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# **Physical inactivity during lockdown and the implications for incidence of stroke, severity, mortality, reoccurrence and rehabilitation.**

Fern Rodgers, MSc<sup>1</sup>, Rosemary Varley, PhD<sup>1</sup>, Ahmad Khatoonabadi, PhD<sup>2</sup>, Amir-Homayoun Javadi, PhD<sup>1,2,3,\*</sup>

<sup>1</sup> Language & Cognition, Psychology & Language Sciences, University College London, UK

<sup>2</sup> School of Rehabilitation, Tehran University of Medical Sciences, Iran

<sup>3</sup> School of Psychology, University of Kent, UK

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**\* Corresponding Author:**

Amir-Homayoun Javadi

[a.h.javadi@gmail.com](mailto:a.h.javadi@gmail.com)

+44 1227 82 7770

Address:

School of Psychology

Keynes College

University of Kent

Canterbury, CT2 7NP

United Kingdom

## Letter to Editors

COVID-19 emerged in 2019 and was declared a pandemic by the World Health Organisation (WHO) on 11 March 2020<sup>1</sup>. As of 30 August 2020 there have been over 24,822,800 confirmed cases in over 200 countries and territories worldwide, and by the end of March over 100 countries had implemented local or national 'lockdowns' to prevent the spread<sup>1,2</sup>. Governments have taken different approaches but, overwhelmingly, the global population have been advised to stay at home and avoid unessential travel, and "clinically vulnerable" groups have been identified as being more susceptible to the worst side effects of COVID-19, due to age and/or underlying health conditions. With no vaccine currently available, it is of paramount importance to examine the effects of the pandemic beyond cases of the virus itself.

Stroke is one of the leading causes of disability worldwide, causing a range of cognitive and motor impairments. In the UK alone there are roughly 100,000 incidences of stroke every year, with two thirds of survivors chronically affected, at an annual cost to society of 26 billion pounds<sup>3</sup>. With up to 21% risk of recurrent stroke within the first year<sup>4</sup> and one third of stroke survivors falling victim to a subsequent stroke within five years<sup>5</sup>, it is important to focus on preventative measures even after an initial attack. Whilst many disabled individuals may be vulnerable to severe reactions to COVID-19, potential and existing stroke survivors are among the most at risk due to the COVID-19 virus' complicated, and as yet not fully understood, mechanism of action which appears to increase likelihood of blood clots and increase vessel occlusion<sup>6,7</sup>. Moreover, situational anxieties around visiting hospitals have, in some cases, led to delays in accessing emergency medical care; in stroke care, acute management is one of the most important predictors of recovery and its prioritisation must not be neglected during the viral outbreak<sup>8</sup>. However, incidence and damaging consequences of stroke can also be moderated by modifying lifestyle<sup>9</sup>, thus such measures are increasingly important for prevention and rehabilitation.

Lifestyle changes before and after stroke can improve incidence rates and outcomes. Up to 36% of first-time strokes are attributed to inactivity<sup>9</sup>. Post-stroke individuals are more sedentary, moving less and more slowly, which exacerbates the risks and complications further. Physical activity (PA) is a primary modifiable risk factor for stroke and transient ischemic attack. Even 'light' PA, such as walking, can have substantial implications, with one study finding that women who walked for more than two hours a week had a 57% reduced risk of haemorrhagic stroke than non-walkers<sup>10</sup>. PA is directly related to stroke risk, and is consistently linked to severity, likelihood of complications, mortality rates and functional outcomes<sup>4</sup>. PA can not only lower the likelihood of recurrence but also influence the level of post-stroke disablement and wellbeing<sup>11,12</sup>. Furthermore, PA can boost social, sensory and cognitive stimulation. Thus, exercise is a proxy for broadscale cognitive engagement.

COVID-19 lockdown measures have led to the cessation of many businesses. Gyms, leisure centres, and even parks have seen closures, and organised events such as fundraising walks and marathons have been cancelled. Without access to space, or advice on exercising safely from home, many people are likely to engage in less PA than usual, putting them at higher risk of health problems including stroke.

Commonly cited barriers to PA following stroke include environmental context and social influences<sup>13</sup>, both of which have changed dramatically as a result of the pandemic, becoming more obstructive than ever. The context of the pandemic is a further deterrent to PA which could lead to higher instances of stroke, post-stroke complications, and prolonged rehabilitation. With the virus in our lives for the foreseeable future, it is vital to promote PA, both to prevent stroke and minimise the effects thereof during this period. The well-evidenced relationship between PA and stroke means activity-centric interventions must be prioritised at this time.

First, it is important to raise awareness of the relationship between PA and stroke, as knowledge is cited as a facilitator to exercise<sup>13</sup>. By informing people that even low-intensity, free, and safe activities, such as walking, offer substantial protective benefits, it may be possible to increase people's motivation to increase PA. Second, free and accessible targeted community activities specifically engaging at-risk groups ought to be developed that can adhere to current guidelines (e.g. social distancing) and encourage people to increase and maintain activity levels. Interventions should be developed with self-management in mind as this has been shown to optimise health outcomes by increasing self-efficacy and thus sustained PA in the short and long term<sup>4</sup>. Third, we recommend specific access to suitable spaces be available to vulnerable groups at certain times to lessen the anxieties these individuals may have about being out during the pandemic. By offering priority access for vulnerable groups to parks, gyms, pools (etc), the importance of PA can be emphasised, promoted and protected. Finally, more research is necessary to further understand the impact of COVID-19 on PA and stroke, and develop safe, effective ways of encouraging PA going forward. In sum, the context of COVID-19 must not obstruct management of health behaviours and rehabilitation in relation to any disability, including stroke.

#### **Conflict of Interest**

The authors declare no conflict of interest.

#### **Authors' Contribution**

FR and AHJ wrote the manuscript, FR, RV, AK and AHJ revised the manuscript

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