

Telerehabilitation: a brief review of the evidence and its relationship with the Case Management Framework.

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Introduction

Rehabilitation is a complex set of processes that need a coordinated 're-boot' in the wake of the COVID-19 pandemic (Phillips et al, 2020). The risk benefit ratio for virtual healthcare has massively shifted seeing 1000% increase in use of telehealth since the COVID-19 pandemic (Webster, 2020). This crisis has increased the need for case managers to use remote methods more often. There is a developing literature on telerehabilitation but little research on its use in case management. The question is: what does the evidence say about case managers working remotely? This is answered in a brief review of some of the literature on the functions of case management. It is presented under headings relating to a case management framework so that case managers can be informed about the evidence for tele-case management.

Method

This is by no means a systematic review but a sample of relevant papers. The search period was set between 2000-2020 due to the sparsity of literature on tele-case management. We used Google Scholar to search due to its wide-reaching parameters and free access (Gusenbauer, 2018). This means this project can be easily replicated as the literature base rapidly builds in a period of increasing virtual healthcare.

A jointly produced Case Management Framework (CMF, 2015) describes three areas of practice: professionalism and personal development; working with clients and stakeholders; case management practice. The area of practice most affected by social distancing is 'Working with Clients and Stakeholders'. CMF criteria and other relevant words were used as search terms as per Box 1.

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Box 1. Search Terms

Stage One:

Tele+
Case management
Case manager
Case manage

Remote+

Case management
Case manager
Case manage

Stage Two:

Tele+
Communication
Assessment
Goal setting
Rehabilitation
Record keeping
Planning
Monitoring
Evaluation
Management
Leadership

These terms were entered into Google Scholar in various configurations with case management as a central feature of interest. As we had expected, few papers were produced from Stage One describing tele-case management, the terms were gradually broadened in Stage Two.

Wherever possible systematic reviews were the source of evidence, but some individual papers were reported because they addressed salient case management issues.

Evidence for CMF criteria*Communication*

Communication is an essential aspect of case management. A range of methods includes telephone, mobile device, mobile application, videoconference, email, text, internet, and virtual reality.

Telephone is the most frequently used method of telecare (O'Neil et al. 2019). It can be used to good therapeutic effect and can be more acceptable to the patient than visiting a clinic (Lee

et al. 2010). It has been used with people with a range of health conditions, reducing rate of hospitalisation (Riegel et al. 2002) and increasing treatment availability (Houlihan et al. 2011).

Videoconferencing allows verbal and nonverbal communication (Steel et al., 2011). Health professionals can provide services to remote areas through videoconference (Appleby et al., 2019). Older adult and adolescent clients report positive experience of videoconferencing and a good therapeutic alliance is possible (Marra et al. 2020; Parikh et al., 2013; Wade et al. 2020). Several papers report health professionals are less keen than patients on videoconferencing with low levels of satisfaction and confidence (Chapman et al. 2020; Steel et al. 2011). Reasons for this include perceived limitations of competencies and technology. One-to-one use can work well, but groupwork needs careful systems in place for facilitating communication (Banbury et al. 2016).

Online web-based material with enhancement of other communication technologies such as email or videoconferencing is used successfully with teenagers and families. Therapy with younger and more cognitively impaired children is more difficult (Wade et al., 2020).

Texting can provide positive outcomes e.g. to support fathering and mental health in remote young Aboriginal participants (Fletcher et al. 2017). Texting helps community case managers contact hard-to-reach drug-using youth (Jongbloed et al. 2016). Adversely, reliance on text or telephone may miss important nonverbal communication for an assessment of e.g. suicide risk (Westers et al, 2019).

Wickersham et al. (2019) report a systematic review of mobile applications to treat post-traumatic stress disorder. They were cautiously optimistic about feasibility and acceptability. A mobile application plus clinician support saw greater reduction in symptoms than application only (Possemato et al. 2016). The rapid increase in popularity of WhatsApp has seen its use in data sharing and clinical decision making. This has led to concerns about regulatory and privacy issues (Calleja-Castillo & Gonzalez-Claderon, 2018).

Email can be a vehicle for supervision and feedback, improving communication (O'Neil et al. 2019). Many practitioners use email as an adjunct to their treatment. Treatment adherence is better with follow up of personalised email and phone than with text reminders alone (Robertson et al. 2005).

Virtual reality in physical stroke rehabilitation has been as effective as, and cheaper than in-clinic treatment (Llorens et al. 2015). O'Neill et al., (2019) list effective use of virtual reality, instant messaging and digital recording for remote rehabilitation. These are helpful for supervision in physiotherapy and speech & language therapy. Though not necessarily in the case manager's toolbox, use is increasing, and the case manager should be aware of them.

Assessment

Case management assessment includes gathering information, applying relevant measures, sharing knowledge and information. Tele-assessment can be feasible and acceptable to practitioners and clients but may not always lead to a comprehensive information set. It is useful for crisis management, but quality of connectivity is a key factor.

A systematic review by Brearly et al. (2017) described how adults respond to neuropsychological assessment using videoconferencing. Assessment with adults of up to 75 years, and those using a high-speed network connection produced comparable test results in videoconference mode to face to face. Assessments with older patients and with slower internet connections were more variable. Remote assessment is feasible with young people (Hodge et al., 2019), although there are concerns about the ability of younger and cognitively impaired children to concentrate in formal assessments over videoconferencing (Waite et al., 2010). Careful consideration should be given to the equipment for smaller children and internet speed should be fast and reliable.

Questionnaires and daily logs can be used in tele-assessment of adolescents with mental-health problems (Grealish et al. 2005). In rural Korea where it is difficult for patients to be seen in person, patients' attitudes were more positive in those receiving tele-assessment versus coming into a clinic (Lee et al., 2010).

Remote assessments of home adaptations and risk are limited in validity. However, tele-physical therapies are supported by evidence of successful treatment using a virtual environment-based system integrated with videoconferencing (Holden, et al., 2007). Behavioural observation through videoconference allows additional assessment information about levels of distress in high risk cases. This is dramatically illustrated by the successful remote rehospitalisation of a suicidal patient described by Gros et al. (2011).

Goal Setting

Case management involves identifying, setting and evaluating goals. Technological advances mean that remotely negotiating goals is possible but the literature on tele-goalsetting is limited. Dingwall et al., (2014) found support for the acceptability, feasibility and appropriateness of a goal setting mobile application for First Nations Australians called Stay Strong³. This helped

³ The AIMhi Stay Strong app is available to download:
https://www.menzies.edu.au/page/Research/Projects/Mental_Health_and_wellbeing/Development_of_the_Stay_Strong_iPad_App/

clinicians maintain a person-centred approach. Limitations included WiFi and power availability. In Scottish pulmonary rehabilitation, Hill (2010) reported goal setting was comparable on videoconference platform versus a clinic assessment, and considerably cheaper. Buono & Citta (2007) describe using multidisciplinary videoconferencing and email to assess, set goals, implement and review plans with families of children with intellectual disabilities.

A cloud-based software platform for multidisciplinary rehabilitation goal setting, Goal Manager has been recently developed (Trayner et al. 2019)⁴. It helps the case manager incorporate goals into the International Classification of Function (ICF) and can lead to nearly 50% reduction in time spent on goal setting over 6 months. This seems a positive development, but tele-goalsetting clearly requires more research.

Planning & Prioritising

Tele-case management involves care coordination, brokering, resource allocation and communication with team members (Tahan, 2020). Cost, adherence, outcomes and acceptability are all relevant factors in planning rehabilitation (Turolla et al., 2011).

Telerehabilitation improves multidisciplinary work and scheduling. For some years, multidisciplinary videoconferencing has been used with positive results (e.g. Buono & Citta, 2007; Clark et al. 2002). Although the latter article is old, it is included as a clear, helpful template for MDT working. Attempts have been made to automate therapy selection and delivery. An Intelligent Therapy Assistant (ITA), which automatically configures and schedules brain injury rehabilitation, was used with 582 patients in comparison with a manual planning procedure (Solana et al. 2014). The treatment delivered by ITA was considered as effective as that from the traditional method. Virtual MDT meetings are increasingly seen as effective and pragmatic in minimising potential for viral transmission in the COVID-19 era (Sidpra et al. 2020).

Despite some encouraging individual papers (e.g. Clark et al. 2002; Thota et al. 2020), although telerehabilitation is often cheaper than its clinic-based alternative, there is insufficient evidence as to whether telerehabilitation is cost-effective. Rogante et al. (2015) summarised 10 systematic reviews, concluding that telerehabilitation resulted in effective care but there was insufficient evidence for cost-effectiveness. Kairy et al. (2009) systematically reviewed 28 long-term condition telerehabilitation studies. Clinical outcomes improved with

⁴ The Goal Manager website can be accessed here: <https://www.goalmanager.co.uk/goal-manager/index.html>

telerehabilitation, to some extent better than with an alternative intervention. There was preliminary evidence of potential cost savings but only five studies examined costs.

Tele-rehabilitation is environmentally beneficial. To reduce travelling and carbon emissions, Holmner et al (2014) replaced home visits with telemedicine appointments, resulting in 40-70 times carbon emissions decrease. Telemedicine was the greener choice when at a distance of a few km and when the alternative was car transport. Thota et al (2020) describe how in three years a telehealth oncology service for 119 patients reduced carbon emissions by approximately 150,000 kg compared with their conventional clinic.

Implementing Plans

A case manager's role is to ensure delivery and continuity of rehabilitation plans. Rather than delivering therapy, the case manager provides leadership, coordinating activities towards goals. Psychosocial interventions may be delivered effectively but physical therapies are more difficult. The evidence favours systematised interventions.

A meta-analysis of technology-based training programmes for children with acquired brain injury on 14 studies (Corti et al. 2019) found moderate effect sizes for behavioural training and some cognitive training components. These programmes are structured and manualised. Laatsch et al. (2020) quote teen online problem-solving TOPS (Wade et al., 2019a) as a practice standard, but it is not available for routine clinical use.

There is debate as to whether physical care can be implemented remotely. O'Neil et al (2019) reviewed 26 studies of remotely supervised physical rehabilitation. These used a range of methods. It was not possible to determine effectiveness due to lack of crucial data. Better definition of supervision and outcomes was recommended

Toombs et al (2020) reports a systematic review of 10 studies of mental-health intervention for indigenous youth. The youths required training to become proficient in the technology, longer time was needed to build rapport when using technology and safeguards needed to be built in.

Monitoring / Evaluating

A case manager needs to regularly review interventions in relation to their outcomes to ensure the rehabilitation is moving forward. This involves monitoring progress, identifying effectiveness of interventions and applying continuous improvement principles.

A systematic review showed adult tele-rehabilitation was as effective if not better than in person with therapies for motor, higher cortical, and mood difficulties (Sarfo et al. 2019). Tele-monitoring is possible but there is not enough evidence to determine whether it is better or worse than face to face delivery. It is cheaper to provide but not enough information is available for cost effectiveness (Laver et al 2020).

A range of mobile applications are described for monitoring mood and mental-health conditions (Dubad et al, 2018). They range in reliability but are usable, positively perceived by youth and aid in the detection of mental-health problems. A wide range of outcome measures can be used with telerehabilitation. Veras et al (2017) provide detailed technical specification on measures for telerehabilitation and virtual reality for stroke, with 58 different outcome measures just for physical function.

Summary and conclusions

A review of literature describing telerehabilitation was performed and arranged under CMF criteria. Evidence was available to support most criteria for effective and acceptable tele-case management. A range of communication systems is acceptable to clients. Technology training for case managers is recommended. Remote psychosocial assessment is feasible and acceptable but may miss important information. Quality and security parameters are essential. Physical assessments are limited by technology. Goal setting has a limited but promising tele-evidence base; more research is required. Planning and prioritising can be done remotely. Tele-rehabilitation saves travel costs and the environment. Well-supervised remote monitoring of intervention implementing shows promise. The best evidence is for manualised and systematised tele-plans. Tele-rehabilitation can be as effective as face to face. It remains to be seen if this is cost effective. Tele-rehabilitation and tele-case management can be viewed as a tool to be used selectively by a practitioner taking into consideration research findings available to date.

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