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The use of virtual consultations in an orthopaedic setting: How do changes in the work of being a patient influence patient preferences? A systematic review and qualitative synthesis

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Abstract

Objectives

To systematically review qualitative studies reporting the use of virtual consultations within an orthopaedic rehabilitation setting and to understand how its use changes the work required of patients.

Methods

Following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Statement we conducted a systematic review of papers to answer the research question 'How do changes in the work of being a patient when using communication technology influence patient preferences?' Electronic databases were searched for studies meeting the inclusion criteria in April 2020.

Results

The search strategy identified 2057 research articles from the database search. A review of titles and abstracts using the inclusion criteria yielded 21 articles for full text review. Nine studies were included in the final analysis. Six studies explored real time videoconferencing and three explored telephone consultations. The use of communication technology changes the work required of patients. Such changes will impact on expectations for care, resources required of patients, the environment of receiving care and patient-clinician interactions. This adjustment of the work required of patients who access orthopaedic rehabilitation using communication technology will impact on their experience of receiving care. It is proposed that changes in the work of being a patient will influence preferences for or against the use of communication technology consultations for orthopaedic rehabilitation.

Conclusion

We found that the use of communication technology changes the work of being a patient. The change in work required of patients can be both burdensome (it makes it harder for patients to access their care) and beneficial (it makes it easier for patients to access their care). This change will likely to influence preferences. Keeping the concept of patient work at the heart of pathway redesign is likely to be a key consideration to ensure successful implementation.

Registration

PROSPERO registration number: ID=CRD42018100896.

Strength and limitations of this study

- A taxonomy of patient work will assist in understanding implementation processes.
- The use of middle range theory has been employed to guide theorization of the data.
- A secondary analysis of data has been employed to explain concepts which the authors had not originally intended.
- The date range of included studies (2005-2019) include a range of technologies including the use of bespoke software which may present different challenges to modern off the shelf software.

Introduction

Background

The NHS Long Term Plan¹, The United Kingdom's health service's plan to 'make the NHS fit for the future of patients', advocates digital-first primary care and envisions the use of e-consultations to become a new option for every patient. Virtual consultations can support the management of patients with long term conditions such as musculoskeletal disease² where long term management may require repeat visits for appointments with healthcare practitioners.

There are examples of virtual consultations in practice. The PhysioDirect telephone and advice service³ is an example that was found to be safe and resulted in equivalent outcomes to face to face appointments for patients with musculoskeletal disorders. The visual component offered with videoconferencing software offers distinct advantages over telephone consultations⁴. Research has been conducted investigating patients using Skype, a free to access videoconferencing software, to access care⁵. Patients who received telerehabilitation for knee arthritis via SKYPE⁶ found it to be feasible and acceptable. The Virtual Online Consultations-Advantages and Limitations (VOCAL) study⁷ found video outpatient consultations to be safe, effective and convenient in appropriate situations.

The process of implementing a new intervention (such as the introduction of virtual consultations in healthcare) has been demonstrated to be dependent on how the intervention is operationalised by its users⁸, the work people do when they implement a new intervention⁹ and the mobilisation of resources over time¹⁰ across different settings¹¹. Normalisation Process Theory (NPT) frames implementation processes through its focus on the things people *do* when they implement a new intervention in practice. One study investigated nurse call takers conducting a physical assessment of patients' over a telephone helpline¹². The study reported nurses' interactions with patients as they instructed them over the phone to perform physical manipulations. The accomplishment of a physical examination required work from patients that differs to face to face consultations. Burden of treatment theory¹³ explains how the capacity for action interacts with the work that stems from healthcare. Burden of treatment has been demonstrated to arise when the workload demands exceeds the capacity for patients with COPD and lung cancer¹⁴. An understanding of the factors that contribute to a change in the work for patients using virtual consultations is an important consideration for patient experience

Research conducted in the UK found that the majority of people say they would use video consultations to consult their General Practitioner about minor ailments and ongoing condition¹⁵. A proportion (approximately 35%) would not use this modality. Our previous research investigated whether patients preferred face to face or virtual consultations¹⁶: patients with atraumatic shoulder instability were offered the choice between SKYPE and face to face follow up rehabilitation appointments. Half of patients preferred to see their rehabilitation professional in person¹⁶ in part due to not having access and knowing how to use the software and equipment. The use of SKYPE changed what patients needed to do to engage in their care in our small study and this influenced their choice on whether or not to use it.

Preferences are a set of complex factors that may include enjoyment comparisons (*x to y is preferred if someone enjoys x more than they enjoy y*), comparative evaluations (*x to y is preferred if someone thinks x is better than y*), favouring (*selecting x over y because x has a particular set of characteristics*) or choice ranking (*x is chosen over y if and only if they are faced with a choice of x over y*)¹⁷. To get past the complexities of preferences, preferences can be defined as a 'total subjective comparative evaluation'¹⁸. In essence, someone will prefer x over y after consideration of

the alternatives, the actions, the state of affairs and the consequences of choosing each alternative. In this paper we are interested in understanding how patient work influences patient preferences.

Aims of this review

This paper reviews qualitative literature on the use of communication technology for patients in an orthopaedic rehabilitation setting to understand how the work of being a patient influences preference. The purpose of this paper is to develop a taxonomy of tasks required of patients using communication technology. We then consider how factors relating to these tasks influence the comparative evaluation patients face when offered the choice of a communication technology or a face to face consultation for orthopaedic rehabilitation.

Methods

A systematic review was conducted using the PRISMA approach in order to answer the research question: *How do changes in the work of being a patient when using virtual consultations influence patient preferences?* This review was registered on the International prospective register of systematic reviews (PROSPERO registration number: ID=CRD42018100896)¹⁹. The protocol for this review, which forms phase 1 of the CONNECT Project, has previously been published²⁰.

MEDLINE, AMED, CINAHL, PsychINFO and SCOPUS were searched from inception on the 4th April 2020. Full search terms and the search strategy is available to view in Supplementary Material (See Supplementary Material 1). Articles were screened independently by two authors (AG and AJ) with a third author (JJ) available to discuss any discrepancies (See Figure 1).

Studies were eligible for inclusion providing they met the criteria for inclusion shown in Table 1. Relevant studies were firstly screened by their title and then by their abstract. Remaining texts were then read in full with all texts retained after this point for qualitative synthesis. Risk of bias was screened using the CASP tool for qualitative studies²¹. A discussion was held, between two authors (AG and AJ) with a third author (JJ) available to discuss any discrepancies, to decide whether included studies were of sufficient quality to include in the review.

Table 1: Eligibility Criteria of Studies

Inclusion:	Exclusion:
<ul style="list-style-type: none"> • Full text English Language academic papers from inception to 6th April 2020. • Patients with an orthopaedic / musculoskeletal problem • Studies reporting patients accessing physical assessment / rehabilitation through the use of virtual consultations (e.g. telephone, videoconferencing) in an orthopaedic / musculoskeletal setting. • Qualitative studies or studies with a qualitative component that focuses on the patient viewpoint of accessing virtual consultations. 	<ul style="list-style-type: none"> • Conference abstracts • Participants without an orthopaedic / musculoskeletal complaint • Quantitative studies • Studies not reporting patient viewpoints

Full texts were uploaded to QSR NVIVO Software (QSR International Pty Ltd. Version 12, 2018). NVIVO was used to collect and organize data from the results, discussion and conclusion sections of each paper. Each sentence from the included sections were coded on a line by line basis. The codes

were labelled using a description of the content of the respective sentence. Data analysis subsequently took three forms: firstly, two authors (AG and CM) conducted a thematic analysis of codes. This was undertaken to familiarize the authors with the content of the papers. For the second iteration of coding the following was considered: *what is the work of being a patient when using virtual consultations?* Codes were then organized into groups depicting the *type* of work required of patients when using virtual consultations to access healthcare. The two authors (AG and CM) then considered the question: *how might the work of being a patient when using virtual consultations influence patient preference?* The data were revisited and theoretical ideas arising from the data were discussed between AG & CM. From here themes, empirical regularities in the data, were identified and characterised. Finally, themes arising from the data were mapped out in the form of a model to demonstrate how, based on the included papers, the change in the work of being a patient might influence preference for virtual consultations.

Results

Study Selection

Systematic search identified 1,655 references (after de-duplication) of which 1,634 were excluded on the basis of titles and abstracts and a further 12 excluded at full text review. As a result 9 papers were included in the review. Of the eight papers, two originated from Australia^{6,22}, 2 from Canada^{23,24} and 3 two from England^{16,25,26} and with one from Sweden²⁷ and one from the Netherlands²⁸. Six studies explored real time videoconferencing^{6,16,23,24,26-28} and three explored telephone consultations^{22,24,25}. Study demographics are shown in Table 2. All studies were screened using the CASP tool for qualitative studies²⁷ and all were deemed by the authors to be of sufficient quality and therefore retained for analysis.

Figure 1 – PRISMA Flow Diagram of included and excluded studies

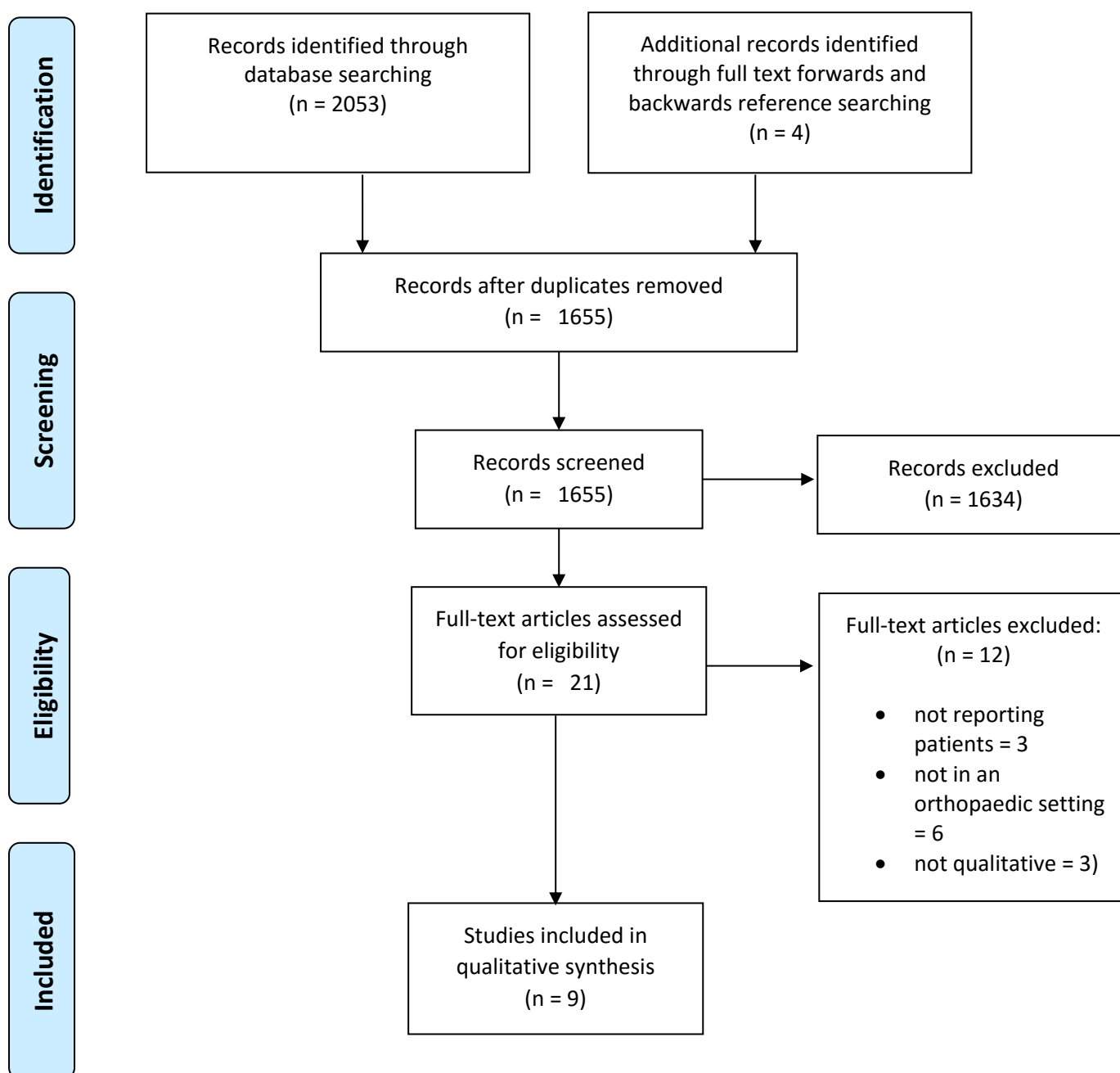


Table 2 – Study Characteristics.

Included Study	Study Setting	Study Purpose	Technology Used	Participants
Harrison et al 2006 ²⁶	Joint teleconsultations between the patient and their GP and a hospital specialist (England)	To explore patients' experiences of joint teleconferenced consultations	ISDN2 link and off-the-shelf videoconferencing software	28 patients who were enrolled in the Virtual Outreach Randomized Trial ²⁹ . Six patients had a generic orthopaedic diagnosis.
Young et al 2007 ²⁴	Telephone and videophone follow up after scoliosis surgery (Canada)	To better understand the relative effectiveness of two types of telehealth technology, telephone versus videophone, following a child's scoliosis surgery from the perspective of patients and care-givers	For the videophone group patients were provided with a videophone (KXC-AP150, Panasonic, Japan). For the telephone group patients used an ordinary telephone line	43 patients and their families (dyads) who had undergone scoliosis correction surgery. 21 dyads received videophone support and 22 dyads who received telephone support.
Eriksson et al 2011 ²⁷	Video-based physiotherapy at the patient's home for two months after a shoulder replacement (Sweden)	To describe patients' experiences of physiotherapy at home by video-link after a shoulder replacement	Standard commercial videoconferencing units (e.g. Tandberg 800, Sony PCS-50, Polycom VSX 3000)	10 Adults who had undergone a shoulder replacement.
Cranen et al 2011 ²⁸	Telerehabilitation services at a rehabilitation centre (Netherlands)	To explore patients perceptions regarding prospective rehabilitation services and the factors that facilitate or impede patients' intentions to use these services	Home based treatment by means of (unspecified) web cam treatments	25 chronic pain patients from a rehabilitation centre.
Kairy et al 2013 ²³	Telerehabilitation between the patient at home and the physical therapist at the hospital (Canada)	To better understand the patient's experience of home telerehabilitation	Internet access and the telerehabilitation platform was installed in the patient's home as reported in[29].	5 patients who had previously received in-home telerehabilitation post knee arthroplasty. Patients were

			The telerehabilitation device was custom built for the study	selected from a pool of participants from the experimental arm of a RCT for in-home telerehabilitation ³⁰ .
Pearson et al 2016 ²⁵	Telephone based physiotherapy between a patient and a senior physiotherapist (England)	To describe key variables that determined patient acceptability of the PhysioDirect service and to understand how the patient experience differed from those accessing usual physiotherapy care.	Telephone	57 patients with a musculoskeletal problem. Participants were recruited from the PhysioDirect study ³¹ .
Hinman et al 2017 ⁶	SKYPE mediated physiotherapy consultations between the patient at home and the physiotherapist (Australia)	To explore the experience of patients and physical therapists with Skype for exercise management of knee osteoarthritis (OA)	SKYPE software	12 patients with a diagnosis of knee osteoarthritis. Participants were key informants from an RCT ³² .
Lawford et al 2018 ²²	Exercise therapy for people with knee arthritis via telephone (Australia)	To explore people's perceptions of exercise therapy delivered by physiotherapists via telephone.	Telephone	20 patients with knee osteoarthritis. Participants with knee OA were recruited as key informants from an RCT ³³ .

Gilbert et al 2019 ¹⁶	Follow up consultations for patients after a period of inpatient rehabilitation for atraumatic shoulder instability.	To explore reasons behind acceptability of SKYPE follow up consultations	SKYPE software	7 patients chose a SKYPE consultation, 6 patients chose a face to face consultation. In addition, 8 clinicians were interviewed.
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Worked Example of Data Analysis

Data from the nine studies were synthesized. All data were treated to the same three step process. An exemplar is demonstrated below using data from Eriksson et al²⁷:

1. Data identified (initial line by line identification)

Inability to touch the patient meant therapists were forced to rely more on their subjective assessment of the patient, leading them to spend more time talking with and listening to patients.

2. Data characterized (initial line by line coding)

Code assigned: *Therapists were unable to use 'hands on' during assessment.*

3. Data theorized (consideration of the question: *what is the work of being a patient when using virtual consultations?*)

Patients have to present themselves in a different way during assessment via VC.

Data from the papers are presented in Table 3.

Table 3 - Factors that may affect patient preference for virtual consultations and considerations for virtual consultations

Finding	Construct	Results from included papers: factors that contribute towards the work of being a patient when using communication technology	Considerations for virtual consultations
Preferences are shaped by the requirements of the consultation how these change the work	The processes that change	Patients were able to engage in consultation from different places ⁶ . Using virtual consultations required patients to arrange for additional equipment in the home ²³ . They were required to log in to an account ²⁸ and to learn how to use the communication technology ⁶ .	<ul style="list-style-type: none"> • Consider the impact of changing processes on patients. • Offer troubleshooting for logging in and how to use the equipment. • Consider offering guidance surrounding the suitability of different locations when engaging in virtual consultations.
	The skills & expertise that is required	As patients moved away from physically facilitated exercises there was the requirement to adjust ²⁷ , overcome patient-clinician communication difficulties over video-call ^{24 26} and phone call ²⁵ and face an increased reliance on them to communicate information ⁶ . In the absence of hands on treatment more emphasis is placed on patients completing exercises ⁶ . Patients need to self-assess when they cannot be physically assessed by a therapist ⁶ . Patients may need to adapt to clinicians who do not have adequate communication skills or training for using virtual consultations ²² . Patients may be encouraged to self-monitor improvements more than if they were seen face to face ²⁵ .	<ul style="list-style-type: none"> • Brief and support patients on the changes in style of communication. • Facilitate patients to communicate their problems through a virtual consultation. • Facilitate self-assessment of patients in the absence of clinician's 'hands-on' care. • Facilitate and provide guidance on self-assessment and ongoing monitoring. • Design personalized exercise regimens that are suitable for the patient's clinical problem and their home environment
Preferences are shaped by the resources that are required of patients	Logistics	Use of virtual consultations helps to avoid of transportation issues ^{6 16 22 23 27 28} , reduces travel times ²⁸ for both patients and carers and can increase access to services ⁶ .	<ul style="list-style-type: none"> • Consider offering virtual consultations for patients who experience difficulty with travel

	Time	The ease in which exercises can be integrated into home routine ^{16 28} and through avoidance of travel provides additional time and energy for other activities ²⁷ . Patients valued being able to wait for their appointment in their own chosen environment rather than in the clinic ^{6 25 26} .	<ul style="list-style-type: none"> • Consider conflicting demands for patients. • Consider the impact of travel and time on patient symptoms. • Consider the impact of patient comfort when waiting for their appointment.
Preferences are shaped by the work required due to the changes in the environment	Setting for physical rehabilitation	Patients had to find ways to overcome a lack of space ^{6 28} and equipment ^{6 23} at home. Patients were required to integrate their rehabilitation in the home environment ^{6 22} .	<ul style="list-style-type: none"> • Support patients to establish a suitable rehabilitation environment at home. • Design treatment regimens based on the patients access to rehabilitation equipment. • Support patients to integrate rehabilitation within the home environment.
	Setting for virtual consultation	At times the rehab was impaired due to technical difficulties ⁶ and patients felt they missed learning through fellow sufferer contact through not attending the clinic and would need to seek this elsewhere ²⁸ .	<ul style="list-style-type: none"> • Offer troubleshooting when faced with technical difficulties • Consider offering peer support groups for patients who are unable to physically attend the clinic.
	Hardware and software	Patients needed to be supported to access ^{6 23} and use the equipment ^{6 16 24 28} and manage to real-time troubleshoot connection problems as they arose ^{6 24 27 23} .	<ul style="list-style-type: none"> • Consider offering equipment based on the patient's needs. • Tailor support for equipment use based on patient's skill set. • Offer troubleshooting when faced with technical difficulties.
Preferences are shaped by the work that goes into maintaining adequate interactions	Interactions	Patients may have to focus additional attention when communicating over a stutter connection ^{6 27} or when faced with a language barrier ²⁴ . Patients may need to rely on additional non-verbal communication when communicating over a screen ²⁶ . Patients who feel alienated ²⁸ or detached ^{25 28} or expect	<ul style="list-style-type: none"> • Clearly communicate when the connection is impaired; be prepared to abandon and reboot the virtual consultation as required. • Be prepared to emphasize the use of non-verbal communication.

		hands on care ^{6 24 25} may need to invest additional effort in developing an effective therapeutic the patient clinician relationship.	<ul style="list-style-type: none">• Have an awareness of patient preferences; patients who prefer face to face care may require additional input to develop a therapeutic relationship.
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Synthesis of Results

Theme 1: Requirements of rehabilitation

1.1 The processes that change

The use of virtual consultations within the treatment pathway required additional steps for patients, such as logging in²⁸ and setting the software up⁶. Some patients valued the portability of using Skype⁶ and found that they could use it across different settings¹⁶ to fulfil the purposes of the consultation. Patients valued the opportunity to run through the processes of using SKYPE for the first time in the form of a 'dummy run'¹⁶.

1.2 The skills & expertise that is required

The use of virtual consultations changed the skills patients needed. Video communication required specific communication skills that included listening with close attention with no interruptions²⁷. The gaze of the patients and clinicians were used to signal the start and end of conversations²⁷. Patients and their families found it challenging to express how they felt from a distance and were reliant on the visual capabilities of the technology²⁴. The lack of visual information was a concern for patients in the PhysioDirect service²⁵ who did not have visual cues and physical contact. The lack of physical contact meant that therapists were more reliant on information shared by patients rather than those derived from physical tasks⁶. Therapist focussed on more effortful treatments such as exercises and self-management rather than providing them with hands on care⁶. Traditional face-to-face interaction is well established and accepted. It was recognised that virtual communication required different skills and therapists' training needs, to ensure effective communication with patients, were considered in one study of telephone consultations²². Traditional physiotherapy patient assessment (such as 'hands on' palpation of a joint) is not possible via Skype. As a result of this patients were taught to self-palpate under guidance⁶ and instructed how to demonstrate their range of movement over the screen. It is self-evident that visual assessment was not possible over telephone^{22 24 25} and this required good communication from both therapists and patients to describe the movements. Patients felt they did not need 'hands on' care when they were seen by an experienced therapist²⁷ and clinicians were more likely to encourage self-management and exercises when they were seen virtually²⁵.

Theme 2: Resources

2.1 Logistics

Patients who underwent virtual consultations experienced reduced travel times and transportation issues^{6 22 23 27 28} and was often seen as more convenient for patients, particularly those who suffered from chronic pain⁶. Virtual consultations enabled patients to access health services more easily^{23 26}. Problems did arise with the PhysioDirect service where patients were unable to get through requiring them having to make multiple calls to speak to a therapist.

2.2 Time

Virtual consultations offered flexibility²²: *'If I know I'm stuck at work and I can't get to see someone [the telephone] would be a good option...I can ring someone or have an appointment on the phone, and be at work doing what I need to do, and still have my appointment.'* It was particularly useful for patients who had multiple commitments: *'Because life's so busy in general too, so to be able to speak to somebody in your home and then you can go on with your, you know, your next thing, is just*

wonderful...it just opens another brilliant option for people' as it provided more time for other activities and to integrate rehabilitation into daily life²⁷.

Theme 3: Environment

3.1 Setting for rehabilitation

Rehabilitation in the home was welcomed by some patients as it gave them the opportunity to rehab within their own environment whereas other patients preferred to keep their home environment separate from the clinical environment²⁸. Patients found that they had a lack of space at home compared to the clinic^{6 28} and could not access clinic-based equipment^{6 23}. Rehabilitation required patients to troubleshoot ways to integrate their rehabilitation tasks within the home^{6 22}.

3.2 Setting for virtual consultation

Some patients valued fellow sufferer contact and felt that through not physically attending the clinic they missed out on stimuli which kept them motivated. Rehabilitation was impaired when there were issues with connectivity and audio-visual interference disrupted the flow of the consultation⁶. Some patients felt that telerehabilitation was as good as real life and didn't affect the flow of the consultation²⁷.

3.3 Hardware and Software

Patients who did not have access to equipment for virtual consultation needed to be provided with the required hardware^{23 24 27}. In some cases, significant support was required for patients to understand how to use the equipment^{28 6 24} and to troubleshoot connection problems when they arose^{6 23 24 27}. Overcoming these barriers was an important factor in maintaining the quality of the virtual consultation and is likely to require technical support provided by the clinical team⁶.

Theme 4: Interactions

Some patients reported being more relaxed in their own home⁶. One patient, however, felt uncertain about having someone looking into their home and aborted the video consultation²⁷. Virtual interactions were impaired at times there was a poor connection^{6 27} or a language barrier²⁴. These situations demanded additional focus and non-verbal communication²⁶ from the patient. The therapeutic relationship between patients and clinicians is negatively affected when patients feel alienated²⁸ or detached^{25 28} from their clinician. Patients with an expectation of hands on care^{6 16 24 25} found virtual rehabilitation more challenging and may need to invest additional effort to maintain an effective relationship with their therapist.

Discussion

This review synthesized nine qualitative studies reporting the use of virtual consultations in an orthopedic setting. We explored how the use of these technologies impacts on the work of being a patient. All studies in this review demonstrated that adjustments are required of patients to operationalise communication technology for virtually mediated clinical interactions. The adjustments (in the work) that a patient needs to make will have an effect on their experiences of receiving care. These experiences, whether previously lived or anticipated in the future, are likely to influence whether or not an individual finds the use of virtual consultations acceptable. The patient preference for a virtual consultation will depend on individual circumstances. Some of these factors which might influence their decision have been and presented in a conceptual model. The model attempts to demonstrate the relationship between patient work and preference when using communication technology. The model suggests that the use of virtual consultations changes the work of being a patient. The consequences (both positive and negative) of these alterations in work may impact on the patient's experience of receiving their healthcare, their burden of treatment and their ability to engage with their healthcare. This is an important consideration for clinician, managers and policy makers.

Clinicians have to pay more attention to the patient as a result of communicating using technology compared to face to face consultations⁹. This appeared to be at odds with traditional consultations where physiotherapists spoke for half of the allotted time compared to patients who spoke for only 33.1%³⁴ in initial encounters. A study found, during a follow up session between physiotherapists and patients, that physiotherapists spent twice as much time talking as the patients did and they relied on the use of their hands during the session³⁵. In addition to the content within sessions, the relationship experienced between the clinician and the patient may differ during a virtual consultation due some patients being more relaxed at home⁹.

Some patients expected 'hands-on' treatment. The transfer of clinician manual therapy towards patient self-palpation⁶ and exercise²⁵ may go against what is expected of therapists. The normative expectations of the patients change as a result of the geographical separation (and physical resources that can be mobilized) between patient and therapist³⁶. This places particular emphasis on self-management which shifts the responsibility for health away from the state and onto the individual³⁷. This is an important consideration as virtual consultations becomes increasingly used in clinical practice. The additional responsibility of self-management³⁸, the change in work and tasks required to operationalise communication technology may further burden patients as they are rehabilitated virtually.

Patient viewpoints are important. Kaambwa et al³⁹ found in their study of older people that patients had strong preference for telehealth services that targeted individuals living in remote regions without easy access to clinic. Our previous research¹⁶ demonstrated that distance to travel to a hospital was not the sole reason leading to the acceptability of Skype consultations and that preference is multi-factorial. We found that having rehabilitation in the patient's own environment was preferred by some although bringing the clinical space into the patient's home can change the meaning of their home for them⁴⁰. Greenhalgh et al⁴¹ considers, amongst other things, *what is expected* of the patient when using new technologies and explains that complex tasks are more likely to lead to non-adoption.

Greenhalgh et al's VOCAL study⁴² found that the situations where patients were appropriate for video outpatient consultations only formed a fraction of the overall workload. Such situations

included when close physical examination was not required and when both parties were technically confident and competent. The use of virtual consultations in these situations may increase patient work and therefore contribute towards their burden of treatment. Patients may therefore opt to choose a face to face consultation. Sav et al⁴³ call for collaborative discussions to help alleviate treatment burden.

Digitally enabled services are a key focus for the UK's National Health Service over the next 10 years¹. The use of digitally enabled services such as virtual consultations may be useful for some but add to the burden of treatment to others. Tools have been developed to assess burden of treatment⁴⁴⁻⁴⁸. Further research investigating the utility of tools such as these may highlight areas where digitally enabled services negatively (or positively) impact on patient experience. The work required and subsequent treatment burden for patients will differ on an individual case by case basis. Table 4 outlines some considerations for clinicians and policymakers considering the use of virtual consultations based on our findings from this systematic review. Further research investigating patient preference will help researchers and clinicians tailor services in a way that suits the need of patients.

Figure 2 demonstrates how the themes from this review interact with patient preferences. The work required of a patient will influence their expectations of whether or not the use of virtual consultations is acceptable. The logistics and time required of a patient will shape the resources the patient has to dedicate towards their care. The space available and the equipment the patient has access to determines the suitability of the environment. These, coupled with the impact on patient-clinician interactions will determine patient preference for or against virtual consultations. This leads us to our first preposition: Proposition 1: The work required of patients when using virtual consultations will influence their preferences for their use.

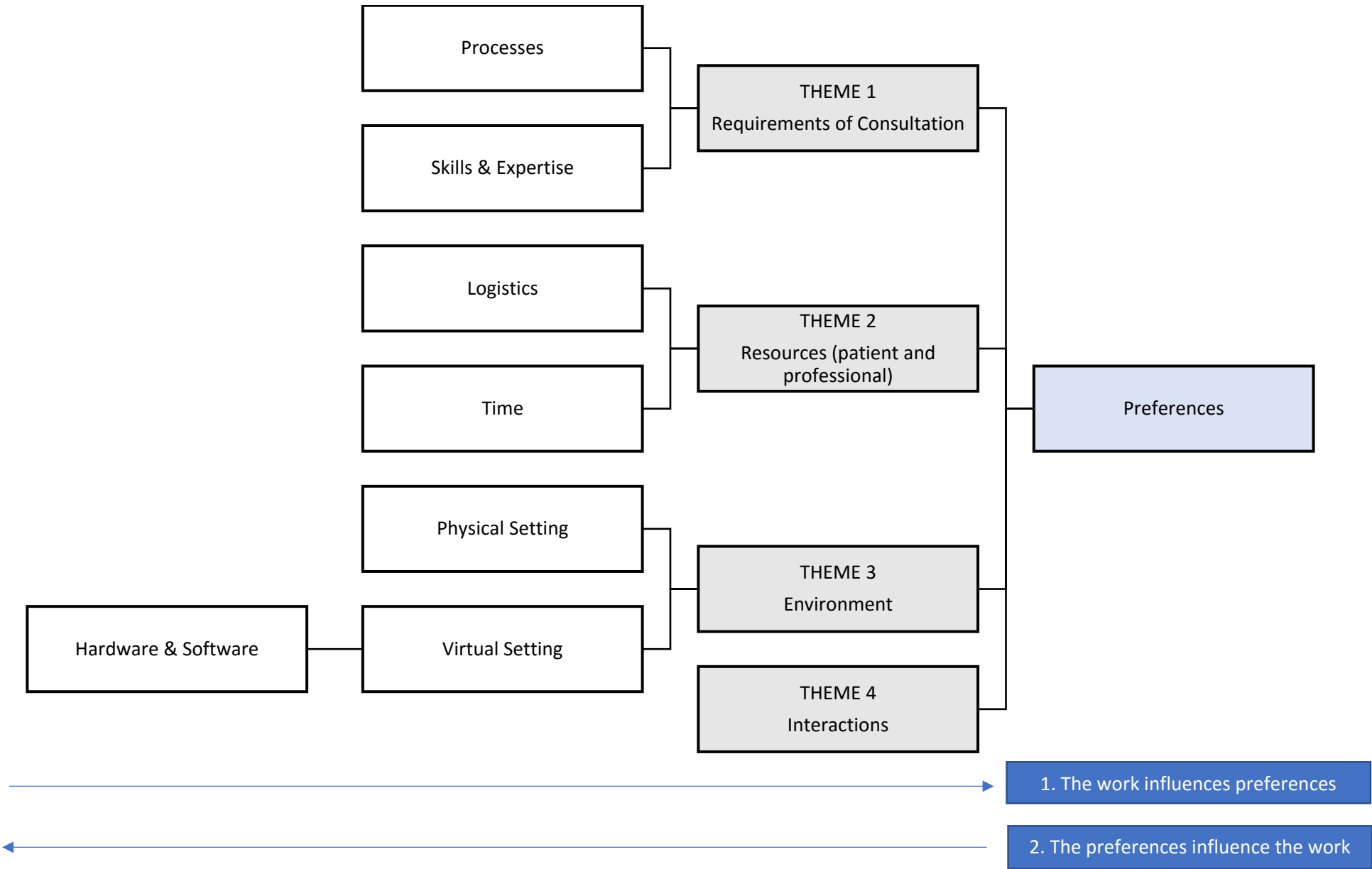
Face to face consultations and communication technology consultations have different requirements. Upon choosing a face to face consultation the patient follows the standard pathway. Choosing a communication technology consultation changes what is needed of patients. The change of work demands different skills, processes, expertise, logistical and environmental considerations. This in turn impacts on the nature of the interactions between the patient and their therapist. This leads us to our second preposition: Proposition 2: The preferences regarding the use of virtual consultations will influence the work of being a patient.

The outbreak of 2019 novel coronavirus (COVID 19) was first reported in Wuhan, China and reached the United Kingdom on the 31st January 2020. The COVID-19 virus spreads primarily through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. Social distancing measures have been established with the UK public being placed on 'lockdown' from the 23rd March 2020⁴⁹ to avoid transmission of the disease. Healthcare organisations have subsequently embraced the use of virtual consultations to comply with these social distancing measures⁵⁰ The outbreak of COVID-19 has led to a huge upsurge in the interest and importance of virtual consultations in practice⁵⁰⁻⁵². As such, many more patients have been forced into undergoing virtual consultations than would have otherwise been required. NHSx recently published information governance advice for health and care professionals⁵³ to facilitate appropriate use of virtual consultations during COVID-19. Future research should carefully evaluate the consequences of rapid virtual consultation implementation to allow for appropriate redesign of services embracing communication technology. Such redesign should consider how the use of these technologies impact on the work of being a patient.

Table 4 – Considerations for policy makers

Finding	Construct	Considerations for virtual consultations
Preferences are shaped by the requirements of the consultation how these change the work	The processes that change	<ul style="list-style-type: none"> • Consider the impact of changing processes on patients. • Offer troubleshooting for logging in and how to use the equipment. • Consider offering guidance surrounding the suitability of different locations when engaging in virtual consultations.
	The skills & expertise that is required	<ul style="list-style-type: none"> • Brief and support patients on the changes in style of communication. • Facilitate patients to communicate their problems through a virtual consultation. • Facilitate self-assessment of patients in the absence of clinician’s ‘hands-on’ care. • Facilitate and provide guidance on self-assessment and ongoing monitoring. • Design personalized exercise regimens that are suitable for the patient’s clinical problem and their home environment
Preferences are shaped by the resources that are required of patients	Logistics	<ul style="list-style-type: none"> • Consider offering virtual consultations for patients who experience difficulty with travel
	Time	<ul style="list-style-type: none"> • Consider conflicting demands for patients. • Consider the impact of travel and time on patient symptoms. • Consider the impact of patient comfort when waiting for their appointment.
Preferences are shaped by the work required due to the changes in the environment	Setting for physical rehabilitation	<ul style="list-style-type: none"> • Support patients to establish a suitable rehabilitation environment at home. • Design treatment regimens based on the patients access to rehabilitation equipment. • Support patients to integrate rehabilitation within the home environment.
	Setting for virtual consultation	<ul style="list-style-type: none"> • Offer troubleshooting when faced with technical difficulties • Consider offering peer support groups for patients who are unable to physically attend the clinic.
	Hardware and software	<ul style="list-style-type: none"> • Consider offering equipment based on the patient’s needs. • Tailor support for equipment use based on patient’s skill set. • Offer troubleshooting when faced with technical difficulties.
Preferences are shaped by the work that goes into maintaining adequate interactions	Interactions	<ul style="list-style-type: none"> • Clearly communicate when the connection is impaired; be prepared to abandon and reboot the virtual consultation as required. • Be prepared to emphasize the use of non-verbal communication. • Have an awareness of patient preferences; patients who prefer face to face care may require additional input to develop a therapeutic relationship.

Figure 2 – Visual Model to demonstrate how work influences preference.



Limitations of this review

Our review is subject to a number of important limitations. We included papers from the UK, Sweden, USA, Canada, the Netherlands and Australia which utilized a variety of communication technologies. The data that underpins our results are a secondary analysis of other previously collected data. We did not have access to the original qualitative datasets, only that presented in the research papers. To arrive at our conclusions, we have subjected the data from the primary studies to explanatory concepts that the original authors had not intended. The studies spread from 2005 to 2018. During this time technology has advanced considerably and the bespoke software used in the earlier studies (that were developed for the research study) may present different challenges to modern off the shelf software for use with commonly used personal devices such as phones, tablets or computers. It is also important to acknowledge the differences between the different types of technologies. A phone call does not allow for visualization whereas a video call does. Focusing on specific technologies may have generated more applicable results. The original research recruited patients who had opted into these studies. Patients who are satisfied with these technologies are more likely to be recruited to telemedicine studies and may not be a representative sample.

Conclusion

We reviewed eight qualitative studies which reported the use of phone or videocall in orthopaedic care and found that the use of virtual consultations changes the work of being a patient. We identified four different kinds of work relating to: (1) the consultation, (2) the use of resources, (3) changes in the environment and (4) interactions with the healthcare professional. Across all four domains, the change in work required of patients can be both burdensome (it makes it harder for patients to access their care) and beneficial (it makes it easier for patients to access their care). The burden experienced by patients is a result of the relationship between the demands of the work and their capacity to fulfill these demands. Such burden is individual and situational, depending on the clinical requirements and the patient's lifeworld. As a result, we have proposed that the work of being a patient influences their preferences and the resulting choice has consequences on the resulting work that is required of them. Changes in circumstances (such as availability of equipment, understanding of how to use the equipment, requirements of the rehabilitation) may alter what is required both clinically and technologically and influence preferences. This is an important consideration to patients, clinicians, managers and policy makers, especially at a time where the use of technology is being favored during the COVID-19 outbreak. We have demonstrated the importance of considering the work of being a patient when designing and implementing new technologies. Keeping the concept of patient work at the heart of technology implementation is essential to ensure successful uptake in practice.

Patient and Public Involvement

The CONNECT Project Patient and Public Involvement steering group (PPISG) has been set up to provide guidance on the conduct of the research (details available from www.theconnectproject.info). The first meeting of the PPISG was held in August 2016 prior to the submission of the research to the NIHR in May 2017. A discussion was held about the overall research aims which supported the identification of the research questions. The PPISG has supported the design of the overall research plan and will continue to be involved during the development and refinement of each phase prior to the completion of each study protocol. In addition, the PPISG will support the development of the lay-summary outputs to be disseminated to patients and members of the public. Links to research outputs will be made available on the CONNECT Project website available at www.theconnectproject.info.

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Contributors

AG wrote the paper and conceived the project with CM and JJ. CRM contributed knowledge on systematic reviews and qualitative analysis. AG and AJ completed the literature search, identification of papers and quality analysis of papers. CM, JJ, and AJ edited and critically revised the paper. All authors have read and approved the manuscript. AG is the guarantor of the manuscript.

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Competing Interests

None Declared

Patient Consent for Publication

Not required.

Data Availability

Data are available upon reasonable request.

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