

A PILOT STUDY EVALUATING A HOME EXERCISE DVD FOR PATIENTS WHO RESIDE IN A RURAL AND REMOTE LOCATION

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ABSTRACT

Objectives: Home exercise programs are an important component of a hand therapy rehabilitation program. Compliance with the recommended home exercise regime is generally considered essential for good treatment outcomes. The aim of this pilot was to determine the clarity of an innovative hand therapy DVD. This DVD will be utilised in a randomised controlled trial (RCT) examining the usefulness of DVD technology for enhancing treatment compliance for rural and remote hand therapy patients. **Methods:** A series of seven DVDs of previously utilised home exercise protocols were taped and edited by the researchers. The pilot used a convenience sample of nine consecutive consenting patients who attended the Hand Therapy Service at a regional hospital in North Queensland. Subjects viewed a DVD that related to their clinical diagnosis and then completed a questionnaire on the suitability of the research instrument. **Results:** There were unanimously positive responses to the DVD from all subjects, with 100% indicating yes to the prompt questions. No negative comments were received. **Discussion:** The DVDs produced were found to be clear and useful for a group of hand therapy patients characteristically similar to those who will be recruited into the RCT. Resulting compliance with these home exercises will be presented in a subsequent paper resulting from the RCT. Given the poor health outcomes generally associated with patients from rural and remote areas, this endeavour contributes to the ongoing effort to improve service delivery to better address the health needs of rural and remote patients.

KEYWORDS: Hand Therapy; Compliance; Home Exercise Programs; DVD

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INTRODUCTION

Traumatic hand injuries are generally complex and may result in a loss of sensory and motor dysfunction (Gustafsson and Ahlstrom, 2004). Enabling the client to regain functional use of their hand or arm and return to pre injury occupations is a primary focus following such injuries. The provision of hand rehabilitation involves therapy for physiological impairments, difficulties with activities and limitations in occupational roles (Case-Smith, 2003). Home exercise programs are considered to be an important component of a hand therapy rehabilitation program. Hand therapy rehabilitation is usually completed following an acute rehabilitative phase; these programs prevent ongoing stiffness and disability (Kirwan et al., 2002; Weeks et al., 2002). Compliance with the recommended home exercise regime encourages patient self management and is generally considered essential for good treatment outcomes (Chen et al., 1999). 2009 Compliance with hand rehabilitation is defined as the extent to which a patient or clients actively follows therapist advice and instruction (Chen et al, 1999). Behaviours that demonstrate compliance include attending appointments, active participation in rehabilitation activities at the clinic and home and the wearing of protective or therapeutic devices (Kolt et al, 2006). Factors that may influence compliance include: the duration of treatment; presence of stable family network; financial situation; accessibility of treatment setting; transportation; literacy; positive or negative feedback from therapists; fit with daily routines and pain caused by exercises (Chen et al., 1999, Groth and Wulf, 1995; Kirwan et al 2002). Patients who believe that little can be done by exercising or are unable to see the results of exercises are less likely to be

compliant (Henry et al., 1999). Kirwan et al. (2002) highlights that often therapists and patients have different perceptions regarding levels of compliance to home exercise programs. For example, hand therapists believed their patients were less motivated and committed than the patients viewed themselves. Patients ranked pain and discomfort caused by exercises higher than therapists for reasons for non compliance.

Compliance is the most unpredictable and least controllable variable in medical intervention (Groth and Wulf, 1995). Although there are other factors involved in achieving successful outcomes, compliance is generally recognised to be an important factor in rehabilitation (Henry et al., 1999, Jan et al., 2004, Lyngcoln et al., 2005, Shaw et al., 2005). In a study exploring outcomes after distal radius fracture, compliance to home exercises were believed to be important aspects in determining short term outcome (Lyngcoln, et al., 2005). Poor compliance affects the recovery and functional abilities of a patient and can result in ongoing disability (Kirwan et al., 2002). The long term cost of treatment, morbidity and side effects may be alleviated by undertaking what is considered to be relatively inexpensive exercise programs, as prescribed by a hand therapist (Schneiders et al., 1998). Measuring compliance is a difficult and often subjective process. Patient or client reports, which are a commonly used measure, result in varying degrees of accuracy and reliability (Bassett, 2003; Schneiders et al., 1998; Sluijs et al., 1993). Attendance at therapy sessions, the reported time spent exercising and the intensity of observed exercise have also been utilised to measure compliance with exercise programs (Shaw et al, 2005). A study by Brewer et al. (2004) provided home exercise

programs on videocassettes containing a hidden counter that recorded each time the video was played. Brewer et al. (2004) found that the total number of self reported completions of the home exercise routine was significantly higher than the number of times the videotape was played. However, as the research does not report whether ethical approval was granted to undertake this covert monitoring, this is not a study methodology that would be advocated for future research into compliance.

The observation of proficient exercise performance is highlighted in the literature as being positively correlated with patients' self reporting higher levels of compliance (Codori et al., 1992; Henry et al., 1999). The same studies acknowledge that the amount of training a patient receives and the tendency of patients to overestimate their compliance does impact upon the exercise performance proficiency and compliance relationship (Codori et al., 1992; Henry et al., 1999). Email and on-line registration or reporting has also been suggested in order to enhance patient compliance (Shaw et al., 2005).

Few of these compliance measures have been tested for reliability or validity. The Sports Injury Rehabilitation Adherence Scale (Brewer et al., 2002) uses three items to measure compliance. A five point scale is used to assess the intensity with which exercises are performed, the extent to which patients follow the therapist's advice and the patient's receptiveness to change. The use of multiple measures of compliance is recommended, including attendance at therapy sessions, exercise diaries and logbooks, therapist rating of compliance, as well as patient self report (Shaw et al., 2005).

There is increasing acknowledgement that people in rural and remote locations are not doing as well in health status as those in the cities (Gregory et al., 2006). This discrepancy is reported to be the result of lower income, level of education and employment types, exposure to harsher environments, sparser infrastructure and poorer access to health services (AIHW, 1998). Rural and remote populations have a disproportionate share of the burden of traumatic injury (AIHW, 2006). People living in rural and remote locations and engaged in occupations such as farming, mining, forestry and fishing are at higher risk of traumatic injuries due to the physical risk involved in these occupations (AIHW, 2006). In addition, for rural people, the need to travel over long distances on country roads can also hold dangers due to factors such as higher speeds, fatigue from longer driving times and animals on the road (AIHW, 2006).

The recovery from such traumatic injuries can be exacerbated by the issue of compliance with treatment regimes, which can be of particular concern for people who reside some distance from a treatment centre. The cost of travel to attend specialist treatment is commonly highlighted in literature discussing rural and remote issues (Bolch et al., 2005; Eckert et al., 2004; Humphreys, 2000; Jones et al., 2006; National Rural Health Alliance, 2002; Simmons, 2000). Travel and accommodation costs and the time taken seeking services in metropolitan centres often limit the duration and follow up of treatment.

Furthermore, there is an attitudinal difference between populations. People who live in metropolitan and regional areas tend to view health as the absence of disease or dysfunction, but for people who live in rural and remote locations health is seen as

the ability to carry out activities of daily living at home and work tasks (Elliott-Schmidt and Strong, 1997). People who live in rural and remote locations are described as stoic, hard working, self sufficient and independent in times of adversity (Edwards et al., 2007; Kelly and Smith, 2007; Rolley and Humphreys, 1993). These attitudinal differences between populations may influence the level of compliance that a patient has to a treatment regime and subsequently outcomes.

Health professionals working with rural and remote patients have to address relevant health issues, whilst also dealing with the highlighted factors surrounding distance, isolation and a dispersed population (National Rural Health Alliance, 2002). One solution is a home based therapy program that can be monitored and adapted when the patient does visit (Elliott-Smith and Strong, 1997).

Home exercise programs, particularly for hand injuries such as tendon repairs or crush injuries, rely on the execution of protocols that align the need for protection with early movement. When the need to regain function for work and home tasks becomes a focus, therapists must promote compliance through balancing a recommended home exercise program within the daily life of their patients.

The provision of a DVD or videotape may ensure performance proficiency and compliance, and hence, improve health outcomes. Research has investigated the use of videotape education to improve medication adherence (Brook et al., 2005; Wong et al., 2006), frequency of breast examination (Janda et al., 2002), and awareness of medical conditions such as colitis and heart failure (Eaden et al., 2002; Smith et al., 2005). Wong et al. (2006) noted that the use of a video is useful for people with lower levels of education and limited understanding of the importance of their therapy. Weeks et al. (2002) argued that dynamic modelling, through the use of a video tape, was more effective than static illustrations. Moreover, Lin et al. (1997) found that the group who received a videotape performed the exercise more regularly and correctly than those who received a booklet only.

Schoo and Morris (2003) conducted a systematic review on the effectiveness of face to face instructions, illustrated brochures, audiotapes and videotapes on the correctness of home exercise performance and compliance. They concluded that there was moderately strong evidence for face to face verbal instructions combined with handouts, with modest support for the provision of additional videotape instructions to further improve correctness and compliance. Further to this Schoo et al. (2005) conducted a RCT and reported that there was no evidence to support that providing videotape, in addition to brochures, would improve compliance and correctness of exercise performance. Compliance in Schoo et al.'s study was measured through patient self report which is considered an unreliable measure, when used on its own (Bassett, 2003; Shaw et al., 2005). Utilising other outcome measures, in addition to patient self report, may have provided more comprehensive data for the above study and therefore more positive results for the use of videotape.

For rural and remote patients, face to face contact and the provision of handouts cannot always occur on a regular basis. Attendance at therapy sessions may need to coincide with appointments with surgeons, and this often occurs infrequently.

Schoo et al. (2005) did note that videotapes may benefit those patients who are unable to attend face to face appointments due to lack of transport or distance. The obvious benefit in this case being, that when instruction in the home exercise program is video based, the patient can take the video home and replay it.

This pilot study was conducted to examine instructions outlined in DVD home exercise program, which was developed for patients of a regional hospital hand therapy service. This DVD will be further utilised in a study that explores whether providing a DVD in conjunction with brochures improves compliance with prescribed exercises, when compared to providing brochures alone. It is important to ensure a research instrument is clear when used in the major study (van Teijlingen and Hundley, 2002). Specifically, the aim of this pilot was to determine the clarity of an innovative hand therapy DVD.

METHODS

Approval was received for the study from The Townsville Health Service District Human Research Ethics Committee (protocol #14/07) and the James Cook University Human Research Ethics Committee (approval # H2697).

The authors published an announcement in the newsletter of the Australian Hand Therapy Association, requesting information from any hand therapists in Australia as to the existence of exercise protocols on videotape or DVD. No responses were received to indicate that media other than brochures or handouts were utilised. Telephone contact was made with hand therapists employed in teaching hospitals in Brisbane, Sydney and Perth who also confirmed that home exercise protocols were not provided on either DVD or videotape.

A series of seven DVDs of previously utilised home exercise protocols were taped and edited by the Audiovisual Department and Occupational Therapy Department at the regional hospital (see Table 1). Occupational Therapy Department staff members were filmed demonstrating correct execution of the exercises. Audio instruction was also provided by an Occupational Therapy Department staff member. The DVDs followed the protocols provided on handouts currently in use within the Occupational Therapy Department. These protocols have been reviewed by specialist hand and upper limb therapists and surgeons. They have been published by EKCO Occupational Services Hand and Upper Limb Rehabilitation Unit (Anderson et al., 2006).

Table 1: Hand Therapy DVD Protocols

DVD	Hand Therapy Regime/Protocol
1	Flexor tendon repair: early active motion protocol
2	Flexor tendon repair: passive protocol
3	Flexor Pollicis Longus (FPL) repair: early active motion protocol
4	Flexor Pollicis Longus (FPL) repair: passive protocol
5	Short arc early active range of motion repair for zones 2 to 3
6	Controlled early active motion for zones four to seven extensor tendon repair
7	Trimmed fixation following distal radius fracture

SUBJECTS

The pilot used a convenience sample of nine patients who attended the Occupational Therapy Department Hand Therapy Service at a regional hospital in North Queensland. The pilot target group were all patients who presented to the hand therapy service over a period of one month between May and June 2007. After nine patients volunteered to take part, recruitment was ceased. A sample size of 10% or over of the major study size is commonly deemed adequate for a pilot study (Lackey and Wingate, 1998). The subsequent RCT will recruit prospectively 52 patients from this regional hospital patient base, thus this current study is larger than the required sample size (15%). In addition, Hertzog (2008) notes that a sample of ten or fewer subjects is acceptable in a pilot study aimed at assessing clarity of instruction, wording, formatting or ease of administration. Ethics approval for the subsequent RCT necessitated subjects to be over the age of eighteen.

Criteria for participating in the pilot study were that subjects had to be receiving a therapy program that related to one of the seven DVDs, be able to speak English, have no visual impairments and no diagnosed cognitive disability.

The pilot subjects demographics were compared to previous participants of a hand therapy study from the same regional hospital patient base (see Table 3), in order to predict their similarities with the subsequent RCT target group (which will be derived from the same regional hospital hand therapy patient base).

PROCEDURE

A standard script was devised for the treating therapist to invite patients to participate in the pilot study. This script was read out during their regular treatment session. Patients who agreed to participate were then taken to a separate room with a research assistant for 15 minutes after their scheduled appointment. This step ensured limited interruption to normal treatment sessions and enabled subjects to view a DVD that related to their clinical diagnosis and rehabilitation program. The option was also provided for the subject to take the DVD home and to discuss it at their next treatment session.

After viewing the DVD subjects were provided with a questionnaire. The questionnaire was designed specifically for this pilot study and was based on issues that determine the

suitability of the research instrument in terms of clarity and potential usefulness (Table 2). The questionnaire addressed the ease of use, understanding and of the DVDs. Responses were yes/no with ability to comment.

Table 2: Pilot Questions

Number	Question
1	Is it easy to navigate around the DVD?
2	Is the audio clear and easy to understand?
3	Is the picture clear?
4	Are instructions for the exercises clear?
5	Is it easy to understand the correct positioning of the hand and fingers for the exercises?
6	Is the DVD too long, too short or the right length?

RESULTS

With 55.6% males and 44.4% female, mean high school education level and an age range of 21-70 years, subjects were characteristically similar to those recruited in a previous study on the same patient base as the target group for the subsequent RCT (see Table 3). Thus this pilot sample is likely to be representative of the target RCT group. The results from the questionnaire have been provided in table format outlined below (Table 4).

Open ended comments provided further information as to the how the subjects felt about the use of a DVD in providing home exercise instructions. There was a unanimously positive response to the DVD from all subjects, with 100% indicating yes to the questions (see Table 4). No negative responses were received from any subject regarding the use of the DVD. For example:

- *Clear instructions about what you have to do;*
- *Wished I had it. Would have been great for me as I got confused with the hand exercises;*
- *Useful and helpful;*
- *It's a really good idea to be able to refer to DVD as sometimes you forget what you have been shown. Good for family members as well;*
- *DVD showed a bit more. Makes it clear in your mind what to do.*

Table 3: Subjects Characteristics

	Current Study Subjects (n = 9)	Previous Hand Therapy Study Subjects (2003-2007) (n = 65)
Male	5 (55.6%)	33 (50.7%)
Female	4 (44.4%)	32 (49.3%)
Age Range	21- 70 years	21 – 82 years
Mean Education Level	High School	High School

Table 4: Results of DVD pilot questionnaire

Question	Yes (n=9)	Comments
Is it easy to navigate around the DVD?	100%	Able to click on each week.
Is the audio clear and easy to understand?		
Is the picture clear?	100%	
Are the instructions for the exercises clear?	100%	Need to clarify how many times the exercises have to be.
Is it easy to understand the correct positioning of the hand and fingers for the exercise?	100%	Easier than on paper. Explained well.
Question	Just right	Comments
Is the length of time for the DVD too long, too short or just right?	100%	Would have liked more info, not less.

DISCUSSION

The results from the pilot show that patients are accepting of technology and perceive that it improves their understanding and knowledge. Responses to the clarity of the DVD picture, audio, instructions provided and the length were clearly positive.

In addition to the feedback regarding these surveyed aspects, subjects also reported that the DVD provided clarification regarding the number of exercises and their execution. Positives for home exercise programs include improved efficiency and enhanced patient, family and caregiver understanding of the exercises (Barber, 1999). Lysack et al. (2005) notes that the potential benefit of technology is that it can result in better understanding, knowledge retention and positive behavioural change in patients. This benefit is due to the ability to replay the DVD or technology thus reinforcing the exercises. Thus home exercise programs utilising technology can enhance compliance.

The results reflect the growing trend and acceptance of video technology in the health workplace (Gysels and Higginson, 2006; Lewis et al., 2002). Moreover, as a means of instruction, DVDs are used widely with cooking, gardening and 'do-it-yourself' activities (Miller et al., 2004). Therefore, this technology should be familiar for people to use in their homes.

Research investigating the use of videotape or DVD technology in the prescription of home exercise program has sought to determine whether it results in improved correctness of exercise performance and compliance (Schoo et al., 2005), quality of exercise performance and motivation (Weeks et al., 2002), clinical

progress and compliance (Miller et al., 2004), change in wellbeing, patient satisfaction and patient's skills (Roddey et al., 2002), patient satisfaction and compliance (Lysack et al., 2005) and performance accuracy (Reo and Mercer, 2004). Studies have also examined videotape technology in improving education and knowledge (Consoli et al., 1995; Dunn et al., 2004; Gates et al., 2005; Miller et al., 2005; Partin et al., 2004). This pilot study is the initial phase in a RCT that will be undertaken to answer the research question: Following a traumatic hand injury, does providing a DVD in conjunction with brochures outlining a home based exercise program improve patient compliance, when compared to providing handouts alone? Testing the DVD on a sample of patients has been successful in confirming the clarity, understanding and ease of use of a series of DVDs that outline various home exercise protocols. The positive results gained for the DVDs developed indicate, even at this preliminary stage, that the level of clarity of the DVD should enhance the understanding of the exercises required to undertake a successful home program. Whether enhancing such understanding, results in increased patient compliance with these exercises at home, will be presented in a subsequent paper resulting from the RCT. Regardless, this pilot project has highlighted the value patients place on therapist's efforts to develop appropriate medium to enhance communication with them. Given the poor health outcomes generally associated with patients from rural and remote areas, this endeavour contributes to the ongoing effort to improve service delivery to better address the health needs of rural and remote patients.

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