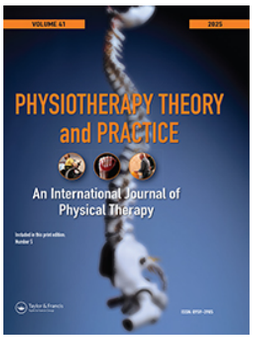

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QUALITATIVE RESEARCH REPORT

"A feeling of being part of the future": a qualitative study on physical therapists' experiences of delivering digital first-line treatment for hip and knee osteoarthritis

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ABSTRACT

Introduction: Digital options for osteoarthritis (OA) treatment are increasingly available with high patient satisfaction and acceptability. Little is, however, known about physical therapists' (PT) perception of this treatment modality.

Objective: To investigate PT's experience of delivering digital treatment for hip and knee OA using a smart-phone application.

Method: Nine PTs (mean age 36 years, women $n = 5$) with 3–24 months experience of delivering digital OA treatment were interviewed using a semi-structured interview guide. The interviews were transcribed verbatim and analyzed using content analysis.

Results: Four main categories arose; 1) A feeling of being part of the future, 2) Making an osteoarthritis diagnosis in a digital setting, 3) Facilitators and barriers of digital OA management and 4) Where to go from here? PTs were in general positive for digital treatment delivery but felt that a lack of visual assessments and physical examinations to enhance exercise evaluations and diagnosis accuracy was sometimes a disadvantage.

Conclusion: Digital treatment delivery was in general perceived as a time-efficient way of providing high-quality care that may increase patient motivation and adherence without violating the therapeutic alliance. Future implementations of digital OA treatment programs should consider the possibility of including real-time video calls for visual assessment.

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Digital treatment; e-health; osteoarthritis; physical therapist

Introduction

According to international guidelines, first-line treatment for hip and knee osteoarthritis (OA) should include education and exercise, along with weight management if necessary (Bannuru et al., 2019; Kolasinski et al., 2020), and generally involves face-to-face visits with a physical therapist at a primary care setting (Skou and Roos, 2017; Thorstensson, Garellick, Rystedt, and Dahlberg, 2015). Such treatment has repeatedly been shown to improve OA symptoms, physical function, and health-related quality of life, reduce the need for OA medication as well as postpone total joint replacements (Juhl et al., 2014; Kroon et al., 2014; Skou and Roos, 2017; Skou et al., 2015; Svege, Nordsletten, Fernandes, and Risberg, 2015).

Given the expected increase in OA prevalence, along with the high prevalence of OA in rural areas (Boring et al., 2017), the healthcare system is facing several challenges related to reach, accessibility and healthcare resources the coming decades (Cross et al., 2014; Salmon et al., 2016). To increase access to OA care, telehealth options or different digital solutions for disease management have been initiated as a cost-effective (Fatoye, Gebrye, Mbada, and Useh, 2023) option to traditional OA treatment (Hinman, Lawford, Nelligan, and Bennell, 2023). Several studies report that telehealth and/or digital treatment improve pain, function, and knee-related quality of life to the same extent as traditional face-to-face treatment in individuals with hip or knee OA (Fan et al., 2023; Hinman et al., 2024; Holm, Roos, Grønne, and Skou, 2023; Jönsson et al., 2022).

In qualitative studies, high acceptability for OA treatment provided via video conferencing or mobile apps have been reported, with availability, flexibility, effectiveness of the program and a feeling of getting noticed as most important factors for the patients'

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positive experiences (Cronström et al., 2019; Ezzat et al., 2022; Hinman, Nelligan, Bennell, and Delany, 2017; Lawford, Delany, Bennell, and Hinman, 2018; Simonÿ et al., 2023). While many patients seem to have a positive attitude toward remote OA treatment, a survey including 217 physical therapists across Australia revealed that the healthcare personnel may be much less convinced when it comes to the benefits of telehealth in OA management. Less experience and confidence in using technical solutions as well as lack of physical contacts with the patient were related to lower interest in using telehealth as a treatment option (Lawford, Bennell, Kasza, and Hinman, 2018).

Few studies do, however, exist on physical therapists' experiences of using digital delivery of OA care. In a qualitative study, Lawford, Delany, Bennell, and Hinman (2019) reported physical therapists to be less skeptical about delivering OA treatment using telephone calls after participation in a trial on telehealth compared to the start of the trial. They perceived that this delivery modality actually promoted self-management compared to traditional care (Lawford, Delany, Bennell, and Hinman, 2019). Hinman, Nelligan, Bennell, and Delany (2017) reported physical therapist to have positive experiences with providing OA treatment via Skype, especially with regard to convenience and exercise adherence but the physical therapists lacked the possibility of physical examinations (Hinman, Nelligan, Bennell, and Delany, 2017). Digital technology in healthcare is rapidly evolving (Patrick et al., 2016) and many remote treatment programs for hip and knee OA are now delivered by smart phone applications (Dahlberg et al., 2020; Gohir et al., 2021; Patten et al., 2022). To meet the demands of an aging population and decreasing health-care resources, this development is most likely inevitable. To optimize digital treatment and enhance the implementation of such programs in OA care, it is important to consider the physical therapists' perspective and experience of this delivery modality. The aim of this qualitative study was, thus, to investigate physical therapists' experience of delivering digital OA treatment using a smart-phone application.

Materials and methods

A qualitative study design using semi-structured interviews was applied. The study adheres to the COnsolidated criteria for REporting Qualitative research (COREQ) guidelines (Tong, Sainsbury, and Craig, 2007).

Setting and sampling

The digital program, delivered by a smartphone application (Dahlberg, Grahn, Dahlberg, and Thorstensson, 2016), is inspired by the Swedish face-to-face management program for OA "Better management of patients with OsteoArthritis" (Thorstensson, Garellick, Rystedt, and Dahlberg, 2015) and is reimbursed by the Swedish National Health Insurance. Patients were referred to the program by either their primary care physical therapist, orthopedic surgeon, insurance company or via online search engines. In the few cases where patients did not have a previous OA diagnosis, the patients had a clinical OA diagnosis confirmed by the physical therapist in the digital program before joining the program. All patients had an initial start-up meeting via telephone with an assigned physical therapist and were then offered three more telephone consultations during a 3-month treatment period. In addition, based on patients' preferences and needs, there was an opportunity to chat asynchronously with the assigned physical therapist for feedback and questions during the entire treatment period. The program includes OA education (instructional videos on OA, physical activity, and weight management) and neuromuscular exercises with increasing difficulty. The exercises were mainly generated by the application, but the physical therapist could adapt the level and structure of the exercises to fit each specific patient's needs and abilities. This particular program has previously been shown to have similar effect on OA-related outcomes (i.e., pain, function, quality of life and willingness to surgery) as traditional care (Jönsson et al., 2022).

All physical therapists registered to work with the program in May 2021 ($n = 250$) were contacted by e-mail with written information about the study and an invitation to participate. One reminder e-mail was sent out after 4 weeks. Nine physical therapists responded and agreed to be interviewed (median age 36 years, women $n = 5$, experience as physical therapist (range) 1–32 years, experience of digital OA treatment delivery (range) 3–24 months). All participants worked part-time with digital treatment alongside other physical therapist employments or retirement. The study was approved by the Swedish Ethical Review Board (Dnr: 2020–06414) and all participants gave their written informed consent.

Data collection

All interviews were conducted via Zoom (hosted by Lund University) by two physical therapy students using a semi-structured interview guide (see Appendix A for interview guide). Prior to

conducting the interviews, the students were trained in interview technique by the last author who has extensive experience of qualitative research methodology. The interviewers had no relationship with the participants. The interview guide consisted of open questions regarding the experience of delivering digital OA treatment related to digital diagnosis, treatment delivery and patient–therapist relationship. Follow-up questions were frequently used for clarification and elaboration of the participants' experiences. The interview guide was pilot tested on six physical therapists not involved in the digital program, which resulted in minor editing. All interviews were audiotaped, lasted between 30 and 60 min, and were then transcribed verbatim. Brief field notes were made during the interviews. No one else was present besides the participant and one of the interviewers.

Data analysis

All interviews were analyzed with conventional content analysis (Graneheim and Lundman, 2004) using an inductive approach, i.e. the result was derived from patterns in the interviews, and no prespecified frameworks or theories were applied (Elo and Kyngäs, 2008). Two authors coded the data (AC, CSH). Data processing consisted of the following steps: 1) Every interview was read several times to understand the essence of the data. 2) Meaning units were formulated in codes representing the essence and meaning of the statements and were extracted from the text. 3) Next, the codes were organized into sub-categories and categories. 4) Both authors had several meetings to edit and validate the data, e.g., removing duplicates and codes that did not correspond to the aim of the study. Both authors then read the original data to make sure that no aspects were missed and that the coding of the data was correct. 5) In order to enhance transparency and trustworthiness, the COREQ checklist has been included (Tong, Sainsbury, and Craig, 2007). Examples of the process of coding are illustrated in Table 1.

Results

The interviews revealed four main categories with associated sub-categories in italics; 1) A feeling of being part of the future with two sub-categories a) Working in a *flexible and accessible environment*, and b) *Feelings of loneliness at times*, 2) Making an osteoarthritis diagnosis in a digital setting, 3) Facilitators and barriers of digital OA management with four sub-categories a) *Daily contact increases patient motivation and adherence*, b) *Weekly registration on performance and digital follow-up enhances compliance*, c) *Patient – physical therapist relationship* and d) *Seeing is believing* and 4) Where to go from here? With two sub-categories, a) *An opportunity to add exercises for multiple conditions* and b) *suggestions for continued exercise and video-calls.*

A feeling of being part of the future

This category includes two sub-categories: a) Working in a flexible and accessible working environment and b) Feelings of loneliness at times.

Working in a flexible and accessible environment

The physical therapists described a flexible working environment where they oversaw their own working schedule but with a clear framework. That they could choose when and where to work was perceived as very positive and often the main reason for working with digital treatment. They also expressed that the digital treatment delivery enabled a more time-efficient way to work with shorter

Table 1. Examples of the process of coding using content analysis.

Meaning unit (citation)	Condensed meaning unit	Code	Subcategory	Category
"I have a lot of freedom and flexibility in my work, how I work. At the same time, it´s very clear what´s expected of me . . . // . . . It feels kind of modern, it's fresh, and it feels like you´re a part of the future." (6F)	Having a sense of freedom and flexibility, yet aware of what´s expected, feels modern and like being a part of the future	Freedom and flexibility in my work	Working in a flexible and accessible environment	A feeling of being part of the future
"I think it's easier to motivate them [digitally]. *You know what they do and what they don't do which isn´t the case when you see them every three weeks, then you ´ve no idea what they´ve done in between . . . // . . . you can send cheering in the app, like good work, I can see that you´ve performed most exercises or I can see that you´ve missed out a few days here, how come?"* (2B)	It´s easier to motivate patients as you can monitor everything they do and what they don´t do.	Motivating patients	Daily contact increases patient motivation and adherence	Facilitators and barriers of digital OA management

waiting lists and that they could reach more patients in need of OA management compared to traditional primary health care. The digital treatment concept was further perceived as modern and innovative, and feelings of being part of the future in OA care were expressed.

> *A great advantage is that I control my own working time. When I work and where in the world I´m located doesn't matter.* (3C, male, experience of working as a PT: 33 years, experience with digital treatment: 2 years)

> *I have a lot of freedom and flexibility in my work, how I work. At the same time, it´s very clear what´s expected of me . . . // . . . It feels kind of modern, it's fresh, and it feels like you´re a part of the future.* (6F, male, experience of working as a PT: 10 years, experience with digital treatment: 1.5 years)

> *More patients are reached, at more locations, such as in the countryside where you need to go far to come to your primary care clinic. This is really an advantage I think . . . // . . . Most start-up calls I also make within a few days which I would say is quite rare in traditional primary health care.* (9I, female, experience of working as a PT: 3 years, experience with digital treatment: 3 months)

Feelings of loneliness at times

Although there was a possibility to chat digitally with other physical therapists, a few physical therapists expressed that they missed the social interaction and the collegial affinity that are often associated with a clinical employment and that they sometimes felt lonely and isolated within their working environment.

> *I really miss to have that consistent social interaction with other physical therapists, you don't have that here . . . // . . . It's actually kind of lonely, yes, it is.* (1A, male, experience of working as a PT: 1 year, experience with digital treatment: 9 months)

Making an osteoarthritis diagnosis in a digital setting

Most physical therapists expressed that they felt confident in making an OA diagnosis in a digital setting, especially since OA is associated with very specific symptoms that are possible to determine by a thorough anamnesis. They described that they by working with a digital concept had improved their skills in asking adequate questions. Also, that working with only one diagnosis allowed them to be specialized and experts on this specific condition which further increased their confidence in determining the correct diagnosis.

> *For osteoarthritis specifically, the risk of getting it wrong is quite small . . . // . . . I'm very secure in my role as physical therapist and I'm feeling confident in identifying any red flags, and when it comes to such a specific diagnosis as osteoarthritis, I'm feeling quite sure.* (8 H, female, experience of working as a PT: 16 years, experience with digital treatment: 2 years)

On the other hand, all physical therapists expressed that a clinical examination would be beneficial for establishing a correct diagnosis in certain situations. If the patient did not present with typical OA symptoms, they wished to be able to perform a clinical examination to exclude other conditions, such as back-related problems, which is not possible over the phone or via an app. Some also expressed concerns that many patients know what to say to get the treatment they want. In those cases, it was not possible to verify the anamnesis with a clinical examination which potentially may lead to that the patients end up with a wrong diagnosis.

> *That you can't do a clinical examination, especially if the symptoms are kind of different* [atypical OA symptoms], *is a disadvantage . . . // . . . if they have several or different symptoms, it would have felt good to be able to examine . . . to be able to clarify.* (7 G, female, experience of working as a PT: 2 years, experience with digital treatment: 1 year)

> *A combined assessment is always the best. An anamnesis together with a clinical examination, then you will have better accuracy in your assessments and a greater possibility of setting the correct diagnosis . . . // . . . It can be hard, quite often you meet people that definitely don´t have osteoarthritis. The patients are also often quite up to date and know what to say to be included in the treatment and I can´t, by means of a physical examination, tell them that they shouldn't.* (5E, male, experience of working as a PT: 1 year, experience with digital treatment: 8 months)

Facilitators and barriers of digital OA management

This category has four sub-categories a) Daily contact increases patient motivation and adherence, b) Weekly registration of performance and digital follow-up enhances compliance, c) Patient – physical therapist relationship and d) Seeing is believing.

Daily contact increases patient motivation and adherence

Most physical therapists felt that the possibility of having daily interactions with the patient was the main key to increased patient motivation and adherence and an advantage compared to treatment in ordinary primary health care. They perceived that giving immediate

feedback on patients' questions and comments and the daily support given by the physical therapists led to that the patients performed the suggested exercises to a much greater extent. The physical therapists also described that when having daily contact, the patients seemed to experience a greater sense of affirmation and being listened to compared to treatment in ordinary primary health care where you do not meet or communicate with the patient that often.

> *I think it's easier to motivate them* [digitally]. *You know what they do and what they don't do which isn´t the case when you see them every three weeks, then you´ve no idea what they´ve done in between . . . // . . . you can send cheering in the app, like good work, I can see that you´ve performed most exercises or I can see that you´ve missed out a few days here, how come?* (2B, female, experience of working as a PT: 7 years, experience with digital treatment: 1 years)

> *This daily contact is fantastic. The patients get support and acknowledgement in a whole other way and, thus, they perform what they´re supposed to do* [exercises] *to a much greater extent and then you get a result.* (4D, female, experience of working as a PT: 11 years, experience with digital treatment: 1 year)

> *I´ve tried for many, many years, in different ways, to get the patients to perform the exercises between physical visits in the clinic, but they don't do them. Because it's hard to take that time when you don't get specific support.* (8 H, female, experience of working as a PT: 16 years, experience with digital treatment: 2 years)

Weekly registration on performance and digital follow-up enhances compliance

The patients' weekly registration of exercise performance, pain level and functional ability in the application were expressed to facilitate follow-up. Digital follow-ups were also expressed as a pre-requisite for reaching and following patients that for some reason were not able to attend physical visits, which was further perceived as an advantage compared to usual care.

> *I can see their pain levels and performance on functional tests, it's really easy, and it's also easy to see how much exercise they have done each day, in this protocol. And it's easy to see their exercise level, it's only a click away.* (9I, female, experience of working as a PT: 3 years, experience with digital treatment: 3 months)

> *I have patients that travel. For example, I have patients that have a job where they´re away all the time, which usually results in that it's not possible to have follow-ups. But with digital treatment this is very efficient, and it works really well.* (1A, male, experience of working as a PT: year, experience with digital treatment: 9 months)

Patient – physical therapist relationship

Several physical therapists perceived that they were getting close to the patient and that their relationship was more personal with digital treatment compared to face-to-face visits in primary health care. This was believed to be a result of patients being more relaxed and safer in their own home compared to a clinical environment.

> *You´re getting closer to the patient in a way, you could maybe compare it with home care, where you´re entering the patients' homes. When the patients come to the clinic it's a much more sterile environment and it's not particularly personal. But when you talk to someone digitally and you hear their dog or their partner or children in the background, it's getting very personal.* (1A, male, experience of working as a PT: 1 year, experience with digital treatment: 9 months)

A few physical therapists experienced, however, that the digital treatment was less personal and that it was harder to establish a relationship with the patient without any physical meeting.

> *It´s downright boring because you don't meet the patient. It's more like that you have so many patients at the same time, and you don't get any personal connection to them, it's only a bunch of numbers and patient-ID's and pain and function digits here and there, without knowing who´s in front of you.* (5E, male, experience of working as a PT: 1 year, experience with digital treatment: 8 months)

Seeing is believing

That the physical therapist and patient were not able to see each other was described as a disadvantage. Language barriers, having hearing problem or not being technically savvy were specifically pointed out as circumstances that may lead to misunderstandings that could not be solved as observing or using body language was not feasible.

> *If the patient isn´t used to technical solutions, or it could be that they can't hear you that well when on the phone. Then you can't compensate with eye contact, you can't show them with your hands and it's very much up to your voice or ability to write in the chat.* (6F, male, experience of working as a PT: 10 years, experience with digital treatment: 1.5 years)

Not being able to see how patients move or perform the exercises was further described to potentially hamper treatment and the treatment evaluation. They lacked the possibility to physically show the patient how to adequately perform an exercise and correct the movement pattern if necessary.

> *It's always coming back to that you don't see the patient. The patients that write in every other exercise that -this exercise doesn't work and this one isn´t possible to perform, you want to see these patients move. It may be a strategy*

they have or fear of movement, which I would need to do something about or motivate them, you´ll manage this or try doing like this instead. Now I must guess what people in general are doing wrong in that specific exercise. (5E, male, experience of working as a PT: 1 year, experience with digital treatment: 8 months)

Where do we go from here?

This category has four sub-categories a) An opportunity to add exercises for multiple conditions and b) Suggestions for continued exercise and video calls.

An opportunity to add exercises for multiple conditions

That it was not possible for physical therapists to add exercise for OA or other conditions was described as a limitation to disease-specific digital treatment delivery. Since most patients with OA have multiple diagnoses, the physical therapists perceived that it was hard to work with a holistic approach and it was sometimes described as under-stimulating to work with an automatized distribution of exercises.

There should be a catalogue with exercises that you could add . . . if there were a few standard exercises for the neck for example or for another part of the body for which there´s not a full program. Because there are so many that, of course, have more problems than the osteoarthritis. It's so very, very strict when it isn´t possible to add anything else. (9I, female, experience of working as a PT: 3 years, experience with digital treatment: 3 months)

You´re talking about the importance of adapting the level and treatment to the person in front of you, but with digital treatment you´re only playing with numbers and delivering exercises that are the same for all. It´s very under stimulating, as a physical therapist, to work like that. (5E, male, experience of working as a PT: 1 year, experience with digital treatment: 8 months)

Suggestions for continued exercise and video calls

Several physical therapists expressed a concern about the abrupt ending of the treatment. They wished that they at least were able to provide the patients with a document with exercises at the end of the program to facilitate continued exercise. To be able to have video calls and thereby a possibility to demonstrate the exercises and see patient performance was another suggestion for improvement of the digital treatment program.

Well, there are many people who wants to continue to do exercise when the treatment period is finished. It´s frustrating to end the treatment as it´s a chronic disease, and it feels relevant to be able to offer a continuation of treatment for those who are afraid of losing their routine if they can´t be in the program. (8 H, female, experience of working as a PT: 16 years, experience with digital treatment: 2 years)

In some cases, it would be good to have video calls so that we would be able to demonstrate the exercise to the patient. (6F, male, experience of working as a PT: 10 years, experience with digital treatment: 1.5 years)

Discussion

In this study, we explored physical therapists' perspective of delivering digital first-line OA treatment via a mobile application. In general, physical therapists had a positive experience with this treatment modality, which they believed was flexible and time efficient, enhanced patient motivation and adherence as well as facilitated follow-ups. They lacked, however, the possibility of visual assessments and hands-on physical examinations when deemed required.

Individuals with hip or knee OA are reported to perceive digital treatment or telehealth as a convenient, flexible, and highly accessible alternative to traditional care (Cronström et al., 2019; Hinman, Nelligan, Bennell, and Delany, 2017; Lawford, Delany, Bennell, and Hinman, 2018). In addition to being convenient for the patients, the physical therapists in this study expressed that, although sometimes lonely, working with digital treatment was innovative and flexible (they could choose when and where to work) and that it may facilitate follow-up, especially in patients that were not yet retired or were often traveling as a part of their work. Being very time-efficient, they also felt digital treatment to be a way to reduce their long waiting lists of patients, without tampering with the quality of care provided. The expected increase in OA incidence in the coming years will put high demands on health-care providers (Cross et al., 2014) with a possible increased risk of burnout associated with higher work load and tighter working schedules among physical therapists (Elinich, Wynarczuk, and E, 2023). Digital treatment may meet this demand by providing high-quality treatment to more patients in less time, and at the same time, give the physical therapists a possibility to have more control over their own workload and working schedule. Future research is, however, needed to evaluate if working with digital treatment is associated with less workload and associated burnout symptoms in health-care personnel.

Support and encouragement from care providers is reported to have a positive effect on the generally low adherence (Pisters et al., 2010) to treatment programs in these patients (Dobson et al., 2016), one of the major challenges in first-line OA treatment. In this study, the

application-based contact with the patient, where the physical therapists could provide daily feedback and support, as well as the weakly registrations of performance and symptoms were perceived to increase patient motivation and adherence to the program compared to traditional care where contact with the patient is much less frequent. This is in line with a previous qualitative study investigating patients' experiences of participating in the same digital treatment program (Cronström et al., 2019). In that study, patients with hip or knee OA reported the daily support from the physical therapist to be the main reason for continuing the exercises (Cronström et al., 2019). Digital treatment with an option to have daily contact with the physical therapist, which is not feasible in everyday clinical practice may, thus, be one way to overcome this barrier in first-line OA treatment.

Previous research has demonstrated that it is possible to develop a strong patient–therapist relationship without face-to-face meetings (Knaevelsrud and Maercker, 2007; Lingely-Pottie and McGrath, 2006; Muller, Kirby, and Yardley, 2015). Yet, many physical therapists have a belief that remote delivery of OA care may hamper the therapeutic alliance (Lawford, Bennell, Kasza, and Hinman, 2018; Lawford, Delany, Bennell, and Hinman, 2019). However, after being trained in OA treatment using telehealth, the physical therapists in two studies reported to have developed a strong relationship with the patients when delivering OA care via telephone calls (Lawford, Delany, Bennell, and Hinman, 2019) or video-conference meetings (Hinman, Nelligan, Bennell, and Delany, 2017) and they even perceived the communication and relationships to be more personal using telehealth compared to traditional face-to-face consultations (Hinman, Nelligan, Bennell, and Delany, 2017; Lawford, Delany, Bennell, and Hinman, 2019). In line with the results from these studies, most physical therapists in the current study experienced that the patient–therapist relation was closer and more personal when delivering treatment via the mobile application. They believed that the reason for this may be attributed to the fact that the patient's home constitutes a safer and less sterile environment compared to the clinic which may facilitate more relaxed conversations. This was also illustrated in the study by Hinman, Nelligan, Bennell, and Delany (2017) where the patients felt that being observed in their own home created a sense of more focused, personal, and individualized care (Hinman, Nelligan, Bennell, and Delany, 2017). The result from the current and previous studies therefore suggest that digital delivery of OA treatment does not have a negative impact on the therapeutic alliance and that digital delivery may even lead to a greater sense of affirmation among patients with hip or knee OA compared to traditional care.

The physical therapists in this study expressed high confidence in making the OA diagnosis without any physical meeting. They perceived that by using a digital tool, they had improved their communication skills and their ability to ask the right questions which facilitated the overall assessment. Previous studies on telehealth also found that the increased focus on verbal communication may lead patients more toward self-management of the disease and increased ownership of the treatment with less focus and expectations on physical hands-on interventions (Hinman, Nelligan, Bennell, and Delany, 2017; Lawford, Delany, Bennell, and Hinman, 2019; Simonÿ et al., 2023).

Hip and knee OA are primarily clinical diagnoses based on patient demographics and symptoms without any need for radiography (Abhishek and Doherty, 2013). Nevertheless, all physical therapists lacked the possibility of a first hands-on clinical examination when the patients' symptoms were less clear. They then wished to be able to verify and increase the accuracy of the diagnosis, and similar to patients participating in digital OA treatment (Cronström et al., 2019), they were worried that they would miss other serious conditions without a physical examination. This opinion was also evident in the study by Hinman, Nelligan, Bennell, and Delany (2017) where the physical therapists felt that telehealth should preferably be a complement to an initial hands-on clinical examination in which the correct diagnosis is established (Hinman, Nelligan, Bennell, and Delany, 2017). A recent systematic review of the validity and reliability of diagnosing people with musculoskeletal disorders using digital tools compared to traditional face-to-face examinations found, however, moderate to perfect validity (exact + similar agreement) and reliability and perfect agreement with regard to the treatment decision between the two modalities (Bernhardsson et al., 2023). These findings indicate that an initial clinical examination may not add any beneficial information for increasing the accuracy of the diagnosis and subsequent decision on treatment.

Another limitation of the digital program described by the physical therapists was the absence of visual observations. This was related both to potential communicational problems which could not be solved by using body language and to the fact that it was not possible to see how the patient moved. Not seeing how the patient performed the exercises made it almost impossible to give feedback and possible suggestions for corrections of the movement pattern and was expressed as being close to guessing. Similar to

a previous study where physical therapists were reported to prefer video-based over telephone-based delivery of OA care (Lawford, Bennell, Kasza, and Hinman, 2018), the physical therapists in this study suggested an option to include video calls to be able to demonstrate as well as follow-up on the patients' execution and progression of the exercises. This opinion was also reported among physical therapists who used telephone calls to deliver OA care, where a possibility to see the patient's technique and performance of the exercises was desired (Lawford, Delany, Bennell, and Hinman, 2019). This concern seems further to be shared with the patients, who expressed a worry that they may execute the exercises incorrectly when given by telephone or other digital solutions without supervision of a physical therapist (Cronström et al., 2019; Lawford, Delany, Bennell, and Hinman, 2018; Simonÿ et al., 2023). Thus, incorporation of video-calls may be a feasible add-on that may increase both patient and physical therapists' satisfaction of such programs.

OA is a chronic condition with no cure, and the main goal of first-line treatment is therefore to support the patient in managing their disease to be able to maintain an active lifestyle despite their symptoms. The physical therapists in this study as well as patients with OA in other studies (Cronström et al., 2019; Simonÿ et al., 2023) perceived the ending of the digital programs to be very abrupt for a chronic disease and requested the possibility of either prolonged participation or to have a pamphlet or similar with exercises after finishing the program. Without these options, both patients and physical therapists were worried that they would stop doing the exercises and thereby get worse in their disease again. Since comorbidities, including other musculoskeletal diseases, are very common in patients with OA (Swain et al., 2020), the physical therapist also wanted to be able to add exercises for other conditions. They described that working with pre-determined exercises only targeting OA could be somewhat understimulating and prevented a holistic view of the patients' health problems. To ensure that the patients are performing the exercises with correct technique, increase the likelihood of continued exercise after program completion, and to facilitate a more holistic approach to the treatment, future programs of remote/digital OA treatment should consider incorporating the possibility of visual assessments, have pamphlets or similar for post program exercises and include an option to add exercises for multiple conditions.

This study has limitations. Of the 250 invited physical therapists registered to work with the program, only nine agreed to participate in this study. The participants did, however, represent both sexes, had a wide range in age (25–63 years), experience as a physical therapist (1–32 years) and time working with the digital program (3–24 months) from different parts across Sweden, and may, thus, be a representative sample of physical therapists working with the program. In addition, we did not get any new information from the two last interviews, indicating saturation of data and limited effect on the results if more physical therapists had agreed to participate. This is in line with a systematic review indicating that 7–12 interviews are often sufficient to achieve saturation in qualitative studies (Guest, Namey, Chen, and Soundy, 2020). Although both positive and negative experiences were reported, the possibility that physical therapist that had a more positive attitude toward digital treatment may have been more prone to participate in the study needs to be considered when interpreting the results. All physical therapists were involved in one particular digital OA program, and their experiences may not apply to other remote treatment options for hip and knee OA.

During the analyses and coding of the data, the authors worked individually. However, in order to maintain reflexivity, the authors had frequent discussions during the analysis to keep us aware of our preunderstanding. To add transparency and trustworthiness to our findings, we have thoroughly described all steps of the data collection, the analysis and the participants' identity number were added after each quotation (Malterud, 2001). The physical therapists´ experiences of working with different patients all over the country gave us rich and varied data. In addition, both positive and challenging situations during treatment were described, which gave us a deeper understanding of what it meant to work in a digital setting, which further increased trustworthiness.

Conclusion

Delivering treatment for hip and knee OA via a mobile application was perceived by the physical therapist as a time-efficient way of delivering high-quality care that may increase patient motivation and adherence without violating the therapeutic alliance. Future implementations of digital OA treatment programs should consider the possibility of including real-time video calls to enhance communication and supervision of exercises. In addition, an option of adding exercises aiming at other musculoskeletal conditions would be beneficial, to facilitate a more holistic approach given the common presence of multicomorbidity in patients with OA.

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Data availability statement

The participants in this study did not provide consent for public data sharing. The current approval by the Swedish Ethical Review Board (Dnr: 2020–06414) does not include data sharing. A minimal data set could be shared by request from a qualified academic investigator for the sole purpose of replicating the present study, provided the data transfer is in agreement with EU legislation on the general data protection regulation and approval by the Swedish Ethical Review Authority.

Data deposition

Not applicable

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