

ORIGINAL ARTICLE

On the inside of a walking skill programme for patients who have undergone total hip or knee arthroplasty: A qualitative study

VIGDIS BRUUN-OLSEN¹, ASTRID KLOPSTAD WAHL¹,
KRISTIN MARGRETHE HEGGEN¹, KRISTI ELISABETH HEIBERG^{1,2} &
ANNE MARIT MENGSHOEL¹

¹Department of Health Sciences, Institute of Health and Society, University of Oslo, Oslo, Norway, and ²Department of Physiotherapy, Bærum Hospital, Vestre Viken Hospital Trust, Bærum, Norway

Abstract

A walking skill intervention was reported by two randomized controlled trials (RCTs) to be effective in improving walking for patients who had undergone total hip or knee arthroplasty. When studying non-pharmacological interventions, addressing outcomes as well as developing insights into how the intervention is tailored to the specific context is recommended. The purpose of this study was to examine how and why adjustments to a walking skill intervention were made in clinical situations. Field and reflection notes from two physiotherapists' self-observations of 50 training sessions performed during 6 months were analysed. The field notes were subjected to thematic analyses. The paper describes how walking skills were improved and normalized through a series of adjustments. The adjustments were made according to how the patients' aspirations differed, what impairments the physiotherapists considered important to improve, the severity of the impairments and how they influenced the patients' ability to walk. To enable the patient to perform the programme, the physiotherapists applied a mixture of theoretical and practical knowledge in their reasoning, and considerable creativity was shown in finding appropriate exercises to meet each patient's needs. Individualized adjustments dependent on the programme may give insight into a greater complexity of practice than reported in RCTs.

Key words: Evidence, hip/knee arthroplasty, physiotherapy, qualitative study, walking skills

Introduction

Physiotherapy interventions are often complex, containing several interconnected elements (1). The randomized controlled trial (RCT) is considered the gold standard for evaluating the effects of interventions. Qualitative designs may examine contextual adaptations and provide insight into other elements in the intervention that may be of importance to physiotherapists who would like to implement the intervention in their practice. When studying complex interventions in physiotherapy, there seems to be a majority of clinical trials examining effects (2), while there is seldom a focus on how the particular intervention is performed in a practical context (3).

In two previous papers we reported on the effects of a walking skill programme (see Appendix 1) on walking capacity following total knee arthroplasty

(TKA) or total hip arthroplasty (THA) (4,5). Our initial intention was to examine the effect of the programme in a strict RCT design, and consequently describe the intervention in a standardized manner, with number of repetitions or time to target muscle strength, joint flexibility or balance during ambulation. Over the course of the training programme, and as the physiotherapists conducting the intervention, we became increasingly aware that the programme was highly individualized and contained various elements that we had not included in the RCT reports. These individualizations included a variety of adjustments in both the exercises that were performed and how the tasks were approached. We started questioning whether the individual adjustments were crucial for the patients' ability to pursue with the programme (6). We therefore concluded that

Correspondence: Vigdis Bruun-Olsen, Department of Health Sciences, Institute of Health and Society, University of Oslo, PO Box 1153 Blindern, NO-0318 Oslo, Norway. Tel: + 47 22845381. E-mail: vigdis.bruun-olsen@medisin.uio.no

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we had to study in more detail how the walking skill programme was actually practised. Moreover, by providing such information, we believed that we would address part of the criticism raised by clinical physiotherapists, that descriptions of interventions in RCTs lack the details necessary to implement the interventions in clinical practice (7). Furthermore, by describing how the walking skill intervention was practised, we surmised that the present study would contribute towards developing further insight into physiotherapy practice as such.

This qualitative study is based on an in-depth examination of how a walking skill intervention was practised. Theoretically, we were inspired by Gannik (8), who considered that how illness is lived or performed is situational. In the present study, we considered how physiotherapy is practised as situational. Therefore, we examined how the physiotherapist and patients interacted in particular clinical situations in which they were involved. This meant that the actions and interactions of the physiotherapist and the patient were understood in light of their different personal experiences, goals for treatment, sources of motivation and expectancies of what was going to happen in the actual situation. In other words, descriptions of what is going on in particular clinical situations may expand on the standardized description of an exercise programme and thereby make an important contribution to broadening the understanding of the content of the intervention.

This paper therefore describes how the walking skill intervention was performed in practice. The questions we addressed were: How and why were the physiotherapists making adjustments in the walking skill intervention? How could a deeper and more detailed understanding of how the intervention was put into practice add value to understanding how physiotherapy is practised?

Methods

Participants and walking skill intervention

Two physiotherapists (authors VB-O and KEH) and a total of 29 patients with TKA and 35 patients with THA participated in the programme over a period of 18 months. The patients ranged in age from 49 to 81 years. While they were in the programme, the patients met with a physiotherapist twice a week for 6 weeks, participating in a total of 12 group training sessions each. The number of patients participating in each session varied from three to 12. The patients with TKA started their training 6 weeks after the operation; the patients with THA joined approximately 3 months following the operation, when the

surgeon lifted restrictions on avoiding hip flexion over 90 degrees, internal rotation and adduction.

Each training session lasted for approximately 70 min and took place in a large gym at a local hospital in Norway. The gym was equipped with chairs, foam pillows, a staircase, steps and a ball. A 40 m hospital corridor was used to vary and challenge the patients' ways of moving during the training sessions. The walking skill programme has previously been described in terms of number of repetitions or time to target muscle strength, joint flexibility and balance during ambulation (4,5). Balance was trained according to theories of motor control (9), and exercise intensity was set in accordance with the guidelines for muscle training (10). All patients but two completed the intervention.

Examining our own practice

As the physiotherapists conducting the intervention, two of the authors (VB-O and KEH) were responsible for practising the walking skill programme we had developed, as well as studying in a structured way how we practised it. This meant that we had several roles in the research process. In designing the programme, we were able to draw on our years of practice in clinical physiotherapy. We had a strong belief that training reflecting the walking demands of everyday life would have positive effects on the patients' recovery of their previous walking skills (9).

Traditionally, researchers examine clinical practices by observing what other people are doing (11). Examining our own experiences and practice, however, is supported and inspired by the work of Brinkmann (12). Brinkmann's argument in favour of studying our own experiences is that we live and act in the present, with a capacity to distance ourselves from what we are doing and critically appraise our experiences. Thus, we found it helpful to make self-observations by writing down our experiences immediately after the training sessions. To maintain a certain distance from our self-observations, the two authors (VB-O and KEH) both wrote individual field and reflection notes from each training session. We shared and discussed them with each other afterwards. A further distance was created during the process of analysis by involving coauthors not practising the programme, who had different professional backgrounds and clinical experiences.

In the beginning, our field notes described the patients' reactions to the group and the training, as well as which exercises they performed. At this stage of data collection, the reflection notes described how each patient performed the tasks, as well as how we as the physiotherapists conducting the programme

evaluated their task performance. Over time, however, the field notes became more focused, and comprised descriptions of the purpose of a particular exercise, how the patients acted and responded in the training situations, and how we as physiotherapists adjusted to what happened. The reflection notes increasingly included our reflections on why adjustments were undertaken, and evaluations of our own and the patients' actions, as well as our assessments of successes and failures.

Written informed consent was obtained from each patient before inclusion, and the study was conducted in accordance with the Helsinki Declaration of Research Ethics and approved by the Regional Committee for Medical Research Ethics.

Data analysis

The data material analysed comprised of approximately 100 pages of field and reflection notes from 50 training sessions of approximately 25 patients, developed separately by the two physiotherapists involved in conducting the programme. In our analysis, focus was on the various ways in which we as physiotherapists construed and adjusted our actions in close collaboration with the patients, with the goal of enabling the patients to pursue improvements in their ability to walk.

An inductive data-driven thematic analysis, inspired by Braun and Clarke (13), was performed. First, we read each field and reflection note separately to become familiar with the data material and to gain an overall understanding of the text. Then, excerpts of the texts were identified and coded manually, i.e. the meaning of each excerpt was condensed into fewer words. Examples of codes were: lack of knee extension, limping, and alternative exercise.

We then analysed our codes by examining how codes could be combined and grouped to develop subthemes, such as physiotherapist's observation, patient's aspiration of future functioning and performance of exercises. Looking across these subthemes, we identified three analytical traces and overarching themes in the empirical material: how adjustments to exercises were made in the training programme in response to the physiotherapy evaluation and the patient's aspirations for future recovery, how adjustments to exercises were made during treatment in accordance with how well the patient performed the walking task during the session, and how the individualization was taken care of by the physiotherapists in the group setting.

During the analysis, two of the authors (VB-O and AMM) read the field notes initially to obtain a comprehensive picture of the data. Subsequently, two coauthors (AKW and KMH) who had not

participated in the training sessions perused the data. In all of these readings, a guiding question was: What do these data tell us about tailoring the intervention to the clinical situation and to the patient?

Results

Adjustments to training in response to physiotherapy evaluation and patients' aspirations for future recovery

The training programme was based on the guiding principle of current rehabilitation philosophy: the patients are experts on their own lives and should be actively involved in determining the goals of their rehabilitation process (14). The physiotherapists made every effort to ensure that the training programme was in line with each patient's aspirations for future recovery of physical functioning. As soon as the patients entered the programme, the physiotherapist asked them what activity they wished to improve. Most of the responses concerned walking, but the level of proficiency to which they aspired varied. Some patients simply wanted to be able to walk safely indoors; others said they would like to be able to go shopping on foot once again; still others hoped to be able to resume their prior participation in strenuous leisure activities such as walking in the forest or hiking in the mountains.

After the physiotherapist had elicited a patient's aspirations, she performed an assessment to determine what the training sessions should include to meet them. This included close observation of how the patient moved from sitting to standing, walked on a flat surface and uneven ground, and climbed stairs. Often, the physiotherapist detected altered movement patterns such as unsteadiness or limping and an inability to bear weight on one leg or bend a knee. With these observations in mind, the physiotherapist then assessed whether these movement issues could be related to impairments such as reduced muscle strength, insufficient joint flexibility or balance challenges. The patient's desired improvements determined which tasks should be given priority during the training sessions, and the findings from the physiotherapy assessments were used to build in specific impairment exercises into the training of the tasks, which had to be continually adjusted.

One example of how assessment, aspirations and task training were intertwined in this programme was a patient with TKA who wanted to be able to climb stairs. The initial examination revealed that his inability to do so was due to limited knee flexion. The physiotherapist responded by asking the patient to hold the affected leg on a step using as much knee flexion as possible and then to gradually shift his body weight forward to increase the knee flexion. The patient took

steps forward and back repeatedly, varying his movements slightly within his pain limits. After a while, the physiotherapist encouraged him to take a step with his affected knee, straighten it, and lift the other leg past it to the step above. Through this process, the physiotherapist adjusted the task that the patient considered important to include the impairments that she believed it was important to ameliorate.

In another example of a modification to achieve a patient's aspiration, a patient with THA wished to resume fairly strenuous leisure activities such as hiking in the forest. The physiotherapy evaluation revealed that he was a long way from being capable of doing that, and had balance challenges as well. To enable the patient to attain his aspiration, the physiotherapist tried to improve his physical stamina by encouraging him to put as much effort as possible into performing a series of walking exercises, and varied them in ways designed to strengthen his balance. For example, he was encouraged to walk down a corridor 40 m long, alternating long and short steps. This imitated the experience of walking in the woods while strengthening his balance and physical stamina.

Sometimes patients changed or modified their aspirations during the course of the training programme. When this occurred, the training programme took a new direction. One instance of this concerned a patient who was hardly able to walk after the operation, even indoors. When she entered the walking skill programme, her only recovery goal was to be able to walk more easily and safely indoors. As the training programme proceeded, she progressed to a point where she was able to walk better than she had hoped and expanded her ambitions to include being able to hike in the woods. The physiotherapist reshaped the task training to accommodate this more ambitious aspiration. In other cases, patients narrowed their ambitions during the training programme. One of the patients with TKAs began the programme hoping that by the time he completed it he would be able to climb a steep mountain ridge. To support this aspiration, we designed task training that included walking tasks resembling hiking in the mountains, such as walking over obstacles and balancing on a board. However, as the training programme proceeded, the patient continually found it difficult to keep his balance while performing challenging exercises. This experience led him to conclude that hiking up mountains was too ambitious, at least during the training period.

Ongoing adjustments in clinical situations

Many of the patients had acquired dysfunctional walking habits before the operation that persisted

after it had taken place. For example, the physiotherapist noticed that many patients walked with a limp and did not extend their hip or knee fully while walking. The physiotherapist responded by making the patient aware of his or her habitual walking pattern. Together, they looked for ways in which the patient could move without limping. Their strategy was for the patient to try and retry a normal walking pattern until it became possible.

In one case, during the initial assessment, a patient with THA was unable to stretch out his hip while walking. The physiotherapist asked him to focus on his hip when he walked forward to try to find out for himself where the problem was. The patient tried moving his hip back and forth a few times and said that he noticed that the front of his thigh felt tight when he extended his hip, and that he was unable to put his full weight on that leg. The physiotherapist suggested that the patient should try to modify his movement slightly by focusing on the plantar flexion of his foot, which would help him to straighten his hip when he walked. The physiotherapist and the patient tried out the movements together in several ways. After they did this, the physiotherapist watched the patient walk and tried to figure out what the challenge was. Then she tried the movement herself. Based on what she observed and her own movement experience, she asked the patient to try the movement again, slightly differently. Gradually, the patient and the physiotherapist discovered that the patient habitually walked rather quickly. The physiotherapist reasoned that this reduced the stress on his weak hip muscles and avoided extending the hip during walking. Based on her understanding of the challenge acquired through this collaboration, the physiotherapist gradually reduced the patient's walking speed during the training sessions to strengthen his weak hip muscles and facilitate extending the hip joint.

Another approach used was to vary the activity slightly each time the patient tried it. For example, when one of the patients was working on knee extensors during stair climbing, the physiotherapist encouraged him to straighten his knee each time he reached the top of a step. The physiotherapist encouraged another patient to extend his knee slowly as he stepped up. She then suggested that he take each step a little differently, for example by adjusting the load on the affected knee, using a higher step or adjusting his speed. By challenging the patients to move in a variety of ways, the physiotherapists challenged them to replicate the activities of everyday life while they were ameliorating the underlying impairments. As each patient tried out the movements, the physiotherapist explored her own way of moving to find solutions to the patient's challenges. She continually

experimented and modified the exercises to develop alternative ways of walking and accelerate the patient's progress towards normalization.

Individualizing training in the group setting

The training programme was conducted in a group setting, but the physiotherapist sometimes worked with a single patient while the others were performing an exercise together. When the physiotherapist instructed the group as a whole, she also had to keep an eye on each individual patient's performance and individualize each exercise based on his or her individual capabilities. For example, after the physiotherapist observed during a warm-up exercise that although some of the patients were able to take broad sideways steps when walking in place, others felt so unsteady that they did not dare to step sideways at all, she individualized the challenge. She suggested that patients unable to perform sideways steps hold on to a chair, and encouraged those who were able to take broad sideways steps to strengthen their balance even more by lifting their legs higher.

The group sessions also included one-on-one situations. In such situations, the physiotherapist and the patient worked together on a specific task while the other group members practised on their own. For example, the physiotherapist might teach a patient to walk up a step while the rest of the group practised climbing stairs with different levels of difficulty. While working with a single patient, the physiotherapist had to keep an eye on all of the other group members to make sure that each one was performing the exercise properly. She therefore constantly had to switch her attention and adjust herself to the group as a whole as well as to each individual patient, along with adjusting and individualizing each task to normalize walking.

Discussion

A close analysis of the physiotherapists' field notes expanded the description of the walking skill intervention in our prior RCTs by revealing considerable individualizations with respect to how the tasks were trained. These individualizations were based on a synthesis of the physiotherapists' findings from an examination of each patient's limitations in physical functioning of the lower limbs, the patient's desires for future functioning before starting the intervention, and an ongoing evaluation and exploration of how tasks had to be adjusted to enable the patient to perform during the training situations. For the physiotherapists, this implied that they had to keep an eye on the performance of each individual as well as the

group as a whole when conducting the walking skill programme.

In the RCTs, the 6 min walk test assessed the main outcome variable (4,5). The faster the patient walked, the better the outcome of the walking skill programme, i.e. the better walking capacity. This was in line with the content of the programme, described in terms of improving physical capacity such as muscle strength, joint flexibility and balance. However, our present analysis of how the programme was practised suggests that how the programme was performed may also have been of importance for the recovery of the patients. First, if the exercises had not been adjusted to each patient's capability, the patients would probably not have been able to complete the programme. Secondly, by tailoring the exercises to normalize walking, the patients may not only have improved their walking capacity, but also learnt to walk in a more skilled way. In other words, they may have become more skilled walkers, which was the activity the patients initially wanted to achieve (15). In clinical physiotherapy, a walking skill is believed to include both capacity and a normalized walking pattern. As we were not fully aware of why the adjustments were made during the training situations, a normalized walking pattern was not assessed in the RCT. We therefore assume that having the clinical gaze for normalizing a walking pattern is a taken for granted part of practical knowledge in physiotherapy.

Initially, the walking skill programme was founded theoretically on principles of training capacity (16) and motor control (9). However, adjusting exercises and exploring movements in situations where the patient did not comply with what the physiotherapists meant by adequate ways of doing the exercises, rely on a broader set of knowledge that even may vary in different training situations. According to Jensen et al. (17), physiotherapists base their clinical reasoning on both theoretical, abstract knowledge and practical knowledge, which is more situational and personal. Our data material on why the physiotherapists adjusted the exercises supports this notion. Descriptions of why and how the physiotherapists made adjustments indicate that their reasoning drew on a bricolage of theoretical knowledge, clinical experiences, and relational and bodily competence of movement and how to move. This suggests that adjusting exercises to each patient's capability and goals involves complex reflexive reasoning and creativity to find appropriate exercises. The present empirical study supports a recent theoretical paper proposing that more research is needed to unravel the complex reasoning put into play in clinical situations (18). As Mattingly (19) observed by studying the practice of occupational therapists, situational

practical knowledge is subtle. By emphasizing research merely on outcomes of what we plan an intervention to be, and not looking closer into how it was actually practised, various aspects of practical knowledge, which is an important part of knowing in physiotherapy, may be overlooked. Thus, the present study can also be seen as an attempt to study how complex it is to practise individualized physiotherapy.

RCTs are founded on a belief that therapy and therapist can be separated. In other words, it is assumed that a well-described intervention will work regardless of the people involved in it and the context where it takes place. Our study questions such a belief, as it seems that practising physiotherapy is linked to the therapist's knowledge, reflexivity and creativity to find ways to perform exercises in particular situations. We believe that by adding descriptions of the process of how an intervention was practised, we may also have moved one step forward to make our intervention more understandable to other physiotherapists. Naturally, how an intervention is practised can never be described fully and in such detail that others may directly replicate it. That was never our goal. However, in the present study, a more comprehensive description of an intervention may be obtained by appraising how an intervention was actually practised. Thereby, tacit practical knowing in physiotherapy is made explicit.

Methodological considerations

The self-observations included in the data material were chosen based on what we found relevant in a variety of clinical situations. We described successful, failed or challenging exercise situations. Thus, it is likely that situations that we found ordinary were omitted. Nevertheless, we had data from a great variety of situations that still enabled us to elicit what otherwise may have been taken for granted in physiotherapy. In collecting the data, we had closeness to the practice studied as we were experiencing the walking skill intervention through conducting it. Through the lenses of clinical physiotherapists, the descriptions therefore elicited an insider perspective of how we construed and understood what we experienced. This gave us a unique possibility to describe the challenges involved. On the other hand, an enhanced critical distance may have been accomplished by an outsider taking video-recordings of us conducting the walking skill programme. However, the reasons why adjustments were made would then have been missed out. Thus, we think that our self-observations could be considered as valid data for the purpose of the present study.

In the systematic analysis of data, we tried to keep a critical distance from the data material by involving several researchers with different backgrounds, who

were not familiar with the training programme, to scrutinize the analyses. Therefore, our preconceptions were under constant questioning and the trustworthiness of the study was improved. In a broad sense, our study is perhaps mostly an argument for the importance of studying therapeutic processes and thereby visualizing the artistry embedded in clinical practice.

Conclusion

In summary, by examining how and why the physiotherapists in this study were making adjustments in a walking skill intervention, we were able to identify and outline an individualized form of practice. Based on these findings, we believe that how practice is performed cannot be isolated from its participants, as they are involved in creating its content. Thus, it is important to also examine and understand the process of physiotherapy practice. This study may therefore be considered as an early attempt to bridge the gap between the standardized descriptions of what an intervention comprises in RCTs and descriptions of how complex it can be when the intervention is actually put into practice.

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Appendix 1. Components of the walking skill intervention.

Weight-bearing tasks with supervision, guidance and feedback	Target	Description and progression
Warm-up with music		Ten minutes of standing with weight transfers, sidesteps with arm swing, walking in a circle at different speeds and step length
Sit to stand	Strength and flexibility	Five minutes of rising from and lowering onto a chair, squats, at different speeds and with weight transfers
Lunges	Strength, stretching and balance	Five minutes of lunges forwards and sideways on alternate legs
Single-leg stance	Strength and balance	Five minutes of single-leg stance on alternate legs while moving the other leg
Standing on foam balance pad	Strength and balance	Ten minutes of squats, forwards, backwards and sideways, with increasing angles in hips and knees
Step-up/step-down	Balance, strength and flexibility	Five minutes of ascending and descending a step, forwards and backwards and at different speeds and different step heights
Stair climbing	Balance, strength, and flexibility	Five minutes of going up and down five steps with different heights and at different speeds
Obstacle course	Walking balance	Ten minutes of stepping over obstacles, stepping onto, along and down from an aerobic step and bosu ball, walking over a foam mat and progressing by increasing the speed, height and number of obstacles
Throwing ball	Balance and coordination	Five minutes of throwing and catching a ball to each other in a circle while moving around
Walking	Endurance and flexibility	Five minutes of walking in a crowded corridor at different speeds and step lengths, with turns and progression to maximal walking speed
Stretching	Flexibility	Five minutes of stretching of calf, leg, thigh, neck and shoulder muscles