

*The Exercise
date series*

Green Exercise

Linking nature, health and well-being

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Green care

Nature-based interventions for vulnerable people

Joe Sempik and Rachel Bragg

Types of green care

This chapter begins by defining green care and outlining the key types of green care available in the UK, before giving a historical overview. An overview of different ways of experiencing and engaging with nature is then presented in order to illustrate the key elements of a range of green care interventions. The chapter concludes by exploring the evidence base for green care.

Green Care has been defined as: ‘...utilising plants, animals and landscapes to create interventions to improve health and well-being (i.e... not ... a casual encounter with nature)’ (Sempik and Bragg, 2013). Recently, though, the newly formed UK Green Care Coalition has refined this definition to ‘Green care: nature-based therapy or treatment interventions specifically designed, structured and facilitated for individuals with a defined need’ (Green Care Coalition, 2015). The diversity of different interventions is shown under the ‘Green Care Umbrella’ (Figure 10.1; Bragg and Atkins, 2016).

Social and Therapeutic Horticulture, care farming, and environmental conservation (as a treatment intervention) are the main types of green care currently available, followed by green exercise interventions (such as walking programmes) and Animal Assisted Therapy (including equine-assisted therapy). Other green care interventions exist but are on a smaller scale and so have been grouped together in the ‘Other’ box. Food growing as a treatment intervention has been grouped with Social and Therapeutic Horticulture as the two approaches share common practices; and Ecotherapy (in its specific sense) has been grouped with environmental conservation as there is much overlap in their practice and ethos (Bragg and Atkins, 2016).

The point made in Figure 10.1 is that each of the interventions can occur in different contexts, with different participants and include a range of activities to suit the needs of those participants. Whilst there is an acknowledged set of practices and pedagogy surrounding these interventions, individual practitioners have the freedom to shape their practice to suit the context and the needs of their clients.

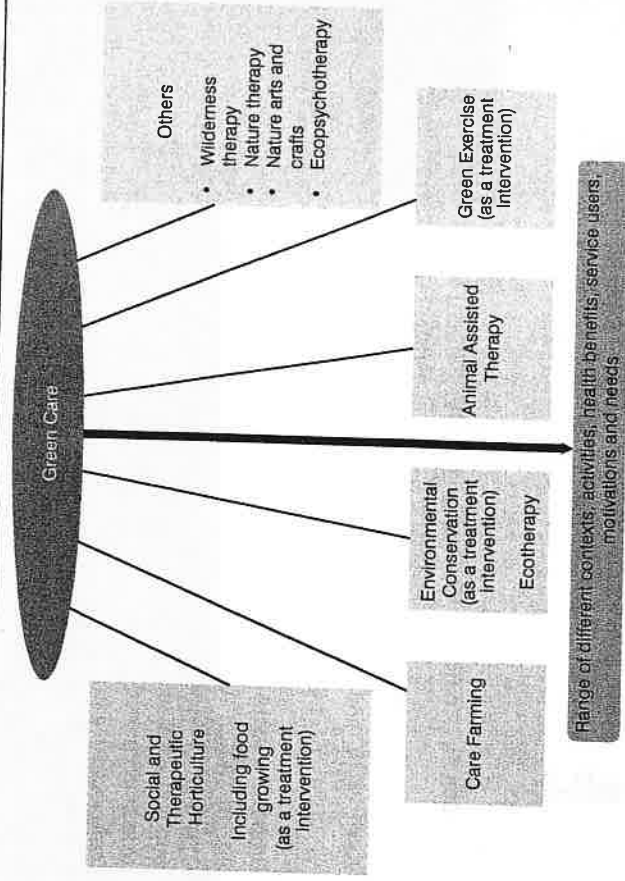


Figure 10.1 The green care umbrella

Source: Bragg and Atkins (2016) adapted from Hine et al. (2008a)

The fundamental elements of green care: an historical perspective

Natural spaces have found themselves alongside places of healing and recuperation. Some of these spaces have been shaped by man into gardens and parks, whilst others have been used as settings to enable the experience of nature – the views, the smells, the sense of ‘being there’ and sense of place, all contributing to their ‘therapeutic’ power. A tradition has developed of using the natural environment as a therapeutic setting. The therapeutic quality of nature has been applied to people with many different ailments and difficulties, and gardens (and natural settings) have been used for tending the sick and dying in monasteries, hospitals, asylums, prisons and other institutions.

Walled outdoor areas, known as airing courts, were provided in many hospitals and asylums so that patients could benefit from being outside; shelters were also built in hospital grounds to protect them from inclement weather; and patients were encouraged to work in the farms and gardens not only to help feed themselves but also to breathe the ‘fresh air’. Alongside the provision of nature for people with illness and disabilities, there is the long-recognised knowledge that open spaces and nature are pleasing to most people and offer opportunities for many forms of recreation.

The importance of meaningful occupation (as opposed to *employment*) has long been recognised. It is now central to occupational therapy. In writing about the benefits of occupation in the nineteenth century, David Hack Tuke, a descendant of Samuel Tuke, the founder of The York Retreat hospital, advocated occupation as a part of treatment for people with mental ill health, saying that 'the immediate object is not the value of the labour but the benefit to the patient' (Whiteley, 2004, p. 234). In other words, meaningful occupation is more important than productivity. Other reports from that time painted a similar picture regarding occupation but also praised the benefits of fresh air:

We find that the patients derive more benefit from employment in the garden than anywhere else, and this is natural, because they have the advantage of fresh air as well as occupation

(Nottingham Borough Asylum, 1881, page 11, quoted by Parr, 2007, p. 542).

They also drew attention to the aesthetic qualities of the natural surroundings of the farm, and their ability to stimulate interest and conversation:

The healthy mental action which we try to evoke in a somewhat artificial manner, by furnishing the walls of the rooms in which the patients live, with artistic decoration, is naturally supplied by the farm. For one patient who will be stirred to rational reflection or conversation by such a thing as a picture, twenty of the ordinary inmates of asylums will be so stirred in connection with the prospects of the crops, the points of a horse, the illness of a cow, the lifting of the potatoes, the growth of the trees, the state of the fences, or the sale of the pigs

(Tuke, 1882, pp. 383-4).

In the mid-1950s, before the advent of antipsychotic medication, O'Reilly and Handforth (1955) noted the importance of social interaction and cohesion in a gardening group for patients with severe mental ill health (schizophrenia):

Whereas at first each patient went her own way, lost in her own fantasies, there has been a definite trend towards greater cohesion. Verbal and nonverbal forms of communication have increased (p. 764).

Nature appears not only to be pleasing but also a positive influence on well-being and generally desirable. This represents a starting point for much of the research on preference for different landscape types and the psychological effects of experiencing those environments. Whilst much of this work was conducted with people who had no disabilities or difficulties, such research formed the foundations for therapeutic interventions that emerged and evolved from the notions that natural environments and activities within them were 'healthy'. The work of Rachel and Stephen Kaplan

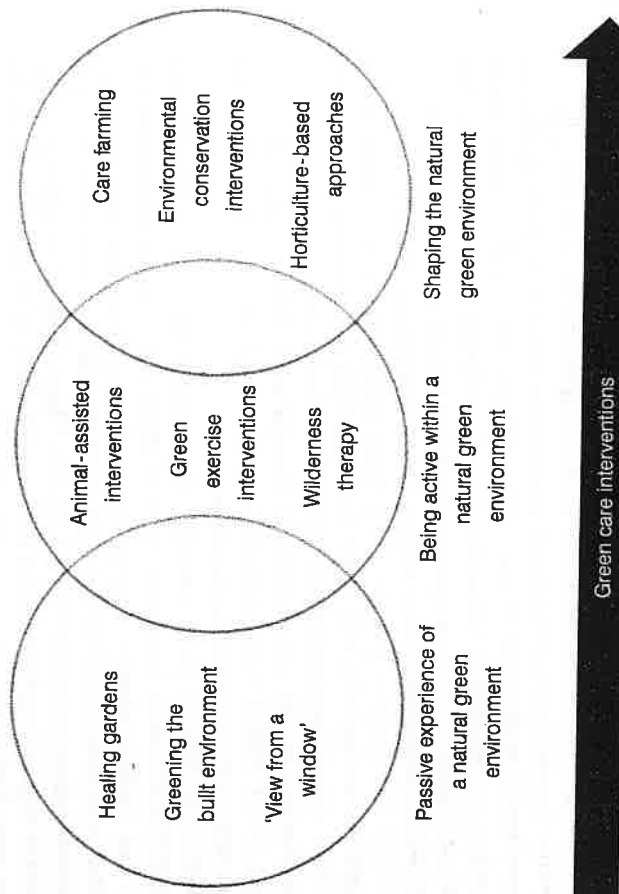


Figure 10.2 Green care approaches and ways of experiencing nature
Adapted from Fieldhouse and Sempik (2014)

(Kaplan and Kaplan, 1989; Kaplan, 1995) on Attention Restoration Theory and that of Roger Ulrich (Ulrich, 1984, 1991) on Psycho-evolutionary Theory (showing that volunteers recovered more speedily from stressful stimuli when they viewed images of nature) were influential in generating momentum for other research – particularly that around effectiveness; and were also instrumental in providing theoretical concepts that were used to explain nature-based approaches as forms of health and social care for vulnerable people.

In order to understand nature-based approaches for health and social care i.e. 'green care', it is useful to consider the different ways in which nature can be experienced. These are summarised in Figure 10.2.

Being in nature

Apart from providing opportunities for passive experiences, the natural environment also offers opportunities for physical activity – 'being active within a natural green environment'. There are many ways in which such physical activity can be taken, for example, through hiking, cycling, boating, climbing and many other pastimes. Whilst these can be recreational activities in which the general public participate, they can also be provided specifically for vulnerable individuals

and groups in the form of 'facilitated green exercise'. Research shows that people with mental health problems and learning difficulties are at a much greater risk of physical illness such as cardiovascular disease than the general population (Brown, 1997; Harris and Barraclough, 1998). Outdoor activities can help to reduce such risks through increasing the general level of physical activity and fitness.

The green environment adds to the therapeutic potential of the physical activity. We also know green exercise is effective in promoting psychological well-being (Barton et al., 2012) and is often more effective than exercise alone. Many GPs refer patients to regular exercise programmes in order to help treat conditions such as obesity and diabetes, but whilst some patients engage with these programmes, others drop out. Green exercise programmes offer the additional attraction of their natural settings and may, therefore, increase compliance (Bragg et al., 2013).

Green exercise uses the natural environment as a setting for a range of physical activities. In the course of that process, it inevitably has an influence on the shape of the environment – paths can become established, for example. Such impact is intentionally small and not detrimental – no more than that produced by any other recreational group. It is not the intended aim to shape or change the environment in which the activities take place. However, some green care approaches intentionally shape their environment.

Shaping the green natural environment

The creation of a garden shapes the environment; farming practices shape the environment; conservation interventions shape the environment. These are all examples of green care approaches that are intended to 'shape the natural green environment'. Such interventions use elements of the natural environment, plants and animals, as the fundamental materials for their activities.

The results of such activities, for example, ploughing patterns, garden boundaries, newly established woodlands, can have a profound and long term influence on the landscape and natural environment. It represents a partnership between green care participants and the natural environment. The notion of a partnership is important, it suggests a process of mutual benefit for the individual and the environment. This is the basic principle of *ecotherapy*. Green care interventions have sometimes also been called 'ecotherapy'. However, this is (partly) a misnomer. *Ecotherapy* is a well-developed set of principles and pedagogy stemming from Roszak's exploration of *ecopsychology* (Roszak et al., 1995; see also Pedretti-Burks, 2007, 2008). The principle of mutual benefit exists in most (if not all) green care projects but it is not always explicitly stated, and sometimes not recognised. Sustainable practices such as organic gardening, recycling schemes, wind-power and so on are evident in many projects, and participants (both clients and staff) are attracted to them for this reason (Sempik et al., 2005). The important element is that of nurturing – both individual animals and plants, and the whole ecosystem. The opportunity to nurture is a major theme that emerges

from the exploration of the therapeutic benefits of green care, for example, as illustrated in the following quote by a participant in a therapeutic horticulture programme: 'We not only nurture the plants, they nurture us as well' (Parkinson et al., 2011, p. 530).

The ways of interacting with nature described here are a general representation, and as can be seen in Figure 10.1, the areas overlap and boundaries become blurred. Some green care interventions straddle those boundaries because those interventions can be modified to suit different individuals with different needs. As seen above, a person can sit quietly in a garden or actively participate in horticulture.

Key elements of green care

One feature that distinguishes green care from casual recreation in the outdoors is its structured nature and defined aims and outcomes. For most people, structure is provided through employment which is the context for meaningful occupation, development of skills and status. Employment provides people with the means (financial and otherwise) of engaging with their community. It enables their social inclusion. Burchardt et al. (2002) have proposed that social inclusion contains four major elements – production, consumption, social interaction and political engagement. These elements are usually provided through employment. Indeed, research over many years has shown that employment provides more than just financial reward; people would still continue to work even if there was no financial need (Morse and Weiss, 1955; Vecchio, 1980). These 'latent benefits of employment' (Jahoda, 1979; Creed and Macintyre, 2001) had been termed *vitamins by Warr* (1987) and include time structure, opportunities for social interaction, the sense of status that a job and skill provide, common goals and activity. It is well known that loss of employment can lead to severe distress and mental health problems (see Royal College of Psychiatrists, 2008). Such vitamins, therefore, are essential for human health and well-being. However, many of those who participate in green care projects have lost structure and routine from their lives and are marginalised from society due to their illness or disability.

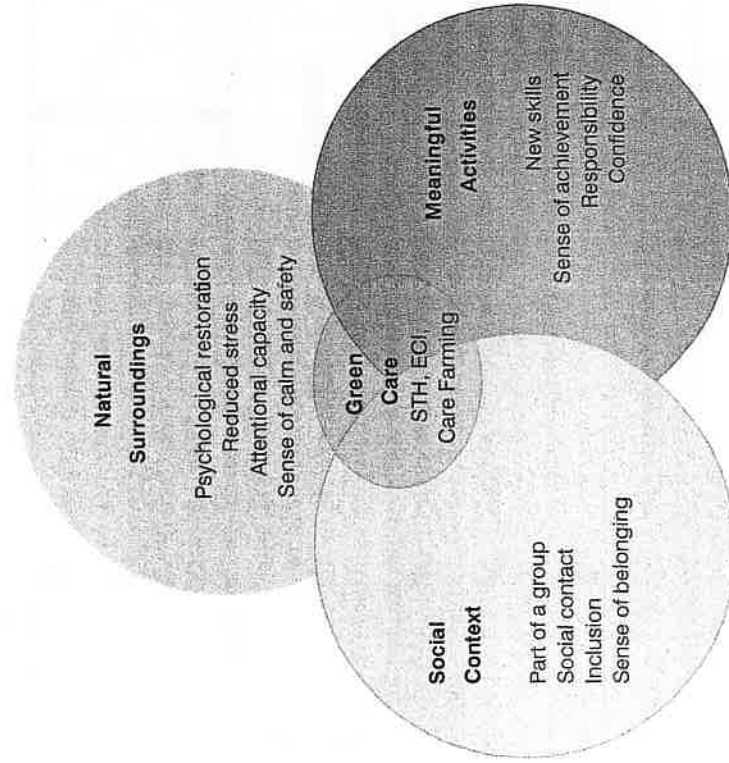
Green care projects give access to those latent benefits of employment for people who are excluded from them and it has been proposed that green care (in the form of social and therapeutic horticulture, care farming and environmental conservation) enables social inclusion (Sempik et al., 2005; Bragg et al., 2013; Bragg, 2014). Indeed, in the study of Sempik et al. (2005), one major theme was 'like employment but without the pressure'.

Historical reports have carefully documented the basic elements that characterise the more interactive forms of green care – meaningful occupation that can include physical activity, an outdoor environment that stimulates interest both in itself and its associated activities, and a social environment that promotes interaction and develops cohesion. These elements, in addition to the notion of mutual benefit discussed above, can be used to create a framework for green care. Furthermore, the mental health and well-being benefits from these

'hands-on' nature-based interventions, stem from the combination of the three key elements; i) the natural environment; ii) the meaningful activities; and iii) the social context, which characterise these green care approaches (Figure 10.3).

These elements of green care can be placed within an Occupational Therapy (OT) model such as the Person-Environment-Occupation-Performance (PEOP) created by Christiansen et al. (2005), and which has been used in the context of green care (Sempik et al., 2010, p. 54).

The model identifies factors relevant to occupational performance and participation and can therefore be used to target areas for therapeutic intervention. The model consists of four elements: the **Person** themselves with their inherent characteristics, strengths and weaknesses; the **Environment** which supplies the factors that support, enable or restrict a person in their activities, tasks and roles; **Occupation** which describes what people want or need to do in their daily living; and **Performance** i.e. the act of doing the occupation. The interaction of these elements determines a person's occupational performance and participation. The environment and the occupation can be adapted to facilitate



STH – Social and Therapeutic Horticulture; ECI – Environmental Conservation Interventions

Figure 10.3 The interaction of the three key elements within green care

a person's occupational performance and participation. Green care offers many opportunities for occupation (activities) to be tailored to suit a person's needs and abilities, and the natural and social environments provide the context and the stimulus for enhancing occupational performance and promoting participation.

The green care framework has also been mapped to the *Five Ways to Well-being* – a modern initiative developed by the New Economics Foundation and promoted by the National Health Service in the UK (Aked and Thompson, 2011; Bragg et al., 2013). The five ways are:

Connect, Be Active, Take Notice, Keep Learning, Give

Each of these steps could be interpreted through the green care framework shown in Figure 10.3. For example, the process of giving is important throughout green care: the process of mutual benefit to the participant and the environment, central to the principles of ecotherapy, is achieved through giving time and effort to nature, and by avoiding the short cuts and easy fixes of chemical remedies for simple garden problems; social cohesion is formed through the give and take of social interactions.

Developing structured interventions for individuals with a defined need

The previous section has touched upon two frameworks – that associated with employment in general, and that concerned with occupation (as distinct from employment) in a natural environment. These two come together in green care through organised and structured interventions. However, what distinguishes green care from casual recreation in the natural environment, and from nature-based health promotion projects, is not just the organisation and structure of the activities, but the presence of a trained practitioner who facilitates clients' interactions with the natural and social environments and who can set clinical aims and individual goals. The role of the practitioner has often been overlooked when examining the therapeutic effects of green care and instead the focus has been on the natural environment and the associated activities. However, some work has discussed the part that practitioners do play. For example, Elings (2012) has highlighted the relationship between care farmer and client, and compared it to the therapeutic interaction between other treatment providers and their clients.

The role of the therapist or practitioner is illustrated in Figure 10.4. It is important to note that the therapist also interacts with natural and social environments and benefits from such interactions, not only from the 'latent benefits' of their employment but also from participating in green care. They are engaged in the same tasks as the clients and in the same settings, and in some circumstances, for example, in the case of care farming which often takes place in a productive farm, they are working towards the same goals – i.e. running an agricultural enterprise.

It is not uncommon for clients in green care projects to progress to be helpers as their conditions improve, and some may train to become therapists. Often it

Green care – a guided process

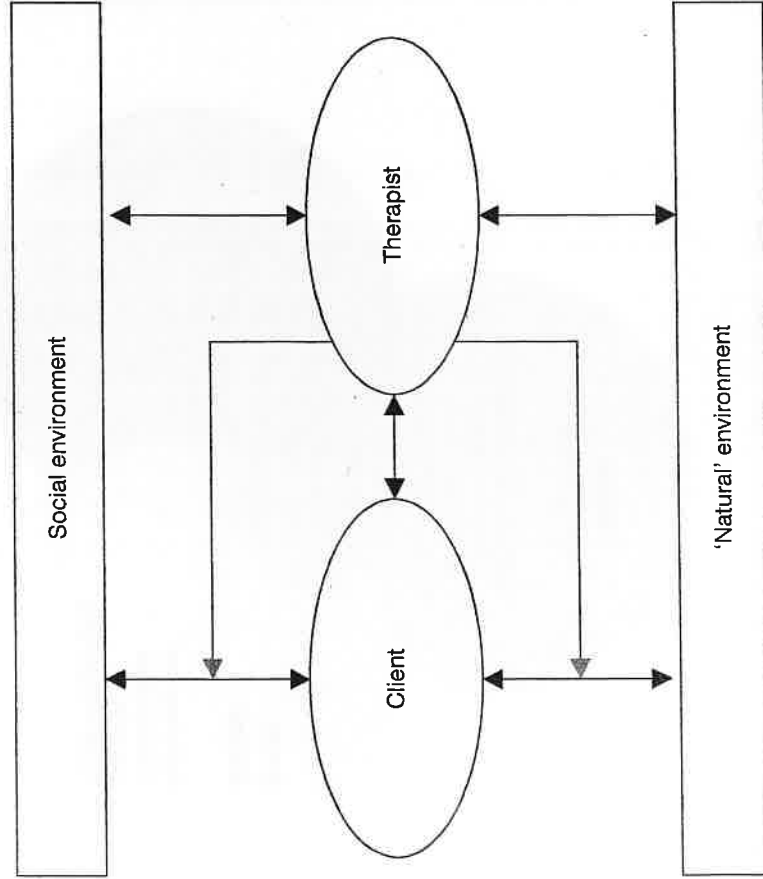


Figure 10.4 The role of the therapist in green care

is difficult to distinguish between clients and helpers (Sempik et al., 2005, pp. 39–43) adding to the general ethos of social inclusion, where the therapists and clients form part of the social environment in green care. Green care projects are often integrated within their local communities and interact with them through, for example, sales of produce or provision of facilities for visitors such as cafés.

Using nature within green care interventions

The preceding sections have laid out the basic structure of green care. It can be seen that it has the potential to improve mental well-being and to enable physical activity in those whose illness, disability, lifestyle or financial means may preclude them from other forms of exercise and recreation. Through the opportunities for

meaningful occupation and development of transferrable skills, it addresses the overall functioning of individuals and helps them to interact with the social and natural environments not only of the green care project, but with those in the wider community. Hence, its wide range of indications – green care can improve the lives of people with many different conditions and disabilities. Indeed, it has been used for most if not all vulnerable groups and individuals. By promoting general physical and mental well-being, and creating order and structure for people who may have chaotic lives, it has the potential to reduce the symptoms of conditions such as depression. For example, therapeutic horticulture and care farming have been shown to reduce depression scores in patients with clinical depression (Gonzalez et al., 2009, 2010; Kam and Sui, 2010; Pederson et al., 2011).

Using the frameworks and components above, it is possible to create green care interventions in many different settings (see also: Sempik and Bragg, 2013; Bragg, 2014) and to adapt activities to suit all vulnerable people. The development of interventions has also been subjected to local influences, contexts and resources. Their application and use has also been influenced by local effects. Sometimes the nature of those influences is clear. For example, the use of wilderness in therapy has been developed in the US where there is access to such areas, but is not widely available in Europe.

At other times the local drivers of a particular intervention may not be so obvious. Care farming developed mostly in mainland Europe, it only later became established in the UK even though the UK already had a history of farms and market gardens within its hospitals and asylums. Horticultural therapy was developed in the US in the 1950s and 1960s and quickly spread to the UK in the 1970s but was slower to be used in Europe. Such differential adoption and use of green care interventions may have helped to identify some specific indications for particular approaches. Certain practices have found favour with specific groups or have been found to be useful with people who have particular conditions.

For example, wilderness therapy has been found to be effective for adolescents who have behavioural problems (Wilson and Lipsey, 2000; Williams, 2000). Being in the wilderness gives troubled young people the opportunity to be away from their home environment and to confront personal challenges; it gives them time for reflection. In the UK, both wilderness therapy and care farming have been found to play a similar role for such young people (Hine et al., 2008a; Peacock et al., 2008; Bragg et al., 2013). This does not mean the wilderness therapy and care farming are only useful for young people with behavioural problems but that it represents a good choice of intervention for this group.

Other approaches, such as social and therapeutic horticulture (STH), have been found to have a more generic applicability. This is because they can be used in many different settings, for example, STH can be practised in gardens, allotments and even indoors. It can take place in different contexts such as hospital occupational therapy units, secure units, and projects run by voluntary organisations; and its activities can be adapted to suit a wide range of disabilities. An STH session for people with mental health problems or learning difficulties

can last for most of the day and take place outdoors, but a session for people with dementia may last only an hour or less and take place indoors, in a residential home or even a secure unit.

Table 10.1 summarises the key client groups of a range of green care interventions. This does not mean the green care is not used with the other groups but the intention is to present an overall picture as to where green care is used in general.

Building the evidence base for green care

The theoretical basis for green care discussed above shows that it may have a range of different effects for different individuals. It is common for mixed client groups, for example, those with mental health problems and those with learning difficulties, to share green care sessions. In terms of practice, this endows green care with great versatility. However, in terms of research it creates some difficulties, especially when such work tries to position itself within a medical literature that sets great store by clearly-defined interventions and homogeneous study populations. Hence, much early work was descriptive or used very small groups. Nonetheless, evidence of effectiveness has continued to emerge since the historical reports and early case studies quoted above. In a 2003 review of social and therapeutic horticulture, Sempik et al. (2003) concluded the following:

The data presented in this literature review provide evidence for the effectiveness of horticulture and gardening in a number of different therapeutic settings. Experimental evidence from environmental psychology also supports a theoretical framework for therapeutic horticulture. Even though this evidence does exist there is a need for more research and the authors of this review acknowledge the observations of previous writers who have highlighted the scant amount of 'hard evidence' that exists in support of therapeutic horticulture (p.47).

Since 2003, the evidence base has continued to grow and many green care interventions have been researched using a wide variety of research methods. This has enabled some researchers and practitioners to define their 'offer' – what the intervention is, what the indications are, and to list the evidence that supports their claims (see Bragg et al., 2014).

New researchers have also entered the field and brought new methods and approaches. For example, studies have been conducted using randomised (cluster randomisation) approaches (Jarrott and Gigliotti, 2010) and some physiological measures have also been used in this context including measurement of cortisol and heart rate variability (Lee, 2010) and brain imaging (Mizuno-Matsumoto et al., 2008), showing that sophisticated and modern methodology can be applied to research on green care. However, few studies have been conducted using comparative (control) groups, notable exceptions being the work of Christina Gigliotti and Shannon Jarrott on the use of therapeutic horticulture in dementia

Green care intervention									
Table 10.1 Key client groups of a range of green care interventions									
Key client group	Care farming: many different types of farms, and a range of levels of agricultural productivity	Horticulture: includes horticultural therapy; Social and Therapeutic Horticulture; and Garden Therapy	Environmental Conservation interventions: a wide range of settings and activities including:	'Green Gyms'	Green Exercise: a wide range of settings and activities	Animal Assisted Interventions: includes Animal-assisted Therapy, Equine-assisted Therapy and Riding	Wilderness Therapy: includes Outward Bound programmes and adventure-based learning		
Young people	✓	✓	✓	✓	✓	✓	✓	✓	✓
Adults	✓	✓	✓	✓	✓	✓	✓	✓	✓
Older people	✓	✓		✓	✓	✓		✓	
Mental health problems	✓	✓	✓	✓	✓	✓	✓	✓	✓
PTSD and stress-related	✓	✓			✓		✓	✓	✓
Drug and alcohol problems	✓	✓			✓		✓	✓	✓
Social difficulties (e.g. long term unemployed)	✓	✓	✓		✓			✓	✓
Behavioural difficulties	✓	✓				✓		✓	✓
Learning disabilities	✓	✓			✓			✓	✓
Physical disabilities	✓	✓	✓	✓	✓			✓	✓
At risk of physical disease (e.g. obesity)	✓	✓	✓		✓			✓	✓
Dementia	✓	✓			✓			✓	✓

(Jarrott and Gigliotti, 2010, 2011); that of Kam and Sui on the use of care farming in schizophrenia (Kam and Sui, 2010); and Pederson's research on the use of care farming in clinical depression (Pederson et al., 2011, 2012a,b).

There are inherent difficulties in studying green care approaches. They are complex interventions which can be difficult to define and standardise between study sites. Even on the same site different individuals may well be allotted, or choose, different tasks and settings; the client population is highly heterogeneous, making it difficult to assemble a homogeneous sample with the same condition or difficulty; and there is generally a slow turnover of clients which has an impact on recruitment of participants (for an exploration of methodology in therapeutic horticulture, see Sempik, 2007). But new research is being conducted and published. Academic study is taking place with doctoral level research on green care in a number of different universities utilising a range of approaches and client groups.

The published research on green care is now sufficiently large and reliable for it to be subjected to systematic review. Annerstedt and Wahrborg (2011) analysed 35 studies and concluded:

This [systematic] review gives at hand that a rather small but reliable evidence base supports the effectiveness and appropriateness of NAT [nature-assisted therapy] as a relevant resource for public health. Significant improvements were found for varied outcomes in diverse diagnoses, spanning from obesity to schizophrenia. These findings highlight the importance of considering nature as an important resource in mental and public health care and the value of putting further efforts into research of this subject (p. 15).

Whilst the evidence for green care continues to grow, in terms of controlled and randomised trials, the quality of the research does not match that of many medical interventions. In the past, some researchers have argued for a more 'medicalised' approach to nature-based research (see, for example, Frumkin, 2004) with randomised controlled trials (RCTs) and standardised interventions. However, as discussed above, green care is a set of complex interventions that can vary widely between individuals on the same programme. There may be a need to re-evaluate the research paradigm in this area to establish what are the most appropriate (and achievable) methodologies, considering that green care has already become established as a form of social care.

'Standards of Evidence' as proposed by Puttick and Ludlow (2013) may be helpful in this respect and are represented in Figure 10.5. Level 1 is the minimum standard, representing a low threshold and appropriate to interventions in their early stages. As data are collected, there is a progression through the levels, demonstrating causality and external validation. Finally, at level 5, there is demonstrable evidence that the service can be delivered at multiple locations and still produce a strong, positive impact. With regards to green care, we need to decide what approaches and methods we need to take us to the final level of evidence.

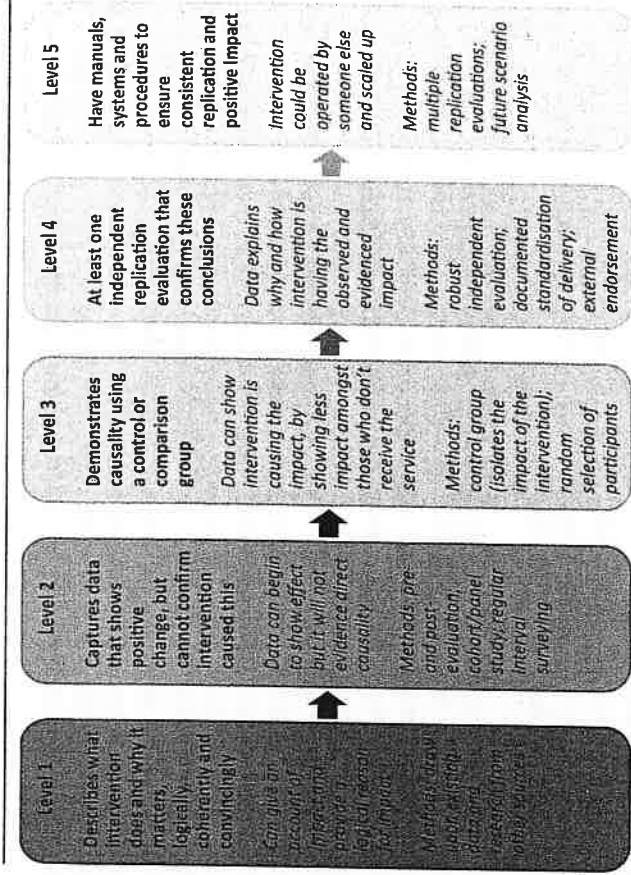


Figure 10.5 Standards of Evidence

Source: Bragg and Atkins (2016) adapted from Puttick and Ludlow (2012)

Conclusions

There is a long history of the use of nature as a treatment and as a therapeutic setting for people with a range of illnesses and conditions, and there is much modern research linking the natural environment with positive outcomes in terms of health and well-being. Both this tradition of the use of nature as a therapeutic medium and the findings from that research support the continuing use of green care interventions based around natural settings and the use of elements of nature. Additionally, there has been research into specific green care interventions which has shown that they are effective for a range of individuals with a wide range of difficulties and problems. The evidence base is steadily growing and green care interventions are finding their way into mainstream social care and medical practice. However, the complex character of green care interventions presents many challenges to researchers. Many of the methods and approaches used in conventional medical research, such as randomised controlled trials are difficult to apply in the context of green care. There is a need to take stock of the evidence base, and to establish the best pathways in terms of research and methodology that will lead to the next level of evidence and the wider use of green care.