

Staying Active in Isolation: Telerehabilitation for Individuals With the Severe Acute Respiratory Syndrome Coronavirus 2 Infection

To the Editor:

The recent outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is now a pandemic.¹ As a result, many individuals worldwide are in isolation for treatment and/or monitoring to prevent the spread of the infection.¹ However, isolation leads to activity restriction, which can cause physical and psychological decline.² It also increases the risk of depression and anxiety in patients in isolation.³ These issues are especially concerning in the older people,⁴ who are at greater risk of serious illness due to the SARS-CoV-2 infection. In addition, it can be difficult while in isolation to access rehabilitation services, which are the most effective countermeasure against physical and psychological decline.

Telerehabilitation, which aims to provide rehabilitation services to individuals in remote locations,⁵ may serve as a solution to this problem. Here, therefore, we introduce a preliminary attempt to use a telerehabilitation system to deliver exercise opportunities to individuals isolated because of SARS-CoV-2 infection. Four hospitalized individuals (aged 19–66 yrs, median age =

53 yrs, 2 male individuals), who were infected with SARS-CoV-2 during the outbreak on the Diamond Princess cruise ship, participated in the program. Written informed consent was obtained from the participants. The telerehabilitation equipment consisted of an android tablet computer connected to the Internet via Wi-Fi and a pulse oximeter (RingO2; Neuroceuticals Inc, Tokyo, Japan) connected to the tablet via Bluetooth, both of which were located in the participant's room, as well as a desktop computer in the therapist's room.

Using videoconferencing (Zoom by Zoom Video Communications Inc, San Jose, CA) and remote control software (TeamViewer; TeamViewer GmbH, Göttingen, Germany), a physical therapist guided each individual in a 20-min exercise program (Fig. 1). The actions by the participants were minimized with the use of the remote control software to facilitate participation in the program. The participants were simply asked to wear the pulse oximeter and launch the remote control software at the scheduled time; the physical therapist then accessed the tablet from the host computer and started the exercise program, which consisted of stretching, muscle strengthening, and balance exercises directed by a video program with real-time instructions provided by the physical therapist. A movie file of the video exercise program was preinstalled on the tablet, to allow for possible instability of the Internet connection.

After the session, the participants were asked to rate, using numeric rating scales (0–10), (1) their overall satisfaction, (2) whether they felt it meaningful for their health to participate in this program, and (3) whether they would recommend this exercise to others. The exercise session was successfully completed by all participants without any issues or complications. The participant-reported overall satisfaction with the exercise program ranged from 8 to 10 (median of 10), whereas the answers on the second and third questions ranged from 7 to 10 (median of 10) and from 8 to 10 (median of 10), respectively.

With the pandemic spread of SARS-CoV-2, the number of isolated individuals is expected to increase. In addition to the efforts being made for the prevention and treatment of the infection, attempts to minimize declines in functional status—especially in vulnerable populations, such as the elderly and disabled—are important to reduce the accompanying social burden. This type of telerehabilitation system, which can be easily assembled using a combination of affordable technologies, could be a powerful tool—regardless of whether it is used in hospitals or the community—to address the social struggles related to this pandemic.

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Therapist's room



Participant's room



FIGURE 1. Exercise program delivered using the telerehabilitation system. Left panel: A physical therapist provides the participant with exercise guidance using the telerehabilitation system. The pulse rates and SpO₂, measured using a monitoring device, are displayed on the monitor in the therapist's room (lower corner). Right panel: Participant performing exercises in his room. Exercise instructions were provided on the screen of the tablet computer installed in the participant's room (lower corner).

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