What helps or hinders clinicians in their decision-making processes when using or prescribing mHealth apps in practice? An exploratory study.

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Abstract

Recent advancement and use of technology in healthcare has led to a rapid growth and availability of mobile health applications (mHealth apps) in clinical practice. This proliferation has led to growing concern over the unregulated nature of this new industry. The expectation that clinicians abide by the rule "do no harm" has also raised concerns regarding the maintenance of client safety and questions as to how clinicians navigate this tension and how mHealth apps are being used in clinical practice. This research investigated what helps and hinders the use and prescription of mHealth apps in allied health clinical practice. Using a qualitative descriptive methodology, an exploratory study was conducted utilising a mixed methods approach. The twelve participants consisted of 11 physiotherapists and an occupational therapist. Thematic analysis was used to analyse data. Two themes were constructed from the data: (1) Deflection of professional responsibility and (2) Dependence on the physiotherapy toolbox and evidence based practice. This research established basic understanding of the acceptability and use of mobile technology in allied health practice. Results demonstrated a poor use of mHealth apps and a preference for a certain kind of evidence-based technique in clinical practice. Clinicians also voiced a lack of knowledge and confidence in their own skills or judgements in relation to mHealth apps, with many admitting to relying on recommendations by colleagues, professional bodies and clients.

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INTRODUCTION

As smartphone accessibility increases, exposure to and use of mHealth apps is escalating. Despite this, uptake of mobile health applications (mHealth apps) in clinical practice has not paralleled rising smartphone ownership (Chan, Torous, Hinton & Yellowlees, 2015; Donker et al, 2013). This is hypothesised to be a result of clinician uncertainty, limited available research, and "app overload" (Chan et al., 2015; Chan & Misra, 2014; Donker et al., 2013; Van velsen, Beaujean & Van Gemert-Pijnen, 2013).

With increasing availability of mHealth apps, particularly for self-management of various chronic conditions, there is potential for clients to self-prescribe or seek recommendations and guidance from clinicians on their use (Ozdalga, Ozdalga & Ahuja, 2012; Mosa, Yoo & Sheets, 2012; Powell, Landman & Bates, 2014). Recognising this, Fairburn & Rothwell (2015) suggest that clinicians should enquire about their clients' mHealth app use during initial assessments. This sets the expectation that clinicians are familiar with and knowledgeable about mHealth apps in their field of practice.

Currently, mHealth apps are poorly defined and demarcated in research and clinical practice, resulting in a thin and overly broad literature base (Cummings, Borycki & Roehrer, 2013). Broadly, mHealth might be considered a sub-set of eHealth, but with a specific focus on smartphone technologies, in particular how apps are developed and used on these phones for health and fitness purposes (e.g., MS Energise, a new app that facilitates fatigue management using cognitive behavioural techniques). The combination of rapid industry growth and a lack of quality assurance has generated concerns of potential risk to patients' physical and psychological safety (Boulos, Brewer, Karimkhani, Buller & Dellavalle, 2014). Risks may arise through provision of inaccurate information, poor privacy, and potential lack of therapeutic benefits (Boudreaux et al., 2014; Buijink, Visser & Marshall, 2013). Unchecked industry development adds to these concerns, as rapid technological advances can sacrifice client safety for consumer demand (Doarn & Merrell, 2013). Although mHealth apps must meet specific criteria to be sold via application stores (e.g. Google Play, Apple iStore), these criteria are predominantly technological in nature, and do not require medical oversight (Butcher, MacKinnon, Gadd & LeBlanc-Duchin, 2015). Consequently, mHealth apps may lack appropriate content quality and sufficient medical accuracy prior to public availability. This highlights the need to identify safe and trustworthy mHealth apps (Jin & Kim, 2015; Yasini & Marchand, 2015).

According to Butcher et al. (2015) and Donker et al. (2013), clinicians demonstrate poor overall knowledge regarding suitable and safe use of mHealth apps. Butcher and colleagues (2015) stated that of the 77% of nurses and doctors using mHealth apps in the United Kingdom, only 23% conducted an informal evaluation of mHealth suitability prior to use. Other studies have tended to assume the use of evaluation tools for critical assessment of mHealth apps prior to clinical use (e.g., Hussain et al., 2015; Donker et al., 2013).

Literature concerning the implementation of mHealth apps in clinical practice appears limited, especially as this applies to implementation within Aotearoa/New Zealand (A/NZ), with none directly or exclusively pertaining to the allied health professions. The extent to which the use of mHealth apps occurs within clinical practice remains thus largely unknown. The aim of this study was to provide insight into the barriers and facilitators for the clinical use of mHealth apps by allied health clinicians. In this study, an mHealth app was defined as any application used for education, point of care, patient interaction or clinical reference on a portable smart device, such as a smart phone or a tablet (Aungst, Clauson, Misra, Lewis & Hussain, 2014).

METHODS

Design

This paper reports on a qualitative descriptive study, exploring the perspectives of A/NZ registered allied health professionals regarding their mHealth app use in clinical practice – especially in light of the expectation to "do no harm." A post-positivist, realist perspective has been used throughout the study, underpinned by the principles of naturalist enquiry (Golafshani, 2003). Prior to the research project ethics approval was gained through the Auckland University of Technology Ethics Committee (reference number: 15/459).

Recruitment and Sampling

Participants were recruited initially through convenience sampling using social and professional connections within allied health professions; snowball sampling was used after this point. Potential participants received a participant information sheet and invitation to take part via email. Only A/NZ registered health professionals were included.

Health professionals were eligible to take part when they a) owned or had access to a smart device (phone or tablet), b) were familiar with the use of smart phones and apps, c) had an mHealth app or were willing to download an mHealth app on their phone and d) were using or intended to use mHealth apps in clinical practice.

Data collection

Three data collection methods (online survey and single in-person interview or focus group) were used at two data collection points. First, participants were invited to select a mHealth app of their choice, or from a list provided by the research team, and evaluate the chosen app for its usability, quality and safety in preparation for the first data collection point. Participants were then invited to take a "qualitative dominated" online survey (Terry & Braun, 2017) with a set of open and closed questions that focused on the clinician's experience of evaluating their chosen app. A number of participants began the survey and were therefore allocated a participant number, but did not complete the survey.

For the second data collection point, participants were invited to take part in a single individual interview or focus group depending on their preference. Focus group and interview questions were semi-structured and offered an opportunity to further explore survey question answers and generate a richer understanding of the research question. Interviews and focus group data were transcribed verbatim. Participants were offered the choice to participate at both collection points or take part in either depending on their available time; therefore, not all participants took part in all collection points. A total of 12 Auckland-based participants completed one or both data collection points. Offering this flexibility was a predetermined strategy to facilitate recruitment. For all participants, demographics and consent were obtained. Table 1 gives participants' demographics and data collection methods.

Table 1: Participant demographics

Participant Code	Sex	Age	Ethnicity	Professional background	Level of experience	Data collection method
John	Male	40-49	NZ European	Physiotherapist	Very/Specialist	OS
Jacinda	Female	-	NZ European	Physiotherapist	Experienced	OS
Jessica	Female	40-49	NZ European	Physiotherapist	Very/Specialist	OS + II
Jennifer	Female	30-39	NZ European	Physiotherapist	Experienced	OS
Julia	Female	40-49	NZ European	Physiotherapist	Very/Specialist	OS
Jamie	Female	50-59	NZ European	Physiotherapist	Experienced	OS
Jenna	Female	20-29	British	Physiotherapist	Experienced	II
Jasmine	Female	20-29	NZ European	Physiotherapist	Experienced	OS
Jade	Female	40-49	NZ European	Occupational Therapist	Very/Specialist	II
Joy	Female	30-39	NZ European	Physiotherapist	Very/Specialist	FG
Jane	Female	20-29	British	Physiotherapist	Experienced	FG
Jordan	Female	20-29	British	Physiotherapist	Experienced	FG

Notes: Very/specialist, refers to clinicians who were senior within their chosen specialties; II, individual interview; FG, focus group; NZ, New Zealand; OS, online survey.

Analysis

Data from the surveys and interviews and focus group were analysed using thematic analysis, following Braun and Clarke's (2006) six-stage process. This process of analysis included familiarisation with collected data, coding at a semantic level, identifying key ideas of interest, identifying candidate themes, refining candidate themes, naming and defining final themes (Terry, Hayfield, Clarke, & Braun, 2017). The first author familiarised herself with the data and coded them, and met with the second and third authors to discuss coding and initial impressions. Coding was returned to, and improved upon, in a recursive manner. Theme construction was consultative and iterative, with all authors meeting regularly to discuss findings and to test interpretations.

RESULTS

Two salient themes were generated within the dataset, with each cohering around a distinct central organising concept (Terry et al., 2017): (1) Deflection of professional responsibility; and (2) Dependence on the professional toolbox and evidence based practice. We will discuss each below with illustrative data extracts.

Theme 1: deflection of professional responsibility.

This theme was constructed from accounts of practitioner tentativeness in taking responsibility for client use of mHealth apps. The primary reason for this deflection of responsibility was a self-described lack of knowledge and experience. Participants argued that they were "not tech savvy", limiting their ability to offer what they understood to be specialist advice. Further, participants seemed reluctant to identify their level of technology use and skills.

Despite these assertions, participants described multiple incidences of mHealth app use, and commonly claimed to use social media in multiple aspects of their lives. It might be hypothesised that this disparity regarding use may be due to constant immersion and unconscious integration of technology. As a result, clinicians appeared to have become unaware of the knowledge and skills they have. When interview questions prompted thinking, participant comments suggested an increasing recognition of technology use: *"I think we know a little more about technology than I thought… when you dig deeper you realise how much you do use it day to day"* (Jane)

However, a number had trouble identifying what might be categorised as an mHealth app, referring to other software used in clinical practice, for instance: *"thinking about it a bit more, we use an online programme called PhysioTech"* (Jenna).

This confused or unclear definition of mHealth apps was often portrayed as contributing to their inability to identify the extent of their technology use. For example: *"I'm not sure about the health bit, but, I, in terms of, um, managing an illness… I don't know whether that would be classed as a health app"* (Jade).

This lack of clarity, may have contributed to clinicians' lack of perceived ability and "tech savvy-ness", giving rise to deflection of responsibility. Participants commonly argued that their low confidence in their evaluative skills made it hard to offer advice concerning many technologies or apps: *"I think if I was going to recommend something, I would need to have experience in it"* (Jenna). *"Yeah, I mean, my limitation is my own confidence and knowledge"* (Jade).

Many clinicians also indicated that the use of technologies was more "naturally" aligned with other allied health professionals, for example, *"I think occupational therapists use quite a few"* (Joy) and *"it's more the speech therapists"* (Jade), not connecting app use to their own professional domain.

Further, clinicians tended to profile certain types of clients as being uninterested in app use. For example, most participants classified a number of their clients as "too old" to use technology and therefore assumed a disinterest: *"If all of us were in our sixties then maybe we wouldn't use technology so much"* (Jane)

Responsibility was further deflected by minimising risk. For example, clinicians expressed a higher willingness to *"get on board"* (Jenna), with '*'self-motivated"* clients who initiated the use of mHealth apps. This reliance on client initiation absorbed the risk which might otherwise be directly applicable to the clinician.

Clinicians also appeared hesitant regarding the use of newer, unfamiliar clinical technologies and apart from "one or two" familiar apps claimed to rely on recommendations from peers or other trusted sources: *"I tend to stick to the ones that I already know, unless somebody else talks to me probably"* (Jade)

Clinicians often deflected responsibility for gaining new knowledge, preferring "tried and true" approaches, which tended to be constrained by the training they had experienced formally and informally. It is this reliance on a particular clinical sense-making framework that our second theme will discuss.

Theme 2: dependence on the physiotherapy toolbox and evidence based practice.

The second theme explored the idea of clinician dependence on their professional "toolbox" and evidence based practice. The most prominent aspect of this theme was preference for traditional and familiar techniques, rather than newer technologies. Many participants mentioned the familiarity and well-established nature of their current professional toolbox versus mHealth app technologies, which tended to be less frequently utilised and more easily forgotten: *"I think it's just remembering that the technology is there"* (Jade). *"So, I think it's just being aware that these things exist, and you can use them for part of your tools"* (Jessica).

This tendency to default to familiar practising techniques may also be increased by "app overload". Overwhelming variability of choice, excessive availability and rapid development may all have the potential to paralyse practitioner engagement. One participant (Jade) further alluded to poor integration into professional education, suggesting there was an inflexibility among students and new graduates when it came to the use of new technologies. Both Jade and Jessica suggested a conservative orientation toward standardised approaches within university environments. These more traditional methods of thinking were thought to promote the security of routine and established knowledge, for example: *"Doing your study and* *stuff, you don't want to learn something new [above the basics] at that point"* (Jade).

Participants also referred to the gap between rapid app proliferation and much slower rates of academic publication. Evidence supporting the clinical use of apps was described as lagging behind the fast-paced innovative nature of app technology: *"Yeah, so I don't know that we explicitly talk about those as tools to use, the problem is I don't think there's much evidence that they work"* (Jessica).

Despite these assertions, there appeared to be an underlying expectation that young graduate clinicians will integrate technology into their practice due to "native" familiarity. This may be generated from assumptions that universities are now educating students in technology use, or that younger individuals' lives are more immersed in various technologies. However, Jessica, reasoned *"we don't know how technology might be integrated into the physiotherapy curriculum"*, indicating its incorporation in some areas is still incomplete. Jade further recognised integration is not always plausible, suggesting *"as a new grad, just doing the basics is enough... anything extra was like, no way"* with time often identified as a limited resource.

As a result, many clinicians could be hesitant in clinically recommending unfamiliar technology use to patients as they *"may look like complete fools"* (Joy) attempting to educate clients in this regard. On the other hand, participants argued, this was rarely experienced with familiar, well-rehearsed techniques currently integrated in clinical practice, which they would generally fall back on when they felt out of their depth.

These factors suggest that clinicians operating strictly within evidence-based medicine paradigms may restrict mHealth app integration into their wider practising toolbox due to the risk of feeling like a failure that may be associated with newer approaches. This risk-aversive orientation may contribute to a lack of mHealth app uptake in clinical practice, avoiding their use, despite technology being *"unavoidable now"* (Jade).

DISCUSSION

Our findings have provided insight into the lack of mHealth technologies uptake into allied health clinical practice, especially as it pertains to physiotherapists. Although mobile technology is pervasive in society, our participants remained unsure of its potential in clinical work. Further, there is often an assumption in the literature that clinicians are technologically literate and using published evaluative tools prior to prescription of mHealth apps (Fairburn & Rothwell, 2015; Aungst et al., 2014; Hussain e al., 2015; Donker et al., 2013). Other relevant studies have revealed tools to evaluate mHealth apps are predominantly unknown and underused in clinical practice (Butcher et al., 2015). Only one participant in our study demonstrated knowledge of an mHealth app evaluative process. Assuming systematic evaluations of apps prior to use may thus prove problematic.

Due to a lack of clinician knowledge or confidence with regard to technology, and the absence of established pre-publication evaluation criteria, or even adequate and understandable privacy policies, public consumers may be at risk (Butcher et al., 2015; Chan et al., 2015; Murfin, 2013). Indeed, Cummings et al. (2013), proposed the rapid proliferation of mHealth apps causes difficulty for health consumers generally in successfully identifying high quality examples.

Non-systematic evaluation risks both clinicians and patients. Although most studies state that evaluation is orientated toward patient safety, our study revealed that most participants had only considered the potential for unhelpful or improper advice. Users and clinicians must remain cautious, as security and the development of adequate privacy (including location information), are not always a priority for mHealth app developers (Knorr & Aspinall, 2015; Buijink et al., 2013).

Amongst our participants, there was a reliance on published literature and colleague recommendation for mHealth app use. However, due to the disparity between mHealth app deployment and evidence accumulation, reliability of published technological recommendations is suspect (Zapata, Fernández-Alemán, Idri & Toval, 2014; Björk & Solomon, 2013). Despite this, many published evaluative measures, such as Boudreaux et al. (2014) and Butcher et al. (2015), still include scoping of relevant published literature in their proposed systematic evaluations (Boudreaux et al., 2014; Butcher et al., 2015).

This exploratory study is directly relevant to practising and researching clinicians as it allows insight into current technology use in clinical practice by physiotherapists in A/NZ, which was previously unavailable. In order to maintain client safety, it is essential that future research aims to quantify the efficacy of technology use in clinical practice. This study has identified that uptake of mHealth apps into clinical practice can be hindered by lack of proven efficacy, poor integration into clinical toolboxes, and a tendency to deflect professional responsibility to know or understand the value, or not, of the various mHealth apps that are available. Recommendation from trusted sources such as colleagues or professional bodies and client proposition acted as facilitators.

Although this study has provided some insight into technology use, there were limitations, such as a small number of study participants. We anticipate that a larger sample size may yield a wider range of perspectives or may provide deeper insights. Although representative of physiotherapy and occupational therapist populations, participants were predominantly A/NZ European/Pākehā female working age physiotherapists, which may have narrowed the transferability of the findings. A more heterogeneous population with regards to ethnicity, gender and healthcare profession, would likely have provided a more diverse and richer source of data.

CONCLUSION

In conclusion, this exploratory study has established a base for understanding the integration of technology into modern day clinical practice. It offers insight into what helps and hinders clinician use and prescription of mHealth apps and technology. These insights are novel in that mHealth app use has not been sufficiently explored, especially in the New Zealand context. As a result, this study may provide clinicians a platform for reflection which may enable them to identify technology as part of their clinical toolbox more readily, allowing for integration of technology into treatment plans for patients who may benefit from this approach. By developing knowledge in this area, clinicians may also be encouraged to recognise their existing skills and build their confidence in taking responsibility for understanding the value and uses of technology in practice with patients, as done with other familiar clinical techniques. This level of engagement means avoiding a reliance on colleagues and/or clients to introduce these newer tools into practice. Clinicians may then propose mHealth apps in support of treatment, based on sound clinical reasoning and systematic evaluation of safety and clinical usability for their clients. In this way, our findings are relevant, as positive clinical mHealth app use begins with informed recommendations to patients, but more importantly the normalisation of technology-use in clinical practice. Therefore, in the future, a place must be developed for mHealth apps within a clinician's toolbox.

KEY POINTS

1. mHealth apps are a growing industry, gaining in popularity and use. However, little is known about the current state of utilisation in clinical practice.
2. Clinicians may not be aware of their responsibilities with regard to health technology and lack the confidence to integrate mHealth apps into their clinical practice.
3. Clinicians demonstrated deferral of responsibility and lack of integration of mHealth apps into professional toolboxes. Consideration should be given towards this aspect of clinical practice.

DISCLOSURES

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