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Preference of face masks among consumers during COVID-19 pandemic

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Abstract
COVID-19 spreads primarily through respiratory droplets exhaled when infected people breathe, talk, cough and sneeze. The effectiveness of face masks in preventing the spread of respiratory illnesses was controversial before the covid pandemic due to a lack of relevant data to support their use. Hence, the present work designed with an objective, to study the preference of face masks among consumers during COVID-19 pandemic. The data was collected among the 360 respondents through online survey. The Google from contains demographic information of respondents, occasion and duration of wearing mask, type of face mask used, reasons for wearing a specific mask, and problems faced by the respondents while wearing a mask. Majority of respondents wear mask during driving for maximum 1 to 6 hours and it was noticed that the majority of respondents prefer re-useable cloth mask followed by surgical mask, N95 particulate respirator mask, and KN 95 disposable respirators. Respondents also revealed that prolonged use of masks causes adverse effects like sweating problem, suffocation/ breathing discomfort, fogging of spectacles, irritation, pain in the ear due to elastic loops etc. Hence, it can be concluded that, mask wearing behaviour is a key measure to suppress transmission of disease although while wearing it develops irritation but to protects our health it is essential to use during pandemic. The re-useable cloth mask is more preferable might be due to the comfort ability and ease of use.

Keywords: COVID-19 pandemic, Google form (Online Survey), demographic information and preference of face mask

Introduction
Airborne diseases are bacteria or viruses that are most commonly transmitted through small respiratory droplets. These droplets are expelled when someone with the airborne disease sneezes, coughs and exhales in some way. These infectious vehicles can travel along air currents, linger in the air, or cling to surfaces, where they are eventually inhaled by someone else (Brennan, 2021).

With the recent COVID-19 pandemic, everyone has become more conscious about the air to breathe and the surfaces to touch. Disease transmission can happen in different ways, but the most unpredictable method is via airborne transmission. COVID-19 spreads primarily through respiratory droplets exhaled when infected people breathe, talk, cough and sneeze. The droplets are smaller than 10μm in diameter, which is *aerosols*. The number of small droplets and particles increases with the rate and force of airflow during exhalation. Larger droplets fall out of the air rapidly, but small droplets and the dried particles formed from them can remain suspended in the air. In circumstances with poor ventilation, typically indoor enclosed spaces where an infected person is present for an extended period, the concentrations of these small droplets and particles can build sufficiently to transmit infection.

With economic activity severely and adversely affected by broad-based shutdowns to stem the initial surge in COVID-19 cases, policymakers are eager to find more targeted ways to reduce the number of new cases (Edward *et al*, 2020). The broad usage of masks or other cloth face coverings appears to hold promise in this regard. A variety of evidence suggests that masks can help reduce the transmission of the novel coronavirus. To the extent that masks or face coverings are widely worn, they can potentially help to improve public health outcomes at a relatively low cost in terms of foregone economic activity when compared with alternative approaches, such as mandated closures of segments of the economy.

Respiratory masks are protective devices covering a part of the face. They are designed to protect both the person who wears them and the immediate environment from breathable pollutants.

Different types of masks are available in the market *viz.*, surgical mask, N95 particulate respirator mask, EN 149 cone mask, KN 95 disposable respirator and reusable cloth mask. Surgical mask that covers the user's nose and mouth and provides a physical barrier to fluids and particulate materials. The mask meets certain fluid barrier protection standards and Class I or Class II flammability tests. N95 filtering facepiece respirator is a particulate-filtering facepiece given by National Institute for Occupational Safety and Health (NIOSH) and it filters at least 95% of airborne particles. EN 149 cone mask is the European Standard specifies the minimum requirements for filtering half masks used as respiratory protective devices, specifically against particles. Half half mask is one in which the facepiece consists entirely or substantially of filter material or comprises a facepiece in which the main filter forms an inseparable part of the device. Cloth face mask is made of cotton, which are recommended by public health agencies for disease "source control" in epidemic situations to protect others from virus laden droplets in infected mask wearers' breath, coughs, and sneezes. The effectiveness of face masks, in preventing the spread of respiratory illnesses was controversial during the covid pandemic due to a lack of relevant data to support their use. Hence, the present work designed with an objective to study the preference of face masks among consumers during COVID-19 pandemic.

Materials and Methods

Survey design

The data was collected from the 360 respondents through online survey using self- Google form. The Google form contains different types of questions such as short answer text, multiple choice and image choice survey questions. The Google form contain questions related to following information.

- **Demographic information:** It includes general information *viz.*, name, age, gender, locality, occupation and annual income.
- **Preference of face mask:** It includes following information
  - **Occasion of wearing mask:** Driving, during work, health issues and for safety.
  - **Duration of wearing mask:** More than 12hours, 6 to 12 hours, 1 to 6 hours and less than 1 hour.
  - **Type of face mask used:** Surgical Mask, N95 particulate respirator mask, EN 149 cone mask, KN 95 disposable respirators and re-useable cloth mask.
  - **Reasons for wearing a specific mask:** Easy availability, Safety Features, Re-usability, Comfort ability and Economical/ Low cost.
  - **Problems faced by the respondents while wearing a mask:** Irritation, sweating, suffocation/ breathing discomfort, tieing a string is elaborate, pain in the ear due to elastic loops, fogging of spectacles, improper fit and laundering problems.

Statistical tools: The collected data was calculated using mean and frequency.

Results and Discussion

Demographic information of the respondents

Table 1. Shows the demographic information of the selected respondents. Most of the respondents belong in middle age group (30-50 years) with 55.83 per cent followed by old age (> 50 years) with 84.00 per cent and younger age group (< 30 years) with 75 per cent. Among the respondents the gender proportion of female respondents was greater (66.66%) than male respondents (33.33%). 84 per cent of the respondents belong to the urban area followed by rural area 15.83 per cent. Further, the 50 per cent of respondents are the government employee followed by students (20%), other work (15%), private sectors (12.50%), self-employed (1.66%) and retired (0.83%) respectively. The annual income of respondents was divided into three categories *i.e.*, high (> Rs. 7.00 lakhs), middle (Rs. 3.00 to 7.00 lakhs) and low (< Rs. 3.00 lakhs). Majority of the respondents belong to high income group followed by middle (25%) and low (21.66%) income group respectively.

Table 1: Demographic information of the respondents

Demographic variables	Frequency
Age (Years)	
Younger (< 30 years)	75 (20.83)
Middle (30-50 years)	201 (55.83)
Old (> 50 years)	84 (23.33)
Gender	
Male	240 (66.66)
Female	120 (33.33)
Locality	
Rural	57 (15.83)
Urban	303 (84.16)
Occupation	
Student	72 (20.00)
Government employees	180 (50.00)
Private sector	45 (12.50)
Self-Employed	06 (1.66)
Retired	03 (0.83)
Others	54 (15.00)
Annual income (Rs.)	
High (> Rs. 7.00 lakhs)	192 (53.33)
Middle (Rs. 3.00 to 7.00 lakhs)	90 (25.00)
Low (< Rs. 3.00 lakhs)	78 (21.66)

Figures in parentheses indicate mean and frequency

Occasion and duration of wearing mask

Table 2. depicts the occasion and duration of wearing mask. Majority of respondents wear mask during driving followed by 19.16 per cent of respondents wear mask for their safety, 15.83 per cent while suffering from health issues/ allergies and 10 per cent of respondent wear mask during work.

Duration of wearing mask was categorized as, more than 12 hours, 6 to 12 hours, 1 to 6 hours and less than 1 hour. Majority of respondents wear mask for 1 to 6 hours followed by 6 to 12 hours (25%), less than 1 hour (22.50%) and very less respondents wear mask for more than 12 hours (0.83%) respectively.

Table 2: Occasion and duration of wearing mask

Sl. No.	Particulars	Frequency
(a)	**Occasion of wearing mask**	
1	While Driving	75 (20.83)
2	During Work	36 (10.00)
3	Health Issues/Allergies	57 (15.83)
4	For Safety	69 (19.16)
(b)	**Duration of wearing mask**	
1	More than12 Hours	03 (0.83)
2	6 to 12 Hours	90 (25.00)
3	1 to 6 Hours	186 (51.66)
4	Less than 1 Hour	81(22.50)

Figures in parentheses indicate mean and frequency

Preference of types of face masks

There are different types of masks available in the market which can wear depending on the situation. Always one should choose a well-fitting and comfortable mask and wear it properly by fully covering nose and mouth. A poorly fitting or uncomfortable mask may be worn improperly or taken off frequently, which may reduce its intended benefit.

Table 3 discloses the type of face mask used by the respondents. It is noticed that the majority of respondents used re-useable cloth mask followed by surgical mask (40.00%), N95 particulate respirator mask (10.00), EN 149 cone mask and KN 95 disposable respirators (6.66%) respectively. The most of the mask wearer preferred re-useable cloth mask might be due to the comfortability, ease of use and most importantly it is made up of cotton fibre which is biodegradable, recyclable and is highly recommended for its porousness and breathability.

Table 3: Preference of types of face masks

Sl. No.	Type of face mask used	Frequency
1	Surgical Mask	144 (40.00)
2	N95 Particulate Respirator Mask	36 (10.00)
3	EN 149 Cone Mask	24 (6.66)
4	KN 95 Disposable Respirators	24 (6.66)
5	Re-useable Cloth Mask	255 (70.83)

Figures in parentheses indicate mean and frequency

Reasons for wearing a specific mask

Masks are a key measure to suppress transmission and save lives. It is a simple barrier to prevent your respiratory droplets from reaching others and should be used as part of a comprehensive approach including physical distancing, avoiding crowded, closed and close-contact settings, good ventilation, cleaning hands, covering sneezes and coughs, and more. There are some reasons for wearing a specific mask *i.e.*, easy availability, safety features, re-usability, comfortability and economical/ low cost.

Table 4. Inferences the reasons for wearing a specific mask by the respondents. Majority of respondents wear mask for its comfortability (52.50%) followed by easy availability (51.66%), re-usability (45.00%), Safety feature (37.50%) and economical/ low cost (18.33%) respectively.

Table 4: Reasons for wearing a specific mask

Sl. No.	Reasons	Frequency
1	Easy availability	186 (51.66)
2	Safety Features	135 (37.50)
3	Re-usability	162 (45.00)
4	Comfort ability	189 (52.50)
5	Economical/ Low cost	66 (18.33)

Figures in parentheses indicate mean and frequency

Problems faced by the respondents while wearing a mask

Wearing masks for a prolonged amount of time causes a host of physiologic and psychologic burdens and can decrease work efficiency. Activity cannot be performed as long or as efficiently while wearing masks as compared to without mask. Additionally, the timeframe that an activity can be sustained is decreased when wearing masks. Prolonged use of masks causes adverse effects such as irritation, sweating, suffocation/ breathing discomfort, tieing a string is elaborate, pain in the ear due to elastic loops, fogging of spectacles, improper fir and laundering problems. It also interferes with vision, communication, and thermal equilibrium.

Majority of respondents faced sweating problem while wearing a mask (68.33%) followed by suffocation/ breathing discomfort (50.00%), fogging of spectacles (26.66%), irritation (19.16%), pain in the ear due to elastic loops (16.66%), tieing a string is elaborate (10.00%), improper fit (3.33%), laundering problems (1.66%) and 2.50 per cent of respondents faced other problems. Hence, the sweating, suffocation/ breathing discomfort and fogging of spectacles were recognised as common adverse effects / problems among the respondents while wearing mask. The results are on par with the results of Alves (2021) [1] who stated that, breathing issues and inconvenience are key factors behind non-compliance

When it came to non-compliance towards covering face, breathing problems emerged (50%) as a key reason, followed by discomfort and inconvenience at 44% (Table 5).

Table 5: Problems faced by the respondents while wearing a mask

Sl. No.	Problems faced	Frequency
1	Irritation	69 (19.16)
2	Sweating	246 (68.33)
3	Suffocation/ Breathing Discomfort	180 (50.00)
4	Tieing a string is elaborate	36 (10.00)
5	Pain in the ear due to elastic loops	60 (16.66)
6	Fogging of spectacles	66 (26.66)
7	Improper fit	12 (3.33)
8	Laundering problems	06 (1.66)
9	Any Other	09 (2.50)

Figures in parentheses indicate mean and frequency

Conclusion

The effectiveness of face masks, in preventing the spread of respiratory illnesses was controversial before the covid pandemic due to a lack of relevant data to support their use. The scientific evidence has increased during the pandemic. Compiling the data, it showed that majority of respondents wear mask during driving for maximum 1 to 6 hours and it was noticed that the majority of respondents prefer re-useable cloth mask followed by surgical mask, N95 particulate respirator mask, and KN 95 disposable respirators. Respondents also revealed that prolonged use of masks causes adverse effects like sweating problem, suffocation/ breathing discomfort, fogging of spectacles, irritation, pain in the ear due to elastic loops etc. Wearing a face mask is an effective non-pharmacologic strategy for reducing the transmission of virus, particularly as source control to reduce spread from infected people and protect the person from exposure of infection.

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