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## Knowledge among dental students about types of masks used during Covid-19 pandemic

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### Abstract

**Background:** Corona virus is a respiratory illness caused by severe acute respiratory syndrome (SARS-2). Due to this pandemic, masks have been recommended as a main factor to tackle this situation. N95 respirators, surgical masks and home-made masks plays a major role in it. Shortage of these masks have been created a negative impact.

**Aim:** The study aims at assessing awareness and knowledge about types of mask among dental students.

**Method and Materials:** The descriptive cross-sectional study was conducted among dental students between the age of 17-32 years. Due to COVID pandemic the questionnaires were sent through various social platforms like whatsapp, instagram and Statistical analysis was evaluated.

**Results:** It was observed that 95.3% were aware about types of mask and 30.2% of the participants believed that wearing mask will protect them from corona virus. And when question was raised about which mask was appropriate in this COVID 19 pandemic, about 56.4% responded that N95 respirators is the correct mask to wear in this COVID situation. And 40.9% of them stated that 4 hours is the maximum usage of surgical mask and 31.5% responded that there are about 3 levels in surgical masks.

**Conclusion:** In this study most of them were aware about types of mask. Yet considerable number of participants were to be imparted knowledge about types of mask. Hence forth, people can be educated by conducting online awareness programmes.

**Keywords:** corona virus, N95 respirators, surgical mask

### Introduction

Corona virus (COVID-19) is a respiratory illness caused by severe acute respiratory syndrome corona virus2(SARS-CoV-2), which was first originated in China in December 2019, and since then it spread to various countries over the world. It spreads to people when infected person coughs or sneezes and through respiratory droplets. The risk of getting corona virus is getting higher now-a-days<sup>[1]</sup>. Due to this outbreak situation masks have been recommended as potential key to overcome this pandemic situation<sup>[2]</sup>. A face mask is a flexible-fitting and single-use device that covers the nose, mouth and chin. It provides a barrier against potentially infectious droplets<sup>[3]</sup>. Three types of masks play a major role in this pandemic situation, they are N95 respirators (Fig 1), surgical masks (Fig 2), and home-made masks (Fig 3) There is currently a global shortage of N95 and surgical masks due to higher rate of COVID cases and for use in hospitals. Homemade masks present a pragmatic solution for use by the public<sup>[2]</sup>. Filtering facepiece particulate respiratory and facemasks are widely utilized for reducing the risk of infection spread. In health care environments, NIOSH-certified N95 respirators and surgical masks are considered to be a perfect means of preventing or slowing transmission of corona virus. These N95 respirators are used by health care workers, general public, patients, etc. The main purpose of this N95 respirators is to protect a wearer from inhaling ambient aerosol particles. This N95 mask requires FIT testing. But surgical masks do not need any FIT testing. And the purpose of surgical masks is to protect other people from the aerosol expelled by its wearer<sup>[4]</sup>. Wearing surgical masks or N95 masks will slow down the virus spread and reduce the infection spread. Even though these masks are intended for single use only and should be carefully disposed as recommended by the manufacturers.

Reuse of these masks are strictly prohibited [5]. Due to the shortage of N95 masks and surgical masks, on April, 3<sup>rd</sup> 2020, the Centres for Disease Control (CDC) issued new guidelines advising everyone to wear a homemade/cloth masks in public areas where close contact with other people is unavoidable [6]. World Health Organization recommended that homemade mask be used in nonmedical settings to reduce the spread of

SARS-CoV2. These masks also protect us from aerosol particles [7]. Bond between dentist and mask has been there more than decades. Masks beside being a protective wear has become a daily wear. The aim of this study was to assess an awareness on knowledge about types of masks among Dental Students.



Fig 1: N95 Respirator



Fig 2: Surgical Mask



Fig 3: Home Made Mask

**Materials and Methodology**

A cross-sectional study was conducted among dental students in various dental colleges. The purpose of this study was to determine the knowledge about types of masks used during COVID-19.

The main purpose of this study is to gain knowledge about different types of masks, duration, their effectiveness, etc. The questionnaire was included about the demographic details such as age, email-id and qualification. And the questionnaires regarding types of mask, layers of masks and risks associated with wearing mask for prolonged were included to the subjects.

This study was conducted and distributed through google forms for various dental colleges over Tamil Nadu among

third year 13.8% (65), final year 15.3% (72), intern 47.9% (225) and post-graduates 23.0% (108). It takes barely 5-6 minutes to fill this google form.

This study was started on 21<sup>st</sup> May 2020 and completed on 20<sup>th</sup> August 2020. Total 470 students were participated in this Questionnaires survey with their concern.

**Result**

This study was conducted to analyse the knowledge about types of mask among dental students. A total of 470 samples were collected of age which is from 17-32 years of mean 23.368±1.8070 which 217 (46%) were females and 253 (53%) were males.

**Table 1:** Distribution of Study Participants According to Knowledge about Types of Mask

Question	Option	Frequency (n)	Percentage (%)
Are you aware of types of mask	Yes	448	95.3
	No	22	4.7
Do you think wearing mask will protect you from corona virus	Yes	142	30.2
	No	137	29.1
	May be	169	36.0
	Don't know	22	4.7
Which mask is appropriate in this covid 19 pandemic	Surgical mask	136	28.9
	Others	27	5.7
	N95 respirator	265	56.4
	Homemade mask	42	8.9
Who invented n95 mask	William Stewart Halsted	113	24.0
	Peter Tsai	179	38.1
	Paul Berger	56	11.9
	Johann von Mikulicz-Radecki	122	26.0
In which year n95 mask was patented Can n95 mask be refused by doctors after contact with covid patients	2010	66	14.0
	1998	84	17.9
	1995	191	40.6
	1994	129	27.4
	Yes	133	28.3
	No	186	39.6
	May be	110	23.4
How many layers does n95 mask respirator contains	Don't know	41	8.7
	10	42	8.9
	8	81	17.2
	6	145	30.9
What does n in n95 mask mean	4	202	43.0
	Non Resistant to water	201	42.8
	Non Resistant to oil	87	18.5
	Non Resistant to fog	98	20.9

	Non Resistant to dust	84	17.9
What are the risk associated of n95 extended use	Risk of infection spread	156	33.2
	Loss of filtration effectiveness	73	15.5
	Discomfort	130	27.7
	All of the above	111	23.6
What material is n95 mask made of	Woven polypropylene Fiber	188	40.0
	Polyethylene	47	10.0
	Polycarbonate	74	15.7
	Non-woven polypropylene Fiber	161	34.3
How long can you use n95 respirators	More than a day	49	10.4
	8 hours	196	41.7
	4 hours	125	26.6
	1 day	100	21.3
What are the side effects of wearing n95 respirators	Nausea	86	18.3
	Itching	91	19.4
	Headache	133	28.3
	Dizziness	160	34.0
Does n95 mask require fit testing	Yes	156	33.2
	No	132	28.1
	May be	123	26.2
	Don't know	59	12.6
Do you think n95 mask is washable	Yes	126	26.8
	No	154	32.8
	May be	147	31.3
	Don't know	43	9.1
In which condition n95 respirators shouldn't worn	Pregnancy	123	26.2
	Dizziness	66	14.0
	Asthma	161	34.3
	All of the above	120	25.5
How many layers does surgical masks contains	4	117	24.9
	3	151	32.1
	2	110	23.4
	1	92	19.6
How long can you use surgical mask	More than 8 hours	61	13.0
	8 hours	129	27.4
	4 hours	192	40.9
	2 hours	88	18.7
What material is surgical masks made of	Woven Polypropylene fabric	195	41.5
	Polyvinylchloride	41	8.7
	Polystyrene	90	19.1
	Non-Woven polypropylene fabric	144	30.6
What is the pore size of surgical masks	0.3-1.0 micron	54	11.5
	0.3-0.5 micron	194	41.3
	0.2-0.8 micron	105	22.3
	0.2-0.5 micron	117	24.9
How many levels there in surgical masks	4	135	28.7
	3	148	31.5
	2	123	26.2
	1	64	13.6
Do you think wearing masks for prolonged period can cause itching	Yes	153	32.6
	No	118	25.1
	May be	145	30.9
	Don't know	54	11.5
What are all the side effects by using masks for several hour	Peeling	89	18.9
	Pain	60	12.8
	Itching	177	37.7
	Burning sensation	144	30.0

When questioned about “Are you aware of types of mask” about, 95.3% of the participants responded positively and 30.2% of participants responded positively when question raised about “Do you think wearing mask will protect you from corona virus. (Table 1)

When questioned about “Which mask is appropriate in this COVID 19 pandemic” most of the participants i.e. 56.4% responded N95 respirator. About, 38.1% responded Peter Tsai was the appropriate answer for the invention of N95 mask. When questioned about “In which year N95 mask was

patented” about, 40.6% of the participants stated that N95 mask was patented in 1995

When asked about “Can N95 mask reused by doctors after contact with COVID patients” Most of the participants 39.6% were aware that, doctors should not use N95 mask after contact with the COVID patients, when questioned about, “how many layers does n95 respirators contains”, around 43% of the participants revealed 4 layers is the appropriate answer. When questioned about “what material is N95 mask made of” only 34.3% were aware that it is made of Non-woven

polypropylene fiber.

About 41.7% of participants responded 8 hours as the appropriate answer when questioned about “How long can you use N95 respirators?”. When questioned about “Does N95 mask require fit testing” about, only 33.2% of the participants responded positively.

About 32.1% of the participants responded there are 3 layers in surgical masks. When questioned about “How long can you use surgical mask” about 40.9% of the participants responded correctly 4 hours is the maximum usage of surgical mask. About 30.6% of the participants responded Non-Woven propylene fabric is the appropriate answer for the question “What material is surgical mask made of”.

When questioned about “How many levels there in surgical masks” about 31.5% of the participants responded there are about 3 levels in surgical masks. And about 32.6% of the participants responded positively when questioned about “Do you think wearing masks for prolonged period can cause itching?”. Most of the participants 37.7% responded itching is the side effect by using masks for several hour.

### Discussion

The aim of this study was to assess the awareness of knowledge about types of mask among dental students. In time of COVID 19 pandemic, our safety is really in our hands. N95 respirators, surgical masks and cloth masks plays a vital role in this situation. The use of face masks or coverings by the general public has been recommended by health officials to reduce the risk of transmissions. Masks also remind others to practice physical distancing.

Wearing mask is the normal part of being around other people and is the protective measure against corona virus. According to the present study “wearing mask for the protection from corona virus” about 30.2% responded positively which is lower compared to the study conducted by Edward Knotek *et al*, which was 47.2%. This shows that participants were aware of the protective measures to protect themselves<sup>[8]</sup>.

In present study “When asked which type of mask was appropriate in COVID 19” about 56.4% answered N95 respirators, which is higher when compared to the study conducted by Ukasz Matusiak *et al*, where it was 13.3%. This shows that participants were conscious about spread of the disease and wanted to safeguard themselves<sup>[9]</sup>.

When question was asked about “How long can you use surgical masks” 40.6% responded to 4 hours of wearing mask which is similar to the study conducted by Josabet Johana Arellano Cotrina *et al*, which is comparatively 4 hours<sup>[10]</sup>. In contrast to the study conducted by Jagdesh Kumar Batheja *et al*, which is 14.3% is lower when compared to the present study<sup>[1]</sup>. This is because lack of perception about masks.

Masks besides acting as a barrier against spread of infection. It also provides certain side effects. In present study “when asked about the side effects of wearing N95 respirators. About 28.3% answered headache when compared to the study conducted by Lim *et al*, which is 37.3%<sup>[11]</sup>. In contrary, to the study conducted by Hu *et al*, which is 95% higher when compared to the present study<sup>[12]</sup>.

In present study “Does N95 mask require fit testing” Most of the participants 33.2% responded positively which is lower when compared to the study conducted by A. Regli *et al*. About 96% of participants gives a fit test pass rate<sup>[13]</sup>. This shows that participants in our present study should know more about N95 masks.

When questioned about layers of the surgical masks about 32.1% responded 3 layers which is lower when compared to

the study conducted by Jagdesh Kumar Batheja which is 68.9%. This reveals that specific group of people were still unaware of the layers of the mask<sup>[1]</sup> and when asked about levels of surgical mask 31.5% responded 3 layers which is the correct answer whereas in a study by Mary *et al* they concluded that 69.6% responded that the triple layer of masks were used for surgical procedures<sup>[14]</sup>

Most of the people about 32.6% were sure that wearing mask for prolonged time causes itching in this present study.

In the present study 26.8% of participants were sure that N 95 respirators is washable. This assures that people need to know more about the N95 mask. In the study conducted by Ma QX *et al*, used the sample of avian corona virus as this mimics SARS-COV 2. This revealed that N95 mask has capacity to sustain their blocking ability even after being steamed on boiling water. They also stated that steaming the N95Ms for 5 minutes will completely eradicate avian corona virus. This study also put forward that N95 mask can be reused through decontaminating by steaming<sup>[5]</sup>.

### Conclusion

In this COVID 19 pandemic N95 respirators, surgical mask and home-made masks plays an irreplaceable role. Hence the result of this study concludes that the dental students were aware of knowledge about types of mask. But still considerable amount of participants were to be imparted knowledge about the types of mask.

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