Allied Health Student Engagement in Telehealth Clinical Placements: A Rapid Review

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Abstract

Purpose: The engagement of allied health students in telehealth consultations whilst on clinical placement has rapidly increased due to the disruption caused by COVID-19. While this is understandable given the circumstances, it has occurred on the largely unfounded assumption that utilising telehealth is pedagogically appropriate to supplement or replace assessed placements. Method: This rapid review used the Cochrane rapid review methodology to synthesise the literature relating to the perspectives of allied health students whilst on clinical placements utilising telehealth. Results: A systematic search and selection process found three studies. In summary, the combined findings of the research suggest that student perspectives were generally positive, and several important benefits were reported, including being able to improve knowledge and skills, and reduce anxiety for some consultations. However, students acknowledged that some consultations were considerably more difficult to undertake without being in the same physical space as clients. Conclusions: The methodological quality of these three papers was inconsistent, and collectively the area clearly needs more evidence to support the transition of face-to-face to telehealth environments. Recommendations: Based on broader telehealth literature, the authors propose several recommendations to meet the immediate challenge of insufficient guiding research evidence. These include deconstructing telehealth placements into discrete clinical placement elements, using education theory to support student clinicians to implement a proactive, integrated approach to adopting telehealth as a standard service modality, and investing in and developing infrastructure, policy, systems, education, and training in an explicit, systematic manner. The use of telehealth within allied health clinical placements is here to stay, but considerable work is needed to prepare students for this environment as well as triaging and progressively scaffolding their experiences.

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A Rapid Review

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ABSTRACT
Purpose: The engagement of allied health students in telehealth consultations whilst on clinical placement has rapidly increased due to the disruption caused by COVID-19. While this is understandable given the circumstances, it has occurred on the largely unfounded assumption that utilising telehealth is pedagogically appropriate to supplement or replace assessed placements. **Method:** This rapid review used the Cochrane rapid review methodology to synthesise the literature relating to the perspectives of allied health students whilst on clinical placements utilising telehealth. **Results:** A systematic search and selection process found three studies. In summary, the combined findings of the research suggest that student perspectives were generally positive, and several important benefits were reported, including being able to improve knowledge and skills, and reduce anxiety for some consultations. However, students acknowledged that some consultations were considerably more difficult to undertake without being in the same physical space as clients. **Conclusions:** The methodological quality of these three papers was inconsistent, and collectively the area clearly needs more evidence to support the transition of face-to-face to telehealth environments. **Recommendations:** Based on broader telehealth literature, the authors propose several recommendations to meet the immediate challenge of insufficient guiding research evidence. These include deconstructing telehealth placements into discrete clinical placement elements, using education theory to support student clinicians to implement a proactive, integrated approach to adopting telehealth as a standard service modality, and investing in and developing infrastructure, policy, systems, education, and training in an explicit, systematic manner. The use of telehealth within allied health clinical placements is here to stay, but considerable work is needed to prepare students for this environment as well as triaging and progressively scaffolding their experiences.

Keywords: telehealth, allied health, clinical placement, work integrated learning

INTRODUCTION
Clinical placements are a crucial component of all health profession education courses.[1] They provide the context for students to engage in experiential, situated learning to translate curriculum-informed knowledge into practical clinical scenarios and workplace ecosystems.[2] Placements, practicums, or field work typically occur in a range of health and community contexts to ensure students develop and practice inherent skills required to become competent new graduate clinicians. Such skills and competencies are usually stipulated by accrediting or professional bodies and are based on minimum competencies as determined by specific assessment, completion of a set range of clinical activities, or a minimum number of clinical hours.[3] In-situ, or "real-world" learning environments also allow students to observe and understand the culture, ethos, processes, and overall workings and milieu of the larger health or education organisations and systems.[4,5]

Health education placements have been significantly impacted by the universal COVID-19 disruption of the delivery of health, community, and education services.[6-8] In many instances, student placements have been cancelled or postponed as organisations focus their business on essential health service delivery amidst this world crisis.[9] While necessary, cessation of health placements has, and will continue to have, a significant impact on the pipeline of health professional students qualifying and entering the workforce.[9] Consequently, health education providers and clinical placement agencies have been forced to adapt their clinical learning and practicum pathways, with many pursuing alternative opportunities to demonstrate clinical competencies.[6,7] Due to the scale and ongoing nature of this placement disruption, Tolsgaard and colleagues proposed a "COVID-19 education roadmap" recommending the triaging of medical education activities into stages labelled continue, postpone, adapt, drop or add.[9(p742)] Such placement models will be required indefinitely, as the world operates within COVID-safe recommendations and possible future lockdowns until effective vaccines are administered on a global scale.[10] As a result, implementation of new clinical practicum models will require flexibility in health education curriculum and placement design that are likely to deviate and challenge traditional pre-pandemic practices.[7] This has included, and will continue to include, a heavy reliance on telehealth adapted placements. [9]

A recent scoping review of the experiences of students who have used telehealth was completed by Serwe and colleagues.[11] Overall, six studies of the initial 955 identified were included. Notably, only one of the six studies occurred within a clinical placement or fieldwork placement. Liu and Miyaki authored a three-page supplementary report briefly describing an outreach satellite service established between the University of Alberta and rural communities between 1996-1999 that delivered 254 consultations.[12] The learning outcomes and experiences of the students were not explicitly stated, and it is unclear if the reported benefits relating to clinical education and outreach communities were based on analysis of student data or investigator observations. The remaining five studies in Serwe and colleagues' review all related to health education coursework and varied in pedagogy; two studies included telehealth simulation activities, and three included a single or repeated clinical activity delivered to a client. Clinical activities varied from a single screening session to intervention. All activities were part of a voluntary, formative or pilot program within designated tertiary subjects.

The absence of situated learning or clinical practicum studies in the Serwe et al. review is noteworthy.[11] There is a staunch belief, and historical practice, that allied health students must complete their clinical placements "in the field" to truly apply and translate coursework into "real world" clinical practice and be competent to enter the workforce. Thus, formative coursework experiences, as described in Serwe and colleagues' scoping review, differ greatly from situated learning or fieldwork placement activities that occur within the clinical environment as part of a complete service delivery model within a health service or organisation.

Given the uncertainty around the management, suppression, and ultimate extinction of COVID-19, together with the access and economic benefits telehealth can provide to both clients and clinicians, it is reasonable to anticipate that many health services that have recently adopted telehealth will maintain it long term. Yet, it is believed that collectively allied health students are not well prepared for working in telehealth environments. It is unclear whether pre-placement telehealth coursework and experiences translate to student telehealth competency. The dearth of evidence in this field is concerning given the recent global uptake of telehealth placements and the expectations that students and clinical educators can utilise a service delivery model that neither have experience with. Currently, the risks associated with the rapid telehealth adaption of clinical placements appear largely unknown, and it is unclear if the model is a valid, scalable, and sustainable option.

While there is some literature that describes the educational underpinnings of the preparation of students for telehealth practice or ad-hoc coursework-based experiences, it is difficult to establish the breadth of this literature and how it relates to clinical placements and field work. This is primarily because research investigating telehealth has focused predominantly on single disciplines and the development of clinical guidelines within these disciplines. As such, there has been no attempt to synthesise the literature on telehealth clinical placements to inform practice.

In this study, we undertook a rapid review using the eight-step method published by the Cochrane Rapid Reviews Methods Group.[13] The aim of this rapid review was to synthesise the published literature relating to the educational perspectives of allied health students whilst on clinical placements utilising telehealth.

METHODS
A rapid review is an accelerated and modified systematic review method used to synthesise relevant evidence in an efficient manner. Rapid reviews are often used in times of crisis or emergency, as in the current COVID-19 pandemic, when timely dissemination of actionable and strategic evidence is needed to make crucial decisions about health systems.[14] Consequently, topics are refined, eligibility criteria are limited, and searching a restricted number of databases is recommended, including a limit or exclusion of grey literature.[13] This exclusion supports efficient and economic rapid review practices, with a focus on search specificity rather than the sensitivity privileged in traditional systematic reviews.[13,14] In the context of COVID-19, rapid reviews have been published across health in relation to virtual geriatric clinics, mental health, and palliative care.[15-17] These reviews also relied on searching 3-4 main databases, with one also reporting manual searching of systematic review reference lists .[15-17]

Search Strategy and Selection Criteria
The search strategy and search terms were established by the research team in consultation with a Senior Library Research Advisor. Search terms were organised across three main concepts: 1) telehealth; 2) allied health discipline, and 3) placement. Database searching was conducted by a Senior Library Research Advisor in July 2020. The following databases were searched: CINAHL, Embase, Medline, Cochrane Central and ERIC ProQuest. Appendix A provides the full list of search terms including the allied health disciplines as designated by the State Government of Victoria, Australia, at the time of this search.

The following inclusion criteria was applied: 1) met the definition of telehealth as live and synchronous delivery; 2) published after 2005 (as universal access to internet-based telehealth platforms was feasible due to the rise of higher-speed, lower-latency, and lower-cost wireless technologies[18]); 3) investigating and reporting student perspectives or experiences of telehealth clinical placements; 4) students from one of the designated health disciplines (Allied Health Professions as designated by the State Government Department of Health, Victoria, Australia, at the time of this search: https://www2.health.vic.gov.au/health-workforce/allied-health-workforce/allied-health-professions; Appendix A) and; 5) students engaged in a placement/practicum. For the purposes of this study, the following definition of a placement/practicum was used: a clinical placement or practicum is the location where a student is sent to learn how to apply practice skills already studied in coursework. The placement occurs over a set period of time in which the student completes a range of clinical activities and/or minimum number of clinical hours with evaluation of their skills and competencies.[3,5] Studies were excluded if 1) they solely reported on how telehealth was used; 2) they investigated and reported on the perspectives of medical practitioners or nurses (i.e. not allied health disciplines); 3) they evaluated asynchronous activities; and 4) they described a student experience rather than a placement (i.e. not meeting the definition above). As per the Cochrane protocol, pilot testing occurred with the first 30 abstracts, resulting in no changes to the data extraction form or protocol.[1]

Study Selection
The initial search yielded 5135 studies, of which three met our inclusion criteria and are included in this review (Figure 1). Studies were imported into the EndNote reference management system where duplicates were removed prior to screening by a Senior Library Research Advisor. A total of 3957 items remained after removal of duplicates. Screening of titles and abstracts was completed by the first author using the predetermined inclusion and exclusion criteria. A second reviewer (the second author) screened 20% of all titles and abstracts (approximately 790 items) as per Cochrane recommendations.[13] Percentage agreement at title and abstract screening was 99%. A third reviewer (the fourth author) screened all excluded abstracts. There were 37 eligible studies following title and abstract screening which progressed to full-text review. Full-text screening of 37 studies was carried out by a trained research assistant. A second reviewer (the third author) screened all excluded full text studies. Percentage agreement at full text screening for excluded studies was 100%. A total of three studies were included in the final review (Figure 1).
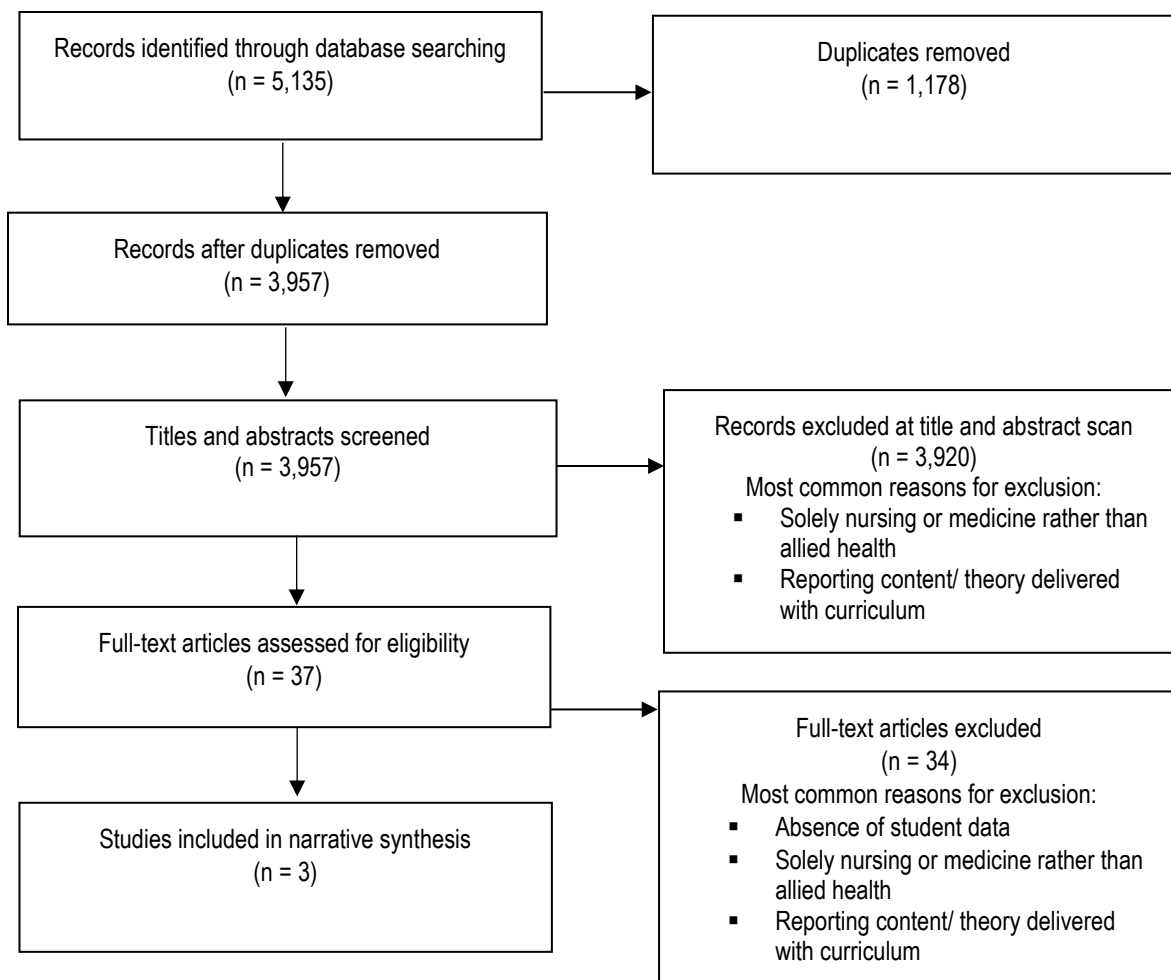
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│             searching                │───────▶│            (n = 1,178)              │
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│                                     │        │   Most common reasons for exclusion: │
│                                     │        │   ▪ Solely nursing or medicine rather than │
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│                                     │        │   ▪ Absence of student data         │
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Figure 1: Search and Selection Process

Data Extraction

A data extraction form from the Cochrane Developmental, Psychosocial and Learning Problems Review Group's Data Collection Form for Intervention Reviews (RCTs and non-RCTs) was adapted for this rapid review. The adapted data extraction form (Appendix B) was confirmed by all authors prior to data extraction commencing. The main modification to the original Cochrane data collection form was to remove the section used to determine whether a study met the review's eligibility criteria, as this had already been determined prior to data being extracted. The same research assistant involved in full-text screening extracted data from the three included studies. A second reviewer (the third author) checked for completeness and accuracy of the extracted data. This involved data crosschecking between the data extraction form and article for each of the included studies to confirm accuracy of the data extraction process.

Quality Appraisal

The Cochrane Developmental, Psychosocial and Learning Problems Review Group's Risk of Bias Assessment Form was used to evaluate the quality of the included studies. The risk of bias form assesses selection, performance, detection, attrition and reporting bias through six items requiring the assessor to identify the risk as "high," "low" or "unclear." The form has been designed for use with experimental studies; however, many of the assessed forms of bias on the form are relevant in non-experimental designs. In addition, for non-experimental studies, the reviewers were encouraged to use the "other forms of bias" section of the form to note other types of bias not otherwise accounted for. One reviewer (the second author) conducted the risk of bias assessment with full verification by a second reviewer (the first author).

RESULTS

The aim of this rapid review was to provide an evidence-based synthesis of the perspectives and experiences of allied health students on clinical placements utilising telehealth. A systematic search and selection process found three studies which are presented in this review. The methodological characteristics of the included studies, and demographic characteristics of the study samples, are provided in Table 1 and synthesised narratively below.

Date of Publication and Study Design

The three included studies were published in the last five years, one in 2015 (Skoy et al.), one in 2017 (O'Hara and Jackson) and the most recent in 2018 (Bridgman et al).[19-21] There were two Australian studies and one from the USA.[19-21]

Participant Characteristics

Across the three studies, data were collected primarily from two participant groups: allied health students engaging in a telehealth clinical placement and their clients. One study collected the perspectives of educators in addition to client and student perspectives.[20] Allied health students included pharmacy students (n= 82), physiotherapy and occupational therapy students (n= 4), and speech pathology students (n= 6).[19-21] As the focus of this review is on student perspectives, client and educator characteristics and perspectives are not described here (refer to Table 1 for a summary).

Characteristics of the Telehealth Clinical Placement

Two studies reported on a single assessment delivered via telehealth and one reported on a 20-day placement.[19-21] Skoy et al described the perspectives of pharmacy students who delivered counselling via telehealth to patients located in remote areas.[19] O'Hara and Jackson investigated the skills and experiences of an occupational therapy student and a physiotherapy student after administering a 90-minute clinical interview and physical assessment.[20] Finally, Bridgman et al reported student attitudes and experiences across several time-points of a stuttering clinical placement incorporating both in-clinic and telehealth services.[21]

Data Collection Tools

All three studies employed written questionnaires as the primary method of data collection, consisting predominantly of Likert-scale questions in response to 9, 13, and 18 statements.[19-21] Two studies included open-ended questions.[20,21] Data were collected at one timepoint immediately following the telehealth consultation or telehealth assessment, and at three timepoints (end of first placement day, mid-placement, final placement day) for the study by Bridgman and colleagues.[19-21]

Methodological Quality

The preliminary nature of the included research means the results should be interpreted with some caution. The included non-experimental studies were designed to measure student experiences and attitudes to telehealth after engaging in a telehealth clinical placement: however, none established these prior to commencement for comparison. This means factors like previous exposure to telehealth or technology in general were not accounted for. In each case, the study authors developed a questionnaire for the purposes of their research. While these were reported to be based on a review of the literature or adapted from other questionnaires, their psychometric properties were not established. Skoy et al also reported data from a faculty developed rubric used to assess student clinical performance.[19] This assessment was administered without attempt to blind the assessor from the purpose of the research. Another factor potentially impacting the validity of the results is the relationship of the student participants to the researchers and the health service their placement occurred at. In each study, the researchers were also the clinical educators for the student participants. As such, there is the risk that the participants' responses to the surveys were influenced by an intention to provide responses they perceived as desirable by their supervisors. This is especially the case given two of the studies had very small sample sizes and so the risk of being identified was heightened.

Main Findings

The main findings for each of the included studies are presented in Table 1. In summary, the combined findings of the three studies suggest that the student perspectives of telehealth clinical placements were generally positive, and several important benefits were reported. As the only study that collected data on multiple occasions, Bridgman and colleagues also demonstrated that with direct telehealth clinical placement experience, student attitudes towards telehealth can change over the course of a clinical placement.[21] The participants' attitudes towards telehealth generally were shaped by both their own experiences and the perceived benefits they observed for their clients. Participants across all studies recognised the widely accepted benefits of telehealth for providing services to clients in remote locations or with specific lifestyle or health conditions that mean they would not ordinarily have access to the service.

Students in the O'Hara and Jackson study recognised the benefit of telehealth for advancing their own knowledge and skills.[20] This was achieved by delivering a specialist service to a client facilitated by an expert clinician at a remote location that they

otherwise would not have been able to experience. Perhaps unexpectedly, participants in the study by Bridgman et al reported that the telehealth environment was less anxiety-provoking and more conducive to student learning than in-clinic sessions.[21]This was due to the ability to seek support outside of the clients' view including referring to notes and speaking to educators off-camera. Some students also reported that telehealth allowed them to monitor their own performance through the real-time visual feedback afforded by the screen.

The participants across the three studies identified some limitations of telehealth. For example, students perceived more differences relating to the observation and interpretation of the whole client's face and body when using telehealth. This was particularly challenging for the students in both the Bridgman et al study, as it impacted clinical performance by making identifying stuttering difficult, and in O'Hara and Jackson where the students could not view a client whilst performing fine motor tasks or walking.[19,20] The participants in Skoy et al reported a significant difference in their ability to detect differences in aspects of voice quality when speaking to a client via telehealth compared to being in the room with them.[19] Building rapport with clients was also perceived to be more difficult via telehealth.[21] Having established relationships with telehealth clients was perceived as useful for students supporting clients to overcome technological challenges.[20] Problems with technology meant that clients and practitioners could not always be heard clearly, and significant audio-visual latency meant that assessments sometimes took longer to complete or were more difficult to accurately complete than in an onsite mode.[20,21]

Reference	Aims	Participants	Client characteristics	Characteristics of the telehealth placement setting	Data collection	Main results
O'Hara & Jackson[20]	To understand the experiences of clients, Allied Health Professionals (AHPs) and students using telehealth in terms of technology; interaction via videoconferencing; comfort; confidentiality; accessibility of expert services; and clinical knowledge and skills.	Two allied health students (occupational therapy, physiotherapy) in Mt Isa with three staff members (AHPs), and two students/two staff from Townsville (observers).	Ten adults with neurological conditions[1] who had previously accessed the service and had previously met the AHPs during onsite services in a previous delivery period. Clients were selected based on their need for a clinical review.	A 90-minute assessment consisting of a clinical interview and physical assessment provided via telehealth by three AHPs (occupational therapists and physiotherapists) with assistance from two students.	18-item questionnaire (clients, staff, students) and staff review of the program and processes.	Students rated all relevant survey items as agree-strongly agree. They identified the benefit of telehealth for service access and for advancing their own knowledge and skills. All students reported they would use telehealth again.
Skoy, Eukel, Frenzel & Schmitz[19]	To evaluate pharmacy students' ability to counsel via telepharmacy to determine if there was a difference in their ability to counsel via telepharmacy or onsite. To investigate student perceptions regarding telepharmacy consultations.	82 second year pharmacy students at the North Dakota State University organised into two groups consisting of 25 students (group one) and 57 students (group two)[2].	Patients at a remote, rural pharmacy approximately 320km away.	Students conducted a single interview and assessment with a patient located in a remote area.	13-item questionnaire (4-point Likert scale) immediately after the telepharmacy consultation.	Group one (with more prior experience of face-to-face consultations) perceived more differences between telehealth and face-to-face consultation than group two based on the overall survey results but these differences were only statistically significant for one survey item relating to voice tone and volume.
Bridgman, Pallathil, Ford, Tran, Lam, Wee & Kefalianos[21]	To explore the attitudes and experiences of speech pathology students delivering telehealth and in-clinic stuttering treatments as part of a clinical placement.	Six final year speech pathology students (working in pairs)[3].	Adults and adolescents self-referring for stuttering treatment (n=8) and one school-aged child. Clients lived in metropolitan or regional areas of Victoria, interstate or overseas.	20-day clinical placement	A questionnaire consisting of nine Likert-scale questions and six open-ended questions completed at three timepoints: 1) end of first placement day; 2) mid-placement, and 3) end-placement.	High level of agreement with survey statements around developing rapport, delivering assessment and treatment and overall satisfaction with both the telehealth and in-clinic placements at the conclusion of the placement. No preference for either service delivery model at the conclusion of the placement except for one student expressing a strong preference for telehealth.

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[1] Cerebrovascular accident (n=5), cerebellar ataxia (n=2), spinocerebellar ataxia (n=1), spinal cord injury (n=1) and acquired brain injury (n=1).

[2] Group one was first evaluated on their onsite counselling and then via telepharmacy, and group two followed the reverse order

[3] Prior to the placement, students attended a one-hour lecture on telehealth delivery of stuttering interventions

DISCUSSION

Across the health disciplines, the impact of COVID-19 has resulted in widespread clinical placement cancellations and delays. As a result, many institutions have rapidly transitioned to telehealth placements out of necessity. Clinical placements represent a crucial component of educating health practitioners. They provide an opportunity for the student to apply their academic learning in a clinical context, and in many circumstances are the final critical educational step before entering the workforce. While the rapid integration of telehealth into allied health clinical placements is understandable given the circumstances, it has occurred on the largely unfounded assumption that utilising telehealth is pedagogically appropriate to supplement or replace assessed placements.

Serwe and colleagues' recent scoping review of the experiences of students who have used telehealth focused on six studies where telehealth was largely embedded within tertiary academic curricula.[11] Our rapid review has served to supplement this by only including research reporting the use of telehealth within allied health clinical placements. Whilst this review reports favourable student experiences and perceptions of telehealth clinical placements, more evidence is required. The initial search yielded many studies, yet only three were found to be relevant and included in this review. The fact there is very little empirical evidence about student experiences and perceptions of telehealth clinical placements confirms that, in the context of COVID-19, these have occurred in the absence of a robust evidence base.

What emerged from the evidence is that students require many skills in addition to clinical competencies to successfully deliver telehealth services. A common finding from the three included studies was that students require appropriate training in the use of the technology. In particular, the ability to problem-solve technology failures and assist clients who are unfamiliar with the technology is important. Previous research has also highlighted problem-solving skills related to technology as the most critical skill to be explicitly taught to students engaging in telehealth.[21] Overby and Baft-Neff also established that additional training in nonverbal communication and communicating with clients via technology is required.[22] This is supported by participant reports in the three studies in this review. Of most concern is that students reported problems with their ability to administer components of assessments or consultations due to the technology. Given the role of the placement is to provide an opportunity to practise the inherent skills required to become a competent clinician, appropriate technology, training, and support is essential where telehealth is a component of the placement. Failure to ensure this means students are burdened with the compounding effect of trying to demonstrate clinical competencies while also managing an unfamiliar and potentially unsuitable or unreliable technology.

While more evidence to inform the use of telehealth within clinical placements is required, the long-lasting effects of the pandemic, along with an appreciation of the economic and access benefits offered by telehealth, will mean that students will continue to participate in this model of service delivery. As such, below we propose several recommendations to meet the immediate challenge of insufficient guiding research evidence.

Recommendations

1. Deconstruct telehealth placements into discrete clinical placement elements and draw on the respective literature.
   - Draw on the procedure, intervention, or discipline-specific literature for the clinical tasks to be undertaken via telehealth.
   - Consider distance supervision literature, as this online supervision pedagogy may translate to current supervision practices whereby supervising clinicians are not co-located with students. [23,24]
   - Use recommended telehealth practices to assist with more context-dependent, less transferable skills; which are more likely to include professional and psychosocial behaviours.[25]
2. Use education theory to support student clinicians. These could include:
   - Contextualisation – including explicit consideration and teaching about the virtual clinical context and the impact this may have on both the clinician, student, and client, including altering the expected learning patterns or being aware of preconceived competency expectations based on typical in-person clinical experiences.[25-27]
   - Complexity Science – supporting educators to view themselves and their students within the four domains Schoo and Kumar position them in; (personal, health services, educational, and societal), and how these can assist with the translation of clinical education within the current climate, and in response to the concerns and influences the pandemic brings.[2]
   - Integrative resilience - inclusion of Wald's "tips" to provide the supervisor with strategies to support and safely supervise their student, given the likelihood of increased anxiety and stress as students navigate health systems, caseloads, and their own health while simultaneously being assessed against non-pandemic competencies that include knowledge translation, clinical reasoning, and professional communication.[6]
3. Implement a proactive, integrated approach to adopting telehealth as a standard service modality and invest and develop in infrastructure, policy, systems, education and training in an explicit, systematic manner.[28,29] Smith and colleagues recommend suitable education and training including integration into competency standards, design of

clinical care models, funding, and legislation to support routine and sustainable telehealth services.[28] Such education and training must consider the context and individual clinicians at a micro-level, and not just organisations at a macro-level. [27]

Limitations
There are some clear limitations of this review that should be acknowledged. As previously noted, only three studies met the inclusion criteria, that was filtered considerably by virtue of considering only published allied health disciplines. This discipline group itself is very diverse in the nature of activities regularly undertaken within these professions, some of which lend themselves more to telehealth environments than others. Another limitation was that the use of data from one timepoint within the telepractice session/experience by O'Hara and Jackson and Skoy et al, which made it difficult to gauge student perceptions of their experience and how this may have changed across the span of the clinical placement.[19,20]

Conclusions
The methodological quality of these three papers was inconsistent, and collectively the area clearly needs more evidence to support the transition of face-to-face to telehealth environments. The recommendations in this study may ultimately serve to add clarity in the understanding of allied health student engagement in telehealth.

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APPENDIX A

Search Terms

Concept 1	Concept 2	Concept 3	Concept 4
• Telepractic* • telehealth • eHealth • mHealth • telemedicine • teledeliver* • video conferenc* • online • web-bas* • web-mediat* • remote • distance • service delivery • virtual clinic	• health science* • allied health • Audiolog* • Exercise Scien* • Occupational Therap* • Physiotherap* • Prostheti* • Orthoti* • Speech Patholog* • Speech Language Patholog* • Speech Therap* • Speech Language Therap* • Dietetics • Dietitian • Nutrition* • Orthopti* • Podiatr* • Social Work • Art therap* • Chiropract* • Exercise physiolog* • Music therap* • Optometr* • Pharmac* • Psycholog* • Osteopath* • Oral health • Biomedical scien* • Diagnostic imaging medical physics • Medical laboratory scien* • Nuclear medicine • Radiation oncology medical physics • Radiation therap* • Radiograph* • Sonograph* • Allied health assistan*	• Clinical placement • Medical education • Fieldwork • Practicum* • Placement* • Work integrated learning • Industry placement* • Clinical education	• Student* • Undergraduate* • Graduate*

APPENDIX B

Data Extraction (Adapted from the Cochrane Developmental, Psychological, and Learning Problems Review Groups Data Collection Form for Intervention Reviews (RCTs and Non-RCTs)

General Information
Date form completed
Name/ID of person extracting data
Reference citation
Study author contact details
Publication type

Characteristics of Included Studies

Methods
Aim of study (e.g., efficacy, equivalence)
Design (e.g., parallel, non-RCT)
Duration of participation (from recruitment to last follow-up)
Ethical approval needed/ obtained for study

Participants
Population description
Setting (e.g., location, social context)
Inclusion criteria
Exclusion criteria
Method of recruitment of participants (e.g. phone, mail, clinic patients)
Informed consent obtained
Total no. randomised (or total at start for non-RCTs)
Age
Sex
Race/ethnicity
Diagnosis and severity
Co-morbidities
Other relevant sociodemographic data

Intervention
Group name
No. randomised to each group, i.e. intervention/control
Description (sufficient for replication)
Duration of treatment period
Timing (e.g., frequency, duration)
Delivery (e.g., mechanism, medium, intensity, fidelity)
Providers (e.g., number, training, profession)
Co-interventions
Integrity of delivery
Compliance

Outcomes
Outcome name and type (primary/secondary)
Time points measured (including from start or end of intervention)
Time points reported
Outcome definition (with diagnostic criteria if relevant)
Person reporting/measuring
Unit of measurement
Is outcome/tool validated?

Imputation of missing data (i.e. the way data is handled in the event of dropouts)
Data and Analysis
Comparison (groups)
Outcome/s
Time point/s (specify from start or end of intervention)
Post-intervention or change from baseline?
Number of participants in intervention/control
Intervention result for each group and Standard Error (or other variance)
Overall results
Any other results reported
Number of missing participants (with reasons)
Number of participants moved from other group (with reasons)
Statistical methods used and appropriateness of these