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Abstract: Information and communication technologies (ICT) have the potential to increase access of Australians, particularly those in rural and remote areas, to speech pathology services. Although telehealth infrastructure has been rolled out over the last decade or so across Australia, speech pathologists have generally been slow to use it for service delivery. This paper reports on qualitative research exploring factors influencing the attitudes of rural speech pathologists in New South Wales towards the use of ICT in their work. Personal and system factors were identified as barriers to the uptake of ICT and suggestions are offered to overcome these barriers.

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Attitudes of Rural Speech Pathologists Towards ICTs for Service Delivery

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ABSTRACT

Information and communication technologies (ICT) have the potential to increase access of Australians, particularly those in rural and remote areas, to speech pathology services. Although telehealth infrastructure has been rolled out over the last decade or so across Australia, speech pathologists have generally been slow to use it for service delivery. This paper reports on qualitative research exploring factors influencing the attitudes of rural speech pathologists in New South Wales towards the use of ICT in their work. Personal and system factors were identified as barriers to the uptake of ICT and suggestions are offered to overcome these barriers.

Access to health services, including speech pathology (Wilson, Lincoln, & Onslow, 2002), is perceived to be less equitable in rural than in metropolitan Australia (Dixon & Welch, 2000). A range of socioeconomic, geographical, service provision, physical and cultural barriers interact to impact on equity in health care for rural and remote populations (National Rural Health Alliance, 2002). The use of information and communication technologies (ICT) to deliver services via telehealth offers a potential solution to inequity in healthcare (Theodoros, 2008).

Clinical applications of telehealth in medicine include electronic health records, transmission of diagnostic images, telesurgery and robotics, and the use of call centres and decision-support software (Stanberry, 2000). In speech pathology, research has supported the efficacy of telehealth for consultation, assessment and intervention in a range of communication disorders, including voice disorders (Constantinescu, Theodoros, Russell, Ward, & Wootten, 2007; Mashima et al., 2003), motor speech disorders (Hill et al., 2006), child speech and language disorders (Fairweather, Parkin & Rosa, 2004; Hornsby & Hudson, 1997; Jessiman, 2003; Waite, Cahill, Theodoros, Busuttin, & Russell, 2006; Wilson, Atkinson, & McAllister, 2008) and stuttering (Wilson, Onslow, & Lincoln, 2004; Lewis, 2007).

Australian state governments have made significant investment in the last decade in the roll-out of videoconferencing suites for telehealth services. However, adoption of telehealth for speech pathology service delivery has been slow in some areas (McCulloch & Stirling, 2006). Parsons (1997) suggested that factors contributing to this slow uptake may be ICT illiteracy and apprehension regarding technology among families and professionals. Baur (2008) cautioned on the impact of this digital divide; that “the same population groups that have poorer health status also have less access to the internet and health information” (p. 417). It is unclear what access to, attitudes towards and levels of confidence with ICT speech

pathologists have, and whether those attitudes affect the uptake of ICT as a method of service delivery. McCulloch and Stirling (2006) found a lack of use of ICT support for speech pathology services in schools. Research by Dunkley, Pattie, Wilson and McAllister (2008) revealed that rural New South Wales (NSW) residents had better access, more confidence in using ICT and more positive attitudes to telehealth delivery of speech pathology services than rural NSW speech pathologists assumed they had. The speech pathologists generally had less access and less confidence with ICT and held less favourable attitudes to telehealth for their clients. The attitudes held by these speech pathologists were influenced by numerous factors including beliefs, values, training and experiences. This paper describes the interaction of these influences and the implications for education and support for speech pathologists to enable better uptake of telehealth.

Method

The data reported in this paper are drawn from a larger research study which used a mixed methodology (Creswell & Plano Clark, 2007) to investigate access and attitudes of rural NSW residents and speech pathologists towards the use of ICT for telespeech pathology. Data for the larger research program was collected using questionnaires which elicited both quantitative and qualitative data, and qualitative, semi-structured interviews. This paper reports on the methods used to collect and analyse interview data from four speech pathologists. Details on other aspects of the data collection and analysis are reported elsewhere (Dunkley, Pattie, Wilson & McAllister, 2008).

Data collection

Eight speech pathologists indicated a willingness to be interviewed on returned questionnaires used in the first part of the research program. Four suitable participants were selected using the principles of purposive sampling (Patton, 2002) to obtain a mix of levels of accessibility to ICT, professional experience, and positive and negative attitudes towards ICT, as expressed on the questionnaires. An information sheet was sent out to the 4 participants, reiterating the purpose of the study and detailing the interview process. The 4 candidates then signed a consent form to participate in a telephone interview and returned it to the principal investigator by fax. All 4 agreed to be interviewed. Two of the participants were 40–45 years old and had worked as speech pathologists for over 15 years. The other two were aged 20–24 years and had worked as speech pathologists for less than 3 years. All 4 were female and from an Anglo Saxon/Anglo Celtic background, consistent with the demographics of the Australian speech pathology profession (Lambier & Atherton, 2003).

Semi-structured telephone interviews of about 30 minutes duration took place at a time and date mutually convenient to the chief investigator and participants. The interviews explored participants' experiences with using ICT and perceptions about its use for service delivery. The interviews were audiotape recorded (with verbal consent) and later transcribed verbatim by the chief investigator. Consistent with ethical requirements, participant anonymity was protected by removing or disguising all identifying information on the interview transcripts. For example, names of participants, workplaces and their towns were changed.

Data analysis

The interview data were analysed using a simple thematic analysis (Patton, 2002). After transcribing the recorded interviews the chief investigator read two transcripts and developed preliminary codes to account for the opinions expressed by the interview participants. The other investigators were then asked to apply these codes to the other two transcripts to test their utility. After discussion between the investigators, the codes were refined and all four

transcripts were reanalysed. The major themes in each interview were identified and synthesised into vignettes which appear below.

Results

To capture the range of interview information, four vignettes were developed by selecting pertinent quotes from each participant's interview transcript to illustrate the recurring themes for that participant. These appear as Vignettes 1 to 4 below. Participants' words appear in italics; the device [...] has been used to indicate glossing of excerpts, to aid flow and ease of understanding for readers.

Data analysis showed that the 4 participants expressed a continuum of attitudes regarding the capacity of ICT to enhance speech pathology services. At the positive end of the continuum of attitudes is Participant 1 who believed that the quality of speech pathology service would be significantly enhanced by ICT. Participant 2 was unsure: she believed that the quality of telespeech pathology services could be significantly enhanced "as it would provide a regular service to those clients with no or little access to services or regular services", or they could be compromised as "some assessments cannot be done well over technology, for example swallowing and some complex communication cases". At the negative end of the continuum of attitudes are Participants 3 and 4 who believed that the quality of speech pathology services would be significantly compromised.

Vignette 1. *It's sort of like a circle*: services would be enhanced by ICT

Participant 1 was in the age range of 20–24 years. She had been in the workforce for less than 2 years and serviced a paediatric caseload. On the questionnaire, she recorded that ICT would significantly enhance speech pathology services. The use of ICT would increase available client contact time as *the better you are at administration, the more effective you can be therapeutically because you can have more time to spend one on one with your client base*. In other words, ICT streamlines administration, thus increasing time available for clients.

This participant was using ICT within therapy sessions (e.g., using computer language and phonological programs, as a reinforcer), but not as a means for delivering therapy over distance. She stated that *our area isn't really that big... so we can go out in person*. Thus use of ICT as a service delivery option for rural clients was not considered. She perceived the need for speech pathology to accommodate for the general shift towards ICT as it makes *[therapy] more effective if [the clients] are being given those [ICT] skills in intervention*. However, there were also perceived limitations of ICT within speech pathology practice: for example, assessing and treating feeding or swallowing disorders.

Participant 1 believed that for the speech pathology profession, ICT for telehealth purposes was *looked at as scary* regardless of when clinicians graduated. She believed that speech pathologists were *finding it hard, other than admin, to realise [ICT] potential for therapy*. She suggested that professional development and undergraduate subjects on applications of ICT for service delivery would give clinicians a *healthier attitude about technology*. If the opportunity to be trained in ICT use for telehealth is not available then, *[clinicians] are not going to use it and then they're not going to be able to do their job as effectively*.

Vignette 2. *The funding dollar*: quality of service not altered by ICT

Participant 2 was within the 40–44 year age bracket and had a total of 17 years professional experience. She serviced a 95% paediatric, 5% adult caseload. She rated the impact of ICT on service delivery as potentially either significantly enhanced *or*

compromised. She feels that ICT *would provide a regular service to those clients with no or little access to services or regular services* (e.g., rural and remote areas where there are service gaps or vacancies). The use of ICT could *provide much better quality documents and much more professional looking communication aids*, as well as efficient caseload management. However, this participant believed services delivered using ICT could be compromised, stating: *some assessments cannot be done well over technology* (e.g., swallowing and some complex communication cases), and that *technology cannot replace face-to-face personal assessment and personal contact*.

ICT had not yet been a therapy option for this participant at the time of data collection, as she had assumed that *[clients] don't have access to [ICT] facilities*. She also assumed that requests for ICT resources would not be granted, stating *anything that costs money the department won't come at*. However, *if we could minimise our travelling and still provide an effective service, [ICT] would be a very desirable thing*.

Vignette 3. *It takes away client time: services would be compromised by ICT*

Participant 3 was a 40–44 year old speech pathologist of 18 years experience. Her caseload consisted of 75% adults and 25% paediatrics. On the questionnaire she stated that ICT significantly compromised speech pathology service delivery and was adamant that the use of ICT was *intrusive* on clinical time. She believed that *use of technology, whether it be mechanical or IT, depends on a person's attitude...and generally [speech pathologists] are not willing*. She believed the more ICT is used, the less clinicians will see their clients face to face, and that is *totally unacceptable*. She believes that *to really treat a client properly, you need to be there*.

Although this participant believed ICT would compromise client care, she saw the value of it for other aspects of professional practice. Although she would drive up to 2 hours to see a client, she would not be prepared to drive 2 hours to access professional development. She used videoconferencing as a means to access professional development and meetings. She believed that ICT not only has the potential to overcome distances for accessing professional development, but also to decrease wasted meeting time. Increased access to ICT decreases travel time to professional development and meetings. However, Participant 3 stated that *ICT takes time to use in the first place*.

Vignette 4. *A matter of willingness: services would be compromised by ICT*

Participant 4 was in the 22–24 year age group and had been in the workforce for 2 years. She worked with a paediatric caseload and believed that with current access and support to use ICT, speech pathology services via this medium would be significantly compromised were she to attempt telehealth.

Participant 4 was beginning to incorporate the use of ICT in service delivery. However, she viewed this as a result of a departmental initiative rather than an individual clinician's choice. She *feels really stressed and like you're not doing your job properly ... as management are not providing extra time or resources*. The implementation of ICT *is not a reasonable ask* as she feels she didn't have adequate time to learn the skills necessary for ICT uptake.

This participant believed clients were *surprised that we don't have better access to computers* and that it was *not unreasonable in expecting that I'll have a computer to access most of the time*. She also felt that ICT was not typically included in consumers' perspectives of what a speech pathologist is. She assumed that clients *see [ICT] as something a bit more advanced than the health system is capable of at the moment*. As a clinician, she believed that the uptake of ICT *was inevitable*; however *its effectiveness needs to be proven*.

Participant 4 believed that ICT improved access to professional networks.

However, those relationships were *standoffish* and impersonal. As a professional, she felt apprehensive towards non-visual ICT as she wouldn't *have face-to-face contact with who I'm speaking to*.

Discussion

This discussion draws on both material contained in the vignettes above and other material in participants' interviews which was not included in the vignettes for reasons of space and succinctness. The data revealed both positive and negative attitudes to the use of ICT for telespeech pathology. In keeping with the traditions of qualitative research (Patton, 2002), we interviewed only a small number of participants. However, our findings support those of the larger quantitative study (Dunkley, Pattie, Wilson, & McAllister, 2008) and in addition illustrate the interplay of factors found in that larger study.

Positive attitudes to ICT for telespeech pathology

The data presented above demonstrate that while the rural NSW speech pathologists we interviewed held somewhat negative attitudes about the use of ICT for telespeech pathology, they were also able to identify potential positive impacts of ICT. Some participants could see that ICT has the potential to overcome distance, time, and cost obstacles for both clinicians and clients in rural areas. They believed that ICT could *provide much better quality of documents* including client communication aids (Participant 2), *open up a whole new avenue for service delivery* (Participant 4), and improve speech pathologists' administration abilities: *the better you are at [clinic] administration the more effective you can be therapeutically because you can have more time to spend one on one with your client base* (Participant 1). Finally, the use of ICT potentially provides *magnificent support* for speech pathologists in rural areas (Participant 3). These positive perceptions of ICT accord with those reported in the literature (Charles, 2000; Currell, Urquhart, Wainwright, & Lewis, 2002); Evans & Hornsby, 1998; Hodgson, 1997; Sheppard & Mackintosh, 1998).

Personal factors influencing negative attitudes to ICT for telespeech pathology

The vignettes revealed a range of personal factors influencing negative attitudes to uptake of ICT by rural NSW speech pathologists. These factors include limited confidence and willingness to use ICT, lack of knowledge about clients' access and attitudes to ICT and telespeech pathology, lack of familiarity with the research base demonstrating efficacy of telespeech pathology, and a belief in the necessity and superiority of face-to-face treatment of clients.

The data from our interviews supports Parsons' (1997) contention that ICT illiteracy among professionals may be one reason why telehealth is not widely used as a method of service delivery for speech pathology. As Dunkley, Pattie, Wilson, and McAllister (2008) found, rural NSW speech pathologists had limited workplace access to ICT. This influenced their comfort in using ICT: *being comfortable to take [ICT] on is a huge thing* (Participant 4), and their confidence. In addition, this study revealed rural NSW speech pathologists know little about synchronous ICT (that, is technologies that allow real time two-way interaction) as opposed to asynchronous ICT, as summarised in the views of Participant 4: *once you move outside of computers and email ...that's the limit of my abilities*. Age does not appear to be a factor in improved confidence; Participant 4 stated *even with new graduates, [ICT] is looked at as a scary thing*. These factors all influence willingness to adopt ICT: *if you're not willing or wanting to [use ICT], then that's a barrier as well* (Participant 1). As Participant 1 commented, *it's sort of like a circle*: lack of access, comfort, willingness and confidence become barriers, feeding into the "vicious cycle" described by Nykodym, Miners, Simonetti,

and Christen (1989), who found that there was a significant correlation between the amount of computer usage and the level of computer apprehension.

Participants' assumptions regarding client access and attitudes to use of ICT also impact on speech pathologists' use of ICT for service delivery. Participants typically believed that clients do not have access to ICT. For example, Participant 2 believed that clients in remote settings were often *not in good financial situations and don't have [access to ICT]*. This belief is not supported by findings from Pattie, McAllister, and Wilson (2005), O'Callaghan, McAllister, and Wilson (2005), and Dunkley, Pattie, Wilson, and McAllister (2008), who discovered that remote families have an unexpectedly high level of confidence and access to ICT due in part to government schemes such as the Higher Bandwidth Incentive Scheme (Department of Communications, Information Technology and the Arts, n.d.) for provision of ICT access to remote Australians.

An additional influence on uptake of ICT for telespeech pathology is beliefs about what a speech pathology service should entail. Participant 2 firmly believed that *technology cannot replace face-to-face personal assessment and personal contact*, a view shared by Participant 3 who stated: *nobody wants to give up their face-to-face visits*. This preference for direct over indirect models of service delivery was also noted in a study of speech pathologists servicing children with communication disorders in rural Queensland schools (McCulloch & Stirling, 2006). This belief that face-to-face services are superior has been reinforced by speech pathologists' apparent lack of familiarity with the growing evidence demonstrating the efficacy of telespeech pathology (Constantinescu et al., 2007; Fairweather, Parkin & Rosa, 2004; Hill et al., 2006; Hornsby & Hudson, 1997; Lewis, 2007; Mashima et al., 2003; Waite et al., 2006; Wilson, Atkinson, & McAllister, 2008; Wilson, Lincoln, & Onslow, 2002). Clients also are ambivalent about receiving speech pathology services via telehealth. A study of the perceived needs and barriers experienced by isolated families when accessing speech pathology services in rural and remote NSW (O'Callaghan, McAllister, & Wilson, 2005) revealed that consumers believed services delivered via ICT would be less effective than clinic-based service, school-based service, home programs with speech pathologist support, or intensive periods of speech pathology. Likewise, Hornsby and Hudson (1997) reported client views that videoconferencing will never replace face-to-face contact with the speech pathologist. However, Pattie, McAllister, and Wilson (2005), in a study of rural and remote NSW families, reported that some prospective consumers held quite positive beliefs that ICT could increase their access to speech pathology services while allowing them to continue living rurally. This view was based on their experience of using ICT for a range of educational purposes requiring high fidelity visual and auditory signals, such as guitar lessons and technical and further education classes.

Even if the evidence base supports the efficacy of telespeech pathology, concerns remain about the need for direct interpersonal contact. The view of Participant 3 was not uncommon in our research data: that *to treat a client properly, you need to be [face to face]*. Some literature shares these concerns about telehealth's potential impact on what Stanberry (2000) refers to as the "traditional clinician-patient relationships" (p. 615). Cornford and Klecun-Dabrowska (2001) caution against "substitution of care with treatment" (p. 161). There is, as Ellis (2004) notes, little research on patient satisfaction with the quality of interactions in telehealth relationships. It is possible that the impersonal nature of telehealth may increase the sense of alienation experienced by some clients, as well as clinicians.

Systemic factors influencing ICT uptake

As well as personal influences on attitudes to the use of ICT for telespeech pathology, a number of systemic barriers were identified in the interviews. These included lack of infrastructure and provision of appropriate ICT training and support, and the already recognised limitations of ICT technology. System constraints influencing negative attitudes

to ICT were mentioned far less frequently in interviews than personal factors, perhaps reflecting limited awareness, availability and experience with ICT. Dunkley, Pattie, Wilson and McAllister (2008) noted the lack of workplace access to ICT for rural NSW speech pathologists. Participant 4 commented on her poor ICT access, thinking it *not unreasonable [to expect] that I'll have a computer to access most of the time*. Even if access is provided, speech pathologists appear to lack *time to use [ICT] in the first place* (Participant 3). Extra time and resources for speech pathologists to learn to use ICT effectively were reported not to be provided by management (Participant 4). There are also inherent limitations in the ICT currently available for telespeech pathology which means that *some assessments cannot be done well over technology* (Participant 2).

Summary and recommendations

The vignettes presented in the paper synthesise and summarise key themes from interview data, revealing some positively influencing factors but mainly a range of factors which negatively influence rural speech pathologists' attitudes towards use of ICT for telespeech pathology. Systemic factors of lack of access to ICT, and lack of training and support to use ICT where it is available, lead to personal factors of lack of comfort, confidence and willingness to use ICT for telespeech pathology. Recency of graduation was not related to attitudes to ICT; the new graduates in our study experienced similar knowledge and skills gaps regarding ICT as the more experienced clinicians. Personal attitudes are further reinforced by misperceptions about client access and preferences for the use of ICT and lack of knowledge about efficacy of telespeech pathology. Legitimate concerns about the impact of technology on the interpersonal dimensions of care also influence their attitudes. This finding highlights the need for more research into the impact of telehealth on interpersonal as well as clinical outcomes, in addition to exposure in professional entry programs to telehealth concepts and use.

Our results have implications for the development of telespeech pathology in Australia. Much work needs to be done to overcome personal and systemic barriers to its uptake. Speech pathologists in their interviews themselves identified first steps to overcoming these barriers. They suggested increased ICT infrastructure, provision of adequate ICT education and support, and further research into the efficacy of service delivery via ICT. Increased knowledge and skills in the use of ICT for service delivery will be needed to help address health inequities in Australia.

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