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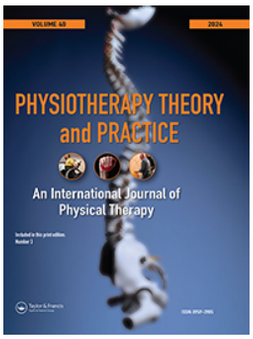

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QUALITATIVE RESEARCH REPORT

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eHealth interventions to support self-management: Perceptions and experiences of people with musculoskeletal disorders and physiotherapists - 'eHealth: It's TIME': A qualitative study

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ABSTRACT

Background: There is increasing interest in the potential role of eHealth interventions to support self-management in people with musculoskeletal disorders (MSDs). The COVID-19 pandemic appears to have been a significant catalyst for the implementation of eHealth modalities into routine practice, providing a unique opportunity for real-world evaluation of this underutilized method of delivering physiotherapy

Objective: To explore the perceptions of eHealth-mediated supported self-management from the perspective of people with MSDs and physiotherapists who work in this clinical area.

Methods: A qualitative interpretive descriptive approach was used. Semi-structured telephone interviews with 13 musculoskeletal physiotherapists and 13 people with musculoskeletal disorders were undertaken. Transcripts were analyzed using reflexive thematic analysis.

Results: Three main themes were identified: 1) Flexibility within a blended care model; 2) eHealth as a facilitator of self-management support; and 3) Technology: Getting it right. Participants expressed concerns about assessment and diagnosis, establishing a therapeutic relationship and felt eHealth should be reserved for follow-up purposes. There was a consistent view expressed that eHealth could facilitate aspects of self-management support. A lack of resources and suboptimal user experience remains a challenge.

Conclusions: eHealth-mediated self-management support interventions were broadly acceptably, predominately as a follow-up option.

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eHealth; self-management; qualitative research; musculoskeletal pain; intervention development

Introduction

Musculoskeletal disorders (MSDs) such as knee osteoarthritis and back pain are some of the leading causes of years lived with disability worldwide (Hay et al., 2017). MSDs pose a considerable burden for individuals and society as they are associated with pain, disability, time lost from work and reduced quality of life (Woolf, Erwin, and March, 2012). Physiotherapy is viewed as a fundamental element in the management of MSDs, reducing pain and optimizing function (Chartered Society of Physiotherapy, 2013). However, access to publicly funded physiotherapy services is limited in many countries such as Canada, the UK and Australia, with extensive waiting lists reported (Deslauriers et al., 2021). Access to physiotherapy has been further exacerbated by the COVID-19 pandemic (van Ginneken et al., 2022).

Self-management is a treatment approach that encourages the individual to take a more proactive role in the management of their condition (Pearce et al., 2016) and is widely recognized and recommended for MSDs (Chartered Society of Physiotherapy, 2013; National Institute for Health and Care Excellence, 2016). Self-management is not the sole responsibility of the individual living with the MSD, it requires a collaborative approach in which the healthcare professional delivers ongoing support (Pearce et al., 2016). Self-management support comprises 14 components (Pearce et al., 2016) and given limited healthcare resource availability, there is increasing interest in the potential role of eHealth to facilitate this process (Slater et al., 2016) with several potentially deliverable via eHealth (e.g. information provision and patient education, psychological support and eHealth-facilitated clinical review). eHealth is a term with contested definitions

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(Shaw et al., 2017). For this study an eHealth modality is defined as any specific digital technology that is applied in the context of healthcare (e.g. internet-based interventions, mobile phone applications) (Showell and Nohr, 2012).

A systematic review examining research from before the COVID-19 pandemic provides insight into the acceptability, challenges, and enablers to the uptake of eHealth for delivering self-management from the perspective of those with chronic MSDs (Fernandes et al., 2022). Key facilitators included patient empowerment and convenience, while key barriers were described as difficulties in establishing a patient-therapist relationship, technological barriers and limited digital literacy (Fernandes et al., 2022). The COVID-19 pandemic, described as a "black swan" moment (Blumenstyk, 2020), appears to have been a significant catalyst for the implementation of eHealth modalities into routine practice (Wind, Rijkeboer, Andersson, and Riper, 2020) providing a unique opportunity for real-world evaluation of this hitherto underutilized method of delivering physiotherapy. Hence, an up-to-date exploration of people with MSDs and physiotherapy perspectives on eHealth is warranted to guide future implementation, improving uptake and sustainability beyond the pandemic.

While there has been research published on patients' (Barton et al., 2022) and physiotherapists' (Bennell et al., 2021; Malliaras et al., 2021) experience of eHealth since the COVID-19 pandemic, it mainly focuses on telehealth-facilitated clinical review, one component of self-management support. The attitudes and experiences of people with MSDs and physiotherapists working in musculoskeletal (MSK) practice toward a more comprehensive understanding of eHealth-mediated self-management support are largely unknown. Furthermore, these studies (Barton et al., 2022; Bennell et al., 2021; Malliaras et al., 2021) appeared to take place in the context of initial COVID-19 lockdowns, among a population who had to use telehealth to access physiotherapy, which may have potentially biased findings. Some pre-COVID-19 research suggests that people with MSDs felt eHealth options were best suited as a supplement rather than a replacement for face-to-face care (Pearson et al., 2016).

A lack of user involvement in the development process of an eHealth intervention has been repeatedly criticized within the literature (Kelly et al., 2022; Kress et al., 2015) and is thought to contribute to low intervention adherence and high attrition rates, which are key challenges for eHealth interventions (Buhrman, Gordh, and Andersson, 2016). This study is part of a larger project, 'eHealth: It's TIME', which aims to develop and test the feasibility of an eHealth-mediated self-management support intervention for those with MSDs. Therefore, the aim of this study was to explore the perceptions of people with MSDs and physiotherapists toward eHealth-mediated supported self-management. Identifying and exploring end-users' needs, experiences and preferences are early steps in a user-centered development process (Dabbs et al., 2009).

Methods

Study design

An interpretive descriptive design was utilized for this study, which draws on experiences and evidence from clinical practice leading to findings with clear clinical implications, rather than research that aims to theorize (Thorne, 2016). The philosophical underpinnings of the interpretive descriptive approach are constituted by constructivist epistemological assumptions, meaning that knowledge is not absolute, but is socially constructed through the subjective person who experiences it (Thorne, 2016). This is in keeping with the study's aims; to understand each participant's own subjective reality about self-management support and their views and beliefs about eHealth. The Standards for Reporting Qualitative Research were followed (O'Brien et al., 2014). This study took place within both the public and private physiotherapy settings as an almost 50:50 two-tier 'public-private' model of MSK physiotherapy services exists in the Republic of Ireland (Casserley-Feeney, Bury, Daly, and Hurley, 2008).

Participants and study procedure

Ethical approval was obtained from the Clinical Research Ethics Committee of the Cork Teaching Hospitals. Participants gave either electronic or written informed consent before data collection began with consent re-confirmed at the outset of each interview.

Purposive sampling was utilized to recruit both individuals with a MSD based on eHealth experience, symptom duration and rural/urban residence and MSK physiotherapists based on clinical experience and setting. Participants were recruited via physiotherapy departments, the Irish Society of Chartered Physiotherapists and social media. Individuals with a MSD were eligible to participate if they had a MSD and were receiving/had received physiotherapy since the COVID-19 pandemic began in the Republic of Ireland (first case: 29/2/20) were

Table 1. Participant demographics – MSK physiotherapists (n = 13).

Gender (male/female)	7 male/6 female
Age range (mean)	26–42 (35)
Years qualified range (mean)	4–19 (12)
Work grade	Senior (n = 7)
	Clinical Specialist (n = 4)
	Private practitioner (n = 2)
Workplace setting*	Public hospital (n = 10)
	Private practice (n = 3)
	Primary care (n = 1)
Geographical location	Urban (n = 11)
	Rural (n = 2)
Experience of using eHealth	Pre COVID-19 (n = 7)
	Since COVID-19 (n = 6)

*Multiple answers possible; MSK; musculoskeletal

English speaking, 18 years or older, and able to provide informed consent. Participants with pain of specific pathological origin (e.g. infection and malignancy) and those that were pregnant or had surgery within the past six months were excluded. Physiotherapists were eligible to participate if they worked predominantly in MSK (at least 50% of their time) in either the public or private setting. Interested participants were asked to contact the researcher. Sufficient sampling was deemed to have occurred when the major themes showed depth and variation in terms of their development, determined through iterative analysis during the data collection (Braun and Clarke, 2021). Thirteen MSK physiotherapists (7 male and 6 female) (Table 1) and thirteen people with MSDs (4 male and 9 female) participated in the study (Table 2).

Data collection and processing

Semi-structured telephone interviews were conducted between March and November 2021 and audio recorded. Field notes were also taken. Semi-structured interview topic guides, informed by a literature review and the study aims, were developed (Appendix A and B). Interviews lasted between 10 and 50 minutes (average = 27 min). All interviews were transcribed verbatim. Transcripts were imported into NVivo.

Data analysis

The data was analyzed using reflexive thematic analysis (Braun and Clarke, 2021). Reflexive thematic analysis is about 'the researcher's subjectivity as analytic resource and their reflexive engagement with theory, data and

Table 2. Participant demographics – people with MSD (n = 13.

Gender (Male/female)	4 male/9 female
Age range (mean)	24–77 (58)
Location of physio*	Private practice (n = 8)
	Public hospital (n = 4)
	Private hospital (n = 3)
	Primary care (n = 1)
Geographical location	Urban (n = 6)
	Rural (n = 7)
Higher degree/professional qualification	Yes (n = 11)
	No (n = 2)
Employment status	Retired (n = 5)
	Full time employment (n = 5)
	Unable to work due to sickness/disability (n = 2)
	Student (n = 1)
Site of musculoskeletal problem	Lower limb (n = 5)
	Multiple (n = 3)
	Other (n = 3)
	Upper limb (n = 2)
Duration of symptoms	< 1 month (n = 2)
	1–3 months (n = 3)
	4–6 months (n = 1)
	1–2 years (n = 1)
	3–4 years (n = 4)
	> 4 years (n = 2)
Experience of eHealth within Physiotherapy	Yes (n = 8)
	No (n = 5)

*Multiple answers possible; MSD; musculoskeletal disorder

interpretation', rather than measures of inter-coder agreement (Braun and Clarke, 2021). As a result the analysis was primarily conducted by the lead researcher (MK). The data was analyzed inductively, thus developing themes from the data rather than using a preconceived list of themes (Willig and Rogers, 2017). Both semantic and latent coding was used in the analysis. As a result, information could be double-coded in accordance with the semantic meaning communicated by the participant and the latent meaning interpreted by the researcher (Patton, 1990). Reflexive thematic analysis (Braun and Clarke, 2021) involves six steps. In step one, MK achieved data familiarization through repeated listening of the interviews and reading and re-reading each interview transcript several times. In step two, initial codes were generated by MK using open coding which resulted in a wide array of potential interpretations of the data. In step three, MK revised codes where necessary and collated them under initial themes. Codes and initial themes were compared between interviews from the person with a MSD perspective and the physiotherapist perspective, to understand concepts and initial themes from different viewpoints, thus triangulating the data. Data triangulation was cross-checked by JMcV. In step four, initial themes were reviewed and refined within and across groups (i.e. people with MSDs and physiotherapists). Step five involved further refining, defining, and naming themes. All members of the research team discussed and agreed on the final themes (Braun and Clarke, 2006). Step six involved writing up a coherent 'story' about the data.

Research team, reflexivity, and trustworthiness

Reflexivity is essential to promote trustworthy and quality results (Braun and Clarke, 2006; Korstjens and Moser, 2018). Strategies utilized to enhance the rigor and trustworthiness of the research are outlined in Table 3 (Lincoln and Guba, 1986). The first author (MK) is a part-time PhD candidate, experienced in MSK clinical practice, and now works in an academic role. The semi-structured telephone interviews were conducted by MK who had undertaken training in qualitative interview techniques. The other members of the research team included three academic physiotherapists (JMcV, BF, and DM) and one academic General Practitioner (CB); all of whom have qualitative research experience. MK completed reflexivity memos throughout the analysis process to engage with and identify possible subjective bias brought to the analysis (Korstjens and Moser, 2018). For example, MK was the project lead on a telephone-based physiotherapy service (Kelly, Higgins, Murphy, and McCreesh, 2021) and was aware of her personal preference for eHealth when interpreting the data. To further enhance the trustworthiness of the work, the analytical process and initial codes and themes developed by MK were checked by JMcV.

Results

Three themes were identified: 1) Flexibility within a blended care model; 2) eHealth as a facilitator of self-management support; and 3) Technology: Getting it right. The themes and subthemes are outlined in Table 4. Each theme is discussed and illustrated with quotes [PT = physiotherapist, PMSD = patient].

Flexibility within a blended care model

A blended care approach was broadly acceptable to most participants as "*it can't ever be all technology*" (PMSD-K). eHealth-mediated self-management support interventions

Table 3. Strategies for enhancing trustworthiness (Lincoln and Guba, 1986).

Criteria	Strategy	Details
Credibility	Prolonged engagement	Lead researcher (MK) conducted all interviews MK repeatedly listened, read, and re-read each interview transcript several times
	Triangulation	Both people with MSDs and physiotherapists were interviewed, allowing for perspectives from two different groups (i.e., the intended end-users of the intervention to be developed) MK analyzed the data, while another researcher (JMcV) reviewed the data analysis process and results to confirm credibility
	"show rather than tell' (Tracy, 2010)	The research team aimed to 'show rather than tell" (Tracy, 2010) by including participants' voices as much as possible.
Transferability	Thick description	The use of detailed demographic and context descriptions will enable readers to decide if results are applicable within their settings
Dependability and confirmability	Audit trail	A detailed description of the data collection and analysis process Confirmability was achieved through the discussion of the analysis process by MK and JMcV once initial codes and themes were named. Final themes were discussed and agreed upon by all members of the research team
Reflexivity	Diary	Reflexivity memos were completed by MK during the analysis process A reflexivity paragraph is included in the methods section of this paper, discussing possible biases as researchers

MSD; musculoskeletal disorder

Table 4. Themes and subthemes.

Flexibility within a blended care model	eHealth as a facilitator of self-management support	Technology: Getting it right
Therapeutic relationship		Infrastructure and resources
Expectations		User experience

had "*a place*" (PT-12) and should be incorporated "*into our normal practice*" (PT-7), although this role was mainly viewed as follow-up as "*everyone would need a physical assessment at the very start*" (PMSD-D). Many physiotherapists agreed that, where appropriate, patient choice should dictate the service delivery method "*that best suits them*" (PT-1) following an initial in-person appointment. People with MSDs considered this flexibility within their episode of care to be very reassuring:

> *"I'd be happy in the knowledge, that at any stage that I could request in-person follow-up . . . if that was made clear"* (PMSD-C)

Flexibility was also considered important for physiotherapists, as it was acknowledged that there is a cohort of patients who were not interested in eHealth modalities, which was not necessarily related to technology literacy. Participants were keen that future developments would not overlook this, with flexibility incorporated into any new care pathways involving eHealth.

> *"make provision for those that just don't want it and aren't interested in it . . . I would hate to feel that patients . . . aren't getting as good a quality service because they don't want that."* (PT-7)

Subtheme 1 – therapeutic relationship

Most participants agreed that it was "*much easier*" (PMSD-G) to build a therapeutic alliance if there has been some initial face-to-face contact. People with MSDs reported that they would be "*more receptive*" (PMSD-A) to follow-up via eHealth if they had initially met the physiotherapist face-to-face.

Many participants felt that as non-verbal communication was more limited via eHealth, it was difficult to have certain conversations as people did "*not communicate with you, maybe as honestly, or as truthfully as they would on a face-to-face*" (PT-9). This difficulty in conveying certain information meant the interaction via eHealth was perceived to be more impersonal:

> "*when I got up there and I got to talk to them face-to-face and actually tell them how much I was you know maybe struggling to get around and that to get a bit of empathy even you know for how you're feeling and how you're dealing with it is harder to get across in a video.*" (PMSD-H)

Subtheme 2 – expectations

Both physiotherapists and people with MSDs felt that a 'hands-on' approach was for appropriate diagnosis and hence why an initial in-person assessment was preferred:

> "*to have the physio. acquainted with where you have the pain or the soreness.*" (PMSD-B)

> *"I think it's very hard to diagnose . . . .through telehealth or eHealth unless it's a very clear presentation . . . .you can only do a rudimentary assessment."* (PT-10)

One patient spoke of their experience of obtaining the correct diagnosis online, but that an in-person physical assessment provided an extra level of confidence:

> *"just having the hands-on diagnosis . . . gave me an extra level of confidence which is probably a mindset I agree . . . .she was perfectly well able to diagnose."* (PMSD-L)

Some MSK physiotherapists perceived the expectation of hands-on therapy as a passive attitude toward rehabilitation, with patients "*looking for the quick fix*" (PT-8), and often being a little "*surprised . . . in terms of their role*" (PT-2), perhaps indicating a lack of understanding and a more biomedical rather than biopsychosocial viewpoint. Some physiotherapists were frustrated by the perceived tension between a hands-on and self-management approach, with these not considered mutually exclusive:

> "*I think there's this massive drive now to not be hands-on . . . But a lot can be lost . . . those initial sessions where you're spending a bit more time with patients, it's how you buy their trust and . . . how you can implement a self-monitoring approach that's much more effective."* (PT-7)

Most people with MSDs that had experience with eHealth spoke of opting for an appointment or class via eHealth due to COVID-19 because "*it was better than nothing*" (PMSD-J). While for some this view did not change following participation in online exercise classes, others spoke of improved acceptance with a blended approach "*the perfect answer*" (PMSD-K). This mixed response following eHealth engagement was also common among physiotherapists; for some, it met or exceeded their expectations "*of what it was perceived as needing to be at that stage as a stopgap*" (PT-12), with these physiotherapists keen to explore its future use beyond COVID-19, while for others, it was considered a "*good backup option*" (PT-10) if unable to provide face-to-face care.

eHealth as a facilitator of self-management support

Given the imbalance between healthcare resource availability and the prevalence of MSDs, eHealth modalities were considered a feasible solution in the medium to long-term to facilitate behavioral change and manage setbacks:

> "*it's so important to be able to get reminders or prompt or support when you fall off the wagon when you're a patient . . . while this isn't always feasible to be done in person . . . .eHealth is the perfect solution to help people stay on track . . . without . . . compromising too much of the clinicians time*" (PT-3)

Some physiotherapists felt that current services do not serve those with long-term MSDs well with a lack of support acknowledged: "*they are left. Okay, here are all your resources and you go off and manage it*" (PT-3).

There was broad agreement among all participants of the benefits of eHealth regarding information provision. People with MSDs were keen to have exercise videos rather than a home exercise sheet "*to reassure that I have the proper technique*" (PMSD-C). Another person with a MSD spoke of the benefit of being videoed doing their home exercises, as the MSK physiotherapist could individualize cues which was very helpful:

> "*when you hear him talking, naming the three or four most important points it was very useful.*" (PMSD-H)

For MSK physiotherapists though, eHealth did not only facilitate the provision of a home exercise program but also provided a wealth of information that a person with a MSD could be directed to:

> "*so that when they go away, and they think about it, that they have the opportunity to you know, re-engage with the information if they haven't taken it all on board at the time of the consultation*" (PT-5).

There was general agreement among both groups of participants that eHealth could increase motivation to complete home exercise programs and increase general physical activity levels.

> "*it's [Fitbit] amazing, you know, it certainly, you know, encourages you to do the specified amount that you have been told to do.*" (PMSD-A)

Technology: getting it right

Subtheme 1 – infrastructure and resources

While issues with connectivity were described as "*sometimes an issue*" (PT-12) by MSK physiotherapists working in an urban setting, this problem was more pronounced for those working and living in rural areas, which caused considerable frustration:

> "*broadband is not as good as it should be . . . . And it can be very frustrating you know. If you've a Zoom thing and it freezes . . . Oh my God almighty you'd nearly want to take a Valium before you start.*" (PMSD-J)

Both groups of participants referred to a lack of resources such as devices, headsets, webcams, and space as a barrier to engagement with eHealth. For MSK physiotherapists, many implied that while access to resources had improved since the onset of the pandemic, it remained far from a perfect situation.

> "*We got a lot more laptops sanction here than in the whole history of primary care . . . but it's still hard enough and there isn't enough space to have say a quiet room to do telehealth in . . . you just have to have your headphones and just maybe hotspot off our phones.*" (PT-13)

For the MSK physiotherapists, there was a varying degree of infrastructure in place prior to the COVID-19 pandemic. Some MSK physiotherapists worked at sites which utilized electronic health records, describing the adoption of telehealth as relatively painless: "*it actually transformed overnight for us here*" (PT-6). However, many physiotherapists whereas the majority did not have electronic health records in situ and felt that this was crucial for the successful sustainable implementation of eHealth:

> "*we need to start looking at developing and rolling out, you know, electronic records . . . .more equipment and more investment . . . as a nation, we are probably just a little bit behind . . . particularly in the public system*" (PT-8)

Subtheme 2 – user experience

Most people with MSDs self-reported moderate to high technical literacy levels, and felt that these skills had improved due to the pandemic and increased use of video teleconferencing during lockdowns:

> "*I've got a lot more confident now and I just think it's not going to eat me, It's not going to bite me. You know you'll always be able to retrieve stuff even if you do go blank . . . . I google everything now you know. There's nothing to be afraid of*" (PMSD-J)

Many MSK physiotherapists spoke of an adjustment period following the introduction of eHealth, with confidence improving through practice: "*the more you do it, and the more you get comfortable doing it, you know, the better it gets*" (PT-8). Another physiotherapist spoke of how clinician confidence '*instills confidence in our patients*" (PT-2). This was touched on by a few people with MSDs, with therapist comfort

and efficiency viewed as important factors in ensuring the experience was positive:

> "*but physios do need to be . . . streamlined. It was efficient to be honest and it was very useful*" (PMSD-H)

The majority of MSK physiotherapists and people with MSDs preferred videoconferencing consultations as these were perceived to be superior in replicating a face-to-face appointment compared to a telephone consultation:

> "*With a video call at least you could like show and she [physio] can see the way you're doing the exercises . . . and maybe advise if you're doing it wrong the same as if you were in the consulting room with her. if you're on a phone call . . . you'd be just describing stuff yourself.*" (PMSD-D)

Although many agreed telephone consultations were a useful solution for technical difficulties, for those with less confidence in technology or those that do not have access to the internet or an appropriate device:

> "*Everyone we see has access to a telephone. So, I suppose that will be the primary use. And I think, if you're looking at eHealth options, that's probably the most likely one.*" (PT-2)

It was important for both groups of participants that eHealth "*makes life easier for clinicians and provides quicker and better access for patients*" (PT-1) and that "*you've to be mindful that it's (technology) not taking up the physio's time either you know away from appointments.*" (PMSD-G). This is noteworthy considering that some MSK physiotherapists felt poor integration and interoperability of systems was creating more administrational duties:

> "*It's an extra three or four steps that you have to do for each patient. So, it's a little bit more admin heavy*" (PT-6)

Regarding the type of eHealth there was a general sense from both participant groups that any program developed should be accessible via both an internet browser and an app. This meant that:

> "*they could log on to on multiple devices, depending on where they were . . . they might be doing their exercises in work one day, and then they just want them on their phone, but they don't have the app. It's at home on the tablet*" (PT-2).

People with MSDs spoke of how engagement with an app "*depends on the capacity on your phone. Like my phone now the storage is full*" (PMSD-G) and how a platform that can be accessed on multiple devices is "*gonna appeal to more people*" (PMSD-H)

Discussion

This study explored the attitudes and experiences of MSK physiotherapists and people with MSDs regarding eHealth-mediated self-management support. While there has been some work exploring perceptions of physiotherapists and/or people with MSDs to eHealth, much of this research has been done before the COVID-19 pandemic (Fernandes et al., 2022; Merolli et al., 2022). Those studies published during COVID-19 (Barton et al., 2022; Bennell et al., 2021; Malliaras et al., 2021) predominately focused on eHealth-facilitated clinical review, which is just one component of self-management support. Given the extraordinary shift toward the use of eHealth within MSK physiotherapy practice due to COVID-19 and the need to reframe MSK care (Lewis et al., 2021) this timely study aims to provide an overview of factors that need to be considered to ensure that eHealth adoption in MSK physiotherapy is more than just temporary. Although differences may exist in health care systems, cultures, and populations, these findings from the Republic of Ireland are relevant for MSK physiotherapy practice worldwide. The unmet need of people with MSDs is a global problem, and physiotherapists work toward the same global goals for MSK rehabilitation services (Briggs et al., 2021) as described by the World Health Organization (2017).

A key finding of this study is that both physiotherapists and people with MSDs were open to the future use of eHealth interventions, within a flexible, blended care model, which is consistent with the existing research (Barton et al., 2022; Bennell et al., 2021). This blended care model would involve initial face-to-face contact, with eHealth reserved for follow-up care. Some concerns were expressed by both groups of participants relating to assessment and diagnosis, a lack of hands-on contact and difficulties establishing a therapeutic relationship with eHealth, which has previously been reported (Barton et al., 2022; Bennell et al., 2021; Malliaras et al., 2021). Flexibility (i.e. patient choice dictating service delivery method) was also considered important, given individual barriers to the use of eHealth mentioned within this study, such as low motivation, limited resources, and perceived poor outcomes. While some people with MSDs will opt for eHealth after one or two face-to-face appointments, others will likely view it as a means of aftercare or checking in, and there will be those that will not wish to opt for it at all. A flexible blended care model will minimize the risk of the digital divide widening (DeMonte, DeMonte, and Thorn, 2015) while also serving as a means of individualizing the intervention and facilitating eHealth acceptance and

engagement (Currie, Philip, and Roberts, 2015). Guidance and personal feedback could also help address the attrition/adherence challenges associated with eHealth interventions (Buhrman, Gordh, and Andersson, 2016; Currie, Philip, and Roberts, 2015) although establishing the most cost-efficient approach to this will be of paramount importance.

There was broad agreement among participants that eHealth could facilitate multiple components of self-management support. As has been previously reported (Harlington, Clarkson, and Smith, 2022; Lawford, Bennell, Kasza, and Hinman, 2018) participants felt that eHealth could facilitate follow-up clinical review with videoconferencing generally preferable to telephone. Participants in the current study felt that telephone-facilitated clinical reviews were a necessary option given the digital divide among patient populations (Chang et al., 2021). Physiotherapists also stated that telephone-based consultations facilitated quick check-ins, efficiently supporting self-management and that both eHealth modalities, videoconferencing and telephone remain options for follow-up clinical review. Both groups of participants considered eHealth to be useful in terms of patient education, particularly as it supports the use of multimedia education using videos. Indeed video delivered information has been shown to be more effective than written information in terms of engagement and information uptake (Tuong, Larsen, and Armstrong, 2014). As has been previously reported (Bair et al., 2009; Bouton, 2014) physiotherapists acknowledged the challenges associated with initial behavioral change and sustaining such change. However, an eHealth intervention incorporating self-monitoring functions (e.g. home exercise program logging, physical activity, and exercise logging) along with digital reminders in-between regular sessions, could support such change (Ludden, Van Rompay, Kelders, and van Gemert-Pijnen, 2015).

This study sought to address the issue of lack of user involvement within eHealth intervention design (Kelly et al., 2022; Kress et al., 2015), which may partly explain the low adherence and high attrition rates associated with the use of such interventions (Buhrman, Gordh, and Andersson, 2016). Similar to other research (Malliaras et al., 2021) a barrier noted by some physiotherapists was increased administrative duties, which may be partly explained by poor interoperability (Brewster et al., 2014). Seamless bidirectional flow of data between various disparate devices over a network is the ultimate goal of interoperability (Moorman, 2010). This is an important consideration to ensure eHealth acceptance given that limited availability of time in the clinical setting is a well-known challenge (Kress et al., 2015). Furthermore, an eHealth intervention that was accessible on multiple platforms was considered most useful given individual preferences and differing resources, although this is in contrast to existing research (Agnew et al., 2022; van Tilburg et al., 2022).

Implications

Given concerns around assessment and diagnosis and establishing a therapeutic relationship, eHealth interventions may be best reserved for follow-up care. Flexible blended care models can serve as a means of individualizing the intervention, facilitating acceptance, and engagement. Considering this study's findings and previous work (Kelly et al., 2022), the next study in this 'eHealth: IT's TIME' project will test a low-fidelity prototype of an intervention that facilitates follow-up self-management support via integrated remote monitoring and behavioral change.

Strengths and limitations

The principal strength of this study was the rigor of its methods, including the purposive sample encompassing MSK physiotherapists and people with acute and persistent MSDs from both public and private physiotherapy settings. The iterative process of analysis and synthesis of qualitative data added further rigor. Another strength of this project was the involvement of key stakeholders in the design and development of a multicomponent eHealth-mediated self-management support intervention. However, the results of this study should be interpreted in light of their limitations. Most people with a MSD were over the age of 45, and most were female, which may limit the transferability and trustworthiness of the results. Lastly, the lead researcher (MK) is experienced in MSK clinical practice, with some participants known to MK. To minimize any resulting bias, reflexivity, and regular peer debriefing were implemented.

Conclusion

This study offers insights into the perception of eHealth-mediated self-management support interventions from those with MSDs and physiotherapists. The study provides considerations that will inform the design and development of a future eHealth intervention. The participants considered an eHealth intervention an acceptable method to facilitate follow-up self-management support within a flexible blended care model. This study also highlights the importance of continued user involvement.

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Appendix A: Interview Guide – Musculoskeletal Physiotherapists

Topic Guide Key Questions and Prompts
The purpose of this interview is to gain a greater understanding of your experience and opinion on the use of technological platforms (e.g. mobile, computer, tablet) in physiotherapy. **Do you _____ consent to taking part in audio recorded telephone** **interviews about your thoughts and opinions on the use of technology** **within physiotherapy*** Thank you very much for agreeing to take part in the study, I really appreciate you giving up your time to talk with me. If you would like to stop the interview at any time just let me know and it will be stopped.We can then start again when you are ready. **(a) Understanding of self-management support** What is self-management support in your opinion? *Prompts*: Are you familiar with this term? What is your experience of this in the clinic? What are the advantages of this approach? What are the disadavntages **(b) Experiences, expectations and needs regarding eHealth** Have you used any form of eHealth with patients? *Prompts*: How did you find this? Did it meet your expectations? If not, why? What factors would reduce/limit your use of eHealth Are you still using? **(c)Willingness to use eHealth for self-management purposes** Do you think you would be interested in using technology to help a patient manage their "musculoskeletal disorder"? Do you think you would be willing to use eHealth to help a patient to manage their condition? *Prompts*: Do you think it could be helpful?Why/ why not? What would make you more likely to use eHealth? What would make you less likely to use eHealth? Is there anything else you would like to tell me about your experience with technological platforms (e.g. mobile, computer, tablet) in physiotherapy? Is there anything I left out? ***Please note consent will be re-confirmed by the researcher at the outset of the interview and consent obtained orally. This process will be digitally recorded by the researcher**

Appendix B: Interview Guide – People with a Musculoskeletal Disorder

Topic Guide Key Questions and Prompts
The purpose of this interview is to gain a greater understanding of your experience and opinion on the use of technological platforms (e.g. mobile, computer, tablet) in physiotherapy. **Do you _____ consent to taking part in audio recorded telephone** **interviews about your thoughts and opinions on the use of technology** **within physiotherapy*** Thank you very much for agreeing to take part in the study, I really appreciate you giving up your time to talk with me. If you would like to stop the interview at any time just let me know and it will be stopped.We can then start again when you are ready. **(a) Understanding of self-management support** What are your first thoughts and feelings about receiving care and encouragement from healthcare professionals to help you manage your "musculoskeletal disorder" and make decisions about it? *Prompts*: Have you previous experience of this? Have you any worries/concerns? **(b) Experiences, expectations and needs regarding eHealth** How would you feel about using technology during your sessions with the physiotherapist? *Prompts*: How did you find this? Did it meet your expectations? If not, would you have been interested in using? What factors would reduce/limit your use of eHealth Would you recommend to family or friends? **(c)Willingness to use eHealth for self-management purposes** Do you think you would be interested in using technology to help you manage your "musculoskeletal disorder"? *Prompts*: Do you think technology could be helpful?Why/ why not? What would make you more likely to use technology? What would make you less likely to use technology? Is there anything else you would like to tell me about your experience with technological platforms (e.g. mobile, computer, tablet) in physiotherapy? Is there anything I left out? Note: "musculoskeletal disorder" will be replaced with the presenting complaint of the patient ***Please note consent will be re-confirmed by the researcher at the outset of the interview and consent obtained orally. This process will be digitally recorded by the researcher.**