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### RESEARCH ARTICLE

#### COVID-19 PREVENTIVE BEHAVIOURS

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#### Abstract

COVID-19 is an infectious disease attributable to SARS-CoV-2, which is transmitted by direct and indirect transmission. There are some measures that have been introduced to society in order to prevent the spread of COVID-19 including face masks, hand hygiene, face shields, and social distancing. Face masks have become one of the most common preventive instruments against viral spreading. The primary use of face masks is to protect or contain the viral mode of transmission such as droplets. Face masks have different types that demonstrate specific uses. Hand hygiene is an accessible method that people can follow. The benefit of hand hygiene appears to be the ability to trap germs and remove them away. In a more sophisticated use, face shields are used together with face masks in order to better the performance of protecting the virus from different directions. Social distancing is known as one of the popular measures among many countries. To decrease the rate of COVID-19 infection, standing 1-2 metres is recommended. We hope that our review paper would provide useful information for the readers, which could be applied in real life. Also, we fully appreciate being a reliable supplement for the following research.

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#### Introduction:-

Our world has been suffering from the COVID-19 pandemic since 2019. COVID-19 results from SARS-CoV-2 infection. SARS-CoV-2 is the seventh coronavirus known to infect humans; SARS-CoV, MERS-CoV and SARS-CoV-2 can cause severe disease, which is transmitted by direct and indirect transmission (World Health Organization [WHO], 2019). The direct transmission includes coughing, sneezing, and droplet transmission (Dhand, 2020). Turning to the indirect transmission, the virus could be contacted via the oral, nasal, and ocular membranes (Fuentes and Santos-López, 2020). Additionally, virus contamination by using the same objects with those who are infected or by asymptomatic infected persons could lead to the spread of the virus (Cai *et al.*, 2020).

The human body has an immune system consisting of innate immunity and adaptive immunity (Spiering, 2015). Innate immunity is frequently accepted as the first line of relatively primitive defence interfering with the pathogen invasion until the mechanisms of 'privileged' adaptive immunity with the production of antibodies and activation of cytotoxic lymphocytes 'steal the show' (Černý, 2019). In addition, innate immunity could indicate pathogens during the infectious phase (Birraet *al.*, 2020). In Wuhan, 99 infected cases were examined. The percentage of total

neutrophils and serum IL-6 have increased by 38% and 52%, respectively. In contrast, total lymphocytes have decreased by 35%. Furthermore, the researchers detected that 84% of c-reactive protein is activated (Mirzaei *et al.*, 2020). Hyperactivation of the immune system contributes to lung damage and could further lead to mortality (Birraet *et al.*, 2020).

Knowledge and beliefs are associated with behaviour responses (Chen *et al.*, 2020). COVID-19 preventive ways are promoted through social media platforms. The most well-known behaviour is social distancing (Norman, 2020). Other several behaviours were taken into practice to prevent the spread of COVID-19 such as social distancing, wearing masks, wearing face shields, and hand hygiene, which would be elaborated in the following parts.

### **Face Masks**

During the COVID-19 pandemic, face mask usage has been common in many countries. A study revealed that wearing a face mask is as frequent as 60% of all preventive behaviours in Italy (Perrotaet *et al.*, 2020). Masks consist of tremendous benefits ranging from individual to wider society. Masks are used for protection (i.e. preventing healthy people from receiving transmitted viruses) and containment (i.e. prohibiting the virus transmission from infected patients) (Howard *et al.*, 2021). The adoption of masks lowers the number of deaths; therefore, diminishing the chance of reaching the peak of the pandemic (Eikenberry *et al.*, 2020). Nonetheless, masks have some drawbacks. Masks typically restrict the path of breath, bringing about difficulties in breathing (Bahkiet *et al.*, 2020). Moreover, masks could result in skin irritation, creating rash and acne (Rosner, 2020). There are various types of masks including N95, medical masks, cloth masks, etc. Each type has its uniqueness. N95 and surgical masks are more protective than cloth masks (Chughtaiet *et al.*, 2020). N95 was not found to be superior to surgical masks (Loeb *et al.*, 2009). N95 were used mostly in laboratory settings. Despite the efficiency of N95, long-time use of it may cause breathing difficulties and headaches to healthcare providers (Lim *et al.*, 2006 and İpek *et al.*, 2021). In 2020, Konda *et al.* conducted a study demonstrating that cloth masks could filter particles with the size of around 10 nanometers to 6 micrometres, which is sufficient for protecting respiratory virus transmission. Cotton, natural silk, and chiffon covered the protection of 50% of the aforementioned range. In addition, hybrids (i.e. combining two types of material) performed better than using only one material. This is due to the mixed effects of electrostatic and physical filtering. Nevertheless, if holes are present in the mask, the efficacy would drop considerably as shown by a 60% decrease. Many countries had experienced mask shortages due to the high demand for masks which resulted from “panic buying” (Ngunjiri, 2020). Lacking masks, optimized distribution is the key to alleviating the situation. Recent research (Worbyet *et al.*, 2020) suggested that, in the general population, infective individuals and the elderly should be prioritized and given the masks first. Adoption of masks is typically required together with other non-pharmaceutical measures (i.e. social distancing) as “policy packages”.

### **Hand Hygiene**

Hand hygiene is one of the most effective ways to prevent the spread of coronavirus (Centers for Disease Control and Prevention [CDC], 2021). The World Health Organization (WHO) has advised everyone to regularly wash their hands with soap and water. Alternatively, when soap and water are not available, the next best option is to use a hand sanitiser containing at least 60% alcohol (CDC, 2021).

### **Handwashing**

Washing your hands with soap and water does not actually kill germs but it traps and removes them (Hackensack Meridian Health, 2020). When our hands are dirty, germs can stick to the oils or grease on our hands. Using water alone will not remove much of the germs because water and oil do not mix. Soap as a surfactant mediates between the water and oil molecules and binds with both of them. The soap carries the germs away after rinsing everything off (Hickok, 2020). The previous study reported that handwashing could reduce the risk of the transmission cycle ranging from 6% to 44% (Rabieet *et al.*, 2006). Proper hand hygiene technique with soap and water consists of 5 steps, as advised by the CDC. The first step appears to be wetting your hand with clean, running water and applying it with soap. Lathering is the second mandatory procedure, by rubbing your hand together with the soap followed by rubbing the backs of your hands, between your fingers, and under your nails. Scrub your hands continuously for at least 20 seconds. Then, rinse your hands well with clean running water. Lastly, drying both hands after washing is a must. Although washing hands could reduce the risk of respiratory infections by 16% (CDC, 2021), soap could be too harsh for the skin. It could cause irritation, blisters, or even burns on the top layer of the skin. If soap gets in the eyes, it could cause redness on the eye and eyelid surface, blurred vision, or pain (Dock, 2021). Moreover, swallowing the soap could lead to adverse symptoms such as diarrhoea or vomiting (Meehan, 2018).

### **Alcohol-based hand sanitisers**

During the COVID-19 pandemic until February 2020, there is a 100-fold increase in Google searches related to “hand sanitisers” in the United States (Berardi *et al.*, 2020). Alcohol-based (hand) rub or ABHR is defined by the World Health Organization (WHO, 2007) as liquid, gel or foam that contain alcohol to prohibit the growth of microorganisms (Larson *et al.*, 1991). Typically, alcohol-based hand rub contains isopropanol, ethanol, n-propanol, or a mixture of two types, interchangeably (Morbidity and Mortality Weekly Report [MMWR], 2002). Isopropanol and ethanol are widely used alcohols in ABHR formulations. The former is better at inactivating bacteria whereas the latter is considered a virucidal agent. Dissimilar properties are attributable to differences in polarity (McDonnell and Russell, 2020). The alcohol concentration of 60-95% (v/v) is highly recommended. (Abuga and Nyamweya, 2021). ABHR is usually mixed with other inactive ingredients (i.e. humectants, thickeners, and fragrance). Glycerol is normally used as a humectant to mitigate skin dryness. Nevertheless, a high glycerol concentration could lead to excessive drying time and add a sticky sensation on the skin (Greenaway *et al.*, 2018). Thickeners, for example, carbomer increase viscosity which could reduce spillage compared to runny liquids (Berardi *et al.*, 2020). Thus, alcohol gel is highly well-known due to its convenience of handling. Fragrance could help alleviate the unpleasant smell of alcohol. It enhances aesthetic and marketing appeal to the products (Sharma *et al.*, 2015). A volume of 3 ml is normally shown to be sufficient for hand hygiene events. Hand size and the achieved coverage are correlated to each other. Moreover, factors that contribute to drying time include hand size, skin temperature, and degree of hydration (Voniatis *et al.*, 2021). Alcohol use is not recommended when hands are visibly dirty or when proteinaceous materials are present (MMWR, 2002). Despite the advantages of alcohol, it could be detrimental in terms of its flammability. The range of 17.5-22 °C is the flashpoint of the mixture of ethanol and water in ABHR formulations (Janès and Chaineaux, 2013). Frequent use of ABHR could trigger skin reactions. Some people may experience dryness and irritant contact dermatitis (Rotter, 1999). ABHR is inedible. Methanol poisoning is more severe than ethanol poisoning in the later period although the initial side effects are similar. The common side effects include headache, blurred vision, nausea, vomiting, abdominal pain, loss of coordination, and decreased level of consciousness. Methanol poisoning could further lead to a patient’s blindness and fatality if not received treatment (Kraut and Mullins, 2019). Methanol ingestion could cause serious adverse effects. In a report from Arizona and New Mexico from May 1 to June 30, 2020, 15 cases of methanol poisoning suffered from swallowing ABHR. 4 patients died and 3 patients started being visually impaired (Yip *et al.*, 2020).

### **Face Shields**

Many countries have been concerned that high-risk areas of COVID-19 infection wouldn’t settle down with only face masks. So, contact investigations for SARS-CoV-2 have confirmed community transmission rates that are consistent with droplet and contact spread (Perencevich *et al.*, 2020). Personal protective equipment (PPE) has become crucial to protect humans from the transmission of the virus (Ong *et al.*, 2020). In order to cope with the current situation, encouraging people to use barriers is one of the COVID-19 measures. The two major options for such barriers (PPE) are face masks and face shields (Perencevich *et al.*, 2020). On the contrary, as a face mask leaves the eyes and the facial skin unprotected, a face shield is required. Face shields are the protection of the face against infectious droplets made with sanitizable materials. Face shields are advantageous in their effectiveness of droplet protection, easiness to disinfect, comfortability to wear even in a long period of time, fast production, durability, and low cost (Neijhoft *et al.*, 2020). Surprisingly, face shields outperform masks when it comes to the effectiveness against small inhaled particles in all configurations (Wendling *et al.*, 2021). Nonetheless, face shields could not fully protect all the droplets since those can slide under the wearer’s shield to the nose, both transversely and vertically (Singh *et al.*, 2021). Furthermore, face shield has many types of products referred to the difference between manufacturing materials such as Polyethylene Terephthalate (PET), Polycarbonate (PC), Polyvinyl Chloride (PVC), and Cellulose Acetate (CA) (Lee *et al.*, 2020). However, people's view about the usage of face shields as it becomes an essential part of human beings like an accomplice during this current pandemic situation (Singh *et al.*, 2021).

### **Social Distancing**

Reducing interactions between people by or physical distancing is an effective and prevalent measure to reduce the risk of infection and aid in slowing transmission of COVID-19. Social-control measures involve staying at least 6 feet apart from others among people in the community (Maragakis, 2020). The Centers for Disease Control and Prevention defined social distancing as “remaining out of congregate settings, avoiding mass gatherings, and maintaining distance from others when possible”. Moreover, isolation and quarantine are public health fitness practices via means of defending the public by preventing exposure to people who have or can also additionally have a contagious disease (Centers for Disease Control and Prevention [CDC], 2021). Although social distancing has been adopted around the world, it requires some time to achieve its effectiveness. That is, social distancing may

not provide immediate positive outcomes (Nande, 2021). These measures range from obligatory quarantine to voluntary self-isolation and have come at the cost of socially isolating many people, setting their intellectual and emotional health at risk (Razalet al.,2020). In fact, social distancing could potentially lead to social rejection, impersonality and individualism. It poses an adverse effect on learning and growth by less socializing which is a fundamental human need (Sikali, 2020).

### Conclusion:-

There are some measures that have been introduced and implemented to society in order to prevent the spread of COVID-19 including face masks, hand hygiene, face shields, and social distancing. Cloth masks are less protective than N95 and surgical masks. Hand hygiene includes handwashing and alcohol-based hand sanitisers. The soap carries the germs away after rinsing everything off. The risk of the transmission cycle could be reduced by handwashing. The steps of handwashing begin with wetting the hands with clean, running water and putting the hand sanitizer on your hands and rubbing your hands together that should take about 20 seconds. Alcohol-based (hand) rub or ABHR is defined by the World Health Organization as liquid, gel or foam, containing alcohol to prohibit the growth of SARS-CoV-2. The alcohol concentration of 60-95% (v/v) is recommended. ABHR is usually combined with other inactive ingredients such as humectants, thickeners, and fragrances. Face shields are used to protect the face against infectious droplets made with sanitizable materials. Face shields are advantageous in their effectiveness of droplet protection to the facial area, the simplicity of disinfection, comfortability to wear even over a long period of time, fast production, durability, and affordable price. Lastly, social distancing is defined as remaining out of congregate settings, and maintaining distance from others when possible.

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