

CRITICALLY APPRAISED TOPIC (CAT) WORKSHEET

Focused Question:

What is the effectiveness of telehealth interventions for clients recovering from strokes to improve occupational performance?

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Clinical Scenario:

Cerebrovascular accident or a stroke is a common medical condition where blood flow to the brain is stopped by either a blockage or a blood vessel carrying blood to the brain is ruptured (Virani et al., 2020). Around 795,000 people experience a new or recurrent stroke every year in the United States (Virani et al., 2020). The estimated direct cost of strokes in the United States is \$28.0 billion in 2014-2015 for emergency department visits, hospital stays, post care visits, medications and home health care (Virani et al., 2020). By 2035, the expected cost related to strokes will more than double to approximately \$94.3 billion (Virani et al., 2020). Strokes are a common cause of disability due to the many complications that can be developed after having a stroke. Some long-term complications from stroke include pain syndromes, gait instability, cognitive impairments, dementia, depression, and anxiety (Rathore et al., 2002). These complications can make it difficult for an individual to complete their daily occupations such as eating, dressing, bathing, and toileting (Walsh et al., 2015).

Occupational therapists can help clients recovering from strokes to regain their independence by working on their daily occupations that they currently have difficulty completing (AOTA, 2020). Occupational therapists can work with clients in the hospital, inpatient rehabilitation facilities, among other settings, to help their clients regain function. Once the client returns to home, they can receive outpatient occupational services. Telehealth can help bridge a gap by connecting occupational therapists to those living in rural or underserved areas by use of a computer or electronic device and internet. The American Occupational Therapy Association (AOTA) defines telehealth as “the application of evaluative, consultative, preventative, and therapeutic services delivered through telecommunications and information technologies” (AOTA, 2013, p. S69.) AOTA believes that telehealth can be used to help reach clients who cannot physically be in the same location as the occupational therapist (AOTA, 2013). Occupational therapy delivered via telehealth can be used to treat clients who have had a stroke who were recently discharged from the hospital.

Summary of Key Findings:

Summary of Levels I, II, and III

- The Fugl Meyer Assessment (FMA) scores indicate that telerehabilitation therapy is not inferior to the in-clinic therapy (Chen et al., 2020, Level I;

Cramer et al., 2019, Level I; Van den Berg et al., 2020, Level I; Wu et al., 2020, Level I).

- The follow up showed significant improvements in motor function were diminished; therefore, a longer rehabilitation than 12 weeks program may be required (Chen et al., 2020, Level I).
- There were no significant differences between the two groups, home telesupervising rehabilitation and conventional outpatient rehabilitation, improvements (Chen et al., 2017, Level I).
- The telerehabilitation group showed significant improvement in the Fugl-Meyer assessment that assesses motor function contributing to occupational performance (Chen et al., 2020, Level I; Cramer et al., 2019, Level I).
- Traditional in-clinic rehabilitation group scored higher on the Patient Satisfaction Questionnaire in comparison to the telerehabilitation group (Cramer et al., 2019, Level I).
- Individuals that are 6 months post stroke with upper extremity involvement can show improvement in quality of life. Quality of life improvement domains include physical strength, memory, feelings and emotions, communication, activities of daily living and instrumental activities of daily living, mobility, hand function, and meaningful activities (Linder et al., 2015, Level I; Wu et al., 2020, Level I).
- Participants who received the telerehabilitation intervention at home demonstrated a trend toward improved mobility in the primary outcome measure, stroke impact scale, at week 8 (Van den Berg et al., 2016, Level I).
- There were significant differences between the control group and the intervention group as the intervention group demonstrated greater improvement in the primary outcomes including the FMA, Berg Balance Scale, Timed Up and Go, 6-Minute Walking Test, and Modified Barthel Index (Wu et al., 2020, Level I).

Summary of Level IV

N/A

Contributions of Qualitative Studies:

N/A

Bottom Line for Occupational Therapy Practice:

The clinical and community-based practice of OT:

- There was strong evidence for equal effectiveness of therapy delivered via telehealth as compared to therapy delivered in person.
- There was moderate research that telerehabilitation is more effective than traditional clinic based occupational therapy.
- There is strong evidence to show that therapy should be provided at least twice a week for least six weeks.
- Many different protocols were used during the rehabilitation process to help regain function lost due to the stroke.
- Further research needs to be done to create a more standard protocol for the number of weeks a client should spent in therapy following a stroke for optimal recovery.

<ul style="list-style-type: none"> • Further research needs to be conducted to see if a longer rehabilitation creates longer lasting results.
<p><i>Program development:</i></p> <ul style="list-style-type: none"> • There was evidence that a home exercise program in conjunction with telerehabilitation was proven to be effective in improving the results of the telerehabilitation intervention. • Programs should be developed to meet the specific needs of telerehabilitation clients. • Telerehabilitation should be an option of care service for individuals recovering and currently in the subacute stroke phase. • Further research needs to be conducted on the specifics of program development used solely with telerehabilitation clients.
<p><i>Societal needs:</i></p> <ul style="list-style-type: none"> • There was strong evidence in multiple studies that telerehabilitation improved the quality of life the individual who had a stroke and is receiving occupational therapy services. • The results of these studies can increase access to individuals who are unable to access traditional occupational therapy outpatient services due to being in an underserved area, lack of transportation, or any other reason the client may not be able to come into the clinic • The results of these studies indicate the potential of cutting costs for individuals receiving rehabilitative services following a stroke diagnosis via telehealth. Transportation, re-admissions, and emergency department visits contribute to the rising costs of care.
<p><i>Healthcare delivery and health policy:</i></p> <ul style="list-style-type: none"> • Continued research would be beneficial in strengthening the validity of home-based occupational therapy telerehabilitation benefits. The small sample size of the studies did not offer statistically conclusive results necessary for determining improvement in occupational performance and quality of life of individuals receiving rehabilitative services following a stroke. • The results of these studies show the effectiveness of telerehabilitation on the improvement of occupational performance in the stroke population. Although there are several limitations and biases within these studies, the current research shows effectiveness in the intervention of telerehabilitation in improving occupational performance in stroke patients. However, more research should be conducted to encompass a larger sample size and the lasting effects of telerehabilitation. • The results of these studies show that there should be increased health policy created that supports telerehabilitation and telehealth. Legislature should be passed for Medicare and Medicaid to have equal reimbursement for OT sessions that are preformed via telehealth as compared to sessions completed in the clinic.
<p><i>Education and training of OT student:</i></p> <ul style="list-style-type: none"> • There is strong research that telerehabilitation is effective; therefore, telerehabilitation should be introduced to entry level students. Telehealth is becoming increasingly popular during these unforeseen circumstances and is a reliable form to provide services and rehabilitation through. • OT students should have hands on experience conducting a telerehabilitation session during their entry level education.

- OT students need to be aware there are differences in state licensure and that the therapist needs to be licensed in both the state they are residing in as well as the state the client is currently in.
- OT students should be familiar with ethics surrounding telerehabilitation. Students need to be aware that HIPAA still applies in the service delivery model of telehealth.

Refinement, revision, and advancement of factual knowledge or theory:

- Further level I Randomized Controlled Trials should be conducted to show effectiveness of telerehabilitation in the improvement of occupational performance of individuals recovering from a stroke. The studies provide advancement in the knowledge that telerehabilitation can be an effective treatment option for clients rehabilitating from a stroke. Current studies are limited due to the small sample size, and future research should include larger sample sizes to increase validity.
- There is strong evidence to support the demand for future research on the effectiveness of telerehabilitation for clients recovering from a stroke to improve their occupational performance.

Review Process:

- The focus question was developed by the student team based on similar interests in access to services for rural populations.
- The instructor reviewed and provided feedback to help narrow the population for our focus question.
- The student team revised the focus question to reflect feedback given.
- The student team identified a peer-reviewed scholarly article that addressed the focus question and additionally supported the developed focus question.
- The instructor reviewed and provided additional feedback.
- The student team conducted a literature search, via several databases, for peer-reviewed scholarly articles utilizing key search terms to identify studies related to the population, intervention, and outcomes of our focus question.
- The literature search was submitted for feedback from instructor. Feedback was given to narrow and identify articles to use for the evidence table.
- The student team established an evidence table of the highest-level studies. Level I-RCTs were used for our table. The studies that were chosen correspond with the established inclusion criteria and published within the previous six years.
- The student group further examined the studies selected and analyzed the implications for occupational therapy and submitted for instructor review.
- The instructor provided feedback to the evidence table. The student group incorporated the feedback and made minor adjustments to the table.
- The student group used the incorporated feedback from the evidence table to complete the critically appraised topic assignment.

Procedures for the selection and appraisal of articles:

Inclusion Criteria:

- Level I studies
- Articles within the last 6 years
- Stroke population
- Intervention of Telehealth to provide rehabilitation services to improve occupational performance for individuals recovering from a stroke

Exclusion Criteria:

- Level II-V and qualitative studies
- Articles older than 6 years
- Intervention of Telehealth to provide rehabilitation services to improve occupational performance for individuals who are not recovering from a stroke
- Traumatic brain injury (TBI) not associated with a stroke

Search Strategy:

Categories	Key Search Terms
Patient/Client Population	Stroke, stroke patients, CVA, Cerebrovascular accident, acute stroke
Intervention	Telehealth, telemedicine, telerehabilitation, telesupervising, home rehabilitation
Outcomes	Occupational performance, activities of daily living, activities of daily living, basic activities of daily living, basic activities of daily living, instrumental activities of daily living, instrumental activities of daily living, occupation-based, physical function, physical performance

Databases and Sites Searched
<ul style="list-style-type: none">• Cochrane Library• CINAHL• Google Scholar• JAMA Evidence• Medline• PsychINFO

Quality Control/Peer Review Process:

- The student group brainstormed together to identify a focus question of interest with input from the instructor to identify a specific population, intervention, and outcome.
- The student group worked together to complete the literature search and identify common themes in the literature.
- The literature search was submitted for feedback from instructor. Feedback was given to narrow and identify articles to use for the evidence table in regards of highest-level studies that support the focus question.
- The student group worked together to complete the evidence table.
- The student group reached out to the instructor for assistance in interpreting the results section of a study.
- Each student of the group reviewed and edited the table prior to submission.
- The instructor provided feedback on the evidence table prior to critically appraised topic assignment due date to allow for fine tuning.
- The student group engaged in an independent consultation with the instructor to ask questions regarding the critically appraised topic assignment.
- The student group incorporated the instructor's feedback and guidance to finalize the critically appraised topic worksheet.

Results of Search:

Summary of Study Designs of Articles Selected for Appraisal:

Level of Evidence	Study Design/Methodology of Selected Articles	Number of Articles Selected
I	Systematic reviews, meta-analysis, randomized controlled trials	6
II	Two groups, nonrandomized studies (e.g., cohort, case-control)	0
III	One group, nonrandomized (e.g., before and after, pretest, and posttest)	0
IV	Descriptive studies that include analysis of outcomes (single subject design, case series)	0
V	Case reports and expert opinion, which include narrative literature reviews and consensus statements	0
	Qualitative Studies	0
		TOTAL: 6

Limitations of the Studies Appraised:

Levels I, II, and III

- The high dose rehabilitation only focuses on UE rehab. There are several other deficit areas post stroke that could potentially benefit from high dose rehabilitation therapy (Cramer et al., 2019, Level I)
- The study participant sample was small and is not representative of a larger group (Chen et al., 2017, Level I; Chen et al., 2020, Level I; Linder et al., 2015, Level I; Van den Berg et al., 2016, Level I; Wu et al., 2020, Level I)
- There was no control group that received no intervention to compare spontaneous stroke recovery with (Chen et al., 2017, Level I; Chen et al., 2020, Level I)
- There was not a way to control if participants in either group, intervention or control, received additional therapeutic interventions that may have impacted the results (Chen et al., 2017, Level I; Chen et al., 2020, Level I)
- Participants knew their group assignment, which may result in a bias for self-reporting measures (Van den Berg et al., 2016, Level I).
- There was a lack of definitive measures of how the intervention was effective (Van den Berg et al., 2016, Level I)
- The researchers were not blind to what intervention each group received (Wu et al., 2020, Level I)
- The researchers could not rule out the impact of spontaneous recovery or development of compensatory strategies on outcome measures (Cramer et al., 2019., Level I; Chen et al., 2017, Level I; Chen et al., 2020, Level I; Linder et al., 2015, Level I)
- The researchers were not able to determine why QOL and depression outcomes improved by the end of the intervention and study and if there were underlying contributing factors (Linder et al., 2015, Level I)
- Due to a few client’s being discharged home during the 8-week intervention, their intervention included in-patient services and home-based telerehabilitation services (Van den Berg et al., 2016, Level I). In the study by Van den berg et al. (2016), several participants did not follow up with telerehabilitation post discharge from an inpatient hospital stay.

Biases

- There was recall bias in a few studies. The evaluation and outcome measures were based on a self-report (Linder et al., 2015, Level I; Van den Berg et al., 2016, Level I).
- There was site bias due to the physical location of the intervention being at the client's home (Cramer et al., 2019, Level I; Chen et al., 2017, Level I; Chen et al., 2020, Level I; Linder et al., 2015, Level I; Van den Berg et al., 2016, Level I; Wu et al., 2020, Level I).
- There was measurement bias due to self-report (Linder et al., 2015, Level I; Van den Berg et al., 2016, Level I).
- There was no blinding during the implementation of the intervention (Chen et al., 2017, Level I; Chen et al., 2020, Level I; Wu et al., 2020, Level I).
- There was administration bias due to both physical and occupational therapists conducting the evaluations and intervention (Linder et al., 2015, Level I). The study did not mention how many therapists provided the intervention and if the participants received the intervention from several therapists.

Levels IV and V

N/A

Articles Selected for Appraisal:

- Chen, J., Jin, W., Dong, W. S., Jin, Y., Qiao, F. L., Zhou, Y. F. & Ren, C. C. (2017). Effects of home-based telesupervising rehabilitation on physical function for stroke survivors with hemiplegia. *American Journal of Physical Medicine & Rehabilitation*, 96(3), 152–160. <https://doi.org/10.1097/PHM.0000000000000559>
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Characterization of incident stroke signs and symptoms: Finding from the atherosclerosis risk in community study. *Stoke*, 33(11), p. 2718-2721.

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Roots, R. K. & Li, L. C. (2013). Recruitment and retention of occupational therapists and

physiotherapists in rural regions: A meta-synthesis. *BMC Health Services Research*,

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