

## **Assessing dysphagia via telerehabilitation: Patient perceptions and satisfaction.**

### **Abstract**

To gain insight into factors which may influence future acceptance of dysphagia management via telerehabilitation, patients' perceptions were examined before and after a telerehabilitation assessment session. Forty adult patients with dysphagia (M = 66y, SD = 16.25) completed pre- and post-session questionnaires which consisted of 14 matched questions worded to suit pre- and post-conditions. Questions explored comfort with the use of telerehabilitation, satisfaction with audio and video quality, benefits of telerehabilitation assessments and patients' preferred assessment modality. Questions were rated on a 5-point scale (1=strongly disagree, 3=unsure, 5=strongly agree). Patients' comfort with assessment via telerehabilitation was high in over 80% of the group both pre- and post-assessment. Pre-assessment, patients were unsure what to expect with the auditory and visual aspects of the videoconference, however there were significant positive changes reported post-experience. In relation to perceived benefits of telerehabilitation services in general, most patients believed in the value of telerehabilitation and post-assessment this increased to 90-100% agreement. Although 92% felt they would be comfortable receiving services via telerehabilitation, 45% of patients indicated ultimate preference for a traditional face-to-face assessment. The data highlight that patients are interested in and willing to receive services via telerehabilitation, however, any concerns should be addressed pre-assessment.

Keywords: Patient perception - satisfaction - dysphagia - telerehabilitation - swallowing examination

## **Introduction**

Across a range of medical, nursing and allied health services, there is a growing body of evidence supporting the use of telehealth (Ekeland, Bowes, & Flottorp, 2010). Telehealth encompasses any healthcare that is delivered over a distance using technology (Craig, 1999) and includes telerehabilitation which is specific to the online delivery of rehabilitation services (Rosen, 1999). Whilst researchers speculated at first that individuals, particularly the elderly, may not be supportive of, or willing to participate in receiving health care services via telehealth (Stanberry, 2000; Stroetmann, Husing, Kubitschke, & Stroetmann, 2002), recent studies have failed to support this hypothesis. In fact, the majority of studies have demonstrated a very high degree of patient satisfaction and report positive patient acceptance of telehealth services (Agrell, Dahlberg, & Jerant, 2000; Balas, Jaffrey, Kuperman, Boren, Brown, & Pinciroli, 1997; Bratton & Short, 2001; Cardozo & Steinberg, 2010; Demiris, Speedie, & Finkelstein, 2001; Finkelstein, Speedie, Demiris, Veen, Lundgren, & Potthoff, 2004; Whitten, Mair, & Collins, 1997).

Understanding patients' perceptions is an important component of telehealth service research, as the level of satisfaction of users of telehealth may directly impact on their willingness to adopt this practice (Craig, 1999). Most patient satisfaction studies involve interviews or questionnaires conducted with patients after they have experienced a telehealth consultation. This methodology provides evidence regarding the patients' levels of comfort during a telehealth consultation, the user-friendliness of the equipment and technology, and the interaction between the service provider and the patient (Balas et al., 1997; Bratton, & Short, 2001; Chua, Craig, Wootton, & Patterson, 2001; Mair & Whitten, 2000; Ryan, Stathis, Smith, Best, & Wootton, 2005; Samii, Ryan-Dykes, Tsukuda, Zink, Franks, & Nichol, 2006).

However, exploring patient perceptions prior to engaging in a telehealth session can also provide important information about potential barriers to patient acceptance of new telehealth services (Brick, Bashshur, Brick, & D'Alessandri, 1997). It is conceivable that for some individuals a new form of healthcare service could be perceived as daunting and complex, especially if it involves some form of technology. Equally individuals with little to no understanding of how telehealth services are delivered may also have doubts as to the nature or the quality of the service that can be provided. Hence investigating patients' perceptions prior to, as well as after their first experiences with telehealth provides a more complete understanding of patient perceptions and any potential barriers to the implementation of a successful telehealth service (Institute of Medicine, 2001).

In the area of speech pathology, most systematic research into the use of telerehabilitation has occurred within the past decade. Much of this work has focused on establishing the validity and reliability of telerehabilitation services delivered to specific populations of patients across a range of communication deficits (Constantinescu, Theodoros, Russell, Ward, Wilson, & Wootton, 2010a; Constantinescu, Theodoros, Russell, Ward, Wilson, & Wootton, 2010b; Hill, Theodoros, Russell, & Ward, 2009a, Hill, Theodoros, Russell, Cahill, Ward, & Clark, 2006a; Hill, Theodoros, Russell, & Ward, 2009b; Howell, Tripoliti, & Pring, 2009; Theodoros, Hill, Russell, Ward, & Wootton, 2008; Theodoros, Russell, Hill, Cahill, & Clark, 2003; Theodoros, Constantinescu, Russell, Ward, Wilson & Wootton, 2006; Tindall, Huebner, Stemple & Kleinert, 2008; Ward, White, Russell, Theodoros, Kuhl, & Nelson, 2007; Ward, Crombie, Trickey, Hill, Theodoros, & Russell, 2009; Waite, Cahill, Theodoros, Busuttin, & Russell, 2006; Waite, Theodoros, Russell, & Cahill, 2010). However patient perceptions have also been explored in a number of these

studies. Using questionnaires following a patient's experience with a telerehabilitation session, these studies have revealed that overall, the majority of participants reported both a positive experience and a willingness to accept speech pathology services delivered via telerehabilitation (Brennan, Georgeadis, Baron, & Barker, 2004; Constantinescu et al., 2010a, b; Hill et al., 2009a, b; Ward et al., 2009).

Within the growing body of literature relating to online speech pathology services, recent studies have reported evidence to support the feasibility, validity and reliability of administering clinical dysphagia assessments via telerehabilitation (Lalor, Brown, & Cranfield, 2000; Myers, 2005; Sharma, Ward, Burns, Theodoros, & Russell, 2011; Ward, Sharma, Burns, Theodoros, & Russell, 2012). Most recent evidence published to date on a clinical cohort of 40 patients revealed a high degree of clinical agreement was obtained between the decisions made simultaneously by an online clinician and a face-to-face clinician during an online clinical swallowing assessment (Ward et al., 2012). To date however, patient perceptions of such services have yet to be systematically studied. The process of conducting a traditional face-to-face clinical dysphagia assessment involves hands-on interaction between the patient and the clinician for both the oromotor assessment and food and fluids trials (Logemann, 1998). It is therefore conceivable that patients may have some concerns regarding how a dysphagia assessment session can be achieved via telerehabilitation when neither tactile information nor direct patient contact is possible between the patient and the assessing speech pathologist in a telerehabilitation assessment. Equally whether or not they felt they feel comfortable when assessed via a remote clinician, and would accept receiving assessments via this service delivery model need to be determined.

Some preliminary evidence regarding patient perceptions of dysphagia assessments conducted via telerehabilitation can be derived from two recent studies by Ward et al. (2007; 2009) who investigated patient satisfaction following a telerehabilitation assessment of communication and swallowing function in a group of patients post laryngectomy. In the study by Ward et al. (2007), participants responded to five questions relating to the service and level of client-clinician relationship, the ease of use of the system, whether the system was sufficient for their presenting problems, and whether they felt that they had been treated with respect. Findings revealed that participants either agreed or strongly agreed with all statements presented. Later in a study with a similar population, Ward et al. (2009), examined patient satisfaction with online assessment of communication and swallowing function and found high levels of satisfaction with the telerehabilitation service, clinician rapport, ease of use, the sufficiency of the audio/video quality, the equivalence to a face-to-face service delivery, and patient's willingness to participate in a telerehabilitation session in the future. Participants were also positive about the convenience and the acceptability of the telehealth mode of speech pathology service delivery (Ward et al., 2009). However, although these studies provide some preliminary information, patient satisfaction ratings in both studies related to the total session experience, that is, an assessment of both communication and swallowing, and were not specific to the swallowing component. In addition, the patient population was not at risk of aspiration (due to anatomical changes created by surgery), and were in the post acute stage of management.

To date there are no systematic data available about the pre assessment perceptions of patients with acute onset dysphagia and if these perceptions change through using telerehabilitation services. Furthermore, the limited data available to

date have reported on only patient perceptions collected following the telerehabilitation experience. No study has examined both the pre and the post assessment perceptions. Considering pre-conceptions about a service may have impact on a patient's willingness to receive the service, this is an important additional aspect which should be included in any evaluation of patient perceptions and satisfaction with a telerehabilitation service. The current research thus aimed to identify any common preconceptions patients may have had prior to their consultation, and determine how these opinions changed following an opportunity to partake in a dysphagia assessment conducted via telerehabilitation. Understanding patients' willingness to engage in telehealth services, their preconceptions about the potential benefits of such services, and their feedback on their experience with the service is important information to help improve services and maximise their future acceptance.

## **Materials and Methods**

### *Participants*

Forty adult patients recruited from the inpatient (45%) and outpatient (55%) caseload of a large tertiary care hospital consented to take part in a telerehabilitation assessment of their dysphagia in a research clinic. All patients had been previously diagnosed with dysphagia (27.5% mild, 55% moderate, 7.5% moderate-severe, and 10% severe) by their treating speech pathologist using the Dysphagia Outcome and Severity Scale (DOSS) (O'Neil, Purdy, Falk, & Gallo, 1999) which was completed following a Clinical Swallowing Examination conducted within two days of the online assessment. The cohort consisted of 23 males and 17 females. Mean age was 66 years (range 25 to 94 years), with 40% of the group over the age of 70 years. Forty

five percent presented with dysphagia due to head and neck cancer management (surgical and non-surgical) while the remaining 55% presented with dysphagia associated with acute and progressive neurological conditions, which included olivopontine atrophy (n=1), Parkinson's disease (n=4), cerebrovascular accident (n=15), mild dementia (n=1) and upper motor neurone disease (n=1). Individuals were excluded if they had moderate or greater cognitive impairment (as determined by their referring doctor), severe receptive or expressive aphasia, significant auditory and/or visual deficits, or an overall poor or rapidly fluctuating health status. Participants were not required to have any knowledge or skills associated with computers and technology and were not required to operate the technology at any point during the assessment session. When asked about prior experience using telehealth, only four participants (10%) reported having used some form of telehealth in other aspects of their healthcare. Prior to participation in the study, all participants were provided with a patient information letter which detailed the purpose of the research and the telerehabilitation assessment session they were about to undertake. All participants provided informed consent to participate.

### *Procedure*

The current study used a questionnaire to assess patient perceptions of telerehabilitation both immediately prior to and after they underwent telerehabilitation assessment of dysphagia. The telerehabilitation session for each patient followed the same procedure detailed previously by Sharma et al. (2011) and as described in detail in Ward et al. (2012). In brief, this involved a clinical swallowing examination that was led by an online clinician who assessed the patient in real time during the videoconference. Store-and-forward technology was incorporated into the system

allowing the online clinician to record the session and review this later to confirm decisions. A detailed Clinical Swallowing Examination proforma (detailed in full in Ward et al. 2012) was used to structure the session and the parameters assessed for each patient. An Assistant was also present for all assessments and was located in the room with the patient to help complete the assessment tasks as directed by the online clinician (e.g. assist patient to complete oromotor movements; assist with food/fluid trials).

Both the pre and post session questionnaire consisted of the same 14 items which examined perceptions regarding 1) level of comfort with telerehabilitation (3 items), 2) audio and video quality (2 items) and 3) general considerations regarding telerehabilitation consultation (9 items) (Table 1). As there are no standardised evaluations of patient perceptions, the questionnaire was purpose built for the current study, and the content for the questionnaire derived from published research (Hill, Theodoros, Russell, & Ward, 2006b; Ward et al., 2009). In the pre-session questionnaire, questions were worded in the future tense that is ‘I will have no difficulty seeing the online speech pathologist’. The post assessment questionnaire contained the same questions, only with grammatical modifications to reflect past tense e.g. ‘I had no difficulty seeing the online speech pathologist’. Patients responded to each statement in both the pre and post questionnaires using a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, 5 = strongly agree). In the post assessment questionnaire, patients also had the opportunity to provide open-ended comments regarding the telerehabilitation consultation. Each questionnaire took no more than 10 minutes to complete.

### *Data analysis*

Prior to analysis, patient responses across the 5 point scale were collapsed to create three groups (i.e. strongly disagree + disagree = 'disagree', unsure = 'unsure' and agree + strongly agree = 'agree'). Descriptive statistics were used to report patterns of responses across the pre and post assessment conditions. The Predictive Analysis SoftWare (PASW) Statistics Version 18.0 (SPSS Incorporated, 2010) was used to analyse the extent of change in perceptions between pre to post using a repeated measures non-parametric test (Friedman's). For all comparisons n=40, with df of 1. Significance was set at  $p < 0.05$ .

## **Results**

### *Pre-consultation*

Results of the pre assessment questionnaires are detailed in Table 1. Prior to assessment the majority (80% or higher) perceived that they would be comfortable undertaking the assessment and using telerehabilitation for an assessment of their swallowing. With respect to the audio/visual quality questions, however, only one in three patients was confident that they would have no difficulty seeing and hearing the clinician with the remaining patients being unsure or expressing concern.

Over 70% of patients felt the assessment would be clear and easy to follow with sufficient time to complete assessments and would provide the opportunity to clarify any doubts or issues they may have had. Over 90% agreed that telehealth allowed easy access and would allow savings of travelling time with three out of four patients feeling that telehealth may benefit all patients alike. However, the group was largely divided as to whether the online and face-to-face methods would be comparable, if the online method would be able to replace a face-to-face assessment, and in their preference to receive a traditional face-to-face consultation (Table 1).

Table 1: Results of pre and post assessment questionnaires which have been concatenated from a five point Likert scale to a three point Likert scale to reveal basic groups of “disagree”, “unsure” and “agree”. The italics and brackets indicate pre/post wording changes between the pre and post assessment conditions.

Item:	Pre-assessment			Post-assessment			Chi	p
	Disagree	Unsure	Agree	Disagree	Unsure	Agree		
1. <i>I will be comfortable</i> (am comfortable) to use telehealth if it is available in the hospital or healthcare facility nearest to my place of residence.	1 (2%)	7 (18%)	32 (80%)	0	2 (5%)	38 (95%)	1.32	0.251
2. <i>I am comfortable</i> (was comfortable) to undergo an assessment for my swallowing disorder via the internet.	3 (8%)	3 (8%)	34 (85%)	0	1 (2%)	39 (98%)	2.51	0.109
3. <i>I will be</i> (was) comfortable being online and would consider using the internet for the rehabilitation of my swallowing	0	8 (20%)	32 (80%)	0	3 (8%)	37 (92%)	5.44	0.20
4. I will have (I had) no difficulty in seeing the online speech	19	9	12	9	0	31	13.37	<0.001*

pathologist.	(47%)	(23%)	(30%)	(23%)		(78%)		
5. I will have (I had) no difficulty hearing the online speech pathologist.	13 (32%)	14 (35%)	13 (33%)	12 (30%)	2 (5%)	26 (65%)	6.53	0.011*
6. I would rate the online assessment as being equal to an assessment conducted traditionally in the face-to-face method.	4 (9%)	16 (40%)	20 (51%)	2 (5%)	5 (12%)	33 (83%)	10.67	0.001*
7. The instructions given during the online assessment will be (were) clear and easy to follow.	1 (2%)	11 (28%)	28 (70%)	0	2 (5%)	38 (95%)	11.27	0.001*
8. I will have (I had) sufficient time to execute the instructions given during the assessment.	0	9 (23%)	31 (77%)	0	0	40 (100%)	14.00	<0.001*
9. I will have (I had) opportunities to clarify any doubts I may have during the online assessment.	0	7 (18%)	33 (82%)	0	0	40 (100%)	8.33	0.004*
10. Telehealth can replace a face-to-face assessment.	7 (18%)	13 (32%)	20 (50%)	4 (10%)	8 (20%)	28 (70%)	9.78	0.002*

11. Telehealth will allow easy access to healthcare.	0	8	32	0	2	38	10.89	0.001*
		(20%)	(90%)		(5%)	(95%)		
12. Telehealth will save me travelling time & money.	1	3	36	0	1	39	14.00	<0.001*
	(3%)	(7%)	(90%)		(3%)	(97%)		
13. Telehealth may benefit all patients alike.	1	9	30	0	4	36	9.94	0.002*
	(2%)	(23%)	(75%)		(10%)	(90%)		
14. I would prefer to have a traditional (face-to-face) consultation with the speech pathologist despite possible costs and inconveniences.	5	17	18	12	10	18	0.17	0.683
	(12%)	(43%)	(45%)	(30%)	(25%)	(45%)		

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### *Post-consultation*

Statistical analysis confirmed changes on a number of questionnaire items following the telerehabilitation session (Table 1). There were no significant changes in levels of comfort using telerehabilitation (Questions 1, 2, and 3), with patients reporting a similar high degree of comfort post session. Significant changes though were observed in the perception of audio and visual quality with 65% and 78% now agreeing that the auditory and visual information respectively, was adequate (Questions 4 and 5). However it should be noted that up to 30% of individuals still reported some difficulty seeing or hearing the online speech pathologist.

For questions eight and nine relating to general aspects of telerehabilitation, significant improvements in patient perceptions were observed. Where 70% or more of the patients agreed with statements pre assessment (Questions 7-9, 11-13), this increased to almost all (90%-100%) agreeing with these statements again post assessment (Questions 6-13). Regarding questions six and ten which evaluated the equality of the online and face-to-face modes of assessment there was significantly less uncertainty post session with the majority now agreeing the modes are comparable. Personal preference for receiving a traditional rather than an online assessment (Question 14) revealed no significant change, with 45% of the group continuing to prefer the face-to-face mode of assessment. Examination of the demographics of these 18 patients revealed that 10 out of 18 (55.5%) patients were over the age of 70 years. However the proportion of individuals who would prefer an online assessment was observed to double from 12% to 30% following the session.

## **Discussion**

The aim of this study was to measure patient perceptions pre assessment and compare the results with post assessment satisfaction in the assessment of dysphagia via telerehabilitation. The results indicate that the patients were generally highly positive with their experience with the telerehabilitation assessment of swallowing disorders. Pre assessment, the majority of patients were open to the idea of using telerehabilitation for the assessment of their swallowing disorder and believed in the potential of telehealth services. Understandably though, some individuals were unsure of the level of auditory and visual aspects and whether or not they would prefer a traditional assessment. However, having experienced the telerehabilitation sessions, patients' perceptions were more positive, although a proportion of the patients still preferred a traditionally delivered dysphagia assessment. Overall these findings indicated that the majority of patients would be open to, and feel satisfied with receiving telerehabilitation services for dysphagia in the future. Results also revealed that even after a single exposure to a telehealth session, patients had become more open to this service modality.

High levels of satisfaction were perceived across all areas of interest pre assessment. Specifically, the questions pertaining to perceived levels of comfort with telehealth revealed that patients were generally comfortable with the concept of telehealth even prior to the experience. This is contrary to the findings of George, Hamilton, & Baker (2009) who reported that the participants in their study for the most part reported concerns about the physical absence of a specialist. However, in the research by Brick et al. (1997), 461 non-institutionalized adults who had no prior experience with telehealth were interviewed regarding perceived attributes, benefits, personal choice and willingness to use telehealth and 59% of their interviewees

perceived that they would be willing to use telehealth in their routine care and would be comfortable doing so. The researchers also reported that 27% - 36% of their participants aged 25 years and above thought that telehealth would be comparable to a traditional consultation and went on to state that the perceptions did not vary by current access or knowledge to telehealth, but was more related to general attitudes about technology. Similarly Dunkley, Pattie, Wilson & McAllister (2010) using mail-out questionnaires and interviews, obtained data from 43 questionnaires from rural residents and 10 interviews with a subset of those residents, and from questionnaires returned by 49 speech pathologists and four interviews with a subset of those speech pathologists. They found that while the participants of their study acknowledged that face-to-face and telerehabilitation services may differ and that telerehabilitation may not suit all patients alike, the participants expressed great willingness to trial telespeech-language pathology. This relationship between positive perceptions of telehealth and technology has also been reported by Turner, Thomas, & Gailiun (2001). It is possible then that in the current study, the high percentage of patients who were positive about using telehealth, which was almost double that compared to past research (Brick et al., 1997; Turner, Thomas, & Gailiun, 2001), may reflect increased exposure to and use of user-friendly computerised technology in other aspects of daily living.

The only results that revealed low scores pre-assessment pertained to perceptions of audio and video quality. It was also noted that particularly the more elderly participants in the current study reported concerns about their potential ability to hear and see the online clinician successfully. In their research on patient satisfaction with telehomecare, Finkelstein et al. (2004) reported that patient's vision and hearing could potentially be determinants of success of a telehealth session,

especially when the patient is elderly. Furthermore, in their study some of the participants who expressed concerns also refused to be involved in telehealth. Hence it is important to recognise these potential patient concerns and discuss these prior to the session. It is also critical to ensure that any individual who requires assistive devices (glasses, hearing aids) has these available for the assessment. While occurring only infrequently, some individuals in the current study attended their session without necessary glasses or hearing aids. Hence it is important to ensure that assistive devices are readily available and in functional condition prior to the commencement of a telehealth session.

Analysis of the post assessment data revealed a positive change in perceptions across all areas of interest. Although not statistically significant, approximately 10% of patients reported to be more comfortable with being online than initially perceived. Other studies have also demonstrated this positive change in perception upon experiencing telehealth. For example, Cranen, Veld, Ijzerman, & Vollenbroek-Hutten (2011) who investigated changes in patients' perceptions of telemedicine for chronic pain, found that after brief exposure patients generally reported more positive opinions of the service compared to pre experience perceptions. Other researchers have also reported this positive change in perceptions post experience (Demiris et al., 2001; Finkelstein et al., 2004). This pattern of higher satisfaction may suggest that patients become more accepting and confident with new technology after participation.

This level of satisfaction may have been further facilitated in the current study through the use of a system which consisted of equipment that looked familiar (videoconferencing via a laptop computer screen) and which did not require any active intervention from the patient. Similar high levels of satisfaction were reported

by other researchers who have used telerehabilitation systems that were essentially similar to that used in the current study (Hill et al., 2009a, b; Ward et al., 2009). For example, the participants in the research by Ward and colleagues reported positive feedback with over 80% stating that they would consider online assessments as the system was easy to use and was more convenient for individuals from remote settings. Similarly, all participants in the research by Hill et al. (2009b) and Theodoros et al. (2008) also indicated that they were eager to participate in a telerehabilitation session in the future.

The findings of the current study are that 98% of patients were comfortable to undergo a telerehabilitation assessment for their swallowing disorder, and 92% would be comfortable to undergo telerehabilitation of their swallowing disorder in the future. Further, the finding that 83% of patients rated telerehabilitation as comparable to the traditional mode of assessment post assessment is particularly encouraging. The high levels of satisfaction in the present research are not unexpected considering that many patients reported that there was adequate time to execute the tasks required, opportunities to clarify doubts and that the instructions provided were clear. However, only 70% of patients felt that telerehabilitation could replace the traditional mode of assessment. Similarly, while a majority of patients were positive in their opinions of the telerehabilitation assessment of their swallowing, 45% of the patients reported that they would still prefer to have a traditional consultation. This highlights that although most individuals are comfortable and satisfied with the telerehabilitation service mode, there may still remain a proportion of patients who are less willing to seek services delivered via telerehabilitation. Equally, this may reflect patient perceptions that there will be some patients and some conditions that telerehabilitation may not be useful for. This important finding has also been observed in other research in

telemedicine, such as in the fields of teleoncology (Allen & Hayes, 1995), multi speciality medicine (Huston & Burton, 1997) and teledermatology (Lowitt, Kessler, Kauffman, Hooper, Siegel, & Burnett, 1998). Allen and colleagues reported that some of their patients were less inclined to want to use the online consultation in the future but did not indicate a percentage. Similarly, Lowitt and colleagues reported that a “substantial minority” (pp. 472) of their patients still preferred the more traditional method of consultation but did not provide exact results within each age group studied. Huston and colleagues on the other hand found that 15 of their 96 patients preferred a traditional consultation. Without further investigation of this particular subset of individuals in the present research, one can only speculate possible reasons for the preference of traditional consultation. Exploration of the age of the group who preferred the traditional service model in the present research revealed that 55% of these individuals were over 70 years of age. Hence it could be that some of the more elderly participants were not as interested in engaging in new and different services. It may also be related to other factors not explored with this current cohort, such as gender, patient’s computer literacy and access, the patient’s health status, the amount and quality of previously experienced face-to-face specialist consultation, and the interpersonal communication and interaction styles of the clinician.

## **Limitations**

By design, the present study excluded certain participants with more complex conditions. As such further research involving a larger number of participants and with more complex needs and conditions is warranted. Future research should also address the concerns of patients who may be uncomfortable being online and the criteria used to determine selection of patients for online assessments. By recognising

the needs and concerns of a range of patients, it is possible to identify the potential success of telerehabilitation as a comprehensive service provision and address the other perceptions and benefits pertaining to issues such as time, financial implications and ease of access to telerehabilitation services in the real world.

## **Conclusion**

The use of telerehabilitation in speech pathology and specifically in the assessment and management of swallowing disorders continues to emerge and requires insight from patients and clinicians in order to achieve optimal care. Pre assessment, some concerns relating to possible auditory and visual quality issues were identified by participants. This highlights the importance of discussing with patients any specific concerns they may have prior to undertaking a telerehabilitation assessment, particularly if it is their first experience. Post assessment, patients in this research largely demonstrated positive changes in their pre-assessment perceptions and had high levels of satisfaction with their experience. Continued evaluations of participant perceptions and levels of satisfaction will help ensure that the utilisation of new technologies in rehabilitation remains focused on patient-care and patient-centred services.

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