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SHORT COMMUNICATION

FEASIBILITY OF USING AN IN-HOME VIDEO CONFERENCING SYSTEM IN GERIATRIC REHABILITATION

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Objective: **This pilot study trialled an in-home videoconferencing system to determine the feasibility of delivering rehabilitation services remotely to aged clients.**
Methods: **Patients approved for community-based transition care were prospectively recruited to trial the eHAB™ videoconferencing system. Staff completed patient logs to record reasons for patient exclusion/inclusion. A staff satisfaction survey recorded qualitative feedback on the operation of eHAB™.**
Results: **Of 44 patients admitted to transition care, 34 (77%) were considered unsuitable for telerehabilitation, due mainly to hearing and/or vision impairment, client/carer anxiety, lack of space in the home, and cognitive impairment. Three proceeded with set-up and use of eHAB™. Staff reported that telerehabilitation was particularly challenging because of the complexity of cases, with many requiring "hands-on" therapy.**
Conclusion: **To implement telerehabilitation more widely in older people there are barriers to be overcome relating to patient limitations, staff issues and the logistics of the system.**

Key words: telerehabilitation; aged; post-acute care; home care service delivery.

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INTRODUCTION

The Australian Transition Care Program (TCP) targets older persons who, at the conclusion of a hospital episode, require more time and support in a non-hospital environment to optimize their functional recovery (1). The care is goal-oriented, short term, and therapy focused (2). Characteristics of the TCP client group are that they are aged, having a mean age of over 80 years, with functional impairment, and at substantial risk of hospital readmission or entry to permanent residential aged care (2).

To provide equitable, high-quality rehabilitation services to clients regardless of their physical location a potential solution is telerehabilitation, the delivery of rehabilitation services via information technology and telecommunication systems (3). The potential advantages of this are: the ability to deliver advice and therapy remotely; to avoid travelling and thus free up valuable clinician time; to enable the remote supervision of less skilled staff; to have more regular interaction with the client for monitoring progress; and to reduce transport costs. For the older client the benefits are the opportunity for access to services in the comfort and familiar surroundings of their own homes, and to avoid having to transport themselves to appointments.

There is now a need to demonstrate viable telerehabilitation services in real-world environments (3), since a review of previous studies (4) shows that few have investigated telerehabilitation as an alternative to physical home-care visits to deliver services, especially for older people. The aim of this pilot study was to trial the eHAB™ in-home videoconferencing system (Telerehabilitation Research Unit, The University of Queensland, Brisbane, Australia) with patients admitted to a community-based TCP in regional Australia to determine the feasibility of delivering therapy-based services remotely to older clients. The study also examined the acceptance of this modality of service by healthcare practitioners.

METHODS

Equipment

The eHAB™ device (Fig. 1) is a personal computer-based videoconferencing system with specialized software to enable the remote measurement of a patient's physical and functional performance. The system has been designed for ease of use by a client in the home with a single on/off switch, with all other aspects of the rehabilitation session controlled remotely by the practitioner. A 12-inch screen ensures that the patient can see the practitioner clearly at all times, even when mobilizing throughout the room. The eHAB™ device is mainly used remotely for physical consultations conducted by physiotherapists, occupational therapists and speech pathologists. However, consultation and therapy can also be conducted remotely by members of the rehabilitation team, such as case managers, medical specialists and dieticians.

Participants and setting

A transition care team in rural Australia, trained in the use of eHAB™, was selected as the trial site. Eligible patients would have an initial visit by a TCP team member to deliver and install the eHAB™ equipment and conduct the initial assessment/s with the patient. All follow-up assessments and other regular communications with these patients would then be conducted using eHAB™.

Clients of the community-based TCP were eligible for this trial provided that they gave consent to participate; had adequate vision and hearing (as assessed by TCP staff); the client, or a person living in

Fig. 1. The eHAB™ telerehabilitation system.

the house, was able to operate the equipment; there was a safe place to locate the equipment; and the client was expected to be on the programme for at least two weeks so that they received at least two sessions of in-home therapy. Based on the TCP case-load, it was expected to recruit 32 clients to the trial over a 6 month period to assess utilization, staff satisfaction and technical function of the equipment.

The study was approved by Human Research Ethics Committees at the University of Queensland and the Health Service District responsible for governance of the TCP site.

Data collection and analysis

Utilization of the equipment was gauged from specially designed patient logs completed by staff to record reasons for patients being chosen/not chosen for eHAB™. A staff satisfaction questionnaire with open-ended questions recorded qualitative feedback on the operation of eHAB™. Technical function and usage was monitored by the Telerehabilitation Research Unit, at the University of Queensland.

RESULTS

Over an 8-month data collection period (August 2008 to March 2009), 44 patients were listed on the transition care patient logs, of whom 34 (77%) were considered to be ineligible. Among the multiple co-morbidities recorded by staff as reasons for ineligibility, the majority related to hearing and/or vision impairment (47%) and client/carer anxiety or stress (38%). Client/carer dementia was reported in 12% of cases. In conjunction with co-morbidities, other reasons for exclusion included a cluttered home environment (26%) and short-term stay in community TCP (12%). Six of the 34 cases were considered ineligible because they declined involvement or were not compliant with components of the programme.

Of the 10 patients who were considered eligible, 7 did not proceed with eHAB™. Of these, 3 patients declined to be involved in the study, citing a preference for face-to-face assessment. For an additional 3 patients, there was no location at home to store the equipment due to space or safety concerns. In one case the trial did not proceed because of change of therapist, lack of staff training and consequent failure to collect data. Of the 3 patients who participated in the eHAB™ trial during the study period, 1 could not proceed with sessions after initial set-up and testing because her condition deteriorated and she was confined to bed.

Feedback from staff indicated that eHAB™ was more likely to be successful for clients with a high level of mobility and few co-morbidities. Staff reported telerehabilitation was particularly challenging with TCP clients, many of whom have complex social problems, decreased hearing and vision, decreased mobility, and cognitive impairment. The complexity of some cases required "hands-on" therapy. Sessions using eHAB™ were thought more likely to be efficient when used with clients who were more than 20 min drive from the TCP centre. It was also reported that eHAB™ had been used successfully for remote geriatrician consultation and case conferencing.

Some of the challenges listed in feedback reports were that "on hand" assistance was needed, not only to set up and start the machine, but also to remain with the client whilst in use, particularly for those clients with impaired balance and gait who were at high risk for falls. The size and weight of the machine meant that it could not be moved around the home by the client without the use of a mobile trolley, and the limited space in many homes meant the machine could not be left set up between sessions.

DISCUSSION

The apparent failure to implement telerehabilitation more widely in this client group of older people may be related to several factors, including the patient's health and social situation, staff issues and capability and logistics of the system.

Health and social factors

A high percentage of TCP clients were considered by the staff to be unsuitable candidates for telerehabilitation due to reasons including hearing and/or vision impairment, client/carer anxiety or stress, lack of space in a cluttered home environment, and cognitive impairment. In addition the feasibility of using telerehabilitation in this population was contingent upon the presence of a third party in the patient's home to ensure patient safety and staff expressed reservation about using the eHAB™ system in complex cases requiring "hands on" therapy. This is a common concern in telerehabilitation applications, and future trials should evaluate the use of carers or family members, who could potentially be trained via the system, to assist with these clients.

Staff issues

Other studies have generally reported that satisfaction with telerehabilitation is consistently high, both for patients and therapists (4) and that healthcare professionals appear satisfied with the service-delivery mode without a face-to-face session

(5). However staff in our trial reported that they disagreed that TCP care via video-conferencing was as good as "face to face" care due to the nature and complexity of the client group. One of the factors accounting for the low uptake of eHAB™ may have been that the clinical "champion" on the trial left the unit. With consequent staff changes, the necessity for re-training was not adequately addressed.

Equipment

Other challenges for in-home telerehabilitation involve capability and logistics of the system including ease of start up and use, quality of sound and video images and location of equipment, especially for older people who may have little experience or confidence in using technology such as computers. Future developments in technology are likely to improve the user interface as well as size and mobility of the equipment, making it more accessible to this client group.

Our study has suggested that further research is warranted to investigate the role of telerehabilitation in a service where the patients are older and have multiple comorbidities. If quality is assured, then the indications for use of eHAB™ in TCP clients may be:

- Video-consultation for monitoring purposes (a visual alternative to the telephone) to check on patient progress and compliance with the treatment regime, when there is no other reason to visit the home.
- Remote assessment by a specialist not locally available.
- Supervision of therapy administered by a junior staff member.
- One-to-one therapy for persons with less complex conditions.

Study limitations

A limitation of the study was that patient characteristics, such as physical and cognitive function, co-morbidities, and living situation, were not collected, nor were patient preferences included in the survey. The pilot study was designed primarily to ascertain the feasibility and therapists' perceptions of using specially designed in-home video conferencing equipment to deliver rehabilitation services remotely.

Conclusion

Telerehabilitation has the potential to be a practical alternative for delivering rehabilitation services in targeted patients, especially in remote communities with limited access to services. However, there are barriers to be overcome to ensure the effectiveness of this mode of service delivery for aged clients in transition care.

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