

(Indoor) isolation, stress, and physical inactivity: Vicious circles accelerated by COVID-19?

The COVID-19 epidemic necessitates the application of strict isolation strategies to curb virus spreading. Isolation of individuals in combination with fear of contagion, quarantine, and stigma, as well as with potential (mis) information overload (“infodemic”),¹ however, causes chronic stress and is associated with a burden on mental health, posing risk factors for anxiety and depression. It is well understood that chronic stress is a major modulator of immunity² and thus directly influences probability of infection. In addition, chronic stress induces structural and functional consequences on the brain resulting in altered social behaviors and limiting in turn individuals’ capacities to cope with the stressful conditions³ during the epidemic. The circular interaction of stressful COVID-19-related conditions with chronic stress triggered impairment of coping strategies, and immune system capacity establishes a first vicious circle.

Isolation strategies like confinement furthermore restrict access to physical activity (PA), in particular if usually practiced outdoors or in groups. Trends of dramatically reduced general non-residential mobility following measures to contain the epidemic can currently be observed all over the world (<https://www.google.com/covid19/mobility/>) and likely reflect an overall reduction of PA. PA, however, on one hand is known to have robust beneficial effects on anxiety and depression,⁴ very likely accentuated if performed outdoors or in groups. On the other hand, chronic stress may also reduce the readiness to practice PA,⁴ thus constituting another vicious circle.

We argue that not enough public emphasis is yet put on the importance of regular PA during confinement. Beside the well-known advantageous effects of regular PA on all-cause mortality,⁵ and in particular morbidities considered as risk factors for severe COVID-19 disease outcome, as well as immunological benefits of PA,⁶ its immediate mood-enhancing, stress-alleviating and long-term mental health improving effects⁷ are of highest relevance for the current social situation.

While the importance of maintaining PA during the epidemic is largely acknowledged, provided the adherence to physical distance recommendations, there is a risk that especially vulnerable parts of the population fall short of staying active. It can be assumed that the implementation of home training activities especially for the elderly, in particular in

combination with motivation-enhancing video conferencing tools, but also communication (eg, by social media) of the necessity of PA during physical distancing, is more difficult. Personalized advice of general practitioners could be integral to fill such communication gaps.

Whereas group activities requiring physical proximity clearly should be avoided during the epidemic (but are recommended, if the possibility exists to perform them remotely, for example using video conferencing tools), performing PA outdoors produces distinct synergistic benefits with regard to viral infection.⁸ Fear of infection as well as political measures to promote physical distancing may for example reduce frequentation of public parks, an activity commonly associated with higher PA levels, and potentially to an even higher degree in older people.⁹ We interrogated Google’s recently released COVID-19 Community Mobility Reports and found highly divergent activity patterns in terms of frequentation of parks during the epidemic across European countries, with particular differences between Nordic and South-European countries (Figure 1). This may be attributable to the regional severity of the COVID-19 outbreak, to nation-specific political measures, or to meteorological or geographical peculiarities but will certainly have modulating effects on COVID-19 infection incidence. The directionality of such effects—(a) increased virus spreading caused by insufficient physical distance or (b) mitigation of disease progression and stress due to PA, fresh air, sunshine, and associated vitamin D production¹⁰—will have to be assessed in post-epidemic analyses. Provision of more complete data sets, for example, by Google is of great interest to assess the associations of mobility and activity with COVID-19 spreading, severity of infections, and secondary physical and mental health consequences.

The uncertainty of the length of confinement strategies in either case adds to the necessity to interrupt the described vicious circles in order to prevent both overlapping additional burden on the health system capacities and long-lasting mental health deterioration in the society subsequent to the COVID-19 epidemic. We urge the rapid issuing and appropriate dispensing of public PA recommendations adapted to isolation conditions and tailored to specific risk groups, including relevant patient groups and the elderly.

