



Effects of nonpharmaceutical interventions for coronavirus disease 2019

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Key message

- Nonpharmaceutical interventions (NPIs) have decreased the incidence of various infectious diseases, including coronavirus disease 2019 (COVID-19).
- During the 2-year COVID-19 pandemic, NPIs changed patients' daily lives, and the impact on mental health was notable.
- The effects of NPIs were evaluated in detail, considering both infections and mental health.

Coronavirus disease 2019 (COVID-19) has hugely impacted healthcare since its initial spread at the beginning of 2020. The highly contagious and severe manifestations of COVID-19 have forced most countries to manage the infection with various unprecedented control measures. At the start of the COVID-19 pandemic, no specific treatments or vaccines were available; therefore, nonpharmaceutical interventions (NPIs), such as social distancing, isolation, travel restrictions, facial mask usage, and personal hygiene measures, were applied to suppress its transmission. Fortunately, NPIs reduced the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).¹ After confirming the impact of NPIs, several modeling studies aimed to estimate new COVID-19 cases, patients requiring admission, intervention scenarios, and the virus's basic reproduction number.² Although the degrees vary among countries, NPI policies have been maintained worldwide for about 2 years. In Korea, stepwise social distancing has been applied according to confirmed COVID-19 cases.

Long-term persistent NPIs to control COVID-19 have had unintended effects on the transmission of other infectious diseases. Most notifiable infectious diseases have decreased dramatically worldwide,^{3,4} and the stricter the NPI policy, the greater their reduction.⁵ This phenomenon was thought to be the result of the application of contact precautions, which was emphasized as a basic principle to prevent the spread of various infectious diseases. Ahn recently analyzed the epidemiological changes in infectious diseases during the COVID-19 pandemic in Korea.⁶ This systematic review included 14 articles on infectious diseases, including respiratory disease, gastrointestinal disease, hepatitis virus, carbapenem-resistant Enterobacter, and

Kawasaki disease (KD). Ahn concluded that strict NPIs affected the decrease in the incidence of these various infectious diseases in Korea. NPIs were previously recommended to decrease the number of cases and reduce the spread of respiratory tract infections, especially influenza.⁷ Before the COVID-19 outbreak, however, NPIs were not readily implemented due to public rejection and the risk of disrupting social stability. However, during the COVID-19 pandemic, NPIs were inevitably implemented to control its transmission and we experienced their impacts. In addition to NPIs, the reduction in hospital visits may have contributed to decreased transmission rates. The decreased hospitalizations for chronic obstructive pulmonary disease and asthma reported by Ahn's study were explained by the reduction in hospital visits as well as respiratory infection rates. The decreased numbers of hospital visits⁸ may have been due to the fear of nosocomial infections and increased testing for SARS-CoV-2 infection.

Interestingly, Ahn's review was not limited to infectious diseases; it also included KD, an acute febrile systemic vasculitis of unknown etiology that predominantly occurs in children. However, the possibility of trigger by infectious diseases and genetic factors has been steadily discussed. The decreased incidence of KD during the COVID-19 pandemic supports the hypothesis of a relationship with infection. This phenomenon has been reported in other countries, including Japan, which has the highest KD incidence worldwide. However, multiorgan inflammatory syndrome in children (MIS-C), which is similar to but distinct from KD, has been newly defined during the COVID-19 pandemic. Despite strict NPIs, the incidence of MIS-C has increased with increasing COVID-19 cases.⁹ Comparative future research of MIS-C and KD will provide new knowledge of the related mechanism.

Although various NPIs have been consistently applied for about 2 years and vaccines against COVID-19 have been provided, we are experiencing a 4th wave of COVID-19 in Korea. The long-term persistence of NPIs has greatly changed our daily lives, and we cannot ascertain how long they should be maintained. Noncontact communication has been universalized, and direct interactions between people are scarce. In particular,

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school closures removed children's right to learn and maintain friendships. The mental health of young children after school closures manifested as depression, anxiety disorder, and child abuse at home.¹⁰ These noninfectious problems caused by NPIs should not be overlooked.

In conclusion, NPIs effectively reduce the transmission of SARS-CoV-2 and other infectious diseases, implying their potential usefulness for controlling other respiratory infectious diseases or transmissible infectious diseases of unknown origin. At the end of the COVID-19 tunnel, continued hand hygiene and mask-wearing should be emphasized considering their great effects despite little effort. However, it should not be overlooked that strict social distancing or isolation could worsen the burden of other diseases.

See the article "Epidemiological changes in infectious diseases during the coronavirus disease 2019 pandemic in Korea: a systematic review" via <https://doi.org/10.3345/cep.2021.01515>.

Footnotes

Conflicts of interest: No potential conflict of interest relevant to this article was reported.

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