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Letter to the Editor

Indoor air quality and COVID-19



Deterioration of indoor air quality (IAQ) might result from the current home isolation requirement that is in place to reduce the spread of coronavirus disease 2019 (COVID-19).

IAQ is important as it has a significant impact on human health status. IAQ has little dependence on social status or the educational level but is greatly influenced by factors such as personnel products, furniture and cleaning materials. These factors may lead to the presence of biological, chemical and physical contaminants.¹ Air ventilation and other processes are used to improve IAQ and reduce contamination; however, ventilation itself can also be viewed as a source of contamination and exposure.¹

Viruses are not organisms, but their presence in our environment and the severe effect they can have on human health is of great scientific interest. Various studies have investigated viruses and air quality.^{2–4} IAQ is of special importance because humans spend the majority of their time indoors, and it can greatly influence their health. Understanding IAQ is important owing to its continuous variation in composition as a result of changes in the surrounding environment, which could lead to different and new health problems.⁵

COVID-19 has been declared a pandemic by the World Health Organization⁶ and, at the time of writing, had infected 2,164,111 individuals and resulted in 146,198 deaths worldwide; these numbers are increasing daily.⁶ There is currently no vaccine or medicine for COVID-19.⁶ Prevention of infection is the only tool available, and this is dependent on home isolation, constant handwashing, increasing awareness and individual immunity.

The most effective prevention tool, implemented in many countries, is home isolation for both healthy and infected individuals with mild symptoms. Isolation for protection from coronavirus might be effective, but unfortunately, isolation with improper ventilation could lead to other health problems, such as irritation, physical symptoms, respiratory and heart diseases and cancer.⁷ Home isolation aims for complete separation from society, but this could also lead to deterioration of IAQ. The situation could be even more serious if the IAQ was poor to begin with. People stay indoors for about 93% of their time, and this may increase to 100% for some in the current situation, which increases their rate of exposure to poor IAQ.⁸

Homeowners improve IAQ by performing regular maintenance on filtering, cooling and heating systems and by opening their windows/doors to allow fresh air into their homes. This being said, research has shown that although good ventilation is important, there is an association between ventilation and spread and transmission of infectious diseases, such as severe acute respiratory syndrome and influenza.¹ IAQ is dependent not only on indoor sources but also on outdoor sources, which gain access through open windows/doors, the building's structural cracks and ventilation systems.⁷

Indoor concentration of some contaminants is sometimes 2–5 times their relative outdoor concentration.⁹ A recent study demonstrated that coronavirus is persistent in the air for about 3 h.¹⁰ The knowledge that COVID-19 infection can occur as a result of being exposed to contaminated air might spark anxiety among some individuals. As a result, social distancing is being taken more seriously than before. In addition, some homeowners may not open windows and doors to allow fresh air in as this may be a source of COVID-19, resulting in poor home ventilation and deterioration in the IAQ. It is important to consider home isolation in terms of family housing, senior citizen homes, labour camps and other establishments where occupancy numbers are increasing. As the occupancy number increases, the need for proper ventilation also increases; however, if there is fear of being exposed to fresh air, then this will lower the IAQ, which is further deteriorated by high occupancy.

Lack of information, conflicting information, unfamiliarity with COVID-19 and human perception play an important role in human behaviour (see Fig. 1). Regardless of the risk level involved and conditions present that may influence the possibility of contracting COVID-19, humans' perception plays an important role in changing the perceived risk level and greatly influences their actions. Therefore, as long as there is insufficient information about coronavirus, in terms of how it spreads through air, how far it travels and in what direction, the message to the public will be confusing. Confusion creates doubt, and accordingly, perception may take over. As a result, home isolation due to coronavirus might protect us from this virus, but poor ventilation due to the fear of contracting COVID-19 might lead to other health problems.

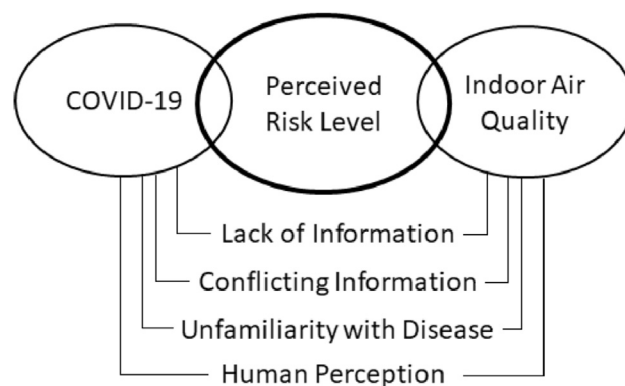


Fig. 1. Perceived risk level of indoor air quality and COVID-19. COVID-19 = coronavirus disease 2019.

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