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"I was really pleasantly surprised": first-hand experience with telephone-delivered exercise therapy shifts physiotherapists' perceptions of such a service for knee osteoarthritis. A qualitative study.

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Abstract (*248 words*)

Objectives: To explore physiotherapists' perceptions before and after delivering exercise therapy via telephone for knee osteoarthritis.

Methods: A descriptive qualitative study (based on interpretivist methodology) embedded within a randomised controlled trial. All eight physiotherapists involved in the trial participated in semi-structured interviews before, and after, delivering exercise therapy to people with knee osteoarthritis via telephone. Interviews were audio recorded, transcribed verbatim, and thematically analysed.

Results: Prior to delivering the intervention, physiotherapists felt that the telephone should only be used for follow-up, rather than the primary mode of providing care. They believed telephone-delivered care would be convenient and cost-saving for patients, would provide increased opportunity for patient education and also increase access to services, but that the lack of visual and physical contact with patients would be problematic. After delivering the intervention, physiotherapists reflected that telephone-delivered care exceeded their expectations, noting positive patient outcomes including improved pain, function, and confidence. The focus on communication allowed more personal conversations with patients and shifted patient expectations of care away from manual therapies and towards self-management. Numerous implementation considerations were identified, including the need for clinician training in communication skills, written resources for patients to supplement calls, and careful deliberation of how telephone calls could be scheduled amongst in-person consultations in clinical practice.

Conclusions: Although physiotherapists were initially sceptical about the effectiveness of telephone-delivered service models for knee osteoarthritis, perceptions shifted once they experienced delivering care via this non-traditional method. Findings suggest that first-hand experience may be necessary for physiotherapists to embrace new models of service delivery.

Significance and innovations:

- There is some evidence that physiotherapists do not agree that telephone-delivered exercise therapy for people with osteoarthritis is an acceptable, safe, or effective mode of service delivery, yet it is not clear why they hold these perceptions or whether these perceptions change with first-hand experience of delivering care this way.

- Prior to delivering care for people with knee OA over the telephone, physiotherapists believed that the telephone should only be used for follow-up with patients, and, although they thought it would be convenient and cost-saving for patients, they expressed concern about the lack of physical and visual contact.
- After delivering care for people with knee OA over the telephone, physiotherapists found that the lack of physical and visual contact was less of an issue than initially anticipated and were pleasantly surprised by the positive outcomes they were able to achieve with patients.
- Although physiotherapists may be initially sceptical of new models of service delivery like telephone-delivered care, our findings suggest that first-hand experience helps to shift perceptions and may help facilitate future implementation of novel service models.

Introduction

Knee osteoarthritis (OA) is prevalent, affecting approximately one quarter of adults [1]. Clinical guidelines recommend exercise as a core component of non-surgical management of OA irrespective of patient age, comorbidity, pain severity, or disability [2-5]. Therapeutic exercise, particularly muscle strengthening, is associated with improvements in pain, function, and quality of life amongst people with knee OA [6]. In addition, given that people with knee OA who are sedentary have poorer physical function [7, 8], advice to increase physical activity is also important.

Of all allied healthcare professionals, general practitioners most commonly refer their patients with OA to physiotherapists [9, 10]. Physiotherapy care is typically provided in-person in clinics, yet there is evidence that people experience difficulties accessing these services [11, 12]. For example, although people with OA believe that exercise therapy and physiotherapy care are important, a range of system barriers contribute to poor uptake (e.g. lack of service provision, inconvenient appointment times or venue location) [13, 14]. In addition, common barriers to exercise participation amongst people with OA include lack of access to facilities, conflict with routines, and transport difficulties [12]. Telerehabilitation, which is the remote provision of rehabilitation services via telecommunication technology [15], is one way in which the accessibility of services like physiotherapy could be improved. Providing care via telephone is a potentially accessible and inexpensive option, allowing patients to consult from their own home or workplace. In addition, the 'hands-off' nature of telerehabilitation consultations might help foster patient self-management skills [16]. There is emerging evidence that telephone-delivered care is effective and comparable to in-person practice for people with musculoskeletal conditions (e.g. OA and those who have undergone knee/hip arthroplasty) [17]. For example, the UK physiotherapist-led telephone service 'PhysioDirect' has been shown to be as equally effective as usual care for improving physical health, and provides faster access to physiotherapy, for people with musculoskeletal conditions [18].

Although there is evidence that telerehabilitation is effective, successful implementation is dependent upon the perceived acceptability and usefulness of these services amongst patients and healthcare providers [19-21]. We recently conducted a survey and found that physiotherapists in Australia, most of whom had no prior experience with delivering telerehabilitation, did not agree that telephone-delivered care would be acceptable, effective, or useful for people with OA [22]. This is in contrast to people with knee and/or hip OA, who

believed that telephone-delivered care would be safe, useful, acceptable, and would improve their OA symptoms [23]. However, as our data from physiotherapists was collected via an online survey, it is not clear why they held these perceptions, or whether their perceptions could be shifted with first-hand experience of delivering care via this non-traditional method. Thus, the aim of this study was to qualitatively explore whether physiotherapists' perceptions about telephone-delivered exercise therapy for people with knee OA shift once they have delivered exercise management for people with knee OA over the telephone.

Methods

Design

This study used a longitudinal descriptive qualitative study design based on interpretivist methodology, nested within an ongoing randomized controlled trial (RCT, Australian New Zealand Clinical Trials Registry ANZCTRN 12616000054415) evaluating the effectiveness of incorporating exercise advice and support by physiotherapists for adults with knee OA into an existing Australian nurse-led national musculoskeletal telephone service [24]. The Consolidated Criteria for Reporting Qualitative Research checklist was used to ensure complete and transparent reporting of this qualitative study [25].

Participants

All eight physiotherapists who were employed to deliver the intervention for the RCT were invited, and participated, in this qualitative study. Physiotherapists were recruited from Victoria, Australia, through the research team's clinical networks. Selection criteria included a physiotherapy qualification, at least two years musculoskeletal professional experience and current Australian registration to practice. All participants provided written informed consent and the institutional ethics committee approved the study.

Intervention

Details of the intervention have been described elsewhere [24]. Briefly, research participants with knee OA were randomly assigned to one of the eight physiotherapists and received between 5-10 telephone consultations over a six-month period. Physiotherapists devised goals and an action plan for each participant that involved both a structured home exercise program and physical activity plan. The program and goals were adjusted as necessary throughout the intervention. Physiotherapists aimed to provide support by increasing participant knowledge and understanding of knee OA and the benefits of exercise, and also worked to increase

participants' motivation and confidence in completing, and adhering to, an exercise program. Before the first consultation, each participant completed a pre-treatment questionnaire that provided information for the physiotherapists about clinical history, knee symptoms, physical limitations, and personal goals.

Each participant was provided with a detailed information folder, three resistance bands for home exercises, and access to a study website containing video demonstrations of each exercise. The information folder contained material about OA and its effective management, the role and benefits of physical activity, and strategies for fatigue management. Participants were also provided with exercise instructions and photos, a diary to record exercise adherence and knee symptoms, and a template of a self-management plan. Each physiotherapist was also provided with an identical information folder to refer to while speaking to participants. Physiotherapists used online treatment notes to record health literacy topics discussed, clinical history, personal motivators, prescribed exercises, action plan strategies, and ratings of participant confidence to carry out the action plan.

In the three months prior to the start of the intervention, physiotherapists underwent training in person-centred practice and behaviour change support using HealthChange® Methodology (http://www.healthchange.com/). This involved an initial two-day training workshop, a period of practice consultations over three months, and a final training day. Briefly, the methodology involves: i) a set of practice principles to guide effective communication and knowledge transfer; ii) a set of techniques used to identify and address barriers to behaviour change, and; iii) a 10-step decision framework that acts as a health behaviour change clinical pathway to guide decision-making. To assist physiotherapists to use these skills throughout the intervention, a structured consultation framework (part of the HealthChange® Methodology) was embedded within the online treatment notes. The training program, and its impacts on the physiotherapists, have been described in detail elsewhere [26].

Interviews

Two semi-structured interviews with each physiotherapist were conducted: i) in the week prior to the training program and; ii) after participant recruitment for the trial was complete and the physiotherapist had completed all consultations with 75% of their allocated participants. The pre-intervention interview guide (Table 1) ascertained physiotherapist beliefs about the likely effectiveness of delivering exercise therapy via telephone, and their

expectations about delivering the intervention. The post-intervention interview guide drew from the Donabedian Framework [27] (Table 1), which is used for quality assessment in healthcare and advocated as a useful model for reviewing physiotherapy services [28]. The framework considers three elements of healthcare quality: i) structure (environment where the service is provided); ii) process (clinician and patient activities involved in delivering/receiving care including the clinician-patient relationship), and; iii) outcome (effects of the care provided).

All interviews lasted approximately 40 minutes and were conducted over the telephone by the same investigator (BJL), a graduate research student who was trained in qualitative methodologies, is not a clinician and had no other interactions with the physiotherapists. Interviews were audio recorded, and externally transcribed verbatim. Pseudonyms were assigned to each participant for confidentiality purposes. All data were de-identified and stored in digital format on a password-protected university server.

Data analysis

The first stage of data analysis involved a more deductive content analysis approach where the data were coded using the elements of the Donabedian Framework as an overarching guide [29]. Consistent with study aims, a thematic analysis approach was used to examine both pre- and post-interview data [30]. The purpose was to identify common patterns and ideas which we subsequently grouped as themes. Interview transcripts were read through by BJL after transcription, and then re-read to identify topics and concepts within the data (i.e. coded). Similar or related topics were organised into categories and combined to form themes. Categories for post-intervention data were organised under each of the three elements of the Donabedian Framework (i.e. process, structure, and outcome) [27]. Categories and themes were separately reviewed and revised by both BJL and a qualitative expert (CD, who had no contact with the physiotherapists at any stage of the research). Overall themes were divided into sub-themes, which were reviewed, discussed, and deliberated with all members of the research team [31]. For reporting purposes, final themes were loosely grouped to the Donabedian Framework. To ensure credibility and confirmability of the data, another researcher (RSH) read all transcripts prior to discussion of the themes/sub-themes that were developed by BJL and CD. All analytical steps were done using standard word processing rather than qualitative analysis software.

Results

Participants

The cohort (Table 2) comprised an equal number of male and female physiotherapists, mostly working exclusively in private practice (63%) with an average (SD) of 14 (8) years of clinical experience. At the time of interview, physiotherapists had consulted with a mean (SD) of 9 (1) participants during the study, completing an average of 64 (22) telephone consultations.

Pre-intervention perceptions of telephone-delivered care (Table 3)

Five themes arose at the pre-intervention stage. These were:

Telephone is only for follow-up: Most physiotherapists tended to only use the telephone in their clinical practice to check-in on their patients and follow-up after an in-person consultation. The telephone was not viewed as a primary mode of providing care.

Patient convenience and cost-savings: Physiotherapists believed that telephone-delivered care would be convenient for patients, and that allowing patients to consult from their own home could make patients feel more comfortable talking about their condition and/or engaging in an exercise program. Some also thought telephone-delivered care could reduce patient costs associated with accessing physiotherapy services.

New opportunities: Physiotherapists believed that telephone-delivered care could provide increased opportunities to educate patients about OA. In addition, they felt that telephone-delivered care could allow a wider variety of people to access physiotherapy, such as those in remote areas or who would otherwise find it difficult to attend clinics in-person.

Unable to see or touch patients: Physiotherapists were concerned about being unable to see or touch patients when consulting via telephone. They believed that this could make assessment of patients difficult, due to inability to observe exercise technique or quality of movement. Physiotherapists thought that relationships with patients might be adversely impacted and it could be difficult developing rapport. They also believed they might experience difficulties communicating, particularly if the patient was unable to clearly describe their condition or movement difficulties. Physiotherapists felt the lack of visual and physical contact would limit the strategies available to them when teaching patients an exercise program.

Improved communication skills needed: Compared to traditional in-person consultations, physiotherapists believed that they would need more effective communication skills to consult via telephone, including clear questioning and careful listening by both themselves and the patient. To supplement this, physiotherapists believed that it would be necessary to provide patients with pictures or videos of each exercise so that patients could gain an adequate understanding of exercise technique.

Post-intervention perceptions of telephone-delivered care (Table 4)

Four themes arose post-intervention. These were:

Exceeded expectations: Physiotherapists found that their experiences delivering telephone-delivered care exceeded their expectations, resulting in new enthusiasm for this service delivery model. The lack of physical and visual contact was "less of an issue" than anticipated. Physiotherapists were also surprised to discover that they developed a strong rapport with patients over the telephone and that patient adherence to their exercise program was high.

Focus on communication: Physiotherapists acknowledged that consulting via telephone forced them to focus on effective conversations with their patients. This allowed them to talk at a more personal level with patients, compared to in-person in their usual clinical setting. Consulting via the telephone, with its inherent focus on communication, caused a noticeable shift in patients' expectations of physiotherapy care, in that they did not expect to receive "hands-on" therapy and seemed more willing to self-manage their condition.

Positive outcomes: Some physiotherapists were surprised by how effective the intervention was for their patients. In particular, physiotherapists noticed improvements in patient's pain and function, and increased confidence to self-manage. Physiotherapists found that telephone-delivered care was convenient for their patients, as they did not have to travel to clinics in-person and could easily fit the consultations into their lifestyle.

Implementation considerations: Physiotherapists believed that, in some circumstances, it would have been helpful for them to see the patient's knee or observe the patient walking in order to get a better understanding of their condition, and to observe their exercise technique. However, physiotherapists found that they were able to work around the lack of visual contact, often by "erring on the side of caution". They valued the written materials that were

provided to patients, including exercise instructions, pictures and video links, which helped them to prescribe exercises effectively. Physiotherapists acknowledged that there was a "safety net" in place with the trial, as each participant had been screened prior to receiving the telephone-delivered care. Physiotherapists expressed some difficulty scheduling telephone consultations amongst their usual day of face-to-face consultations, with most opting to perform calls on days that they were not working in the clinic, or after-hours. Physiotherapists believed that training in communication and/or health coaching is important to effectively deliver care over the telephone.

Discussion

The aim of this study was to explore if the experience of delivering telephone-delivered exercise therapy for people with knee OA shifts physiotherapists' perceptions about such services. We found that, although physiotherapists may be initially sceptical of new models of service delivery like telephone-delivered care, first-hand experience can help shift their perceptions about the challenges associated with delivering these services, which may therefore help facilitate future implementation of such services.

Prior to the intervention, physiotherapists in our study expressed some concern about the lack of physical and visual contact with patients when consulting via telephone and believed that their relationship and rapport with patients would suffer. These expectations of telephone-delivered care reflect those found in a recent qualitative study which aimed to explore service provider's perceptions of telerehabilitation for patients referred to public neurosurgical and orthopaedic specialist services [32]. The 15 physiotherapists that were interviewed in that study, most with no prior experience with telerehabilitation, believed that telerehabilitation would have some limitations when compared to standard in-person care. These included difficulties building rapport, inability to perform hands-on techniques, and having reduced treatment options at their disposal. These findings also broadly reflect the findings from our recent survey of physiotherapists' perceptions of telephone-delivered exercise therapy, where most respondents did not agree that telephone-delivered care by a physiotherapist would be effective, safe, or acceptable for managing people with knee and/or hip OA [22].

However, we found that our physiotherapists' perceptions about the challenges associated with delivering telephone-delivered care shifted with first-hand experience. After delivering the intervention, physiotherapists found that they experienced fewer problems than

anticipated, they developed a strong rapport with patients, and adherence with prescribed exercise was high. Consequently, most physiotherapists had developed increased enthusiasm for telephone-delivered care. This disparity between expectations and experiences may partly be because physiotherapists are not traditionally trained to provide care remotely, or without physical and visual contact with their patient. In fact, entry-level physiotherapy training typically focuses on biomedical models of care (i.e. biological aspects of injury or pain), with particular emphasis on assessment and treatment of physical strength, movement, and function [33]. This is also apparent in the current "culture" of physiotherapy practice, which emphasises 'hands-on' anatomical, biomedical, and biomechanical models of care [33]. Inaccurate beliefs about benefits of exercise for knee OA may also have contributed to the mismatch between expectations and experience, given a survey of UK-based physiotherapists has shown that only 56% of physiotherapists largely/totally agree that knee problems are improved by exercise [34].

The importance of first-hand experience is highlighted by research exploring how clinicians change their practice. For example, one study involved interviews with 23 clinicians (nurses, allied healthcare professionals, and an Aboriginal health worker) to explore how attitudes and beliefs influence the implementation of lifestyle risk factor management in primary healthcare [35]. Interviewees believed that to feel confident providing an intervention, they needed to understand how to do so through direct experience with patients. Another qualitative study interviewed 15 primary care physicians to explore their perceptions about changing their clinical practice [36]. They believed that to overcome feelings of discomfort when introducing new practices or ceasing current practices, direct experience was required. They also believed that successful "unlearning" of habits (e.g. prescribing exercise without visual or physical contact as required by our study physiotherapists) required repeated experience using the practice change. Our findings suggest that for physiotherapists to feel confident and comfortable delivering care via non-traditional methods, exposure or direct first-hand experience is required.

Another previous study qualitatively explored physiotherapists' perceptions about delivering care via telephone. Sixteen physiotherapists who delivered care via the UK PhysioDirect telephone service, which provides initial assessment and advice for people with varied musculoskeletal disorders, were interviewed before and after experience [37]. Prior to experience, the main concerns expressed by physiotherapists were being limited to only

providing generalised treatment, given their inability to observe patients, and being unable to communicate effectively or develop rapport via telephone. After experience, physiotherapists found that they were indeed only able to provide generalised advice, that telephone calls restricted their normal therapeutic relationship and rapport, that it impaired continuity of care (as patients in the PhysioDirect service are unlikely to speak to the same physiotherapist more than once), and that it disengaged patients (as few tried to recontact the service). However, they felt that PhysioDirect was a useful way in which to provide patients with advice about self-management. Somewhat similarly, before experience our physiotherapists also expressed concerns about the lack of physical and visual contact with patients when consulting via telephone and felt unsure about how this might impact rapport. However, our physiotherapists' perceptions changed after experience and contrasted with those of the PhysioDirect therapists. This might be because the PhysioDirect service is designed to provide initial advice for a broad range of patients, including those presenting with acute conditions and those seeking a diagnosis. Our intervention was tailored for a specific patient group who did not require diagnosis, and involved numerous consultations with the same physiotherapist over an extended period, during which the aim was to develop a long-term self-management program involving exercise and physical activity. In addition, our physiotherapists were intensively trained in behaviour change techniques and person-centred practiced prior to starting the trial [26], which likely helped them provide more personalised and supportive care.

Our physiotherapists identified numerous advantages of telephone-delivered care. For example, they believed that it was convenient for patients, helped improve exercise adherence, and led to improvements in confidence, pain, and function. This reflects the findings of our qualitative study exploring the experiences of the patients in the trial who received care via telephone (n=20) [38]. Importantly, and somewhat paradoxically, both physiotherapists and patients found that they were able to talk at a more personal level via telephone than when in-person and that they developed a strong sense of rapport. These findings challenge misconceptions that telehealth is "impersonal" [39] and suggest that personalised care can be provided remotely via telephone, and that a strong rapport can develop between patients and therapists even without physical or visual contact. In fact, there is evidence that the therapeutic alliance is strengthened when patients and therapists talk in more detail about the patient's specific needs [40].

Our findings have clinical implications. Physiotherapists believed that the 'hands-off' nature of telephone consultations helped shift patient expectations of care, leading to better patient engagement in self-management and improved adherence to prescribed exercise. There is evidence that patients with low back pain expect to receive hands-on treatment procedures and physical examinations from physiotherapists [41, 42] and are more satisfied when they receive hands-on therapy [43-45]. Physiotherapists often feel as though they have to provide hands-on therapy in order to meet patient expectations [33]. Our findings suggest that remotely-delivered consultations have can help shift patient expectations away from being a passive recipient of hands-on therapies to being a more active participant in self-management of their condition. It is thus possible remotely-delivered consultations may also be applicable for other chronic conditions where hands-on therapies are less effective and active self-management involving exercise is recommended (e.g. chronic low back pain).

Our findings also have implications for the design of future telerehabilitation services. Physiotherapists, as well as the patients in our other qualitative study [38], expressed a preference for some visual contact during telephone consultations. This suggests that video conferencing for consultations may be the ideal mechanism for implementing remote models of service delivery. Physiotherapists (and patients [38]) both emphasised that comprehensive written resources, including educational material and exercise instructions/photos, were essential to the effectiveness of the intervention. As such, future service providers should ensure that these elements are incorporated into service models. Our physiotherapists found that preparing for, and conducting, telephone calls was difficult to schedule amongst the in-person consultations being conducted in a usual day in their clinical setting, preferring to do them after-hours or on days that they were not in their clinics. Future services may consider "blocks" of telephone consultations, rather than interspersing them amongst in-person consultations, however this may adversely impact patient convenience. Careful screening of patients is also required prior to booking telephone consultations to ensure patient safety, and that their health condition is amenable to a self-management approach. Similarly, telephone services should not replace in-person consultations with a physiotherapist for patients who require a diagnosis of their health condition.

It is important that future telerehabilitation service providers consider training their clinicians in communication skills prior to delivering care via telephone [46]. Physiotherapists in our study believed training in communication or health coaching was necessary. Currently, there

is no evidence to inform appropriate training for improving clinicians' telephone consultation skills [47]. Our physiotherapists completed an intensive training program in person-centred care and behaviour change techniques prior to the trial, involving two initial training days, a 3-month practice phase, and a final follow-up training day. After training, all felt confident and prepared to begin the trial and believed that they were better able to provide care that was person-centred [26]. Physiotherapists who provide care via the UK telephone service PhysioDirect are also required to complete training to enhance listening and interviewing skills [48], involving one-and-a-half days of workshop, a practice period, and a competency check involving observation of telephone consultations.

Strengths of our study include the use of pre- and post-intervention interviews to gain a better understanding of how physiotherapists' perceptions of telephone-delivered exercise therapy shifted with experience, and our evaluation of a robust, clearly-described intervention [24] that can be replicated outside of the research setting. Our study also has a number of limitations. Our study was nested within a RCT, which constrained our sample to the physiotherapists who participated in the trial. Our physiotherapists volunteered to participate in the trial and their perceptions and experiences may not be transferable to the broader population of physiotherapists. Only one researcher (BJL) coded all transcripts, and therefore data analysis may have been influenced by her own attitudes or perspectives.

In conclusion, we found that although physiotherapists were initially sceptical about the effectiveness of telephone-delivered service models for knee OA, perceptions shifted once they experienced delivering care via this non-traditional method. Findings suggest that first-hand experience may be necessary for physiotherapists to embrace new models of service delivery.

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Table 1. Pre- and post-intervention interview guides

Pre-intervention	Post-intervention
1. Tell me what you think about telephone-delivered physiotherapy care. *How do you think telephone-delivered care fits into physiotherapy practice (not just for OA)?*	1. What stands out most about your experience of being a physiotherapist delivering care in the trial?
2. Can you tell me about why you wanted to be involved in this study?	2. During our first interview before the trial started, I asked you about your expectations of the study. Overall, do you think your experiences matched those expectations? *How did it meet/not meet your expectations?* *Was there anything that took you by surprise, that you weren't expecting?* *[Prompt using their transcripts if necessary]*
3. Telerehabilitation is defined as the delivery of rehabilitation services over telecommunication technology. Do you have any experience with telerehabilitation? Tell me about that. *Did you like it?* *What were the outcomes for you/the patient?*	3. What stood out to you as the best things about delivering care over the phone? *Did you think there were any clear advantages of delivering care via phone?* *Were there things you liked about it?*
4. Can you tell me what you think telephone-based physiotherapy services could offer people with knee OA? *How might it help people with OA?* *Do you see any advantages it could have over face-to-face physiotherapy?*	4. Was there anything challenging about delivering care over the phone? *Was there anything you didn't like about providing care via phone?* *Did you have any difficulties at any time?* *Can you remember a particular conversation/treatment that went well or not so well? and why it went well/not so well*
4. Do you see any potential disadvantages of telephone-based physiotherapy for people with knee OA? *What do you think might be challenging? Why?*	5. How do you think it compares to consulting with patients face-to-face in your rooms? *How/why was it different/the same or better/worse?* *If required-Reflect specifically on patients with knee OA.*
5. How do you think providing physiotherapy exercise advice and support over the telephone will compare to the way you usually treat a patient with knee OA in the clinic when you consult with them face-to-face? *In what ways will it be different?* *How will it be similar?*	6. How did the calls fit into the structure of your working day? *Did you make the calls in your usual working hours? Did you make the calls from your usual workplace or elsewhere? How did you feel about these locations*? *Which locations were easier/more difficult?*
6. I'm interested in your ideas about how you might gain an understanding of the patient and	7. Tell me how about you assessed each patient…

their knee condition over the phone. Tell me about that.
Is there anything that you think you would like to do but might not be able to?

7. Tell me a bit about how you normally prescribe exercise to a patient in the clinic, and how you think prescribing exercise over the telephone will be different?
How will you teach the patients their exercise programs over the phone?
What do you expect will be easy/ difficult?

8. Tell me a little bit about your typical communication style and the methods you use to build a relationship with your patients.

9. What sort of relationship do you think you will develop with the patient over the telephone in the Telecare trial, knowing that you won't see your patients face to face?
How will the telephone influence your normal communication style?
How will you pick up on non-verbal cues?

10. Tell me about what impact you think the Telecare intervention will have on people with knee OA?

11. How confident are you feeling about delivering exercise counselling and advice to people with knee OA over the phone?
Do you hope to learn anything yourself from this trial?

Do you have anything else you would like to add about your expectations of being involved in the Telecare trial?

How did you feel about the depth of understanding you gained of each patient's problem?
How did this differ from face-to-face practice?
Anything you couldn't do that you wanted to?
How did being unable to touch or see the patient influence your assessment?
Did you refer to the pre-treatment survey/information that the patient provided? Was it useful?

8. Tell me about your experiences prescribing a structured exercise program and general physical activity plan over the phone.
How did you instruct/teach the patients their exercise programs?
What was easy and what was difficult?
Did you do anything different compared to what you would normally do face to face?

9. How well do you think your patients understood the exercises and physical activity plan you prescribed?
How confident were you that your patients could perform the exercises safely and effectively at home on their own?
How confident were you that your patients would adhere to the exercise/activity programs?

10. I would like you to reflect on your communication with your patients and the relationships you developed. What are your thoughts about this?
Did *you change anything from what you normally do?*
What was easy/what was challenging?

11. What do you think the main outcomes were for your patients in this study?
Did patient symptoms change?
Did patient function change? Did patient knowledge/attitudes/confidence change? Did they achieve/not achieve their goals?

12. Based on your experiences, what would you think about using the phone in the future to consult patients with knee OA?

	What about other patients, not just ones with knee OA? *Advantages/disadvantages you see the phone offers over in-person visits?* *What would your preference be for delivery of exercises? Why?* *Is there anything you would change about such a service, based on your experience in this study?* *If you were in charge of training physios to give advice and treatment over the phone for OA, what would you introduce to the training?* Do you have anything else to add?

Table 2. Physiotherapist characteristics (n = 8)

Pseudonym	Gender	Work setting	Clinical experience (*years*)	Previous experiences delivering telerehabilitation	Number of patients and telephone consultations completed*
Karen	Female	Private and public	20	Yes (via Skype)	10 patients; 92 calls
Luke	Male	Private	4	No	9 patients; 61 calls
Simon	Male	Private	15	No	7 patients; 42 calls
Jane	Female	Private	7	No	10 patients; 83 calls
Maria	Female	Public	28	No	10 patients; 81 calls
Emma	Female	Private and public	14	No	8 patients; 27 calls
Gavin	Male	Private	5	Yes (via Skype)	9 patients; 74 calls
Ian	Male	Private	17	No	8 patients; 52 calls
Mean (SD)			14 (8)		9 (1) patients; 64 (22) calls

SD: standard deviation

*At the time of interview

Table 3. Pre-intervention themes, sub-themes, and exemplary quotes relating to physiotherapists' expectations about delivering exercise therapy via telephone.

Theme: Telephone is only for follow-up	
Check-in on patients	Karen "I guess it's usual in practice that you end up having phone calls with some of your patients – often when things aren't going so well or they want to call you to check with something"
	Luke "telephone care the way I see it is probably more of a follow-up call after you've seen someone"
	Emma "I think a lot of follow-up stuff could be done over the phone – checking in terms of checking how people are complying with exercise programs and monitoring whether they're having flare ups and things"
Not primary mode of providing care	Jane "all of my experiences in physio have been in-person – home visits in the clinic. You certainly do liaise with people over the phone, but not really any - I don't think telephone-based consultations has been widely used at the moment as a way of treating people"
	Maria "with my work at the [hospital] I probably do call some patients... but it's not sort of – it's more about follow-up"
	Luke "you would see someone face-to-face and then you may ring them three days later and just go 'look, how are you going?' …. So I suppose form that point of view I do use it, but I don't use it as a primary source of care"
Theme: Patient convenience and cost-savings	
Convenience	Karen "I guess cost, time, no travel obviously, convenience I think is a big thing I think people find it really difficult to schedule appointments … People find it really difficult to fit in their jobs, they've got family responsibilities, those kinds of things, whereas a phone call you can basically do anywhere – I think that's convenient, it would be a big help."
	Emma "I think certainly for people who are working or are busy and they can't get to a clinic, I think that's often a limiting factor for some people attending the physio and this can make it more convenient and fit into what works for their lifestyle I think there'll be a lot better compliance and a lot better engagement."
Reduced cost for patients	Karen "I think cost is a big issue with physio, particularly when you want to see someone over a bigger period of time … I think potentially having a reduced cost with phone-based physio

	presumably might be more cost-effective and might give an opportunity for a bigger chunk of input to get people you know at a higher functional level." Luke "potentially some physio clinics might go ok so we'll offer it at a cheaper rate because well you know there's no overheads there's no equipment, there's no administration stuff that I'm paying, I'm literally just jumping on a call and I can make that call potentially after hours or when it's suitable for me as well"
Patient comfort	Jane "I think also people are often a little bit more comfortable in their own home, so they might be more willing to participate with home-based exercises than some people. I know some people don't like getting out and coming in to clinics." Maria "I'm thinking that maybe the contact would be more regular, and once again at a time and place that's more convenient for the patient, so they're sort of in the mindset that this is what they're there to do at that point in time"
Theme: New opportunities	
Advice & education	Karen "[telephone-delivered care] offers them an opportunity to ask questions, I think when people have got chronic diseases or knee OA, people often really want some clarity about – particularly related to exercise – but also related to what's reasonable related to symptoms and I think [phone-delivered care] would give them structure" Emma "I think [telephone-delivered care is] possibly a big way of the future. I think a lot of what I guess current research into back pain at least shows that advice is one of the most powerful things you can give the patient, and obviously in terms of patients being busy and time poor, being able to do that over the phone at times that suit them… I think there's a big market for it."
Access	Jane "I think that we'd be able to access clients – or different clients, so people that have difficulty accessing the community, difficulty with transport, non-ambulant. I think a lot of people who struggle with appointments – we'd be able to reach a wider variety of the population" Emma "[over the phone] you're not limited by where people live, so if people are living more remotely you can still provide them with good treatment over the phone. And areas where they might not have access to physio, that's a bit advantage. And I guess people with children and people who just can't get to the physio. It opens up a whole new market."
Theme: Unable to see or touch patients	
Difficult to assess patients	Karen "I think that physios do a lot of observation, I feel like that's a normal thing to do when you're assessing someone obviously, but also looking at their treatment and their quality of movement and those sorts of things. So they're the things I feel a little bit less clear about – how that fits in [to telephone-delivered care]."

	Luke "I think that [telephone-delivered care] really I suppose takes out the power of our observation skills…just trying to get an understanding of what the patient capabilities are over the phone, because obviously I can't see them, so you know are we going to give them something that's far too hard or far too easy, you probably won't be able to regress or progress quickly, and then what's the quality of that movement pattern like…you know all the things that we've got that we take for granted face-to-face might be a little bit of a challenge"
	Maria "in terms of just the objective assessments we're going to have to rely on what that patient is telling us… obviously it's not quite the same as actually eyeballing someone and, you know, possibly putting your hand on someone or watching what they're doing or, you know, watching how well they move…I think just getting used to having no eye contact for me personally might be a bit of a hurdle"
Relationships and rapport will suffer	Karen "I think also there may be issues with the relationship you build…I can see on the phone that you don't know what someone looks like, they don't know – they're only working off how you express yourself verbally"
	Gavin "…it's going to be hard to develop that sort of close relationship I suppose, because when we're so used to meeting people and visualizing them and seeing them and having sort of a face to a name and that sort of thing as well, and sort of things we'll traditionally do as far as meeting people is concerned, and that's a tricky bridge"
	Ian "I think [a strong relationship] comes down to being able to see that person face-to-face, so again we'll lose that in a phone call...[it] will feel distant, I think it will feel very removed, and maybe a bit colder to start with, because you can't use other cues or body language to express yourself"
Difficulties communicating	Karen "I guess you're just relying on the patient to give you clear information, and if they don't have very good - some people just aren't very clear communicators or they don't have very good body awareness, and I think there could be issues with some patients"
	Jane "I think the disadvantage is a little bit in the assessment, where without being able to see and touch and feel as a physio we rely on that information we get from the client a lot more. Which in some cases might be a disadvantage if they're not very good at self-reporting or not very aware at understanding questions you're asking."
	Ian "I think it will be different, and I think there'll be a lot more explanation needed over the phone and clarification about what we're trying to get that person to do...So yeah we're going to have to rely a lot on good communication skills I think, on both parties."

Limits ways to teach exercise	Karen "I guess you can't demonstrate, and you can't observe the patient doing it, and you can't touch them to ask them to move in a different way – all the feedback is going to have to be verbal, and they're going to have to tell you whether they think they're doing it in the way that you want them to…So I guess you've just got limited – more limited options, in terms of how you would go about prescribing exercise." Luke "In terms of exercise delivery and getting the specific exercises I think, from my point of view, that might be a little bit of a challenge because of how physios are all about getting exercise quite detailed and specific to our patient, when that's over the phone that might be a bit of a challenge" Emma "I guess with some exercises, a demonstration often helps, or taking the patient through the actual exercise and showing them how to do it. … I guess describing exercises over the phone will be a skill I'll have to learn as well."
Theme: Improved communication skills needed	
Clear questioning	Karen "I can only assume that you need to compensate for the fact that you can't smile, nod and give them eye contact by being a better verbal communicator or there must be ways that you can show that you're an active listener and they've got your attention, verbally that's just going to have to be a stronger component of what you say" Jane "Asking them lots of questions about what makes them worse, what makes them feel a bit better, can they do – get them to do some things while they're on the phone with you – get up and down from the chair, get them to do some functional activities while they're on the phone, ..I guess some of the things that we would normally want to do from an assessment side of things we just have to ask them to do it."
Careful listening	Simon "I think we take a lot of cues from facial expression, body position, all those sorts of things I think that's certainly something that's going to be, picking up all those sorts of things and tone of voice and those sorts of things may be slightly more difficult to sort of make sure you are hitting the mark" Gavin "You can listen for obviously some cues, with pauses and their language and – it's not something that I've had any training with but you tend to pick up a couple of things along the way and if they're emotive about what they're talking about it will often come up across with their tone or their rate of talk"
Providing pictures or videos of	Karen "I think with the right type of extra audiovisual pictures or other material that I can still see that it should be relatively straight-forward to talk someone through something"

exercises*	Luke "even maybe you know a booklet of exercise is really good but maybe even a – I'm just thinking – some kind of visual sort of DVD or something of actually forming the exercises through range and then actually potentially someone talking verbally how you do the exercise"
	Jane "that would be ideal – if they've already got some resources with some pictures, so they know those details, for example if they've got something at home with an exercise quads over fulcrum, then I can get them to refer to the diagram, the equipment that they either do or don't have, and then just talk them through the set-up, as to how it works."

*At the time of interviewing, physiotherapists were not aware that participants would be provided with images of each exercise as well as access to exercise videos

Table 4. Post-intervention themes, sub-themes, and exemplary quotes relating to physiotherapists' experiences delivering exercise therapy via telephone

Theme: Exceeded expectations	
Fewer issues than expected	Emma "I guess I was really pleasantly surprised with how well the program worked with the patients that I had through. I thought there'd be more difficulty communicating just via phone and getting people to comply…it probably exceeded my expectations, to be honest."
	Ian "Initially I thought [the lack of face-to-face contact] would be hard. I thought there'd be some more barriers to being able to achieve the physio service that we wanted. But I actually found it a lot easier than what I expected. And I think patients were also on board and willing"
	Simon "I guess I was concerned that [exercise prescription] was going to be tricky, but it was probably really easy and clients seemed to be pretty comfortable with getting the exercises done. So the one challenge that I thought was going to be, that it really didn't exist."
Strong rapport	Emma "I was pleasantly surprised at how well rapport could be built just over the phone. And that you don't really need that visual – I was surprised by that."
	Karen "I don't think you lose anything on an interpersonal relationship level which, in the past…that had been my biggest concern: you lost some connection you have with the participant. But I don't think you'd lose anything – I think that you can gain someone's trust and you can develop a good working relationship as a patient and therapist through the phone…I don't know that it matters that they can't see you."
	Jane "I think the thing that surprised me the most was how much rapport you could build with people over the phone. I expected that to be not quite the same as the way you would build rapport with someone in person, but I felt like I was able to do that over the phone"
Patient compliance	Karen "I think the compliance with the exercise routine [in this trial] I think is definitely a standout compared to what I would consider my usual experience…I think the participant being in their own home probably helps to reinforce to them that being at home and doing the exercises themselves is actually something that they do have to tackle by themselves"
	Simon "They were a really easy and positive cohort to work with and seemed to all report really good changes really quickly, and certainly implemented all of the specific exercise stuff really easily into their lifestyle…probably compliance was really easy, rather than

	complex or difficult."
	Luke "[Before the intervention] I would have had doubts about the impact that we could have made and if we could make changes and I was potentially questioning the compliance of our patients and things like that, but I think I have been overly surprised with it."
New enthusiasm	Maria "I think it would be a fantastic program to roll out…it is a relatively easy and I would hope, cost effective way, of getting that information out to these people and assisting them to make significant changes to their lifestyle, positive changes."
	Emma "I think that it's something we, as physios, should be doing. It's so easy, it makes the physio so accessible to so many people and you realise that a lot of the time the most important treatment from a physio is actually that discussion and the talking through problems and the educating. If we can, as a profession, get on top of that I think the chronic disease – especially knee OA and back pain and things like that – there is such a scope to have such a huge impact with very little cost."
	Jane "I think it was very effective. I'd happily do that… I definitely think in those instances where the general course of treatment is exercise and advice, I think that would be perfectly effective over the phone."
Theme: Focus on communication	
More personal conversations	Emma "I was trying not to talk too much at the patient which is kind of what I do in clinics. Like, you get there and you have your thrall of – the lecture of "I'll tell you what's wrong with you." And actually holding back and letting them talk a lot more [over the phone] has been quite powerful as well as a good lesson for me."
	Maria "You had the time to really investigate what was motivating them or what their main issues were. Whereas I guess if you were more face-to-face and doing more of a traditional role you would be more focussed on their range of movement and their strength…it is more about finding out more about them as a person and helping them to remain motivated to continue with the program. I think over the phone facilitated that to a certain degree"
Shifts patient expectations	Emma "It changes everyone's expectations, especially for patients, when treatment is delivered over the phone…probably when I treat face-to-face I guess there's the expectation that a physio has to treat. So you've got to get your hands on, you've got to touch and probably reinforce that whole disability illness behaviour. Whereas, on the phone…you're straight into discussing [health] management and exercises and it just works so much better. It's probably influenced how I'm treating in the clinic a lot more as well. I'm doing a lot more exercise coaching, really, as opposed to actual treatment."

	Jane "I think it did take away from that expectation of manual therapy. I know when people come into the clinic and they're coming in for a similar issue…because you're in the room with them quite often there is an expectation of manual therapy and being on the phone it just completely takes it out of the equation. You don't have to quite justify why you're not doing the manual therapy quite as much because it's just not an option."
Theme: Positive patient outcomes	
Improved pain and function	Emma "Definitely increased functional capacity. A lot of them – nearly all of them – couldn't walk far, couldn't do stairs, couldn't walk up hills. And the majority by the end of it, were doing that…functional improvements probably more so than pain, but learning to function better with the pain."
	Jane "I find with a lot of the people I saw, I feel like we had some great effectiveness. The best part is I feel like I was effective and that I've been able to help the majority of people have been dealing with…A lot of them have returned to things they haven't been able to do for a very long time."
Confidence	Maria "I am thinking of a couple of clients who it seems to have made a huge difference to their lives. For example, one client, she was in tears the first time I spoke to her and was so terrified about her knee pain and then by the end of it she was very much a different person, was really happy, was really positive and felt quite capable to continuing and working on the exercises and found great benefit from that"
	Jane "The biggest difference is a lot of them have a lot more confidence that they went into the program with the attitude of, "I'm going to have surgery," and at the end, "I might be able to do this." I think that was the biggest difference and got that with pretty much everybody; that they do feel confident that they will be able to self-manage if they do the right thing."
Convenience	Gavin "obviously the flexibility for the participant and the fact that, you know, obviously they don't have to be at a location at any particular time…And for the most participants they sort of just were in the comfort of their own home, and that's certainly a perk."
	Ian "The best things are the flexibility with appointment times, so you can access people at various times of the day, and I guess it becomes a little bit easier for patients who can't get into a clinic at a certain time or are restricted with hours of the day."
Theme: Implementation considerations	

Desire to see some patients	Maria "Sometimes I felt with certain clients that I would really like to have been able to see exactly what they were describing and perhaps see what their knee joints looked like and how they were actually walking"
	Emma "I guess, some patients – there's a couple that were getting aggravated by a similar exercise, and I get the – trying to describe over the phone what they were doing - that was probably the hardest thing. If I could have got eyeballs on them and said, "You're doing XYZ wrong." That may have made it easier, but you can work around it."
Erring on side of caution	Maria "There was one patient in particular who was quite elderly and her knees sounded like they were pretty bad in terms of arthritis. I ended up erring on the side of caution very much with her and being very gentle in terms of what we were doing."
	Jane "for me, I do like watching people walk. I like to watch people get out of the chair. They're the two things I really like being able to do. I guess I would ask people about those activities and just ask them to describe what's happening – I think if I wasn't sure I'd just play it safe with my advice."
	Luke "sometimes I would just, particularly that first week, deliberately start low level as well to really start on the easier bands just because I wanted to know the next week when I called them how they responded. Even if I thought they could have handled more, I just wanted to know. So I always felt we'd started lighter than what I should have"
Need written material and resources	Jane "The ability to do it over the phone was dependent on having those resources…I think the effect and the ability to do it on the phone is, in part, dependant on them having access to resources. I'm not sure it would go quite as well if you just called someone and they didn't have anything else in front of them."
	Ian "having the information already in the patient's hand is definitely an advantage because they've got the tools that they can just refer to at their fingertips. That works in our favour, so we don't have to provide that information or put together the exercise programmes. They've got all the advice and the exercises there with them. That's definitely an advantage."
Safety net	Gavin "obviously because they're in the program they've generally been screened pretty well to being specific to one condition. So, I don't know how well that would go in a different context if we were trying to treat different conditions"
	Karen "There has to be some criteria or tightness around people's diagnosis and their issues…If you've got a patient – they're there to see you for knee OA and there's some

	clarity around that and this studies their biggest functional limitation or technical issue, then they're stable to do exercise and you're confident they can do exercise then I think it's a great medium to treat people with."
Training is necessary	Maria "I certainly think the health coaching training we had was really useful because that was all about, I guess, assisting patients to become self-managed themselves, basically. It is kind of what we do in physio but I don't think we are really trained specifically to do that as well as it could be and that needs to be the emphasis with this sort of [telephone] program."
	Karen "For most physios, [telephone-delivered care] would be a very big departure from their standard clinical practice face-to-face. I think there's a huge amount of training that would need to be done…Communication skills or health coaching kind of things"
Scheduling	Luke "I work quite fast-paced in private practice so if I got a little bit behind or things like that then I'd be calling my patients late…So I found it a convenient thing just being able to [do the telephone calls] from home."
	Ian "Probably the time and the paperwork [was a challenge]…trying to fit the service into what we do here day to day, so, with getting ready for the telephone call, there's a bit of preparation time, there's opening up files, there's getting documents ready, and then there's the paperwork to do afterwards. So, trying to get that done within a normal working day in the clinic was probably a little bit of a challenge at times."
	Simon "probably for me as a clinician, doing a one-off call here or there probably used up a lot of time. It probably wasn't as time efficient as I thought it could be…So, tricky for me going forwards in regards to thinking about this application of it in private practice. I think you'd almost have to be all in and have a day or two a week with lots of clients and lots of referral and continuity to that to make it applicable"