

EFFECTIVENESS OF PHYSICAL THERAPY SERVICES THROUGH TELEMEDICINE DURING THE COVID-19 PANDEMIC: SYSTEMATIC REVIEW

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ABSTRACT

The Covid-19 pandemic has greatly impacted physiotherapy services. In the context of the physical distancing strategy, physiotherapy services at health care centers are very limited. Telemedicine or telerehabilitation offers a way out to solve this problem. Despite its popularity, it turns out that this method is still becoming associated with its effectiveness. Therefore, this systematic review aims to update current evidence on the effectiveness of physiotherapy via telemedicine or telerehabilitation during the Covid-19 pandemic. The method used is a systematic review using Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA). Article searches were conducted from the Science Direct, Scopus, and Proquest databases with the keywords "Effective AND Physical Therapy AND Telemedicine OR Telerehabilitation AND Coronavirus". The literature is then analyzed based on the results of existing research. All studies show that physiotherapy services through telemedicine or telerehabilitation have a good impact on the recovery process of motion and body functions of patients, Cost-effectiveness, as well as outreach to patients, are also added values of this telemedicine or telerehabilitation method. Telemedicine or telerehabilitation is the answer to the cause of the occurrence of physiotherapy services during this pandemic. This method of providing remote health services allows patients with impaired movement and bodily functions of patients with cardiorespiratory, musculoskeletal, and neuromuscular disorders to carry out an exercise program at home under the supervision of a physiotherapist and can reduce the risk of being infected with the Covid-19 virus.

Keywords : Covid-19, Physical Therapy, Telemedicine, Telerehabilitation

ABSTRAK

Terjadinya pandemi Covid-19 sangat berdampak pada pelayanan fisioterapi. Dalam rangka strategi *physical distancing*, pelayanan fisioterapi di pusat layanan kesehatan menjadi sangat terbatas. *Telemedicine* atau *telerehabilitation* menawarkan jalan keluar untuk memecahkan persoalan ini. Terlepas dari popularitasnya, ternyata metode ini masih menjadi pertentangan terkait dengan efektivitasnya. Oleh karena itu, tujuan dari tinjauan sistematis ini adalah untuk memperbaharui bukti terkini tentang efektivitas dari layanan fisioterapi melalui *telemedicine* atau *telerehabilitation* pada masa pandemi Covid-19. Metode yang digunakan adalah *systematic review* dengan menggunakan *Preferred Reporting Items for Systematic Review and Meta-analysis* (PRISMA). Pencarian artikel dilakukan dari *database* Science Direct, Scopus, dan Proquest dengan kata kunci "*Effective AND Physical Therapy AND Telemedicine OR Telerehabilitation AND Coronavirus*". Literatur kemudian dianalisis berdasarkan hasil penelitian yang ada. Semua studi terpilih menunjukkan bahwa layanan fisioterapi melalui *telemedicine* atau *telerehabilitation* memiliki dampak yang baik terhadap proses pemulihan gerak dan fungsi tubuh pasien,. Efektivitas dari segi biaya, serta jarak jangkauan kepada pasien pun menjadi nilai tambah dari metode *telemedicine* atau *telerehabilitation* ini. *Telemedicine* atau *telerehabilitation* menjadi sebuah jawaban untuk keberlanjutan layanan fisioterapi pada masa pandemi ini. Metode pemberian pelayanan kesehatan jarak jauh ini memungkinkan pasien dengan gangguan gerak dan fungsi tubuh pasien dengan gangguan kardiorespirasi, muskuloskeletal, serta neuromuskular untuk melakukan program latihan di rumah dengan pengawasan fisioterapis dan dapat mengurangi risiko terinfeksi virus Covid-19.

Kata Kunci : Covid-19, Fisioterapi, *Telemedicine*, *Telerehabilitation*

INTRODUCTION

Since its first outbreak report on December 31, 2019, the Coronavirus disease (Covid-19) has infected hundreds of millions of people worldwide. Meanwhile, new cases and deaths continue to emerge non-stop, as vaccines are still under development and distribution. The whole world must not only face the direct health impacts of this virus, but also the enormous indirect impacts on both the economic and social sectors (Kim & Katelyn Kim, 2021).

In Indonesia alone, as of August 2021, there were 3,760,497 confirmed cases of Covid-19 (Covid-19 Handling Task Force, 2021). Indonesia has the most active cases of Covid-19 among countries in Southeast Asia, (Dong et al., 2020). Until now, with more than 1000 new cases per day, the Covid-19 daily confirmed cases are still relatively high in Indonesia (Cucunawangsih et al., 2021).

The rate of spread of infection indicates that transmission occurs from human to human (Sitorus et al., 2021). Therefore, in order to protect their citizens from the virus and reduce the burden on their healthcare systems, many governments from different countries have used a variety of measures to maintain physical distancing including bans crowd puller events, and travel restrictions (Connor, 2020). The Covid-19 pandemic has also dramatically changed the way outpatient services are practiced in healthcare. Many outpatients avoid visiting health facilities because they do not want to leave their homes and are exposed to the

Telerehabilitation can be defined as the use of telecommunications, either with live video or audio, to provide rehabilitative interventions (Appleby et al., 2019). In a previous study with physical therapy intervention through telerehabilitation services to reduce pain and disability in patients with Patellofemoral Pain Syndrome (PFPS), it was proven successful in 12 physical therapy sessions over 4

risk of getting a Covid-19 virus infection. The existence of government regulations related to restrictions on mobilization also affects patient behavior where patients tend to reduce or even avoid visits to health care facilities to check their health conditions (Mehrotra et al., 2020).

The direct effects of the Covid-19 infection and the indirect consequences of government policies have a severe impact on the subgroups of the population with the greatest health needs, such as people with disabilities or at risk for disability due to chronic conditions. Several international bodies have established health policies that focus not only on the acute management of the Covid-19 disease but also on prevention, intervention, and care in chronically ill patients living at home or in health care facilities, as well as patients suffering from recent functional limitations that require rehabilitation (or treatment in a rehabilitation facility) (Ceravolo et al., 2020).

This situation is a challenge for the medical rehabilitation team, especially physical therapy services to be able to adapt to the conditions of the Covid-19 pandemic (Nugraha et al., 2020). The question is what should the patient do at home to recover his condition? Telemedicine is an alternative approach that can ease some of these obstacles (Batalik et al., 2021). There are several types of telemedicine such as telerehabilitation, telemonitoring, and teleconsultation. Telerehabilitation can be the solution to the state of physical rehabilitation during the Covid-19 pandemic (Prabawa et al., 2021).

weeks (Albornoz-Cabello et al., 2021). Other studies have shown that telerehabilitation services carried out at home, based on the 200 meters Fast Walk Test can effectively improve cardiorespiratory fitness in patients with coronary heart disease with low to moderate cardiovascular risk (Batalik et al., 2021).

However, in other studies, it was found that the results of evaluating the effectiveness of telerehabilitation were contradictory. Where Piotrowicz et al. who conducted a study in patients with heart disease found that administering a 9-week Hybrid Comprehensive Telerehabilitation (HCTR) program did not increase the percentage of days alive and hospital discharge and did not reduce mortality and hospitalizations during a 14-to-26-month follow-up period (Piotrowicz et al., 2020). Therefore, the purpose of this review is to update the literature on the effectiveness of physiotherapy services through telerehabilitation, especially during this Covid-19 pandemic.

METHODS

This study is a systematic review using Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA). Data were acquired from research articles by accessing 3 electronic databases, namely Science Direct, Scopus, and Proquest on the lib.ui.ac.id page.

The search for research articles was conducted using the keywords “Effective AND Physical Therapy AND Telemedicine OR Telerehabilitation AND Coronavirus”. The articles found are read carefully to see if they meet the author's inclusion criteria. The inclusion criteria used are articles published from April 2020 to April 2021 which can be accessed in full text and English. Meanwhile, the exclusion criteria in this study are research journals that have topics outside of physical therapy services through telemedicine or telerehabilitation during the Covid-19 pandemic.

In the initial search, 1,129 articles were found from 3 databases. Then articles with similar content are removed from the list of articles. These results were then selected based on the title, abstract, and content of the article to produce 8 complete articles relevant to this research and included in a systematic review.

RESULTS

A total of 1,129 potentially relevant articles were found by searching from 3 databases. After the deletion of duplicate articles, as well as the screening of titles and abstracts, a total of 30 articles were reviewed in full text. A total of 8 articles met the eligibility criteria and were included in the analysis. The PRISMA flowchart is illustrated in Figure 1. The articles that were included in the systematic review were then analyzed based on the title, year, author's name, location, study design, results, and research conclusions. These data are then listed in Table 1.

The eight articles that meet these criteria are studies conducted in the continents of Asia, Europe, North America, and South America. The continent of Asia is represented by China. The European continent is represented by the Czech Republic, Spain, England, and Italy. The continent of North America is represented by the United States of America. The continent of South America is represented by Chile. From the eight articles reviewed, it is known that physical therapy services through telemedicine or telerehabilitation have produced good results for their users during the Covid-19 pandemic. This method has been successfully applied to patients with cardiorespiratory disorders, patients with musculoskeletal disorders (Patellofemoral Pain Syndrome and breast cancer), as well as patients with neurological disorders (Stroke, and Amyotrophic Lateral Sclerosis) (Albornoz-Cabello et al., 2021; Batalik et al., 2021; De Marchi et al., 2021; Hameed et al., 2021; Lewis et al., 2021; Mella-Abarca et al., 2020; Miao et al., 2021; Turcinovic et al., 2021)

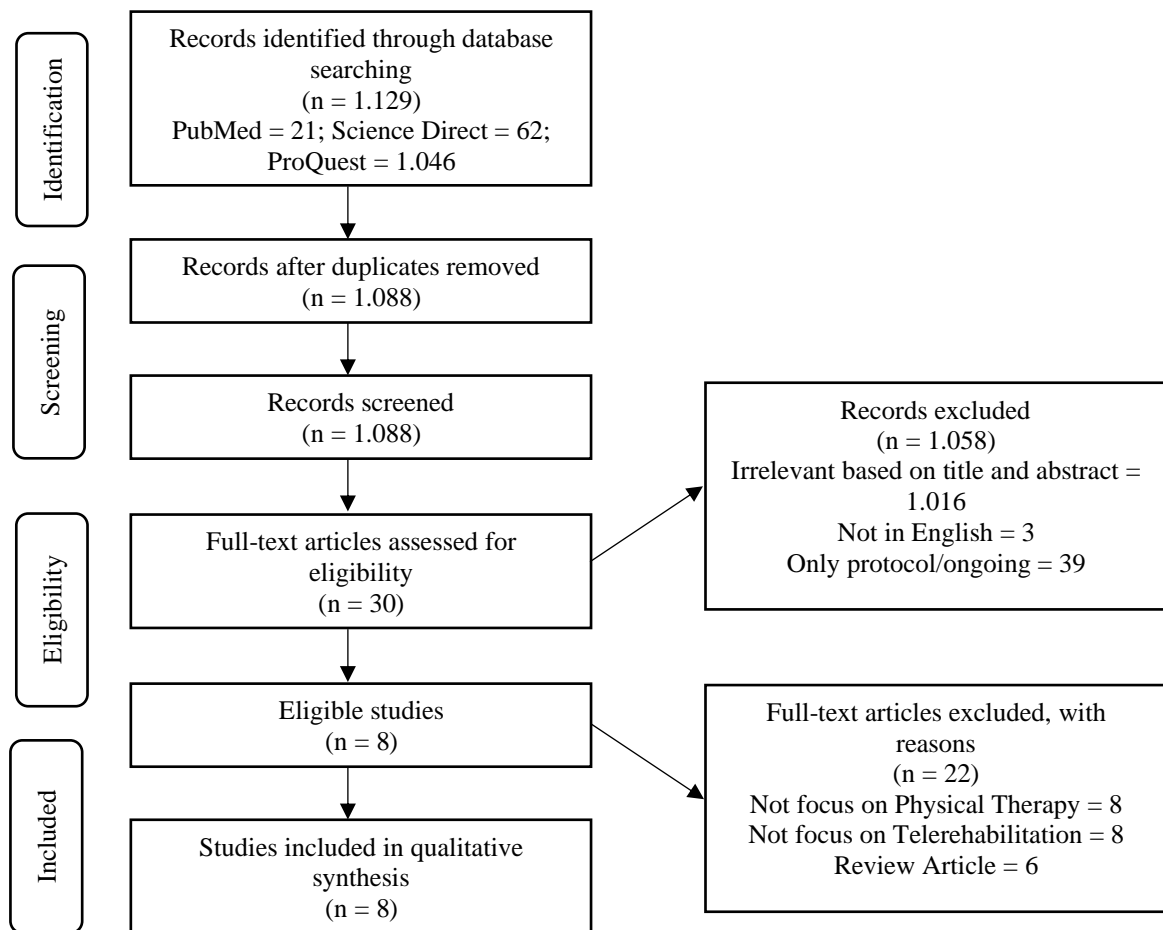


Figure 1. PRISMA Flow Chart

Table 1. Article Search Results

No	Author (Year)	Title	Place	Study Design	Results	Conclusions
1	(Miao et al., 2021)	A Construction Method of Lower Limb Rehabilitation Robot with Remote Control System	China	Quasi-experimental	Experiments with robotic designs that combine on-the-spot and telerehabilitation methods to facilitate patients in walking show that they can actively maintain body balance while reducing the burden of walking on the patient's lower limbs and increasing patient initiative in the rehabilitation process.	The data obtained during the rehabilitation process can be used by doctors to research to increase the effect and efficiency of rehabilitation. Remote rehabilitation systems can provide long-term health guidance and support for disabled patients in remote areas.

2	(Batalik et al., 2021)	Cardiac Rehabilitation Based on the Walking Test and Telerehabilitation Improved Cardiorespiratory Fitness in People Diagnosed with Coronary Heart Disease during the Covid-19 Pandemic	Czech Republic	Quasi-experimental	Study participants felt a significant enhancement in cardiorespiratory fitness stated by an 8% lessening in test run time.	Cardiac telerehabilitation effectively improves cardiorespiratory fitness in people with coronary heart disease with low to moderate cardiovascular risk. This study can be an alternative method to contribute to health care during the Covid-19 pandemic.
3	(Albornoz-Cabello et al., 2021)	Effectiveness of Tele-Prescription of Therapeutic Physical Exercise in Patellofemoral Pain Syndrome during the Covid-19 Pandemic	Spain	Longitudinal and prospective clinical trial	There was a 1/10 reduction in pain with the Visual Analog Scale and Douleur Neuropathique 4 Questions, an improvement of disability level by 15 points with the Lower Extremity Functional Scale and 20 points with The Kujala Anterior Knee Pain Scale and increasing range of motion by an average of 9°.	Therapeutic exercises supervised by physical therapists through telemedicine showed higher effectiveness in reducing discomfort and disorder in patients with Patellofemoral pain syndrome than simply providing educational information sheets to patients.
4	(Lewis et al., 2021)	Feasibility of an Online Platform Delivery of Pulmonary Rehabilitation for Individuals with Chronic Respiratory Disease	England	Mixed-methods approach	The results of the interview show that pulmonary rehabilitation patients are very likely to be done online. The results of online training are considered more successful than face-to-face methods.	Online pulmonary rehabilitation can improve patient results and is deemed appropriate and acceptable for individuals who are referred for face-to-face pulmonary rehabilitation to maintain social distancing related to Covid-19.

5	(Hameed et al., 2021)	Outcomes of a Covid-19 Recovery Program for Hospitalized Patients with SARS-Cov-2 Infection in New York City: A Prospective Cohort Study	United States of America	Prospective cohort study	As many as 65% of patients with Virtual Physical Therapy (VPT) and 88% of patients with Home Physical Therapy (HPT) found a significant difference in the increasing scores from sitting to standing, in comparison to the independent exercise group and the no-exercise group. Significant differences in increasing step test scores were also found in 50% of HPT patients, 74% of VPT patients, independent exercise, and no-exercise groups.	Online outpatient rehabilitation for patients recovering from Covid-19 can improve lower extremity strength and cardiopulmonary endurance. Virtual physical therapy appears to be an effective treatment delivery method for recovering Covid-19 patients.
6	(Turcinovic et al., 2021)	Physical Therapy for Hospitalized Patients with Covid-19 in Isolation: Feasibility and Pilot Implementation of Telehealth for Delivering Individualized Therapy	United States of America	Pilot study	There was an increase in function from being inpatient (score 8-24) to discharge (score 14-24) as measured by the 6-click Activity Measure of Post-Acute Care with an average of 2 physical therapy sessions per day by every Covid-19 patient.	This study has shown the feasibility of conducting physical therapy with a mix of face-to-face and virtual sessions for inpatients isolated with Covid-19. The model also has wider application in the hospitalized and home-based.
7	(De Marchi et al., 2021)	Telehealth Approach for Amyotrophic Lateral Sclerosis Patients: The Experience During Covid-19 Pandemic	Italy	Quasi-experimental	All patients were satisfied and pleased with how the team understood their problem. There was a decrease in the Amyotrophic Lateral Sclerosis Functional Rating Scale during treatment, from a score of 0.88 (SD 1.17) to	The study believes that ALS patients carried by telemedicine receive a quality of care comparable to in-person healthcare, and this needs to be an integrated platform to provide high-

					0.49 (SD 0.75) after telerehabilitation.	quality tertiary ALS care during disease monitoring.
8	(Mella-Abarca et al., 2020)	Telerehabilitation for People with Breast Cancer Through the Covid-19 Pandemic in Chile	Chile	Quasi-experimental	The telerehabilitation program at the Dr. Health Care Complex. Sótero del Río has an excellent level of acceptance and enjoyment, both by physical therapists and patients. Patients are satisfied to have a therapist who is willing to help resolve the patient's doubts.	Experience at the Health Care Complex Dr. Sotero del Río. Chile has shown that it is possible to implement early intervention and physical therapy models in breast cancer cases through telerehabilitation to minimize the risk of being infected with the Covid-19 virus.

DISCUSSION

Several studies have been conducted to find out about the effectiveness of physical therapy services through telemedicine or telerehabilitation. One of them is a study conducted by Albornoz-Cabello et al. in 54 patients with musculoskeletal disorders, namely patellofemoral pain syndrome (PFPS). In this study, patients were given an exercise program at home supervised by a physical therapist via telephone and e-mail, 3 times a week (4 weeks duration, 12 therapy sessions). The results obtained were a significant improvement in pain intensity, joint range of motion, and level of disability. This study concluded that therapeutic exercises supervised by a physical therapist via telematics channels showed greater effectiveness in reducing pain and disability rates in patients suffering from PFPS than simply providing

Likewise in neuromuscular cases, such as Amyotrophic Lateral Sclerosis (ALS). In a study conducted by De Marchi et al. On 19 ALS patients, the physical therapist provided advice aimed at managing the main problems felt by the patients through

patient education brochures (Albornoz-Cabello et al., 2021).

Other studies related to physical therapy services through telemedicine or telerehabilitation have also been carried out in patients with cardiorespiratory disorders, where the sample used was 19 patients with coronary heart disease (CHD). This patient did a regular exercise program 3-5 times a week, with a minimum duration of 30 minutes, for 8 weeks.

The physical therapist acts as a remote trainer, examining patients and providing feedback or feedback over the phone every two weeks. The effectiveness of similar telerehabilitation approaches in people with CHD has also been confirmed, and this approach is highly recommended as a promising alternative (Scherrenberg et al., 2020; Scott-Sheldon et al., 2020).

demonstration videos and explained how to perform the exercises. As a result, the local pain felt by the patient was stable, not getting worse (De Marchi et al., 2021).

From the studies that have been reviewed above, it is very clear that the

provision of physical therapy services through telemedicine or telerehabilitation is effective in restoring or maintaining the function and movement of the patient's body. In addition, it turns out that this method has other advantages. One of them is cost-effective (Batalik et al., 2021; Miao et al., 2021). Telerehabilitation showed to be at least as cost-effective as traditional cardiac rehabilitation programs (Kraal et al., 2014). This cost-effectiveness can occur because it requires fewer clinic-based facilities and less contact with physical therapists for treatment (Fatoye et al., 2020).

In addition to the advantages mentioned above, telerehabilitation may have advantages that far exceed the current limitations of the government's policy of social distancing related to the Covid-19 pandemic. The effectiveness of telerehabilitation can be strengthened by several currently available technologies, such as virtual reality which can recreate a realistic environment in which patients can physically move, and wearable sensors that allow physical therapists to quantitatively monitor patient achievements (Nuara et al., 2021).

CONCLUSIONS

The use of telemedicine or telerehabilitation methods allows the provision of physical therapy services through long-distance communication media, whether in the form of audio or video. This method can be a way out for patients with impaired movement and body function during the Covid-19 pandemic because it allows patients to carry out an exercise program at home, thereby reducing the risk of being infected with Covid-19.

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REFERENCES

- Albornoz-Cabello, M., Barrios-Quinta, C. J., Barrios-Quinta, A. M., Escobio-Prieto, I., de los Angeles Cardero-Durán, M., & Espejo-Antunez, L. (2021). Effectiveness of tele-prescription of therapeutic physical exercise in patellofemoral pain syndrome during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, *18*(3), 1–11. <https://doi.org/10.3390/ijerph18031048>
- Appleby, E., Gill, S. T., Hayes, L. K., Walker, T. L., Walsh, M., & Kumar, S. (2019). Effectiveness of telerehabilitation in the management of adults with stroke: A systematic review. *PLoS ONE*, *14*(11), 1–18. <https://doi.org/10.1371/journal.pone.0225150>
- Batalik, L., Konecny, V., Dosbaba, F., Vlazna, D., & Brat, K. (2021). Cardiac rehabilitation based on the walking test and telerehabilitation improved cardiorespiratory fitness in people diagnosed with coronary heart disease during the covid-19 pandemic. *International Journal of Environmental Research and Public Health*, *18*(5), 1–11. <https://doi.org/10.3390/ijerph18052241>
- Ceravolo, M. G., De Sire, A., Andrenelli, E., Negrini, F., & Negrini, S. (2020). Systematic rapid “living” review on rehabilitation needs due to COVID-19: Update to March 31st, 2020. *European Journal of Physical and Rehabilitation Medicine*, *56*(3), 347–353. <https://doi.org/10.23736/S1973-9087.20.06329-7>
- Connor, P. (2020). *More than nine-in-ten people worldwide live in countries with travel restrictions amid COVID-*

19.
Covid-19 Handling Task Force. (2021). *Peta Sebaran Covid-19 di Indonesia*. Cucunawangsih, C., Wijaya, R. S., Lugito, N. P. H., & Suriapranata, I. (2021). Post-vaccination cases of COVID-19 among healthcare workers at Siloam Teaching Hospital, Indonesia. *International Journal of Infectious Diseases*, 107, 268–270. <https://doi.org/10.1016/j.ijid.2021.05.020>
- De Marchi, F., Sarnelli, M. F., Seriola, M., De Marchi, I., Zani, E., Bottone, N., Ambrosini, S., Garone, R., Cantello, R., Mazzini, L., Solara, V., Biroli, G., Riso, S., Vercelli, R., & Massara, M. (2021). Telehealth approach for amyotrophic lateral sclerosis patients: the experience during COVID-19 pandemic. *Acta Neurologica Scandinavica*, 143(5), 489–496. <https://doi.org/10.1111/ane.13373>
- Dong, E., Du, H., & Gardner, L. (2020). An interactive web-based dashboard to track COVID-19 in real time. *The Lancet Infectious Diseases*, 20(5), 533–534. [https://doi.org/10.1016/S1473-3099\(20\)30120-1](https://doi.org/10.1016/S1473-3099(20)30120-1)
- Fatoye, F., Gebrye, T., Fatoye, C., Mbada, C. E., Olaoye, M. I., Odole, A. C., & Dada, O. (2020). The clinical and cost-effectiveness of telerehabilitation for people with nonspecific chronic low back pain: Randomized controlled trial. *JMIR MHealth and UHealth*, 8(6). <https://doi.org/10.2196/15375>
- Hameed, F., Palatulan, E., Jaywant, A., Said, R., Lau, C., Sood, V., Layton, A., & Gellhorn, A. (2021). Outcomes of a COVID-19 recovery program for patients hospitalized with SARS-CoV-2 infection in New York City: A prospective cohort study. *PM and R*, 13(6), 609–617. <https://doi.org/10.1002/pmrj.12578>
- Kim, H. H. soo, & Katelyn Kim, H. jin. (2021). Income inequality, emotional anxiety, and self-rated health in times of the coronavirus pandemic: Evidence from a cross-national survey. *Research in Social Stratification and Mobility*, 75(July), 100640. <https://doi.org/10.1016/j.rssm.2021.100640>
- Kraal, J. J., Peek, N., Van Den Akker-Van Marle, M. E., & Kemps, H. mc. (2014). Effects of home-based training with telemonitoring guidance in low to moderate risk patients entering cardiac rehabilitation: Short-term results of the FIT@Home study. *European Journal of Preventive Cardiology*, 21, 26–31. <https://doi.org/10.1177/2047487314552606>
- Lewis, A., Knight, E., Bland, M., Middleton, J., Mitchell, E., McCrum, K., Conway, J., & Bevan-Smith, E. (2021). Feasibility of an online platform delivery of pulmonary rehabilitation for individuals with chronic respiratory disease. *BMJ Open Respiratory Research*, 8(1), 1–8. <https://doi.org/10.1136/bmjresp-2021-000880>
- Mehrotra, A., Chernew, M. E., Linetsky, D., Hatch, H., & Cutler, D. A. (2020). *The Impact of the COVID-19 Pandemic on Outpatient Visits: A Rebound Emerges*. <https://www.commonwealthfund.org/publications/2020/apr/impact-covid-19-outpatient-visits>
- Mella-Abarca, W., Barraza-Sánchez, V., & Ramírez-Parada, K. (2020). Telerehabilitation for people with breast cancer through the COVID-19 pandemic in Chile. *Ecancermedicalscience*, 14, 1–8. <https://doi.org/10.3332/ECANCER.2020.1085>
- Miao, M., Gao, X., & Zhu, W. (2021). A construction method of lower limb rehabilitation robot with remote control system. *Applied Sciences (Switzerland)*, 11(2), 1–19. <https://doi.org/10.3390/app11020867>

- Nuara, A., Fabbri-Destro, M., Scalona, E., Lenzi, S. E., Rizzolatti, G., & Avanzini, P. (2021). Telerehabilitation in response to constrained physical distance: an opportunity to rethink neurorehabilitative routines. *Journal of Neurology*, 0123456789. <https://doi.org/10.1007/s00415-021-10397-w>
- Nugraha, B., Wahyuni, L. K., Laswati, H., Kusumastuti, P., Tulaar, A. B., & Gutenbrunner, C. (2020). COVID-19 pandemic in Indonesia: Situation and challenges of rehabilitation medicine in Indonesia. *Acta Medica Indonesiana*, 52(3), 299–305.
- Piotrowicz, E., Pencina, M. J., Opolski, G., Zaręba, W., Banach, M., Kowalik, I., Orzechowski, P., Szalewska, D., Pluta, S., Głównyńska, R., Irzmański, R., Oręziak, A., Kalarus, Z., Lewicka, E., Cacko, A., Mierzyńska, A., & Piotrowicz, R. (2020). Effects of a 9-Week Hybrid Comprehensive Telerehabilitation Program on Long-term Outcomes in Patients with Heart Failure: The Telerehabilitation in Heart Failure Patients (TELEREH-HF) Randomized Clinical Trial. *JAMA Cardiology*, 5(3), 300–308. <https://doi.org/10.1001/jamacardio.2019.5006>
- Prabawa, I. M. Y., Silakarma, D., & Widnyana, M. (2021). Telerehabilitation as a physical therapy solution for the post-stroke patient in COVID-19 pandemic situations: A review I Made Yoga Prabawa. *Intisari Sains Medis / Intisari Sains Medis*, 12(1), 1–5. <https://doi.org/10.15562/ism.v12i1.873>
- Scherrenberg, M., Wilhelm, M., Hansen, D., Völler, H., Cornelissen, V., Frederix, I., Kemps, H., & Dendale, P. (2020). The future is now: a call for action for cardiac telerehabilitation in the COVID-19 pandemic from the secondary prevention and rehabilitation section of the European Association of Preventive Cardiology. *European Journal of Preventive Cardiology*. <https://doi.org/10.1177/2047487320939671>
- Scott-Sheldon, L. A. J., Gathright, E. C., & Wu, W.-C. (2020). Promoting Social Connectedness among Cardiac Rehabilitation Patients During the COVID-19 Pandemic and Beyond. *Rhode Island Medical Journal* (2013), 103(9), 34–35. <http://www.ncbi.nlm.nih.gov/pubmed/33126785>
- Sitorus, R. J., Wathan, I., Ridwan, H., Wibisono, H., Nuraini, L., Yusri, Kosim, G., Nurdin, N., Mamat, H., Andrayani, I., Antara, N. Y., & Natalia, M. (2021). Transmission dynamics of novel Coronavirus–SARS-CoV-2 in South Sumatera, Indonesia. *Clinical Epidemiology and Global Health*, 11(November 2020), 100777. <https://doi.org/10.1016/j.cegh.2021.100777>
- Turcinovic, M., Singson, R., Harrigan, M., Ardito, S., Ilyas, A., Sinvani, L., Hajizadeh, N., & Burns, E. (2021). Physical Therapy for Hospitalized Patients With COVID-19 in Isolation: Feasibility and Pilot Implementation of Telehealth for Delivering Individualized Therapy. *Archives of Rehabilitation Research and Clinical Translation*, 3(2), 100113. <https://doi.org/10.1016/j.arct.2021.100113>