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Letter to Editor

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Moisture-proof masks as a potential source to prevent COVID-19 during the rainy season

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Dear Editor,

Identifying the exact route of transmission of viral diseases is an essential step in developing effective intervention strategies (1). Based on the evidence, viral diseases like influenza, severe acute respiratory syndrome (SARS), COVID-19, and norovirus have the same transmission path (1). However, since the COVID-19 outbreak, many unknown factors are affecting transition path (2). Initially, there was few information on coronavirus transmission routes. The main route of its transmission was the spread of droplets (respiratory droplets) and the hand to face contact. But over time, evidence has shown that the airborne route can also transmit the virus. In general, there is currently evidence of coronavirus transmission through two pathways; one is contact, such as close and face-to-face contact with a contaminated person, hands, and surfaces, and another pathway is the respiratory tract through the air, such as cough and sneeze (3).

Although, there are numerous trials underway to find treatment for the COVID-19 through testing vaccines as well as existing drugs (4), but apart from many synthetic chemicals, wearing masks is among the non-pharmaceutical intervention measures that could be effectively implemented at a minimum cost and without dramatically disrupting social practices (5).

Scientific research shows that infectious and viral diseases such as coronavirus-SARS-CoV-2 and influenza can be moderated by various seasonal environmental factors, such as temperature and humidity (6). Also, winter's ecological and climatic conditions increase the rate of transmission of these viruses, including COVID-19 (7).

The spread of the COVID-19 virus through the air has become a controversial topic among scientists, recognizing that it is transmitted through the air or coughs and sneezes (8). However, the way the virus is transmitted, in any form, requires protection and standard methods to prevent biological agents from entering the air into the human body. The face mask as a physical intervention against COVID-19 transmission is agreed in all cultures and societies because masks have played a crucial role in preventing and reducing the COVID-19 (8).

Systematic research also shows, surgical masks, N95 filtering face piece respirators, and cloth mask prevent the spread of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-19) infection and protect medical personnel (9).

According to the World Health Organization (WHO), four types of masks including disposable masks, medical masks, surgical masks, and fabric masks. Still, at the same time, they are generally being sensitive to moisture. They are vulnerable to air, and their filtering effect to prevent the coronavirus from entering is significantly reduced, and they lose their effectiveness (10). Since the amount of rain and snow increases with the onset of autumn and winter, it should be asked how to use the mask to avoid covid-19 on rainy days.

Because, masks are usually made of loosely knit fabrics that are not suitable for use as masks to prevent COVID-19 transmission, but unfortunately the scientific evidence around world shows the use of Such masks by the general public to impede COVID-19 transmission is advancing rapidly (11) policymakers need guidance on how the general population should use masks to combat the COVID-19 pandemic. In this study, are recommended to prevent the transmission of coronavirus on rainy days due to the mask getting wet and its vulnerability to moisture. A simple solution for people is to change the mask quickly

because, in damp and rainy weather, regular replacement of the face mask can be helpful, but despite the importance of this method, due to the high cost and limited access to the mask, it is less recommended in some communities, however, more useful and affordable solutions should be sought.

Since the evidence shows that the efficacy of masks filtration depends on the type of material used, number of layers, and degree of moisture in the mask and fitting of the mask on the face (3), it seems to be beneficial to inform the public that the wet cover loses its effectiveness, and leaving the house on a rainy day may cause the mask to get wet, therefore, they are recommended to use an umbrella on such days. But the definitive solution to this method of transmitting the virus is to produce moisture-proof masks by textile engineers and researchers. Waterproof fabrics that are inherently resistant to water penetration and moisture under a chemical supplement, are made of natural or synthetic fibers with waterproof materials such as polyvinyl chloride, polyurethane, silicone elastomers, and fluoropolymers such as waxed fabrics. The use of waterproof materials such as plastic and polyester, as well as the production of synthetic leather and raincoat cotton which prevent the entry of raindrops, at the same time allows the person to breathe comfortably. Water and moisture repellents should be used to increase the filtration efficiency of masks without obstructing moisture respiration.

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Ethical issues

The authors certify that this manuscript is the authors' original work. All data collected during the study are presented in this manuscript, and no data from the research has been or will be published elsewhere separately.

Competing interests

The authors declare that they have no conflict of interests.

Authors' contributions

All authors contributed equally to the data collection, analysis, and interpretation. All authors critically reviewed, refined, and approved the manuscript.

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