Pengembangan Model Telerehabilitasi untuk Pasien Long COVID: Efektivitas terhadap Kapasitas Fungsional, Kualitas Hidup, Stres Oksidatif, dan Disfungsi Endotel = Development of Telerehabilitation Model for Long COVID Patients: Effectiveness on Functional Capacity, Quality of Life, Oxidative Stress, and Endothelial Dysfunction

Nurul Paramita, author

Abstrak

Infeksi COVID-19 (Corona Virus Disease 2019) dapat meninggalkan gejala sisa multisistemik (long COVID). Gejala long COVID meliputi kelelahan, sesak napas, batuk, sakit kepala, nyeri otot, dan gangguan kesehatan kognitif atau mental seperti kecemasan atau depresi. Salah satu tata laksana long COVID adalah intervensi rehabilitasi dan telerehabilitasi disarankan sebagai salah satu strategi inovatif. Namun, belum dikembangkan model telerehabilitasi untuk pasien long COVID di Indonesia. Oleh karena itu, perlu dilakukan penelitian yang bertujuan untuk mengembangkan model telerehabilitasi dan menilai efektivitasnya terhadap perbaikan kapasitas fungsional, kualitas hidup, tingkat stres oksidatif dan disfungsi endotel pada pasien long COVID di Indonesia. Penelitian dilakukan di Jakarta pada Juni 2022 hingga Juli 2024. Tahap pertama adalah studi kualitatif pengembangan model telerehabilitasi CoFit Rehab untuk pasien long COVID menggunakan metode Delphi yang melibatkan 24 panelis. Tahap kedua adalah uji randomisasi terkontrol pada 41 pasien long COVID (21 subjek perlakuan dan 20 subjek kontrol) untuk menguji efektivitas model telerehabilitasi yang dikembangkan. Selama 12 minggu, subjek perlakuan menjalani intervensi telerehabilitasi dan subjek kontrol menjalani intervensi rehabilitasi standar. Dilakukan pengukuran parameter kapasitas fungsional (uji jalan enam menit, uji sit-to-stand 30 detik dan uji kekuatan genggam tangan), kualitas hidup (kuesioner EQ-5D-5L versi Indonesia), tingkat stres oksidatif (kadar GSH dan rasio GSH/GSSG) dan disfungsi endotel (kadar mikropartikel endotel CD31+CD42b–). Studi kualitatif mendapatkan model telerehabilitasi. Uji randomisasi terkontrol memperlihatkan peningkatan bermakna jarak tempuh uji jalan enam menit baik kelompok kontrol dan kelompok perlakuan. Peningkatan jarak tempuh uji jalan enam menit lebih besar pada kelompok perlakuan. Ditemukan peningkatan bermakna jumlah repetisi uji sit-to-stand 30 detik, kekuatan genggam tangan, skor VAS EQ-5D-5L yang bermakna pada kelompok perlakuan. Ditemukan penurunan bermakna kadar mikropartikel endotel CD31+CD42b– plasma pada kelompok perlakuan. Tidak terdapat perbaikan bermakna pada parameter lain. Model telerehabilitasi CoFit Rehab terbukti lebih unggul dalam memperbaiki kapasitas fungsional dan fungsi endotel pada pasien long COVID dibandingkan rehabilitasi standar.

.....COVID-19 (Corona Virus Disease 2019) infection can result in multisystemic sequelae (long COVID). Commonly reported symptoms include fatigue, shortness of breath, cough, headache, muscle pain, and cognitive or mental health disorders such as anxiety or depression. One of the management for long COVID is rehabilitation intervention and telerehabilitation is suggested as one of the innovative strategies. However, a telerehabilitation model (CoFit Rehab) for long COVID patients has not been developed in Indonesia. This study aims to develop a telerehabilitation model for long COVID patients and assess its effectiveness in improving functional capacity, quality of life, oxidative stress levels and endothelial dysfunction in long COVID patients in Indonesia. This study was done in Jakarta from June 2022 until July 2024. The first

stage was a qualitative study to obtain a telerehabilitation model for long COVID patients using the Delphi method that involved 24 panelists. The second stage was a randomized controlled trial on 41 long COVID patients (21 treatment subjects and 20 control subjects) to test the effectiveness of the telerehabilitation model that has been developed. For 12 weeks, treatment subjects received telerehabilitation intervention and control subjects received standard rehabilitation intervention. Functional capacity parameters (six-minute walk test, 30-second sit-to-stand test, and handgrip strength test), quality of life (Indonesian version of the EQ-5D-5L questionnaire), oxidative stress levels (GSH levels and GSH/GSSG ratio) and endothelial dysfunction (concentration of CD31+CD42b– endothelial microparticles) were measured. The qualitative study obtained a telerehabilitation model. Randomized controlled trial showed a significant increase in the six-minute walk test distance in both groups. Compare to the control group, the distance increase in the six-minute walk test was greater in the treatment group. There was a significant increase in the total repetitions of the 30-second sit-to-stand test, handgrip strength, and EQ-5D-5L VAS scores in the treatment group. There was a significant decrease of the endothelial microparticle plasma level (CD31+CD42b) in the treatment group. There was no significant improvement in other parameters. The telerehabilitation model (CoFit Rehab) was shown to be superior in improving functional capacity and endothelial function in long COVID patients compared to standard rehabilitation.