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Meaningful and psychologically rewarding nature-assisted occupations – A feasibility study for improving alternatives in vocational rehabilitation in Iceland

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ABSTRACT

Background: Nature-assisted activities (NAA) have been linked to improved mental health and well-being, and are often perceived as psychologically rewarding. However, little is known about how these activities are experienced within vocational rehabilitation programs in the Icelandic context.

Objective: This study aimed to explore participants' experiences of nature-assisted occupations in vocational rehabilitation, focusing on their perceived meaningfulness and psychological benefits, to inform the development of nature-based interventions within existing programs.

Methods: A mixed-method convergent longitudinal design was used at a vocational rehabilitation centre in Iceland with 11 participants. Participants engaged in weekly, voluntary two-hour NAA sessions over a period of 4–11 months. Activities included outdoor play, foraging, adventure-based tasks, as well as outdoor and indoor gardening. Data were collected using the Meaningful and Psychologically Rewarding Occupation Rating Scale and a focus group interview.

Results: *Quantitative findings:* Outdoor and adventure-based activities were rated as the most meaningful and psychologically rewarding. *Qualitative findings:* Participants described increased enjoyment, personal growth, a sense of freedom, and reduced performance pressure as central to their positive experiences. Structured and indoor tasks were generally seen as less beneficial.

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Introduction

In recent years, research into the role of nature in human health has increased significantly [1–3], with growing evidence that both active and passive exposure to nature can have a positive impact on human health [4–6]. Nature is a salutogenic factor that can contribute to a healthier lifestyle and well-being [1,7]. When natural environments are used in rehabilitation, nature-assisted occupations, participants often find that staying and participating can be psychologically restorative, providing a sense of peace [8–10] and positively affecting their mental state [11]. A theory has been proposed: when nature is integrated into the rehabilitation process, it becomes a key influencing factor that alters the individual's consciousness and initiates recovery. This change in consciousness seems to support, accelerate, and deepen the recovery process for individuals with stress-related problems [12].

The concept of nature-based interventions (NBI) refers to a place-dependent approach where nature serves as the setting for intervention. NBI applies both active and passive engagement with the natural environment, i.e. watching or 'being' in nature, as well as being active [13,14]. However, nature- and animal-assisted intervention (NAAI) focuses on occupations that utilize natural materials and objects to support rehabilitation. NAAI are place-independent interventions that can be performed indoors, outdoors, in space, or subspace [14,15], also called nature-assisted interventions (NAI).

Research on the effects on health and well-being of NAI has created a solid database supporting the positive psychological and emotional effects of being in nature [16,17]. However, the impact on physiological factors is less clear [18–20]. NBR and NAI have shown promising results, especially for individuals with depression, anxiety or stress-related problems [21–24], as well as for quality

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of life, reducing exhaustion symptoms and enhancing overall health [25]. In NAI programmes, the distance from daily demands, positive distractions, and indirect attention contributes to decreased depression and increased concentration [26]. Moreover, NAI increases the chances of returning to work after nature-based vocational rehabilitation [27,28].

Meaning and purpose are brought to life through the occupations individuals perform in different contexts [29]. Unlike other activities, occupations are thought to be personally meaningful and provide a sense of purpose in life [30]. Recognizing purpose in life is an essential part of people's well-being. Meaningful activity can be defined as 'generally positive subjective experiences, composed of a breadth of unique and identifiable aspects that are associated with human action or doing' [31,p.94]. Changes in the fulfilment of basic psychological needs (i.e. autonomy, competence, relatedness) and changes in the meaning of life are predicted by changes in meaningful activity [31]. Similarly, meaningful occupation and occupational value influence the prediction of life satisfaction and the sense of meaning in life [32]. When performing an occupation, the individual's experience, rather than the performance itself, has a health-promoting effect. This underlines the importance of daily activities being both enjoyable and essential to individuals [33]. 'Meaningfulness' constitutes one aspect of Antonovsky's concept, 'sense of coherence', which he considers a necessary part of the process towards improved health [34].

Occupational therapy

Just as an occupation must be meaningful, it must also be psychologically rewarding. Participation in meaningful, psychologically rewarding occupations has also been shown to positively affect people's experience of health and well-being [35]. Research also shows that occupations that lead to a sense of purpose and meaning significantly contribute to health and life satisfaction [36]. These findings suggest that occupational therapists can increase the effectiveness of interventions by choosing occupations that clients experience as fun, mentally and physically stimulating and create contact with other people. Occupational therapists can facilitate engagement in outdoor environments through occupation-focused and occupation-based interventions. This is considered a complex context; therapeutic occupations that foster connections with nature, others, and oneself can positively affect health, well-being and restoration [37].

A theory of occupational values [38] describes three main dimensions: concrete, symbolic, and self-rewarding perceived values. An occupation with concrete value is

often associated with its results rather than the satisfaction derived from its performance. Symbolic occupations tend to be related to personal factors and culture, and the value of an occupation that is rewarding for the individual lies in the pleasure of performing it and the empowerment it brings.

The nature-assisted rehabilitation programme developed in the rehabilitation garden in Alnarp, Sweden, emphasizes participation in meaningful, practical, enjoyable, and self-rewarding occupations. The experience indicates that when an occupation is meaningful, it incentivises clients to try things that may be challenging for them [8,39]. Participants have also succeeded in changing the rhythm of daily life and achieving greater balance. They have achieved this in part by engaging in enjoyable, comfortable, and creative occupations. These are often natural and creative occupations [40].

There is a sure consistency between occupational therapy theories and approaches to nature-assisted rehabilitation [41]. Occupational therapy assumes that individuals are active by nature and that meaningful occupations and activities suit their abilities and bring pleasure, thereby enhancing their overall health [42]. Nature-assisted interventions have been shown to have a positive impact on individuals with stress-related conditions, and numerous studies have been conducted worldwide targeting different user groups [43]. But none have been conducted specifically in Iceland on occupations, rather than on health-promoting outdoor space [11,44,45]. Therefore, it is of interest to investigate which nature-assisted occupations are experienced as meaningful and psychologically rewarding in the Icelandic context of occupational therapy.

Aim

This study aimed to explore participants' experiences with nature-assisted activities and to assess whether they found them meaningful and psychologically rewarding, with the aim of improving and extending the rehabilitation program offered to clients at the Vocational Rehabilitation Centre (VRT).

Materials and methods

This feasibility study employed a convergent longitudinal prospective design [46], utilizing both qualitative and quantitative approaches to assess participants' experiences with nature-assisted activities over one year. Self-monitored questionnaires and a focus group interview were used to evaluate participants' perceptions of participating in these activities.

We have used the term nature-assisted activities (NAI) for simplification, as the study focuses mainly on occupation performance and its associated values.

The venue

The study was conducted at the Vocational Rehabilitation Centre (VRC) in Isafjordur, Westfjords, the northwestern corner of Iceland. The centre provides rehabilitation for individuals who are dealing with some form of health impairment in need of vocational rehabilitation with the goal of returning to work or education.

Participants

Participants were recruited from the VRC in Isafjordur to participate in the nature-assisted vocational rehabilitation programme as an add-on to their ongoing rehabilitation. The study was announced during a VRC group meeting, and information sheets were handed out by staff. Their rehabilitation is individualized and includes various group programmes at the centre, as well as individual counselling and training tailored to their needs. The length of the rehabilitation varies, depending on the specific needs of the participants. A total of 11 individuals accepted the invitation: three men and eight women, aged between 29 and 53, with an average age of 42. The participation period varied from 4 to 11 months, with an average of seven months (see Table 1).

All participants received verbal and written information about the study and had the opportunity to ask questions before deciding to participate. Participation was voluntary; thus, participants could withdraw at any time without affecting their ability to participate in other occupations in their rehabilitation. The study followed the Helsinki Declaration of Ethical Principles, conducting research involving humans [47]. The national Bioethics Committee in Iceland

concluded that no ethical approval was needed for the feasibility study.

Nature sessions as an add-on intervention

The intervention was offered as an add-on to the ongoing vocational rehabilitation programme, comprising two-hour 'nature sessions' per week, which the participants could choose as part of their vocational rehabilitation. Attempts were also made to find activities suitable for all seasons. The activities were selected in a collaboration with the participants and with the possibility of being carried out on-site. These activities were divided into five categories: outdoor play, foraging in nature, adventure activities, outdoor gardening and indoor gardening. During the sessions, the emphasis was on working calmly and enjoying the moment. No goals were set for completing the work; participants were free to quit, and even encouraged to do so, without completing a project they had started. This was because some of them found it challenging not to do things perfectly. Additionally, they could choose not to participate and just be present, watching.

Indoor gardening activities took place on the centre's premises, where there are many indoor plants and space to cultivate flowers and vegetables. Outdoor gardening took place in a 300 m² garden next to the rehabilitation centre. This is a grassy area with some trees, a seating area, and a greenhouse, and the intention is to rebuild it in accordance with the Supportive Environment Theory (SET). Other outdoor activities took place in natural areas, e.g. up in the mountains, by the seashore, at sea and in the forests. All occupations are inspired by horticulture therapy practice [48] and outdoor and adventure therapy [49,50], but are adjusted to the practice and work at the VRC, as described in detail below.

Planning of nature-assisted activity sessions

When planning the activities, a certain amount of flexibility was necessary, as many factors had to be considered, including growth and harvest times, weather, and tides. A tentative schedule was created for the planned activities and their completion dates, but often, the plan had to be adjusted due to weather conditions. For instance, it is unlikely that people will enjoy picking berries in the rain, although it is tolerable with a bit of rain when harvesting seaweed. Rain and windy weather, on the other hand, can ruin the enjoyment of any activity. Therefore, every effort was made to organize the activity sessions so that the likelihood of a good and positive experience for the participants was as high as possible.

Table 1. An overview of the number of participants ($n=11$), their ages (average: 42.1years), and duration of the vocational programme (start to end of program; total months in the program).

Participants	Age	Period of participation		No. of months
F1	49	Dec. 2018	June 2019	7
F2	29	Dec. 2018	June 2019	7
F3	41	Dec. 2018	May 2019	6
F4	48	Dec. 2018	June 2019	7
F5	38	Dec. 2018	July 2019	8
M1	42	Feb. 2019	Dec. 2019	11
M2	53	Feb. 2019	Dec. 2019	11
F6	42	April 2019	Dec. 2019	9
F7	39	July 2019	Dec. 2019	6
M3	32	Sept. 2019	Dec. 2019	4
F8	50	Sept. 2019	Dec. 2019	4
	42.1			7.3

Outdoor play

Outdoor play sessions were offered throughout the year. Altogether, four sessions were offered in the garden, by the seashore, in the mountains, and in an unfrequented park. Creating a snow sculpture, sledging, sea swimming, and picnicking are the occupations classified as play. Snow sculptures and snowmen were made in the garden outside the rehabilitation centre, and works of art and ‘angels’ were made in the snow on the ground. For sledging, participants carried their sledges up the mountain and then slid down. Sea swimming presented a significant challenge. People were not required to swim in the sea, and some participants chose to wade in. The picnic took place in Simsonsgardur, where participants basked in the sunshine and good weather, drank coffee and chatted.

Foraging

This included picking and collecting herbs, berries, seaweed, Icelandic moss, and natural cones and branches. Various herbs were picked in mild weather at the end of June. Then, the herbs were dried and stored in jars. At the end of the session, participants brewed and enjoyed tea from a selected herbal

mixture. Icelandic moss was harvested at the beginning of October, laid out to dry, and finally stored in jars. It was later boiled in milk and savoured as a nourishing beverage. Bilberries were picked in late August. The group drove to a place with many berries, and for 45–60 min, they picked while chatting and resting. At the end of the session, berries were enjoyed with cream. At the end of November, seaweed was harvested. This day was carefully scheduled in advance, as it had to be harvested during low tide. A beach with much seaweed called *dulce* was chosen as it is easily accessible during low tide. The harvested dulce was then rinsed, baked in the oven, and eaten as a snack. In early November, cones, birch branches, heather, and moss were collected. Everything was allowed to dry, except for the moss, which was placed in a bag and stored in a cool place to keep it soft. After that, these materials were used to make Christmas decorations in December (Figure 1).

Adventure activities

Kayaking and hiking were classified as adventure activities and offered once each in the spring and autumn, respectively. During the kayak trip, the group



Figure 1. Walking in the mountains, picking berries and herbs during the summer. Photo: Kristjánsdóttir.

rowed from the clubhouse of the local sailing club with an experienced kayak guide (Figure 2).

The hiking took place in the nearby mountains, where it was possible to drive quite high up and then walk along a marked path with a relatively gentle slope. This journey took about 45 min in each direction. Thus, the group reached a high point in the mountains and enjoyed a magnificent view .

Those two adventure activities occurred only once during the research period: kayaking in the spring and hiking in the autumn.

Outdoor gardening

Outdoor gardening sessions took place in a garden outside the rehabilitation centre. During these sessions, the trees were pruned, manure was applied to the flower beds, and weeds were removed, among other tasks. At the beginning of summer, vegetables and summer flowers sown and grown indoors were planted in raised garden beds and flowerpots outdoors. These areas had to be watered and weeded throughout the summer.

Harvest day occurred in the garden and indoors in late August. Lettuce, chives, kale, and arugula grown in the raised beds in the garden during the summer

were harvested, as well as tomatoes from indoor cultivation, all of which were combined to make a salad. Outdoor gardening activities took place from May to September, with a total of 6 sessions.

Indoor gardening

Indoor gardening activities focused on caring for indoor plants and sowing and cultivating summer flowers and vegetables. Care for indoor plants involved repotting, pruning, and watering. Some plants grew quickly; thus, these plants were propagated, and cuttings were planted in separate pots. During pre-cultivation, seeds were sown in trays or small pots made from newspapers, which were then transplanted. The plants were placed under vegetation lights until warm enough to put the hardy ones outdoors. Heat-loving plants, e.g. tomato plants, were placed in larger pots indoors. It was possible to practise gardening indoors year-round, and there were 9 meetings (Figure 3).

Data collection

All quantitative data were collected post-intervention (after each occupational therapy session) over 1 year.



Figure 2. Kayaking during the spring in Ísafjörður. Photo: Kristjánsdóttir.



Figure 3. Indoor gardening, including annuals and perennials, both edible and ornamental plants. Photo: Kristjánsdóttir.

At the end, after the quantitative data collection, a focus group interview was conducted.

Quantitative outcome measures

Meaningful and psychologically rewarding occupation rating scale

At the end of a two-hour session, where the subject was some nature-based or nature-assisted occupation, participants completed the assessment titled ‘Meaningful and Psychologically Rewarding Occupation Rating Scale (MPRORS)’ [35]. In the rating scale, participants are asked to assess how particular descriptions apply to a specific occupation. The descriptions include: ‘fun’, ‘not physically stimulating’, ‘connecting me with others’, ‘boring’, ‘not mentally stimulating’, ‘physically stimulating’, ‘isolating’, and ‘mentally stimulating’. The answers are given on a scale of 1 – 7, where one means ‘false

for this occupation’, and seven means ‘true for this occupation’. From the answers to these eight descriptions, a specific method calculates how psychologically rewarding and meaningful people experience a particular occupation; see further detail in [35]. The result of that calculation can range from 6 to 42. According to the assessment guidelines, these two factors, i.e. psychologically rewarding and meaningful occupation, should form the basis of the planning of intervention for clients in occupational therapy [35].

Qualitative outcome measures

Photographs and videos

The researcher and the participants took many pictures and videos throughout the research process, even though they were encouraged to enjoy being in nature rather than taking photos. However, they often felt the need to

capture the beauty of nature and document their experience while participating in an unfamiliar activity. Those pictures then became part of the research data. The researcher compiled the photographs and categorized them. They were then viewed in connection with focus group interviews with participants and used to support the data analysis.

Focus group interview

The focus group interview took place in January 2020, and six of the 11 participants participated. Due to personal circumstances, the remaining five could not participate. The interview began by reviewing the photographs taken during the nature sessions (taken by the OT). Afterwards, participants were asked about their experiences with the different activities, including which aspects they found positive and negative. Open-ended questions were posed, and follow-up questions were asked on subjects raised by the participants. Not only were photographs and videos viewed, but the first author's notes taken throughout the process were also reviewed, e.g. to identify comments jotted down about the study's progress, participants' comments on various aspects, and what they thought was positive or could be improved. This information was used to support the analysis and interpretation of the data.

Analysing data

Meaningful and psychologically rewarding occupation rating scale

The answers on the rating scale were calculated according to the instructions provided with the scale. It yielded two numbers that indicated, on the one hand, how psychologically rewarding and, on the other hand, how meaningful each occupation was for the participants. The numbers could range from six to 42, with higher numbers indicating greater meaning or psychological reward associated with the occupation. The numbers for each occupation category were calculated, as well as the average across all categories.

Focus group interview

An audio recording of the entire interview was listened to, and written comments about participants' experiences in nature-assisted activities were noted. Data were analysed according to content analysis [51]. The interview was transcribed verbatim, and then all authors read the transcript. The first author conducted the initial analysis, sorting the findings by occupation. The second step involved a joint session

Table 2. There is a strong positive correlation between the factors 'psychologically rewarding' and 'meaningful' ($r=0.92$) (table 2). All scores are above 30, indicating a high level of significance considering the scale's range.

	Psychologically rewarding	Meaningful
Outdoor play	36.5	34.5
Forage	34.2	31.2
Adventure activities	38.0	36.8
Outdoor gardening	36.5	35.3
Indoor gardening	33.3	32.0
Average	35.7	34.0

to discuss and agree on the themes presented in the results. The results are presented at the group level, encompassing the entire group. As this was a group interview, no specific account is given of how many spoke about a particular aspect of 'xx' or 'YY'.

Results

The results regarding participants' experiences during the research period will be presented here, including quantitative findings from a questionnaire and qualitative findings from a focus group interview.

Quantitative data

Participants found all activities meaningful and psychologically rewarding, with adventure activities, outdoor gardening, and outdoor play ranking highest. Foraging and indoor gardening were perceived as less rewarding (Table 2).

Qualitative data

The focus group interview results are presented for each occupation type. This can, which deepened our understanding of participants' experiences with different kinds of activities, concerning the quantitative findings.

Outdoor play

Outdoor play was an activity the participants said they had never considered or dared to do alone. 'It hasn't occurred to me to go sledging since I was little'. Experiences filled with laughter and joy made people want to keep going despite feeling tired, for example, walking up again and again with the sledge after sliding down a slope. 'This was just so much fun'. The sledging trip was a tremendous physical challenge for many participants; within some, it aroused both sadness over their physical limitations and a sincere

desire to improve them: ‘I realized I just needed to be able to do things like that’. Some participants initially felt that this occupation had no specific purpose and was useless. However, they immediately realized that ‘maybe that was exactly what we needed, and we also need to learn a little bit that we can also just do something fun’. They felt that more time could have been devoted to play than was spent during the sessions.

Swimming in the sea presented a big challenge for the participants, with not everyone choosing to go into the cold sea; instead, they waded in. Despite this, participants were pleased with the session, and some found it among the most memorable. Outdoor play was a major personal challenge for the participants, and for some, it was also a physical one. These sessions were characterized by frolic and joy.

Foraging

Here, participants found that the projects held a sense of purpose, ‘and you saw some results’. Foraging created a state of absorption and mindfulness, where people had to focus on the environment to find what to collect. It took them a while to learn where to look. We went there, and I saw no cones, nothing, and did not know where to look. But all of a sudden, you just saw, you know, just bling, bling, bling, and all of a sudden, they were all over the place. ‘It was the same with the Icelandic moss; it was crazy too. These experiences generated enthusiasm in the group during the search and gathering process. Many participants had never attempted to harvest, e.g. Icelandic moss and dulce, and had never tasted them. ‘I didn’t quite like the taste, but it was fun to taste’. It led to mixed opinions about the taste; nevertheless, people enjoyed trying new things. The participants felt great satisfaction in finding what they were looking for, thus fulfilling the purpose of the session. These sessions were characterized by mindfulness and focus.

Adventure activities

Participants found the adventure activities very enjoyable and felt that activities of this kind should have taken place more often. There were some differences in the experiences of the hike and the kayak trip, though both were perceived as positive. The kayak trip proved more challenging for the participants, as none had ever gone kayaking. One participant saw it as an opportunity to address his fear of the sea, and another went somewhat beyond his comfort zone.

Unfortunately, one participant capsized after only 15–20 min at sea. However, the guide reached the individual quickly and helped the person back into the boat. The participant who was unlucky to fall into the water stated that ‘I think I experienced all the emotional realms’. This included the excitement of trying out a kayak and the feeling of freedom as he sailed out to sea, which he experienced as ‘an indescribable feeling to be there alone in the sea in complete stillness’. It was also followed by fear when he fell out of the kayak, then by relief to get back in and find the guide’s safety, and the pleasure of having achieved all this when he returned to land. Other participants also expressed a variety of emotions, from ‘feeling a little insecure’ or ‘complete anxiety attack’ to a feeling of victory over having faced the challenge and the pleasure of trying.

All participants had tried hiking at some point, though it had been a long time for some. One participant expressed satisfaction with going along, feeling as though he had overcome an invisible hurdle and was now determined to start hiking in the mountains again. ‘Now I know I can do this myself’. Another participant described the pleasure of reaching the hill he had set out for and the sense of freedom standing there and looking over the landscape, stating, ‘It was just wonderful to be up there’.

Participants experienced outstanding achievements and a spectrum of emotions. A defining characteristic of these sessions was the sense of encountering great challenges and the freedom they felt when venturing far out into nature.

Outdoor gardening

During a focus group interview, participants felt it was essential that they could contribute to beautifying the environment. They felt that what they did was important and that ‘one could see the results of the work’. Additionally, these needed to be ‘real tasks that mattered’. Participants found the tasks fun and noted that the sessions could have been a little longer at times. Even those who claimed that ‘gardening was not a favourite’ liked to attend the sessions and felt that they could ‘get carried away while digging up some roots’. They mentioned that some tasks had been physically demanding, but the group understood that not everyone could handle them. Those in better physical condition were ready to take on more complex tasks, and other tasks suited everyone. ‘It was always clear that we didn’t have to do more than we could manage’.

Participants felt pride in contributing to building something that would benefit themselves and others

in the future. They were enthusiastic, and the time passed quickly in those sessions.

Indoor gardening

Participants found it exciting and fun to participate in and monitor the entire cultivation process, from sowing seeds indoors to transplanting the seedlings into pots, watching them grow, and eventually planting them outdoors in the flower beds. 'It was fun to see those tiny seeds become big plants.' It was also considered an advantage that the projects had some purpose, 'that there was a purpose to all this.' Engaging in these activities allowed participants to learn a lot about plants and crops, and it caused them to think about and notice things they had not seen before. It also sparked their interest in cultivating at home. 'I even grew some basil in my kitchen window last summer. Participants felt that the indoor sessions provided a better opportunity for social connections than the outdoor sessions, where people were often in the same room, sat together at a table, and worked. For some, it was both challenging and rewarding, but usually fun, with 'a lot of laughter and a lot of chatting.'

Participants were deeply moved by watching life emerge from a seed, which sparked their interest in cultivating for themselves.

Generally, the participants were happy to have the opportunity to participate in activities they had not done in a long time or to try new things they had never tried before. Even though many of the activities posed significant challenges, participants felt joy, mindfulness, freedom, enthusiasm, and connection throughout the process.

Discussion

The findings of this study indicate that participants perceived all categories of nature-assisted activities as meaningful and psychologically rewarding.

They placed the highest value on their experiences with adventure activities, followed by outdoor gardening and outdoor play, with indoor gardening and foraging ranking lower. These three most valued groups of occupations have in common that their activities always took place outdoors in a natural environment, which likely positively influenced participants' experiences. The natural environment may thus have acted as a supportive factor, as shown in a study [8] that found participants felt supported by the natural environment across all phases of rehabilitation. Outdoor activities have also increased people's attention more than indoors [52]. A comparison between walking outside in nature, walking indoors, and observing

nature indoors revealed that walking in nature had the greatest stress-reducing effect (although the difference was not significant) [53]. This may be because being in nature allows individuals to see their lives and themselves in a different light, which alone can contribute to well-being [54].

Another factor that seems to positively affect participants' experiences is the absence of a focus on performance and results during the activities. Specifically, participants did not have to complete any defined tasks in the sessions. Instead, they could start at the beginning of the session and then stop when they had had enough or the time was up. The outdoor space also allowed participants to step back from the group and work independently. These factors made the activity less demanding. Getting rid of the pressure to succeed and the associated stress is considered necessary for the recovery of individuals with stress-related and/or mental problems [8,55]. The 'Concept Manual' for NBR at the Nacadia Rehabilitation Centre in Denmark also recommends that individuals with low physical and mental abilities choose an activity that requires little social interaction and is not highly performance-oriented. As individuals become more capable, they can choose activities that involve greater physical and mental challenges, more social interaction, and even visible goals for success [15].

The same reasons could explain why the participants perceived indoor gardening and foraging as the least psychologically rewarding and meaningful. Most foraging sessions took place outside, but often ended inside once the collection was complete. In that sense, it was a result-oriented activity, with the group ending with some harvest or product. Although participants were encouraged to enjoy being at the natural sites where they were picking and were told that it did not matter how much they liked or whether they managed to complete the task, many still felt compelled to achieve these goals. This has been found to be less rewarding and therefore important to facilitate occupations not results-oriented [8,40] but rather supporting self-rewarding values [38].

Gardening is frequently used in occupational therapy interventions and is considered a meaningful, purposeful activity that motivates clients, whether indoors or outdoors [56]. However, participants found that indoor gardening provided better opportunities for social connections than outdoor gardening, which they found both challenging and rewarding. In addition, as the name suggests, indoor gardening took place indoors and therefore lacked the benefits of outdoor activities, such as fresh air, daylight, and a feeling of freedom outside the walls of a house [8,18].

Also, when doing indoor activities, it was more obvious that one had to clean up and put all materials back to make room for other indoor activities, rather than outdoors, where all materials belonged in the garden. These factors may have contributed to foraging and indoor gardening being perceived as slightly less psychologically rewarding and meaningful than occupations in the other three categories.

Adventure activities (kayaking and hiking) received the highest scores in all categories. This aligns with research indicating that individuals who engage in outdoor recreation, e.g. hiking, cross-country skiing, canoeing/kayaking, have greater life satisfaction, vitality, and success, with more positive emotions, increased awareness, and reduced depression and negative emotions [57,58]. Hiking is slightly more valued than kayaking and is therefore perceived by participants as the most meaningful and rewarding activity. This is consistent with the findings of a Swedish study [59], which showed that walking was one of the three types of occupations people preferred, regardless of stress symptoms. Hiking has been shown to enhance individuals' connection with nature more than many other activities [60], and it offers various health benefits [61–63], catering to different needs [64]. The feelings expressed by participants regarding hiking and kayaking are similar to those described in a study [44], which analysed tourists' emotional connections with Icelandic nature. Participants in that study expressed feelings of victory over enduring stress and overcoming challenges, the sense of freedom that comes with being alone in nature, and the wonder people feel when they see and marvel at nature's unique qualities.

In the USA, occupational therapists have been encouraged to pay closer attention to leisure activities and to incorporate them more into their work with clients. This emphasis is placed on the significance (meaningfulness) of these activities for clients and their positive effects on occupational balance and health [65].

During a focus group interview on the experience of participating in nature-assisted activities, participants often reported that they had begun engaging in more NAA themselves after the sessions. Some individuals, e.g. became more interested in gardening or finally acted on the idea of growing vegetables at home, on a balcony or in a garden, after years of wanting to do it but not getting around to it. Participating in NAA sessions opened people's eyes to the potential benefits of nature for improving their health and well-being. This finding is consistent with studies indicating that people's perceptions of the

value of everyday activities changed after participating in nature-based rehabilitation [40,41]. Furthermore, individuals find ways to incorporate nature and NAA into their lives and continue doing so even after rehabilitation ends [40,66].

Participants mentioned that outdoor play and adventure activities could have been done more often. Play is an activity people do voluntarily, with no specific goal other than enjoyment, and is probably the activity adults do the least. It is interesting how little research has been conducted on adult play, which makes it challenging to find relevant studies. The same can be said of the concept of playfulness, which has been examined in a qualitative study [67]. Based on that study, it was concluded that playfulness can enhance and improve individuals' performance in occupations and thus be an essential tool in occupational therapy interventions. Play is a vital part of people's lives, and participation in playful activities can increase balance in daily activities [42]. Evidence suggests that individuals who experience a balance in occupation have a higher quality of life, are more satisfied with their occupation and are less depressed [68]. Play and leisure activities were also rated as the most psychologically rewarding, although some participants perceived them as lacking a particular purpose or use. This aligns with Person and Erlandsson's [38] concept of the value of personally rewarding occupations, which emphasizes the satisfaction derived from performing an activity and the empowerment that follows. Thus, it is not the result that is important, but managing to forget time and place while doing a pleasurable activity. How people experience the implementation is more important than the implementation itself [33]. The most significant difference between the terms psychologically rewarding and meaningful is that psychologically rewarding occupations are considered more fun [36,69]. Better awareness of one's own needs and how to fulfil them is part of the positive effect that nature-based rehabilitation can have [40]. A fun activity that is performed because people want to is perhaps exactly what participants in vocational rehabilitation need the most. As one participant expressed regarding his experience of the play's apparent lack of usefulness: '... but maybe this is exactly what I need'.

Participants found that outdoor activities, particularly adventure activities such as hiking and kayaking, provided the greatest psychological benefits. These activities and outdoor play were highly valued due to the positive effects of being in a natural environment, which contributed to wellbeing. The absence of performance pressure in the activities played a significant

role in the participants' positive experience. Activities that did not focus on specific outcomes were perceived as more enjoyable and less stressful, aiding recovery for those with stress-related conditions. In contrast, the structured, goal-oriented activities were perceived as less rewarding. This is because they focused on outcomes, took place indoors, and limited the benefits of outdoor exposure.

Participating in nature-assisted activities during rehabilitation inspired many individuals to continue engaging in similar activities after the program ended. These are significant results and highlight the long-term positive impact on their health and lifestyle, which is the essence of occupational therapy. This study included clients with diverse rehabilitation needs and vocational impairments. Therefore, future in-depth studies are warranted to determine how to construct a nature-assisted rehabilitation program that targets the needs of different user groups in vocational rehabilitation. Despite being a feasibility study, the results provide insights into NAA that can be incorporated into the VRC's vocational rehabilitation program and serve as a basis for further research in the Icelandic context.

Ethical considerations

The study followed the ethical standards for conducting research involving human participants. All data were handled in accordance with the recommendations of the Swedish Ethical Review Authority and SLU's data handling policy under the General Data Protection Regulation.

Study limitations

This study was a feasibility study examining participants' experience with the particular NAA offered at the centre. Therefore, the findings reflect only the particular NAA, not the participants' health-related outcomes. The aim was to identify activities to be included in future programs. Therefore, no particular target group were chosen, but all participants at the centre were invited to participate. As this study is conducted as a feasibility study with a relatively small sample size, it limits the generalisability of the findings. Also, there can be a selection or recruitment bias due to participants' specific interest in nature.

Conclusion

Engagement in enjoyable, flexible, and nature-based outdoor occupations supports psychological recovery and well-being in vocational rehabilitation settings.

Significance

These findings highlight the value of integrating personally meaningful, low-pressure nature-assisted occupations into vocational rehabilitation programs to foster lasting engagement in health-promoting behaviours.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Use of AI in scientific writing

No AI was used in scientific analysis or writing. The authors conduct all work.

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