

Pandemic covid-19 - development opportunity

doc. dr. MOJCA AMON, PT

Visokošolski zavod Fizioterapevtika, Slovenska cesta 58, 1000 Ljubljana

e-mail: amon.mojca@gmail.com; www.fizioterapevtika.si

Abstract

The occurrence of coronavirus (COVID-19, SARS-CoV-2) has affected various areas of an individual's life, as well as society as a whole. In addition to monitoring the daily number of people affected on a global level, we should consistently assess and above all, strengthen the well-being of the individual. There are many definitions of health, but in general, health is a state of physical, mental and social well-being, and not merely the absence of disease. The World Health Organization describes health as a comprehensive dynamic system capable of adapting to environmental influences and enabling the performance of biological, social and occupational functions. Modern rehabilitation practices also increasingly emphasize health as a value, a source of productive quality of life and a functional condition for adapting to the environment. Effective implementation of social distancing protocols can significantly limit the spread of COVID-19 throughout the community and protect the health care system from overloading beyond the capacity to treat COVID-19-related complications. However, protocols to limit the spread of the disease have significant consequences in limiting the availability of general health care. Last but not least, social alienation limits the health of society both bio-psycho-socially and mentally. The consequences of the COVID-19 pandemic are likely to be significant. It is therefore essential that today's healthcare approach is based on effective adaptation to demanding health conditions. We believe that health is our responsibility, which, however, requires specific adaptations of the health care system to the individual. Key words: epidemic, telemedicine, telerehabilitation, telephysiotherapy, COVID-19

Pandemija covid-19 - razvojna priložnost

Povzetek

Pojavnost koronavirusne bolezni (COVID-19, SARS-CoV-2) je posegla v različna področja posameznikovega življenja, kot tudi celote družbe. Poleg spremljanja dnevnega števila obolelih ljudi na globalni ravni, bi morali dosledno ocenjevati in predvsem krepiti zdravstveno stanje posameznika. Obstajajo številne definicije zdravja, vendar na splošno zdravje pomeni stanje telesnega, duševnega in socialnega blagostanja, in ne le odsotnosti bolezni. Svetovna Zdravstvena Organizacija opisuje zdravje kot celovit dinamičen sistem, ki je sposoben prilagajanja vplivom okolja, ter omogoča opravljanje bioloških, socialnih, poklicnih funkcij. Sodobna rehabilitacijska praksa prav tako vse bolj poudarja zdravje kot vrednoto, vir produktivnega kakovostnega življenja ter funkcionalni pogoj za prilagajanje okolju. Učinkovita uvedba protokolov za ohranjanje socialne razdalje lahko znatno omeji širjenje COVID-19 znotraj skupnosti in zaščiti zdravstveni sistem pred preobremenitvijo, ki presega zmožnosti zdravljenja zapletov, povezanih s COVID-19. Vendar pa imajo protokoli za omejitev širjenja bolezni pomembne posledice v omejevanju razpoložljivosti splošne zdravstvene oskrbe. Nenazadnje, ohranjanje socialne razdalje omejuje zdravstveno stanje družbe tako bio-psiho-socialno ter duševno. Posledice pandemije COVID-19 bodo verjetno precejšnje. Zato je nujno, da današnji zdravstveni pristop temelji na učinkoviti adaptaciji zahtevnim zdravstvenim razmeram. Menimo, da je zdravje naša odgovornost, ki pa zahteva določene prilagoditve zdravstvenega sistema posamezniku. Ključne besede: epidemija, telemedicina, telerehabilitacija, telefizioterapija, COVID-19

1. INTRODUCTION

Health is the foundation of social and economic development, which is clearly defined, but often systematically complex to implement. Health values cannot be measured directly or quantitatively. Healthcare professionals in the area of rehabilitation have a number of indirect health indicators at their disposal, such as assessment protocols and tests for assessment in practice.

In physiotherapy, we have assessment procedures and physiotherapeutic diagnostics at our disposal, which determine the success of physiotherapeutic methods and techniques. Regardless of the selected physiotherapeutic procedures, whether movement therapy (clinical exercise therapy or kinesiotherapy), manual therapy or the use of supportive instrumental agents, physiotherapeutic treatment typically begins, continues, and ends with diagnostics (Brodly and Hall, 2018).

Since excessive burden on the health system and various health emergencies may prevent direct contact between healthcare professionals and patients, alternative solutions are being developed and designed. An example of such solution is the use of information technology in medicine. Certain physicians and patients already use remote access methods to communicate about health status, prescriptions, medications, examination results or chronic illnesses. Technological support, such as telemedicine, provides an additional system of medical support to patients (National Institute for Health and Care Excellence, 2016; Zhang et al., 2010; Victor et al., 2008).

2. METHODS

Suggested methods

The first limitations of direct therapeutic contact also led to the development of the idea of telephysiotherapy. Similar to telemedicine, telephysiotherapy refers to several forms of telemonitoring, teliagnostics, and telekinesiotherapy as part of telerehabilitation (Adhikari et al., 2020; Stanhope and Weinstein, 2020). We believe that in practice telephysiotherapy is currently still in a developmental phase that needs appropriate guidance and direction. Researchers with scientific findings indicate a trend that the partial digitalization of physiotherapy can to some extent contribute to the evaluation of performed therapeutic exercise and motivate the individual to regularly perform therapeutic exercises or daily kinesiotherapy or clinical exercise therapy.

Telemonitoring can be an automated process of exchanging information between the home and medical environment about a physiological condition. For instance, researchers report monitoring clinical symptoms such as dyspnea or pain (Hwang and Elkins, 2020). The method of telephone support is proven to result in reduced risk of mortality, hospitalizations associated with heart failure, and improved quality of life and self-care. Researchers Rathleff et al. (2016) stepped up our understanding of telemonitoring, which they demonstrated in their concluding remarks. The researchers performed exercise control of adolescents with the presence of patellofemoral knee joint pain. They used an innovative system that is connected to a built-in sensor in the training elastic band and electronically connected in data transmission that provides the patient and physiotherapist information on exercise dosing (tension time, number of repetitions and sets) and pain level information before and after the exercise. Interestingly, individuals achieved a 15% value of prescribed exercise, confirming that self-assessment diaries go beyond and overestimate the work done (Rathleff et al., 2016). The authors conclude that such devices can contribute to the evaluation of the performed physiotherapeutic exercise and encourage the consistency of the individual to perform the exercise task.

3. RESULTS

Researchers also studied telecoaching as support and advice through motivational messages, or phone calls to increase accountability and maintain physiotherapy goals. Iles et al. (2011) examined the effects of telephone surveillance of individuals with the presence of non-chronic and nonspecific low back pain. Telephone call management included identifying the patient's willingness to change, motivational conversation, and goal setting. The authors concluded that five telephone treatments, in addition to

classical physiotherapy treatments, contributed to an improvement in the level of physical activity and rehabilitation expectations over 12 weeks (Iles et al., 2011). Many researchers have studied various modes of telecommunications such as remote access handling either through telecommunications technologies such as telephone, video calling and other ways using a web connection.

In addition to telemonitoring, the approach allows a part of clinical evaluation and implementation of treatment. We observed an expansion of findings regarding the effects of telerehabilitation in the musculoskeletal (Cottrell et al., 2017), and some chronic diseases treatments (Laver et al., 2020). Chien et al. (2011) studied the effects of telerehabilitation in patients with myocardial infarction. The group implemented a muscle strengthening program in addition to a minimum of 30-minute walk, at least 3 times per week, for 8 weeks. Participants received a phone call every week or every other week to monitor performance, provide feedback, and resolve issues. The authors reported an improvement in quality of life and functional exercise capacity in a group that was included in telekinesiotherapy in addition to kinesiotherapy. Similarly, 12-week telekinesiotherapy proved to be no worse than traditional kinesiotherapy in classical physiotherapy treatment, at least in terms of functional capacity, even telekinesiotherapy was shown to have a higher participation in heart attack patients (Hwang et al., 2017). The results demonstrate that videoconferencing can be a direct control of group exercise and provides real-time and direct audio-video feedback. Importantly, both studies used relatively accessible equipment (telephone, computer, videoconferencing software, automatic sphygmomanometer, and pulse oximeter), allowing for improved transfer to clinical practice.

4. DISCUSSION

Technological accessibility and rehabilitation restrictions

Participation in a telerehabilitation program requires access to technological devices, such as smartphones, computers, and tablets, with a good Internet connection. According to data from the European Commission from 2016, as many as 79% of Europeans aged 16 to 74 accessed the Internet via mobile or smartphone. Age is therefore not necessarily a barrier to the remote use of health and medical services. However, it is not clear if all patients, especially those in cardiopulmonary rehabilitation programs, are technologically skilled or trained. Seidman et al. (2017), in an Australian study, presented significant advances in the understanding and acceptability of telerehabilitation. Of the 254 patients who underwent pulmonary rehabilitation, 92% were classified as technology-skilled participants (personal access to and use of at least one technology device in their home), and participants cited improved therapy and comfort as motivators for telerehabilitation participation. The ability of pulmonary rehabilitation participants to cooperate with technology was later confirmed (Bonnievia et al., 2019). In this study all of the 105 adults with chronic respiratory disease, who were referred for pulmonary rehabilitation, were able to quickly learn how to operate a Bluetooth pulse oximeter during exercise. Nearly, all study participants, considered this monitoring equipment acceptable, and oximetry data were provided with minimal artifact or invalid data. This is particularly welcome evidence, as the adoption of telerehabilitation requires patients to work with technology and associated monitoring equipment.

Many scientific conclusions relate to general aspects of the implementation of telephysiotherapy. A key factor in patients receiving telephysiotherapy is the assessment of outcome, including functional physical performance. Depending on the environmental constraints in the home environment, patients may perform a 6-minute walk test on a shorter route than the recommended guidelines. However, in a study by Beekman et al. (2013) shorter distances were used, with a 10-meter path compared to the standard 30-meter path in patients with chronic obstructive pulmonary disease. The authors noted the limitations that the results obtained by the shorter path should be interpreted with caution, as studies on prognosis and normative values were created by tests at altered distances.

The growing number of technologies also poses important concerns for physiotherapists. For example, whether mobile applications, virtual reality programs, and wearable devices used in telephysiotherapy constitute medical devices and, if so, whether they are fully acceptable for practice. Physiotherapists have certain responsibilities in developing and recommending mobile applications or certain virtual

games as a medium for therapy. To illustrate the different responsibilities, researchers professionally discuss a number of open issues, accompanied by the technological development of medicine, rehabilitation and physiotherapy, which in the future will have to adapt to the needs of modern times and individuals. It is certainly positive that there are emerging opportunities to provide physiotherapy services at home through various telehealth systems. Technological advances and the ubiquitous nature of the Internet dictate new arrangements. Last but not least, telephysiotherapy also has the potential to overcome traffic barriers, which are already reported in traditional rehabilitation programs. Cox et al. (2017), for example, summarized a number of barriers for individuals in the process of pulmonary rehabilitation in a comprehensive literature review, and the most commonly represented area is precisely the urban “environment” that includes travel, transport, and health system resources. The scientific findings and burdens of the health care system reinforce the growing need for alternative models, such as telephysiotherapy.

The range of telemedicine and telerehabilitation

Telemedicine or telerehabilitation methods may also have the potential to distribute expertise over a wider geographical area. The way it works also represents an opportunity to increase existing services and expand services to meet the needs of new patients. This is crucial for rural and remote regions that have difficulty accessing traditional physiotherapy services. At the same time, innovative services may also benefit urban areas by removing traffic barriers and promoting a more flexible implementation model. Telephysiotherapy also offers patients the opportunity to receive physiotherapy services in the comfort of their own homes, while supporting physiotherapists to monitor and progress the intervention (Holland et al., 2017).

5. CONCLUSION

Crisis situations such as the coronavirus pandemic can lead to the rapid adoption of telerehabilitation, as this model of service can improve the availability of some services to a limited extent and reduce the risk of cross-infection of patients. We agree with many researchers that such circumstances provide an “unparalleled natural experiment” for our health services by releasing some systemic barriers. This is a real experimental opportunity to explore the feasibility and acceptability of incorporating telephysiotherapy into routine service delivery. Experimental experience can assist future opportunity planning as a continuation of normal practices. In any case, it is worth emphasizing the importance of expertise on a number of general considerations for the implementation of telephysiotherapy. It is certainly necessary to consider; which subgroup of patients is most likely to benefit from telephysiotherapy. It is important for our work to be aware that each treatment procedure has clear consequences for rehabilitation outcomes and the work of physiotherapists. We believe that the situation dictates the need for a list of restrictions, benefits and instructions for the implementation of telerehabilitation.

6. REFERENCES

1. Adhikari SP, Shrestha P, Dev R, 2020. *Feasibility and Effectiveness of Telephone-Based Telephysiotherapy for Treatment of Pain in Low-Resource Setting: A Retrospective Pre-Post Design.* *Pain Res Manag.* 2741278
2. Beekman E, ET AL., 2013. *COURSE LENGTH OF 30 METRES VERSUS 10 METRES HAS A SIGNIFICANT INFLUENCE ON SIX-MINUTE WALK DISTANCE IN PATIENTS WITH COPD: AN EXPERIMENTAL CROSSOVER STUDY* *J Physiother*, 59: 169-176.
3. Bonnevie T, ET AL., 2019. *PEOPLE UNDERTAKING PULMONARY REHABILITATION ARE WILLING AND ABLE TO PROVIDE ACCURATE DATA VIA A REMOTE PULSE OXIMETRY SYSTEM: A MULTICENTRE OBSERVATIONAL STUDY.* *J Physiother*, 65: 28-36.
4. Bonnevie T, Elkins M, 2020. *Chronic obstructive pulmonary disease.* *J Physiother*, 66: 3-4.

5. Brodly LT, Hall CM, 2018. *Therapeutic Exercise: Moving toward function*. Walters Kluwer 4th ed. 2-15.
6. Chien CL, ET AL., 2011. HOME-BASED EXERCISE IMPROVES THE QUALITY OF LIFE AND PHYSICAL FUNCTION BUT NOT THE PSYCHOLOGICAL STATUS OF PEOPLE WITH CHRONIC HEART FAILURE: A RANDOMISED TRIAL. *J Physiother*, 57: 157-163.
7. Cottrell MA, ET AL., 2017. Real-time telerehabilitation for the treatment of musculoskeletal conditions is effective and comparable to standard practice: a systematic review and meta-analysis. *Clin Rehabil*, 31: 625-638.
8. Cox NS, ET AL., 2017. PULMONARY REHABILITATION REFERRAL AND PARTICIPATION ARE COMMONLY INFLUENCED BY ENVIRONMENT, KNOWLEDGE, AND BELIEFS ABOUT CONSEQUENCES: A SYSTEMATIC REVIEW USING THE THEORETICAL DOMAINS FRAMEWORK. *J Physiother*, 63: 84-93.
9. Dennett AM, Elkins MR, 2020. *Cancer rehabilitation*. *J Physiother*, 66: 70-72.
10. Holland AE, 2017. TELEPHYSIOTHERAPY: TIME TO GET ONLINE. *J Physiother*, 63: 193-195.
11. Hwang R, ET AL., 2017. HOME-BASED TELEREHABILITATION IS NOT INFERIOR TO A CENTRE-BASED PROGRAM IN PATIENTS WITH CHRONIC HEART FAILURE: A RANDOMISED TRIAL. *J Physiother*, 63: 101-107.
12. Hwang in Elkins, 2020. *Telephysiotherapy*. *J Physiother*, 66: 143-144.
13. Iles R, TAYLOR NF, DAVIDSON M, O'HALLORAN P, 2011. TELEPHONE COACHING CAN INCREASE ACTIVITY LEVELS FOR PEOPLE WITH NON-CHRONIC LOW BACK PAIN: A RANDOMISED TRIAL. *J Physiother*, 57: 231-238.
14. Inglis SC, Clark AR, Dierckx R, Prieto-Merino D, Cleland JGH, 2015. Structured telephone support or non-invasive telemonitoring for patients with heart failure. *Dosegljivo*, 20.8.2020: <HTTPS://WWW.COCHRANELIBRARY.COM/CDSR/DOI/10.1002/14651858.CD007228.PUB3/EPDF/FULL>
15. Laver KE, ET AL., 2020. Virtual reality for stroke rehabilitation *Cochrane Database Syst Rev*, 1, p. CD010255.
16. National Institute for Health and Care Excellence, 2016. *Low Back Pain and Sciatica in over 16s: Assessment and Management*. NICE guideline NG59. Retrieved Apr 25, 2017, from. https://www.ncbi.nlm.nih.gov/books/NBK401577/pdf/Bookshelf_NBK401577.pdf.
17. Negrini et al., 2020. *Feasibility and Acceptability of Telemedicine to Substitute Outpatient Rehabilitation Services in the COVID-19 Emergency in Italy: An Observational Everyday Clinical-Life Study*. *Physical Medicine and Rehabilitation*. In press.
18. Rathleff MS, ET AL., 2016. NEW EXERCISE-INTEGRATED TECHNOLOGY CAN MONITOR THE DOSAGE AND QUALITY OF EXERCISE PERFORMED AGAINST AN ELASTIC RESISTANCE BAND BY ADOLESCENTS WITH PATELLOFEMORAL PAIN: AN OBSERVATIONAL STUDY. *J Physiother*, 62: 159-163.
19. Russell TG, ET AL., 2011. IMPLICATIONS OF REGULATORY REQUIREMENTS FOR SMARTPHONES, GAMING CONSOLES AND OTHER DEVICES. *J Physiother*, 57: 5-7.
20. Stanhope J, Weinstein P, 2020. Learning from COVID-19 to improve access to physiotherapy. *Aust J Prim Health*. 26(4): 271-272.
21. Seidman Z, ET AL., 2017. PEOPLE ATTENDING PULMONARY REHABILITATION DEMONSTRATE A SUBSTANTIAL ENGAGEMENT WITH TECHNOLOGY AND WILLINGNESS TO USE TELEREHABILITATION: A SURVEY. *J Physiother*, 63: 175-181.
22. Victor FSF, Sum ZH, Aung APW, et al., 2008. *Innovative platform for tele-physiotherapy*. *Proceedings of the 10th International IEEE Conference; July; Singapore*.
23. Zhang, W, Nuki, G, Moskowitz, RW, Abramson, S, Altman, RD, Arden, NK, et al., 2010. OARSI recommendations for the management of hip and knee osteoarthritis: Part III: changes in evidence following systematic cumulative update of research published through January 2009. *Osteoarthritis Cartilage* 18 (4), 476–499. <https://doi.org/10.1016/j.joca.2010.01.013>.