Exercise: A positive feature on functioning in daily life during cancer treatment – Experiences from the Phys-Can study

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\section*{Abstract}

\textbf{Purpose:} Impaired functioning due to cancer treatment is a challenge for daily life. Exercise during treatment can improve functioning. However, research describing experiences of how exercise affects activities of daily life is limited. We aimed to explore how individuals with cancer receiving curative treatment and participating in an exercise intervention experienced their functioning in daily life.

\textbf{Methods:} Twenty-one participants were recruited from Phys-Can, an exercise intervention study. Semi-structured interviews were conducted after the intervention had finished, and data was analysed using thematic analysis.

\textbf{Results:} Two main themes evolved: “Striving to maintain a normal life in a new context” and “Struggling with impairments from side effects of cancer treatment”. The supervised group exercise proved popular, and participants reported positive effects on physical and psychological functioning, as well as social and informative support from other participants. Participants struggled with impaired cognitive and physical functioning and exhaustion. They strove to maintain a normal life by adjusting their activities.

\textbf{Conclusions:} Perceived physical and psychological benefits from exercise during cancer treatment suggest that exercise should be a part of cancer rehabilitation to facilitate activities and participation in daily life. Striving to maintain a normal life during cancer treatment is vital, and adjustments are needed to maintain activities and participation in daily life. Cancer nurses should motivate patients to engage in physical activity and encourage the introduction of exercise as part of their rehabilitation. They could also support patients in making adjustments to maintain functioning in daily life.

1. Introduction

Impaired functioning due to the symptoms of cancer and cancer treatment is a challenge for daily life, and negatively affects a person’s health-related quality of life (HRQOL) (Appleton et al., 2015; Fleischer and Howell, 2017; Okamoto et al., 2012; Stuhlfauth et al., 2017). Functioning is an overall term for body functions, body structures, activities and participation (World Health Organization, 2013). According to WHO (2013), activities may be operationalized as domestic responsibilities, leisure, work and school, and participation as joining in community activities and participating in society. The present study focuses on activities and participation, hereinafter referred to as \textit{functioning in daily life}, in the context of cancer care, which few previous studies have done.

Social participation and activities of daily life often need to be adjusted due to impaired functioning during treatment (Fleischer and Howell, 2017; Stuhlfauth et al., 2017). Ness et al. (2006) investigated recent and long-term cancer survivors and found that more than 50% were limited in terms of performing physical tasks that required muscle activity, such as bending, lifting or carrying, compared to 21% of the general population (Ness et al., 2006). More than 30% of the survivors also reported limitations in performing activities of daily life such as shopping and attending social events, compared to 13% of the general population. Up to 90% of those receiving cancer treatment report fatigue, a distressing symptom affecting the ability to participate fully in activities due to exhaustion (Berger et al., 2015; Minton et al., 2013). Another common challenge with regard to functioning in daily life is impaired cognitive functioning affecting learning, memory, speed of
processing and concentration, which has a negative impact on participation in social life (Bernstein et al., 2017; Meattini et al., 2017; Von Ah et al., 2013). Functioning in daily life can also be affected by neuro-pathic symptoms, particularly numbness and tingling in the hands and feet (Tofthagen et al., 2011).

Exercise, a planned, structured and repetitive activity intended to maintain or improve physical fitness (Caspersen et al., 1985), has been tested as an intervention to reduce side effects of cancer treatment and thereby improve functioning in daily life, and is now recommended as an important part of the rehabilitation process (Fong et al., 2012; Furmaniak, 2016; Mishra et al., 2012; Ormel et al., 2017). Studies have shown that exercise can decrease fatigue, anxiety, depression, nausea and sleep disturbance, and has a positive effect on physical functioning, role functioning, HRQOL and emotional wellbeing (Fong et al., 2012; Mishra et al., 2012; Schmitz et al., 2010). Unfortunately, many people reduce their physical activity levels during cancer treatment (Huy et al., 2012), increasing the risk of impaired functioning (Fong et al., 2012; Furmaniak, 2016; Hall-Alston, 2015). Although the benefits of exercise are well documented, it has still not been explored whether functioning in daily life during cancer treatment can be facilitated by exercise.

Due to the significant consequences of impaired functioning, assessments of functioning are an important area for cancer nurses when supporting and motivating patients during their rehabilitation process (Hauken, 2018). In order to develop and implement clinically relevant rehabilitation programmes, it is important to increase knowledge about how patients experience the effects of exercise on their functioning in daily life and to examine the role exercise plays in their recovery. However there is limited research in this area. This study aimed to explore how individuals with cancer receiving curative treatment and participating in an exercise intervention experienced their functioning in daily life.

2. Method

2.1. Research ethics

The study was approved by the Regional Ethical Review Board in Uppsala, Sweden (ref. 2014-249). Informed consent was obtained from all individual participants included in the study.

2.2. Design

A qualitative interview study using a semi-structured interview guide was conducted. Data was analysed using thematic analysis (Braun and Clarke, 2006).

2.3. Participants

The participants were recruited from the Phys-Can study, a Swedish multicentre randomized controlled trial evaluating the effects of exercise with high or low-to-moderate intensity on cancer-related fatigue (Bernsten et al., 2017). The Phys-Can study recruited participants from three university hospitals and included individuals ≥18 years of age, diagnosed with breast cancer, colorectal cancer or prostate cancer, scheduled for curative chemotherapy and/or radiotherapy and/or endocrine therapy. Participants were deemed to be eligible by a cancer specialist. Exclusion criteria were: individuals not able to perform basic activities of daily living, presenting with cognitive disorders or severe emotional instability, and suffering from other disabling co-morbid conditions that might contraindicate physical exercise (e.g. heart failure, chronic obstructive pulmonary disease, orthopaedic conditions or neurological disorders). (Bernsten et al., 2017). The intervention lasted for six months during cancer treatment and consisted of home-based monitored endurance training together with twice-weekly supervised resistance training at a gym with other participants. The exercise programme was standardized and equal at all sites, and physiotherapists were responsible for the design of the intervention. The participants had ended their primary curative treatment by the end of the intervention. A convenience sample of 22 individuals, representing the three diagnoses, both sexes and various ages, were recruited from one of the three university hospitals in the Phys-Can study. They were asked at the end of the exercise intervention to participate in the present study; one declined. One participant interrupted the intervention for personal reasons a few weeks before it ended. Since this person had already been invited to participate, the person was included in this study (Table 1). During the final interviews, no new information was obtained from the interviewees’ and thus the data collection was closed.

2.4. Procedure

The Phys-Can gym instructors identified potential participants to receive written information about the study. The gym instructors informed the first author (AA) in which candidates were positive towards receiving further information. AA subsequently phoned or emailed those who were interested in receiving further information, and if they were willing to participate a date and location for the interviews was agreed.

2.4.1. The interviews

To minimize recall bias, the interviews were conducted within one month of completing the exercise programme. They were conducted by AA between December 2016 and May 2017 in a room at the local hospital, the participants workplace, their home or a gym. The interviews lasted for six months during cancer treatment and consisted of home-based monitored endurance training together with twice-weekly supervised resistance training at a gym with other participants. The exercise programme was standardized and equal at all sites, and physiotherapists were responsible for the design of the intervention. The participants had ended their primary curative treatment by the end of the intervention. A convenience sample of 22 individuals, representing the three diagnoses, both sexes and various ages, were recruited from one of the three university hospitals in the Phys-Can study. They were asked at the end of the exercise intervention to participate in the present study; one declined. One participant interrupted the intervention for personal reasons a few weeks before it ended. Since this person had already been invited to participate, the person was included in this study (Table 1). During the final interviews, no new information was obtained from the interviewees’ and thus the data collection was closed.

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To minimize recall bias, the interviews were conducted within one month of completing the exercise programme. They were conducted by AA between December 2016 and May 2017 in a room at the local hospital, the participants workplace, their home or a fitness centre, according to the participant’s wishes. A semi-structured interview guide (Table 2) was used, influenced by the questionnaire WHODAS 2.0 (World Health Organization, 2010), assessing domestic responsibilities, leisure, work, community activities and participation in social life. Two pilot interviews were conducted, which highlighted exercise to a greater extent than we expected. After a discussion within the research group, we chose to add aspects of the experiences of how exercise impacted upon daily life to the interview guide. Since the pilot interviews covered the modified interview guide, we chose to include them in the analysis. The interviews lasted 25–73 min and were recorded on a digital recorder. The demographic characteristics of the participants (Table 1) were collected from medical records.

| Table 1 Demographic characteristics of the 21 participants. |
|------------------------|-------------------|
| Age, mean years (min–max) | 57.5 (42–75) |
| Sex | Number |
| Female | 18 |
| Male | 3 |
| Cancer diagnosis and treatments | Number |
| Breast cancer, n = 15 | |
| S and ET | 1 |
| S, CT, RT and endocrine therapy (ET) | 5 |
| S, RT and ET | 5 |
| S and RT | 1 |
| S and ET | 3 |
| Colorectal cancer, n = 3 | |
| S and CT | 3 |
| RT | 2 |
| RT and ET | 1 |
| Total | 21 |
Table 2
Examples of questions in the interview guide.

<table>
<thead>
<tr>
<th>Main questions</th>
<th>Probing questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What was your experience of performing household chores over the past six months?</td>
<td>Differences compared to before illness</td>
</tr>
<tr>
<td>Can you tell me about your experiences of carrying out leisure activities compared to before your illness?</td>
<td>- If you had any difficulties, how have they affected you?</td>
</tr>
<tr>
<td>Can you tell me about your social life over the last six months?</td>
<td>What sort of impact do you think it had on you?</td>
</tr>
<tr>
<td>Can you tell me what your relationship with your family has been like?</td>
<td>How did you feel?</td>
</tr>
<tr>
<td>Can you describe any everyday situations where you found that exercise has affected you?</td>
<td>What initiatives did you take to participate in different activities?</td>
</tr>
<tr>
<td></td>
<td>How did your health affect your ability?</td>
</tr>
</tbody>
</table>

Table 3
Examples of data analysis from data extract to themes.

<table>
<thead>
<tr>
<th>Data extract</th>
<th>Codes</th>
<th>Sub-themes</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your head is messed up, you feel stupid and you don’t understand. I have</td>
<td>Difficult to concentrate.</td>
<td>Impaired cognitive functioning.</td>
<td>Struggling with impairments from side effects of cancer treatment and striving to maintain a normal life in a new context</td>
</tr>
<tr>
<td>enormous difficulty with concentration. (P4)</td>
<td></td>
<td>Adjusting activities.</td>
<td></td>
</tr>
<tr>
<td>We haven’t had any dinner parties. Those close friends that we spent time</td>
<td>Spending time with close friends,</td>
<td>Striving to maintain a normal life in a new context.</td>
<td></td>
</tr>
<tr>
<td>with have been kind, saying “Come over to ours and eat. It’s important</td>
<td>made easier by adjusting the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>that we meet up, but you don’t have to do everything – come here</td>
<td>activity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>instead.” (P15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You might feel tired before, and then after exercising you feel really good</td>
<td>Exercise reduced tiredness and</td>
<td>Exercise facilitated functioning in daily life.</td>
<td>Striving to maintain a normal life in a new context</td>
</tr>
<tr>
<td>and I notice that I have more strength in my body. You can see it, and I</td>
<td>increased physical strength.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>also feel that I’m physically stronger. (p. 18)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


2.5. Data analysis

The interviews were transcribed verbatim by AA within a few days of each interview. Thematic analysis with an inductive approach was used (Braun and Clarke, 2006). The transcripts were read through within the research team, and several times by AA. All statements relevant to the aim were extracted and the data were then organized into initial codes. All researchers were involved in this process, with AA taking main responsibility. The coding was data-driven. Data were organized manually in Microsoft Word® and initial codes with similar content were highlighted to find patterns. The next step was to abstract the codes to potential subthemes and themes using mind maps. To assess credibility and trustworthiness (Lincoln and Guba, 1986), all relevant to the aim were extracted and the data were then organized into initial codes. All researchers were involved in this process, with AA taking main responsibility. The coding was data-driven. Data were organized manually in Microsoft Word®, and initial codes with similar content were highlighted to find patterns. The next step was to abstract the codes to potential subthemes and themes using mind maps. To assess credibility and trustworthiness (Lincoln and Guba, 1986), all members of the research team employed peer debriefing to discuss and collate the codes and gathered them together into potential subthemes and themes. The themes were then checked in relation to codes, data extracts and the entire data set by AA (Table 3). The subthemes and themes were processed and clarified into fewer distinctive themes by all members of the research team. Finally, the research team defined and labelled the subthemes and themes together.

2.5.1. Reflexivity

Reflexivity refers to the subjective effect that the researcher can have on the setting and the people being studied, the research questions, data collection and its interpretation (Berger, 2015). Reflexivity is important in qualitative studies because there are so many ways in which researcher bias could affect the study due to the researchers using themselves as instruments in the research process. The research team in this study consisted of four cancer nurses and one psychologist. AA has limited experience of qualitative research, but the other members of the research group are experienced researchers with comprehensive knowledge of research conducted using qualitative method. All the researchers were involved in the Phys-Can study except MC. AA is a clinician researcher and had met some of the participants during the recruitment for the Phys-Can study, and two in connection with their chemotherapy, but not as their primary nurse. AA was also a doctoral student in the study, which might have discouraged the participants from expressing negative opinions about the intervention.

3. Results

Two themes (“Struggling with impairments from side effects of cancer treatment” and “Striving to maintain a normal life in a new context”) and six subthemes were generated from the data (Fig. 1).

3.1. Struggling with impairments from side effects of cancer treatment

This theme describes the negative aspects of the participants’ functioning in daily life. Acute and late side effects of the treatment had a negative impact on participants’ daily life, and limited activity and restricted participation. Despite struggling with side effects, the participants attended the exercise intervention and experienced positive effects, and believed their functioning in daily life would have been even worse without the intervention.

3.2. Exhausted all the time

Participants experienced both physical and mental exhaustion, which could come on at any time, but mostly during the evening. This had a profound negative effect on functioning in daily life. Experiences of being affected either most of the time or on certain occasions were expressed.

“You can’t work all day, or you get tired and you don’t work more than a certain number of days in a row. The body says, now we’re taking it easy to recover. This message has been very clear.” (P11)

The physical exhaustion had a negative impact on social life when participants were too tired to go out in the evening, and mental exhaustion limited their participation in social life because social interaction with others took a lot of effort. Family life could be affected by not having the capacity to be a parent or a partner. Work capacity could be affected by not being able to work full time. However, participants said they thought they would be even more exhausted without the exercise intervention.

“Exercise has been a positive thing. Of course, I’ve been tired pretty much all the time, but how would I have been without exercising?” (P2)
3.2.1. Impaired cognitive functioning

Participants experienced difficulties with concentration when performing activities that required them to focus. The ability to initiate activities such as creative work or to participate in social meetings was also limited.

“I’ve experienced social and mental tiredness all the time. I haven’t been able to spend a long time with people, that’s what has affected me the most.” (P4)

When returning to work, they said that it was harder to stay focused and concentrate for a whole day, and their ability to handle stressful situations and multitask was reduced. Their memory was affected during cancer treatment and participants described experiences of forgetting what task to do next, what had been agreed with others, or the names of things.

“I felt really mushy in the head. I couldn’t concentrate on facts, so I felt that I didn’t need to get it right now, so I filed it away and didn’t even think about it because it felt exhausting.” (P3)

3.2.2. Impaired physical functioning

Particularly after surgery, some participants stated that they were dependent on help from family and friends with household activities like cooking, cleaning and carrying groceries, because they found it hard to lift their arms or carry heavy weights. Experiences of neurological side effects from the chemotherapy treatment causing tingling and numbness in the hands or feet reduced their functioning, so the participants dropped things or felt unstable when walking. However, the paraesthesia did not stop them from engaging in the exercise programme and other activities.

Cancer treatment could affect their social life due to bodily changes. Participants with stoma and urinary urgency were limited in their activities because they were afraid of leakages in public places. Intimate relations with partners could cause feelings of discomfort in connection with revealing their naked body.

“I still don’t look at myself in the mirror properly. I would never get changed in a locker room. I don’t go to the swimming pool anymore. I don’t want to show myself to my husband. This affects me a lot. It affects me more than anything else, I think.” (P5)

Participants receiving chemotherapy experienced a fear of catching infections, and this could limit their social life. Public places, such as public transport, social events and shopping malls, were avoided during busy hours. This fear could also affect their family life, leading to greater isolation and less participation in activities than before.

“However, my husband and I didn’t meet so many people. To begin with, I was afraid to spend time with people because I thought that with chemotherapy you’re so susceptible to infections. Then it turned out that it wasn’t so dangerous.” (P18)

3.3. Striving to maintain a normal life in a new context

This theme describes the positive aspects of the participants’ functioning in daily life. Due to changes in health conditions during and after cancer treatment, the participants have to adjust their daily life according to a new context. The participants strove to maintain a normal life and adjusted their activities and participation so they could maintain routines. The perceived benefits from the exercise intervention encouraged them to maintain their activities and their participation in daily life.

3.3.1. Exercise facilitated functioning in daily life

The exercise was an important part of the rehabilitation, and helped the participants to maintain their health and physical fitness and to focus on things other than their cancer. The participants stated that they were proud to have carried out the physical tests that showed an improvement in their physical strength and endurance after participating in the exercise intervention. The exercise helped them to structure their day, whether they were on sick leave or retired. The exercise was helpful for maintaining an active life. By maintaining physical functioning during treatment, many experienced that they gained more capacity for other activities such as housekeeping and participating in leisure activities that were physically demanding. Participants also stated that the exercise improved their self-esteem because they were able to exercise in spite of impaired physical functioning and fatigue during their treatment. Being in a healthy environment such as the fitness centre empowered their efforts to improve their health.

“I think the exercise has helped me in every situation. I’ve managed to think positively and I’ve developed a body that can manage everyday life all the time. It’s affected me. You could see this in the test results. I’m much stronger now than I was before … and the exercise didn’t take place in a hospital environment, it was at a public gym. I think that also helped me to feel healthier.” (P6)

The exercise also brought psychological benefits. The participants stated that they had felt depressed, but after the exercise session they were calm and full of mental energy, happiness and a sense of psychological wellbeing.

“I’ve been healthier and stronger, both mentally and physically. I can manage, if I hadn’t exercised like that I think it would have taken longer for me to get going physically. Now I’ve been active all the time. Exercise improves your mental health, I’ve really felt that.” (P14)

Side effects from the treatment, such as joint pain and stiffness, were improved as were problems with pain in the shoulders and back before the diagnosis, which was helpful when returning to work and doing heavy lifting.

3.3.2. Social and informative support from the exercise group

Social life could be limited during treatment, and the exercise group provided a context for participation and meeting others in a similar
situation.

“It’s also been positive in a social way. We’re a great group and have got to know each other. We talk, support and encourage each other. It’s because you actually go there and hang out even when it feels quite challenging. Yes, it’s important to meet others who understand what you’re going through. You notice that, because it’s much easier to talk to people who know.” (P1)

The participants experienced that the group was supportive and provided motivation to attend the scheduled exercise sessions at the gym. The gym instructors contributed to the perception that exercise is safe during treatment and they also encouraged the participants to engage in other activities.

“You get a bit scared of doing things, especially if you’ve had a wound after the operation. Having a professional to provide guidance and having a special exercise programme were positive things.” (P16)

3.3.3. Adjusting activities

The participants could continue with many household activities during treatment by making adjustments. Being on sick leave was helpful when adjusting activities to match their capacity.

“Weekdays have worked because I have a lot of time to myself during the day. Today I’ve done a little laundry and tomorrow I will vacuum a little. Thus, you can do some of these things every day at your own pace. I’ve been able to handle all that, so it’s felt good to me.” (P6)

The participants said that they had maintained their social lives and had retained the ability both to support others and to stay in contact with friends and family, although sometimes less than before. Instead of meeting people, it was easier to remain in contact by email or phone. Increased free time during sick leave was perceived as facilitating participating in social life. Still, adjustments were made, and social activities were often carried out during the daytime due to fatigue.

“My social life has probably been quite similar, and I’ve probably also prioritized that. Like meeting people and not being withdrawn. On the other hand, we may have done it in a simpler way, not making dinner but sitting over a coffee or buying a pizza.” (P10)

Participants stated that they travelled less and stayed closer to home or went away for shorter periods than before. It was important to continue with activities such as singing in a choir or taking dance classes as part of the rehabilitation, even though adjustments including rests were needed.

Experiences of work ability differed between participants. At the time of the interview, some had been working for months and others for just a few weeks. Returning to work was important as it contributed to being part of a social context and to finding continuity, and it also brought structure to daily life. However, due to fatigue and impaired cognitive functioning, adjustments were made to occupational tasks and many worked part time at first and changed their working hours if needed.

Being affected by a serious disease like cancer causes changes in perspectives about what is important in life. Many participants started to prioritize themselves and meaningful things. Reduced working hours gave them more time for themselves. Being close to family and friends, as well as having more time to participate in activities, traveling and exercise, became more important.

4. Discussion

The results from this study showed that people with cancer participating in an exercise intervention during treatment found that exercise improved functioning in daily life during cancer treatment through improved physical and psychological functioning, reduced symptoms and by facilitating their return to work. Thus, exercise may be of great value in reducing the negative experiences of cancer treatment and fostering a feeling of normality. The participants also stated that despite their exhaustion, they managed to exercise during cancer treatment and they maintained their physical activity level or even increased it, even though a reduction in physical activity level is common during treatment (Huy et al., 2012). This indicates that the cancer nurse plays an important role as part of a multi-professional rehabilitation team to promote exercise during cancer treatment as a means to improve health and functioning in daily life. Cancer nurses are required to establish an individual care plan for each cancer patient, in which the rehabilitation needs must be assessed (Brennan et al., 2014; Swedish Government Official Reports, 2009).

Daily life during cancer treatment was a struggle for the participants due to the side effects, as also seen in previous research (Bennion and Molassiotsis, 2013; Mishra et al., 2012; Nilsson et al., 2013; Stuhlfauth et al., 2017). Despite side effects, the participants strove to live a normal life and to maintain routines in their new context. Many had the capacity to continue with their activities; however, they had to make adjustments due to deteriorating health condition and impairments. In our study, many participants were on sick leave. Having more time to perform household activities and receiving support from friends and family were facilitating factors in maintaining functioning of daily life. This is consistent with previous research which shows that people with cancer have to find strategies for adjusting activities to compensate for their limitations (DeSanto-Madeya et al., 2007; Ness et al., 2006). However, our findings also indicate that exercise can facilitate functioning of daily life since participants experienced that the exercise improved their physical functions and decreased their exhaustion, and thereby facilitated activities of daily life during treatment.

The group exercise was another important factor that facilitated the participants’ functioning in daily life. One positive aspect of participating in the exercise intervention was being in a social context with others in the same situation, giving participants social and informative support from fellow patients, which included empathic understanding, information and increased motivation. The participants stated that the group exercise promoted their participation in daily life, and that it took the focus away from the cancer and improved their health. Previous research also shows the benefits of exercising in a group, due to both motivating aspects and social support, complementing our results (Backman et al., 2016; Segal et al., 2017). The participants in our study raised the importance of meeting others in the same situation, and that participating in group exercise may provide both physical benefits and peer support. Similar results from another study showed that a combination of walking and talking not only brought physical benefits but also encouraged everyday and cancer-related conversation (Ireland et al., 2018). The exercise intervention was also helpful when structuring the participants’ days during their cancer treatment, which is consistent with previous research (Backman et al., 2016; Midtgård et al., 2015).

Participating in social life was important for the participants, and family and close friends were prioritized more than before, which is consistent with other research (Pinquart et al., 2009). However, participation could be restricted due to exhaustion, impaired cognitive functioning or fear of catching infection, similar to the results from another study (Fleischer and Howell, 2017). Despite their fear of infections, the participants chose to attend the group exercise sessions. Fear of infection might affect participation in social activities during chemotherapy treatment, so it is important for cancer nurses and physicians to inform patients that the risk of catching infections from others is small, and that most infections during chemotherapy are caused by their own bacterial flora (Freifeld et al., 2011).

Returning to work after sick leave was also important for many of the participants, and exercise during cancer treatment was perceived to facilitate their return to work because it helped the participants to maintain their physical functioning. Other studies also show that exercise during or after treatment can facilitate a return to work for...
This study contributes additional knowledge demonstrating the potential of exercise as a rehabilitation tool to improve functioning in daily life as a part of HRQOL during cancer treatment. As far as we know, no study has explored the experience of functioning in daily life while participating in an exercise intervention for as long as six months during cancer treatment. Our study also contributes by describing the experiences of individuals with various diagnoses, which is important since most previous research has focused on women with breast cancer. Our intention was to obtain a representative sample of participants, mirroring the three different diagnoses groups included in the Phys-Can study. This was achieved except for males with colorectal cancer. Thus, as in the Phys-Can study (90% of the participants were women with breast cancer), the majority of the participants in our study were women with breast cancer (15/21), which might limit the transferability of the findings. Further studies about the perceived value of exercise for functioning in daily life that include participants with a range of cancer diagnoses and a mix of sexes are needed. Phys-Can is a randomized controlled study, including individuals from three large hospitals in Sweden covering three regions with similar demographic populations. Since we do not expect to see differences between participants enrolled at the three university hospitals, we chose to include participants from one of the sites in the present study for convenience reasons. The participants in this study had voluntarily participated in an exercise intervention, and their experiences of the benefits of exercise might have been influenced by a positive attitude towards exercise.

Being involved as a researcher in the intervention study may have affected how the data was interpreted. Personal bias is impossible to avoid in qualitative research (Tong et al., 2007), and the pre-understanding within the research group will have influenced the interpretation of the data (Berger, 2015). However, one researcher had not been involved in the planning or implementation of the Phys-Can study. Having experienced qualitative researchers within the group was an advantage during the data analysis process.

5. Conclusion

Exercise was perceived as being important for maintaining functioning in daily life during cancer treatment, and the group exercise provided important social and informative support from others in a similar situation. Struggling with side effects of treatment which affected functioning in daily life made adjustments important in order to keep their daily life as normal as possible.

6. Implications for practice

The experienced advantages of participating in the exercise intervention in this study, together with similar results from other studies, indicate that exercise should be a natural part of cancer rehabilitation, and that healthcare staff should recommend exercise during cancer treatment to improve functioning in daily life. It should be the responsibility of the health care organisation to provide evidence-based information and to support exercise. Cancer nurses should motivate patients to maintain physical activity during treatment, in cooperation with the rest of the healthcare team and guided by physiotherapists. Cancer nurses should also include exercise during treatment as a part of the rehabilitation process and refer all patients with a need for advanced exercise support to a physiotherapist. Since many patients need to adjust their activities and participation during cancer treatment, cancer nurses and the health care team can also help them to find strategies for making adjustments in daily life.

Declaration of competing interest

The authors declare they have no conflicts of interest.

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