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## Gardening as a Meaningful Occupation in Initial Stroke Rehabilitation: An Occupational Therapist Perspective

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# Gardening as a Meaningful Occupation in Initial Stroke Rehabilitation: An Occupational Therapist Perspective

## Abstract

*Background:* Initial rehabilitation after stroke is demanding for patients whose primary aim is to regain their functions. The literature indicates that gardening may provide medical rehabilitation opportunities and health resources. This study explored occupational therapists' own observations and descriptions on how participation in a gardening group may support inpatients' initial rehabilitation following acute stroke.

*Methods:* The authors analyzed notes written by occupational therapists during a 6 month-period that reflected their observations and descriptions after sessions with a gardening group. The therapists were trained in stroke rehabilitation and offered two sessions with gardening groups per week. The sessions were integrated into the occupational therapy program at a residential rehabilitation hospital. The study had a qualitative descriptive design, which included thematic analysis.

*Results:* Six themes were revealed: possibilities for skills training, engagement in the occupation, mastery of the activity, finding mental rest, connection to past experiences, and shared experiences and hope.

*Conclusions:* The occupational therapists found that gardening provided clinical opportunities for skills training and health resources. The results are discussed in relation to meaningful occupations through occupational characteristics, such as doing, being, becoming, and belonging. As a group-based, common occupation, gardening may provide a complementary approach in stroke rehabilitation.

## Comments

The authors report no conflicts of interest to disclose.

## Keywords

belonging, engagement in activity, gardening group, mental rest, past experiences, shared experiences

## Cover Page Footnote

The gardening intervention was supported by the Norwegian Extra Foundation for Health and Rehabilitation with the last author, Nina Levin, as the project leader.

## Credentials Display

Grete Patil, PhD; Mona Asbjørnslett, OTR, PhD; Kristin Aurlien, OTR, MSc; Nina Levin, OTR, MSc

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In the initial phases of rehabilitation following acute stroke, patients commonly focus mainly on regaining their lost physical or cognitive functions (Kirkevold, 2002). However, a patient's experience of an acute stroke will generally leave him or her affected by uncertainties about his or her health and future life. Hence, the question of how to cope with such situations and various needs beyond purely medical ones is identified as a significant concern for patients who have had a stroke (Peoples, Satink, & Steultjens, 2011). In this respect, both the pursuit of familiar activities and the support of family members and peers are important. Hammell (2004) suggests that the types of occupations selected in occupational therapy should primarily be those that the patients themselves consider meaningful. The underlying notion is that participation in meaningful occupations promotes health and an improved quality of life (Hammell, 2004; Wilcock & Hocking, 2015). Furthermore, Halding, Wahl, and Heggdal (2010) report that social relationships and support are important in rehabilitation, and Hammell (2014) emphasizes that one of the core domains of "meaningful occupations" is the sense of belonging (p. 39).

Gardening for therapeutic purposes has commonly been practiced in occupational therapy since the early days of the profession (Gerlach-Spriggs, Kaufman, & Warner, 1998). For example, Wiseman and Sadlo (2015) describe how gardening for therapeutic purposes is widely used in occupational therapy in Europe and the US to promote recovery and well-being in different target groups. A common approach is the formation of a gardening group, although sometimes the approach is used for individuals. According to the results of a survey conducted among Swedish occupational therapists, 44% of the therapists used creative activities for therapeutic purposes, and 30% of those chose gardening and plant-related activities (Müllersdorf & Ivarsson, 2012). The responses to a survey of occupational therapists conducted online via portals throughout the US led Wagenfeld and Atchison (2014) to conclude that gardening is both purposeful and meaningful. They highlight the importance of participants' physical interactions with the natural environment and/or by interacting with plants, plant materials, and gardening activities. Contact with nature is generally associated with the restoration of depleted mental resources and stress, as well as opportunities for physical activities and social interactions, all of which are important for improving subjective well-being (Hartig, Mitchell, de Vries, & Frumkin, 2014; Kaplan & Kaplan, 1989). Söderback, Söderström, and Schälander (2004) describe an occupational therapy program for the rehabilitation of people with neurological injuries, and they identify and argue the case for eight therapeutic outcomes of garden-related activities: mental healing, learning new recreational occupations, social integration, sensory enrichment and integration, cognitive reorganization, sensory motor training, assessment and training of prevocational skills, and assessment and training of ergonomic bodily positions.

However, there are few published empirical studies of the health benefits of gardening for people who have had a stroke. Lee, Park, Park, and Son (2018) report an improvement in upper limb functions and balance in inpatients who attended an 18-week therapeutic horticulture program in a rehabilitation hospital compared to a control group with no additional treatment. Kim, Kim, Mattson, and Kim (2010) describe similar improvements in visual motor skills among long-term inpatients who participated in a gardening group in a hospital compared with a control group with treatments as usual. Both of the aforementioned papers report improvement in activities of daily living and a decrease in depression among the gardening group. Barello et al. (2016) interviewed elderly inpatients who have had a stroke and found that their participation in a hospital's gardening program had a stronger sense of having an active role in their health care and life situations. Furthermore, Lee et al. (2018) report that patients who had had a stroke were satisfied with their participation in a gardening program, and Ho, Lin, and Kuo (2016) found an improved quality of life after tending

plants once a week over a 3-month period. Jonasson, Marklund, and Hildingh (2007) studied the experiences of outpatients with neurological impairment, in most cases because of a stroke, who worked in an adapted training garden in a rehabilitation hospital. The authors found that the activity was beneficial for the outpatients' rehabilitation and that they had enjoyed doing practical work. Jonasson et al. (2007) also point out that there was a need for activities adjusted to the outpatients' functional level and capacity.

Literature on other target groups points to the benefits of gardening and horticultural activities for mental health (Gonzalez, Hartig, Patil, Martinsen, & Kirkevold, 2010) and for stimulating the mental resources of patients recovering from somatic diseases, such as cancer (Cimprich & Ronis, 2003). Furthermore, studies of people with stress-related problems have revealed that patients' experiences of engagement in such activities were associated with feelings of enjoyment (Eriksson, Westerberg, & Jonsson, 2011). Diamant and Waterhouse (2010) describe how a garden program and shared daily activities were used to strengthen social inclusion among members of the gardening group and the wider society.

Through this article, we aim to contribute to qualitative studies of how gardening in group-based occupational therapy may be a useful approach in initial stroke rehabilitation. We chose to study the approach from the perspective of experts, namely occupational therapists who have worked in stroke rehabilitation for 5 to 15 years and who have seen many patients through the initial phase of their rehabilitation. Apart from the study by Söderback et al. (2004), there are limited in-depth descriptions by clinical experts on how gardening activities may support the rehabilitation process of patients who have had a stroke, and in this respect, we consider that views of clinical experts may complement patients' views (Barello et al., 2016; Jonasson, Marklund, & Hildingh, 2007).

The care unit in which our study was conducted had a distinct focus on medical rehabilitation and purposeful occupations. As an extension to that approach, the occupational therapists—two of whom are coauthors of this paper—were concerned with occupations that their patients might view as meaningful, and this led them to become interested in how gardening as occupation might serve both perspectives in the patients' rehabilitation processes. For our study, we, the four coauthors, employed the understanding of meaningful occupations through four domains, specifically the sense of meaning through doing, being, belonging, and becoming (Wilcock & Hocking, 2015), whereby doing relates to the meaning sensed by carrying out the actual occupation, being indicates an individual's reflections on his or her life and identity, belonging refers to an individual's relatedness to others, and becoming concerns the development of the self. Hammell (2014) argues for an extended understanding of the sense of belonging through "connectedness" (p. 40). In addition to connectedness to others, social integration, and participation in activities with and for others, she includes connectedness to one's own history, culture, and the nature environment, and connectedness through the sense of being in a safe place.

The specific aim of our study was to explore occupational therapists' observations and descriptions of how participation in a gardening group supported inpatients' initial rehabilitation following an acute stroke. Our approach was to analyze notes written by the therapists immediately after gardening sessions.

## Method

### Study Design

We applied a qualitative descriptive design (Sandelowski, 2000; Stanley, 2015) in our attempt to uncover and explore the occupational therapists' observations and descriptions of gardening as an approach used in occupational therapy for the rehabilitation of patients following a stroke. The gardening program was started prior to the start of our study.

## Participants

Four occupational therapists supervised the gardening program during the data collection. All of the therapists were women between the ages of 40 to 60 years. Three of the therapists had 10 to 15 years of clinical experience in stroke rehabilitation and one had 5 years of experience. All of the therapists were licensed occupational therapists and two held a master's degree in health sciences. The two therapists who are coauthors of this paper were among the three therapists with 10 to 15 years of clinical experience, and they later participated in the data analysis.

## Study Context

The study took place in a residential medical rehabilitation hospital in southeast Norway. The hospital is situated next to a fjord, with spectacular views both toward the coast where there are boats and water activities and toward the adjacent natural landscape. Most of the hospital buildings date from the 1950s and later; they are surrounded by paths and there is limited car traffic. In 2012, a roof terrace was renovated and equipped with plants and furniture to provide an adapted outdoor space for leisure activities and gatherings. The renovation was initiated by the last-named author of this paper.

The hospital accepts patients with a variety of complex and acute illnesses and injuries, including those released from acute stroke units in other hospitals. The average length of stay at the hospital for patients who had have a stroke is 31 days, after which they are transferred to less specialized health care units or sent home.

The gardening group was initiated indirectly as a result of external funding designated for the development of a suitable rehabilitation program that was adapted to patients who have had stroke and for whom use of the natural environment outdoors and gardening activities outdoors and indoors formed part of their rehabilitation. The group formed an integral part of the hospital's occupational therapy program, and participation in the group was offered as soon as the patients had become adjusted to the hospital environment and the rehabilitation program. The patients in the gardening group were, therefore, still in an acute phase of rehabilitation, in which the major focus of attention was on them regaining their physical and cognitive functions (Kirkevold, 2002). The four occupational therapists who supervised the gardening group, and the staff in the occupational therapy unit as a whole, grounded their approach to treatment in the perspectives of the Model of Human Occupation (MOHO) (Kielhofner, 2008). The activities and tasks in the gardening group were adapted to each patient with respect to his or her skills, motivation, and capacity, and were viewed in relation to the overall context of the patients and their rehabilitation process. Normally, three of the four therapists were present during all therapy sessions to facilitate and support the patients and to be attentive to their potential for skills training, such as the use of an affected hand. All four therapists had equal responsibility for ensuring that the patients completed the program.

Each session in the gardening program lasted between one and one-and-a-half hours, and two sessions were held per week. The activities were group-based, with between two and six patients participating each time. There were four patients during the majority of the sessions. On average, each patient took part in four sessions during his or her stay (range 1 to 17 sessions). Each patient was recruited to the gardening group through his or her designated therapist, and information about the offer was posted on boards in the common hospital areas. More men than women participated in the program, and this was also the case for the group of patients in the stroke unit. The patients participated in horticultural activities, such as propagating plants from seeds or cuttings, potting, planting, watering, composting, harvesting plant material, and preserving the material for tea or decorative purposes. They also made food or handicraft items using materials obtained from outdoors. The activities took place both indoors and outdoors, depending on the season, the weather, or purely practical reasons, such as limited time to dress the patients for poor weather conditions

(e.g., low temperatures and precipitation). Indoor activities, such as sowing seeds and handling plantlets, was common in March and April, while from May to late fall the group spent equally many sessions outdoor as indoors. During indoor sessions, the door to the outdoor area was kept open and patients often went outside to do gardening tasks or to enjoy being outdoors.

### **Data Material and Ethics**

The data material consisted of 29 typed pages of notes taken by the four occupational therapists. The notes were taken between the months of March and November, with a break during the summer. The notes were from 49 sessions, in which more than 50 patients had participated. Immediately after each session, the therapists shared their observations and lessons learned and took turns in writing the notes the same day. The starting point for each discussion was how the session had been experienced by the patients and therapists, whether the selected activities were suitable, and the extent to which the therapists observed them as beneficial to the patients' rehabilitation. However, as the therapists gained more experience with the gardening group, the range of topics they discussed became wider, particularly in relation to the group dynamics. For most sessions, their notes covered approximately half of a page and contained information on what kind of garden activities the group did, the therapists' observations and descriptions of how the participants viewed the activities, and the therapists' comments on whether the occupation supported the patients' rehabilitation. In a few cases, the therapists noted anonymous quotes they recalled as either made by the patients or by themselves.

The study was presented to the South East Committee of the Regional Committees for Medical and Health Research Ethics, which concluded that it concerned the quality development of a clinical program and, therefore, did not require approval under Norway's Medical and Health Research Act of 2008. To preserve anonymity, neither the occupational therapists nor the patients were identified in the notes. Therefore, no records of the analyses of individual patients were made available, only information on each patient's participation at the group level.

### **Analysis**

Two of the occupational therapists who had supervised the gardening groups and two external researchers—the two coauthors who did not participate in the gardening program as therapists—participated in the analytical process. Thematic analysis was used to examine the written notes (Stanley, 2015). When reading and discussing the written notes, the two therapists and the other two external researchers tried to understand the meaning of the descriptions to gain a deeper understanding and more critical interpretation (Kvale & Brinkmann, 2009) of the therapists' views on how the program had supported the patients' rehabilitation. The process shifted between discussions among the authors and in-depth sorting of the data material by one or two of the authors.

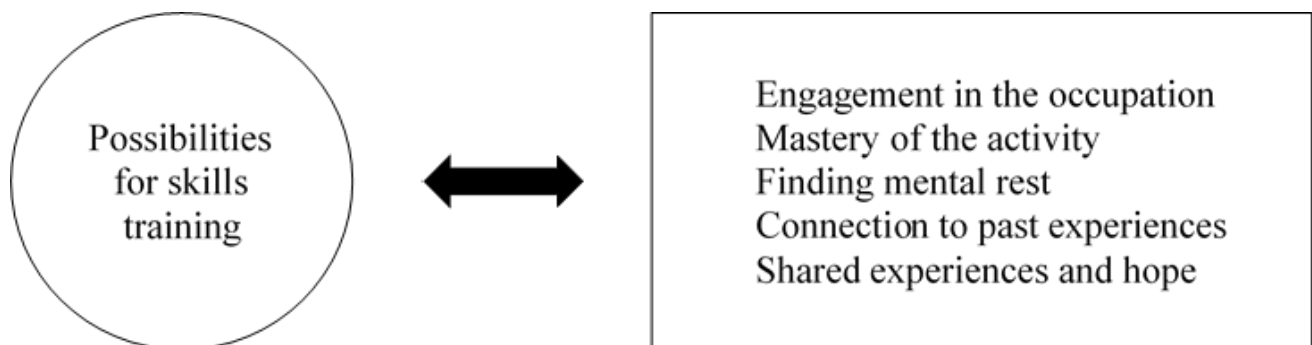
As a first step, we read the notes and discussed their contents and meaning. Thereafter, one of the external researchers categorized the data material. The first categorization of the meaning of the text material (Kvale & Brinkmann, 2009; Stanley, 2015) reflected the fact the two occupational therapists had been inspired by the MOHO (Kielhofner, 2008). In that early phase of the analysis, we constructed various categories of gardening as clinically purposeful, as well as descriptions of the gardening activities and clinical reasons for them that were inspired by the MOHO with respect to skills and functions. That step in the analysis made it clear that the gardening program gave opportunities for skills training.

We then discussed the contents of the notes again. We understood that the notes contained additional information on how, apart from the skills training, gardening could be experienced as a meaningful occupation for the patients. In a second phase of the analysis, the two occupational therapists read the notes again and used their clinical experiences to understand and identify such

additional information. The outcome was a sorting of the text whereby they described the extended meaning of how participation in the gardening program could support the patients' rehabilitation process. They found that the notes covered aspects, such as shared motivation, cooperation, mental rest, natural movement, forgetting one's illness, sensory stimulation, communication, life experiences, expectations, and hope. At that stage in the analysis, Hammell's (2014) extended view on dimensions of meaningful occupations started to become central in the analytical discussions among the four coauthors as a group. We used the material to sort the data into a new set of categories of the therapists' observations and descriptions on how gardening supported rehabilitation (for example "sharing experiences," "belonging to a group," and "hope for the future"). Finally, we identified central themes based on the aforementioned categories to explore the meaning of the text material more fully (Kvale & Brinkmann, 2009; Stanley, 2015). We ended up with six themes that described different aspects of skills training and occupational meaning with respect to the benefits of participation in the gardening group for stroke rehabilitation.

### Results

The first of the six themes that emerged following the analysis, namely possibilities for skills training, focused on gardening as purposeful for functional training, while the remaining five themes shed light on the experience of occupational meaning through gardening (see Figure 1). The arrow in Figure 1 indicates a mutual relation between what the occupational therapists observed and described as purposeful and meaningful when gardening.



*Figure 1.* Themes indicative of a relationship between skills training for a particular rehabilitation purpose and themes indicative of additional occupational meaning.

### Possibilities for Skills Training

The written notes were rich in examples of how the four occupational therapists described the patients' work with plants and garden-related tasks. They commented on how the patients worked on the functioning of their hands and feet to perform the tasks and meet the rehabilitation goals that had been set for them. The notes described how the patients' capacities, such as strength, balance and coordination, gross and fine motor skills, and cognitive and sensory skills, were challenged.

Both light and heavy physical work challenged the patients' strength and balance. The occupational therapists observed that activities, such as digging or using a wheelbarrow outdoors, were hard physical work for the patients who were able to walk with limited assistance. Also, less demanding tasks, such as stretching to pick apples from a tree or just standing on an uneven lawn, challenged the patients' balance and movements in many ways. The notes indicated that the therapists made use of their experiences and understanding of skills training in adapting the patients' bodily positions during their performances of a gardening task. The following quote relates to the therapists' observations of the therapeutic value of working with pumpkin seedlings indoors:

The patient was standing and used his affected hand as support . . . he was aware of this himself . . . crossed the [body's] midline, was balanced while standing and managed to transfer body weight. When he was standing and balanced, he used his paretic left hand to grip the watering bottle and release it again.

The patient in question had attended the gardening group for some time, and the therapists viewed him as self-confident and independent when gardening. The patient intuitively used his affected hand, which challenged his balance while he was standing at a table working with the plants. The task was considered a common everyday task and ideal for working on improving balance and developing the strength needed to function in everyday life.

The occupational therapists pointed out that both fine motor skills and cognitive skills, such as visuo-constructive abilities, were essential when performing common gardening tasks. One of the tasks undertaken in the gardening program was planting tulip bulbs, since it required judgment of distances between the bulbs and planting depths, as well as grip strength to hold bulbs of different sizes. This similarly applied to working with seeds of different sizes. From the therapists' understanding, such simple tasks were used to determine the planning of planting sequences and making strategies for carrying out the activities. Their notes contained many examples of how they organized the tasks in such a way that the patients had to focus on strengthening the neglected side of their bodies.

In addition, skills training for other functions, such as speech and sensory perception, were prominent in the notes. The occupational therapists described how one patient demonstrated greater verbal expression when doing simple gardening tasks, such as picking fir cones and branches for the compost bins, than when in other settings. Gardening challenged and triggered the patients' need to express an interest in the activities verbally, and thus provided a natural setting for speech training.

The occupational therapists also reported that when some of the patients first joined the gardening group, they expressed that they failed to see how gardening could support their need for skills training. Some of the patients left the program without engaging in the group, while others were willing to see whether the therapy would work for them. The therapists understood that some patients did not consider gardening suitable for skills training. Although the therapists described gardening as a suitable occupation for patients to reach their rehabilitation goals, the observations led them to consider how the activities could be adjusted in order to challenge different physical and cognitive capacities and how gardening could be further adjusted to individual needs and rehabilitation goals.

### **Engagement in the Occupation**

The occupational therapists' observations and descriptions of the patients' motivation for engaging in the gardening tasks were of fundamental importance in the study. The patients expressed their engagement verbally in the gardening group and the therapists similarly observed the patients' engagement in their body language. The patients' engagement often led to further skills training, sometimes unintentionally. For instance, the therapists described how one patient who usually sat in a wheelchair took the initiative to walk away from the wheelchair to water and care for some plants:

appeared to be very interested . . . took initiative . . . was thriving and came . . . to the session on own initiative . . . walked straight to the pumpkin plants and was happy to see they had grown . . . worked calmly and at an even tempo.

According to the notes, the same patient took charge and adapted the activities to suit his functional level. He chose the size of the watering can and filled it with an amount of water that was possible for him to carry. The patient's use of a portable table for support when walking away from his



wheelchair demonstrated improvisation. The therapists considered that he found gardening attractive and that it led to appropriate skills training. The patient was described as being surprised about what he could manage to achieve, and his progress in balancing and walking was seen as having been supported by his engagement in gardening and an interest in caring for plants. The therapists thought that patients, such as this one, experienced a sense of flow and motivation that advanced their skills training. They also noted that both this patient and others had observed that the plants had grown and developed between one group session and the next, and that this had given the participants a sense of satisfaction and motivated them to continue to participate in the gardening group and thereby continue their skills training.

The occupational therapists often observed that the patients engaged in the gardening tasks without particularly focusing on their skills training, and they commented that sometimes movements, such as stretching the arm and the body, were triggered when the patients searched for an object on the table or were picking berries. Further, the patients were sometimes described as surprised when they recognized their progress in regaining function. The notes described one patient with an affected right hand who was cleaning up outdoors when that patient suddenly realized his or her affected hand was holding the broomstick tightly. The therapists reflected on the clinical value of managing such an everyday task and that the patients could explore their bodily movements, feel their body being used, and sense that their coordination of their movements was returning. As a further example, the smell and taste of plants and garden products made the patients aware of their sensory capacity, such as when one patient used the lavender to explore whether his or her sense of smell was still intact.

### **Mastery of the Activity**

The occupational therapists described the patients' experience of mastery when participating in the gardening group. According to their notes, the patients expressed satisfaction when doing an occupation adapted to their functional level, and their satisfaction was particularly enhanced when they managed tasks that were of interest to them. The occupational therapists considered the use of gardening in stroke rehabilitation as both a context and an occupation in which the patients themselves could recognize their own progress, experience mastery in functioning, and look for new ways to challenge themselves.

The notes contained descriptions of the importance of experiencing manageable tasks, both for the patients' mental health in general and for progressing in their skills training. The occupational therapists noted that one patient who was depressed and felt lonely did not want to participate in the rehabilitation program and expressed feeling defeated. The patient was persuaded to just sit and watch the gardening session, and this became the first step toward integration in the group activities. The patient first engaged in cleaning picked lavender, experienced it as a manageable task, and made progress thereafter. Yet another patient revealed verbally to the therapists that when attending the gardening group the patient had sensed mastery for the first time during the hospital stay. Part of the reason for this was that the tasks were not too difficult to manage, the context was informal, and the patient did not feel any pressure to perform to the same extent as in traditional training sessions.

The occupational therapists discussed how, in liminal stroke rehabilitation, patients might experience situations that could be associated with a lack of function and thereby lack of mastery, and thus have a negative experience. The therapists attributed value to knowledge that progress in rehabilitation developed naturally when the patients participated in an everyday manageable occupation, such as gardening, and how, for some, it was important not to be constantly reminded of their lack of function.

Furthermore, gardening as an occupation led to enjoyment and satisfaction from making a specific product, and through this, the gardening contributed to the patients' increased sense of well-being and self-esteem. The occupational therapists noted the importance of harvesting fruits or herbs in the garden or making products in the group, and how these became concrete and visible indications of the patients' mastery. Some products, such as potted plantlets, lavender bags, and glasses of jam, could be taken home by the patients when they left the hospital. Many patients expressed satisfaction with this possibility and saw the products as gifts and as a reminder of what they had achieved in the gardening group.

### **Finding Mental Rest**

Many of the gardening sessions introduced occupations that helped patients to become calmer and to gain mental rest. As an example, the occupational therapists referred to a patient who had told them that it was nice to attend the gardening group because it allowed the patient to let go of difficult thoughts. The therapists also described how seeing plants grow and develop over time could help patients to unwind and be less impatient concerning the rate of their rehabilitation progress: "The plants are growing at their own tempo; he is telling that it is helping him to be more patient." The occupational therapists often described the importance of being in a natural environment or in contact with elements of nature, such as exemplified in the quotation above. Many of the activities took place outdoors in the garden, and thus provided opportunities to listen to the summer rain or to touch plants and soil, for example. The therapists were aware of the patients' comments about such experiences when they did simple and sometimes routine tasks.

The occupational therapists' notes also contained examples of activities that enabled the patients to unwind and rest to the extent that they could focus on their skills training. One patient, who enjoyed outdoor gardening tasks, such as raking the lawn and composting, told them that when he was in that setting and in a relaxed mood, his progress in skills training, such as recalling difficult words, was at its best. The therapists thought that self-selected tasks ensured a safe and known context and occupation, which in turn led to mental rest and thereby boosted speech training.

The occupational therapists described how they had observed that the patients had thrived during the gardening sessions to the extent that they sometimes forgot their illnesses and functional limitations. In some cases, the patients noticed this themselves and were surprised by the outcomes. In such cases, their focus of attention had been shifted away from their lack of function to an object in the garden or whatever was happening. In the same way, their sense of not being hospitalized but taking part in an everyday activity when attending the gardening sessions was apparent. The same observations were made about how a patient gained the idea from the gardening group to weed and clean the plantings on the roof garden during quieter times in the day. When he was in a peaceful atmosphere, the patient read tags with plant names and used the activity to work on his memory skills. The occupational therapists concluded that carrying out pleasant activities enabled patients to restore their minds and mental resources for dealing with their loss of function.

### **Connection to Past Experiences**

The occupational therapists observed that the patients sometimes related gardening to past experiences or that they experienced gardening as a familiar and preferred context and occupation. They observed that the patients could thus experience gardening as personally meaningful and as a reflection of their identity and preferences. In a number of places, the therapists' notes point to how the patients' positive relations to gardening or the experiences of nature strengthened their engagement in the gardening group, and how that, in turn, led to progress in their skills training and rehabilitation.

Childhood memories were evoked among the patients in the gardening group, and for some that became meaningful in and of itself. The occupational therapists referred to one patient who had told them that the smell of soil evoked childhood memories of field trips with a grandparent, when he had been sleeping in a tent and the sensory experiences had become strongly associated with good memories. The patient used his body language to visualize his memories and explained how gardening gave meaning to his hospital stay. In his case, gardening as an occupation seemed to provide a link to important life events that provided a source of inspiration for him to continue gardening. There were only a few cases when the therapists linked a patient's preference for an activity to his or her vocational history, such as farming. Moreover, their notes about one patient showed that familiar outdoor work in the garden had been emphasized by the patient's psychologist as essential for future rehabilitation.

### **Shared Experiences and Hope**

The occupational therapists described the gardening group as an opportunity for patients to meet and work together. They considered the social environment as supportive and noted that the patients shared their experiences and own stories about gardening, their health challenges and worries, and their views and hopes for the future. They used books to gain knowledge of gardening in general, and the books stimulated the patients' conversations about new occupations in daily life and how to carry on with gardening when they returned home.

The occupational therapists observed that in the gardening group the patients understood and cared for each other and took the initiative to help each other. In their notes, they described the social environment as inclusive and as providing mutual acceptance. The patients had different roles in the group and their roles reflected their characters and identities:

one of the younger patients, a restless person, wanted to sit next to the older person . . . during several sessions . . . the older one talked about the farm where the person grew up, what sorts of apple trees they grew and how they made apple cakes. This person had a 'grandparent's' attitude that appeared reassuring to the younger one and the rest of the group.

The therapists thought that the older patient seemed to bring comfort and create a sense of calm for the younger one, and the experiences and stories from the past added positively to the atmosphere and facilitated the communication in the group.

The occupational therapists also observed that the social environment in the gardening group opened a wide range of collaborations whereby the patients could complement and support each other during a demanding period in their lives, and the group was seen as a social environment in which the patients could sustain their hope of successful rehabilitation. In addition, the therapists observed that the patients conveyed their own progress in gardening and rehabilitation to new patients, and gave verbal support when other patients struggled with tasks and felt discouraged. A common supportive comment was 'I could not do such tasks two weeks ago, but look at me. Now I can!' The therapists noted that such supportive conversations inspired the patients to achieve higher levels of performance and to test past and new occupations for their lives in the future. They described one patient who, prior to his stroke, had enjoyed hunting with his family and friends. The group conversations caused the patient to reflect on his contribution to the hunting group in the coming season, and he happily realized that taking care of the campfire and the coffee pot would be both manageable and a meaningful contribution to the group.

Some gardening activities were viewed as possible to carry out at home. One patient told one of the occupational therapists that he would start watering his houseplants. He also described how newly acquired knowledge, such as how to dry herbs for tea, was a potential occupation to continue later. Other occupations inspired patients to think of new interests, such as planting flowers in a

garden or making plans for using their own outdoor space. As an example, the therapists referred to a patient who said that she would like to have an apple tree in her garden. Apart from coinciding with the patients' own occupational interests and history, such statements could indicate that the activities in the garden group initiated the patients' reflections on occupational preferences and priorities in their lives in the future.

### Discussion

The aim of our study was to explore occupational therapists' observations and descriptions on how participation in a gardening group could support the initial rehabilitation of patients following acute stroke. The findings indicate that in the four therapists' view the gardening program covered different needs during the initial phase of the patients' rehabilitation. Gardening in a group was seen as a purposeful occupation to achieve rehabilitation goals, such as skills training, and at the same time it provided a meaningful occupation for many of the patients. In addition, the findings indicate that the therapists saw possibilities for individual patient's adaptation through everyday, common gardening activities, which also triggered engagement, mastery, mental rest, connection to past experiences, and connection with others. As shown in Figure 1, the findings indicate that what may be seen as purposeful in the occupation interacts mutually with what may be seen as meaningful. In the following, we discuss the findings in relation both to relevant empirical literature and to possible domains of what may be experienced as meaningful occupations: doing, being, belonging, and becoming (Hammell, 2014; Wilcock & Hocking, 2015).

First, we wish to point out that a group setting was applied as the social context for the gardening occupation, and that the benefits of experiencing social ties with others and social support among the group members were prominent in most of our findings. The development of such strong social ties has been observed in earlier studies of group-based therapeutic horticulture interventions (Diamant & Waterhouse, 2010), as well as in other group-based approaches in rehabilitation (Halding et al., 2010). It is worth mentioning that although Barello et al. (2016) point to horticultural activities as facilitators of communications between patients and therapists, the occupational therapists in our study noted that, to some extent, they withdrew from their roles as therapist to give the patients support when needed and otherwise be an equal member of the group. Apart from covering the social relations as one aspect of the domain of belonging (Hammell, 2014), we also wish to point out the relevance of the group setting in the following discussion of other domains of meaningful occupations. The observed benefits of the group setting support the critique by Dickie, Cutchin, and Humphry (2006), who stress that an individual should be viewed in relation to his or her context when discussing the meaning of occupations.

The first theme to emerge from the analysis was how the use of gardening as an occupation gave possibilities as well as motivation for skills training. The gardening group was an integral part of the patients' rehabilitation program, which aimed to meet individual patient goals, and this may explain why the four occupational therapists, all of whom had *extensive* experience in stroke rehabilitation, described their observations of skills training in such detail. The findings from our study are in line with findings in the quantitative studies by Kim et al. (2010) and Lee et al. (2018), who describe improvement in visual-motor coordination, upper limb function, and balance in patients after their systematic engagement in garden activities in rehabilitation following stroke. In our study, the analysis of the occupational therapists' notes revealed that the patients themselves had noticed progress in their activity performance and, consequently, had been inspired and motivated to carry on with their rehabilitation. The process of doing the activity was considered meaningful by many of the patients, either because it had a rehabilitation purpose or because of the pleasure derived from and the inner meaning of carrying out a task, such as caring for a plant, working outdoors, or

making a product to take to their rooms or to share with others. The patients expressed satisfaction when they could adapt simple gardening tasks to their functional level without sensing defeat, and this led them to attempt more advanced tasks, which in turn increased their motivation and self-confidence. Some of the patients adapted to the activities without outspoken reflections and found their way either alone or with support. Peoples, Satink, and Steultjens (2011) underscore that, for people recovering from stroke, doing activities that could be carried out independently was important for them to gain a sense of power and control over their own rehabilitation.

In our study, a common feature of the patients who were motivated to do gardening was the shift in focus away from a specific training purpose to becoming attentional and absorbed in doing the tasks. This may be interpreted as a distraction from their loss of function through participation in engaging, motivating, and meaningful occupations as well as experiencing a sense of flow in the occupation (Nakamura & Csikszentmihalyi, 2014). The experience of performing at least simple tasks created a sense of mastery and prompted the patients' discussions on how to cope with life in the future, which, according to Peoples et al. (2011), is important in stroke rehabilitation. However, some patients did not value the activities in the gardening group as physical training. They likened gardening to traditional physical training modalities with focus on body functions and thought that gardening was less effective in that respect. The finding indicates that not all persons who have had a stroke may view gardening as a valuable occupation to meet their rehabilitation goals.

The experience of fatigue is common among patients who have had stroke (Lerdal et al., 2011). Our analysis of the occupational therapists' notes revealed that many of the patients expressed their experience of mental rest during gardening either verbally or through their body language. In light of the dimensions of meaningful occupations, this finding may reflect how the being dimension was expressed in the garden activity. Mental restorative benefits of being in nature has often been described and discussed in studies of gardening and rehabilitation (Barello et al., 2016; Wagenfeld & Atchison, 2014). The experience of fascination and the sense of being away from everyday life are two perceived qualities of natural environments that are assumed to contribute to the restoration of mental fatigue (Kaplan & Kaplan, 1989). The occupational therapists experienced that during the gardening the patients tended to be absorbed in the activities and forgot that they were in a specialized health facility for treatment of their conditions. The temporary change in focus may have led to mental restoration through their participation in fascinating activities in a different environment and context. From the literature, it is known that people who have had a stroke may struggle to adjust to an unfamiliar hospital environment and to find rest from strict routines and demands (Peoples et al., 2011). However, the therapists' notes did not describe in detail the role of nature for mental restoration per se, but rather, recorded the notion that the patients benefited from the positive atmosphere in the gardening group in general. This might reflect their view of the gardening setting as a complex context in which many physical, social, and cultural environmental components worked together, and that access to nature was just one of the components that gained the attention of the occupational therapists.

In addition to treating mental fatigue, restorative environmental settings have been discussed in relation to the provision of mental resources for reflection (Hartig et al., 2014; Kaplan & Kaplan, 1989). Further, participation in group-based horticultural activities is associated with people with clinical depression spending less time ruminating, in addition to the alleviation of depression symptoms and increased attentional capacity (Gonzalez et al., 2010). For some patients in our study, the therapists described that their participation in some tasks led to reflections on life in general, as well as recollections of and reflections on past occupational identity and occupational preferences. It is important to underline that the sense of meaning through the being dimension led some of the

patients in our study to continue with their skills training, either consciously or otherwise (see Figure 1).

According to Hammell (2014), the experience of occupational meaning through belonging has many facets. In addition to the formation of social ties and support gained in our studied gardening group, there was also interaction through the patients doing tasks together, helping others, and learning from others. All of the aforementioned aspects may lead to the development of meaningful occupations through belonging. The shared experience of progress seemed to be of value to the patients in such an early phase of their rehabilitation after stroke, and many of them were motivated to continue after seeing what others in their group had achieved. The familiarity of gardening and the garden context may help people to develop a sense of belonging in a group, which in turn may be particularly important for patients with a history of involvement in gardening or agriculture, as it may mirror part of their identity. However, gardening is a familiar activity; therefore, patients without a vocational agricultural or horticultural background may develop a sense of identity with the activity and the group. Hammell (2004) has criticized the field of rehabilitation for being disconnected from patients' history and identity, and in this regard our findings indicate that gardening activities can serve as a purposeful occupation in order for patients to regain function and at the same time be individually and socially meaningful for them.

Life in the future was uncertain for many of the patients at the time when they participated in the gardening group. However, the occupational therapists noted the patients' reflections on what they could become and what role leisure activities and activities in a natural environment or a garden could have for them in the future. The patients discussed how they could adapt so that they could participate in personally valued occupations that formed part of their earlier core identity, or how they could develop new interests. Kubina, Dubouloz, Davis, Kessler, and Egan (2013) interviewed outpatients about what was important for them when considering engaging in activities that had a personal value for them, and found that social connections and the experience of having control were two core factors for initiating risk-taking and testing their own abilities. Although thoughts about life in the future were not always voiced among the patients who participated in the gardening group in our study, we found that their underlying thoughts were their reflections on what the future held for them.

The occupational therapists who had initiated and hosted the gardening group were preoccupied with developing their occupational therapy practice. Based on our findings, we see a role for such creative group activities in stroke rehabilitation. As a common and everyday activity, gardening involves many different, detailed, and adjustable tasks. It may be possible for patients to continue gardening when they return home, and an introduction to such an occupation during a rehabilitation program may inspire patients to pursue meaningful and creative occupations, either outdoors or indoors, while adjusting to life after a stroke. In sum, we highlight the value of activities that can be carried out in groups, as well as the benefits of support from others when working together on individual goals.

### **Methodological Considerations**

Our study was based on the perspectives of experienced occupational therapists who discussed and recorded notes on gardening as an occupation in rehabilitation. In line with the nature of a qualitative descriptive study design (Sandelowski, 2000; Stanley, 2015), our study was limited to analyses of their observations and descriptions and did not allow us to discuss the use of gardening in medical rehabilitation objectively. However, we consider that the studied notes provided valuable empirical material and that the analysis of the notes gave us a deeper understanding of the meaning

of gardening as an occupation in stroke rehabilitation from the perspectives of skilled occupational therapists.

The occupational therapists sometimes quoted patients, but in line with the aim of the study, they used those quotes for their own interpretations and descriptions of the potential benefits of gardening. In this paper, we have argued for the expert perspective by pointing to the patients' demanding life situation early on after experiencing acute stroke and the fact that the experienced occupational therapists had sufficient knowledge to adapt the activities to be useful and timely for the patients' rehabilitation. However, we have risked not presenting a critical view on what is the best-informed client-centered practice (Hammell, 2015). Rather, such a perspective needs to be complemented with the patients' own experiences and reflections (Hammell, 2006), reported retrospectively when they have the appropriate capacity (Barello et al., 2016; Peoples et al., 2011).

The four occupational therapists who led the gardening groups and wrote the notes might not have had the same critical view on what was going on in the group as someone who had simply observed the sessions. Moreover, the fact that two of the therapists participated in the analysis of the data might have challenged the reliability of the study. Further, from an ethical perspective, their therapy and views in the notes and their input into the analysis may appear as "romanticising" (Whelan & Burman, 2011, p. 217). However, it might have strengthened the reliability of the study, since the therapists were present during the sessions and were able to note what they saw and heard. Further, the fact that the occupational therapists discussed and noted their practices after each gardening session, together with their participation in the analysis, might have added a deeper understanding of what occurred during the sessions. The two researchers among the coauthors contributed an outsider perspective during the analysis, and thus helped to challenge the process and deepen the understanding of the occupational therapists' experiences and interpretations. Lastly, we could have interviewed the occupational therapists who run a group-based gardening program for people recovering from stroke, but then they would have had to rely on their recollections of examples and what happened in the group.

### **Closing Comments**

The analysis of written notes by four occupational therapists (two of whom are coauthors of this paper) with experience in medical stroke rehabilitation revealed that the use of gardening as an occupation in initial stroke rehabilitation offers diverse possibilities for patients' skills training, mental rest, mastery, and manageable tasks and occupations in the future. The outcomes of the therapy were interrelated with regard to the promotion of skills training and the provision of health resources to cope with the rehabilitation process in general. Performing activities in groups was seen as particularly beneficial because social interaction can foster mutual support and companionship among people facing similar health challenges.

We underline that the occupational therapists observed that not all of the patients who participated in the gardening group viewed the activities as suitable to meet their clinical rehabilitation goals. For others, simple and adjusted gardening tasks were the starting point and motivation for them to progress with their training. Hammell (2006) has criticized the field of medical rehabilitation for focusing too much on the goal of the activity and less on the patient's former identity, life history, and personal interests. Our findings indicate that simple and familiar occupations, such as gardening, can be adjusted to meet and challenge the functional level of each patient and thereby provide a complementary option in their medical rehabilitation.

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