



What makes nature-based interventions for mental health successful?

Dan Bloomfield

NERC Knowledge Exchange Fellow in Environment and Health, University of Exeter, UK, email d.bloomfield@exeter.ac.uk

Declaration of interest. The author manages the 'A Dose of Nature' project online. He has a background in: psychotherapy; knowledge exchange between researchers and the environmental and health sectors; ecology; and public engagement in science.

Nature-based interventions for mental health are beginning to become more common in the UK. The evidence for their usefulness is building. Taking the 'A Dose of Nature' project in the south-west as an example, factors for making such interventions a success are described.

Throughout the UK there is increasing interest in the relationship between natural outdoor spaces and human health and well-being (Bragg & Leck, 2017). Some of this work involves using nature as the setting for health interventions, for example outdoor exercise programmes. Other initiatives position nature explicitly as the source of betterment, for example ecotherapy programmes. In all examples, nature is understood to hold therapeutic potential, and the relationship between experiencing nature and being healthier is the focus.

In particular, there has been a surge of interest in nature-based interventions for mental health problems, as there is now strong evidence that people with good access to natural environments are more likely to have better mental well-being (Mitchell *et al.*, 2015; Lovell, 2016).

While many countries have inadequate community mental healthcare provision, the resources needed for nature-based interventions for mental health can be found in every country. The potential opportunities for capitalising on this service delivery model are vast. This paper: outlines the evidence for nature-based interventions for mental health and well-being; describes how one service, 'A Dose of Nature', was developed and delivered; considers likely patient benefits from this sort of intervention; and outlines key challenges and factors that ensure success.

Evidence summary

Broadly, the evidence for a link between mental health and engagement *with*, access *to* and interventions *within* nature is substantial; the findings are of variable reliability but there is a consistent positive trend (Lovell, 2016). Some of the most robust evidence relates to general well-being, such as the evaluation of the UK's Walking for Health programme (Marselle *et al.*, 2014). These gains in well-being may accrue via improvements in the following factors: affect and cognition (Bratman *et al.*, 2015); mood (van den Berg *et al.*, 2003); attention, anger, fatigue and sadness (Bowler *et al.*, 2010; Thompson Coon *et al.*, 2011).

Evidence for specific mental health conditions is less extensive, although there are studies showing a positive impact of being in natural environments

upon depression (Berman *et al.*, 2008), anxiety (van den Berg & Clusters, 2011) and, by improving concentration, upon attention-deficit hyperactivity disorder (van den Berg & van den Berg, 2011).

What has been missing from these accounts to date are detailed case studies of nature-based interventions, to shed light upon questions concerning dose, replicability (at scale and in different environments), access, cost-effectiveness, and the potential to address mental health inequalities. These are complex issues, and A Dose of Nature was set up to begin the process of providing the kind of service that can support such studies.

A Dose of Nature

From spring 2015 to autumn 2016, eight different nature-based interventions for health and well-being were run in Bristol, Exeter and locations throughout Cornwall, all in the south-west of the UK. The work began with a lengthy process of engagement with doctors, mental health professionals, patients, environmental managers and those able to run interventions. It allowed for a model to slowly emerge of what kind of nature-based intervention was both practicable and attractive to all.

The interventions had common features. Each was a partnership between health staff working in primary care (mostly doctors in general practice, as well as practice nurses), local organisations owning and/or managing natural assets, and practitioners able to run the intervention itself. The interventions ran for 12 weeks and involved small groups of participants (typically four to ten). Each weekly session was 2–3 hours long. Simple well-being questionnaires were completed before and after the course. The time was spent outside, in places defined as rich in natural beauty and/or biodiversity. The courses were free to participants.

The majority of participants were referred to the courses, but some groups also included self-referred participants. While all of the groups involved some sort of physical activity and some sort of activity focusing on engaging with natural phenomena, this allowed for a variations in the details of delivery. Some groups focused on walking, while some had a silent or meditative element. Some involved conservation, such as managing woods. Another major source of difference within the overall programme was the natural environment itself, which inevitably varies across locations. Some were based in woodland areas, some in coastal zones, some in areas of countryside dominated by agriculture and others in greenspace in and around urban settlements.

At the beginning of the programme the general objective, following the logic of knowledge exchange work, was to increase interest in the topic in all relevant groups, and to build capacity in the system to support further work and identify subsequent research questions. As a result, at first, no specific mental health diagnosis was the focus of the work; doctors were able to make a referral simply because they felt that such an activity would be good for that individual. At this stage, it was not yet the intention to replace existing clinical care options (e.g. the prescription of antidepressants or a referral to community mental health services), but only to increase choice, for both patients and referrers. As the project developed, the referral process tightened to focus on patients with a diagnosis of mild to moderate depression and/or anxiety. In the final patient cohorts, all referrals were based on a diagnosis of depression, from mild to severe (i.e. referrals from both primary care and clinical psychiatrists within secondary care).

Benefits

The impacts on patient-participants involved in A Dose of Nature have been numerous. These include mental health gains as well as social and financial benefits. The project has seen 64 patient referrals, from which have resulted:

- 48 patients completing a programme of 10–12 weeks
- an average cost per patient of £317.33
- an average increase of 69% in self-reported well-being (using the Warwick and Edinburgh Mental Well-Being Scale)
- two new self-organised support groups
- at least four patients signing up for further training and/or volunteering activities
- at least two patients reducing, or expecting to reduce, prescribed medicines.

We have measured considerable improvements in mental well-being. Patients have described improvements in mood and reductions in anxiety. Typical statements from service users were as follows:

It's been a fantastic experience for me and I do hope in the future that instead of being a pilot scheme this will go on to become a more permanent thing. (Patient, Stennack Health Centre)

I suffer with mental health issues and it has helped me enormously; it's kind of like a breath of fresh air in a way. You see things differently and you forget your worries for the day, which is good. Talking to others who have gone through similar experiences such as myself has also helped me very much with my mental health. All round it's been a definite benefit. (Patient, Bodriggy Surgery)

Participants have also reported improvements in their social skills: greater confidence in social settings; improved sense of individual worth and of agency; learning new skills and knowledge; and the formation of new friendships. Clearly, the social dimension of a nature-based intervention group is

important in terms of group dynamics and thus in terms of effect upon outcomes. A question for the future is to what extent the social, as opposed to the natural environmental, dimension can be teased out and examined in terms of intervention efficacy. In the meantime, however, it should be noted that with this kind of intervention, a 'social prescription', benefits can deepen over time; for example, a number of self-organised groups have continued to meet after the 12-week 'official' intervention ended.

Referrers have also responded positively to the pilots; all 12 of the referrers into the scheme stated that they saw benefits to their patients and wished to continue to be able to send people to the service, or a similar extension.

Case studies have shown that participating in a nature-based intervention can result in personal financial gains, both from avoiding costs (e.g. for prescriptions) and from entering the employment market (Vardakoulias, 2013). The experience of A Dose of Nature seems to bear this out, as participants have gained new skills, taken up voluntary positions and expressed confidence in being able to reduce their medication in due course.

As well as individual patient benefits, it is worth considering the larger potential impact on health economics. The cost of mental health problems in the UK is estimated at £70–£100 billion per annum, or 4.5% of gross domestic product (Bowler *et al*, 2010). Although the analysis for A Dose of Nature has not been carried out, Mind's 'Ecominds' programme – a more extensive programme of similar and varied nature-based interventions – resulted in an average saving per participant of £7082, via reduced costs to the National Health Service, benefits reductions and increased tax contributions (Vardakoulias, 2013).

Key factors in developing successful nature-based interventions

The experience of developing and delivering A Dose of Nature has identified a number of key factors affecting success.

Engagement

Unless all key groups are brought together to discuss the intervention at an early stage, then the work will likely fail. All participants – patients, doctors, those running the groups and those owning and managing the land that is being used for this purpose – must have confidence in the programme and in each other. This takes time. It requires a coordinator who is able to speak (at least) two different 'languages': the language of healthcare and practice; and the language of nature and environmental engagement.

Flexibility

The issue of language is important because as the project develops it is necessary to jointly co-design, co-own and co-deliver the intervention. Health professionals are liable to see the work largely or wholly in terms of health benefit to patients and

reduced health costs. There is an inherent risk of devaluing the work if this happens. Similarly, conservation or environmental management partners might see the work only in terms of potential ecological gain, or even as a way of boosting their income. Again, this can derail the project. It is important to identify mutual benefits, questions that both sides of the equation are interested in answering, and practical solutions that meet everyone's needs (e.g. timings, activities, dates, bad-weather options and transportation).

Managing the introduction

How does one best take a patient from a clinical setting to a non-clinical, social one? How does one minimise the rate at which patients fail to engage, or fail to complete the course? The initial referral, the introduction to the idea, is vital. Designing a nature-based intervention requires a lot of thought about the words and images used in printed material, whether the intervention organiser will contact the patient directly or not, and whether a third-party referral coordinator will be used. The aim should be to put the patient-participant at the heart of this process, so that it is clear from the start that the work is focused on meeting their needs.

At the same time, there is a risk that patients expecting traditional medical treatment might feel they are being offered something that is a cheaper, second-best alternative; the referral process needs to emphasise that a nature-based intervention – or any form of social prescription – is a high-quality option, run by professionals with adequate training and oversight, but that it is additional to, not instead of, clinical care. A social prescription is not a clinical intervention.

Practitioner skills

People leading nature-on-referral schemes need: to be able to explain, describe or otherwise animate nature so that it is made relevant and engaging to participants; to be able to manage simple group dynamics; and to pass a set of locally determined criteria (typically including insurance, driving skills, criminal background checks and first-aid certification).

The interventions are run by local groups rooted in the community, delivering non-clinical work. Advanced psychological or nursing backgrounds are not necessary: practitioners come from a variety of backgrounds – clinical but also psychotherapy, education or community engagement.

Timings

For some of the A Dose of Nature interventions, participants had to wait until a sufficient number had been referred to form a group, and this could mean waiting times of up to 6 weeks. Other groups used a rolling model, with participants able to join and leave at different times. The choice of format was up to the practitioners, the referrer and the patients, but it can be noted that season

and weather were largely irrelevant factors. In fact, some patients reported the greatest positive impact against feelings of depression as occurring during poor weather as the winter season became more advanced.

Applicability

As has already been said, the key ingredients for nature-based interventions are common: a health system that is struggling under the burden of mental ill-health; a local natural environment of some description (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 depression being a global pandemic, and with some form of 'green' or natural space being accessible even in the world's biggest cities, at the very least the potential of such an approach is worth exploring internationally.

Next steps

The work done in A Dose of Nature is being carried forwards in two different but related ways. First, it will help inform an ongoing realist review (Husk *et al.*, 2016). This is a type of systematic review that will look at the different ways in which referrals occur within social prescribing initiatives, and at what works, for whom and in what circumstances. As nature-based interventions develop, this is an important area to address for the whole process to be successful.

Second, the author is currently working with Cornwall Council, alongside the local Health and Well-Being Board, the Local Nature Partnership and the Local Economic Partnership, to deliver a project (funded by the Natural Environment Research Council) that seeks to expand and standardise the referral of patients to nature-based interventions, and make them available across the entire county. More information can be found at <http://www.adoseofnature.net>.

References

- Berman, M. G., Jonides, J. & Kaplan, S. (2008) The cognitive benefits of interacting with nature. *Psychological Science*, 19, 1207–1212.
- Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., *et al.* (2010) A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health*, 10, 456.
- Bragg, R. & Leck, C. (2017) *Good Practice in Social Prescribing for Mental Health: The Role of Nature-Based Interventions*. Natural England Commissioned Reports, Number 228. Available at <http://publications.naturalengland.org.uk/publication/5134438692814848> (last accessed September 2017).
- Bratman, G., Daily, G., Levy, B., *et al.* (2015) The benefits of nature experience: improved affect and cognition. *Landscape and Urban Planning*, 138, 41–50.
- Husk, K., Blockley, B., Lovell, R., *et al.* (2016) What approaches to social prescribing work, for whom, and in what circumstances? A protocol for a realist review. PROSPERO 2016:CRD42016039491. Available at http://www.crd.york.ac.uk/PROSPERO/display_record.asp?ID=CRD42016039491 (last accessed September 2017).



Lovell, R. (2016) Links between natural environments and mental health: evidence briefing (EIN018). Natural England. Available at <http://publications.naturalengland.org.uk/publication/5748047200387072?category=6159558569361408> (last accessed September 2017).

Marselle, M., Irvine, K. & Warber, S. (2014) Examining group walks in nature and multiple aspects of well-being: a large-scale study. *Ecopyschology*, 6, 134–147.

Mitchell, R. J., Richardson, E. A., Shortt, N. K., *et al* (2015) Neighborhood environments and socioeconomic inequalities in mental well-being. *American Journal of Preventive Medicine*, 49, 80–88.

Thompson Coon, J., Boddy, K., Stein, K., *et al* (2011) Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environmental Science and Technology*, 45, 1761–1772.

van den Berg, A. & Clusters, M. (2011) Gardening promotes neuroendocrine and affective restoration from stress. *Journal of Health Psychology*, 16, 3–11.

van den Berg, A. & van den Berg, C. (2011) A comparison of children with ADHD in a natural and built setting. *Child: Care, Health and Development*, 37, 430–439.

van den Berg, A., Koole, S. & van der Wulp, N. (2003) Environmental preference and restoration: (how) are they related? *Journal of Environmental Psychology*, 23, 135–146.

Vardakoulis, O. (2013) *The Economic Benefits of Ecominds: A Case Study Approach*. NEF Consulting. Available at <https://www.mind.org.uk/media/338566/The-Economic-Benefits-of-Ecominds-report.pdf> (last accessed September 2017).

Feel blue, touch green: examples of green spaces promoting mental health

Claire Henderson-Wilson¹ and Rona Weerasuriya²

¹School of Health and Social Development, Deakin University, Burwood, Australia, email claire.henderson-wilson@deakin.edu.au

²School of Health and Social Development, Deakin University, Burwood, Australia

The design of hospital environments with an increased focus on incorporating nature and natural features has been reported to have multiple health and well-being benefits. This paper reports on three Australian case studies that each investigated the relationship between green spaces and people's mental health. The results suggest that gardens or other green spaces should be included within plans for future healthcare design. While we acknowledge that there are a range of considerations in the allocation of healthcare resources and programmes for maximum benefit, we believe that those programmes which highlight the beneficial outcomes for people with mental illness of 'feeling blue and touching green' are worth implementing.

There is strong historical evidence, dating back to the early civilisations in China, Greece and Persia, to support the idea that contact with nature, through viewing or being in landscapes with vegetation, water and other natural features, relieves stress and provides human health benefits (Velarde *et al*, 2007). In Europe, the earliest hospitals were typically located in monasteries, which had cloistered gardens and provided a peaceful and calming environment for patients (Velarde *et al*, 2007).

The design of hospital environments with an increased focus on incorporating nature and natural features has been reported to have multiple health and well-being benefits for users. For example, research indicates that patients have increased levels of social functioning, self-mastery and sense of coherence, and a significant reduction in symptoms of anxiety and depression as a result

of participating in both active and passive therapeutic activities carried out in gardens (Corazon *et al*, 2010). Additionally, research has shown that living close to green spaces significantly mediates individual resilience and life coping skills (van den Berg *et al*, 2010). Other international evidence demonstrates a strong connection between time spent in green spaces and people's enhanced mental health and well-being (Townsend *et al*, 2015).

This paper reports on three small-scale Australian studies that each investigated the relationship between green spaces and people's mental health. All studies received university ethics approval and were conducted in accordance with ethical research guidelines. Given the qualitative design of the studies, they had small sample sizes, so the findings cannot be generalised to the wider population.

Case study 1. Perceptions of contact with nature in relation to mental health

The study, commissioned by the South Australian Department of Environment, Water and Natural Resources, explored people's perceptions of 'nature' and how it affects their well-being and the use of state-managed parks as a vehicle for facilitating this relationship.

Face-to-face semi-structured interviews were undertaken with 14 park users and 14 non-users of parks. Opportunistic sampling was used to recruit participants in two different parks/open space areas within the Adelaide area for the park-user interviews. A similar approach was used to recruit participants in a shopping centre close to the selected park areas for the non-user interviews. Interviews were recorded and transcribed prior to data analysis. Both thematic and 'rich point