



Impact of Sedentary Behavior on Bodily Pain While Staying at Home in COVID-19 Pandemic and Potential Preventive Strategies

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Dear Editor,

Novel coronavirus 2019 (COVID-19) has emerged as a global health concern. According to the rapid spread of the virus in the world (reported in 115 countries as of March 11, 2020, with 119,239 affected cases and 4,287 deaths), it is crucial to implement health policies to flatten the epidemic curve (1). Based on limiting the exposure of people to this virus, safety recommendations have been advised by the World Health Organization (WHO) (2) and the Centers for Disease Control and Prevention (CDC) (3). Furthermore, social quarantine, social distancing, and isolation of infected populations have been successfully performed in China and some other countries (4). However, self-isolation of individuals is associated with an increased risk of cardiovascular, autoimmune, and mental health problems, especially in the elderly. Thus, as it is essential to reduce the spread of the virus in the community, preventive strategies should be urgently considered as well, to minimize the health concerns of social or self-isolation plans (5).

Sedentary behavior, by definition, is low energy expenditure work performed in sitting or reclining positions. Sedentary behavior may impose detrimental effects on well-being and quality of life (6). Moreover, it influences the risk of diseases, independent of the level of individual physical activity. It is documented that sedentary behaviors, including television viewing, total sitting time, general screen time, sedentary occupational time, and total sedentary time, are all associated with lower physical activity among adults (7). Currently, sedentary behavior is of particular concern since it escalates during staying at home in COVID-19 epidemic and, along with an increased

number of people involved in these programs worldwide, contributes to established adverse health effects. Some recent reports emphasize the importance of being physically active during this period (8-10).

Previous studies have demonstrated the associations of sedentary behavior with some types of bodily pain. Regression models in one study in medical personnel revealed a 3.5-fold increase in recurring non-specific low back pain. In addition, it was shown that excessive coffee consumption and cigarette smoking increased the likelihood of recurrent low back pain as well (11). Another study found an association between sitting behavior and chronic low back pain among sedentary office workers (12). Moderate physical activity is reported to be associated with reduced odds of bodily pain as well as pain related to knee osteoarthritis (13). Furthermore, impaired microcirculation of shoulder/neck regions in combination with a sedentary lifestyle was associated with ischemic shoulder pain among 37 female office workers in Taiwan (14). One study among 439 children aged 6 - 8 years indicated that high levels of sedentary behavior and low levels of cardiorespiratory fitness were associated with an increased likelihood of any pain conditions (OR = 1.95 for higher sedentary behavior and OR = 0.54 for higher cardiorespiratory fitness) (15). Moreover, in 419 women with fibromyalgia, lower levels of sedentary time or higher levels of light physical activity were associated with lower pain and fatigue, and overall impact of disease (16). In a nationwide cross-sectional study among 14,274 children, we found that increased sedentary leisure time, including watching television and computer use, was associated with a higher fre-

quency of stomach ache and irritability. Prolonged leisure time activities were associated with children's psychosomatic health status in our study (17). These pieces of evidence, all together, propose the potential effects of sedentary behavior on generating or aggravating some types of bodily pain in some periods of life, including isolation programs, which are non-specific for a particular age or gender.

On the other hand, another contributing factor should be considered for bodily pain. Vitamin D deficiency is prevalent in both developed and developing countries. A systematic review and meta-analysis revealed significantly lower concentrations of circulating 25(OH) vitamin D in patients with arthritis, muscle pain, and widespread chronic pain, compared with healthy individuals (18). Thus, decreased outdoor activities, higher screen time, and limited exposure to sunlight, as a major source of vitamin D, may be associated with lower serum concentrations of vitamin D (19) and, in turn, with increased bodily pain, at least in individuals with vitamin D deficiency.

According to the WHO recommendations in isolation times, for individuals without any signs and symptoms of acute respiratory illness or specific health condition, staying hydrated and eating healthily in addition to walking around, relaxing activities and home-based physical activities, i.e. 150 minutes of moderate physical activity per week, would be beneficial for keeping optimal health (20). Simple and safe home-based exercises include, but not limited to, stretching, strengthening, and balance exercises or a combination of those (8). Some recommended types of exercises are as follows: knee to the elbow, plank, back extension, squats, side knee lifts, bridge, chair dips, chest opener, child's pose, seated meditation, and legs up the wall (20). Furthermore, mind-body exercises (MBE), including Tai chi, yoga, and Qigong, might have positive effects on cardiovascular health. These exercises are low impact physical activities with mild to moderate intensity, suitable for frail populations and individuals with low exercise intolerance. Coordinated sequential movement in MBE associates with higher visual-spatial ability, postural stability, and cognitive stimulation (21). The positive effects of moderate-intensity exercise on immune system responses to respiratory tract viral infections are documented (22).

A survey in the post-severe acute respiratory syndrome (SARS) epidemic period in Hong Kong revealed that some favorable health changes could be achieved from the epidemic period (23). Thus, practicing health-seeking behaviors, such as decrease in sedentary works and increase in physical activity with appropriate intensity and duration, should be considered for the general population in the time of social distancing and self-isolation of COVID-

19 epidemic, as recommended by health authorities. It is of special concern that people with special medical conditions should obtain medical care from their health care providers. To decrease the incidence of musculoskeletal pains and keep the body fitness, staying at home in the COVID-19 epidemic may be considered an excellent opportunity to learn, practice, and continue the health behaviors even for a long time.

Footnotes

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