



Research Paper

KAP study on hand hygiene in the era post COVID-19 SARS among general population.

¹Himani Gupta, ²Bhanu Priya Singh, ³Seema Gupta, ⁴Vivek Mahajan, ⁵Nusrat Kreem Bhat

^{1,3,4,5}(Department of Pharmacology, Government Medical College and Hospital, Jammu)

²(Department of Pharmacology, All India Institute of Medical Sciences, Vijaypur, Jammu)

Corresponding Author: Bhanu Priya Singh

ABSTRACT:

Background: Hand hygiene accounts one of the most effective ways of keeping diseases at bay. As of now, this practice stands as a key cornerstone post COVID-19 era, thus helping to break the chain of contact transmission of such deadly outbreak's outcome. **Aims and Objectives:** To assess knowledge, attitude and practices (KAP) relating to hand hygiene among general population post COVID-19 era. **Materials and Methods:** A cross-sectional study was done among general population of our setup over a span of 2 months by distributing online a pre-designed, pre-validated and semi-structured Google Form survey questionnaire having questions based on knowledge (10), attitude (07) and practices (06) relating to hand hygiene post COVID-19 era. Individuals enrolled were tech-savvy with access to e-mail and internet facility, and able to understand English language. **Results:** Data from responses of 545 individuals among our general community was collected and analyzed, out of which majority (88.9%) responders already had a basic insight about hand hygiene. 91.2% responders clearly believed hand hygiene is important to prevent the infection spread from contact. While 25.7% responders answered 40-60 seconds as minimum time required for hand washing, comparable majority (48.9%) marked it as 20-40 seconds. 70.9% responders were strongly against use of gloves as a substitute for hand washing. Interestingly, many had a mixed say regarding time span for which an alcohol-based hand sanitizer be rubbed onto hands viz. 32.3% stating it as 10 seconds, 27.7% as 20 seconds, 21.2% as 5 seconds and 18.8% as 15 seconds, respectively. Majority (85.4%) voted hand washing as better and probably the best mode of maintaining hand hygiene. Majority (93.1%) responders felt the need of practicing hand hygiene possibly at all the times. While most of our study population practiced hand hygiene thoroughly, 77.5% responders said that it positively affected their life also. However, in contrast, only 57.4% responders washed their hands after using public transport/money exchange, while 39.3% practiced it only sometimes. **Conclusion:** Our study highlights that despite of a positive relation between the awareness among general masses with regard to positive attitude about hand hygiene post COVID era, there was a mixed response about practice of the same, thus stressing on the need to reinforce such practices with due clarity so that the message goes loud and clear among public at large for breaking the chain of COVID transmission till date. Further our study can aid decision-makers in forecasting the effectiveness of infection mitigation strategies or in defining valid changes based on the practices, attitudes, and understanding of the intended population.

KEYWORDS: post COVID-19, KAP study, hand hygiene

Received 22 July, 2024; Revised 02 Aug., 2024; Accepted 04 Aug., 2024 © The author(s) 2024.

Published with open access at www.questjournals.org

I. INTRODUCTION

The deadly COVID-19 outbreak has a contagious transmissibility via respiratory droplets, aerosols and close contact. Contaminated hands or body parts that come into contact with the mucosa of the mouth, nose, or eyes can spread the infection through contact. Indirect contact transmission is facilitated by the virus's ability to spread from one surface to another through infected hands [1]. Hand washing, thus is a crucial component in the effort to stop the spread of COVID-19. Low- and middle-income countries with weak health care infrastructure further disadvantage their inhabitants because these countries cannot support the number of healthcare facilities needed to address these situations, which is made worse by the high population density of these countries. Therefore, it is essential to educate the public about the best hand hygiene practices, which include washing

your hands with soap and water and using alcohol-based hand rubs (ABHR), in order to stop the COVID-19 virus and other viruses and bacteria that cause the common cold, flu, and pneumonia from spreading and lowering the overall burden of disease [2].

By incorporating frequent hand hygiene into their daily routines, community members can play a critical role in eradicating COVID-19 as a whole. Evidence from the COVID-19 and SARS epidemics further highlights how crucial hand cleanliness is in preventing infections among medical personnel. At least 60% alcohol should be present in hand rub products with an alcohol base. Because plain soap dissolves the oily surface membrane of enclosed viruses, including the COVID virus, the virus is rendered inactive. Additionally, according to the 2009 WHO Guidelines on Hand Hygiene in Health Care, washing your hands mechanically eliminates germs. Hands that are obviously dirty should be washed with soap and running water; if not, use an alcohol-based hand massage. It is critical to practice proper hand hygiene at the appropriate times and with appropriate tools, such as ABHR or soap and water washing followed by cleaning with fresh or disposable towels.

The World Health Organization advises to wash the hands with water and soap for 40 to 60 seconds and rub the same using alcohol for 20 to 30 seconds [3].

II. MATERIALS AND METHODS

This two-month study, from July to September 2022, focused on knowledge, attitude, and practices and was open-label, cross-sectional, and questionnaire-based. A survey instrument was created to determine the general public's knowledge, attitude, and hand hygiene practices in the wake of COVID-19 pandemic.

As part of a pilot research, the questionnaire was initially given to 20 individuals in order to validate the sample form. The necessary changes were made to the same once the pilot study's outcomes were assessed. The investigation was carried out by giving the questionnaire to individuals once it had been validated. Additionally, the ones who could read and comprehend the English-language questionnaire were included in the study. All of them were tech-savvy and had access to email, internet and whatsapp on their smartphones. Water, soap, hand sanitizers, and hand scrubs with alcohol base were made available to every attendee. Following an explanation of the study's objectives, each participant provided signed, informed consent. The study eliminated participants who refused to provide informed consent or take part in it.

The purpose of the questionnaire was to assess people's awareness, perceptions of themselves, and attitudes around hand hygiene in the post COVID-19-SARS era.

There were twenty-three questions on the questionnaire, and it was disclosed up front that there might be more than one right response to some of them. Because printed copies of the questionnaire were avoided due to the potential for virus transmission through friends, the subjects were notified in advance of the day and time of administration. The information was communicated to them by email or whatsapp. All of the responses were gathered, and information was assessed.

III. OBSERVATIONS AND RESULTS

Total of 545 subjects participated in the study after they gave consent and eventually filled and returned the completed questionnaire. The details of questions prepared and the responses elicited are listed below:

Knowledge related questions (depiction in **Table 1**):

Table 1: Participants knowledge on hand hygiene post COVID-19 (n=545)

S. no.	Question	Yes	Some idea	No idea
1.	Basic insight about hand hygiene	466 (88.9%)	49 (9.4%)	30 (5.5%)
2.	Importance of hand hygiene	476 (91.2%)	48 (8.8%)	21 (4%)
3.	Minimum time required for hand washing	255 (48.9%)	254 (48.7%)	36 (6.6%)
4.	When to practice hand hygiene	440 (80.73%)	61 (11.19%)	44 (8.07%)
5.	Best approach to improve hand washing compliance	369 (70.7%)	134 (25.7%)	42 (7.7%)
6.	Could wearing gloves be a substitute for hand washing	371 (70.9%)	124 (23.7%)	50 (9.17%)
7.	Minimum time span for rubbing alcohol-based hand sanitizer onto hands	144 (27.7%)	98 (18.8%)	303 (55.5%)

8.	How to turn off water tap after hand washing	454 (86.8%)	79 (14.49%)	74 (13.58%)
9.	When should hands be washed thoroughly	426 (78.17%)	78 (14.31%)	41 (7.52%)
10.	Is hand washing superior to the use of hand sanitizer	444 (85.4%)	68 (13.1%)	33 (6.05%)

1. What is hand hygiene?

- a. washing hands with water and soap
- b. washing hands with water only
- c. washing hands properly i.e., in between webs of fingers and wrist with soap and water
- d. no idea

Answer: 88.9% responders had basic knowledge about hand hygiene and 9.4% had some idea while 5.5% seldom had any idea about the same.

2. Why is hand hygiene important?

- a. it can prevent spread of infection transmitted from contact
- b. hand hygiene can contribute to reduce various infections
- c. both a and b
- d. No idea

Answer: 91.2% of the responders stated about the relevant importance of hand hygiene while 8.8% had only meagre idea and 4% had absolutely no idea about the question asked.

3. Minimum time required for hand washing?

- a. 10-15 seconds
- b. 20-40 seconds
- c. 40-60 seconds
- d. don't know

Answer: 48.9% responded correct answer while almost similar proportion (48.7%) had only some idea about the correct knowledge of the question asked. Only 6.6% had no idea about the same.

4. When should hand-hygiene be practiced?

- a. both before and after having contact with patient only when you think your hands are dirty
- b. before and after eating
- c. all the times

Answer: Majority 80.73% responders stated that it should be done both before and after having contact with patient only when you think your hands are dirty.11.19% believed that hand-hygiene be practiced before and after eating, while 8.07% were of the opinion of practicing it at all times.

5. What is the best approach to improve hand washing compliance?

- a. motivation
- b. availability of alcohol-based hand rub or soap instruction demonstrating correct hand washing techniques to be displayed
- c. all of the above

Answer: 70.7% of the responders answered satisfactorily while 25.7% were of the opinion of availability of alcohol-based hand rub or soap instruction demonstrating correct hand washing techniques to be displayed. 7.7% had no clue about the same.

6. Can wearing gloves be a substitute for hand washing?

- a. yes
- b. no
- c. don't know

Answer: Majority (70.9%) responders denied in contrast to 23.7% who agreed, and 9.17% had no idea of the same.

7. When using alcohol-based hand sanitizer, how long should it take to rub your hands?

- a. 5 seconds
- b. 10 seconds
- c. 15 seconds
- d. 20 seconds

Answer: According to WHO guidelines, 20 to 30 seconds is the ideal amount of time for an alcohol-based hand rub. Respondents had a mixed response as shown in **Fig. 1**.

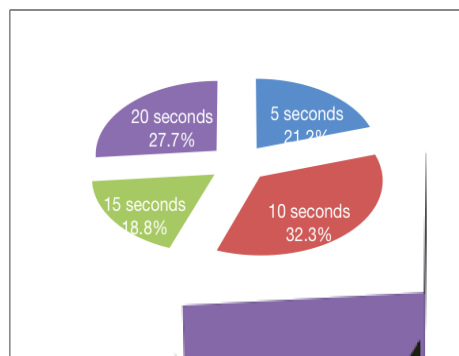


Fig.1: Minimum time span for rubbing alcohol-based hand sanitizer onto hands

8. After washing your hands, how to turn off water tap?

- a. turn off water tap with your hands
- b. turn off water tap using paper towel or your elbow or any other hands free way
- c. no idea

Answer: 86.6% responded turning off water tap using paper towel or your elbow or any other hands free way while 9.2% were of the opinion of turning off water tap using hands. Only 4.2% didn't have any idea about the same.

9. What is true among the following?

- a. Considering that soap helps remove soiling, hands that are filthy should be cleaned with soap and water
- b. The best course of action is to disinfect hands with an alcohol-based solution when they are contaminated but not obviously dirty
- c. both a and b
- d. no idea

Answer: 78.6% believe that using soap and water to wash your hands and disinfecting hands with alcohol-based hand rub is both imperative in situations when hands are visibly soiled or when hands are contaminated but not visibly soiled respectively.

10. What is better- hand sanitizer or hand washing?

- a. using a hand sanitizer
- b. hand washing
- c. no idea

Answer: 85.4% considered hand washing as a better choice over use of hand sanitizers (13.1%).

Attitude related questions (depiction in **Table 2; Figures 2,3,4,5,6,7 and 8**):

Table 2: Participants attitude to hand hygiene post COVID-19 (n=545)

S. no.	Question	Disagree	Maybe	Agree
1.	Should hand-hygiene practices be followed at all times?	20 (3.67%)	42 (7.71%)	483 (88.62%)
2.	Do you feel guilty about omitting hand-hygiene practice?	55 (10.09%)	58 (10.64%)	432 (79.27%)
3.	Should healthcare professionals act as role models/guide in demonstrating this practice among general masses?	5 (0.92%)	48 (8.81%)	492 (94.6%)
4.	Do you think maintaining proper hand-hygiene can prevent most of infections?	7 (1.28%)	52 (9.54%)	486 (93.6%)
5.	Should hands be washed only if they are soiled and visibly dirty?	427 (82.1%)	41 (7.52%)	77 (14.8%)
6.	Do you feel uncomfortable when others omit hand hygiene?	57 (10.4%)	54 (9.9%)	434 (79.6%)
7.	Do you commit to proper rules of hand hygiene all the times?	69 (12.66%)	108 (19.82%)	368 (67.52%)

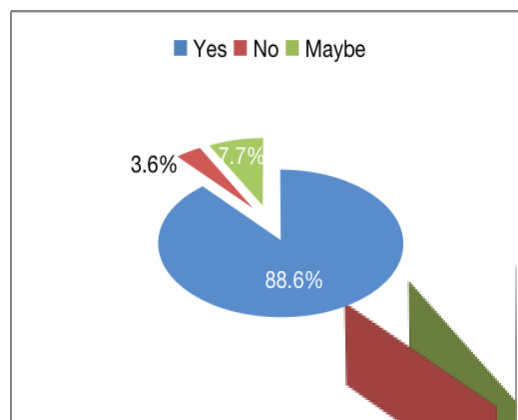


Fig.2: Should hand hygiene practices be followed at all times?

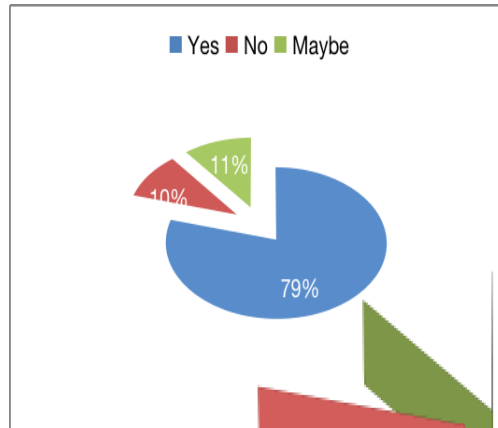


Fig.3: Do you feel guilty about omitting hand hygiene practice?

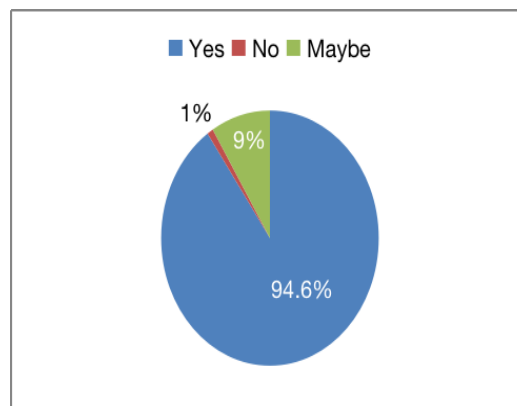


Fig.4: Should healthcare professionals act as role models/guide in demonstrating this practice among general masses?

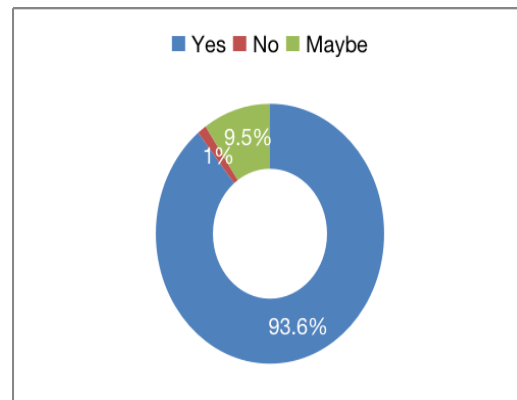


Fig.5: Do you think maintaining proper hand hygiene can prevent most of infections?

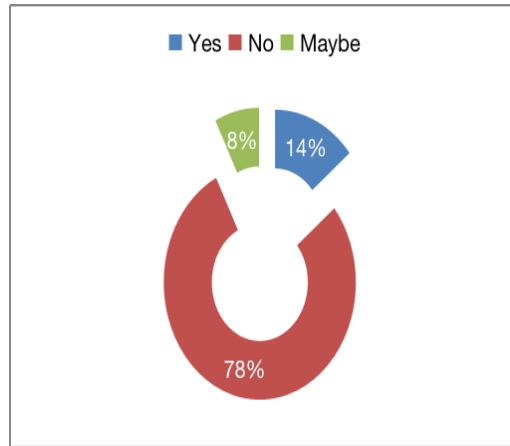


Fig.6: Should hands be washed only if they are soiled and visibly dirty?

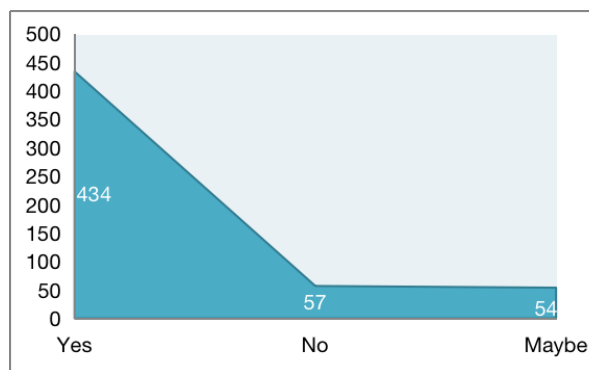


Fig.7: Do you feel uncomfortable when others omit hand hygiene?

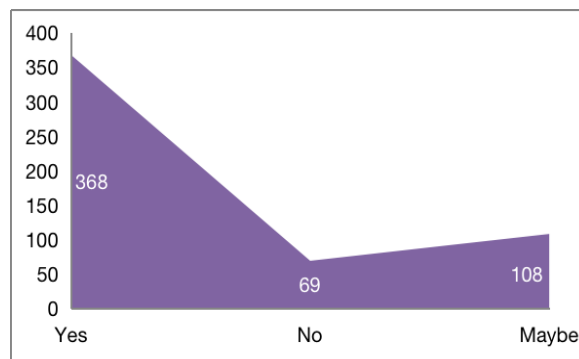


Fig.8: Do you commit to proper rules of hand hygiene all the times?

Practice related questions (depiction in **Table 3**):

Table 3: Participants practices of hand hygiene post COVID-19 (n=545)

S. no.	Question	Always	Sometimes	Never
1.	Does hand wash policy affect you positively?	414 (75.96%)	106 (19.45%)	25 (4.59%)
2.	Does hand wash frequency affect you negatively?	315 (57.79%)	179 (32.84%)	51 (9.36%)
3.	Do you wash your hands after returning to home?	448 (82.20%)	87 (15.96%)	10 (1.83%)
4.	Do you wash your hands after using public transport/money exchange?	309 (56.69%)	215 (39.45%)	21 (3.85%)

5. How often a day do you wash your hands?

- a. 1-2 sessions
- b. 3-5 sessions
- c. 6-10 sessions
- d. 11 and over

Answer: 253 (46.4%) individuals washed their hands 6-10 times, whereas 183 (33.6%) performed only 3-5 sessions of the same (**Fig. 9**).

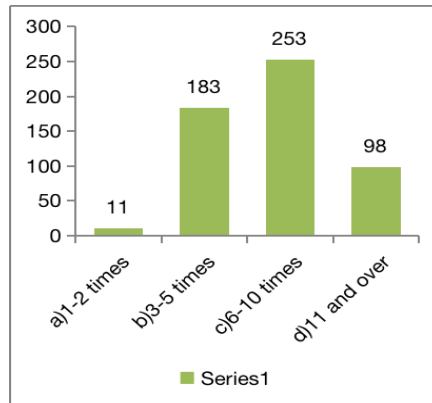


Fig.9: How often a day do you wash your hands?

6. Why is hand washing neglected primarily?

- a. A distant sink
- b. No need
- c. Time constraint
- d. Side-effects
- e. Forgetfulness

Answer: Majority 197 (36.2%) quoted forgetfulness as the major cause for skipping hand washing, followed by the reason of a distant sink in 103 (18.9%). However, only 56 (10.3%) did not feel the need of hand washing regularly (**Fig. 10**).

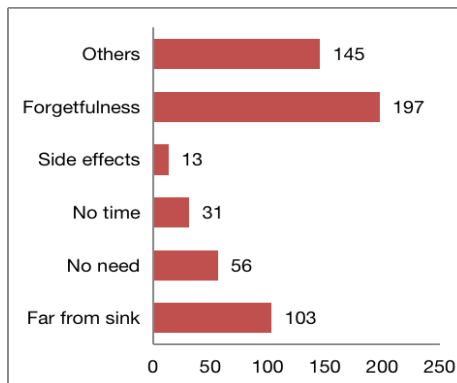


Fig.10: Main reasons for skipping hand washing

Data from responses of 545 individuals among our general community was collected and analyzed, out of which majority (88.9%) responders already had a basic insight about hand hygiene. 91.2% responders clearly believed hand hygiene is important to prevent the infection spread from contact. While 25.7% responders answered 40-60 seconds as minimum time required for hand washing, comparable majority (48.9%) marked it as 20-40 seconds. 70.9% responders were strongly against use of gloves as a substitute for hand washing. Interestingly, many had a mixed say regarding time span for which an alcohol-based hand sanitizer be rubbed onto hands viz. 32.3% stating it as 10 seconds, 27.7% as 20 seconds, 21.2% as 5 seconds and 18.8% as 15 seconds respectively. Majority (85.4%) voted hand washing as better and probably the best mode of maintaining hand hygiene. Majority (93.1%) responders felt the need of practicing hand hygiene possibly at all the times. While most of our study population practiced hand hygiene thoroughly, 77.5% responders said that it positively affected their life also. However, in contrast, only 57.4% responders washed their hands after using public transport/money exchange, while 39.3% practiced it only sometimes.

IV. DISCUSSION

Now already known that a family of flu-like viruses known as coronaviruses are extremely contagious. In addition to being potentially lethal, their symptoms might range from a minor fever to runny nose to slight stomach distress. A novel coronavirus pathogen called COVID-19 is rapidly gaining global traction. Like with other flu-like illnesses, the initial symptoms include fever, coughing, and difficulty breathing.

SARS-CoV-2 is a member of the beta CoV family. Its morphology is round or elliptic, frequently pleomorphic, and its diameter ranges from 60 to 140 nm. It is heat- and UV-sensitive, just like other CoVs. In this sense, even though high temperatures inhibit the ability of any viral species to replicate. As of right now, SARS-CoV-2's inactivation temperature has to be thoroughly understood. This virus appears to be inactivable at roughly 27°C. Conversely, it can withstand temperatures as low as 0°C. Furthermore, lipid solvents like ether (75%) , ethanol, chlorine containing disinfectant, peroxyacetic acid, and chloroform apart from chlorhexidine can efficiently inactivate these viruses [4]. SARS-CoV-2 can remain on plastic for up to 2-3 days, stainless steel for up to 2-3 days, cardboard for up to 1 day, and copper for up to 4 hours, according to a study [4]. This information relates to the length of time that the virus can remain on devices and surfaces. It's thought that respiratory droplets (particles larger than 5 µm to 10 µm in diameter) from sneezing and coughing spread the infection, just like other respiratory viruses like the flu and rhinovirus do. In the event of extended exposure to high aerosol concentrations in enclosed areas, aerosol transmission may also occur.

Based on data analysis, intimate contact between individuals appears to be necessary in order for SARS-CoV-2 to spread throughout China. It is noteworthy that up to 80% of COVID-19 transmission may be attributed to pre- and asymptomatic people. In actuality, the spread is more restricted to close contacts (6 feet, 1.8 meters) such as family members and medical professionals [4].

Considering that this is a new virus for which there is currently no vaccination, it is crucial to stop the virus from spreading from person to person in order to reduce the burden on medical staff and the already inadequate healthcare system. The first line of defense against COVID-19, as with many infectious infections, is to wash your hands thoroughly and often. In addition to the possibility of transmission through contaminated surfaces, the primary mode of transmission is droplet infection, which is transferred by coughing or sneezing. Best hygiene measures therefore have a significant role in preventing the virus from spreading from person to person. Regular and rigorous hand washing that is generally performed, together with other behavioral changes like social distancing, can help stop future outbreaks and help control the pandemic related outcome. In regards to hand hygiene, the World Health Organization advises the following appropriate strategy for cleaning your hands:

First step: moist hands

Make sure you use enough liquid soap after wetting your hands to form a thick lather. The ideal range for the water's temperature is 35 to 45 degrees Celsius.

Step2: Press your palms together

Move your hands in circular patterns, rubbing palm to palm, both clockwise and counterclockwise rotation.

Step 3: Give your hands a back rub

Rub your left hand's back with your right palm while keeping your fingers connected with the other hand. Next, switch.

Step 4: Join your fingers together.

Faced against each other, join your fingers to form clasped hands. Next, give your fingers and palms a little rub.

Step 5: Make a fist

With your left hand under and your right hand over, make a cup with your fingers. Rub the backs of your fingers on your palms while keeping your fingers interlaced. Next, switch.

Step 6: Tidy up your thumbs

Rotate your left thumb while enclosing your right hand around it, then switch.

Step 7: Use your fingers to rub your palms

Make a circular motion with your fingers over your left palm, then switch.

The recommended cleaning time for hands is 20–30 seconds with an alcohol-based hand rub and 40–60 seconds with water and soap.

When is the right time to wash your hands is another subject that needs to be addressed. Regular hand washing is necessary, particularly after sneezing, coughing, or blowing your nose; following a visit to a public area, such as a marketplace, a place of church, or public transportation; following contact with items outside of the house; following contact with cash; before and after meals; before, during, and after providing care for an ill or vulnerable individual.

Hand washing should always be done after using the restroom; after handling trash; both before and after eating; following pet and animal contact; following diaper changes for infants or assistance with potty training; when there is obvious filth on your hands.

Given that hand hygiene has been shown to be the most successful single intervention for preventing the spread of illnesses through multimodal techniques, which also include access to the necessary supplies, the World Health Organization developed the following recommendations:

1. Every public (including schools and healthcare facilities) or private commercial building should have one or more hand hygiene stations in front of the entrance, where people can wash their hands with soap and water or rub their hands with an alcohol-based hand rub. This encourages people to practice good hand hygiene both before entering and after the building.
2. All transportation hubs, particularly major bus and train stations, airports, and seaports, should have facilities.
3. To better encourage use and cut down on waiting times, the number and usability of hand hygiene stations should be adjusted to the type (e.g., small children, the elderly, those with limited mobility, etc.) and number of users.
4. Public health authorities should be given overall control over the equipment's installation, supervision, and routine replenishment, with building managers handling this role. Initiatives from the business community and civil society to assist the resources, upkeep, and efficient use are encouraged.
5. During the COVID-19 pandemic, using public hand hygiene stations should be required before entering any facility or boarding any type of public transportation. In this way, frequent hand washing outside of private residences can integrate itself into the fabric of daily life in every nation.
6. In addition to quickly ensuring the acquisition of sufficient quantities of high-quality hand hygiene supplies, refresher hand hygiene training, and reminders and communications about the significance of hand hygiene in preventing the spread of the COVID-19 virus, all private and public health care facilities should establish or strengthen their multimodal programs for improving hand hygiene.
7. At all points of care, in areas where Personal Protective Equipment (PPE) is put on or taken off, and where medical waste is handled, local health authorities should guarantee the constant presence of functional hand hygiene stations (alcohol-based hand rub dispensers or soap, water, and disposable towels) for all healthcare workers. All patients, their families, and guests should also have access to functioning hand hygiene stations, which should be placed five meters away from restrooms, at entrances and exits, in waiting and dining rooms, and in other public spaces.
8. According to WHO guidelines, local manufacturing of alcohol-based hand rub formulations in national, subnational, or hospital pharmacies, or by private firms, should be highly promoted. This is especially true if commercial options are scarce or prohibitively expensive, in particular, before putting on and after removing personal protective equipment (PPE), when changing gloves, after any contact with a patient who may have the COVID-19 virus, their waste, or the environment in the patient's immediate vicinity, after contact with any respiratory secretions, before preparing and eating food, and after using the restroom, health care workers should practice hand hygiene using the correct technique and in accordance with the guidelines known as "My 5 moments for hand hygiene" [5].

V. CONCLUSION

Following good hand hygiene becomes crucial in order to stop the unique coronavirus from spreading rapidly, as the entire world is engaged in combat with this invisible adversary that has destroyed businesses and drastically changed how people interact with one another. Breaking the chain of transmission will mostly involve the use of alcohol-based hand rubs, antibacterial washes, and soaps, which are widely accessible to individuals from all socioeconomic backgrounds worldwide.

Our study highlights that despite of a positive relation between the awareness among general masses with regard to positive attitude about hand-hygiene post COVID era, there was a mixed response about practice of the same, thus stressing on the need to reinforce such practices with due clarity so that the message goes loud and clear among public at large for breaking the chain of COVID transmission till date. Further our study can aid decision-makers in forecasting the effectiveness of infection mitigation strategies or in defining valid changes based on the practices, attitudes, and understanding of the intended audience.

However, owing to the short duration of research project, this survey was accessible only to tech-friendly masses using smart-phones with ability to understand English language due to which a vast chunk of population from lower class with low educational score were left untended. Thus, similar studies with improved access and inclusion of such technically weak strata of society need to be conducted in order to substantiate findings for the general safety of community en masse.

REFERENCES

- [1]. Chowdhry S, Lamba A, D'Souza P. KAP study on hand hygiene in the era of COVID19-SARS: A dermatologist's perspective. Clin Med 2021;3(1):1030.
- [2]. WHO. Coronavirus disease (COVID-19). World Health Organization. 2020. [Cited on: 8 August 2022]. Available at: <https://www.who.int> .
- [3]. Centers for Disease Control and Prevention. 2020. Hand sanitizer use out and about. [Accessed on: 11 June 2021]. Available at: <https://www.cdc.gov/handwashing/hand-sanitizer-use.html>.
- [4]. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Di Napoli R. Features, Evaluation and Treatment Coronavirus (COVID-19). Stat Pearls 2020 Jan;1-17.
- [5]. WHO. Five moments for hand hygiene. [Cited on: 30 August 2022]. Available at: <https://www.who.int> .