



## An invigorating journey towards better function and well-being: A qualitative study of knee osteoarthritis patients' experiences with an online exercise and education intervention



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### ABSTRACT

**Objective:** To explore what it means for patients with knee osteoarthritis (OA) to engage in online delivered exercise and education.

**Method:** We combined participant observations and focus group interviews with knee OA patients who engaged in an 8-week program (12 exercise sessions and 2 education sessions) delivered online. Data underwent a three-level phenomenological-hermeneutic interpretation inspired by Ricoeur's narrative and interpretation theory.

**Results:** We performed 17 participant observations during online group-based exercise sessions with twenty individuals with knee OA (12 females), median age 71 years (range: 48 to 81), and five focus group interviews with fifteen of the individuals. The following three themes emerged from the data analysis: 1. *Exercise engagement* portrays an experience of ownership of the exercise-based treatment, leading to better function and well-being and raising hope for the future 2. *A good start but only halfway supported* portrays perceived well-guided in performing knee OA exercise, however also some unmet support needs in the online format, and 3. *Beneficial peer companionship with online constraints* portrays a socially engaging peer forum that, at times, was limited by the online format.

**Conclusions:** This phenomenological-hermeneutic study reflects that supervised online exercise and education facilitate identity mobility, potentially increasing self-efficacy to adopt weekly exercise habits in patients with knee OA. However, the program may benefit from enabling a more interactive approach between peer participants and combining the online format with physical group classes. Moreover, further individualization and focus on a gradual approach toward self-management are encouraged.

### 1. Introduction

Online-based health care is a growing part of public health services worldwide [1]. This has been especially pertinent in the last few years, where the extraordinary events of the COVID-19 pandemic have pushed

the search for sustainable alternative healthcare delivery models [2,3]. For patients with knee OA, where exercise, education, and weight loss (if relevant) are the recommended first-line care options for everyone, irrespective of disease stage [4], online delivery of first-line OA care may be a viable alternative treatment option [5–7]. Consumers are welcoming

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the use of videoconferencing for physiotherapy services – rating the comfort and effectiveness as high [8]. Recent qualitative insights from Australia indicate that people with knee OA have overall positive experiences from exercise advice and support via telephone [9] and online group-based exercise and education [10]. Yet, online healthcare delivery models are still in their infancy, and with service technologies constantly evolving, more insights into the users' perspectives – by giving patients a voice about what it is like to be in the world while engaging in the models – will contribute with important insight, which can illustrate the experienced impact and inform user-based refinement [11].

As part of a COVID-19-enforced initiative to secure access to appropriate first-line knee OA care in Denmark, two Danish hospitals established online exercise and education classes for people referred to the orthopedic outpatient clinic with knee OA symptoms. By conducting participant observations and focus group interviews with a subset of individuals with knee OA participating in this online service, we aimed to provide knowledge on what it means for patients with knee OA to engage in online exercise and education.

## 2. Method

### 2.1. Design

Within a phenomenological-hermeneutic frame, we used a qualitative design adapted to the online form.

We aimed insight into patients' lived experiences, and to obtain rich data, we chose to combine participant observations and focus group interviews [12–14]. Such a combination serves to investigate the lived experiences of the patients comprehensively. What is observed can be investigated further and confirmed by interviews, and vice versa [14]. Using lived experiences as the basis for analysis and interpretation aimed at illuminating *what it means* to be a person participating in the online treatment program and what impact it has on everyday life with knee OA [15]. Analysis and interpretation took inspiration from the theory of narrative and interpretation of the French Philosopher Paul Ricoeur [14, 16,17]. The design of this study was guided by the Eight "Big-Tent" Criteria for Excellent Qualitative Research [18]. Reporting adheres to the 32-item checklist of the consolidated criterion for reporting qualitative research checklist [19].

### 2.2. Ethics

The Scientific Ethics Committee of Region Zealand waived ethical approval of the study (J.nr. 20–000013). The study was approved by The Danish Data Protection Agency of Region Zealand (REG-115-2020) and adhered to the Declaration of Helsinki. Participants gave informed consent on behalf of oral information provided by telephone and written information material sent to their homes. We emphasized that participation was voluntary, results were presented anonymously, data was handled confidentially according to the GDPR legislation, and participants could withdraw from the study without any consequences for their care.

### 2.3. Participants and enrollment

We studied patients with knee OA, who participated in an online exercise and education program via referral from the Orthopedic Outpatient clinic at Naestved Hospital, Region Zealand as part of a COVID-19 enforced clinical initiative to provide increased access to first-line OA care for patients waitlisted for orthopedic assessment [20]. All participants had a clinically and radiographically verified knee OA diagnosis and chose online participation over a referral to onsite exercise therapy rehabilitation in the municipality. None of the participants had participated in structured physiotherapist (PT)-led exercise and education for their knee OA symptoms within the past six months. Exclusion criteria for the online exercise education program were: another reason

than OA for the knee symptoms, for example, tumour; inflammatory joint disease, or sequelae after hip fracture; other symptoms that are more pronounced than the OA problems, for example, chronic, generalised pain, or fibromyalgia [21]. Through convenience sampling, we invited all individuals that chose to participate in the online care delivery model in autumn/winter 2020.

### 2.4. TeleGLA:D

The online exercise and education program named TeleGLA:D, adopted an online version of the Good Life with Osteoarthritis in Denmark (GLA:D®) program, which offers first-line non-surgical care for patients with knee OA in Denmark. The GLA:D® program has been implemented in 10 countries around the world [21,22].

The overarching aim of GLA:D® is to implement clinical guidelines for first-line knee and hip OA care (exercise and education). GLA:D® constitutes three mandatory elements: 1) a 2-day course for PTs; 2) two disease-specific education sessions and 12 supervised neuromuscular control exercises over approximately 8 weeks delivered by the trained PTs in clinical practice; 3) Registration in the national GLA:D® registry with data from baseline, 3 and 12 months [21,23,24].

Like GLA:D®, TeleGLA:D consists of supervised exercise and education for patients with knee and hip OA symptoms delivered by trained PTs (same content, dose, and frequency) TeleGLA:D was delivered through a live audio-visual connection to smartphones, tablets, or laptops into participants' homes or remote locations. From training rooms in Naestved and Slagelse Hospitals, PTs supervised groups of up to six online participants via 65" screens that gave audio-visual online contact. Additional features of TeleGLA:D included: 1) An initial 1-h online group call, where the supervising PT helped participants arrange home exercise equipment and handle the technical set-up (hyperlink for meeting, microphone, video). 2) Provisioning of exercise bands and a manual for online meetings, including instructions for using alternative equipment if necessary. TeleGLA:D was an alternative delivery model of first-line OA care at Slagelse and Naestved Hospitals from May 2020 to May 2021, enrolling a total of 89 participants.

### 2.5. Research group

The lead interviewer (CS) is nurse and experienced qualitative researcher with no experience in treating knee OA patients. CS was supported by a group of one nurse (MB, qualitative background) and 5 PTs with backgrounds in rehabilitation (BC, LHT) and musculoskeletal conditions (MN) and specific expertise in exercise-based management of knee OA (BC, STS, PMH). The research group comprised three women and four men.

### 2.6. Data generation

CS, and BC, collaborated on the data generation, from August 31 to December 8, 2020. Continuously, thoughts, ideas, and emerging interpretations were discussed between CS, BC, and the principal investigator; PMH. This focused the data generation to follow emerging phenomena. Data generation ended when deemed unlikely that new significant phenomena would occur [12–14].

#### 2.6.1. Online participant observations

We made online observations of six different TeleGLA:D groups during exercise and educational classes (lasting 45–65 min each). With inspiration from Hammersly and Atkinson [13], we explored the context and activities during TeleGLA:D participation. The only relationship between the data generators and participants was that BC had informed and included participants through phone conversations. The two data generators focused on how the participants expressed themselves over time, both in bodily terms and employing statements, how they interacted with the PT and peers, how they exercised and organized

themselves with the exercise in their homes, and what was meaningful to them. Occasionally, the observations included informal conversations with participants [13]. Notes and quotations were made during the sessions, and immediately after, field notes were written to ensure an accurate description [13,25]. The PTs' perspective is part of another parallel interview study.

### 2.6.2. Online focus group interviews

To gain further insight into what it meant for participants to participate in TeleGLA:D, we conducted online focus group interviews, guided by the methods of Rosaline Barbour [12]. CS and BC collaborated in moderating the interviews where the patients were invited to elaborate on the following questions: *How did you experience participating in TeleGLA:D? How did your participation in TeleGLA:D affect your daily life?* The participants and the interviewers had an audio-visual connection through the online platform used for the TeleGLA:D program, and the focus groups were moderated to include dynamic dialogues between participants. Hence, they elaborated on experiences while using their own language and concepts [12]. The interviewer ensured participants felt comfortable during interviews and that the tone was respectful [26]. The interviews took place within one week after the program ended and lasted 45–60 min. BC transcribed audio recordings verbatim.

## 2.7. Data analysis

We compiled field notes and the transcribed focus group interviews into one text. The analysis and interpretation involved using what Ricoeur describes as a hermeneutic spiral by following the text and its movements from “sense” to “reference,” that is, from “what the text says to what the text talks about” [16,17]. With constant movements between the whole of the text and its parts, the authors achieved what Ricoeur names a “sophisticated understanding” [14,16]. Such sophisticated understanding provides a new in-depth, nuanced understanding of what it means to participate in the TeleGLA:D program while living with knee OA.

We conducted three analytical interpretation phases: Naive understanding, Structural analysis, and Critical interpretation and discussion [14,16]. (See Fig. 1).

**Naive understanding.** We read and re-read the text to achieve an initial understanding of what it meant to the patients to participate in TeleGLA:D. According to Ricoeur, this phase is essential but constitutes only a preliminary component of the overall interpretation that must be validated by subsequent structural analysis [16].

**Structural analysis.** We structured and explained the text by units of meaning (what is observed/what is said) and units of significance (what is the observation about/what is being talked about). To ensure

coherence, we compared the units of meaning and the units of significance with the naive understanding [16]. Hereby, three themes emerged. An example of the structural analysis is presented in Table 1. We present this part of the analysis in the section on results.

**Critical interpretation and discussion.** Given the themes, the findings were further interpreted and discussed with: motivational theory by Albert Bandura [27], the theory of well-being and identity mobility by Kathleen Galvin and Les Todres [28], and research. This brings the interpretation from the individual to the general level [16], presented in the discussion.

## 3. Results

Out of 24 individuals invited, 20 participants (12 females) accepted study participation and were part of 17 observations. Of the 20 participants accepting study participation, 15 (10 females) participated in five focus group interviews (5 could not attend). This led to a data material of 152-page text with field notes and transcribed interviews. The median age of all study participants was 71 years [range: 48–81 years]. The participants had an overall high attendance to the TeleGLA:D exercise and education program, with 89% attending more than 75% of the 14 prescribed sessions.

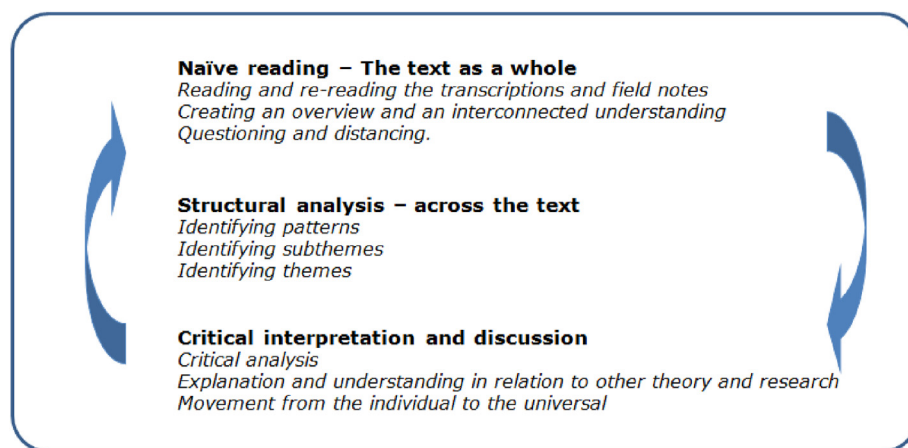
The naive reading indicated that engaging in TeleGLA:D was highly motivating because participants experienced being supported in establishing exercise as part of daily life, leading to a sense of higher overall function and mobility, reduced pain, better management of life with knee OA, and hope for the future. Nevertheless, receiving individual guidance and motivational support was challenging when not being physically together with the PT and peers.

In the following, we describe the three themes that emerged from the structural analysis. Selected quotes from interviews (I) and field notes (FN) are included to show transparency.

### 3.1. Exercise engagement

While participating in the TeleGLA:D program, participants experienced being motivated to integrate weekly exercise in their home surroundings. Both observations and focus-group interviews revealed that regular knee exercise was invigorating because it influenced everyday life physically and mentally. Most participants experienced an overall sense of increased robustness and health due to increased physical ability and improved belief in personal capability. A 72-year male said it this way: *“I feel more wellness all over my body. It is not merely the knee”* (I).

The online form and the inherent necessity of independently structuring home exercises right from the start paved the way for making exercise a natural part of everyday routines. The same male stated:



**Fig. 1.** An illustration of the three interpretation phases We conducted the interpretation in dialectical movements between the three phases using both explanation and understanding. Hereby, we followed a hermeneutic spiral while moving between “sense” and “reference” or in other words, from “what the text says to what the text talks about” [14,16,17].

**Table 1**

An example of the structural analysis.

Units of meaning: “What is said/what is observed”	Units of significance: “What is being talked about/ what is the observation about”	Theme:
<b>Selected quotations:</b> <i>A significant gain for me is that I have now made an exercise set up at home to continue in the future. I am not sure that I would have had the energy to establish all this on my own after the program ended.</i> (I) They described how they took fast-paced walks outside, a ride on the bike cycle, a tour on the stairs in or outside their home, sit-to-stand-exercise, jumps, and yoga to warm up before they logged on to the Tele-GLA:D sessions. (FN) <i>You find something you like and are comfortable with for warm-up</i> (I) <i>Being invited to do warm-up exercises before the program starts is a joy-filled duty.</i> (I) <i>Doing the warm-up preparation is a nice reminder to structure daily exercise into my daily routines.</i> (I) <i>It was crucial to have a professional at your side. Because I used to think that the pain was a warning to watch out, and now I understand that it is rather a hint to be active.</i> (I) <i>I am now much more aware of how to avoid provoking pain. And it is now my luck that they took me off the surgery list.</i> (I) <i>I feel more wellness all over my body. It is not merely the knee.</i> (I) <i>My everyday living has changed because I am now close to the good old habits. I have re-established my walking trips, and I expect them to become as long as they used to be.</i> (I) Another explained: “ <i>My capacity has improved because I could go on the ski-piste with my family, which went very well. I assume that a walk on Moens Klint [a rough Danish terrain with steep stairs and hills] will also be a success for me</i> ” (I)	The participants experienced being motivated to integrate exercise weekly in their own surroundings. Regular knee exercise was invigorating because it positively impacted everyday life. Participants found it easy to receive instructions, and they felt well-guided by the PTs. They experienced an overall sense of increased robustness and health due to increased physical ability and improved belief in personal capability. The online form and the inherent necessity of independently structuring home exercises right from the start paved the way for making exercise a natural part of everyday routines. Another enforcement part of the program was that the participants should do warm-up exercises independently before logging into the sessions. By this, they were invited to do warm-up procedures aligned with their preferences and what was feasible in their home surroundings. Also, reducing pain was crucial to participants because this was associated with feeling freer in everyday life. Enrolling in regular exercise routines improved participants' mobility and added new hope for future capability.	Exercise engagement

The structural analysis followed the Ricoeur-inspired method and reflects the movement of the interpretation. The unit of significance contains the researchers' explanation of what the text speaks about and is presented in the section of results [14,17].

“A significant gain for me is that I have now made an exercise set up at home to continue in the future. I am not sure I would have had the energy to establish all this on my own after the program ended” (I).

Another engaging part of the program was that the participants should do warm-up exercises for 5–10 min independently before logging into the sessions. Accordingly, warm-up procedures aligned with preferences and what was feasible in their home surroundings. Their choices varied from fast-paced walks outside to yoga, etc. They described it as “a joy-filled duty” (I, 76-year-female) and: “a nice reminder to structure daily exercise into my daily routines” (I, 77-year-female).

Also, achieving pain reduction was crucial to participants because this was associated with feeling more free in everyday life, as one disclosed with a big smile: “*My everyday living has changed because I am now close to the good old habits. I have re-established my walking trips, and I expect them to become as long as they used to be*” (I, 76-year-female). Another explained: “*My capacity has improved because I could go on the ski-piste with my family, which went very well. I assume that a walk on Moens Klint [a rough Danish terrain with steep stairs and hills] will also be a success for me*” (I, 48-year-female). These quotes underline how enrolling in regular exercise routines improved participants' function and mobility and added new hope for future capability in their everyday lives.

### 3.2. A good start but only halfway supported

The participants revealed that receiving close instructions from the PTs was a great help. A 57-year female said, “*It was indeed individual exercises. If someone were not able to do one of the exercises, they did not do it*” (I). Participants experienced being well-supported in their particular situation and appreciated how this supported them in addressing unique troubles in their everyday life due to knee OA.

Nonetheless, some pointed out they preferred additional hands-on guidance from the PTs. “*To me, it would have been better to have your hands on my foot to instruct me instead of this one-sided verbal guidance,*” a participant said to the PT (FN, 67-year-male). This statement shows how participants tended to feel insecure about whether they performed exercises correctly.

Besides expressing the need for hands-on advice, some patients seem to miss the possibility of one-to-one interaction or more discrete chats with the PT because they experienced a lack of individual care and advice that fully supported them as human beings and not just someone with knee pain. One said: “*I would have preferred to have the chance to talk alone with the PT. Because my intimate troubles are of no interest to the others.*” (I, 71-year-female) This statement reflects how the absence of a discrete forum to engage with the PT was considered a significant drawback of TeleGLA:D.

Moreover, the observations revealed that participants sometimes struggled to create a focused exercise session at home due to phones ringing or relatives and pets interfering. Also, some wished for access to a longer-lasting treatment program or the chance to follow a new Tele-GLA:D program because they feared they would forget how to manage their knee symptoms. Some had worries about ending up in limbo without follow-up, which a male described by saying, “*I am afraid of being left on my own with my pain.*” (FN, 72-year-male).

### 3.3. Beneficial peer companionship with online constraints

Frequently participants compared TeleGLA:D with the perceived benefits of a standard onsite GLA:D® program. They exchanged views dynamically since some had tried a standard GLA:D® program earlier.

Participants found the group-based form beneficial because being together with peer patients reflected helpful perspectives and thus clarified their respective situations. One said, “*I find it a good thing to be together with others that are also limping. Then I know that I am not the only one in the world with such challenges*” (I, 74-year-female). However, both interviews and observations illustrate that communication was scarce and somehow with a primary focus on the auditive part. Observations of sessions reflect overall limited interactions between participants. In interviews, they explained how they found it confusing to communicate with their peers because their appearance frequently shifted on their screens. One said, “*This is the wrong way of being together*” (I, 50-year-male). Another described experiencing having “*evasive acquaintance*” (I, 68-year-female), and others explained experiencing a lack of closeness. The participants experienced the companionship with peers not as genuine and rewarding as they anticipated it to be if they had been physically together. They also perceived a lack of closeness because they missed having more apparent eye contact and the possibility of informal

chatting. Hence, this concept did not accommodate a need for being close together with peers to make room for sharing experiences from the lived life with knee OA.

Notably, it seemed that peer-to-peer communication became more engaging towards the end of the TeleGLA:D program. This is reflected by one of the final exercise sessions, where the PT facilitated a light and interactive tone by inviting lively dialogue about the participant's social life during the exercise class. There was laughter and persistent chat in-between the participants. Their dialogue showed that they were updated on each other's daily activities because they discussed particular cases from each other's lives in insightful ways. Moreover, they provided each other with advice, for example, how to manage knee pain during the night. While the PT guided one to use a knee bandage, another participant took part in the dialogue with advice to buy a bandage made of wool at the pharmacy (FN).

#### 4. Discussion

This study sheds light on what it means to be a person with knee OA, participating in online exercise and education as first-line OA care. The online form and the necessity of taking charge of structuring parts of the sessions was perceived advantageous in introducing exercises into daily routines. This led to a strong sense of exercise ownership which helped reduce pain and improve not only function but also well-being. However, this study also portrays an online care delivery model that limited participants' interactions with PTs and peers.

##### 4.1. TeleGLA:D introduces exercise ownership

Notably, this study found that by engaging in online exercise, participants were well supported in incorporating exercise as part of weekly routines. Participants were generally required to invest a great deal of ownership into successfully participating in TeleGLA:D; this included arranging their own exercise studio remotely and providing most of the exercise equipment themselves. These routines seemed to permeate into participants' everyday lives. This was reinforced by reduced pain and better knee function that permitted a more active lifestyle and fewer barriers to performing valued activities. Such change in health behavior resonates with the thoughts of the Canadian Professor Bandura [27]. According to Bandura, changing health behavior relies on the belief in one's ability to take on specific behavior and obtain self-efficacy [27]. Along this line, engagement in TeleGLA:D positively shapes participants' self-efficacy because implementing exercise and performing valued activities in everyday life becomes a cornerstone. Like previous studies [8, 29] this confirms that online delivery is perceived as a feasible care model for patients with knee OA. Through enabling an increased sense of ownership, participating in online exercise and education programs like TeleGLA:D may add longevity to exercise routines and increase the potential for lasting health behavior changes among people with knee OA. Future studies should assess the longevity of behavior changes in such online programs, and compare them with on-site models.

##### 4.2. TeleGLA:D facilitates identity mobility

This study highlights that by exercising, the participants gain an overall sense of improved robustness and health with more belief in future personal capability. This corresponds with the thoughts on existential mobility by the British professors Galvin and Tordes [28]. In their lifeworld approach to caring and well-being, they emphasize that being "on the move" during illness trajectories raises a sense of 'I can' which paves the way for growing self-efficacy and well-being [28]. Such 'I can-ness' can range from concrete to existential. In this light, our findings can be seen as examples of "identity mobility" [28] where the improved level of function and emerging hope for a better future includes enhanced self-efficacy and well-being in people with knee OA. Hereby, this study demonstrates how physical motion and existential experiences are intertwined parts of participating in TeleGLA:D. These insights from an

online care model add to prior findings of effectiveness and improvement in pain and function [8] and changed beliefs in the value of exercise through traditional onsite care models [10,30]. This may also indicate that the previously reported benefit of onsite exercise and education on self-management and lifestyle changes [21,22] is retained in this online care delivery model.

##### 4.3. The online form has its' limitations

We identified patients request personal contact with the PTs, in line with findings from other studies [31–33]. In addition, studies indicate that a combination of communication modes is needed to deliver sufficient support [29,30,32]. A positive therapeutic relationship is forged by personal undivided attention delivered coherently to support a gradual increase in self-efficacy [29]. Such an aspect is therefore important to address in the further development of online care delivery models.

Moreover, this study identifies although participants experience being part of a group in the online care delivery model, they consider peer contact superficial. However, observations from the latter part of the program indicate an improved peer interaction with time. This gives reason to believe that PTs can facilitate such peer learning as they become more trained in online care delivery. Accordingly, incorporating peer interactions should be considered in future programs and as part of PTs' formal training in delivering online exercise and education to add this important factor in enhancing participants' self-management. In addition, hybrid solutions that include a combination of online and physical group classes should be considered, as suggested by Barton and colleagues [32].

##### 4.4. Limitations

The strength of this study was the combination of ongoing participant observations and focus group interviews that allowed detailed and rigorous insight into the participants' experiences within the whole span of the TeleGLA:D program [13,14]. Moreover, it permits validation across the entire data material. What was observed could be recognized in statements from focus group interviews and vice versa – this ensured adequate insight [14]. Nevertheless, online observations and focus group interviews come with the inherent risk of technical problems with an internet connection, insufficient sound, and the lack of being in the same room, which may have limited data generation [34].

It is a premise of the Ricoeur-inspired interpretation that the interpretation is expressed in the words of the researchers, and the findings must be read with this premise in mind [14].

Twenty participants with high adherence to the program and fifteen of those giving interviews are considered sufficient within the qualitative scope of this study [35,36]. However, the results must be interpreted in light of a group of people who actively chose the online program over a referral to an onsite exercise therapy class. Therefore, these individuals represent a group of knee OA patients with (for one reason or the other) preferences for the online care delivery model – thus, they are likely biased by their overall positive attitude to this care delivery model as well as a potentially higher degree of digital readiness compared to some of their peers [37]. In addition, this preference for online care may have been different during pandemic-free times, which is why data may not reflect times without societal restrictions and curfews. Nevertheless, this study contributes important insights into end-users' experiences with digital health interventions, which is important for new clinical and policy decisions [38]. Since this study lacks investigation of participants' long-lasting exercise routines, further studies are needed to cover the potential of longevity.

#### 5. Conclusion

This study adds insights into what it means for patients with knee OA to engage in online delivered group-based exercise and education. The

online program facilitates identity mobility by supporting participants towards improved self-efficacy and well-being, thus creating a sustainable base for incorporating weekly exercise into daily life. The perceived limited interactions with the PT and peers suggest that future programs consider facilitating more interactions between the PT and peer participants during online sessions. Future programs may address mixing online classes with onsite attendance in a hybrid format to accommodate care and support needs. Lastly, future programs should consider providing more individualized guidance and a gradual approach towards self-management to aid long-lasting exercise behavior changes.

#### Author contributions

Study conception and design: Simoný, Holm, Clausen, Tang, Skou.

Acquisition of data: Simoný, Clausen, Nyberg, Holm.

Analysis and interpretation of data: Simoný, Clausen, Beck, Holm.

Drafting the article or revising it critically for important intellectual content: Simoný, Clausen, Beck, Nyberg, Tang, Skou, Holm.

Final approval of the article: Simoný, Clausen, Beck, Nyberg, Tang, Skou, Holm.

All authors had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the interpretation of the data.

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#### Disclaimer

All author's views expressed in the submitted article are their own and not the official position of their institutions and founders. Please see the attached International Committee of Medical Journal Editors (ICMJE) disclosures from each author.

#### Declaration of competing interest

Dr. Skou is co-founder of Good Life with Osteoarthritis in Denmark (GLA:D®), a not-for profit initiative hosted at University of Southern Denmark aimed at implementing clinical guidelines for osteoarthritis in clinical practice. Furthermore, he is associate editor of the Journal of Orthopedic & Sports Physical Therapy and has received personal fees from Munksgaard, TrustMe-ED and Nestlé Health Science, all of which are outside the submitted work.

Dr. Clausen is a board member of Danish Interdisciplinary Rheumatology Forum (DIRF). DIRF is a not-for profit national network for health professionals, within the rheumatic field.

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