

## **ABSTRACT**

### **Background**

There is evidence that interventions based on a behavioral medicine approach to physical therapy (BMPI) are beneficial for older adults living with chronic pain; however, knowledge of the perceptions of older people regarding their participation in BMPI is lacking.

### **Aim**

The aim of this study was to describe the perceptions of older people about being participants in a home-based BMPI.

### **Methods**

Semi-structured interviews were conducted with 12 older adults living with chronic pain and participating in a BMPI. Data were analyzed using qualitative content analysis.

### **Results**

The respondents highlighted the importance of the home-based and individualized nature of the intervention. They perceived the support from the physical therapist (PT) as significant for their motivation and goal attainment. The benefits of the intervention were described in physical, psychological, social, and functional terms, and as enabling participants to live at home for longer.

### **Conclusion**

The results show that participation in a BMPI was perceived as a positive and meaningful experience. Support from a PT is crucial to encouraging behavioral changes. Finally, participation in a BMPI may contribute to the ability of participants to 'age in place' for longer.

**Keywords:** exercise, elderly, independence, home-based intervention, qualitative study

## **BACKGROUND**

According to the World Health Organization (WHO, 2015) there are 125 million people aged 80 years or older in the whole world. The increasing age of the population is accompanied by a rise in prevalence of chronic pain due to musculoskeletal conditions. Worldwide, musculoskeletal conditions are the one of the largest contributors to disability, with pain and restricted mobility the unifying features linking a range of diverse musculoskeletal conditions (WHO, 2018). The most common and disabling musculoskeletal conditions are osteoarthritis, back and neck pain, fractures associated with bone fragility, injuries, and systemic inflammatory conditions, such as rheumatoid arthritis.

Among community-dwelling older adults, 45%–80% report some kind of pain (Gibson and Lussier, 2012). Studies in Norway have demonstrated that, compared to men, older women report a higher degree of chronic pain related to musculoskeletal conditions (Kinge, Knudsen, Skirbekk, and Vollset, 2015), as well as older adults who live alone and/or are dependent on support to manage their daily life (Cederbom et al, 2014; Gibson and Lussier, 2012; Reid, Eccleston, and Pillemer, 2015). Two studies, one from Norway (Landmark, 2013) and one from Sweden (Pietila, Holmner, Stalnacke, Enthoven, and Stenberg, 2018), demonstrated that this problem is particularly extensive in these countries. According to Norwegian Statistics (SSB, 2018), in 2017, almost 350,000 persons with musculoskeletal and/or connective tissue disorders were registered. Given the relevance of cost-effectiveness issues related to hospital admission and treatment and planning care at home, it is crucial to identify and understand the physical and psychological conditions of patients, along with social and physical environmental factors that may influence treatment goals (Cederbom, Denison, and Bergland, 2017).

Chronic pain due to musculoskeletal conditions is associated with poor self-reported health, substantial disability from reduced mobility, decreased physical activity, falls, sleep

disturbance, social isolation, anxiety, and depression, and it ultimately has a negative effect on quality of life. All of these comorbidities are associated with higher rates of mortality (Mantyselka, Turunen, Ahonen, and Kumpusalo, 2003; Reid, Eccleston, and Pillemer, 2015). Pain-related problems and disability are more common in older women and those who receive home care, relative to older men. Living with chronic pain as an older adult is also associated with a substantially elevated risk of developing a disability and impaired mobility over time (Eggermont et al, 2014; Soldato et al, 2007).

Despite the negative impacts chronic pain may have on health, everyday life activities, and the quality of life of an older person, and the economic burden this major public health problem represents for society, chronic pain remains underdiagnosed and undertreated (Reid, Eccleston, and Pillemer, 2015). Recently, there has been an increased interest in qualitative studies that explore the experiences of patients living with chronic pain (Pietila, Holmner, Stalnacke, Enthoven, and Stenberg, 2018), the participation of older people in physical activity and exercise programs (Booth et al, 2017; Karlsson et al, 2018), or their experiences of participating in home-based exercise programs (Arkkukangas et al, 2017). However, although research interest has increased, knowledge of how older people experience their participation in interventions based on a behavioral medicine approach to physiotherapy, which further will be defined as BMPI, is lacking.

BMPI focus on changing the behavior of a person in ways related to the attainment of goals associated with disabilities effecting daily life (Cederbom et al, 2014). BMPI are individualized intervention programs based on physical activity and exercise, which aim to enhance an individual's ability to perform everyday activities, and particularly in this study, to improve physical function and decrease pain-related disability and pain-related beliefs (Åsenlöf, 2005; Cederbom et al, 2014). BMPI are beneficial for middle-aged adults living with chronic pain (Emilson et al, 2016); however, knowledge of the effects of BMPI among

target populations, as well as how older people perceive and experience their participation in BMPI, is lacking (Cederbom, Denison, and Bergland, 2017). Therefore, it is of high scientific interest to achieve a deeper understanding of *how* participants perceive and experience taking part in home-based BMPIs. The aim of this study was to describe the perceptions of older people of participating in a 12-week home-based BMPI; this paper presents the findings of the qualitative component of the study.

## **METHODS**

### **Study design**

The study had an inductive explorative qualitative design.

### **Participants and setting**

The participants were recruited from an ongoing randomized controlled trial (RCT; registered at ClinicalTrials.gov under the identifier, NCT02953470). The participants were recruited from a municipal register that recorded community-dwelling older adults that received support from the municipality. The first author was responsible for recruitment of the participants. The potential participants received an information letter where they were informed about the study and, at the same time, invited to participate in the study. The first and the research assistants then contacted the person by phone and checked the inclusion criteria. If the inclusion criteria were fulfilled, the persons were invited to participate in the study.

The first 12 participants randomized to the intervention group who had completed the 12-week intervention program were invited to participate. The inclusion criteria for the RCT study were as follows:

- age  $\geq$  75 years
- musculoskeletal pain for at least three months
- live alone in ordinary housing

- dependent on formal or informal care, for individual needs or housekeeping activities, at least once a month
- ability to walk independently indoors, with or without a walking aid
- able to speak and understand Norwegian

Exclusion criteria were as follows:

- ongoing physiotherapy treatment for an injury/illness
- in palliative care
- experienced heart failure in the past three months

Twelve individuals (nine women and three men) were interviewed between January and August 2017. Participants were aged 79–96 years and had lived with chronic pain for 0.5–17 years. Ten of 12 used some kind of walking aid indoors and nine of 12 were able to get outdoors by themselves. One participant had daily help from home help services, the remainder had help once a month with cleaning.

### **BMPI Intervention**

The intervention was a 12-week home-based program consisting of nine home visits and a ‘motivation telephone call’ from a physical therapist (PT) during the intervention period. The intervention was an individually tailored exercise program, based on a behavioral medicine approach, aiming to decrease pain-related disability, pain-related beliefs (i.e., fear of falling and catastrophizing thoughts) to improve physical performance and health related quality of life (Cederbom, Denison, and Bergland, 2017).

BMPI are characterized by systematic consideration of the patient’s physiological and psychological conditions and the social and physical environmental factors related to the goal of treatment. As mentioned earlier, the promotion and the improvement of the level of

physical activity and exercise are the basis for treatment in order to reach the goal. The exercise is functional and the number of exercises and their intensity are based on the degree to which the participant are able to collaborate with and the exercise increase progressively, according to changes in performance and participant health status. Another important goal is to improve the self-efficacy of participants (Åsenlöf, 2005; Cederbom, 2014; Littbrand et al, 2006). The goals are either a problematic everyday activities or activities that are highly important to maintain and are self-chosen. Some examples of goals are: climbing stairs safely and without increasing knee pain, doing household activities without increasing low back pain, and walking longer distances outside without increasing pain.

To check the adherence to the intervention, the participants were instructed to daily record the exercises they did and training of the goal behavior in an activity diary.

There were two physiotherapists (PT) involved in the intervention. To secure the fidelity of the intervention, the PTs received education about the theoretical frame of the study and training in performing the data collection procedures, as well as designing and delivering the intervention. The PTs were also provided with regular supervision during the intervention and data collection period to discuss various issues and problems related to the project. The education as well as the supervision were performed by the project leader, who have a PhD degree, and also educated as physiotherapist, thoroughly trained and having deep knowledge about and competence within BMPI.

### **Data collection**

Two co-researchers (authors 2 and 3), who were not involved in the intervention or testing procedure and had never previously met the respondents carried out the interviews. The interviews took place at the respondents' homes one month after the intervention had ended. Before conducting the interview, the interviewer made a telephone call to the respondent and agreed the day and the time for the interview.

Data were collected using individual semi-structured interviews based on an interview guide. Prior to commencing the interview, the interviewer informed the participant about the purpose of the interview. All interviews were introduced in the same way, starting with the question: “Could you please tell me about your reasons for participating in the intervention program?” Questions were addressed in a dialogue form, allowing the respondents to talk freely about their motivation to participate in the intervention. The guide comprised some main questions, along with follow-up questions based on the participants’ answers to the main questions (Kvale and Brinkmann, 2009). Content areas for the interviews included the participants’ perceptions of their participation in the intervention program, if they had perceived any changes in their everyday life or their ability to perform everyday activities, and thoughts about their motivation or barriers to maintaining their new behavior (i.e., continue to exercise and be physically active after the intervention program ended). Depending on the respondent’s dynamism during the interview, each interview lasted between 25 and 45 minutes.

### **Ethical considerations**

The study was conducted in accordance with the principles of the Declaration of Helsinki of the World Medical Association (WMA, 2013). Verbal and written information about the study were provided for the respondents and written and oral consent were gathered from all participants prior to data collection. The participants were guaranteed confidentiality and reassured that their participation was entirely voluntary and that they could withdraw from the study at any time without needing to state their reasons. The study was approved by the Regional Committee for Medical and Health Research Ethics (REK), Norway, dnr 2016/2234.

### **Data analyses**

Interviews were audio recorded and transcribed verbatim by an independent person. The transcriptions resulting from the 12 interviews amounted to a total of 111 pages.

To understand the meaning of the content of the interviews and to reach a deeper understanding of the research topic, the text was analyzed as a whole using qualitative content analysis, with an inductive approach, as described by Elo and Kingäs (2008). The process of evaluation included a three-step content analysis: preparation, organizing, and reporting the results.

The preparation step started with the authors working separately, each reading through four interviews of the total of 12, in combination with listening to the audio-recorded version to obtain a sense of the content. Within this step, units of analysis were selected. Organizing included open coding, creating categories, and abstraction. 'Open coding' refers to the researchers writing notes and headings in the text or on the margins while reading it. The headings were collected from the margins and transcribed onto coding sheets. At this stage, the categories were freely generated and classified as belonging to a particular group and then grouped under a higher order heading (sub-category). The categories were created through interpretation and named using content-characteristic words. Sub-categories with similar content were grouped together as generic categories. At that time, through abstraction, the generic categories were further grouped under a main category.

At meetings, all three authors, discussed the classification and formulation of the codes for all interviews and created categories and sub-categories for all the interviews. Changes were made until consensus was achieved (Elo and Kyngäs, 2008). The final version of the analysis was read by all authors to ensure the rigor of the findings and the categories and subcategories described (Graneheim and Lundman, 2004). In addition, an expert in the research field read the codes and categories and compared them with the chosen units of meaning to validate the findings.



## **Trustworthiness**

To increase the trustworthiness of the analysis process, the authors used a coding scheme (Elo et al, 2014) to corroborate the relationships between chosen meaning units and the developed codes. All three authors brought different knowledge bases/backgrounds, pre-understanding, and experience to the study and data analysis. Both insider and outsider perspectives were represented. The disciplines of the researchers were physical therapy and nursing. Their previous theoretical and clinical knowledge of physiotherapy and nursing care in the present field could have influenced the interviews and data analyses; therefore, it was important that the researchers were aware of their pre-understandings and existing knowledge during the interviews and analysis (Elo and Kyngäs, 2008). While the first author was involved in planning and conducting the intervention, and contributed extensive experience in BMPI, rehabilitation, and exercise interventions among older people, the second and third authors had experience of rehabilitation nursing, as well as with qualitative interviews and the theory of content analysis. In an attempt to ensure maximum credibility, the selection of participants, data collection, and data analyses are presented as thoroughly as possible (Elo and Kyngäs, 2008) in this paper.

## **RESULTS**

Analysis of the interviews revealed three categories: ‘*Overall perceptions of the intervention*’, ‘*Expectations and perceived gains*’, and ‘*Enabling hope for the future*’ and 10 sub-categories (Table 1).

In the following paragraphs, the findings are presented according to these categories and illustrated with quotations from the interviews. To provide a reflexive and credible reproduction of the quotations, quotations from interviews are cited using the numeric code assigned to each participant.

## **Overall perceptions of the intervention**

### *Supportive environmental factors*

The fact that the intervention was home-based and that the intervention and exercises were suited to and performed within a well-known environment was highlighted as an important factor facilitating the participation of individuals in the program. Some participants even expressed that this was a prerequisite that had positively influenced their participation in the study, as they were not able to get outdoors by themselves. Another advantage for these participants was also that they could train inside, at home, regardless of the weather. Overall, the intervention was perceived as “*easy and fun*” (4). One man said:

... “*I got different exercises I could use and I thought that it was very nice to get the instructions ... “She has taught me a lot of leg exercises and different ways of how to perform it ... and I think it was very nice that the PT came to my home. It suited me very well”* (8).

The exercises were described as having various levels of degree of difficulty and challenge.

One woman was positive about the exercises because she was assigned: “*16 relatively simple exercises, varied and well-composed*” (11).

Many participants perceived the exercises included in the intervention as easy to perform, as they were individualized and adjusted to their physical abilities and needs, and their own goal for the intervention. Although the exercises were simple, they were important as they activated the participants, as one man said: “*The experience was that I had to activate myself to put up with these exercises. Moving myself back and forth and going sideways*” (1). One woman said: “*I thought it was supposed to be hard training .... so, I feared the physiotherapy session, but the PT understood*” (4) and she asserted that the PT adjusted the exercises and the time according to her pace, satisfying her expectations: “*Yes, finally I have got an exercise schedule that I am comfortable with*” (4).

### *Self-monitoring of exercise*

Participants expressed different perceptions of recording their exercise in the activity diary.

One asserted that filling the exercise-diary was not difficult at all, and that it was important to properly document all the exercises:

*“It was just filling out the sheets we received I took each day by itself... I could look back in the book and see ...”* (1).

For some participants, filling the diary motivated them to continue:

*“I think it was easier to be motivated (by keeping a diary). We had to write down in the diary that we had done it (the exercises), and it becomes a daily routine, in a way. It is your proof that “now I have done it””* (8).

Although one participant was not sure about the benefit she obtained from making the written record, she said: *“Anyway, I wrote down what I did and with retrospect I could oversee what I had done”* (2).

Although the majority of participants appeared to be engaged in this activity, there were some who, after a while, were not comfortable with writing the diary. Some of them felt that it was too much work and quite difficult, as one man expressed:

*“And when I had to write the report... it slid somehow! I skipped two or three days and then I had to think: “what should I write here?”, “What did I do yesterday or the day before yesterday?” ... and it became boring.”* (3).

### *Support from the Physiotherapist*

Support from the PT appeared to be highly important to the participants. The PT was perceived as a “motivator”, “coach”, and “catalyzer”. All the respondents perceived the PT as

providing expert knowledge, as a competent and tolerant person, who was clever and sensitive to their needs, as well as supportive in their struggle to exercise. The PT's attributes were perceived as promoting good teamwork between participants and the PT. The participants described their experiences of being involved in decision making at all levels of the intervention, from goalsetting for the intervention, planning the exercise program, and adjusting the amount of time the exercise program would last, to which kind of exercises might suit their bodies. One woman perceived the PT as: *"...the first PT that understood and gave me a fun schedule to exercise with. Finally, one that understood"* (4). Many of them expressed satisfaction with the information given about the intervention in advance and that they were provided sufficient time to receive instructions and support from the PT.

All participants agreed that their expectations of the PT were fulfilled, as she proved to be a supportive person that encouraged them to persist and manage more than they thought they might be able to. The PT encouraged them not to give up while they were performing the exercises. She supported the participants by teaching them strategies that sustained the different behavioral changes that they made during the intervention in their everyday life. The participants also experienced the PT as a person who was easy to talk to and cooperate with and felt they could discuss their life situation or life circumstances, not only questions related to the intervention. One man said:

*"It felt good to have somebody to push you a little bit... It was nice, and we cooperated well with each other. I am easy to talk to, and we had good discussions, and then we cooled down a little bit and talked again"* (3).

## **Expectations and perceived gains from the intervention**

### *Expectations of the intervention*

All participants had some expectations of the intervention. They expressed beliefs that they would get better physically, improve their balance to prevent falls, and reduce their pain condition. At a minimum, they expected relief from the symptoms of pain or reduced joint stiffness caused by their chronic musculoskeletal conditions, if relief or treatment was not possible.

One participant anticipated that they would: *“get some exercises, so I could get better in my back, so I did not have to take so many breaks during the day... I thought that she is a specialist, educated as a PT, and I thought that she will have some good individual programs in which I can train...”* (11).

One participant expected that the intervention would motivate him to go outside and train a little bit: *“...it was a great deal because I was staying inside the house all the time and it was like a wake-up... She (PT) came here every week, every Wednesday, and made me go outside...the pain comes and goes; however, it's better now...”* (3).

One woman anticipated becoming steadier on her legs and: *“the most important goal was to prevent falls and to become independent”* (10).

However, while almost all participants had some or many expectations, one woman said: *“I am curious by nature and I join almost everything all the time. I had basically no expectations (from the intervention)...”* (9).

Although many participants were positive about the intervention and its outcomes and expressed gratefulness about being invited to participate, some had somewhat unrealistic expectations. The expectations of those individuals were not fulfilled and they expressed a degree of disappointment. One of the respondents thought that she would become, *“fit as a*

*fiddle*” (6), another that the PT would teach her some tricks to get better. One woman, having had previous experiences with PTs, hoped that the intervention would include some massage of her stiff neck.

Others individuals believed that participating in the intervention would bring them some material benefits, such as different types of aid: *“I’m missing having a pillow to sit on in order to get up more easily”* (1). Alternatively, one of the men believed that he may experience sufficient health improvements to enable him to do some physical work, as he did when he was younger: *“Now I’m lying and fantasizing during the night that I’m painting both the railing and whatever it is. I paint from morning to evening ... I wake up in the morning and I’m so tired”* (3).

#### *Strengthened physical function and improved mental wellbeing*

The participants were aware that they were living a sedentary life, most of them watching TV, due to their older age and pain conditions that limited their physical activity; therefore, exercising under the supervision of a PT was perceived as a gift to themselves.

One woman said that she experienced less pain and she felt physically better, after she had exercised for a while: *“I’m fine. It is better now when I’m standing up”* (4). Another participant said that: *“I do not have to sit on a chair any more (when exercising) ... My body feels much better now after I have started to exercise. I have less pain, so it helped me.”* (7).

Another man perceived that his physical function had improved when he realized that he was able to go outside without a walking aid:

*“Two to three days ago, I went to the trash can and it felt good. I thought I did not have my aid walker ... But now I can go almost like in the old days ... So, it also helps your mood, you wake up in the morning and want to do something, and you feel that is possible ... you feel a little bit quicker.”* (8).

Just being able to go to the shopping center was perceived as an improvement of physical function. One woman said that when she went to the shopping center: *“it felt OK”* (2).

Many participants were concerned about improving their balance. Most of them felt that they became steadier: *“Firstly, my balance is better than before, and I think I have a good feeling in my body after I started to train. Secondly, I do not have so much pain as before the exercises... I had much pain in my joints and other places. It helps me...”* (7).

All participants perceived that their mental wellbeing had improved. They were surprised to discover that the intervention made them more comfortable performing the exercises. The participants expressed that, after they participated in the intervention and started to exercise, they perceived improvements in their mood. They felt joy, improved self-esteem, and relief from their everyday pain. One man said:

*“You get a positive impression about yourself (by training), and in addition I'm basically optimistic... exercising gives me meaning and goals, in a way”* ... (3).

#### *Reinforcement of physical and social activities*

For some of the participants, exercising gave them increased capacity to participate in social and physical activities. For example, a 94-year-old man narrated that, since childhood, he performed 20 squats every day in the morning: *“I have done this every day in my life...”* (1).

Due to his heart failure and pain related to his knee problems he had to stop doing it for several months. He appreciated that the exercises had helped to reinforce him to carry on with these squats, as it was a part of his daily routines.

Many participants felt that the intervention gave them the energy to perform some activities that were meaningful for them. One woman said that she enjoyed playing Bridge, but she has a long way to travel in order to play cards: *“I have to take the bus to Majorstua (a neighborhood in Oslo downtown), then I have to take the tram upwards... and I cannot be*

*late as we start to play precisely to the minute...*” (10). Although she felt that everything was perceived as a hardship, her need to meet friends and to be social gave her energy to carry on with the exercises and remain active, as playing Bridge involved a lot of effort in traveling.

The respondents perceived being invited to participate in the intervention as something positive that made their days less boring and lonely. Participation in the study was also a discussion topic when the participants socialized with their families and/or friends. The participants informed friends and family about the intervention, the exercises they were performing, about how they perceived the cooperation with the PT, and the gains they might obtain by exercising. The participants were excited about the possibility that was offered to them, as one woman said: *“I thought it was a very good offer, so I told about it to all my friends.”* (9).

The intervention was also seen as an opportunity to connect with other people. One participant came in contact with ... *“two neighbors, and together we are exercising by going up and down the stairs”* (2). By meeting neighbors and talking with them daily, the participant received inspiration and support to continue exercising, as well as her need to be social being met.

#### *Improved knowledge, self-efficacy, and empowerment*

One goal of the intervention was to increase the level of physical activity and to provide participants with knowledge and strategies to implement more physical activity and exercise, so that it became part of their normal daily routine. Another key feature of the intervention was the promotion of participant self-efficacy, in relation to performing physical activity/exercise, as well as other routine activities. Many participants perceived improved self-efficacy and empowerment as a result of exercising, as they were better able to master their everyday activities. Nevertheless, they felt that they gained knowledge about how to live



with their everyday pain and accept it as part of their lives. Some of them felt that their inner resources had been mobilized; however, they tried as best they could to overcome pain and learn to live with their bodily failures. One woman perceived that, after she had exercised, although she was in moderate pain, she became empowered to do some work at home, such as cleaning, dusting, making food, or going out to the store to do some shopping.

Some participants said that the PT taught them what to do if they should fall on the floor, as one of the participants asserted:

*“She (PT) has taught me... “what will you do?” and when I was lying there I was thinking, “I have to be calm and think what the PT said to me: “Be calm and think about what... (name of the PT) said to me. What did she teach me?” And I reached the pillow from that chair, I put it under the knees and then I got up and I sat there” (10).*

Daily training contributed to skill maintenance, as the participants were aware of their fragility and limitations, as well as their physical capabilities. The participants exercised alone which, for the majority of them, resulted in a higher level of engagement during training sessions. Many participants, particularly women, learned to be more confident and to set goals for the day. By believing in the benefits of the intervention, the participants strengthened their abilities, as it was important for their outcomes; as one woman said: *“I cannot give up now... When you see that this works (to exercise), you get a little more guts as well...” (7).*

Enabling hope for the future

*Increasing functional ability to maintain independence*

The intervention had a positive impact on the participants, as it increased their functional status. It became clear that one motivation for the respondents to persist with their new physical activity and exercise habits was to maintain their physical independence.

The participants were sure that, by exercising, they would be able to remain active and relatively independent in everyday life. Their physical health was important, as none of them wanted to become a burden to their families or healthcare services. They were motivated to maintain satisfactory physical health as it influenced their capacity to gather with family, visit friends, or do things that they enjoyed. Some of them employed particular strategies to carry on with the training program, such as looking forward to the future by setting small goals and doing what they could to reach them.

As one of the men asserted, although he was 96 years old, he was looking forward to having his family visiting him and to be able to have some fun with his great-grandchildren. He was looking forward to getting physically better before the summer, so that he would be able to travel with his family up in the mountains or to the Norwegian coast in the southern part of Norway. Another man was planning to improve his functional ability so that he could help his son to build a house and paint its walls. One man was looking forward to improving his physical ability to be able to just walk freely: “...*I don't walk in the woods anymore, but I think that I have to try it*” ... and laughing he continued... “*if the summer comes this year, I am going to walk at Bygdøy (peninsula)*” (8). Another woman sadly asserted that: “*I always enjoy walking around Sognsvann (a lake). It is many years since I was able to do this. I believe that I could do it now... I believe it!*” (9).

#### *Preventing future disease*

In addition to pain caused by one or several musculoskeletal conditions, the majority of participants also had pain related to other diseases or physical failures. When their symptoms deteriorated, many of them required hospitalization. They feared admission or/and re-admission to hospital, as they interpreted these events as signs that their health was no longer satisfactory. Simultaneously, they felt that by being hospitalized, they would regress, rather

than making progress, or maintaining the same level of health, as one women said after she had a heart attack: *“One year ago I barely could go three meters... I had a heart attack... And, physically, I was way back. Although there was a big team around me, it was hard. I am so afraid that I will get there again (hospital), therefore, I am doing these exercises”* (7).

Daily exercise gave the majority of participants a feeling that they must take care of themselves, as one of the participants asserted: *“nobody else will do this for me, and it is important ... in order to improve my balance and to not fall”* (8). Many of them said that a fall would lead to more pain and even physical conditions requiring their re-admission to hospital.

Many participants believed that being physically active would help them to continue with their lives, although many of them had undergone long periods of hospitalization. Although one woman, in addition to other health problems, had broken her femur three years ago, she said that she still travels and flies a great deal, both inside and outside the country. She was aware that it was important for her physical mobility to go outside the house every day. She motivated herself by saying: *“Now, I have to exercise... and it helps. I take my walking sticks and I go out”* (9).

The primary goal of participants was not to deteriorate, as one women asserted: *“at least to maintain the status quo, because it is important when you are so old ...”* (12).

#### *Being able to live at home for longer*

Although they were of advanced age, had decreased physical function, and experienced pain, the majority of participants expressed wishes and hopes to live at home for as long as possible. All of them believed that by participating in the intervention, they would improve their physical health and thus be able to live at home for the rest of their lives. The participants were widows or widowers and they had lived alone for many years in the same

house. Many of the participants had lived in the same place for many years and had developed a strong sense of connection to physical spaces, such as their gardens or homes, which they did not want to lose. Moreover, memories from their early lives tied them to their houses.

The idea of being physically active and healthy was also linked to the notion of the possibility of being able to choose where they should spend the rest of their lives. Moving to a nursing home was not a deliberate choice or option and was seen as a failure. This idea emerged very strongly through an interview with one man, who emphasized the need to exercise because, as he said: *"I don't want to be negative, but the next step is to move into a nursing home... Of course, some people have no choice and they have to live their lives there... there might be many reasons for this, but if you have the opportunity (to participate in an exercise program), you have to grab it."* (8).

One woman hoped that exercising daily would positively influence her health and strengthen her: *"to manage my life at home as long as it is possible"* (11). Another woman hoped that she would not move from her house, and she wondered if she would continue to exercise: *"why could I not be able to live here with these stairs?"* (10). It was her inherent wish to be able to experience the day after tomorrow at home.

## **DISCUSSION**

Knowledge of how older people experience participation in a home-based intervention that focuses on behavior changes is sparse (Arkkukangas et al, 2017). To the best of our knowledge, no study has explored how older adults living with chronic pain perceive being participants in a BMPI. Therefore, we believe that this study contributes new, valuable, and interesting information, relevant to both researchers and healthcare providers in the field of rehabilitation, in the context of a behavioral medicine approach to physiotherapy.

Overall, the participants perceived their participation in the BMPI to be a positive experience. They perceived many different gains, both in a short-and long term.

The participants stressed the importance of the intervention being home-based and, for some of them, this was perceived as a prerequisite that enabled them to participate in the study. The benefits of home-based interventions have also been demonstrated in other research studies (Harris et al, 2008). Both the intervention and the exercises were experienced as individualized, developed, and adapted to the participants physical abilities, health status, and their personal goals. In some studies, these are described as highly recommended factors that should be taken into account when designing and implementing exercise programs for community-dwelling older people, as well as for BMPI (Cederbom et al, 2014; Manor and Lipsitz, 2013). These factors are also shown to promote the adherence of older people participating in different interventions and exercise programs (Arkkukangas, Söderlund, Eriksson, and Johansson, 2017; Jimenez-Beatty Navarro et al, 2007). The results of a Spanish study (Jimenez-Beatty Navarro et al, 2007) demonstrated that, if an intervention and exercise program is well-structured, provides a positive experience, and is performed in a suitable environment for the older adult, adherence to and acceptance of the program will be promoted; these results are supported by the findings of the present study.

To check adherence and promote self-monitoring, as well as behavior changes, exercise diaries are tools typically used in similar studies (Cederbom et al, 2014). The use of exercise diaries in interventions for older people can be a challenge (Cederbom et al, 2014). However, even if there were some struggle for the participants in this study with writing in the diaries, they continued to do so and for most of them, the diary notes was a reminder and motivated them to continue. To do something that can be experienced as a challenge, but still choosing to do it, can be associated with the phenomenon of cognitive dissonance. Cognitive dissonance refers to a situation involving conflicting attitudes, beliefs and behaviours. This

phenomenon can be explained in the terms of that we have an inner drive to hold all our attitudes and beliefs in harmony and avoid disharmony or dissonance (Festinger, 1957). Moreover, these findings are also in line with the results from a previous study, where older adults expressed their experience that the exercise diary reinforced their motivation to perform the exercises (Arkkukangas et al, 2017).

The findings from this study demonstrate that the support and motivation of PTs were crucial for successful implementation of the intervention and for the outcomes of participants. PT personality traits, competence and tolerance facilitate exercise performance among older people (Arkkukangas et al, 2017; Lindelof, Karlsson, and Lundman, 2012). The participants perceived the PT as a ‘motivator’ and a coach and the PT was observed to provide expert knowledge, having the necessary attribute of being experienced as a competent and tolerant person. The participants also perceived that the PT involved them in all levels of decision making in relation to the intervention, which is a key feature of BMPI (Cederbom, Denison, and Bergland, 2017).

Other important characteristics of BMPI include its ability to improve an individual’s performance of everyday activities, their level of physical activity, and their self-efficacy in relation to different activities. The PT also provides participants with knowledge, in terms of strategies to maintain new behaviors, over both the short and long term (Cederbom, Denison, and Bergland, 2017). All of these key features were described by the participants in the present study. These findings are in accordance with previous studies that have explored the gains older adults may experience by participating in different exercise interventions (Arkkukangas et al, 2017; Lindelof, Karlsson, and Lundman, 2012).

The majority of the expectations of participants were realistic in relation to the BMPI and it appears that most of them were fulfilled, based on the descriptions of the perceived gains

from the intervention. The participants described that they experienced decreased pain severity and felt that they were better able to tolerate and manage their pain, which met some of their expectations for the intervention. This is very encouraging for future intervention studies, as knowing that these two factors can contribute to decreased pain-related disability in older adults can ultimately promote a more active lifestyle in the target population (Cederbom, Söderlund, Denison, and von Heideken Wågert, 2014; Cederbom, Wågert, Söderlund, and Söderbäck, 2014).

One of the findings was regarding participants perceiving themselves as having a sedentary lifestyle. Findings from previous studies demonstrate that this is a well-known problem among older people living with chronic pain (Stubbs et al, 2013). To decrease the negative consequences of a sedentary lifestyle, it is highly important for all healthcare professionals to enable, support, and promote physical activity, particularly among the target population who are at a higher risk of having a sedentary lifestyle (de Rezende, Rey-Lopez, Matsudo, and do Carmo Luiz, 2014; Stubbs et al, 2013). In the present study, the PT supported the participants to become physically active and to make/perform physical activity and the exercise program as a part of their daily routines. The improved level of physical activity also strengthened the physical function and mood of the participants. This finding is in line with those of previous studies, where the support of a PT in home-based exercise interventions contributed to improving the physical function and mood of participants (Arkkukangas et al, 2017; Cederbom et al, 2014). The findings of this study are of high clinical relevance, given that an increased level of physical activity and physical function is known to enable the reserve capacity among older people. Reserve capacity can be defined as capacity exceeding that necessary to manage everyday life, which makes an older person more resistant to unexpected events (Clegg et al, 2013). In the present study, the participants perceived that the exercises contributed to improved performance, thus they enabled them to exceed the capacity

necessary to manage their everyday life. In this way they could prevent future morbidity and avoid hospitalization and re-hospitalization.

The participants perceived that their participation in the intervention decreased their fear of falling, a finding that is of high clinical relevance for target populations at elevated risk of falls (Stubbs et al, 2014). Working on the psychological issues of participants (i.e., fear of falling) is also a basic part of a BMPI, as described in literature (Cederbom, Denison, and Bergland, 2017).

The reinforcement of social activities through the intervention and the experience of being less lonely were two important findings. Being old and living alone are risk factors in themselves and very often result in poorer health, greater disability, higher levels of pain, social isolation, and higher degree of depressed mood (Bradbeer et al, 2003; Cederbom, 2014). Therefore, it is important to enable, maintain, and improve social activities in daily life, hence the aspiration to decrease loneliness among the target population. The participants included and inspired friends, family, and neighbors to be more physically active. Social support was important to maintenance of their new behavior. Previous research has found that support is a crucial factor in undergoing behavioral changes, especially for older adults (Arkkukangas et al, 2017; Brawley, Rejeski, and King, 2003).

Despite their advanced age and awareness that they were approaching the end of their lives, the participants were motivated to continue with and maintain their new behaviors. They expressed a strong will and desire to be independent and live at home for as long as possible. These findings can be related to the concept of 'ageing in place' which can be defined as the ability of older people to live in their own home, wherever that might be, for as long as they feel confident and comfortable (Yen and Anderson, 2012). To 'age in place' has been described by older people as promoting their independence and autonomy (Wiles et al, 2011).



Overall, as the findings of the present study demonstrate, BMPI may enable older people living with chronic pain to ‘age in place’.

### **Strengths and Weaknesses**

This study has some limitations. Qualitative interviews were chosen to collect the data for this study, due to their appropriateness for allowing descriptions of people’s experiences or perceptions, and to gain a deeper understanding about the phenomenon of interest (Streubert and Carpenter, 2011). The choice of method seems adequate to meet the aim of the study.

To assure and strengthen the credibility of the study, strategic sample selection was chosen, thereby increasing the possibility of better answering the research question (Patton, 1987).

Although the study involved a small sample, mainly comprised of women, the sample size was regarded as sufficient, given the rich content of the interviews; therefore, the collected data can be considered adequate for achieving appropriate variation in the analysis. This supports the reliability of the findings.

The findings are limited to the participants and to their personal perceptions and, as is common in qualitative research, the data may be subject to alternative interpretations; therefore, the findings should be considered with caution. Overall, the participants were very positive to the intervention which may be explained by the fact that they generally were positive to be physically active and had earlier positive experience of training and exercising. Another possible explanation could be that the participants tried to achieve cognitive dissonance. (Festinger, 1957). In this study, it could for example be that the gains and positive experiences that the participants encountered could be affected in a negative way if they would try to find anything negative that could connected with the participation or to the intervention or if they wanted to please the interviewers.

Since knowledge of the perceptions of older people about their participation in BMPI exercise programs is sparse, although this study included a restricted group of participants, the knowledge gained is valuable. Additionally, the similarities of some of our findings to those of previously published studies is noted above and supports the transferability of the results of this study to a broader context.

### **CONCLUSION**

The findings of the present study provide insights into the perceptions of this specific group of older people of participating in a home-based BMPI. Overall, the findings show that participants were satisfied and described their participation as a positive experience. The support of the PT was perceived as important for achievement of the goals of the participants. Participation in the intervention and the exercise program were perceived to improve physical function, decrease pain severity, and enable participants to better manage their pain and reduce their fear for falling. One potential implication of the study is in relation to the increased possibility for participants to age in place. Finally, the knowledge generated by the present study contributes new and valuable insights, relevant to both researchers and healthcare providers in the field of promoting active ageing and quality of life for older people living with chronic pain. Further research is needed to evaluate the effect of BMPI among the target population, and will be provided by the ongoing RCT.

### **DISCLOSURE OF INTEREST**

The authors report no declarations of interest.

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**Table 1: Overview of Categories and Subcategories**

<b>Categories</b>	<b>Sub-categories</b>
<b>Overall perceptions of the intervention</b>	Supportive environmental factors Self-monitoring of exercise Support from the PT
<b>Expectations and perceived gains</b>	Expectations of the intervention Strengthened physical function and improved mental wellbeing Reinforcement of physical and social activities Improved knowledge, self-efficacy, and empowerment
<b>Enabling hope for the future</b>	Increasing functional ability to maintain independence Preventing future disease Being able to live at home for longer