mersey Forest
Tel: 0151 231 4436
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Dr Kaye Richards

CPsychol; Senior Lecturer in Outdoor Education;
Programme Leader BSc (Hons) Outdoor
Education
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PARTICIPANT CONSENT FORM

Evaluating the health and wellbeing benefits associated with outdoor interventions and informing the development of natural health services

Clare Austin, Physical Activity Exchange

Please tick/cross the relevant boxes below:

1. I confirm that I have read and understand the information provided for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation in the research is voluntary and that I am free to withdraw at any time, without giving a reason and that this will not affect my legal rights.

3. I understand that any personal information collected during the study will be anonymised and remain confidential.

4. "I have read the information sheet provided and I am happy to participate. I understand that by completing and returning this questionnaire I am consenting to be part of this research study and for my data to be used as described in the information sheet provided".

5. I am willing to be contacted to take part in a follow-up questionnaire, telephone interview, to give further information on the impact the Nature 4 Health programmes have had on my health and wellbeing?
My preferred contact number is _____

- a. If taking part in a telephone interview, I would be happy to have preliminary results and check them for accuracy.

6. I am willing to be contacted in 12 weeks after completing the Nature4Health programmes to complete a final follow-up questionnaire.

My address is: _____

7. I am willing to be contacted in the future to give feedback on the Nature 4 Health programmes.

Please note: This information will enable us to contact you for future participation in the study. This will not be shared with anyone outside of the research project. Your personal information will be anonymised by assigning you a participant number, which will be used throughout the study.

Please sign, if you agree to take part.

I agree to take part in the above study

Name of Participant: _____

Signature: _____ Date: _____

Name of Researcher	Date	Signature
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Name of Person taking consent (If different from researcher)	Date	Signature
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Participant number:

(Research use only)

EVALUATING THE HEALTH AND WELLBEING BENEFITS ASSOCIATED WITH OUTDOOR INTERVENTIONS AND INFORMING THE DEVELOPMENT OF NATURAL HEALTH SERVICES

I have read the information sheet provided and I am happy to participate. I understand that by completing and returning this questionnaire I am consenting to be part of the research study and for my data to be used as described.

Please answer the questions below, read the instruction for each section and then select the answer based on your first initial response. There are no right or wrong answers. If you choose not to answer any particular question please leave this blank.

Your Health and Well-Being. This information will help us keep track of how you feel and how well you are able to do your usual activities.

For each of the following questions, please circle the statement or number that best describes your answer.

In general, would you say your health is:	Excellent	Very good	Good	Fair	Poor
---	-----------	-----------	------	------	------

Compared to one year ago, how would you rate your health in general now?	Much better now than one year ago	Somewhat better now than one year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago
--	-----------------------------------	---------------------------------------	--------------------------------	--------------------------------------	----------------------------------

During the past 4 weeks...

How much bodily pain have you had?	None	Very mild	Mild	Moderate	Severe	Very severe
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To what extent has your health or emotional problems interfered with your normal social activities with family, friends, neighbours, or groups?	Not at all	A little bit	Slightly	Moderately	Moderately	Quite a bit	Quite a bit	Extremely
---	------------	--------------	----------	------------	------------	-------------	-------------	-----------

Participant number:

(Research use only)

The following questions are about activities you might do during a typical day. Does your health limit you in these activities? If so, how much?	Yes, limited a lot	Yes, limited a little	No, not limited at all
Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	1	2	3
Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
Lifting or carrying groceries	1	2	3
Climbing several flights of stairs	1	2	3
Climbing one flight of stairs	1	2	3
Bending, kneeling or stooping	1	2	3
Walking more than a mile	1	2	3
Walking several hundred yards	1	2	3
Walking one hundred yards	1	2	3
Bathing or dressing yourself	1	2	3

How true or false is each of the following statements for you?

Statements:	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
I seem to get ill more easily than other people	1	2	3	4	5
I am as healthy as anybody I know	1	2	3	4	5
I expect my health to get worse	1	2	3	4	5
My health is excellent	1	2	3	4	5

Have you had any of the following problems with your work or other regular daily activities as a result of your health? How often have you...	All of the time	Most of the time	Some of the time	A little of the time	None of the time
Cut down on the amount of time you spent on work or other activities	1	2	3	4	5
Accomplished less than you would like	1	2	3	4	5
Were limited in the kind of work or other activities	1	2	3	4	5
Had difficulty performing the work or other activities (for example, it took extra effort)	1	2	3	4	5
Have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? How often have you...	All of the time	Most of the time	Some of the time	A little of the time	None of the time
Cut down on the amount of time you spent on work or other activities	1	2	3	4	5
Accomplished less than you would like	1	2	3	4	5
Did work or other activities less carefully than usual	1	2	3	4	5

For each question, please give the one answer that comes closest to the way you have been feeling.	All of the time	Most of the time	Some of the time	A little of the time	None of the time
Did you feel full of life?	1	2	3	4	5
Have you been nervous?	1	2	3	4	5
Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5
Have you felt calm and peaceful?	1	2	3	4	5
Did you have a lot of energy?	1	2	3	4	5
Have you felt downhearted and low?	1	2	3	4	5
Did you feel worn out?	1	2	3	4	5
Have you been happy?	1	2	3	4	5
Did you feel tired?	1	2	3	4	5
	All of the time	Most of the time	Some of the time	A little of the time	None of the time
Has your health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc)?	1	2	3	4	5

Below is a list of statements dealing with your general feelings about yourself. Please circle the number to state your agreement or disagreement with the statements.	Strongly Agree	Agree	Disagree	Strongly Disagree
On the whole, I am satisfied with myself.	1	2	3	4
At times, I think I am no good at all.	1	2	3	4
I feel I have a number of good qualities.	1	2	3	4
I am able to do things as well as most other people.	1	2	3	4
I feel I do not have much to be proud of.	1	2	3	4
I certainly feel useless at times.	1	2	3	4
I feel that I am a person of worth, at least on an equal plane with others.	1	2	3	4
I wish I could have more respect for myself.	1	2	3	4
All in all, I am inclined to feel that I am a failure.	1	2	3	4
I take a positive attitude towards myself.	1	2	3	4

<p>Physical Activity: Think about all the vigorous activities that you did in the last seven days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.</p>		
1. During the last seven days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast cycling?	_____ days	<p>No vigorous physical activities</p> <input type="checkbox"/> <p>Skip to question 3</p>
2. How much time did you usually spend doing vigorous physical activities on one of those days?	_____ hours per day	<p>Don't know/Not sure</p> <input type="checkbox"/>
<p>Think about all the moderate activities that you did in the last seven days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.</p>		
3. During the last seven days, on how many days did you do moderate physical activities like carrying light loads or cycling at a regular pace? Do not include walking.	_____ days	<p>No moderate physical activities</p> <input type="checkbox"/> <p>Skip to question 5</p>
4. How much time did you usually spend doing moderate physical activities on one of those days?	_____ hours per day	<p>Don't know/Not sure</p> <input type="checkbox"/>
<p>Think about the time you spent walking in the last seven days. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise or leisure.</p>		
5. During the last seven days, on how many days did you walk for at least 10 minutes at a time?	_____ days per week	<p>No walking</p> <input type="checkbox"/> <p>Skip to question 7</p>
6. How much time did you usually spend walking on one of those days?	_____ hours per day	<p>Don't know/Not sure</p> <input type="checkbox"/>
<p>The last question is about the time you spent sitting on weekdays during the last seven days. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.</p>		
7. During the last seven days, how much time did you spend sitting on a week day?	_____ hours per day	<p>Don't know/Not sure</p> <input type="checkbox"/>

Below is a list of words that describe feelings people have. For each question, please circle the number that best describes how you feel.

Feeling	Not at all	A little	Moderately	Quite a lot	Extremely
Tense	0	1	2	3	4
Angry	0	1	2	3	4
Worn Out	0	1	2	3	4
Unhappy	0	1	2	3	4
Proud	0	1	2	3	4
Lively	0	1	2	3	4
Confused	0	1	2	3	4
Sad	0	1	2	3	4
Active	0	1	2	3	4
On edge	0	1	2	3	4
Grouchy	0	1	2	3	4
Ashamed	0	1	2	3	4
Energetic	0	1	2	3	4
Hopeless	0	1	2	3	4
Uneasy	0	1	2	3	4
Restless	0	1	2	3	4
Unable to concentrate	0	1	2	3	4
Fatigued	0	1	2	3	4
Competent	0	1	2	3	4
Annoyed	0	1	2	3	4

Feeling	Not at all	A little	Moderately	Quite a lot	Extremely
Discouraged	0	1	2	3	4
Resentful	0	1	2	3	4
Nervous	0	1	2	3	4
Miserable	0	1	2	3	4
Confident	0	1	2	3	4
Bitter	0	1	2	3	4
Exhausted	0	1	2	3	4
Anxious	0	1	2	3	4
Helpless	0	1	2	3	4
Weary	0	1	2	3	4
Satisfied	0	1	2	3	4
Bewildered	0	1	2	3	4
Furious	0	1	2	3	4
Full of pep	0	1	2	3	4
Worthless	0	1	2	3	4
Forgetful	0	1	2	3	4
Vigorous	0	1	2	3	4
Uncertain about things	0	1	2	3	4
Bushed	0	1	2	3	4
Embarrassed	0	1	2	3	4

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS)

Below are some statements about feelings and thoughts.

Please circle the number 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
1. I've been feeling optimistic about the future	1	2	3	4	5
2. I've been feeling useful	1	2	3	4	5
3. I've been feeling relaxed	1	2	3	4	5
4. I've been feeling interested in other people	1	2	3	4	5
5. I've had energy to spare	1	2	3	4	5
6. I've been dealing with problems well	1	2	3	4	5
7. I've been thinking clearly	1	2	3	4	5
8. I've been feeling good about myself	1	2	3	4	5
9. I've been feeling close to other people	1	2	3	4	5
10. I've been feeling confident	1	2	3	4	5
11. I've been able to make up my own mind about things	1	2	3	4	5
12. I've been feeling loved	1	2	3	4	5
13. I've been interested in new things	1	2	3	4	5
14. I've been feeling cheerful	1	2	3	4	5

Appendix 6.2.

Table of all Participant Demographics across Each Time Point

Table of all Participant Demographics Across Each Time Point

	<u>Time 0</u>	<u>Time 1</u>	<u>Time 2</u>
<u>Participant Numbers</u>	n=144	n=80	n=31
<u>Age (years)</u>	M=49.22, SD=16.82	M=51.53, SD=14.82	M=64.50, SD=12.13
<u>Gender</u>			
<u>Male</u>	n=67	n=34	n=13
<u>Female</u>	n=76	n=46	n=18
<u>Not Disclosed</u>	n=1	n=0	n=0
<u>Employment Status</u>			
<u>Employed</u>	n=28	n=26	n=9
<u>Unemployed</u>	n=26	n=7	n=6
<u>Retired</u>	n=58	n=34	n=13
<u>In Education</u>	n=7	n=2	n=0
<u>Carer</u>	n=1	n=1	n=0
<u>Not Disclosed</u>	n=24	n=10	n=3
<u>Health Issues</u>			
<u>Arthritis</u>	n=3	n=2	n=1
<u>Blood Pressure</u>	n=3	n=2	n=2
<u>Asthma</u>	n=2	n=2	n=1
<u>Back Problems</u>	n=1	n=1	n=0
<u>Cardiomyopathy</u>	n=1	n=0	n=0
<u>Chronic Fatigue Syndrome</u>	n=1	n=1	n=1
<u>Diabetes</u>	n=1	n=0	n=0
<u>General Health</u>	n=1	n=1	n=1
<u>Mobility</u>	n=1	n=1	n=1
<u>Visually Impaired</u>	n=1	n=0	n=0
<u>Mental Health Problems</u>	n=3	n=2	n=2
<u>Anxiety and Depression</u>	n=2	n=0	
<u>Anxiety</u>	n=2	n=2	n=0
<u>Depression</u>	n=4	n=3	n=2
<u>Schizophrenia</u>	n=1	n=0	n=0
<u>Learning Difficulties</u>	n=7	n=0	n=0
<u>None</u>	n=31	n=23	n=9
<u>Not Disclosed</u>	n=79	n=41	n=16

Appendix 6.3.

Table of Median and Interquartile Ranges of Outcome Measures for all Participants across Each Time Point

Table of Median and, Interquartile Ranges of Outcome Measures for Participants at Each Time Point

<u>Outcome Measures</u>	<u>Time 0</u>		<u>Time 1</u>		<u>Time 3</u>	
<u>Total Number of Participants</u>	<u>(n=144)</u>		<u>(n=80)</u>		<u>(n=31)</u>	
	<u>Median</u>	<u>IQR</u>	<u>Median</u>	<u>IQR</u>	<u>Median</u>	<u>IQR</u>
<u>SF-36v2 Health Survey</u>						
• Physical Functioning	80.00	38.75	85.00	32.49	82.50	38.00
• Role Physical	66.28	46.88	75.00	51.56	75.00	39.06
• Bodily Pain	74.00	42.00	78.00	41.00	68.00	36.25
• General Health	69.50	30.50	67.00	20.00	67.00	24.00
• Vitality	65.62	32.81	62.50	31.25	62.50	28.13
• Social Functioning	87.50	37.50	75.00	40.60	75.00	50.00
• Role Emotional	87.50	35.41	79.16	50.00	95.83	54.17
• Mental Health	65.00	26.25	75.00	21.00	82.50	36.25
• Physical Components Summary	50.72	15.97	50.76	14.47	51.23	36.25
• Mental Components Summary	50.05	13.38	50.82	7.93	51.68	18.00
<u>Warwick-Edinburgh Mental Wellbeing Scale</u>	50.50	14.25	50.00	11.50	51.50	14.75
<u>Rosenberg Self-Esteem Scale</u>	22.00	8.00	21.00	7.00	20.00	10.00
<u>Profile of Mood States</u>						
• Tension	7.00	9.25	5.50	6.25	5.00	8.50
• Anger	4.00	4.25	3.00	3.00	3.00	4.25
• Fatigue	5.00	8.25	5.00	7.25	5.00	9.00
• Depression	6.00	6.25	4.00	5.50	3.00	7.00
• Esteem-Related Affect	13.00	6.00	13.00	4.25	9.00	8.00
• Vigour	9.00	9.00	12.00	7.75	9.50	8.25
• Confusion	5.00	5.75	3.00	4.75	3.50	4.75
• Negative Subscales	33.00	23.50	19.00	22.50	22.00	20.00
• Positive Subscales	23.00	9.00	23.50	11.75	20.50	10.50
• Total Mood Disturbance	11.00	36.00	6.00	29.75	2.50	2.50
<u>International Physical Activity Questionnaire</u>						
• Vigorous (METMin)	240.00	1920.00	480.00	5220.00	1440.00	4680.00
• Moderate (METMin)	938.00	1170.00	420.00	1890.00	960.00	2760.00
• Walking (METMin)	940.50	1567.50	1386.00	2029.50	1386.00	2079.00
• Total	1950.00	3654.75	3570.00	9333.00	4428.00	9361.50

Appendix 6.4.

Table of Median and Interquartile Ranges of Outcome Measures for Participants who Remained Engaged in across all Three Time Points

Table of Median and, IQRs of Outcome Measures for participants who completed Time 0, 1 and 2 (n=31)

<u>Outcome Measures</u>	<u>Time 0</u>		<u>Time 1</u>		<u>Time 3</u>	
	<u>Median</u>	<u>IQR</u>	<u>Median</u>	<u>IQR</u>	<u>Median</u>	<u>IQR</u>
<u>SF-36v2 Health Survey</u>						
• Physical Functioning	75.00	<u>45.00</u>	85.00	40.00	82.50	38.00
• Role Physical	68.75	50.00	75.00	50.00	75.00	39.06
• Bodily Pain	74.00	52.00	72.00	48.00	68.00	36.25
• General Health	72.00	47.00	67.00	15.00	67.00	24.00
• Vitality	62.50	37.50	62.50	25.00	62.50	28.13
• Social Functioning	87.50	37.50	75.00	50.00	75.00	50.00
• Role Emotional	75.00	41.67	75.00	50.00	95.83	54.17
• Mental Health	65.00	15.00	65.00	25.00	82.50	36.25
• Physical Components Summary	49.78	23.46	50.54	15.90	51.23	36.25
• Mental Components Summary	48.47	10.73	48.85	15.59	51.68	18.00
<u>Warwick-Edinburgh Mental WellbeingScale</u>	50.50	14.25	50.00	11.50	51.50	14.75
<u>Rosenberg Self-Esteem Scale</u>	21.00	7.50	21.00	7.00	20.00	10.00
<u>Profile of Mood States</u>						
• Tension	6.00	9.50	6.00	5.75	5.00	8.50
• Anger	4.00	4.00	3.00	3.50	3.00	4.25
• Fatigue	5.00	9.00	5.00	6.50	5.00	9.00
• Depression	4.50	6.50	4.00	6.25	3.00	7.00
• Esteem-Related Affect	13.00	5.50	13.00	3.75	9.00	8.00
• Vigour	9.50	8.75	12.00	6.75	9.50	8.25
• Confusion	5.00	4.75	3.50	4.00	3.50	4.75
• Negative Subscales	30.50	23.75	21.50	21.25	22.00	20.00
• Positive Subscales	23.00	11.00	23.50	10.50	20.50	10.50
• Total Mood Disturbance	10.50	2.50	6.00	4.00	2.50	2.50
<u>International Physical Activity Questionnaire</u>						
• Vigorous (METMin)	240.00	1920.00	480.00	5220.00	1440.00	4680.00
• Moderate (METMin)	522.00	1170.00	793.00	1800.00	960.00	2760.00
• Walking (METMin)	940.50	2359.00	1386.00	2128.50	1386.00	2079.00
• Total	2376.00	3654.75	3363.00	9333.00	4428.00	9361.50

Appendix 6.5.

Table of Median and Interquartile Ranges of Time 0 Outcome Measures for Participants who Completed Outdoor Interventions and those who Dropped Out

Table of Median and, Interquartile Ranges of Outcome Measures at Time 0 for those who completed the outdoor interventions (n=80) and those who dropped out (n=64)

<u>Outcome Measures</u>	<u>Time 0 Scores of Participants Who Completed Outdoor Interventions (n=80)</u>		<u>Time 0 Scores of Participants who dropped out at Time 1 (n=64)</u>	
	<u>Median</u>	<u>IQR</u>	<u>Median</u>	<u>IQR</u>
<u>SF-36v2 Health Survey</u>				
• Physical Functioning	75.00	45.00	85.00	20.00
• Role Physical	68.75	50.00	75.00	28.13
• Bodily Pain	74.00	52.00	64.00	30.00
• General Health	72.00	47.00	72.00	25.00
• Vitality	62.50	37.50	62.00	21.88
• Social Functioning	87.50	37.50	87.50	37.50
• Role Emotional	75.00	41.67	83.33	50.00
• Mental Health	65.00	15.00	75.00	22.50
• Physical Components Summary	49.78	23.46	51.86	9.83
• Mental Components Summary	48.47	10.73	48.24	12.36
<u>Warwick-Edinburgh Mental Wellbeing Scale</u>	50.50	14.25	51.00	12.50
<u>Rosenberg Self-Esteem Scale</u>	21.00	7.50	21.00	9.00
<u>Profile of Mood States</u>				
• Tension	6.00	9.50	6.00	8.00
• Anger	4.00	4.00	3.00	7.00
• Fatigue	5.00	9.00	4.00	3.00
• Depression	4.50	6.50	4.00	6.00
• Esteem-Related Affect	13.00	5.50	13.00	5.50
• Vigour	9.50	8.75	11.00	7.50
• Confusion	5.00	4.75	4.00	7.00
• Negative Subscales	30.50	23.75	25.00	23.50
• Positive Subscales	23.00	11.00	26.00	14.00
• Total Mood Disturbance	10.50	2.50	4.00	3.50
<u>International Physical Activity Questionnaire</u>				
• <u>Vigorous (METMin)</u>	240.00	1920.00	260.00	1220.00
• <u>Moderate (METMin)</u>	522.00	1170.00	520.00	1880.00
• <u>Walking (METMin)</u>	940.50	2359.00	792.00	1287.00
• <u>Total</u>	2376.00	3654.75	1737.00	4096.00

Appendix 7.1.

Table of Median and Interquartile Ranges of Outcome Measures Across Each Time Point for Participants who were Interviewed

Table of Median and, Interquartile Ranges of Outcome Measures for Participants Interviewed in Study 3b (n=8)

<u>Outcome Measures</u>	<u>Time 0</u>		<u>Time 1</u>		<u>Time 3</u>	
	Median	IQR	Median	IQR	Median	IQR
<u>SF-36v2 Health Survey</u>						
• Physical Functioning	85.00	62.50	90.00	57.50	45.00	80.00
• Role Physical	93.75	71.88	100.00	68.75	50.00	68.75
• Bodily Pain	74.00	79.00	100.00	37.00	50.00	57.00
• General Health	72.00	57.00	67.00	36.00	42.00	52.00
• Vitality	43.75	56.25	50.00	50.00	56.25	43.75
• Social Functioning	87.50	68.80	62.50	37.50	50.00	31.25
• Role Emotional	100	33.33	75.00	50.00	33.33	66.67
• Mental Health	65.00	5.00	75.00	23.00	50.00	42.50
• Physical Components Summary	56.67	32.74	56.43	25.74	41.52	29.00
• Mental Components Summary	47.66	8.33	48.16	16.85	36.48	20.00
<u>Warwick-Edinburgh Mental Wellbeing Scale</u>	43.00	12.25	48.00	21.00	52.00	18.00
<u>Rosenberg Self-Esteem Scale</u>	21.00	9.00	21.00	7.00	22.00	9.00
<u>Profile of Mood States</u>						
• Tension	6.00	9.00	4.00	8.50	3.00	9.00
• Anger	4.00	3.50	2.00	3.50	3.00	2.00
• Fatigue	5.00	11.00	5.00	14.00	5.00	10.00
• Depression	7.00	10.50	4.00	12.00	2.00	6.50
• Esteem-Related Affect	9.00	10.50	12.00	7.50	15.00	7.00
• Vigour	5.00	7.00	8.00	8.50	8.00	2.50
• Confusion	9.00	6.50	8.00	9.50	1.00	8.50
• Negative Subscales	41.00	13.50	35.00	38.50	11.00	34.50
• Positive Subscales	14.00	17.50	17.00	14.50	22.00	9.00
• Total Mood Disturbance	27.00	31.00	18.00	47.00	12.00	40.00
<u>International Physical Activity Questionnaire</u>						
• Vigorous (METMin)	480.00	720.00	840.00	360.00	480.00	960.00
• Moderate (METMin)	240.00	840.00	360.00	310.00	280.00	360.00
• Walking (METMin)	495.00	4125.00	990.00	3118.00	198.00	840.51
• Total	918.00	5197.50	1485.00	93831.00	678.00	1680.51

