A survey of the clinical use of telehealth in speech-language pathology across Australia

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Research into the use of telehealth technology for speech-language pathology (SLP) services has been conducted for over 30 years; however, it is unknown whether this research has translated into clinical practice. A web-based survey was deployed to determine key factors around the clinical use of telehealth by Australian SLPs. Quantitative analysis revealed that clinicians are using a wide range of technology to deliver a variety of SLP services to both paediatric and adult populations. A number of benefits to using telehealth in clinical practice were identified, along with significant barriers to the expansion of telehealth in SLP. Suggested facilitators for the further development of telehealth in SLP included more professional development in the area of telehealth, demonstrations by experienced users of telehealth, and access to electronic assessment and treatment resources. Limitations of the study are discussed with directions for future research.

Telehealth is defined as the application of telecommunications technology to the delivery of professional health services at a distance by linking clinician to client, or clinician to clinician, for assessment, intervention, and/or consultation (American Speech-Language-Hearing Association [ASHA], 2005). Telehealth has been endorsed by ASHA as an appropriate and suitable service delivery model for speech-language pathology (SLP) provided that telehealth services are of the same quality as those delivered face to face (ASHA, 2005).

As a service delivery model, telehealth has the capacity to overcome issues relating to access to services such as distance and immobility, as well as assisting in caseload prioritisation, allowing for intensive treatment regimes, reduced length of stay in hospital, longer term rehabilitation management, and meeting the increased demand for SLP services (ASHA, 2005).

Research into the use of telehealth delivery of SLP services has been conducted for over 30 years, increasing during the last decade due to the expansion of technology, high-speed data transmission, and rising demand for SLP services (Hill & Theodoros, 2002; McCue, Fairman, & Pramuka, 2010). This research has explored the use of a variety of technology such as videoconferencing, telephone, videophone, email, and Skype (Mashima & Doarn, 2008; McCue et al., 2010). While the research is dominated by feasibility projects and case studies, a number of high-quality randomised control trials and robust pilot studies have produced an emergent evidence base for the use of telehealth for some services (Reynolds, Vick, & Haak, 2009). It should be acknowledged that a discrepancy is evident in the literature between paediatric and adult studies, with the majority of research being undertaken with adults (Reynolds et al., 2009). A growing body of literature supports assessment via telehealth, particularly for the following groups: adult dysarthria (Hill et al., 2006; Hill, Theodoros, Russell, & Ward, 2009a), adult apraxia of speech (Hill, Theodoros, Russell, & Ward, 2009b), adult aphasia (Hill, Theodoros, Russell, Ward, & Wootton, 2008), paediatric speech, language, and literacy disorders (Waite, Theodoros, Russell, & Cahill, 2011a, b), patients post-laryngectomy (Ward et al., 2009), and the assessment and review of clients using alternative and augmentative communication (Styles, 2008).

The literature around the use of telehealth in treatment services is less diverse. Two adult telehealth treatment programs found to be equivalent to traditional delivery modes are the Lee Silverman Voice Treatment program (LSVT® LOUD; Constantinescu et al., 2011), and the Camperdown Programs for adults who stutter (Carey et al., 2010). The use of telehealth in the treatment of paediatric fluency disorders with the Lidcombe Program has also been examined through a well-executed phased research program using telephone and postal services (Lewis, Packman, Onslow, Simpson, & Jones, 2008; Wilson, Onslow, & Lincoln, 2004). It is interesting to note a tendency for researchers to investigate the application of treatment programs that already have established efficacy in the face-to-face environment. Nevertheless, there is an urgent need to invest in high-quality telehealth research into other intervention programs if the evidence base for intervention delivered via telehealth is to become fully established.

While current research literature supports telehealth as an effective service delivery model for some SLP services, the question remains as to whether it has translated into clinical practice. A survey of the use of telehealth in SLP and audiology was conducted in the United States of America by ASHA in 2002. Of the 825 SLPs who responded, 9% reported using telehealth to deliver services; however, 47% of SLPs reported an interest in using it in the future.
The SLP respondents to ASHA’s survey used telehealth primarily for counselling and follow-up services, and to a lesser degree for treatment and screening (ASHA, 2002). Telehealth was used across a range of disorders (e.g., motor speech and cognitive communication disorders) and settings (e.g., schools, client’s home) (ASHA, 2002). Other key findings from the survey were the barriers to the expansion of telehealth services, which included the cost of technology and lack of professional standards (ASHA, 2002). Results of this survey prompted ASHA to provide members with information on types of technology available and endorse telehealth as a suitable service delivery model where the quality of the service is equivalent to face-to-face delivery. To date ASHA has not re-surveyed its members on their use of telehealth.

Although not specifically focusing on the clinical use of telehealth in SLP, a number of recent Australian surveys have investigated service delivery models and attitudes towards the use of technology in SLP (Department of Health and Aging [DHA], 2011; Dunkley, Pattie, Wilson, & McAlister, 2010; Zabiela, Williams, & Leitão, 2007). The earliest of these surveys canvassed SLPs in non-metropolitan areas across Australia and found that although technology was available, only 8 of the 51 respondents were using telehealth to deliver direct SLP services (Zabiela et al., 2007). These findings were attributed to a lack of training in the use of telehealth and a lack of evidence for its effectiveness (Zabiela et al., 2007). Dunkley et al.’s (2010) survey of both rural residents and SLPs in New South Wales found that clients not only had greater access to a range of technology than the SLPs expected, but also had a positive attitude towards the use of telehealth as they believed it would improve access to services that would otherwise be infrequent or unavailable. In contrast, SLPs reported less access to technology in their workplace, with some clinicians believing that current technology was not advanced enough for many client populations such as those with dysphagia and intellectual disability (Dunkley et al., 2010). The Department of Health and Aging’s (DHA) eHealth readiness survey also looked at barriers to the adoption of telehealth across 15 allied health professions, including SLP. Reported barriers included a lack of appropriate funding under Medicare for allied health services, poor access to services, and a lack of relevant technology (DHA, 2011). The DHA survey indicated that education is needed if telehealth is to be embraced by practitioners and that some allied health professionals believe the barriers and cost of technology outweigh the benefits of telehealth (DHA, 2011).

Overall, the research literature points to an emergent evidence base for the use of telehealth in the provision of some SLP services, and a growing interest in alternative service delivery models in SLP. This indicates a need for specific research investigating the clinical use of telehealth in SLP practice in Australia. Therefore, the current study aimed to determine the types of technology being used in the provision of direct telehealth services by SLPs in Australia, and the client populations with whom telehealth is being used clinically, and to examine the facilitators, barriers, and benefits to the clinical use of telehealth in SLP.

Method

Ethical clearance

The study was reviewed and granted ethical clearance from the University of Queensland and from the Speech Pathology Australia (SPA) council. Gatekeeper approval was also obtained from leaders of SLP in Queensland Health.

Participants

The survey recruited practising SLPs in Australia who were using telehealth in their clinical practice. Participants were excluded if they were still completing their undergraduate study, did not use telehealth in their clinical practice, or did not fully complete the survey. The participant information sheet and consent form were at the beginning of the web survey and participants could not complete the survey until they had consented to participate by choosing “accept”. Consent was provided by 91 SLPs to participate in the study; however, 36.3% of respondents (n = 33) did not fully complete the survey and were therefore excluded from the data analysis. Data analysis was conducted on 57 complete responses. The respondents were predominantly female (98.2%), Australian born (89.5%), under the age of 45 years (77.3%), and worked full-time (70.2%), with the remainder working part-time (28.1%) or in a locum position (1.8%). The number of full-time equivalent years the SLPs had been working ranged from 0.5 to 35 years with an average of 10.9 years. Responses were received from SLPs in Queensland (42.1%), New South Wales (36.8%), Victoria (15.8%), Western Australia (3.5%), and the Northern Territory (1.8%). There were no respondents from the other states or territory.

Survey

The survey was developed and implemented through SurveyMonkey® and consisted of 27 multiple choice questions, in which the respondent could select multiple responses and four open-ended questions, which related to qualifications, number of years of practice, postcode of workplace, and benefits of using telehealth in clinical practice. Participants had the option of completing the survey anonymously or providing their contact details at the end of the survey. The survey was available for 10 weeks and contained questions relating to demographics, technology used in the provision of services via telehealth, client populations with whom telehealth is used, and the facilitators, barriers, and benefits of using telehealth in clinical practice. The survey took approximately 10 minutes to complete and had to be completed in one sitting.

Procedure

Speech Pathology Australia distributed the link to the survey to all members via the association’s e-newsletter. An email link was also sent through the heads of department at all universities with SLP courses across Australia and heads of SLP departments in Queensland Health and Education Queensland. Time constraints prevented more widespread distribution through public health and education facilities in other states.

Statistics

The quantitative data were analysed using frequency counts and some cross-tabulations for multiple response sets. The qualitative data were analysed by two researchers using content analysis to determine themes in the responses (Creswell, 2009).

Results

Due to length restrictions, not all of the data gathered from the survey are able to be reported here. This article will focus on the settings and technology used in telehealth, client populations with whom it is used, and users’ perceptions of the benefits, barriers, and facilitators of telehealth in SLP.
**Telehealth settings**

The respondents reported providing telehealth services from a number of settings, including public health facilities (57.9%), private practice (22.8%), public education settings (12.3%), community service (10.5%), and specialist services (8.8%). Fewer respondents reported providing telehealth services from private education settings (5.3%), private health services (1.8%), or nursing homes (1.8%). Inspection of the postcodes supplied by respondents revealed that 14 respondents worked in metropolitan centres, while the majority of respondents (75.43%) worked in regional areas. Regional areas included relatively large centres as well as smaller towns.

Respondents reported that clients typically accessed information and communication technology (ICT) for their telehealth sessions from their home (70.2%), medical centre (21.1%), school (21.1%), or work (10.5%).

**Telehealth technology**

The respondents reported most commonly using the telephone, email, and videoconferencing in their provision of telehealth services (see Figure 1). Cross-tabulation of responses against postcode revealed that 23% of metropolitan SLPs used stand-alone videoconferencing to provide telehealth services, in contrast to 60.5% of regional SLPs. Computer-based videoconferencing (excluding Skype) was used by just six respondents, five of which were regional SLPs. However, the use of Skype (video and audio) was evenly distributed across metropolitan and regional SLPs.

The majority of clinicians reported having used telehealth for fewer than six years (80.8%); however 10.5% of clinicians reported using some modes of telehealth (e.g., telephone and email) for more than 10 years. Videoconferencing was the first real-time audio-visual technology to be embraced by clinicians surveyed approximately 8 years ago, followed by customised telehealth systems and Skype at 2 and 4 years ago respectively.

**Direct telehealth services**

Results revealed that 40.4% of clinicians used telehealth to deliver assessment services including standardised assessment (10.5%) and informal assessment (40.4%). The majority of clinicians (86%) reported using telehealth to deliver treatment services. These services included consultations (70.2%), follow-up sessions (66.7%), family

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**Figure 1. Technology used in the provision of SLP telehealth services**

**Figure 2. Types of direct therapy delivered to paediatric clients via telehealth**
they would like to expand their telehealth service to provide a more regular outreach service, to include new technology such as Skype, and to broaden the client populations assessed and treated via telehealth.

**Barriers**
A number of barriers to the current use of telehealth in clinical practice were identified by respondents. The most commonly reported barriers were problems with technology (71.9%) and telecommunication connections (45.6%), closely followed by a lack of assessment and treatment resources suitable for telehealth (40.4% and 36.8% respectively). Difficulty accessing ICT to conduct telehealth (31.6%) and a lack of ICT support (31.6%) were also cited.

**Client populations**
The majority of respondents (73.6%) reported using telehealth with 0–30% of their caseload while a small number of clinicians (7%) reported use with 90–100% of their caseload.

**Paediatric populations**
The majority of respondents (78.95%) who had a paediatric or mixed caseload reported using telehealth to provide direct therapy to paediatric populations across all age groups. The types of direct therapy provided via telehealth reflected the paediatric populations most often treated (see Figure 2).

**Adult populations**
A smaller proportion of respondents (52.63%) reported using telehealth with a variety of adult client populations, but most commonly with those people with dysphagia, degenerative neurological disorders, or stroke. Of these respondents, 33.3% provided direct therapy to adult clients via telehealth. Figure 3 displays the types of direct therapy provided. Cross-tabulation of the type of treatment results against postcode revealed that fluency treatment via telehealth is occurring only in NSW and Victoria, while dysphagia management via telehealth is occurring only in Qld.

**Benefits, barriers, and facilitators to using telehealth**
Most respondents (71.9%) were confident or very confident in their use of telehealth and satisfied or very satisfied (71.9%) with the service they provided via telehealth.

**Benefits**
Respondents reported a wide range of benefits to using telehealth in their clinical practice. Their responses to this open ended question were analysed using content analysis (Creswell, 2009) with five major themes emerging: access, time efficiency, client focus, caseload management, and cost efficiency. Each theme contained benefits for both the client and the clinician. A sample of open responses is displayed in Table 1.

It was found that 70.2% of respondents considered telehealth to be a cost-effective service delivery option for SLP services. The majority of respondents (70.2%) reported support (59.6%), direct therapy (45.6%), and teacher support (36.8%).

**Table 1. Respondents’ comments on the benefits of using telehealth in clinical practice**

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Respondent comments</th>
</tr>
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<tbody>
<tr>
<td>Access</td>
<td>Equitable access to services</td>
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<tr>
<td></td>
<td>Easier to share materials with clients</td>
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<tr>
<td></td>
<td>Easily access support from other clinicians</td>
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<td></td>
<td>The client can stay in their local area and receive appropriate treatment</td>
</tr>
<tr>
<td>Time efficiency</td>
<td>Time efficient for both client and clinician</td>
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<tr>
<td></td>
<td>Reduce staff travel time</td>
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<td></td>
<td>Efficient for student supervision</td>
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<td></td>
<td>Time efficient for the client not having to travel to the clinic</td>
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<tr>
<td>Client focus</td>
<td>Increased intensity of treatment</td>
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<tr>
<td></td>
<td>Increased frequency of reviews</td>
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<tr>
<td></td>
<td>More realistic idea of client’s abilities in natural environment</td>
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<td></td>
<td>The client takes greater responsibility for the treatment program</td>
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<tr>
<td>Caseload management</td>
<td>Increased client base in private practice</td>
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<td></td>
<td>Increased awareness of clinical issues</td>
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<td></td>
<td>Increased flexibility</td>
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<td></td>
<td>Easier to manage clients one after another, less preparation of materials, easy to organise appointments</td>
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<tr>
<td>Cost efficiency</td>
<td>Reduced cost</td>
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<tr>
<td></td>
<td>Reduced travel expenses</td>
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<td></td>
<td>Reduced time away from work for clients</td>
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<td></td>
<td>Reduced cost and resources required by the family and clinician or service</td>
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as significant barriers to current use. Respondents identified similar barriers to the expansion of telehealth services in their clinical practice.

**Facilitators**

Respondents suggested a number of potential facilitators for the further development of telehealth as a service delivery option for SLP services (Figure 4). “Other” suggestions (17.5%) included promotion and support of telehealth and its growing evidence base in SLP; funding for allied health assistants to be based in rural outreach clinics, increased options for clients to access telehealth within the community, clinical capacity to trial new things without impacting on waiting lists, introduction of telehealth into university courses to prepare new clinicians, and education of clients about telehealth.

**Discussion**

The literature supports an emergent evidence base for the use of telehealth in the provision of some SLP services; however, it is unclear whether this has led to an expansion in the use of telehealth in clinical practice. The responses to the current survey provide information on the types of technology being used in clinical telehealth in SLP, as well as on the populations with whom telehealth is used. The respondents to the survey provide an insight into some of the benefits, barriers and facilitators to the use of telehealth in clinical SLP in Australia. It is important to note that the small sample size and skewed geographic distribution of the respondents place some limitations on the conclusions which can be drawn. However, despite the sample being small (n = 57), the respondents to this survey were demographically similar to the SLP population in Australia (SPA, 2005; Speech Pathologists Board of Queensland, 2010).

**Telehealth settings and technology**

The respondents to the current survey predominately provided telehealth services from public health services and private practice, contrasting with the findings of the ASHA survey in 2002 in which most respondents provided telehealth services from schools or non-residential health care facilities. However, both surveys reported that the majority of their clients accessed telehealth services from their home. It remains unclear what type of technology clients are using in their home.

A range of telehealth technology has been reported in the research literature with videoconferencing being the most commonly used (McCue et al., 2010). The clinicians who responded to this survey reported using the same types of technology to deliver telehealth services, although videoconferencing was the third most common form of technology used. This is in contrast to the findings of Dunkley et al. (2010) and Zabiela et al. (2007) who reported that although rural SLPs had access to videoconferencing facilities they were rarely used as an approach to service delivery. Both Dunkley et al. (2010) and Zabiela et al. (2007) attributed their findings to a lack of SLP training and confidence using the technology and lack of access to videoconferencing for clients. The increased use of videoconferencing by SLPs may reflect improvements in training in the use of the technology. Indeed, a large percentage of the respondents in this study reported they were confident or very confident using telehealth technology. The current survey reported clients accessing technology from a wider variety of locations including their home, medical centre, school, and work. There seems to be greater access to telehealth for clients than found in the previous surveys.

**Client populations**

The literature supports a growing evidence base for the telehealth delivery of some SLP services, with stronger evidence for its use in adult populations (Reynolds et al., 2009). Furthermore, reviews of the literature have revealed higher quality research into the use of telehealth for assessment rather than treatment services (Reynolds et al., 2009). Interestingly, the respondents to this survey reported using telehealth for the delivery of treatment services (86%) over twice as often as assessment services (40.4%), and the respondents used telehealth with paediatric clients (78.95%) more often than adult clients (52.63%). While it could be speculated that these findings suggest that some SLPs who responded to this survey have not waited for a firmly established evidence base before applying new service delivery options to their practice, it is important to remember that the types of treatment services provided via telehealth more often included consultation (70.2%), follow-up (66.7%), and support services (59.6%) than direct therapy (45.6%). In the case of paediatric treatment services this may have increased the proportion of respondents reporting use of telehealth with this population. Nevertheless, further exploration of the types of direct treatment services provided to children via telehealth is
Benefits, barriers, and facilitators

Respondents identified a range of benefits to using telehealth in clinical practice which were classified into five major themes; access, time efficiency, client focus, caseload management, and cost efficiency (see Table 1). These benefits have also been identified and discussed in the research literature; indeed overcoming the issue of access and promoting time efficiency are well-established drivers of telehealth (Bushur, 1995). Additional benefits telehealth may garner include meeting the needs of housebound clients and treatment in non-clinic environments promoting generalisability (Mashima & Doarn, 2008; McCue et al., 2010; Tindall, Huebner, Stemple, & Kleinert, 2008). Telehealth has also been promoted as enabling clinicians to cover a larger geographic area while providing more services to patients (Mashima & Doarn, 2008) and this was confirmed by the current survey. This last point is especially important in Australia as a third of the country’s population lives in regional or remote areas (ABS, 2008).

Interestingly, 70.2% of survey respondents felt that telehealth is a cost-effective service delivery option despite a paucity of cost-benefit research in SLP (Mashima & Doarn, 2008; Tindall et al., 2008). True cost effectiveness requires a benefit-cost analysis to be examined within the clinical evidence base (Davalos, French, Burdick, & Simmons, 2009) and this remains an area in which more research is required. Although the respondents considered telehealth to be cost effective, they also expressed concern about the cost of technology and availability of resources. Similar barriers were identified in the ASHA survey (2002) and the eHealth readiness survey by the DHA (2011). It will be important for SLPs wanting to implement or expand their telehealth services to use this increasing body of data on barriers to lobby for change.

Respondents were generous in their suggestion of facilitators to further develop telehealth as a service delivery option. Professional development courses, demonstrations, electronic assessment and treatment resources, and funding to establish telehealth services were the most desired, closely followed by formal training and ethical guidance. The responses closely align to those reported in the surveys by Dunkley et al. (2010) and ASHA (2002). The ASHA survey (2002) also revealed that education and training in telehealth through university or professional development had facilitated the use of telehealth clinically in the United States. Furthermore, the continued rollout of the National Broadband Network and the interest government bodies are displaying in the use of telehealth bodies well for the future of telehealth SLP services in Australia.

Limitations and future directions

This study is the first of its kind examining the clinical use of telehealth in SLP practice across Australia. The responses from the study provide insight into how telehealth is being used in clinical practice and suggests facilitators to enhance this mode of service delivery; however, a number of limitations around the design and distribution of the survey were evident. A major limitation in the survey design was the omission of a definition of telehealth at the beginning of the survey. Inclusion of an unambiguous definition would have provided respondents with a clearer understanding of the nature and purpose of the survey and would have reduced potential confusion between computer-based therapy and telehealth. The other major limitation of the survey was the exclusion of the clinicians not using telehealth. Their inclusion would have substantially enhanced the survey by providing a measure of the extent of telehealth use in SLP, in addition to valuable information on why these clinicians don’t use telehealth, the barriers they have encountered, and their views on facilitators to their future use of telehealth. Other limitations of the survey design included a lack of questions regarding the types of technology used by clients to receive telehealth services and a clear delineation between direct therapy services to a client and consultation or support services around a client, particularly with regard to paediatric populations.

The authors made use of the national professional association’s (Speech Pathology Australia) network for distribution of the survey which afforded potential participation by SLPs throughout Australia. However, other distribution channels were also utilised (e.g., heads of university SLP courses and leaders in Queensland Health). The bias in using mainly Queensland-based organisations may have produced a degree of bias in the results with Queensland having the highest percentage of respondents (42.1%). Furthermore, the survey was available only for 10 weeks. A longer timeframe and reminder emails may have enabled a higher response rate.

The relatively small response to the survey (n = 57) may have been due to a number of factors. The distribution and design flaws evident in the survey have almost certainly contributed; however, another explanation may be that the uptake of telehealth within SLP is still not widespread. The broader telehealth literature has found that the clinical use of telehealth is not as widespread as had been predicted (Walker & Whetton, 2002). While the barriers to using telehealth clinically as reported by the respondents may provide some insight into reasons for low uptake of telehealth, information from non-users would further clarify the factors around uptake.

In order to track the clinical use of telehealth in SLP practice, this study could be repeated every three to four years to determine if telehealth has expanded or if the aforementioned facilitators have been implemented. Future studies should address the design and distribution limitations of the current study to provide comprehensive data on the clinical use of telehealth in SLP.

Conclusion

This study was conducted to determine the clinical use of telehealth by SLPs in Australia. A wide variety of paediatric
and adult clients were reported to access SLP services via telehealth with clinicians delivering a diverse range of direct therapy. However, the results of the survey appear to show a deviation from the emergent evidence base for telehealth in SLP, with the majority of respondents using telehealth to provide clinical treatment services to paediatric populations despite a paucity of evidence in the literature. Clinicians reported high levels of confidence and satisfaction in the services they delivered via telehealth.

Respondents identified a range of benefits to using telehealth in clinical practice and expressed a strong desire to expand their telehealth services. However, significant barriers to this expansion were identified especially in relation to technology, telecommunication infrastructure, and resources. Clinicians suggested a number of facilitators for the further development of telehealth in SLP and these comments require careful consideration by the institutions responsible for the education of SLPs and the provision of SLP services to all client populations. With the Australian government showing interest in telehealth, now is the time for education and training into the telehealth delivery of SLP services so that our profession is ready to respond to new technologies, new telecommunication infrastructure, and client demands for alternative service delivery options. Telehealth will be part of the future for SLP in Australia and should be embraced to facilitate the increased access to services that clients with communication and swallowing problems require.

Acknowledgments

We thank the participants. We also acknowledge Speech Pathology Australia, the heads of department at all universities with SLP courses across Australia, and the heads of SLP departments in Queensland Health and Education Queensland for helping distribute the survey.

References


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