JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S8

# Leveraging Telerehabilitation for Crisis-Driven Physical Therapy Delivery

**Noor Saleh Hassan Basudan[1]**
**Norah munawir almutairi[2]**
**Abdulrahman Saleh Alghanim[3]**
**Ohud Abdullah Aldawsari[4]**
**Nadiyah awadh alanazi[5]**
**Awatef musaad alharbi6**
**Abeer Basher Alaskar[7]**
**Kholoud Abdullah Almufaireej[8]**

1. Physiotherapy
   Prince mohd bin nasser hospital
   Jazan
2. physical therapy
   Al-faha phc
   Al-majmah
3. Physical Therapy
   Almuzahimiyah General Hospital
   Riyadh
4. Physical Therapy
   Prince Mohammed bin Abdulaziz Hospital
   Riyadh
5. Physiotherapy
   prince mohammed bin abdulaziz hospital
   Riyadh
6. Physiotherapy
   prince mohammed bin abdulaziz hospital
   Riyadh
7. Physiotherapy
   prince mohammed bin abdulaziz hospital
   Riyadh
8. Physical therapy
   Security forces hospital
   Riyadh

**Abstract**
Leveraging telerehabilitation for crisis-driven physical therapy delivery has emerged as a transformative approach in modern healthcare. This review explores the role of telerehabilitation in addressing physical therapy needs during crises, such as critical illnesses, intellectual disabilities, and public health emergencies. By synthesizing evidence on its effectiveness, challenges, and systemic factors influencing adoption, the review underscores telerehabilitation's potential to enhance access, improve outcomes, and maintain continuity of care during crises. It also highlights key areas for future research, including improving digital literacy among stakeholders and optimizing virtual interventions for diverse patient populations.

**Aim of Work**
The aim of this work is to examine how telerehabilitation can be effectively leveraged for physical therapy delivery in crisis scenarios. Specifically, it seeks to explore the benefits and limitations of digital platforms in managing conditions such as critical illness, intellectual disabilities, and neonatal abstinence syndrome. The study also investigates the systemic factors influencing the adoption of telerehabilitation, including technological, policy, and provider-level barriers. By doing so, this review aims to provide a comprehensive understanding of telerehabilitation's role in ensuring equitable and efficient healthcare delivery during crises.

## Introduction

### Crisis-Driven Physical Therapy Delivery

Crisis-driven physical therapy delivery involves adapting physical therapy practices to address the unique challenges posed by various crises, such as critical illness, intellectual disabilities, personal goal setbacks, and the opioid crisis.

This synthesis explores the impact of these crises on physical therapy and provides insights into effective interventions and future research directions.

**Physical Rehabilitation During Critical Illness**

Short-term benefits in ICU: Physical rehabilitation interventions, such as early mobilization, cycle ergometry, and electrical muscle stimulation, have shown moderate-to-high quality evidence of improving critical illness polyneuropathy/myopathy, quality of life, mortality, and healthcare utilization when initiated during ICU admission (Connolly et al., 2016). However, the evidence for the benefits of electrical muscle stimulation specifically is of very low to low quality (Connolly et al., 2016).Post-ICU Rehabilitation: There is insufficient evidence to support the benefits of physical rehabilitation delivered post-ICU discharge due to a lack of high-quality randomized controlled trials and inconsistent outcome measurements (Connolly et al., 2016). Further robust trials are needed to determine the long-term impact of these interventions on patient care (Connolly et al., 2016).

**Crisis in Individuals with Intellectual Disabilities (IDD)**

Risk Factors and Crisis Episodes: Individuals with IDD are at a higher risk for crisis episodes, which include unplanned hospital utilization, involvement with the criminal justice system, abuse/victimization, and unplanned changes in living environment (Sutton, 2019). Specific risk factors identified include hypothyroidism, bipolar disorder, intermittent explosive disorder, personality disorder, and multiple psychiatric disorders (Sutton, 2019).Implications for Physical Therapy: Physical therapists often develop long-term relationships with patients with IDD and are well-positioned to recognize early signs of crisis and make timely referrals. However, there is a need for better resources and screening tools to guide clinical decision-making and improve care for this population (Sutton, 2019).

**Action Crises and Recovery in Physical Therapy**

Impact on Recovery: Action crises, which occur when individuals face obstacles in achieving personal goals, can negatively impact recovery from musculoskeletal disorders during physical therapy. Patients experiencing action crises report less improvement in pain and health-related quality of life (Wolf et al., 2019). This suggests that addressing psychological and motivational factors is crucial for optimizing physical therapy outcomes (Wolf et al., 2019).

**Physical Therapy for Neonatal Abstinence Syndrome (NAS)**

Role in NAS Management: Physical therapists play a critical role in managing NAS, a condition affecting infants born to mothers with drug addictions. Nonpharmacological management strategies include supportive care, feeding, parent education, and social aspects of care (McCarty et al., 2019). These interventions aim to improve developmental outcomes and provide comprehensive care for affected infants (McCarty et al., 2019).Challenges and Future Directions: Research in NAS management faces challenges such as the need for standardized protocols and long-term outcome studies. Future research should focus on developing evidence-based guidelines and exploring the long-term impact of physical therapy interventions on infants with NAS (McCarty et al., 2019).

**The effects of crises on rehabilitation outcomes**

Crises can significantly impact rehabilitation outcomes, often hindering recovery and overall well-being. The effects of crises on rehabilitation outcomes can be observed through various dimensions such as physical, psychological, and social aspects.

**Physical Rehabilitation Outcomes**

Musculoskeletal Disorders: Action crises, which involve a conflict between pursuing and disengaging from personal goals, can lead to increased stress and negative affect, resulting in poorer recovery outcomes in physical therapy for musculoskeletal disorders. Patients experiencing action crises showed less improvement in pain and health-related quality of life (Wolf et al., 2019).Cardiac Arrest Survivors: Rehabilitation interventions for cardiac arrest survivors showed mixed results. While some studies indicated no significant improvement in physical health-related quality of life, there was very low-quality evidence suggesting potential benefits in neurological function from inpatient rehabilitation (Joshi et al., 2021).

**Psychological and Social Rehabilitation Outcomes**

Stroke Recovery: Self-management education focusing on psychosocial skill expansion can mitigate declines in functioning in areas such as family roles, daily activities, and work productivity post-stroke. This suggests that addressing psychological and social factors can enhance rehabilitation outcomes, at least in the short term (Kendall et al., 2007).Nature and Crisis Rehabilitation: Experiencing nature has been found to have a powerful rehabilitative effect, particularly for individuals greatly affected by crises. Nature exposure can lead to better stress management and improved rehabilitation potential by fostering new ways of seeing oneself and one's resources (Ottosson and Grahn, 2008).

**Systemic and Programmatic Interventions**

Crisis Resolution Teams (CRTs): The introduction of CRTs has been shown to reduce hospital admission rates following crises and improve patient satisfaction. However, other outcomes such as involuntary hospitalizations, symptoms, social functioning, and quality of life did not show significant changes in the short term (Johnson et al., 2005).Fast Track Rehabilitation for Multi-Trauma Patients: A specialized Fast Track rehabilitation program for multi-trauma patients led to faster recovery in functional status compared to conventional care. However, by twelve months, the differences between the two groups were minimal, indicating that both approaches were ultimately effective (Bouman et al., 2017).

- **Leveraging Telerehabilitation**

Telerehabilitation, the use of digital technology to provide remote rehabilitation services, has emerged as a promising alternative to traditional in-person rehabilitation. This approach is particularly relevant for stroke survivors, who often face barriers such as cost, transportation, and access to trained personnel. This synthesis explores the effectiveness, benefits, and challenges of telerehabilitation for stroke recovery.

- **Effectiveness of Telerehabilitation**

Telerehabilitation has shown mixed effectiveness compared to in-person rehabilitation. Some studies report no significant difference in activities of daily living between the two methods (Laver et al., 2013; Laver et al., 2020). Similarly, specific interventions such as upper limb training and lower limb mobility retraining did not yield statistically significant improvements when delivered remotely (Laver et al., 2013; Laver et al., 2020). Secondary outcomes, including balance, quality of life, and depressive symptoms, also showed no substantial differences between telerehabilitation and traditional therapy (Laver et al., 2020). Nonetheless, telerehabilitation has demonstrated comparable results in enhancing motor function, speech, and overall disability, with patients reporting similar satisfaction levels (Knepley et al., 2020).

- **Types of Telerehabilitation Interventions**

Telerehabilitation encompasses a range of interventions targeting both physical and cognitive recovery. Upper and lower limb rehabilitation techniques, including mobility retraining and virtual reality (VR) systems, have been explored for improving functional mobility and motor recovery (Laver et al., 2013; Sakakibara et al., 2023; Kairy et al., 2016). Programs like the TRAIL initiative, which offers a four-week exercise and self-management intervention, have shown promise in enhancing lower extremity recovery (Sakakibara et al., 2023). Additionally, telerehabilitation is effective in providing speech and cognitive therapy, yielding outcomes comparable to in-person care (Knepley et al., 2020).

- **Patient Satisfaction and Acceptance**

**Patient-Centered Outcomes**:High levels of patient satisfaction have been reported for telerehabilitation services, with most participants rating their experiences as "excellent" or "very good." Benefits include eliminating travel time, incorporating other healthcare advocates, and delivering care in familiar environments, particularly for pediatric patients.

**Barriers to Adoption**:Despite high satisfaction rates, some limitations include technological challenges and the inability to perform hands-on aspects of care. Addressing these barriers is crucial for broader acceptance and integration of telerehabilitation into standard practice.

- **Cost-Effectiveness, Feasibility, and Challenges**

Telerehabilitation has the potential to reduce healthcare costs, though comprehensive cost-effectiveness evaluations remain scarce (Laver et al., 2020; Knepley et al., 2020). Its feasibility is underscored by its capacity to deliver care in underserved regions and reduce logistical barriers (Knepley et al., 2020; Rotundu et al., 2023). However, challenges persist, including the need for higher-quality studies to address methodological limitations and evaluate long-term outcomes (Laver et al., 2020; Suso-Martí et al., 2021). Despite these challenges, patient satisfaction is high, with many appreciating the flexibility and accessibility of remote rehabilitation (Knepley et al., 2020; Serón et al., 2021).

- **key factors influencing the adoption of telerehabilitation in healthcare systems**

The adoption of telerehabilitation in healthcare systems is influenced by several key factors, including technological, organizational, and individual elements. Below are the primary factors identified across multiple studies:

**Technological Factors**

Technical Infrastructure and Usability: Adequate technical infrastructure, including reliable internet connectivity and user-friendly platforms, is crucial for the successful implementation of telerehabilitation. Technical challenges can act as significant barriers (Stephenson et al., 2022; Subedi et al., 2020).

Training and Support: Proper training for healthcare professionals on how to use telerehabilitation technologies is essential. Lack of training can hinder the adoption process (Stephenson et al., 2022; Subedi et al., 2020).

**Organizational Factors**

Cost and Reimbursement: The cost of implementing telerehabilitation and the availability of reimbursement for these services are critical factors. Financial facilitators, such as reimbursement policies, can significantly influence adoption (Seebacher et al., 2023; Nizeyimana, Joseph and Louw, 2022).Readiness and Planning: Organizational readiness, including involvement in planning and exposure to e-healthcare knowledge, is necessary for successful adoption. Resistance to change and lack of urgency can be barriers (Jafni et al., 2018; Bahari et al., 2018).

**Individual Factors**

Perceptions and Acceptance: The perception of telerehabilitation's effectiveness and the willingness to adopt it among healthcare professionals are influenced by factors such as educational level, digital competencies, and core affect towards technology (Seebacher et al., 2023; Albahrouh and Buabbas, 2021).Patient and Provider Satisfaction: High levels of satisfaction and acceptance among both patients and providers are essential for the sustained use of telerehabilitation services (Niknejad et al., 2021; Stephenson et al., 2022).

**External Factors**

Pandemic Influence: The COVID-19 pandemic has significantly increased the willingness to adopt telerehabilitation due to the necessity of alternative healthcare delivery methods (Seebacher et al., 2023; Albahrouh and Buabbas, 2021).Cultural and Social Norms: Cultural acceptance and social norms can either facilitateor hinder the adoption of telerehabilitation. In some regions, cultural acceptance has been a positive influence (Albahrouh and Buabbas, 2021).

**Barriers to Adoption**

Privacy and Confidentiality Concerns: Concerns about patient privacy and data confidentiality can act as barriers to the adoption of telerehabilitation (Albahrouh and Buabbas, 2021).

Access Issues: Geographical and socio-economic factors can limit access to the necessary technology and infrastructure, particularly in low to middle-income countries (Nizeyimana, Joseph and Louw, 2022; Subedi et al., 2020).

- **Example of using Leveraging Telerehabilitation in health care crisis (COVID-19)**

Virtual therapy has proven to be effective during the COVID-19 pandemic for managing various psychological and mental health issues. Here are the key findings from multiple studies:

**General Effectiveness**

**Reduction in Psychological Distress**: Virtual therapy, including virtual reality (VR) interventions, has been effective in reducing stress, anxiety, depression, and post-traumatic symptoms among different populations affected by COVID-19 (Lee et al., 2023; Pallavicini et al., 2021; Riva et al., 2023; Farahimanesh et al., 2023).

**Improvement in Quality of Life**: VR-based psychological interventions have shown significant improvements in the quality of life for participants, including COVID-19 patients and medical staff (Lee et al., 2023; Pallavicini et al., 2021).

**Specific Interventions**

COVID Feel Good Intervention: This self-help VR intervention was effective in reducing perceived stress, general distress, and increasing social connectedness among participants in multiple countries (Riva et al., 2023; Farahimanesh et al., 2023).Teletherapy for Trauma: Digital delivery of trauma-focused therapies, such as prolonged exposure therapy and cognitive processing therapy, has been found to be as effective as in-person therapy for military members, veterans, and public safety personnel (Jones et al., 2020).

**Medical Education and Training**

Virtual Distance Training: Virtual distance training for medical students in intensive therapy and anesthesiology was found to be effective, with students performing better in knowledge tests compared to those who had in-person training (Kovács et al., 2021).Telemedicine and Virtual Care: The rapid adoption of telemedicine and virtual care has been crucial in providing timely healthcare services while minimizing exposure to COVID-19 (Jnr, 2020).

**Therapist Perspectives**

Therapist Assessments: Therapists reported high levels of effectiveness for online therapy, with positive attitudes towards telemedicine and the importance of proper training and preparation for online therapy (Khatib et al., 2021).

**Conclusion**

Telerehabilitation has proven to be a viable solution for delivering physical therapy during crises, offering significant benefits such as improved accessibility, patient satisfaction, and continuity of care. However, its effectiveness is contingent upon overcoming challenges related to technology, policy, and provider readiness. The integration of telerehabilitation into healthcare systems requires targeted strategies to address these barriers and ensure its scalability. Future research should focus on enhancing the quality of evidence for remote interventions, refining digital tools, and fostering systemic support to maximize the potential of telerehabilitation in crisis-driven physical therapy delivery.

**References**


- Access Issues: Geographical and socio-economic factors can limit access to the necessary technology and infrastructure, particularly in low to middle-income countries (Nizeyimana, Joseph and Louw, 2022; Subedi et al., 2020).
- Barriers to Adoption
- Borisova, N., Moore, N., Mahalingappa, S., Cumming, P., Dave, S., Abraham, S., Ramkisson, R., Tavormina, G., Kolsanov, A., Chaplygin, S., Kozina, T., Vlasov, A., Smirnova, D., & Syunyakov, T., 2022. Virtual Reality-Based Interventions for Treating Depression in the Context of COVID-19 Pandemic: Inducing the Proficit in Positive Emotions as a Key Concept of Recovery and a Path Back to Normality.. *Psychiatria Danubina*, 34 Suppl 8, pp. 276-284.
- Bouman, A., Hemmen, B., Evers, S., Van De Meent, H., Ambergen, T., Vos, P., Brink, P., & Seelen, H., 2017. Effects of an Integrated ‘Fast Track’ Rehabilitation Service for Multi-Trauma Patients: A Non-Randomized Clinical Trial in the Netherlands. *PLoS ONE*, 12. https://doi.org/10.1371/journal.pone.0170047
- Connolly, B., O'Neill, B., Salisbury, L., & Blackwood, B., 2016. Physical rehabilitation interventions for adult patients during critical illness: an overview of systematic reviews. *Thorax*, 71, pp. 881 - 890. https://doi.org/10.1136/thoraxjnl-2015-208273
- Cost and Reimbursement: The cost of implementing telerehabilitation and the availability of reimbursement for these services are critical factors. Financial facilitators, such as reimbursement policies, can significantly influence adoption (Seebacher et al., 2023; Nizeyimana, Joseph and Louw, 2022).
- Cultural and Social Norms: Cultural acceptance and social norms can either facilitate or hinder the adoption of telerehabilitation. In some regions, cultural acceptance has been a positive influence (Albahrouh and Buabbas, 2021).
- External Factors
- Farahimanesh, S., Serino, S., Tuena, C., Di Lernia, D., Wiederhold, B., Bernardelli, L., Riva, G., & Moradi, A., 2023. Effectiveness of a Virtual-Reality-Based Self-Help Intervention for Lowering the Psychological Burden during the COVID-19 Pandemic: Results from a Randomized Controlled Trial in Iran. *Journal of Clinical Medicine*, 12. https://doi.org/10.3390/jcm12052006
- Individual Factors
- Jnr, B., 2020. Use of Telemedicine and Virtual Care for Remote Treatment in Response to COVID-19 Pandemic. *Journal of Medical Systems*, 44. https://doi.org/10.1007/s10916-020-01596-5
- Johnson, S., Nolan, F., Hoult, J., White, I., Bebbington, P., Sandor, A., McKenzie, N., Patel, S., & Pilling, S., 2005. Outcomes of crises before and after introduction of a crisis resolution team.. *The British journal of psychiatry : the journal of mental science*, 187, pp. 68-75. https://doi.org/10.1192/BJP.187.1.68
- Jones, C., Miguel-Cruz, A., Smith-MacDonald, L., Cruikshank, E., Baghoori, D., Chohan, A., Laidlaw, A., White, A., Cao, B., Agyapong, V., Burback, L., Winkler, O., Sevigny, P., Dennett, L., Ferguson-Pell, M., Greenshaw, A., & Brémault-Phillips, S., 2020. Virtual Trauma-Focused Therapy for Military Members, Veterans, and Public Safety Personnel With Posttraumatic Stress Injury: Systematic Scoping Review. *JMIR mHealth and uHealth*, 8. https://doi.org/10.2196/22079
- Joshi, V., Christensen, J., Lejsgaard, E., Taylor, R., Zwisler, A., & Tang, L., 2021. Effectiveness of rehabilitation interventions on the secondary consequences of surviving a cardiac arrest: a systematic review and meta-analysis. *BMJ Open*, 11. https://doi.org/10.1136/bmjopen-2020-047251
- Kairy, D., Veras, M., Archambault, P., Hernandez, A., Higgins, J., Levin, M., Poissant, L., Raz, A., & Kaizer, F. (2016). Maximizing post-stroke upper limb rehabilitation using a novel telerehabilitation interactive virtual reality system in the patient's home: study protocol of a randomized clinical trial.. *Contemporary clinical trials*, 47, 49-53. https://doi.org/10.1016/j.cct.2015.12.006
- Kendall, E., Catalano, T., Kuipers, P., Posner, N., Buys, N., & Charker, J., 2007. Recovery following stroke: the role of self-management education.. *Social science & medicine*, 64 3, pp. 735-46. https://doi.org/10.1016/J.SOCSCIMED.2006.09.012
- Khatib, A., Gelkopf, M., Kapolnik, E., & Hassan-Abbas, N., 2021. The assessment of effectiveness by therapists of online therapy during the COVID-19 pandemic era in Israel.. *Journal of Psychotherapy Integration*. https://doi.org/10.1037/int0000267
- Knepley, K., Mao, J., Wieczorek, P., Okoye, F., Jain, A., & Harel, N. (2020). Impact of Telerehabilitation for Stroke-Related Deficits.. *Telemedicine journal and e-health : the official journal of the American Telemedicine Association*. https://doi.org/10.1089/tmj.2020.0019

- Kovács, E., Kállai, A., Fritúz, G., Iványi, Z., Mikó, V., Valko, L., Hauser, B., & Gal, J., 2021. The efficacy of virtual distance training of intensive therapy and anaesthesiology among fifth-year medical students during the COVID-19 pandemic: a cross-sectional study. *BMC Medical Education*, 21. https://doi.org/10.1186/s12909-021-02826-1
- Laver, K., Adey-Wakeling, Z., Crotty, M., Lannin, N., George, S., & Sherrington, C. (2020). Telerehabilitation services for stroke.. *The Cochrane database of systematic reviews*, 1, CD010255. https://doi.org/10.1002/14651858.cd010255
- Laver, K., Schoene, D., Crotty, M., George, S., Lannin, N., & Sherrington, C. (2013). Telerehabilitation services for stroke.. *The Cochrane database of systematic reviews*, 12, CD010255. https://doi.org/10.1002/14651858.CD010255.pub2
- Lee, S., Heo, S., Kim, S., Park, C., Jung, Y., Ji, G., Lee, H., Kim, K., Kim, S., Kim, B., & Kim, J., 2023. The Effectiveness of Virtual Reality Intervention for COVID-19-Related Psychological Distress: A Systematic Review. *Psychiatry Investigation*, 20, pp. 357 - 368. https://doi.org/10.30773/pi.2022.0337
- McCarty, D., Peat, J., O'Donnell, S., Graham, E., & Malcolm, W., 2019. "Choose Physical Therapy" for Neonatal Abstinence Syndrome: Clinical Management for Infants Affected by the Opioid Crisis.. *Physical therapy*, 99 6, pp. 771-785. https://doi.org/10.1093/ptj/pzz039
- Organizational Factors
- Ottosson, J., & Grahn, P., 2008. The Role of Natural Settings in Crisis Rehabilitation: How Does the Level of Crisis Influence the Response to Experiences of Nature with Regard to Measures of Rehabilitation?. *Landscape Research*, 33, pp. 51 - 70. https://doi.org/10.1080/01426390701773813
- Pallavicini, F., Pepe, A., Clerici, M., & Mantovani, F., 2021. Virtual Reality Applications in Medicine During the COVID-19 Pandemic: Systematic Review. *JMIR Serious Games*, 10. https://doi.org/10.2196/35000
- Pandemic Influence: The COVID-19 pandemic has significantly increased the willingness to adopt telerehabilitation due to the necessity of alternative healthcare delivery methods (Seebacher et al., 2023; Albahrouh and Buabbas, 2021).
- Patient and Provider Satisfaction: High levels of satisfaction and acceptance among both patients and providers are essential for the sustained use of telerehabilitation services (Niknejad et al., 2021; Stephenson et al., 2022).
- Perceptions and Acceptance: The perception of telerehabilitation's effectiveness and the willingness to adopt it among healthcare professionals are influenced by factors such as educational level, digital competencies, and core affect towards technology (Seebacher et al., 2023; Albahrouh and Buabbas, 2021).
- Privacy and Confidentiality Concerns: Concerns about patient privacy and data confidentiality can act as barriers to the adoption of telerehabilitation (Albahrouh and Buabbas, 2021).
- Readiness and Planning: Organizational readiness, including involvement in planning and exposure to e-healthcare knowledge, is necessary for successful adoption. Resistance to change and lack of urgency can be barriers (Jafni et al., 2018; Bahari et al., 2018).
- Riva, G., Di Lernia, D., Tuena, C., Bernardelli, L., Maldonado, J., Ferrer-García, M., Porras-Garcia, B., Meyer, M., Shiban, Y., Castelnuovo, G., Pagnini, F., Pedroli, E., Sforza, F., Clementi, A., Sansoni, M., Wiederhold, B., & Serino, S., 2023. A Self-Help Virtual Therapeutic Experience Intervention for Overcoming Psychological Distress Related to the COVID-19 Pandemic: Results From the European Multicentric COVID Feel Good Trial. *Psychosomatic Medicine*, 85, pp. 639 - 650. https://doi.org/10.1097/PSY.0000000000001198
- Rotundu, A., Oancea, A., Maștaleru, A., Costache, A., Cumpăt, C., Abdulan, I., Alexa, A., Chirica, C., Russu, M., & Leon, M. (2023). Benefits of Integrating Technology into Home Exercise Therapy in Patients with Lower Extremity Peripheral Artery Disease. *Journal of Clinical Medicine*, 12. https://doi.org/10.3390/jcm12247635
- Sakakibara, B., Wiley, E., Barclay, R., Bayley, M., Davis, J., Eng, J., Harris, A., Inness, E., MacKay-Lyons, M., Monaghan, J., Pollock, C., Pooyania, S., Schneeberg, A., Teasell, R., Yao, J., & Tang, A. (2023). TeleRehabilitation with Aims to Improve Lower extremity recovery in community-dwelling individuals who have had a stroke: protocol for a multisite, parallel group, assessor-blinded, randomised attention-controlled trial. *BMJ Open*, 13. https://doi.org/10.1136/bmjopen-2023-076723
- Serón, P., Oliveros, M., Gútierrez-Arias, R., Fuentes-Aspe, R., Torres-Castro, R., Merino-Osorio, C., Nahuelhual, P., Inostroza, J., Jalil, Y., Solano, R., Marzuca-Nassr, G., Aguilera-Eguía, R., Lavados-Romo, P., Soto-Rodríguez, F., Sabelle, C., Villarroel-Silva, G., Gomolán, P., Huaiquilaf, S., & Sánchez, P. (2021). Effectiveness of Telerehabilitation in Physical Therapy: A Rapid Overview. *Physical Therapy*, 101. https://doi.org/10.1093/ptj/pzab053

- Suso-Martí, L., La Touche, R., Herranz-Gómez, A., Angulo-Díaz-Parreño, S., Paris-Alemany, A., & Cuenca-Martínez, F. (2021). Effectiveness of Telerehabilitation in Physical Therapist Practice: An Umbrella and Mapping Review with Meta–Meta-Analysis. *Physical Therapy*. https://doi.org/10.1093/ptj/pzab075
- Sutton, K., 2019. A COMPREHENSIVE ASSESSMENT OF CRISIS IN INDIVIDUALS WITH INTELLECTUAL DISABILITIES AND ITS IMPLICATIONS FOR PHYSICAL THERAPY. **. https://doi.org/10.13023/ETD.2020.013
- Technical Infrastructure and Usability: Adequate technical infrastructure, including reliable internet connectivity and user-friendly platforms, is crucial for the successful implementation of telerehabilitation. Technical challenges can act as significant barriers (Stephenson et al., 2022; Subedi et al., 2020).
- Tenforde, A., Borgstrom, H., Polich, G., Steere, H., Davis, I., Cotton, K., O'Donnell, M., & Silver, J. (2020). Outpatient Physical, Occupational, and Speech Therapy Synchronous Telemedicine: A Survey Study of Patient Satisfaction with Virtual Visits During the COVID-19 Pandemic. *American Journal of Physical Medicine & Rehabilitation*. https://doi.org/10.1097/PHM.0000000000001571.
- The adoption of telerehabilitation in healthcare systems is influenced by several key factors, including technological, organizational, and individual elements. Below are the primary factors identified across multiple studies:
- Training and Support: Proper training for healthcare professionals on how to use telerehabilitation technologies is essential. Lack of training can hinder the adoption process (Stephenson et al., 2022; Subedi et al., 2020).
- Wolf, B., Herrmann, M., Zubler, I., & Brandstätter, V., 2019. Action crises in personal goals compromise recovery during physical therapy.. *Motivation Science*. https://doi.org/10.1037/MOT0000106


- Wolf, B., Herrmann, M., Zubler, I., & Brandstätter, V., 2019. Action crises in personal goals compromise recovery during physical therapy.. *Motivation Science*. https://doi.org/10.1037/MOT0000106