

Record: 1

Title: Changes in experienced value of everyday occupations after nature-based vocational rehabilitation.

Authors: Pálsdóttir, Anna María¹ (AUTHOR)
anna.maria.palsdottir@slu.se
Grahm, Patrik¹ (AUTHOR)
Persson, Dennis² (AUTHOR)

Source: Scandinavian Journal of Occupational Therapy. Jan2014, Vol. 21 Issue 1, p58-68. 11p.

Document Type: Article

Subject Terms: *JOB stress
*VOCATIONAL rehabilitation
*EMPLOYMENT reentry
*HEALTH care teams
*HORTICULTURE
*INTERVIEWING
*LONGITUDINAL method
*RESEARCH methodology
*QUESTIONNAIRES
*RESEARCH funding
*STATISTICS
*EVIDENCE-based medicine
*PROFESSIONAL practice
*DATA analysis
*VISUAL analog scale
*MAXIMUM likelihood statistics
*DATA analysis software
*DESCRIPTIVE statistics
*METHODOLOGY

Author-Supplied Keywords: Evidence-based health design
flow
horticulture therapy
stress-related mental illness
supportive environments

NAICS/Industry Codes: 561730 Landscaping Services
624310 Vocational Rehabilitation Services

Abstract: Objective: The aim of this study was to describe and assess changes in participants' experiences of everyday occupations after nature-based vocational rehabilitation (NBVR), to assess

changes regarding symptoms of severe stress and the rate of return to work and possible association with experiencing the occupational value of everyday occupations. Methods: The NBVR was carried out by a transdisciplinary rehabilitation team and took place in a specially designed rehabilitation garden. The study had a longitudinal and mixed-method approach. Data concerning experiences of everyday occupations (Oval-pd), self-assessed occupational competence (OSA-F), health status (EQ-VAS, SCI-93), and sense of coherence (SOC-13) were collected before and after the intervention, and a one-year follow-up was carried out regarding returning to work. Semi-structured interviews were performed 12 weeks after the intervention. Results: Significant changes were measured regarding perceived occupational values in daily life, symptoms of severe stress, and returning to work. Both the return to work rate and symptoms of severe stress were significantly associated with changed experience of everyday occupation. Conclusions: In the interviews, participants explained that they now had a slower pace of everyday life and that everyday occupations were more often related to nature and creativity. This could be interpreted as nature-based rehabilitation inducing changes through meaningful occupations in restorative environments, leading to a positive change in perceived values of everyday occupations. [ABSTRACT FROM AUTHOR]

Copyright of Scandinavian Journal of Occupational Therapy is the property of Taylor & Francis Ltd and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use. This abstract may be abridged. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material for the full abstract. (Copyright applies to all Abstracts.)

Author Affiliations: ¹Department of Works Science, Business Economics and Environmental Psychology, The Swedish University of Agricultural Sciences, Alnarp, Sweden

²Department of Health Sciences, Occupational Therapy and Occupational Science, Lund University, Lund, Sweden

Full Text Word Count: 7605

ISSN: 1103-8128

DOI: 10.3109/11038128.2013.832794**Accession Number:** 94448409**Database:** Academic Search Premier

Changes in experienced value of everyday occupations after nature-based vocational rehabilitation.

Objective: The aim of this study was to describe and assess changes in participants' experiences of everyday occupations after nature-based vocational rehabilitation (NBVR), to assess changes regarding symptoms of severe stress and the rate of return to work and possible association with experiencing the occupational value of everyday occupations. **Methods:** The NBVR was carried out by a transdisciplinary rehabilitation team and took place in a specially designed rehabilitation garden. The study had a longitudinal and mixed-method approach. Data concerning experiences of everyday occupations (Oval-pd), self-assessed occupational competence (OSA-F), health status (EQ-VAS, SCI-93), and sense of coherence (SOC-13) were collected before and after the intervention, and a one-year follow-up was carried out regarding returning to work. Semi-structured interviews were performed 12 weeks after the intervention. **Results:** Significant changes were measured regarding perceived occupational values in daily life, symptoms of severe stress, and returning to work. Both the return to work rate and symptoms of severe stress were significantly associated with changed experience of everyday occupation. **Conclusions:** In the interviews, participants explained that they now had a slower pace of everyday life and that everyday occupations were more often related to nature and creativity. This could be interpreted as nature-based rehabilitation inducing changes through meaningful occupations in restorative environments, leading to a positive change in perceived values of everyday occupations.

Keywords: flow; horticulture therapy; stress-related mental illness; supportive environments; Evidence-based health design

Introduction

Stress-related mental illnesses such as depression, anxiety, and exhaustion disorder are increasing in every part of the world and are estimated to be among the major contributors to ill health and work disabilities on a global scale ([1]). According to a Swedish Social Insurance Agency report ([3]), the most common disorders causing sickness absence from work are stress-related illnesses such as depressive episodes, reaction to severe stress, and adjustment disorders. The effects of these illnesses are felt on both the individual level, harmfully affecting one's mental and physical condition, as well as on the social level, having negative effects on one's interaction with the surrounding environment ([4]). It is common for individuals suffering from stress-related mental illness to change their habits and daily routines, often isolating themselves in their own world of refuge. These people are at great risk of disengaging from everyday occupations, resulting in occupational disruption ([7]). The burden of not being able to meet the demands of the surrounding world or perform one's normal daily occupations gives rise to negative feelings such as lack of control over one's life, and life being meaningless ([8]). Finding meaning in everyday life is one of the core foundations of good health

and well-being ([10]), and arguments have been made that an essential prerequisite for experiencing meaning is the perceived value of daily occupations ([11]). The concept of occupational value, according to the Value and Meaning in Occupations (ValMO) model ([11]), aims to capture how a person values a specific occupation in daily life and is defined as having three dimensions: *concrete*, *symbolic*, and *self-rewarding* values. The *concrete value* relates to the tangible and genuine outcome of an occupation; it can be an actual product of the occupation and/or visibly improved or newly gained skills. *Symbolic value* concerns a less tangible dimension, loading occupations with a symbolic value unique to each person depending on personal experience, cultural background, and/or the environment where the task is performed. Also, *symbolic value* can give rise to temporary relief from inner pressures and strong feelings. *Self-rewarding value* is characterized by enjoyment of the performance of the occupation itself and the perception of control over the occupation and the environment, in optimal cases also leading to the experience of *flow* ([12]).

Within occupational therapy research, the connection between environment and occupation has been an issue and several studies have focused on health-promoting environments, the experience of occupations (e.g. [8,11]) and, more specifically, therapeutic occupations performed in horticultural contexts or nature-based therapy ([16]). Results indicate that occupations performed in nature are experienced as meaningful and have beneficial effects on health and well-being ([18]). It has been argued that caring for plants can foster a life beyond oneself ([22]), and gardening and horticultural occupations in particular have been measured as having positive effects on life satisfaction ([23]) and bringing about changes, such as rediscovering the importance of the enjoyable experiences of everyday occupations ([17], [24]). It has also been argued that nature and the use of natural environments can facilitate recovery from stress ([16], [25]). Nature-based interventions for people with stress-related mental illness and/or clinical depression have been established in specially built environments ([17], [24], [29]), peri-urban agricultural landscapes ([18], [30]), and rural landscapes ([19], [21]) in combination with meaningful occupations which embrace nature with the intention of facilitating the rehabilitation process. These studies focus on aspects such as changes in cognitive, emotional, and physiological conditions ([29]); perceived levels of stress ([19]); changes in the severity of depression and anxiety ([18]); the return to work rate and function ([21], [30]); the clients' own experiences of the rehabilitation ([17], [20]), and how experiences from the nature-based intervention have been integrated in everyday life ([17]). However, none of these studies assesses whether the perceived value of everyday occupations, mentioned above as being a prerequisite to experiencing meaning in everyday life, can contribute to improved health, well-being, and return to work.

The aim of this study was to describe and assess changes in the participants' experienced value of everyday occupations after nature-based vocational rehabilitation. Additionally, it assessed changes regarding symptoms of severe stress, health, and the rate of return to work, in order to study possible associations with experiencing the occupational value of everyday occupations.

Material and methods

The study was conducted as a single-case, interventional study ([31]) evaluating a 12-week, nature-based rehabilitation programme with participants diagnosed with stress-related mental illness. Single-

stage cluster sampling was used where half of the rehabilitations groups were picked for this study ([32]). Mixed methods were used, including data collection using validated and reliability-tested forms and qualitative semi-structured interviews ([32]). Data were collected during 2006–2008 and all 27 participants referred to the selected groups were invited to participate in the study. Of these, 21 agreed to participate. Before entering the rehabilitation programme, the participants received written and oral information about the study and had an opportunity to ask questions about the study procedure before deciding on participation. Participation was confidential and participants could withdraw from the study at any point if they desired without influencing their relationship with their therapist ([33]). The regional ethical committee in Lund, Sweden, approved to the study (D-nr 2011/31).

Venue

The nature based vocational rehabilitation took place in a specially designed health garden on the campus of the Swedish University of Agricultural Sciences in Alnarp, Sweden. The intervention was performed in a safe, undemanding, and serene environment as the basis and the frame for supporting the rehabilitation process. The two-hectare garden was designed according to theories on restorative and supportive environments to embrace the whole intervention ([24], [28]). The garden was divided into different rooms with various characteristics and structures, in order to meet the emerging needs and moods of participants during their rehabilitation ([24], [34]). During the intervention, the participants could use the garden freely according to their own needs and desires, supporting their rehabilitation process ([24]).

Intervention

The nature-based rehabilitation programme ran for three months (12 weeks), allowing four groups a year to undergo rehabilitation, though with some individual variation in the length of participation. The programme was scheduled for four days a week, each day lasting for three and a half hours. In the first week, the participants attended the therapy for one day, and over the following weeks increased their attendance to four days a week. The programme was outlined as group therapy, consisting of four to five individuals in each group. The nature-based programme comprised four integrated therapy forms: occupational therapy, physiotherapy, psychotherapy, and horticultural therapy – thus offering therapy by a transdisciplinary team.

Each day had the same basic structure with four themed sessions led by an occupational therapist who was assisted by a horticulturist. Sessions one, two, and four were the same on all four days; the third session varied each day (Table I). The first themed session was the morning get-together with a cup of tea, allowing the participants to "catch their breath" and settle down before entering the second themed session, a relaxation exercise performed either indoors or in the garden. The third themed session varied each day. On Mondays, the session consisted of creative occupations performed either indoors or in the garden; on Tuesdays, the participants were invited to meet individually with the physiotherapist for a 30-minute session on bodily awareness. On Wednesdays, they were invited to meet privately with the psychotherapist for a 30-minute counselling session. Before and after these sessions, the participants could participate in horticultural occupations led by the occupational

therapist assisted by the horticulturist, or stay in the garden, resting or enjoying the surroundings. The fourth and final themed session was "closure" for the day where all participants got together for light refreshments (often something harvested from the garden, fresh or preserved) before going home. Also, at this time, the participants could discuss the contents of the morning, reflecting on their own experiences from the themed sessions. All therapeutic sessions in the rehabilitation programme aimed to strengthen and restore the individuals' inner power and enhance a salutogenic, curative process for better health and quality of life based on each person's own abilities and needs. Resting and "just being" were considered important occupations as they contribute to a slower pace of life, something lacking in the participants' everyday lives. Similarly important was raising their awareness of their habits and daily routines, which might have hindered them from maintaining an occupational balance in everyday life.

Table I. Weekly schedule for the nature-based vocational rehabilitation, led by an occupational therapist and assisted by a horticulturist.

	Monday	Tuesday	Wednesday	Thursday
Session one	Morning tea & gathering	Morning tea & gathering	Morning tea & gathering	Morning tea & gathering
Session two	Relaxing exercise	Relaxing exercise	Relaxing exercise	Relaxing exercise
Session three – the main focus for the day	Creative occupations (indoors or outdoors depending on weather)	Individual meeting with the psychiatrist or physiotherapist (30 minutes) Before and after: garden and horticultural occupations (in a group or by oneself).	Individual meeting with the physiotherapist or psychiatrist (30 minutes) Before and after: garden and horticultural occupations (in a group or by oneself)	Garden and horticultural occupations (in a group or by oneself)
Session four	"Closure" with light refreshments	"Closure" with light refreshments	"Closure" with light refreshments	"Closure" with light refreshments

3 Note: Sessions one, two, and four are the same for the whole week. Session three varies during the week.

Participants

The inclusion criterion for entering the study was one of the following International Classification of Disease (ICD-10) diagnoses as the primary diagnosis: psychiatric diagnosis of adjustment disorder and reaction to severe stress (ICD F43); depression (ICD F32.0, ICD F32.1); anything that did not require further medical procedures. The exclusion criterion was known drug or alcohol abuse. Of the 21 participants, 19 were women and two were men, with a mean age of 47 years (range: 29–68 years old). Socio-demographic data were collected using a self-assessed questionnaire that included: age, gender, marital status, highest level of education, profession, and postal code ([35]). However, all participants in this study were professionals with a high educational level (e.g. medical doctors, lawyers, midwives, IT consultants) and lived in private residences. On average, the participants had been on sick leave for 1694 days at the start of the rehabilitation period (range 469–3143 days). The

length of time the participants actively participated in the structured rehabilitation programme varied from 34 to 49 days (average 38.5 days).

Data collection

The aim of this study was to describe and assess changes in the participants' experiences of the value of everyday occupations. As little is known about this subject and to increase validity, a mixed-method approach was chosen ([31]) with a pre-test–post-test design to examine changes over time (follow-up 1 and follow-up 2), and semi-structured interviews were carried out to provide a deeper understanding of what might have brought about the changes ([31]). Validated instruments for quantifying changes in occupational value have been developed. However, further descriptions are needed to get a full understanding of how nature-based vocational rehabilitation affects participants' perceived value of everyday occupations. At baseline, the following instruments were used: SCI-93, SOC, OSA-F, Oval-pd, and Eq-VAS. At follow-up 1, the following instruments were used: SCI-93, SOC, and OSA-F. At follow-up 2, the following instruments were used: Oval-pd, Eq-VAS, and semi-structured interviews. One year after the intervention ended, return to work rate was assessed (follow-up 3), see Figure 1. The researchers collected all the data.

Graph: Figure 1. Overview of data collection concerning baseline and follow-up 1, 2, and 3.

For studies like this, stratified sampling selection is a common procedure. However, single-stage cluster sampling gives more accurate results when most of the variation in the studied population is within the groups, not between them. Our assessment was that the variation within the rehabilitation groups was greater than the variation between them. Hence, we used single-stage cluster sampling where each rehabilitation group could be defined as a cluster. Over the course of a couple of years, a number of rehabilitation groups were treated at Alnarp. Some of these groups were randomly selected to participate in this study; 21 of 27 chose to participate in the study. Six dropped out of follow-up 2 (Table II). This was regrettable, but is unfortunately not uncommon in rehabilitation studies. Small sample studies are often needed and can involve finding connections, causes that have a big effect and impact on people's health and well-being ([36]).

Table II. Number of participants (n), mean, range, and standard deviation (SD) at baseline, follow-up 1, and follow-up 2 after the nature-based vocational rehabilitation (NBVR).

	Baseline		Follow-up 1					
Variable	n	Mean	Range	SD	Mean	Range	SD	p-value
Stress and Crisis Inventory								
SCI-93 general value	21	68.1	30-135	26.15	3.6	18-105	29.6	<.0001
Subscale: Muscular	21	16.7	4-35	7.8	14.1	3-31	8.3	0.0037
Subscale: Mental	21	18.9	10-24	3.3	14.1	6-22	5.1	0.0002
Subscale: Autonomic	21	32.5	10-76	17.0	25.4	5-59	17.7	0.0003
Occupational Self -Assessment								
OSA general function	21	34.5	24-51	5.8	41.8	30-55	7.1	0.0002
Sense of Coherence scale								

Summarised general value	21	50.3	28-71	11.655.1	33-79	11.4
Subscale: meaningfulness	21	16.5	9-24	4.3417.6	11-27	4.0
Subscale: manageability	19	17.3	9-32	5.6720.0	11-27	4.4 0.0274
Subscale: comprehensibility	19	16.5	5-22	4.8817.6	8-27	4.8

Table II. Number of participants (n), mean, range, and standard deviation (SD) at baseline, follow-up 1, and follow-up 2 after the nature-based vocational rehabilitation (NBVR).

	Baseline		Follow-up 2			
EQ-vas	18	36.6	20-90	16.2262.010-85	18.50.0009	
Perceived occupational value						
Summarised general value	15	35	22-44	5 44	31-53	8 0.0009
Concrete value	15	12	8-16	2 15	10-19	3 0.0012
Symbolic value	15	7	3-9	2 10	6-15	2 0.0007
Self-rewarding value	15	12	7-19	3 19	3-24	4 0.0005

4 Notes: Follow-up 1: Stress and Crisis Inventory (SCI-93) (*n* = 21), Occupational Self-Assessment – Function (OSA-F) (*n* = 21), and Sense of Coherence scale (SoC-13), general value (*n* = 21), meaningfulness (*n* = 21), manageability (*n* = 19), and comprehensibility (*n* = 19). Follow-up 2: Occupational Value (Oval-pd) (*n* = 15), and Eq-Vas form (*n* = 18).

Occupational Value (Oval-pd)

This instrument consists of 26 statements concerning the perceived value of everyday occupations that the participant has performed within the past month. For each statement, four response alternatives are possible: not at all (1), rather seldom (2), rather often (3), and very often (4). The instrument is intended to reflect the perceived value of everyday occupations composed of three core dimensions: *concrete*, *symbolic*, and *self-rewarding values* ([11], [13]). The instrument is continuously tested for validity in different contexts ([38]).

The Stress and Crisis Inventory (SCI-93) measures one's symptoms in reaction to severe stress and/or crisis and handles mental, muscular, and autonomic (vegetated) symptoms. The protocol, a 35-item self-reported questionnaire, was developed in a Swedish context and is a validated instrument ([40]). The total score can vary from 0 to 140. Scores up to 28 (SD 10.0) indicate a normal capacity to work/perform daily occupations ([41]). Scores of 51 and higher indicate difficulty returning to work within a year. A score of 76 or higher means that the person experiences great difficulty managing everyday tasks, and a total score above 101 is considered to reflect a very high level of stress, indicating that the participant is in great need of medical and psychological treatment before entering a rehabilitation programme ([43]).

The short version of the *Sense of Coherence scale (SoC-13)*, including the subscales *comprehensibility*, *manageability*, and *meaningfulness*, is considered to be reasonably reliable and valid ([45]). A sense of coherence reflects a person's capacity to handle stressful life events, and is a resource that can promote health ([10]). The *Occupational Self-Assessment-Function (OSA-F)* derives from the Model of Human Occupation (MOHO) ([50]), and is a client-centred instrument with 21 items that assess occupational competence ([48]). The instrument has been proven to be both valid and

reliable ([49]). The *EQ-VAS form* was designed for the collection of perceived health states using a VAS rating scale – a vertical 20 cm visual, analogue scale with its end points labelled "best imaginable health state" at the top and "worst imaginable health state" at the bottom, with the respective numeric values of 100 and 0. This scale has been found to be a valid and reliable test concerning stress-related mental illness ([48]). The population norm in Sweden for ages 40–49 is 83.9 (SD 12.5) for men, and 79.8 (SD 18.9) for women ([51]).

Return to work rate

Each of the 21 participants was asked to complete a form regarding their work situation a year after the end of rehabilitation. A questionnaire was mailed to them and followed up with two reminders. The question was: "What was your work situation on xx? (xx being the date one year after they ended their rehabilitation). On this date, it is exactly one year since you left the rehabilitation in Alnarp." The participants were asked to answer according to their actual work situation on the given date, all responses to be rated 100%, 75%, 50%, or 25%, according to the level of work performed as: "Paid work as employee?", "Self-employed?", "Applying for work?" "Student/studying?", "Vocational training in the workplace?", "Continued rehabilitation?", or "Sick-listed?" The questionnaire was constructed for this study. We treated the data as follows: *not available to the labour market* (vocational training, continued rehabilitation, or sick-listed) and *available to the labourmarket* (paid work, applying for work, self-employed, student/studying).

Interviews

In order to describe the changes in the participants' experiences of everyday occupations, semi-structured interviews ([52]) were conducted 10–12 weeks after the participants finished their three-month rehabilitation, as follow-up 2 ($n = 15$). The interviews were performed in Swedish and in ways that best suited the different participants, either face-to-face or by telephone. The last author performed the interviews. Each interview lasted about 30 minutes and was documented using handwritten notes. The interview contained themes concerning everyday occupations: (i) what the participant typically did on a normal day and how these occupations were performed; (ii) whether their actual everyday occupations differed from those prior to the start of their illness; (iii) possible differences concerning the perceived value of the occupations prior to the start of their illness and, if differences were perceived, what the most important differences were. Participation was confidential and the participants could refuse to answer the questions or withdraw or end the conversation at any point if desired without giving any explanation ([33]).

Data analysis

SAS Release 9.2 was used for analysis, and a level of 0.05 was considered significant. Confounders such as gender, age, and socio-economic status were included in the statistical analysis. The Wilcoxon signed rank test (univariate procedure in SAS) was used to investigate possible changes in measured outcome between baseline and follow-ups (1 and 2 respectively). Logistic regression maximum-likelihood with dichotomized data (logistic procedure in SAS) was used to test the associations between *occupational values* and, respectively, *symptom reduction* and *return to work*. "Symptom reduction", measured by SCI-93 values, was dichotomized at a cut-off 51; the variable

"return to work" was dichotomized as "available to the labour market" and "not available to the labour market", while the remaining data were dichotomized based on median values. "Symptom reduction" and "return to work" were dependent variables in the two models, while "occupational value", "sense of coherence", "occupational self-assessment – function", "EQ-VAS", gender, and age were independent variables. To find the relevant covariates, stepwise selection was used. Independent variables were included one by one to find the optimal models for symptom reduction and return to work, respectively.

The structured interviews were analysed with inspiration from Graneheim and Lundman's overview of important concepts in qualitative content analysis ([52]). The process of analysis was conducted by the three authors working together, while the first author had the overall responsibility for driving the process. After the handwritten notes had been read several times to get a sense of the whole content, further reading focused on identifying meaning units that corresponded to the informants' statements. The essence of the meaning units was then increasingly abstracted, first into more condensed units, and then into codes. At the end of this process, four categories were arrived at. Based on the codes, the first and third authors independently formulated categories which, to some extent, differed in formulation but not significantly in content. In the next step, the categories established by the first and third authors were compared by the second author, who found no discrepancies concerning content between the themes. Finally, the three authors together arrived at the final formulation of the themes which they concurred were in agreement with the raw data.

Results

The perceived general occupational value was significantly higher ($p < 0.001$) at follow-up 2: 44 (SD 8) compared with baseline measurements 35 (SD 5), ($n = 15$). The results for the separately summarised value dimensions were all significantly higher ($p < 0.001$) at the end of the intervention compared with the start, $n = 15$ (Table II).

For the *Stress and Crisis Inventory* (SCI-93), the general variable showed a significant difference ($p < 0.0001$) between measurements at baseline and follow-up 1, ($n = 21$). The mean score before entering the intervention was 68.1 (SD 26.1) and after 53.6 (SD 29.6). For all subscales, there was a significant difference in the mean score between baseline and follow-up measurements for: mental symptoms ($p < 0.001$), muscular symptoms ($p < 0.05$) and autonomic symptoms ($p < 0.001$) (Table II). The perceived symptoms of severe stress were expressed at five levels of clinical significance. At baseline, six of the participants scored below 51.0 (clinical classes: normal to slightly raised level of stress), and after the intervention, 12 participants scored below 51.0 (Table III). For *Occupational Self-Assessment – function*, changes between baseline, 34.5 (SD 5.8), and follow-up 1, 41.8 (SD 7.1), were significant ($p < 0.001$). With regard to the *Sense of Coherence scale* (SoC), there was only a significant positive change in the value *manageability* when comparing baseline and follow-up 1 ($p < 0.05$), $n = 19$. EQ-VAS was significantly higher ($p < 0.001$) at the end of the intervention (follow-up 1) compared with baseline, $n = 18$ (Table III).

Table III. SCI-93 – Number of participants at each level of clinical significance (1–5). Levels at

baseline and follow-up-1.

Level of stress	Baseline%	Follow-up%
1. Normal (0–25)	0	5 23,8
2. Slightly raised (26–50)	6	28,67 33,3
3. Moderate (51–75)	8	38,14 19,0
4. High (76–100)	5	23,81 4,8
5. Extremely high (101–140)	2 9,5	4 19,0

Of the 21 participants asked to reply to the questions on returning to work, two had retired (having reached the age of 65), one was deceased, and two did not reply in spite of being reminded twice. Thus, these participants were not included in the study. Of the 16 remaining eligible participants, 10 had returned to work or studies and, of these, five were working/studying full-time and five part-time. Six participants were still on sick leave.

Associations between outcome measurements

We used SAS Proc Logistic regression, stepwise selection, including Hosmer & Lemeshow's goodness-of-fit test. All variables of significance for the aim of the study were included in the models in order to find the best model ([54]). The final model concerning the return to work rate included the occupational value subscale *self-rewarding* and age. The maximum likelihood estimates for both *self-rewarding* values and age were significant ($p < 0.05$; OR 1.8 and 1.4 respectively). Therefore, if self-rewarding values rise after the rehabilitation and the participant is in his/her forties, there is a greater chance he/she will return to the labour market.

Using logistic regression regarding reduction of symptoms of severe stress, the final model was significant, with a likelihood ratio of $p < 0.01$, and included the sense of coherence subscale *manageability*, and all occupational value subscales, i.e. *symbolic*, *self-rewarding*, *concrete*, and age. The maximum likelihood estimates for self-rewarding values were significant at the $p < 0.01$ level (OR 1.9), while age, concrete, and symbolic values were significant at the $p < 0.05$ level (OR 1.3, 1.4, and 1.2 respectively). The sense of coherence subscale *manageability* was not significant. Therefore, if all occupational values rise the participant is younger and, possibly, the sense of coherence subscale *manageability* rises after rehabilitation, there is a greater chance of recovering from symptoms of severe stress.

Experience of everyday occupations

Four main categories were extracted from the material, all having to do with change in the participant's occupational repertoires in everyday life. The themes included aspects such as the following.

Slower pace in everyday life on one's own terms

After the intervention, the participants were more aware of their own needs and saw to it that these were met in a desired way. They performed daily occupations at a slower pace that was not monitored by time but rather by delight and joy. They let things "take their time"; they took breaks more often and tried not to rush things. They did one thing at a time, avoiding multi-tasking. Participants expressed this as "I don't have to be on top of everything all the time any more in what I do", and "Now I don't fill

my days with planned things", or "training is not compulsive anymore. I do it, but much less."

Everyday occupations more often related to nature

The participants spent more time on nature-related occupations such as long walks at nature sites, gardening, and horticulture, either in their own garden, on their balcony, or on an allotment: "We are sharing an allotment my neighbour and I, where I can grow some vegetables and flowers." They stated that being amongst nature was restorative, and that working in the garden eased their minds. They consciously turned more to nature to slow their pace down and for mental recovery, as in this example: "I take walks in the forest every evening; it gives me energy, peace ... and opportunities to discover new things." Some attended vocational training at garden centres, and others planned for education within gardening and horticulture, e.g. "Now, I'm attending work training in a garden shop, which I love".

Social interaction

Many of the participants now managed more social interaction and were actively seeking friends with whom to share leisure occupations and spend time together. For example: "I have a better life now, although more fragile ... each month I try to have lunch with one of my friends", or "I am involved here in a solidarity group for Bosnians, attending their meetings". Social interaction even included participation in different hobby courses, yoga classes, and net-blogging.

Creative occupations

Many participants had either resumed familiar creative occupations or learned new ones. This included singing, gardening, playing an instrument, photography, painting, or working with clay/ceramics. Some citations expressing this are: "I play the organ again, and take courses in Chopin's music", and "We have arranged a room for me now, where I can paint and have my painting stuff for myself". In general, the participants expressed that they felt that these changes had had a positive effect on their inner strength, and they consciously chose occupations that contributed to improved health.

Discussion

It seems that after the rehabilitation programme the participants in this study managed to alter their daily occupational repertoire toward a more balanced lifestyle compared with pre-rehabilitation. This resulted in improved function in everyday life, improved health and, for a significant number, improved working abilities. The participants re-engaged in or introduced new occupations into their everyday life. These occupations were characterized by enjoyment, pleasantness, and creativity, all of which have been described as meaningful ([12], [56]), and identified as essential to recovery from mental illness ([8]). Considering that many of the participants stated that before rehabilitation they had been driven by achievement – doing things without joy in a rushed tempo, running away from themselves while experiencing time pressure – it is likely that many of their daily occupations overall were of a demanding kind, driven mainly by striving for results, i.e. concrete values.

Considering the relatively small number of participants, there is a very strong emphasis on self-rewarding values, reasonably indicating that after the nature-based rehabilitation the participants, to a

greater extent, chose occupations and environments strongly related to *self-rewarding experiences*. We assume that many of the self-rewarding experiences were to be found in what seemed to be an increase in nature/garden and creative occupations, giving the participants a feeling of a greater amount of inherent reward, enjoyment, and control than they had expressed before the rehabilitation. In an interview study with the same client group (with stress-related mental illnesses), Eriksson et al. ([17]) identified changes regarding the re-evaluation of everyday occupations. The clients were provided with safe, calm, and undemanding physical environments in a therapeutic garden combined with relaxing and enjoyable occupations. The results also indicate that the clients created situations similar to those provided in rehabilitation in their everyday lives, thus facilitating their ongoing recovery. In the current study, the changes in the participants' occupational repertoires in everyday life seem to mirror the occupations offered in the rehabilitation programme, including creative occupations, relaxation in nature/garden, and a slower pace in their performance of occupations. Differences between measurements at baseline and after intervention (follow-up 1) show that symptoms of severe stress were significantly reduced and that function and perceived health states also significantly improved. It is relevant to bear in mind that it is argued that in environments containing natural elements where people feel secure, mental recovery is more rapid because there is little to demand their attention and their minds are allowed to rest ([16], [20], [28]). We argue that the use of nature in everyday occupations and the setting aside of more time for meaningful and creative occupations seem to be important factors in the participants' recovery and perceived improved health.

In this study, 10 (63%) of the participants had returned to the labour market or to studies (within the range of 25–100% participation) within a year of finishing their rehabilitation. This can be considered a satisfactory result given the fact that all the participants had been on very long-term sick leave before entering the rehabilitation programme. Stress-related mental illness can result in long-term sick leave, and can cause long-term work disabilities ([58]). It is known to be long lasting and no natural history has so far been documented ([59]).

The results of this study indicate that the most important factors associated with *return to work* were a young age (in their forties) and perceived value of everyday occupations, especially the *self-reward* value dimension, characterized by enjoyment and control over tasks and environment, partly relating to the concept of *flow*. Furthermore, the most important factors associated with reduced symptoms of severe stress were younger age (in their forties) and overall perceived value of everyday occupations (*concrete*, *symbolic*, and *self-rewarding* values). The association between age (younger), returning to work, and the reduction of symptoms of severe stress might not be very surprising. What may be more surprising is that occupational value, topped by *self-reward*, in the stepwise selection model was so dominantly significant. Unfortunately, not all the measurements were used in follow-up 3. Therefore, further research is required to show whether the concept of occupational value has a specific sensitivity when predicting recovery and return to work after nature-based vocational rehabilitation like that investigated here.

This study has provided insights regarding changes in the perceived value of everyday occupations after nature-based vocational rehabilitation and how this might be one contributing factor to improved

health and function in everyday life. However, this needs to be investigated further in a controlled study in a larger population.

Methodological considerations

The authors acknowledge the fact that this study did not include a control group. In further studies, it would be more comprehensive to include a randomized control group to evaluate the true effects of a nature-based rehabilitation versus treatment as usual. In mixed-method research, including qualitative as well as quantitative methods, single-stage cluster sampling is often used ([60]). Therefore, statistical analysis of 15 to 20 cases is a useful procedure ([61]). Significant improvements were measured in this study though the study sample was small. If the sample size were larger, we could be more certain of the effect.

Despite the comparatively small sample, the results from the qualitative and quantitative material converged clearly in the same direction. According to Yin ([31]), it is possible to generalize if results from different methods indicate general mechanisms at work.

Twenty-one of 27 participants in the rehabilitation programme chose to participate in this study. We cannot find any differences between those who participated in the study and those who did not regarding age, sex, or profession. Furthermore, we cannot relate dropouts in this study to sex, age, or profession. Before the rehabilitation, most of the clients were "Yes-people" – i.e. said yes to most of the work or requirements made on them without reflecting on their own needs or desires. After the rehabilitation, the clients became more aware of their own needs/desires and more often said no to things they did not want or wish to do ([20], [24]). This could be the case here. Therapists often comment that towards the end of a rehabilitation period, clients clearly choose activities/occupations based on their own desires/needs ([24]).

The interviews were semi-structured, with the possibility for follow-up questions, albeit not in-depth. In-depth interviews would have been appropriate in order to obtain deeper knowledge about the extent of the change in everyday occupation repertoires.

Conclusion

The nature-based vocational intervention seems to have played an important role in reinforcing the participants' rediscovery of their own desires, motivation, and pace of everyday life, by allowing them to act and be in a supportive context, embraced by the garden and elements of nature. By discovering the importance of enjoyable and calming experiences, many participants might balance the often overwhelming pressure and demands most people bear when starting the programme. Through this process, an increased experience of balance could also be assumed when taking into account how self-rewarding and restorative occupations were reintroduced into their daily life. For many of them, symptoms of severe stress decreased and they returned to social and work contexts. Based on these results, we would like to see further studies on how this seemingly health-promoting interplay works between humans and nature.

Acknowledgements

The authors would like to thank FORMAS for financing the study. Also, they would like to express their gratitude to the anonymous referees for their valuable comments which have improved the quality of the manuscript.

Declaration of interest: The main and last authors report no declaration of interest. The second author is a shareholder in the limited company NAHC (Nature Assisted Health Care AB). The authors alone are responsible for the content and writing of the paper.

References

- 1 Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: A systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012;380:2163–96.
 - 2 Salomon JA, Wang H, Freeman MK, Vos T, Flaxman AD, Lopez AS, et al. Healthy life expectancy for 187 countries, 1990–2010: A systematic analysis for the Global Burden Disease Study 2010. *Lancet* 2012;380:2144–62.
 - 3 Mulder M. Sjukskrivningsdiagnoser i olika yrken (in Swedish) [Sick-list diagnoses in various occupations]. Stockholm: Swedish Social Insurance Agency Social Insurance Report; 2011. p 17.
 - 4 Seyle H. *The stress of life*. New York: McGraw-Hill; 1956.
 - 5 Floderus B, Göransson S, Alexandersson K, Aronsson G. Self-estimated life situation in patients on long-term sick leave. *J Rehabil Med* 2005;37:291–9.
 - 6 Jonsdottir I, Nordlund A, Ellbin S, Ljung T, Glise K, Währborg P, et al. Cognitive impairment in patients with stress-related exhaustion. *Stress* 2013;6:181–90.
 - 7 Eriksson T, Jonsson H, Tham K, Eriksson G. A comparison of perceived occupational gaps between people with stress-related ill health or musculoskeletal pain and a reference group. *Scand J Occup Ther* 2012;19:411–20.
 - 8 Sutton DJ, Hocking CS, Smythe LA. A phenomenological study of occupational engagement in recovery from mental illness. *Can J Occup Ther* 2012;79:142–50.
 - 9 Johnsson C, Isaksson G. Experience of participation in occupation of women on long term sick leave. *Scand J Occup Ther* 2011;18:294–301.
- Antonovsky A. *Hälsans mysterium* (in Swedish) [The Mystery of Health]. Stockholm: Natur och Kultur; 2007.
- Persson D, Erlandsson L-K, Eklund M, Iwarsson S. Value dimensions, meaning and complexity in human occupation: A tentative structure for analysis. *Scand J Occup Ther* 2001;8:7–18.
- Persson D. *Aspects of meaning in everyday occupations and its relationships to health-related factors*.

Dissertation, Faculty of Medicine, Department of Clinical Neuroscience, Division of Occupational Therapy. Lund: Lund University; 2001.

Erlandsson L-K, Eklund M, Persson D. Occupational value and relationships to meaning and health: Elaborations of the ValMO model. Scand J Occup Ther 2011;18:72–80.

Persson D, Andersson I, Eklund M. Defying aches and revaluating daily doing: Occupational perspective on adjusting to chronic pain. Scand J Occup Ther 2011;18:188–97.

Csikszentmihalyi M. Finding flow. New York: HarperCollins; 1997.

Ulrich R, Simons RF, Losito BD, Fiorito E, Miles MA, Zelson M. Stress recovery during exposure to natural and urban environments. J Environ Psychol 1991;11:201–30.

Ericsson T, Karlström E, Jonsson H, Tham K. An exploratory study of the rehabilitation process of people with stress-related disorders. Scand J Occup Ther 2010;17:29–39.

Gonzales MT, Hartig T, Patil GG, Martinsen EW, Kirkevold M. A prospective study of group cohesiveness in therapeutic horticulture for clinical depression. Int J Ment Health Nurs 2011;20:119–29.

Sonntag-Öström E, Nordin M, Slunga Järvholm L, Lundell Y, Brännström R, Dolling A. Can the boreal forest be used for rehabilitation and recovery from stress-related exhaustion? A pilot study. Scand J Forest Res 2011;26:245–56.

Sahlin E, Matuszczyk VJ, Ahlborg G Jr, Grahn P. How do participants in nature-based therapy experience and evaluate their rehabilitation? J Ther Hort 2012;22:9–22.

Nordh H, Grahn P, Währborg P. Meaningful activities in the forest, a way back from exhaustion and long-term sick leave. Urban Forestry & Urban Greening 2009;8:207–19.

Relf DP. The role of horticulture in human well-being and quality of life. J Ther Hort 1999;10:10–14.

Waliczek TM, Zajicek JM, Lineberger RD. The influence of gardening activities on consumer perceptions of life satisfaction. HortScience 2005;40:1360–5.

Grahn P, Tenngart Ivarsson C, Stigsdotter U, Bengtsson I-L. Using affordances as a health promoting tool in a therapeutic garden. In Ward Thompson C, Aspinall P, Bell S, editors. Innovative approaches to researching landscape and health. Open Space: People Space 2. New York: Routledge; 2010. p 116–54.

Kaplan R, Kaplan S. The experience of nature: A psychological perspective. Cambridge: Cambridge University Press; 1989.

Nielsen TS, Hansen KB. Do green areas affect health? Results from a Danish survey on the use of

green areas and health indicators. Health Place 2007;13:839–50.

Millet P. Integrating horticulture into the vocational rehabilitation process of individuals with exhaustion syndrome (burnout): A pilot study. Int J Dis Manage Res 2008;3:39–53.

Stigsdotter UK, Palsdottir AM, Burls A, Chermaz A, Ferrini F, Grahn P. Nature-based therapeutic interventions. In Nilsson K, Sangster M, Gallis C, Hartig T, de Vries S, Seeland K, Schipperijn J, editors. Forest, trees and human health. Dordrecht: Springer; 2011. p 309–42.

Corazon SS, Stigsdotter UK, Claudi AG, Nilsson K. development of a nature-based therapy concept for stress patients at the Danish Healing Forest Garden Nacadia. J Ther Hort 2010;20:34–51.

Pálsdóttir AM, Kyrö-Wissler S, Nilsson K, Petersson IF, Grahn P. Nature based therapy in peri-urban areas for people with stress related illnesses: A controlled prospective study. Proceedings of the 11th International People Plant Symposium, Park S-A, editor. Acta Hort 2012; submitted.

Yin RK. Case study research design and methods. 5th ed. Thousand Oaks, CA: Sage Publications; 2009.

Lavaraks PJ. Encyclopedia of survey research methods. Sage Research Methods. Thousand Oaks, CA: Sage Publications; 2008.

World Medical Association Declaration Helsinki. Available at <http://www.wma.net/en/30publications/10policies/b3/>. accessed 20 March 2013.

Stigsdotter U, Grahn P. Experiencing a Garden: a Healing Garden for People suffering from Burnout Diseases. J Ther Hort 2003;13:38–48.

Swedish socio-economic classification reports on statistical co-ordination. Stockholm: Statistics Sweden; 1982. p 4.

Bacchetti P, Deeks SG, McCune JM. Breaking free of sample size dogma to perform innovative translational research. Sci Transl Med 2011;3:87.

Anderson AJ, Vingrys AJ. Small samples: Does size matter? Invest Ophthalmol Vis Sci 2001;42:1411–12.

Eklund M, Erlandsson L-K, Persson D. Occupational value among individuals with long-term mental illness. Revue canadienne d'ergothérapie 2003;70:276–84.

Eklund M, Erlandsson L-E, Persson D, Hagell P. Rasch analysis of an instrument for measuring occupational value: Implications for theory and practice. Scand J Occup Ther 2009;16:118–28.

Nyström C, Nyström O. Stress and Crisis Inventory – SCI-93: A process-oriented personality exploration starting from a crisis-theoretical frame of reference. Partille: Nyström & Nyström; 1995.

- Nyström C, Nyström O. Skattad stress verifierar autonom dysfunction (in Swedish) [Estimated stress verifies autonomic dysfunction]. *Läkartidningen* 1996;93:2582–4.
- Nyström C, Nyström O. Autonoma symtom – diagnosövergripande hälsostörning (in Swedish) [Autonomous symptoms – diagnosis including health complaints]. *Socialmedicinsk Tidskrift* 2009;1.
- Krafft B, Nyström C, Nyström O, Pedersen C. Ospecifika symtom och välfärdsdata – en populationsstudie (in Swedish) [Non-specific symptoms and welfare data – a population study]. *Socialmed Tidskr* 2004;3:222–9.
- Krafft B, Nyström C. Hög stressnivå och omogna försvar ger ond cirkel vid långvarig smärta (in Swedish) [High stress levels and an immature immune system cause a vicious circle in chronic pain]. *Läkartidningen* 2002;99:4040–3.
- Feldt T, Lintula H, Suominen S, Koskenvuo M, Vahtera J, Kivimäki M. Structural validity and temporal stability of the 13-item sense of coherence scale: Prospective evidence from the population-based HeSSup study. *Qual Life Res* 2007;16:483–93.
- Eriksson M, Lindström B. Antonovsky's sense of coherence scale and the relation with health: A systematic review. *J Epi Com Health* 2006;60:376–81.
- Kielhofner G. *A model of human occupation: Theory and application*. 3rd ed. Baltimore: Lippincott, Williams & Wilkins; 2002.
- Baron K, Kielhofner G, Lyenger A, Goldhammer V, Wolenski J. *A user's manual for the Occupational Self Assessment (OSA)*. Chicago: University of Illinois at Chicago; 2006.
- Taylor R, Lee SW, Kramer J, Shirashi Y, Kielhofner G. Psychometric study of the occupational self assessment with adolescents after infectious mononucleosis. *Am J Occup Ther* 2011;65:20–8.
- Swan J, Sorrell E, MacVicar B, Durham R, Matthews K. Coping with depression: An open study of the efficacy of a group psychoeducational intervention in chronic, treatment-refractory depression. *J Affect Disord* 2004;82:125–9.
- Szende A, Williams A. *Measuring self-reported population health: An international perspective based on EQ-5D*. The EuroQol Group's International Task Force on Self-Reported Health, UK 2004.
- Kvale S. *Den kvalitativa forskningsintervjun* (in Swedish) [The qualitative research interview]. Lund: Studentlitteratur; 1996.
- Graneheim UH, Lundman B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* 2004;24:105–12.
- Vittinghoff E, McCulloch CE. Relaxing the Rule of Ten Events per Variable in Logistic and Cox Regression. *Am J Epi* 2007;165(6):710–718.

SAS/STAT User's Guide. Cary, NC: SAS Institute, Inc 1999. p 4.

Leufstadius C, Erlandsson LK, Björkman T, Eklund M. Meaningfulness in daily occupations among individuals with persistent mental illness. J Occup Sci 2008;15:27–35.

Hammell KW. Dimensions of meaning in the occupations of daily life. Can J Occup Ther 2004;71:296–305.

Hvalsoe B, Josephsson S. Characteristics of meaningful occupations from the perspectives of mentally ill people. Scand J Occup Ther 2003;10:61–71.

Statens offentliga utredningar. Rehabiliteringsrådets slutbetänkande (in Swedish) [Swedish Government Official Reports. The Rehabilitation Council's Final Report]. Stockholm: SOU; 2011. p 61. Available online at <http://www.fritzes.se>.

National Board of Health and Welfare. Utmattningssyndrom. Stressrelaterad psykisk ohälsa (in Swedish) [Mental exhaustion. Stress-related mental illnesses]. Stockholm: Socialstyrelsen; 2003. p 123–18.

Meehl PE. Theory-testing in psychology and physics: A methodological paradox. Philos Sci 1967;34:103–15.

Hoyle RH. Statistical strategies for small sample research. Thousand Oaks, CA: Sage Publications; 1999.

~~~~~

By Anna María Pálsdóttir; Patrik Grahn and Dennis Persson

Reported by Author; Author; Author

---

Copyright of Scandinavian Journal of Occupational Therapy is the property of Taylor & Francis Ltd and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.