



**PUBLIC PRACTICE TOWARDS USAGE OF FACE MASK DURING PANDEMIC
COVID-19 -A CROSS SECTIONAL STUDY**

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ABSTRACT

Background: The pandemic caused by novel coronavirus (SARS-CoV-2) has become a new public health problem. The World Health Organization (WHO) has declared the outbreak of Corona Virus Diseases (COVID 19) as a global public health emergency. At War foot many strategies are being tried to mitigate the disease. **Aims and Objective:** The aim of this study is to assess the usage and disposal of mouth masks among general public during this pandemic COVID-19. **Materials and Methods:** A total of 516 participants from the Maharashtra (India) region completed a questionnaire-based survey on different face covering practice and disposal methods, during the pandemic COVID -19. The self administered questionnaire distributed. Random sampling method was used for the collection of data, and the distribution of responses was presented as percentages. Explanatory statistics were performed for all groups based on the percentage of correct responses. **Results:** A total of 516 participated in the survey, among the respondents, Majority 466 (92.24%) preferred Mouth mask to prevent and control spread of covid. More than 78 % used reusable and used till it torn. Fabric mask was preferred by more than 50%. Majority of participants were not aware about the proper method of storage, disinfection and disposal of mask. However participants were aware about the environmental contamination due to improper usage and disposal of mouth mask. **Conclusion:** The inputs from this study help us to throw some light and fill up space regarding usage and disposal of mask. There is a specific and strong need to implement periodic awareness programmes about impact of injudicious and inappropriate mask usage on themselves and environment.

KEYWORDS: Covid -19, Environment, Face Covering, Storage.

INTRODUCTION

Pandemics are the disease outbreaks that become widespread as a result of the spread of human-to-human infection. There have been many significant disease outbreaks and pandemics recorded in history, like Spanish Flu, Hong Kong Flu, SARS, H7N9, Ebola, Zika.^[1] The word "Pandemic" originates from the Greek "pan" meaning "all" and demos "the people"^[2] With the outbreak of corona virus (covid19) in Wuhan, Hubei province, China.^[3] WHO Director-General, Dr. Tedros Adhanom Ghebreyesus, noted that between February to early March in 2020 the number of cases outside China increased 13-fold and the number of countries with covid -19 cases increased threefold^[4] on March 11, 2020 WHO declared the novel corona virus (COVID-19) outbreak a global pandemic.^[4] Literature Reviews shows, there is an important and strong possibility of airborne transmission of SARS-CoV-2 in indoor air environments. Airborne transmission of SARS-CoV-2 can occur under special circumstances.^[5,6]

WHO has advocated physical distancing, keeping rooms well ventilated, avoiding crowds, cleaning your hands, coughing into a bent elbow or tissue and usage of mouth masks to control Covid -19.^[7] Masks are a type of personal protective equipment used to prevent the spread of respiratory infections. These masks cover the mouth and nose of the wearer and, if worn properly may be effective in preventing transmission of respiratory viruses and bacteria. The government of India across its states penalized the people not using the mouth mask in public places during these testing times.^[8] Thus, Mask became an integral part of everyday life of frontline workers as well as the common people of the country.

Mouth masks are various devices that are used in healthcare and community settings worldwide, ranging from cloth, cotton, or gauze masks (cloth masks); medical, surgical, or procedure masks (medical masks); and N95, N99, N100, P2, P3, FFP2, and FFP3 respirators (respirators)^[9] with the increase usage the risk of

generating waste also increases that could be hazardous to the general population and people handling disposal of waste.^[10]

A cross sectional survey was carried out among general population in Pakistan had adequate knowledge about covid -19 with high prevalence of myth.^[11] Reviewed articles show lack of public awareness in India towards prevention of covid -19. Identifying Mask wearing practice of public regarding face mask utilization is very important to identify gaps and intervene immediately to control the spread of the infection. Hence, the main aim of this study was to determine the peoples practice towards face mask utilization and disposal in Pune, Maharashtra India.

MATERIALS AND METHODS

Participants and procedure

A descriptive and cross-sectional study was conducted between 01-02-2021 to 16-02-2021 among general public in the state of Maharashtra (Pune) regarding public practice towards usage and disposal of mouth mask using closed ended questionnaire. Institutional Ethical Clearance was obtained before the main Study.

Questionnaire

Pilot study was conducted to check the feasibility of questionnaire among 30 people, before the main study modifications were made to collect the required and relevant information pertaining to the objectives of the study. Questionnaire was validated with Cronbach alpha 0.556 Questions were framed based on our observations and reviewing the previous articles. A total of 15 structured questions were prepared to evaluate mouth

mask wearing practice and its disposal. The study was conducted among a total of 516 participants.

Sampling method

The random sampling method was used for data collection; questionnaire was distributed after explaining the objectives of the study and obtaining written informed consent. Adequate time was given to participants to understand and respond the questionnaire.

Statistical analysis

The data were tabulated in excel, and descriptive statistics were made.

RESULTS

Table 1: Distribution of Study Participants according to there Background.

Age	Male	Female
18-35	192	130
36-45	53	35
>45	79	27
Total	324	192
Education		
Illiterate	0	2
Primary school	7	4
Middle school	50	31
High school	53	30
Graduate	170	83
Post Graduate	44	42
Occupation		
Unskilled	37	73
Semiskilled	42	17
Skilled	157	44
Professional	88	58

Table 2: Practice of usage, storage and disposal of mouth mask among general public.

Questions	Answer	Total
1) Do you advocate usage of face coverings during pandemic?	Yes	476 (92.24%)
	No	46 (8.91%)
2) Do face coverings, during pandemic, help in protection of yourself and public?	Yes	489 (94.76%)
	No	27 (5.23%)
3) Which type of face covering do you prefer?	Mouth mask	466 (90.31%)
	Handkerchief	38 (7.36%)
	Scarf	11 (2.13%)
	Bandana	1 (0.19%)
4) Which type of mask do you use?	Disposal	112 (21.70%)
	Resusable	404 (78.29%)
5) When do you dispose your disposable mask ?	After 1-2 days	283 (54.84%)

	After 5-6 days	138 (26.74%)
	Not applicable	95 (18.41%)
6) When do you dispose your reusable mask?	When it's torn /unusable	294 (56.97%)
	1-2 times after using	222 (43.02%)
7) Which type of mask do you use	N95	150 (29.06%)
	Fabric mask	295 (57.17%)
	Surgical mask	38 (7.36%)
	Any other	33 (6.39%)
8) How many times you use your reusable mask	For single time only	138 (26.47%)
	4-5 times	177 (34.30%)
	For a week	124 (24.03%)
	Any other	77 (14.92%)
9) When/Where do you use mouth mask?	Whenever you go outside	143 (27.71%)
	In crowded areas	30 (5.81%)
	In hospitals	28 (5.42%)
	Everywhere	315 (61.04%)
10) how do you wash and disinfect your reusable Mask	Water only	32 (6.20%)
	Water and detergent	212 (41.08%)
	Soaking in hot water and washing with detergent	214 (41.47%)
	Soaking in hot water and washing with detergent and then iron it	58 (11.25%)
11) Do you store your facemask in paper or plastic zip locks bags 72 hours before disposal?	Yes	125 (24.22%)
	No	391 (75.77%)
12) Are you aware that used mask can cause Environment contamination if inappropriately used?	Yes	443 (85.85%)
	No	73 (14.14%)
13) Do you dispose your reused mask?	Yes	439 (85.07%)
	No	77 (14.92%)
14) How do you dispose your facemask after its complete usage?	Cut it in half and throw it in the dustbin	399 (77.32%)
	Burning it in backyard	76 (14.72%)
	Burying it in backyard	28 (5.42%)
	Throw it anywhere in public areas	13

	and on the streets	(2.51%)
15) Where do you dispose your facemask?	Throw it in the dustbin along with domestic waste	346 (67.05%)
	Segregate it in separate bag/dustbin	170 (32.94%)

A total of 516 participants filled the questionnaire by responding to all the questions. Amongst those 516 participants, 324 were males (63.95%) and 192 were females (36.04%). Majority Participants were in 18-35 age group were graduates and possessed skilled occupation. (Table 1) Regarding the usage of face coverings during pandemic covid-19, 476 (92.24%) participants preferred to use face coverings, and 489 (94.76%) agreed wearing face coverings during covid19 help in protection of themselves and public. 466 (90.31%) participants opted for facemask, 38 (7.36 %) handkerchief, while 11 (2.31%) opted for scarf. (Table2)

About type of facemask, 404 (78.29%) used reusable facemasks and 112 (21.70 %) preferred disposable mask. Regarding the dispose of disposable of mask 283 (54.83%) disposed and with respect to reusable mask 294 (56.97%) disposed when it was torn. (Table 2) With respect to preference for particular type of mask majority 295 (51.97%) preferred fabric mask and 150 (29.06%) opted N95 facemasks, When questioned regarding how many times do they use their reusable masks; 177 (34.30%) used mask for 4-5 times/day. When questioned regarding when/where they use their facemask, 315 (61.04%) worn everywhere and 143 (27.71%) worn while stepped outside. Regarding disinfecting their reusable facemask, 214 (41.47 %) Soaked in hot water and washed with detergent and 212 (41.08%) used water and detergent. About storage of their used facemask in paper or plastic zip lock bags 72 hrs. before disposal, 391 (75.77%) didn't follow this practice and 125 (24.22%) practiced the scientific method of storage. When we asked about contamination of mask if inappropriately disposed, 443 (85.85%) of study population answered Yes, and remaining 73 (14.14%) answered No. (Table 2)

When the population was inquired about how do they dispose their facemasks after its complete usage, 399 (77.32%) participants cut their used mask in half and throw it in dustbin. 76 (14.72%) population burnt their used facemask in backyard, 28 (5.42%) population buried in backyard, and remaining 13 (2.51%) population threw it anywhere in public areas and on the streets. (Table 2)

DISCUSSION

COVID-19 pandemic is a major public health emergency. Since the outbreak, various measures have been applied in to control the spread of infection.^[11] Various countries implemented multiple measures to compel people to wear masks^[12], including India that imposed fines for not wearing masks in public.^[8] However, to prevent a new lock down, interventions to limit transmission are urgently needed as the cases soar.

The first and most important recommendation given to the population, has been the implementation of PPE use, associated with social distancing.^[13] Face mask reduces the spread of infection through nasal and oral routes and controls the spread of COVID-19 by reducing the amount of infected saliva and respiratory droplets released into the air from individuals with subclinical or mild COVID-19 symptoms.^[14] The studies conducted in regards to the usage of masks as a strategy of infection control, suggested masks as important tools during the COVID-19 pandemic in both community and health care settings.^[15] Data about the filtration efficiency of cloth masks are still poor. Meta analysis of studies suggested filtration effectiveness between 2 to 38 %, ^[16] however, in order to prevent PPE shortage crisis for healthcare workers, health authorities recommended the use cloth masks.^[17] Currently there are no studies in India assessing the general public's knowledge and use of face masks during the ongoing COVID-19 pandemic.

The proper usage as well as the disposal of used mask is necessary to avoid the contamination and cross contamination in covid 19 pandemic.^[18] Therefore, keeping this in mind, the purpose of our study was to evaluate the knowledge of general public on mask usage and its disposal in India.

Regarding the advice on the usage of face coverings, during pandemic covid-19, maximum participants advocated the usage of mouth mask for the protection of themselves as well as the others. In a similar study from Malaysia, nearly half of the general public studied wore face masks^[19] and in Pakistan 91% of general public felt wearing facemask should be used as a preventive measure for COVID-19.^[11]

Majority opined face coverings help to protect themselves and public in the pandemic situation, the main aim of wearing a mask or face covering is to protect the wearer transmission of respiratory viruses and bacteria, this health awareness among public could have been through reinforcement of covid-19 guidelines by various modes like (digital and print) newspapers, news channels and other social Medias.

Around 90.31% of the population used mouthmask, 7.36% people used handkerchief, 2.13% people used scarf and 1 individual used bandana. Maximum public used the facemask which is in agreement with protective guidelines against pandemic covid-19 according to CDC.^[21] Cloth mask in the form of hand kerchief are still better than nothing.^[22] Mask choice is dependent on their availability and affordability.

When inquired about whether they used disposable or reusable mouth mask 21.70 % public answered disposable and 78.29% people answered reusable. Use of disposable face masks are polluting the environment that has stimulated a surge in new sustainable innovations which includes recycling and improved waste management.^[23] Reusable Cloth face masks have limited efficacy in combating viral infection transmission. However, it may be used in closed, crowded indoor, and outdoor public spaces involving physical proximity to prevent spread of SARS-CoV-2 infection.^[16] One study reported that washing and drying repeatedly may deteriorate the quality and efficacy of the cloth masks, by nearly 20% after four times of this cycle.^[24]

When we questioned about the disposal of disposable mask, 54.83% of the responders answered that they disposed their disposable mask after 1-2 days of use. The disposable masks are used for single time only. This is in contradiction to a study in Italy where participants used for 3-4 hours.^[25] Regarding disposal of reusable mask, 56.97% public use their reusable mask until it became unusable or torn. Reusable masks such as cloth mask can be properly washed, disinfected, dried and can be reused. Public has to be educated about the proper usage and disposal of mask.

With respect to the type of the masks, majority of the public i.e.57.17% preferred use of fabric mask over surgical and N95 masks. This is in contradiction to the study in Pakistan as they preferred surgical masks over fabric.^[11] During a pandemic, cloth masks may be considered, however, they should be used as a last resort when medical masks and respirators are not available.^[26] This might be because of the high cost, shortages for surgical face masks and N95 respirators discomfort for their prolonged use have led to public use of a variety of solutions that are generally less restrictive but provide protection against infection such as homemade cotton masks.

With respect to the place preference for wearing a mask; the majority of participants' answered everywhere when step outside. This is in compliance with CDCs guideline for mitigating covid -19, thus indicates public awareness about mask usage. Around 30% responded that they soaked the mask in hot water and detergent. Literature review showed that the most promising methods of disinfecting mask are use of hydrogen peroxide vapor, ultraviolet radiation, moist heat, dry heat and ozone gas. Soapy water are not fully recommended, this clearly shows people unawareness about scientific method of disinfection.

When enquired if they stored used mask in a zip lock bag for 72 hours before disposal^[18], majority 75.77% responded as negative. Waste materials generated from households and quarantine facilities with infected or suspected patients may possibly contain traces of COVID-19 and could be a source of infection for people

outside the facility. We did not find any articles which indicate public knowledge of same. This clearly indicates the lack of knowledge in public about proper method of mask storage before disposal.

About impact of disposable mouth mask on environmental pollution, 85.85% agreed, Masks decrease the spread of infection from person to person but its inappropriate disposal may cause cross contamination and environmental pollution^[27] Majority (77.32%) answered that they cut the mask into half and throw it in dustbin. Majority 67.05% people threw the mask along with general waste and a smaller (32.94%) proportion segregates the used mask in a separate bag. (Table 2) Even though the people were aware about the negative impact of improper disposal of mask on environment, proper segregation and disposal was not reflected. The public needs to be made aware about proper method of mask disposal.

SUMMARY AND CONCLUSIONS

Appropriate and wise Behaviour leads to prevention and control of pandemic covid -19. Wearing Mouth Mask definitely helps to mitigate this spread of covid-19, Due to many factors people are using different types of face coverings. Wrong knowledge and misinformation related to masks use and reuse, may lead to an increase risk of infection among community. Hence, awareness and information campaigns aimed at general population are urgently needed in order to implement a correct use of masks and their disposal to limit the infection rate. This study did not evaluate any specific reasons (including myths) for not using facemask by the general public and this study was conducted only in one city in India and hence cannot be generalized to the entire nation.

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