THE PROMINENCE OF MASKS, SANITISERS, AND SOCIAL DISTANCING IN THE PANDEMIC SITUATION OF COVID-19

Hindustan Abdul Ahad, Chinthaguinjala Haranath, Gopavaram Sumanth, Pani Sai Raghava DR, Rajasekhar Reddy Venna, Naga Jyothi Mohanavamsi

Department of Industrial Pharmacy, Raghavendra Institute of Pharmaceutical Education and Research (RIPER), Ananthapuramu 515721, AP, India

*Corresponding Author- Email: sumanth925@gmail.com

ABSTRACT - Good sanitation performs the first line of protection against the spread of infectious diseases like COVID-19. A global danger is posed by viral epidemics or pandemics of acute respiratory infections such as Influenza or Serious Acute Respiratory Syndrome (SARS). Antiviral medications and vaccines may not be enough to prevent their spread. Use masks, sanitizers, and social distance will avoid many viruses from transmitting infectious diseases. Throughout this study, an exhaustive review was conducted to briefly summarize the different types of masks, hand sanitizers with their main active ingredients and action mechanisms, and social distancing for preventing and controlling of the spread of a virus-like COVID-19. This review shows the highest transmission rate before symptoms start and offers first proof of the effectiveness of mask use, infection control, and social distance in preventing COVID-19 and other viral respiratory diseases. Use of masks, sanitizers, and social distancing is part of a comprehensive collection of measures designed to prevent and control the spread of many viral respiratory diseases, including COVID-19. However, the use of a mask alone is inadequate to provide an appropriate degree of protection or control over the source, and further steps should also be taken at the personal and community level to avert respiratory virus transmission. Whether masks are being used or not, obedience with hand hygiene, physical distancing, and other infection control actions are important in stopping the transmission of spreadable diseases such as COVID-19 from humans to humans.

Keywords: Types of masks, sanitizers, common effects, social distancing.

1. INTRODUCTION

A face mask (e.g., N95 respirator or surgical mask) that protects the nose and mouth is used to defend against exposure to airborne impurities and transmittable particles. Numbers state the defense percentage. For example, during worst-case testing, an N95 mask filters out at least 95 % of airborne impurities [1]. Surgical masks look like sieves with a polypropylene mesh that potentially bind droplets to fasteners. They are not rated for aerosolized viruses to be fully sieved. Still, they have been revealed to be nearly as effective as N95 respirators in lab tests in contradiction of aerosols and clinical trials against influenza transmission [2]. Germs are the entire time that they will get on hands and stuff that we handle to make us sick during everyday activities [3]. Some of the most key steps one can take to prevent getting sick and spreading germs to those around us is to wash hands with water and soap or hand sanitizer containing at least 60 alcohol% at critical times [4]. Masks are used for the defense of healthy people (worn to shield while in contact with a sick person) or for source control (worn to avoid further transmission by a sick person). Actually, in clinical practice, washing hands with proper soap followed by applying manual sanitizers are two essential forms of hand hygiene. Hand sanitizers mainly increase the chance of keeping the hands sterile [5]. Many sanitizers exist on the market with variable degrees of effectiveness reported in the National Agency for the Administration and Control of Food and Drugs. Besides, hand sanitizers may be an alternative to achieving asepsis in outreach projects, screening interventions in daily practice, water lack areas, and bedside and chair-side clinical review [6]. However, the difficulty is faced by clinicians and common man, when selecting the best of the bunch.

The World Health Organization (WHO) and CDC approve public-use basic and surgical face masks. Such kinds of masks are designed primarily to stop transmitting any disease might have.

2. MASKS

The popularly used marks are of these [7, 8, 9]

- Basic cloth face mask
- Surgical face mask
- N95 respirator
- Filtering facepiece ventilator
- P100 ventilator/gas mask
- Self-contained breathing device
- Full face ventilator
- Full span face shield
- KN95 respirator

2.1. Basic Cloth Face Mask

It is a standard face mask version, every day. This is also the edition suggested in the centre of COVID-19, for use by the normal public. This kind of mask should be used when one goes to the gas station, grocery store, or some other exposed public area.

2.2. Surgical face mask

An FDA- approved surgical mask is made from a thin, disposable material. Medical professionals currently performing COVID-19 drive-thru tests wear a variant of this mask which does not only cover his mouth and nose, and also their cheeks, eyes, and forehead. One can see this kind of mask used in hospitals by respiratory therapists and doctors.

2.3. N95 respirator

This kind of mask is important for first responders and healthcare staff. If one is working with patients directly, please don't use/buy this mask form. The supplies are rare right now and these masks are used for persons who are specially required.

2.4. Filtering Face piece Ventilator

This kind of mask is reusable like the surgical masks. This is not generally used to avoid airborne pathogens from dispersal Instead, it is damaged to reduce the exposure of lumber dust or pollen to pollutants. Those with dislikes might suggest making use of this type of mask during the pandemic.

2.5. P100 Ventilator/Gas Mask

Connecting a P100 respirator to health-care is not common. Instead, it is used in interaction with lead, asbestos, or chemicals by woodworkers, painters, and others. This kind of mask shouldn't use to keep COVID-19 from spreading.

2.6. Self-Contained Breathing device

Firefighters typically use this kind of mask thus they can respire clear air under hazardous conditions. There's no need at all to costume this kind of mask whereas COVID-19 is distributed.

2.7. Full Face Ventilator

A full-face respirator, usually used in home improvement projects, is a good choice. That kind of mask will also be kept for persons who already have respiratory issues or trouble breathing.

2.8. Full Span Face Shield

It's a mask used by welders which are a flimsier, plastic form of the glass one is using. It keeps the complete face from front to back, and a lessened headband is secured. A full-length face-mask in the COVID-19 crisis is not desirable because it is difficult to breathe over time.

2.9. KN95 Respirator

In reality, the KN95 masks look like N95 masks. All masks absorb about 95 % of the air's tiny particles. The main variance is that the N95 masks will trap larger particles.

2.10. Disposal of face mask

Multiple microorganisms may stay into a used mask for varying durations. Experts believe that once left exposed, viruses will live in only some hours to days. It is advisable to all not to throw the mask used indiscriminately in lifts, parks, offices, houses, open dust bins, as it might pose a potential health hazard to people who come into interact with these masks. Some people often pick them up for reuse and thus risk their lives. The filthy masks have breathing secretions on them, also they can spread and be airborne. So please be careful. Wash hands earlier and after removal of the mask [10, 11, 12].

2.10.1. Cloth masks (Wash)

Should be properly and regularly cleaned, and leftward to suspend and dry air.

2.10.2. Surgical masks (Wrinkle, tie, wrap)

Chin should indeed be drawn upwards and caution should be taken not to damage the mask front when separating it from the strings. Later eradicate the mask, frequently wrinkle it partially inwards, so dews from the mouth and nose don't become exposed. Then wrinkle the mask half, and stop when it looks like a circle. Sometimes, the ear loops can cover the mask, so it won't split. Then roll it in a paper towel/polythene bag and throw it out in the waste bin. Keep things handy earlier disposal.

2.10.3. N95 respirator

After eliminating the mask, keep the corner of the bands attached to receive the N95 mask off. Don't interrupt the inner breathless. Previously clean the face, then after, gently remove the mask then chemicals don't settle on the face. Place the mask inside a pliable bag or zip-lock container. One may also store them in a breathable jar, like a paper bag, between uses. Hold on bag safely.

3. SANITIZERS

Hand sanitizer, also called hand antiseptic, an agent applied to the hands to kill common pathogens (pathogenic organisms). Hand sanitizers are usually available in foam, gel, or liquid form. Recommended when soap and water are insufficient for hand washing or when frequent hand washing damages the skin's natural barrier (e.g., causing peeling or peeling). The main purpose of hand sanitizer is to stop the spread of germs, enhance good hygiene and health.

There are two kinds of sanitizers [13] viz., Alcohol-based and non-Alcohol based sanitizer. Alcohol Based Hand Sanitizers (ABHS) contain different amounts and forms of alcohol, typically between 60-95%, and generally isopropyl alcohol, ethyl alcohol, or n-propanol. Alcohol is responsible for killing most germs. Drug-free hand sanitizers comprise anything i.e. quaternary ammonium compounds (normally benzalkonium chloride) in place of drug. They can cut down on microbes but are less active than alcohol. They found to be successful in killing many species of bacteria, as well as *E coli* and MRSA, but they are also successful against several viruses including the Middle East influenza A, hepatitis A, rhinovirus, HIV, and respiratory disease.

3.1 Destroying viruses

Alcohol attacks the protein envelope covering some viruses including coronaviruses and kills them. The protein is necessary for the virus to survive and replicate. Hand sanitizer must be minimum 60% alcohol to destroy most viruses. Hand sanitizers with below of 60 % have also seen less active in the destruction of bacteria, and can only reduce germ growth rather than destroying them directly [14]. And just 60% containing alcohol can't remove all kinds of germs. Studies have identified that washing of hands is more effective than hand sanitizing to eliminate cryptosporidium, norovirus (a parasite that causes diarrhoea), *Clostridium difficile* (that make bowel difficulties and diarrhoea). Commonly adopted disinfectants with their mechanisms is shown in table 1 [15, 16].

Chemical groups and mechanism of action of commonly used sanitizers were shown in table 1 [17, 18].

Table 1: Chemical group classification of normally used disinfectants in sanitizer and their mechanism in microbes

Chemical group	Examples	Mechanism of action
Alcohol	Ethanol(C_2H_6O) Iso-propanol(C_3H_8O)	Changing of proteins in the plasma membrane
Chlorine compounds	Hypochlorite (ClO^-) (E.g., Sodium hypochlorite) Chlorine dioxide (ClO_2) Chloramine-t trihydrate ($C_7H_7ClNNAO_5S$)	Halogenation/oxidation of proteins in cells
Iodine compounds	Povidone-iodine (poly vinylpyrrolidone with iodine)	Iodine can freely enter into pathogens by the cell membranes Followed by attacks on vital proteins, nucleotides, and cell fatty acids
Quaternary Ammonium compounds	Benzalkonium chlorides, including alkyl dimethyl Benz ammonium chloride ($C_{22}H_{40}N$) Benzyl dimethyl octyl ammonium Chloride ($C_{17}H_{30}ClN$) Didecyl dimethyl ammonium chloride ($C_{22}H_{48}ClN$)	Lower superficial tension Inactivate enzymes inactivates cell-proteins
Per-oxygens	Hydrogen peroxide (h_2o_2) Per acetic acid (PAA) ($C_2H_4O_3$)	Oxidation of in free radicals in essential cell components
Bis phenols	Triclosan	Enter cytoplasmic bilayer
Biguanide	Chlorhexidine	Ionic interaction Interrupt cell membrane

The popularly recommended formulations of hand sanitizers by USP and WHO were depicted in table 2 [19, 20].

Table 2: Composition for compounding alcohol-based hand sanitizer based on United States Pharmacopoeia (USP) and WHO recommendations

Components	Formulation 1. Ethanol Antiseptic 80% topical solution	Formulation 2. Isopropyl alcohol Antiseptic 75%topical solution	Formulation 3. Isopropyl alcohol Antiseptic 75%topical solution
Ethanol 96%	833.3ml	-	-
Isopropyl alcohol (99%)	-	757.6ml	-
Isopropyl alcohol (91%)	-	-	824.2ml
Hydrogen peroxide (3%)	41.7ml	41.7ml	41.7ml
Glycerol (98%)	14.5ml	7.5ml	7.5ml
Water q.s.	1000ml	1000ml	1000ml

The mechanism of alcohol and non-alcohol compounds was shown in table 3 [21, 22].

Table 3: Mechanism of alcohols and non-alcohol compounds

Ingredient	Mechanism	Remarks
Alcohol-based		
Alcohol	Denatures protein and lipid membrane of microorganisms	Optimum concentration 60%-95%
Hydrogen peroxide	Inactivates infecting spores in the huge solution	Concentration is as little as 3%. May diminish the colouring agent Corrosive in nature
Non-Alcohol Based		
Chlorhexidine gluconate	Disrupting the membrane	Good activity Gram-positive bacteria Enveloped viruses Weak activity Gram-negative bacteria Fungi Non enveloped viruses
Chloroxylenol	Disrupting the membrane	Good activity Gram-positive bacteria Gram-negative Enveloped viruses Weak activity *Pseudomonas aeruginosa*
Iodine/iodophors	Inhibits the growth of microorganisms on living tissues.	Gram-positive bacteria Gram-negative bacteria Fungi Enveloped viruses Spore-forming bacteria
Quaternary Ammonium compounds Benzalkonium chloride Benzethonium chloride Cetylpyridinium chloride	Disruption of intermolecular interactions	Good activity Gram-positive bacteria Enveloped viruses Weak activity Gram-negative bacteria *Mycobacteria* Fungi
Triclosan	Reduce fatty acid synthesis	Good activity Gram-positive bacteria *Mycobacteria* *Candida spp*. Weak activity *Filamentous fungi*

3.2. Common effects with handwashing soaps or alcohol-based hand sanitizer

The most frequently recorded skin responses by using alcohol-based hand sanitizer are irritant Contact Dermatitis (ICD) and Allergic Contact Dermatitis (ACD). If extreme, with signs such as dryness, pruritus, erythema, and bleeding, ICD symptoms can start from moderate to crippling. The symptoms, as with ACD, can be also mild and localized, or extreme and widespread, with more severe types of ACD showed as respiratory failure or anaphylactic symptoms. Occasionally, the differentiation among ACD and ICD can be difficult due to similarities and symptom similarities. Manual hygiene goods such as sanitizers or soaps can be harmful to the skin over various mechanisms [23, 24].

- Denaturation of stratum corneum proteins
- Modification of intercellular lipids
- Reduction of corneocyte cohesion and
- Decrease of stratum corneum's water-binding capacity.

The key apprehension is the deterioration of the lipid wall, particularly with frequent exposure

to lipid-emulsifying detergents and lipid-melting alcohols as it penetrates deep into the skin layers and changes the skin's flora, leading to more frequent bacterial colonization. To stop the level of ICD includes handwashing soaps, chloroxylenol, chlorhexidine, iodophors, triclosan, and alcohol-containing products are used. Compared to isopropanol and n-propanol, ethanol has a minimum skin-irritant property of the alcohol-based formulations. Other causative factors raise the danger of ICD, however, such as the absence of using of additional emollients, roughness due to and use removal of gloves, and less relative humidity. ABHS also exerts an aeration effect on the hands that can make the skin to crack or peel. In contrast, ACD is due to other agents by hypersensitive reactions in products like triclosan, chlorhexidine, iodophors, chloroxylenol, and alcohol. Persons with allergic responses to alcohol-based preparations that experience an allergy to impurities, aldehyde metabolite, or with other excipients such as benzyl alcohol, parabens, benzalkonium chloride, and fragrances or true alcohol allergy [25].

4. SOCIAL DISTANCING

It`s a non-medical method of control and inhibition of infections introduced to avoid/decrease interaction between individuals infected with a pathogen-causing disease and those not diseased to stop or slow down the rate and duration of disease transmission. This eventually contributes to decreased transmission of the disease, morbidity, and mortality. As suggested by the WHO, 6 feet distance is suitable to avoid the spreading of disease. "Six feet' is normal distance breathable droplets move from a cough or sneeze until they settle down and are no extended likely to be inhaled by others [26, 27]. The explanation of social separation measures and their basis, at individual and group level, is shown in table 4.

Table 4: Explanation of social distancing dealings and their rationale, at separate and group level

Social distancing measure	Description	Rationale
Individual social distancing		
Isolation of cases	Confirmed or suspected COVID-19 cases are isolated which means that Hospitalized to offer care (severe cases), or achieved with good isolation services or at home (mild cases) In a common Group situation spread, blanket advice for people with symptoms can be issued to stay home.	Isolating sick from fit individuals to avoid transmission.
Quarantine of contacts	Healthy people who've had a high or a moderate Low-risk contact with reported case COVID-19, as per the contact investigation Cases may be quarantined voluntarily, or Pflicht.	Typically recommended for self-quarantine in a secure area or at home, and self-monitoring for the occurrence of COVID-19-compatible symptoms; if symptoms are observed, a check should be done promptly. To stay far from other good people transmission as disease occurs, including during Asymptomatic or subclinical period of illness.
Stay-at-home recommendations	A blanket recommendation that the public stay home and stop gatherings and stop encounters with individuals, especially high-risk groups identified	Recommendations for the social distancing of people, especially high-risk groups, to minimize transmission, prevent increased morbidity. and thus minimize the healthcare network burden.
Social distancing distressing groups		

Closure of Educational Institutions Terminations of mass gathering	Schools (including, playschools, primary and secondary schools, day care centres) Closure of higher educational institutions (including universities, research institutions) Cultural activities (theatres, cinemas, etc.) Sporting activities (soccer, indoor and outdoor) Athletic outdoor tournaments, marathon races the USA) Festivals, events founded on faith.	Preventing children's contact is an acknowledged measure for preventing influenza outbreaks and Breakthroughs. Universities and other institutes of education are also areas wherever there are more people Gather in restricted spaces. In influenza epidemic studies, both interventions typically have the highest effect on early deployment in the transmission process and last before pathogen dissemination (i.e., later several weeks) decreases. Need also to prevent meetings/gatherings of young people outdoor schools to ensure efficiency. To prevent transmission into confined spaces between a greater number of people. In other sports (e.g. football matches) participants will be in close touch at the entrance and exit, even however they may be played outside.
	Conferences, seminars, trade fairs, etc.	
Sanitary cordon / Standard Building or residential area(s) quarantine	Refers to quarantine and closure of a house, or an entirely residential area.	To restrict interaction among high-incidence areas, etc.) And the ones with no little rates of transmission. This definition illustrates the above measures (Examples include school closures and higher education. Cancellations for collecting masses) are also Employed inside sanitary cordon to increase social distance.

CONCLUSION

The study gives that masks, hand sanitizer and social distancing use by well people could be beneficial for preventing the entry of certain bacteria and viruses, particularly for COVID-19. Mask studies as source control also indicate a benefit and can be significant in universal unrestricted face mask use as well as in health care settings during the COVID-19 pandemic. Hand sanitizer was created to solve the problems of bacterial and viral infections. It can carry down the number of microbes on hand quickly. Due to their simplicity and comfort of use in combination with simple or antimicrobial soaps and water, the usage of hand hygiene initiatives thereby increasing the degree of hand hygiene compliance.

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