



BMJ Open Experiences of telehealth e-mentoring within postgraduate musculoskeletal physical therapy education in the UK and Canada: a protocol for parallel mixed-methods studies and cross-cultural comparison

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ABSTRACT

Introduction Mentored clinical practice is central to demonstrating achievement of International Educational Standards in advanced musculoskeletal physical therapy. While traditionally delivered face-to-face, telehealth e-mentoring is a novel alternative to offering this unique pedagogy to facilitate mentee critical reflection, deeper learning and enhanced knowledge translation to optimise patient care. With COVID-19 resulting in widespread adoption of telehealth and access to mentors often limited by geography or cost, the potential value of telehealth e-mentoring needs investigating. To investigate the experiences and outcomes of multiple stakeholders (student mentees, mentors and patients) engaged in musculoskeletal physical therapy telehealth e-mentoring across two universities (UK and Canada).

Methods and analysis Using case study design, we will use sequential mixed methods involving qualitative and quantitative components based on existing evidence. To examine the influence of telehealth e-mentoring on health outcomes in patients with musculoskeletal complaints, we will use patient-reported outcomes for satisfaction, patient empowerment and change in musculoskeletal health. We will conduct semistructured interviews to explore the development of critical thinking, clinical reasoning, communication skills and confidence of students engaged in telehealth e-mentoring. To explore the mentor acceptability and appropriateness of telehealth e-mentoring, we will conduct a focus group in each site. Finally, we will include a focus group of participants from each site to allow a cross-cultural comparison of findings to inform international stakeholders. Quantitative data will be analysed using descriptive statistics (median and IQR) to describe changes in outcome data and qualitative data will be analysed following the Framework Method.

Ethics and dissemination This study has ethical approval from both institutions: the University of Birmingham (ERN_20-0695) and Western University (2020-116233-47832). Findings will be published in a peer-reviewed journal and disseminated to key

Strengths and limitations of this study

- This is the first study to explore the experiences of multiple stakeholders engaged in telehealth e-mentoring for postgraduate physical therapy.
- The mixed-methods case study design enables detailed exploration of experiences and outcomes involving all stakeholders as participants.
- Cross-cultural comparison is enabled through the use of multiple study site settings across countries/continents.
- Findings will be specific to physical therapy, the two universities and their respective countries, thus limiting transferability to other professions, settings and countries.

stakeholders in musculoskeletal physical therapy education and practice.

INTRODUCTION

Telehealth, which encompasses ‘telemedicine’, ‘telecare’, ‘telerehabilitation’ ‘teleconsult’ and ‘e-health’,¹ delivers healthcare using virtual technology and online communication platforms and can move beyond traditional practice settings,^{2 3} to overcome barriers to accessing healthcare such as time, geography and costs of specialist services.^{1 4} Considerable evidence exists to support its effectiveness (clinical and cost) and acceptability for improving health outcomes for patients, including reducing hospital admissions.^{1 3 5} Patient satisfaction with telehealth in musculoskeletal (MSK) physical therapy is widely reported as high³ and in fact recent trials reported higher levels than face-to-face care.^{3 6} Yet, widespread adoption of telehealth within physical therapy has been slow³ and to the



author's knowledge has not yet been used as a medium to support postgraduate professional development in MSK physical therapy. While a high level of psychomotor skills are deemed a core construct of MSK advanced practice,⁷ a considerable number of other core constructs (e.g. high levels of clinical reasoning, background knowledge and self-analysis as well as patient-centred approach, critical approach to practice etc.) could be achieved via telehealth.⁶⁻⁸ With evidence of good concurrent validity between telehealth-based physiotherapy assessment and that involving face-to-face assessment for a range of outcomes (pain, swelling, joint mobility, muscle strength etc.)⁹ and a range of studies within medicine supporting that 75%–83% of diagnoses are derived from the patient history data alone,^{10 11} learning outcomes could arguably be achieved through telehealth e-mentoring.

In MSK physical therapy, the International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT) sets the International Educational Standards¹²; being then operationalised through approved programmes in the UK by the Musculoskeletal Association of Chartered Physiotherapists (MACP) and in Canada by the Canadian Association of Manipulative Physical Therapy (CAMPT). Mentored clinical practice (MCP) is central to demonstrating achievement of these educational standards. Using a framework of clinical reasoning, students as mentees, facilitated by a mentor, are able to integrate new skills and knowledge (procedural and propositional) acquired within a university setting into their assessment and management of patients with MSK complaints in a practice setting. MCP offers a unique pedagogy to facilitate critical reflection, deeper learning and enhanced knowledge translation¹³ to optimise patient care. Improvements in patient outcomes for those physical therapists who had completed fellowships with a component of MCP¹⁴ and clinical trial data supporting its clinical effectiveness now exist.¹⁵

MCP is highly dependent on specialist input and suitably qualified MSK physical therapy mentors. Access to these mentors has become increasingly difficult in the UK with many of these highly trained mentors often working at an advanced practice level or in consultant/practitioner roles; therefore being involved in managing or leading large physical therapy services with no capacity for mentorship. Additionally, in Canada the geography of the country makes access to mentors challenging and limits opportunities for mentees to access mentors based on location. This often results in professional isolation for physical therapists practising in rural areas.¹³ Likewise, students report increasing difficulties when negotiating time away from work (costs, access, impact on service etc.) to complete the MCP component of IFOMPT-approved programmes. The COVID-19 pandemic has further compounded these issues forcing us to rethink how we approach healthcare delivery and mentorship. This has resulted in a shift of all initial contact MSK physical therapy being delivered as telehealth via remote digital consultation (telephone consultation and/or

video consultation) and a stepped rationale for escalation to face-to-face consultation.³ In light of these changes, alternative MCP approaches are urgently required to fulfil student and IFOMPT-approved programmes' needs, including the use of telehealth e-mentoring.

While a myriad of approaches are used (face-to-face, e-mentoring and telehealth), telehealth e-mentoring could be an adjunct to conventional face-to-face MCP approaches beyond COVID-19, to better prepare students through novel approaches to delivery of specialist MSK physical therapy; using remote and digital consultation as part of clinical triage in outpatient healthcare consultations.¹⁶⁻¹⁸

Where telehealth e-mentoring has been introduced in light of COVID-19, we urgently need to evaluate its acceptability, appropriateness and satisfaction from the stakeholder perspectives of patients, mentors and students. This potentially offers a novel approach for professional growth and development, integrating knowledge and skills acquired in a university setting into clinical practice.

Aim

To investigate the experiences of postgraduate Masters (MSc) physical therapy students, their mentors and patients with MSK complaints engaged telehealth e-mentoring (consultation/rehabilitation) in a UK and Canadian university setting.

Objectives

1. To examine the influence of telehealth e-mentoring on health outcomes in patients with MSK complaints.
2. To explore the development of critical thinking, clinical reasoning, communication skills and confidence of postgraduate students engaged in telehealth e-mentoring.
3. To explore the mentor acceptability and appropriateness of telehealth e-mentoring to facilitate student development towards achievement of IFOMPT Educational Standards.
4. To conduct a cross-cultural comparison of findings to inform international stakeholders.

METHODS AND ANALYSIS

Design and methods

Using case study design,¹⁹ we will use sequential mixed qualitative and quantitative methods to investigate telehealth e-mentoring as part of postgraduate physiotherapy education (figure 1). Data collection will take place from May 2020 through to December 2021. Details of the telehealth e-mentoring are detailed in figure 2. In the absence of reporting guidelines for mixed-methods studies, the study is designed in line with the Consolidated criteria for REporting Qualitative research,²⁰ and STrengthening the Reporting of Observational Studies in Epidemiology statement²¹ for qualitative and observational study designs, respectively.

Semistructured interviews will be used to explore development of critical thinking, clinical reasoning,

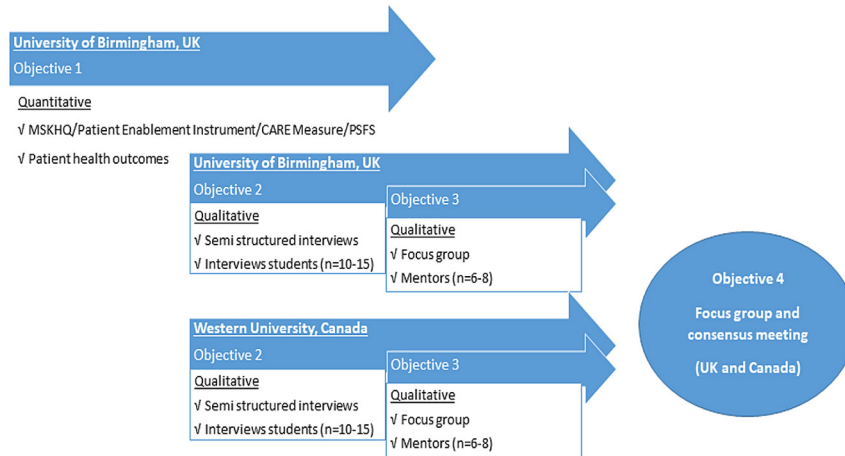


Figure 1 Exploratory sequential case study design. CARE, Consultation and Relational Empathy; MSK-HQ, Musculoskeletal Health Questionnaire; PSFS, Patient Specific Functional Scale.

communication skills and confidence of postgraduate students, patient-reported outcomes to explore patient experiences and changes in MSK health following telehealth e-mentoring, a focus groups to explore mentor acceptability and appropriateness of telehealth e-mentoring and a focus group for cross-cultural comparison of all data.

Participant recruitment and eligibility for each site

All participants must be able to communicate fluently in English, with access to a video consultation platform and able and willing to give informed consent.

- ▶ Patients (expected n=~50+) who self-refer to the UK University Advanced Manipulative Physical Therapy telehealth service with a MSK complaint will be invited to participate.
- ▶ Students (n=10–15) from the cohort of post-graduate students registered on the respective

IFOMPT-approved programmes who are registered on the MCP module/course will be invited to participate in a semistructured interview. Purposive sampling will be used to ensure a variance in the profile of participants with respect to age, gender, geographical and clinical experience on entry to the programme.

- ▶ Clinical mentors from the University of Birmingham and Western University programme (n=6–8) will be invited to participate in the focus group.

Exclusion criteria for patient participants include those who are not reporting an MSK complaint, for example, stroke rehabilitation. Mentees and mentors without licence to practise and professional indemnity insurance for the respective countries will be excluded.

Study setting

Two sites will be used to collect data: the University of Birmingham, UK and Western University, London,

	UK	Canada
Setting	University	Private Practice, University
Platform	Secure, password encrypted platforms (Zoom, WebEx, Canvas Virtual Learning Platform)	
Delivery model (150 hours of mentored practice)	May to September 2020 One telehealth clinic per week over 20 weeks Mentee assesses new patient (NP) each week with follow up patient (FP) appointments	October 2000 to July 2021 In-person, e-mentoring and/or mock scenarios. Patient assessment are in person or e-mentoring.
Mentor : mentee ratio	1:1 to 1:4	
Formative feedback	Weekly formative feedback (verbal/written) virtually and/or in-person (peer and mentor observation). Formative individual assessment week 10	Weekly formative feedback virtually and/or in-person
Summative feedback	Week 20 (assessment and management of a NP (1 hour) and FP (30 mins) with 30 minutes clinical reasoning viva. Examination includes evaluation of personal professional portfolio	Two NP assessment with expectations differing fall to spring. Written report of clinical reasoning of patient assessment and management, with evaluation of patient goals and expectations
Key components	<ul style="list-style-type: none"> • Student mentee’s individual learning contract and aligned to IFOMPT Educational Standards • Assessment and management of a range of msk patients (spinal, peripheral etc.) • Full informed consent gained by mentor/mentee (clinical and research) • Following mentee patient history taking (observed by mentor), mentee plans for physical examination. • Physical examination and management provided as required (adapted examination, exercise prescription etc.) • Patient centred care supported via additional resources e.g. exercise sheets etc. • Mentor observation of mentee • Peer mentoring facilitated through observation of mentee 	
PROM	MSK-HQ, PEI, PSFS and CARE	Patient/client consent is in accordance with the Canadian Physiotherapy Provincial license board
Governance procedures	Patient care provided with a UK licenced physical therapist (HCPC registration) Patient data managed in accordance with University Guidelines and GDPR 2018 – University secure server including record of informed consent (patient care and research)	

Figure 2 Description of telehealth. CARE, Consultation and Relational Empathy; GDPR, General Data Protection Regulation; HCPC, Health and Care Professions Council; IFOMPT, International Federation of Orthopaedic Manipulative Physical Therapists; MSK-HQ, Musculoskeletal Health Questionnaire; PEI, Patient Enablement Instrument; PROM, patient-reported outcome measure; PSFS, Patient Specific Functional Scale.



Ontario, Canada. Both universities host programmes that offer eligibility to IFOMPT via nationally accredited programmes in MSK physical therapy: Birmingham since 2004 and Western since 2007. Each site experiences unique challenges to fulfilment of MCP thereby affording a different lens on the potential merits of telehealth e-mentoring. A video consulting platform e.g. Zoom (password protected) will be used to conduct interviews and the focus group.

Data collection and procedures

Objective 1: longitudinal observational study (UK only)

Participants (patients) will be invited to participate in the study and complete the following questionnaires on initial assessment and/or discharge or onward referral (online supplemental file 1). Outcomes were selected to enable characterisation of the patient population and evaluation of their experiences of telehealth (self-care ability and satisfaction).

1. Patient health: the 15-item Musculoskeletal Health Questionnaire²² is a recently developed patient-reported outcome measure for use with patients with MSK conditions and Patient Specific Functional Scale²³ is a patient-specific valid, reliable and responsive outcome measure for patients with MSK complaints (participants selecting two activities to rate; 2-item).^{23 24}
2. Patient enablement: the 6-item Patient Enablement Instrument²⁵ is a well-established measure of self-care ability in first contact and primary care consultations.^{25 26} It has also been reported to demonstrate fair content validity, construct validity and internal consistency in patients with chronic MSK symptoms.²⁷
3. Patient-reported experience measures (10-item): rating of patient satisfaction will include key telehealth patient satisfaction themes, namely overall satisfaction, audiovisual quality and the Consultation and Relational Empathy measure.²⁸

Objective 2: semistructured interviews

Participants (students) will be invited to participate in a semistructured interview which will last 45–60 min. The interview will explore students' expectations and perceptions prior, during and after the period of telehealth e-mentoring, as well as exploring their individual experiences and beliefs around their development of clinical reasoning. The topic guide (online supplemental file 2) was informed by existing evidence including the M-Level health education Logic Model²⁹ and the core constructs of MSc level practice in MSK physical therapy.⁷

Objective 3: focus group

Participants (mentors) will be invited to participate in a focus group which will last 60–90 min. The focus group will explore acceptability and appropriateness of telehealth e-mentorship to facilitate student development towards achievement of IFOMPT Educational Standards. The topic guide will be developed inductively from the interim analysis of semistructured interview data.

Objective 4: focus group

Researchers and representatives from participant groups (patient, mentor and mentee) will be invited to participate in a focus group which will last 90–120 min. The focus group will explore key themes and outcomes from country-specific findings as part of a cross-cultural analysis. The topic guide for this will be developed inductively from the analysis of data from focus group, semistructured interviews and patient outcomes in each country.

Data management and data analysis

Quantitative data, including participant demographics, will be analysed descriptively using means and SD to determine change on pre-management and post-management, and to characterise the patient population who presented for telehealth in this study. Interviews and focus group will be audio recorded and transcribed verbatim. Post-transcription, response clarification will be completed to enhance accuracy and trustworthiness of participant views (member checking), with field notes used to maintain contextual details and non-verbal responses during data analysis/interpretation.²⁰

Qualitative data will be analysed using the well-established Framework Method.³⁰ This is a seven-stage process for qualitative data management and analysis involving (1) transcription, (2) familiarisation with the interview, (3) coding, (4) developing a working analytical framework, (5) applying the analytical framework, (6) charting data into the framework matrix and (7) interpreting the data. This approach will allow us to examine and understand the experiences of telehealth and e-mentoring from interview and focus group data. The method highlights the importance of involvement of individuals with experience in qualitative research, therefore experienced qualitative researchers will be involved at every stage of analysis.

Data storage, access and disposal

All quantitative data from the study will be collected using a bespoke online questionnaire, incorporating the measures as detailed above. Audio data will be transferred securely, transcribed by an approved service. Participant data will be stored confidentially for 10 years on password-protected computers that can only be accessed by the researchers, and in accordance with General Data Protection Regulation, the Data Protection Act 2018 and University of Birmingham's research governance frameworks in the UK and Western University Health Science Research Ethics Board.

Patient and public involvement

While conceived during the COVID-19 pandemic as a means of supporting ongoing student progression and development, the study is informed through many years of working (clinically and educationally) with patients, postgraduate students and MACP/CAMPT mentors. Given the novelty of this approach to postgraduate education, our prestudy consultation involved students,

patients, practitioners and representatives from relevant professional, ethical and legal bodies.

Mentors, mentees and patient representatives from each country will be invited to participate in the focus group to support cross-cultural analysis and interpretation of results, including key recommendations. Key stakeholders in postgraduate education for MSK physical therapists may also be contacted for their contribution and insight to help aid analysis and interpretation of results including the MACP and CAMPT. Patient and public involvement in the full study will be reported using the GRIPP2-SF when disseminating study results.³¹

Ethics and dissemination

Ethical approval has been granted by the respective ethics committees at the University of Birmingham (15/05/2020 ref ERN_20-0695) for the UK and at Western University, London, Canada (21/12/2020 ref 2020-116233-47832). All participants will sign a consent form and receive a participant information sheet prior to participation. They will have the right to withdraw from the study at any point and up to 4 weeks after data collection is completed. Patient participants will be advised that any involvement will not impact on any current and future healthcare. There are minimal risks associated with this study. When presenting the study findings, pseudonyms will be used to protect the participants' identities. Any protocol deviations will be documented. The findings from this research will be disseminated to key stakeholders in postgraduate MSK physical therapy education nationally and internationally, including MACP and IFOMPT.

DISCUSSION

This protocol outlines the rationale and methodology of a mixed-methods case study design across two countries to explore the experiences of telehealth e-mentoring within postgraduate MSK physical therapy education. The lead researchers for each site have considerable experience of postgraduate education in MSK physical therapy and experiences of the proposed research methodologies including relevant publications.^{7 12 29}

Findings from this international study will place a spotlight on the MACP and CAMPT as leading and collaborating internationally in innovative approaches to enable fulfilment of IFOMPT Educational Standards. The cross-cultural analysis will allow us to consider and share best practice experiences in telehealth e-mentoring, recognising that telehealth is well established in Canada as a means of delivering healthcare. We plan to explore how this and other cultural factors may influence the experiences of stakeholders to inform recommendations to IFOMPT for the adoption of telehealth e-mentoring in other member countries. Findings will inform the advancement of curriculum design in advanced MSK physical therapy postgraduate education, specifically overcoming the known limitations of existing approaches to MCP and to support development of advanced clinical

reasoning using an authentic alternative to conventional approaches. It is anticipated that the findings from this study will also improve the access to mentors with specialist skills and knowledge globally, thus improving the educational fulfilment of student mentees and in turn patient outcomes.

Limitations

Where data collection is occurring across two sites (country and setting) at different time points, the experiences for all participants may differ across sites. Likewise those leading the interviews and focus groups across sites will differ. Steps will be taken to minimise the influence of these factors on the cross-cultural analysis, including use of a co-written standardised topic guide, collaboration through stages of data analysis and interpretation. Furthermore, this will be specifically explored with participants from both sites involved in the final focus group.

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Contributors NRH is the CI leading the protocol development, analyses and dissemination. NRH and ABR are lead researchers for each site, ensuring rigour and quality in project management. NRH, WJ, MN, IT, JS, HG and ABR have contributed to the design and development of the protocol and have contributed to the manuscript draft. All authors have read, provided feedback and approved the final manuscript.

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Competing interests None declared.

Patient and public involvement statement The study is informed through many years of working (clinically and educationally) with patients, postgraduate students and MACP/CAMPT mentors. Given the novelty of this approach to postgraduate education, our pre-study consultation involved, students, patients, practitioners, and representatives from relevant professional, ethical and legal bodies.

Patient consent for publication Not required.

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