

## Internet-based physical activity promotion in the post pandemic era

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The coronavirus disease 2019 (COVID-19) pandemic has caused many countries to implement lockdown policies and mobility restrictions to control the disease spread. The policy includes closing “non-essential” facilities such as fitness centres, sports halls, and outdoor sports facilities. This condition has led to decreased physical activity, particularly in the early pandemic. A multi-national survey in 14 countries, including 13,500 respondents, indicates decreasing the exercise time at moderate to vigorous physical activity (MVPA) and vigorous physical activity (VPA) by 41% and 42.2% compared to before the pandemic.<sup>1</sup>

The increase in physical inactivity during the COVID-19 pandemic potentially causes new global health problems. According to data from WHO before the pandemic, physical inactivity ranked fourth as a risk factor causing death globally.<sup>2</sup> In this pandemic era, physical activity does not only have benefits in preventing various diseases in general. A previous study showed that physical activity improves immune function by releasing cytokines such as IL-7 and IL-15 as well as mobilising lymphocytes.<sup>3</sup> Individuals with high physical activity levels have a low risk of being infected with influenza, herpes virus, and rhinovirus.<sup>3</sup> Relevant to COVID-19 as a respiratory infectious disease, a study in exercise immunology also reported that physical activity effectively prevents upper airway infections.<sup>4,5</sup> Preliminary data from Stefan et al. reported that obesity increases the severity of clinical manifestations of COVID-19.<sup>6</sup> Physical activity plays an important role in preventing obesity. Systematic reviews from Washburn et al. reported that a combination of physical activity and diet provides optimal results in the management of obesity.<sup>7</sup>

The COVID-19 pandemic encourages the use of the internet for work and study, such as work from home, online classes, webinars, and others. The internet makes it easier for people at various levels of society to find information, including preventing COVID-19 infection through increasing immunity. This activity indirectly increased exposure to the physical activity topic. People are becoming more aware of the importance of physical activity for health. A survey from Sport England reported that 62% of adults agree that an active lifestyle is more important today than it was before COVID-19.<sup>8</sup>

A study from Ding et al. that analysed big data from Google Trends in 3 countries (US, UK, Australia) showed an increase in searches for the word “exercise” during the pandemic period.<sup>9</sup> Population-level interest with exercise topics in this period was the highest since recording Google Trends was first conducted in 2004. The data showed that the internet has great potential to promote physical activity to the public. Wide extent promotions are expected to encourage an active lifestyle in the community consistently until COVID-19 subsides in the post-pandemic era.

Although exercise is scientifically proven to have a beneficial effect on health, exercise is also part of physical stress that leads to health problems and even death for people who have had comorbidities.

The selection of the wrong type of exercise or exercise loading exceeds a person's ability: either intensity or duration of exercise has a negative effect on the body, such as musculoskeletal or cardiovascular disorders.

In the future, the promotion of physical activity should be followed by education about the selection of exercise types and safe doses, especially for sedentary people who are just starting an exercise program. Primary health care should also know the basic principles of exercise prescription to get the right education. This act might prevent people from getting disinformation that is widely spread on the internet.

Health screening before beginning to exercise (or commonly called the pre-participation examination) should be carried out to minimise the health risks that emerge when the exercise begins. An instance practical and inexpensive health screening method can be chosen to be used massively, such as PAR-Q+.<sup>10</sup> This questionnaire consists of 7 general health questions for the first screening. The exercise program can be started if they answer "no" and are cleared for physical activity. The follow-up question is about medical conditions, including musculoskeletal, cardiovascular, and respiratory problems, cancer, metabolic disease, and spinal cord injury will be asked if the answer "yes" for one or more questions. Health conditions should also be checked by a health care professional if there are health problems or are experiencing pregnancy before beginning the exercise program.

Further study is needed to investigate the effectiveness of internet-based exercise promotion in changing lifestyle to be more active consistently and the impact of lifestyle changes on reducing non-communicable diseases in the post-COVID-19 pandemic.

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