Nature-based interventions - State of the art and future research

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State of the art

• *Evidence* from eleven recent systematic research reviews with clear inclusion and exclusion criteria, as well as some adjacent studies that are missing in the reviews

• *Theories* regarding Nature Based Interventions
NBI – reviews, regarding the function in general

- Annerstedt M, Währborg P. 2011: **does any kind of NBI have any effect on any health outcome?** Jang et al 2010 Meta analysis of HT effect. Kamioka et al 2014; RCT studies of HT:

- Positive results regarding mental disorders (depression, anxiety, PTSD, schizophrenia, ADHD); social problems (substance abuse, antisocial behavior); somatic diseases (heart failure, stroke); intellectual capacity (cognitive impairment). **Effect size=0.71**, higher regarding children (especially, special needs) and elderly people (especially dementia). Best group size, about 5 participants, with 21-30 sessions or 31+ sessions. Cognitive capacity, social problems, effects on physical capacity and emotional stability.

NBI - mental disorders

• Significant decrease in depression and anxiety (not in control group) and increase in attentional capacity and self-esteem

• In addition, better psychological well-being, lower stress-levels, higher coping capacity, better sleep quality, less agitation and better social behavior

• Positive results regarding dementia: affect and engagement

NBI for elderly people

• Promotes overall health; QoL, physical capacity, cognitive ability and socialization.

• Lower stress hormones, and depression, improved gross motor capacity, cognitive capacity, language and ADL functions. Depended on professionalism of therapists.

• Dementia: Higher emotional health, perceived self-identity and levels of engagement

Animal assisted interventions and care farming


• Gorman R, Cacciatore J. Cultivating our humanity: A systematic review of care farming & traumatic grief. *Health Place*. 2017 Sep;47:12-21
Animal assisted interventions and care farming: Results

• Most evidence regarding “Mental and behavioral disorders”. Types of animal intervention were dog, cat, dolphin, bird, cow, rabbit, ferret, and guinea pig. In a study environment limited to the people who like animals, AAT may be an effective treatment for mental and behavioral disorders such as depression, schizophrenia, and alcohol/drug addictions, and is based on a holistic approach through interaction with animals in nature.

• Favorable effects on clinical status (eg depression) but conflicting effects regarding rehabilitative effects (functioning and quality of life).
What is actually described and discussed? Gaps to fill for translational research: from basic research to praxis

1. Good definition of NBIs and the aim of the intervention; a clear hypothesis
2. Adequate description of the intervention: the intervention quality, including the place and its characteristics, activities and - in some cases - companion animals. Ne
3. Description of the intervention dose
4. Adequate description of research methodology (RCT, cohort study, qualitative interview): participants included and excluded (e.g. ICD diagnosis), randomization (if used), outcomes (validated protocols), cohort studies, registers, ethics
5. Description of adverse effects (e.g., allergy, infection) and withdrawals
6. Description of costs; health economics
7. Transferring the method to regular use
The Black Box

What is the “black box” - the intervention?
First: How should it be defined and named: The big umbrella and how the different parts connect to it: HT, AAT, NAI, wilderness therapy....
Second: What is included in the intervention?

- What is nature in NAI? A primeval forest, wood, urban park, big garden, small garden, or a rose in a flowerpot?
- Which animals are best? A horse, cow, sheep, dog, rat, chicken, wild animals, wild birds?
- Activities associated with NBI?
- Which necessary characteristics of the companion animal, the garden or the natural environment are needed, in order for a therapeutic activity to take place for a particular target group of patients?
- Professional therapists or not? Which therapists are needed? OT, PT, psychologists? Or special NBI-therapists? Or any therapists at all?
Theories

- Attention Restoration Theory, Kaplan & Kaplan, about the best settings for restoring cognitive capacity
- Psycho-Evoutionary Theory, Ulrich, about recovery from high levels of stress: Biophobia – biophilia
- Physical activity, reward system, dopamine
- Daylight, cortisol and melatonin, vitamin D
- Subliminal perception and priming facilitation; parallel thinking in multi-tasking (planning, routines, reflexes etc.)
- Enriched environments, affecting all fifteen senses, muscles, hormones, heart, stomach etc.; and restoring people's physical as well as mental energy and resources
- All of the above are about - supportive environments: physical environments (eg natural environments), social environments (eg fellow patients, therapists, companion animals), cultural environments (eg activities, values, languages)
Immunology

• Shinrin yoku – forest bathing, aromatherapy, forest air with phytoncides, activating NK cells

RCT-study in Alnarp

• Immune system (cytokines: Interleukin-2, Interferon-gamma). Intervention group was significantly affected regarding levels of the immune system, stabilizing the immune system. Important regarding too high (autoimmune disorders) as well as too low levels.

• IFN-gamma, killing virus, activating NK and NKT-cells, cytotoxic T-cells and immunoglobulin. Differences between intervention and control (p < 0.01)

• Interleukin 2, affecting all of the immune system, especially lymphocytes (p < 0.05).
Rehabilitation potential
Stress-related symptoms

Palsdottir, Grahn, Persson 2013 "Changes in …" Scand J Occ Ther online

**SCI-93**

- **Baseline**: 70
- **Follow-up**: 50

![Graph showing changes in SCI-93 scores from baseline to follow-up](chart.png)
Stress-related symptoms

SMBQ

Baseline  Follow up1  Follow up2  Follow up3
Function

OSA - F

Baseline | Follow up1 | Follow up2 | Follow up3
---------|-----------|-----------|-----------
         |           |           |           

Return to work

Baseline Follow up

- Job training
- Part time
- Full time
Dose-effect, percent return to work
Reduced costs for primary care, one year after intervention
Reduced costs for beddays in psychiatric care, one year after intervention
Alnarps Rehabiliteringsträdgård