

# Knowledge About Mouth Mask Usage During Covid-19 Pandemic Among Preclinical Undergraduate Dental Students And Interns.

## A.N.K.Mitthun

Saveetha Dental College and Hospitals,  
Saveetha Institute of Medical and Technical Sciences,  
Saveetha University,  
Chennai- 77  
E-mail ID: [152001044.sdc@saveetha.com](mailto:152001044.sdc@saveetha.com)

## L. Leelavathi

Reader  
Department of Public Health Dentistry  
Saveetha Dental College and Hospitals,  
Saveetha Institute of Medical and Technical Sciences,  
Saveetha University,  
Chennai-77  
E-mail ID: [leelavathi.sdc@saveetha.com](mailto:leelavathi.sdc@saveetha.com)

---

### ABSTRACT:

**Background:** The pandemic caused by novel coronavirus (SARS-CoV-2) in Wuhan, China In December 2019 is a highly infectious disease. Different types of masks were used during this pandemic.

**Aim:** The aim of this study is to assess knowledge and awareness on the usage of mouth masks used during this pandemic COVID-19 among preclinical UG and interns.

**Materials and Methods:** A cross-sectional study was conducted in Chennai,India. A self-administered questionnaire containing 13 questions was designed for preclinical UG and interns. Responses were collected and subjected to statistical analysis using SPSS software. Chi Square test was done to find the association between dependent and independent variables.

**Results:** During aerosol generation (54%) preferred using N95, (15%) preferred combination of any 2 masks, (22%) preferred surgical mask. 45% said the middle layer acts as a barrier in a 3 layered mask. 70% said ffp3 has high filter capacity. Females were more aware than males about the masks to be used during procedures related to aerosol generation, masks with high filter capacity.(p value - 0.000) Females were more aware than males about the masks to be used during procedures related to aerosol generation.(p value - 0.000)

**Conclusion:** The inputs from the study shows that interns have more knowledge in types of mouth masks than 1st and 2nd year students and females were more aware than males. There is a specific and strong need to implement periodic educational programmes and training sessions on infection control practices for COVID-19 among dentists in particular.

**Key words:** Awareness, COVID-19, Questionnaire, Survey, mouth masks, innovative analysis, infection control.

### INTRODUCTION

A mask plays an important role in every procedure among dental students as they come in direct contact with patients(1). In dentistry there is constant exposure and through various other body fluids like blood and saliva. Microorganisms can easily spread through closed spaces through dental operatories. Dentists examine the oral cavity with bare hands. When contact is made with unsterilized needles or other instruments, protective measures like masks, gloves must be undertaken(2).

There are different types of mouth masks such as basic cloth face mask, Surgical face mask, N95 respirator, Filtering facepiece respirator, Self-contained breathing apparatus, Full face respirator, Full length face shield, KN95 respirator(3). Masks should cover both the nose and mouth. A cloth face mask is worn over the mouth and nose and made of commonly available textiles(4). Masks vary widely in effectiveness, depending on material, fit and seal, number of layers, and other factors. A surgical mask is a loose-fitting, disposable device that creates a physical barrier between the mouth and nose of the wearer and potential contaminants in the immediate environment(5). A N95 mask is a particulate-filtering facepiece respirator that meets the N95 air filtration rating of the US National Institute for Occupational Safety and Health, meaning that it filters at least 95 percent of airborne particles, while not resistant to oil like the P95. It is the most common particulate-filtering facepiece(6). It's not commonly used to stop the spread of airborne illnesses, but rather is worn to decrease exposure to particles that come from wood dust, animal dander, and pollen. Those with allergies might consider using this type of face mask during the pandemic. Full Length Face Shield is a mask that's a flimsier, plastic version of the glass ones you see worn by welders. It covers the entire face from forehead to chin and is secured with a cushioned headband. For the most part, a full length face shield isn't ideal during the COVID-19 crisis as it's tough to breathe in over time. KN95 Respirators are very similar to N95 masks(7).

Face masks greatly reduce the risk of dental care workers. Dental practitioners should wear fluid resistant masks. Previous research by Abdul Afraaz et al 2020 stated that "There is a strong need to implement training programs on infection control practice". This research is done to create awareness among dental students and protect society from transmissible diseases like COVID-19. Our team has extensive knowledge and research experience that has translate into high quality publications(8–16),(17),(18),(19,20),(21),(22),(23–27) The main aim is to compare the knowledge between preclinical dental students and interns on types of mouth masks used during this global pandemic.

## MATERIALS AND METHODS

Study Design: A cross sectional questionnaire study

Study Setting: Saveetha Dental College in Chennai.- An institutional based study

Study population: Study was conducted among 100 preclinical dental students and interns at a private dental college in Chennai.

Ethical Clearance: Prior to the start of the study, ethical clearance was obtained from the institutional ethical committee.

Sampling methodology: Non probability convenience sampling was followed to select the study participants. All those who were willing to participate were included in the study and those who were not willing to participate were excluded from the study

Survey Instrument: The source of data was primary in nature and it was obtained through self-administered questionnaires.

Statistical Analysis: The responses were collected and tabulated in the excel sheet and analysed . chi square test was used to analyse the data. Independent variables are age, gender and year of study. Dependent variables are knowledge responses.

RESULTS:

A total of 100 students participated in the survey. 49% of respondents were male and 51% were female. 50% of respondents were 1st year students, 44% were interns and 6% were second year students. During aerosol generation 54% preferred using N95, 15% preferred combination of any 2 masks, 22% preferred surgical mask. On analysing the association between the gender and mask preferred during aerosol generation, females had better knowledge about this than male(Figure 1) and interns had better knowledge about masks preferred during aerosol generation than preclinical UG students (Figure 4). During non-aerosol 6% preferred using a combination of any 2 masks, 36% preferred N95, 22% preferred 3ply cloth mask and 2 suggested using surgical mask. Males had better knowledge of masks preferred during non aerosol generation than the female study participants (Figure 2) and preclinical UG students had better knowledge about masks preferred during non aerosol generation than interns (Figure 5). When the participants were asked whether level 2, level 3 masks can be used while treating low risk patients, 41% responded yes, 58% responded no and 4 responded maybe. responded that the middle layer acts as a barrier in a 3 layered mask, 25% said the inner layer is the barrier and 30% said the 1st layer. 60% prefer changing masks for every patient and 40% don't prefer changing masks. 65% don't think 3 ply masks and N95 are equally effective. 35% think they are equally effective. 88(70%) thinks ffp3 has the highest filter capacity, 70(70%) thinks ffp1 has the highest filter capacity and 7 thinks ffp2 has the highest filter capacity. Females had better knowledge about masks with high filter capacity than males (Figure 3) and interns had better knowledge in this than preclinical UG students (figure 6). About (78%) recommend N95 to the general public and (22%) do not recommend. 68% of respondents said Johann Mikulicz invented face masks, 25% said Joseph Lister invented face masks.

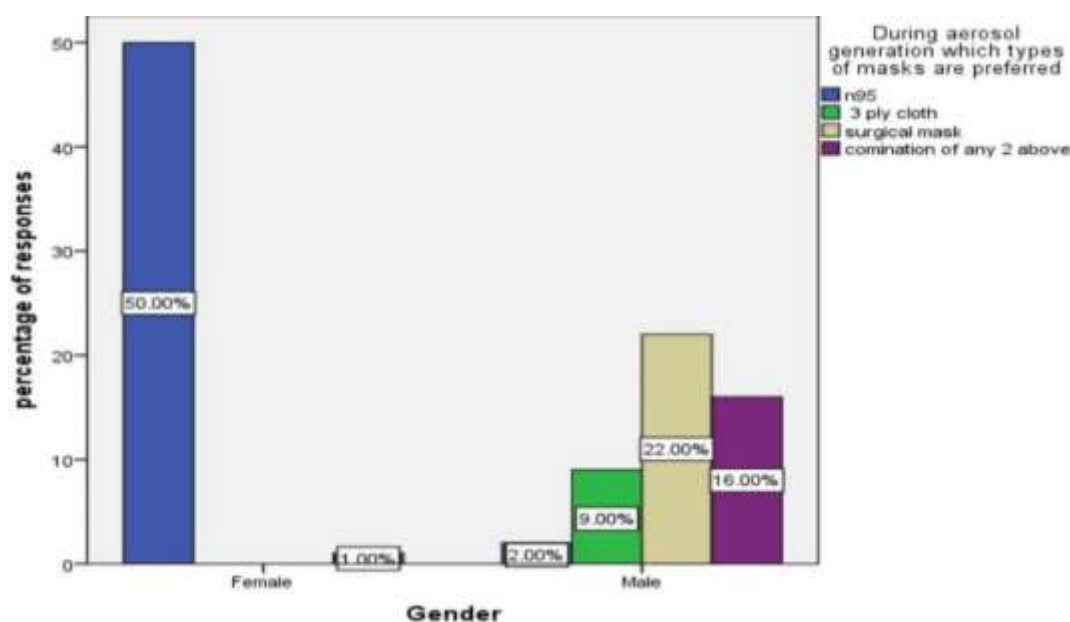


Fig 1: The bar graph represents the association between the gender and mask preferred during aerosol generation. X axis represents the gender and Y axis represents the percentage of responses.

denotes surgical mask, purple combination of any 2 masks, blue denotes N95, green denotes 3ply cloth mask. Females had better knowledge about masks preferred during aerosol generation than male and the difference was statistically significant. (Pearson chi square value - 88.662; p value - 0.000)

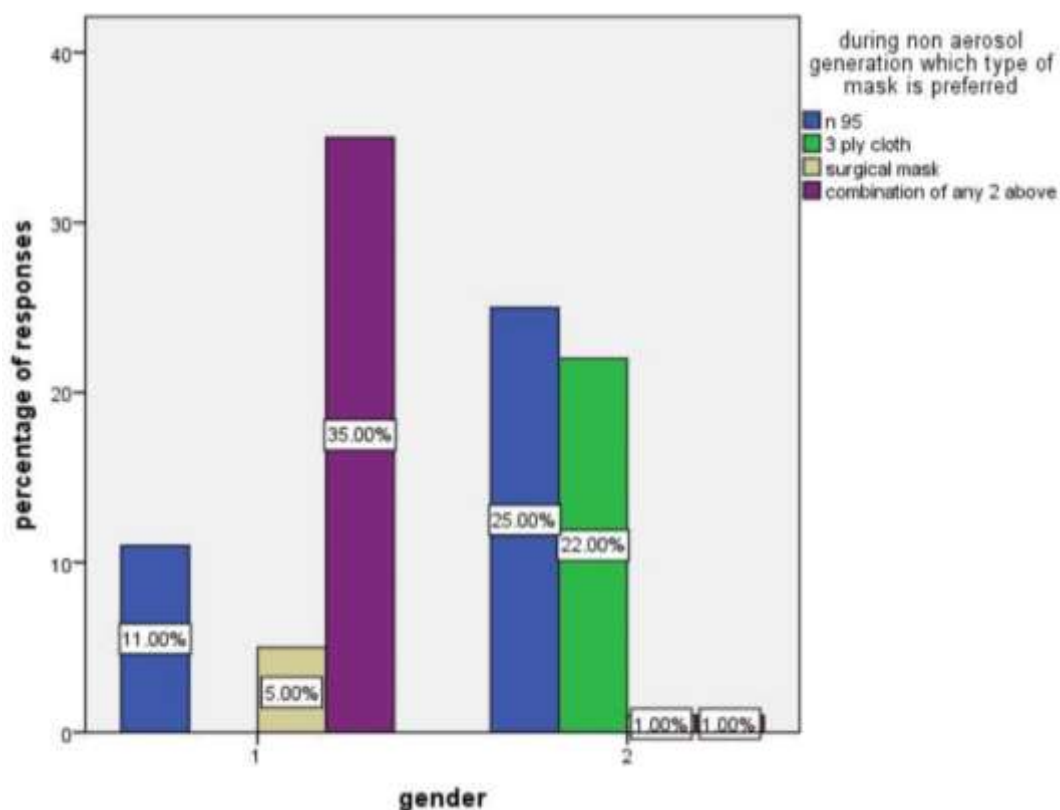


Fig 2: The bar graph represents the association between the gender and mask preferred during non aerosol generation. X axis represents the gender and Y axis represents the percentage of responses. Brown denotes surgical mask, purple combination of any 2 masks, blue denotes N95, green denotes 3ply cloth mask. Male had better knowledge of masks preferred during non aerosol generation than the female study participants and the difference was statistically significant. (Pearson chi square value - 62.207; p value - 0.000)

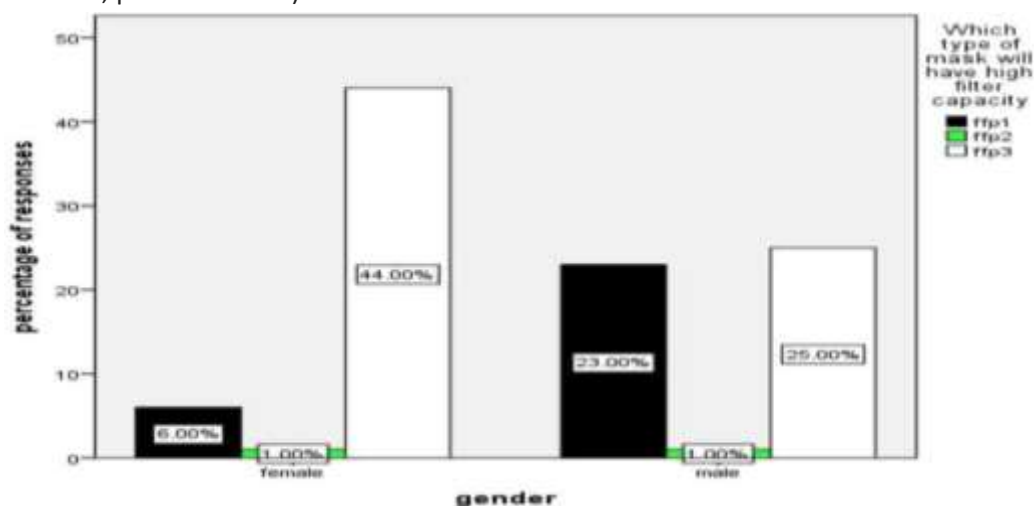


Fig 3: The bar graph represents the association between the gender and mask with high filter capacity. X axis represents the gender and Y axis represents the percentage of responses . Green denotes ffp2,

white denotes ffp3, black denotes ffp1. Females had better knowledge about masks with high filter capacity than males and the difference was statistically significant. (Pearson chi square value - 17.253; p value - 0.000)

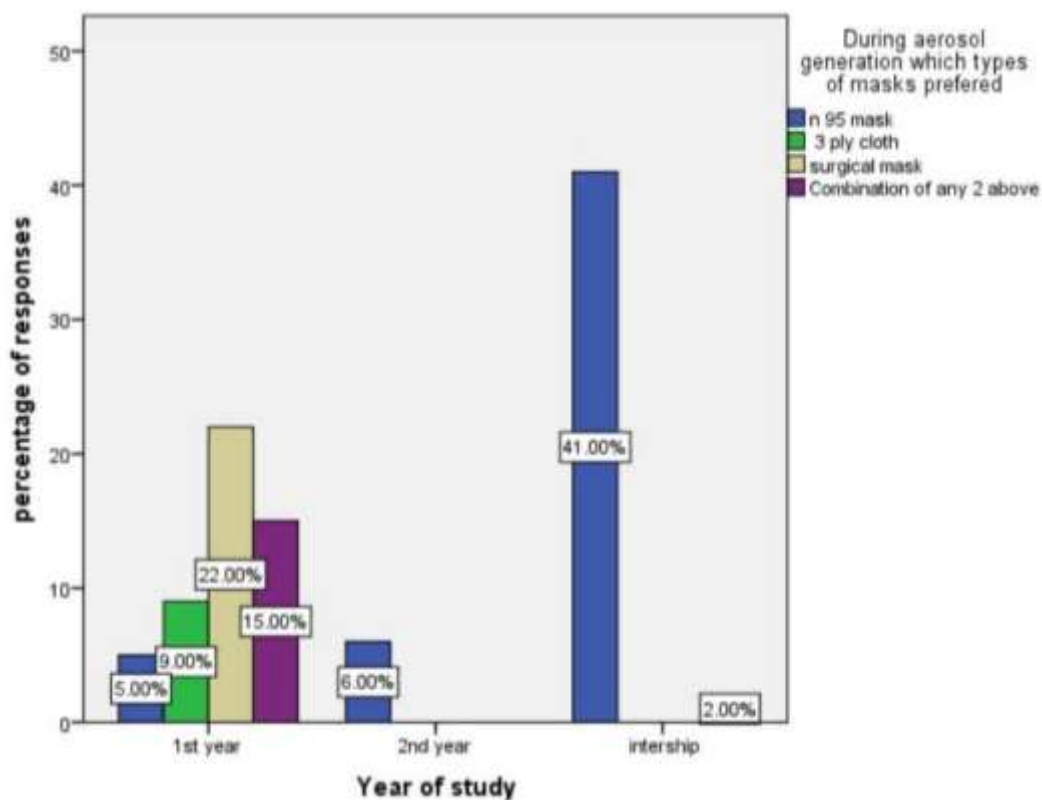


Fig 4: The bar graph represents the association between the year of study and mask preferred during aerosol generation. X axis represents the year of study and Y axis represents the percentage of responses .Brown denotes surgical mask, purple combination of any 2 masks, blue denotes N95, green denotes 3ply cloth mask. Interns had better knowledge about masks preferred during aerosol generation than preclinical UG students and the difference was statistically significant. (Pearson chi square value - 85.185; p value - 0.000)

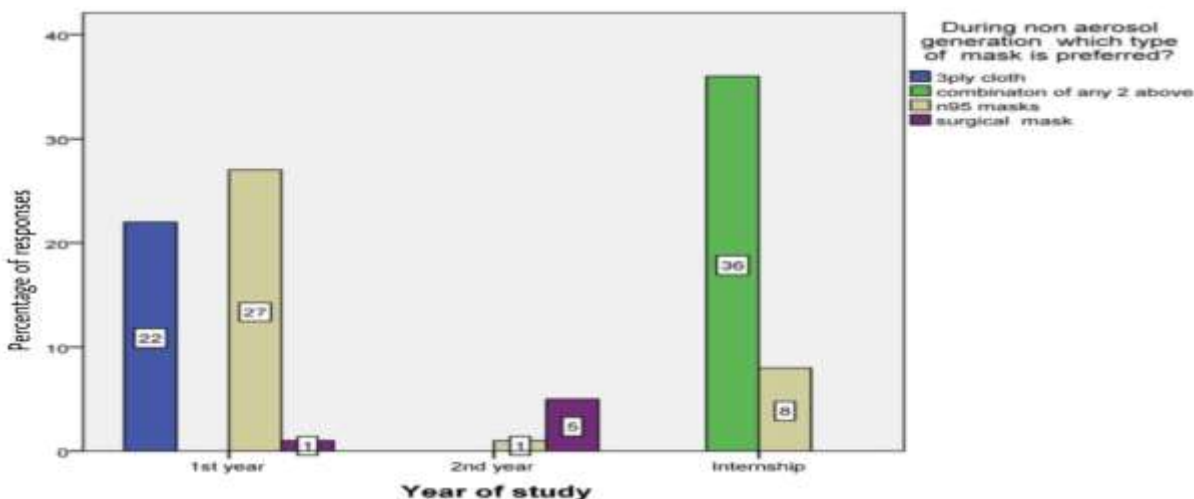


Fig 5: The bar graph represents the association between the year of study and mask preferred during non aerosol generation. X axis represents the year of study and Y axis represents the percentage of responses. Brown denotes surgical mask, purple combination of any 2 masks, blue denotes N95, green denotes 3ply cloth mask. Preclinical UG students had better knowledge about masks preferred during non aerosol generation than interns and the difference was statistically significant. (Pearson chi square value - 140.599; p value - 0.000)

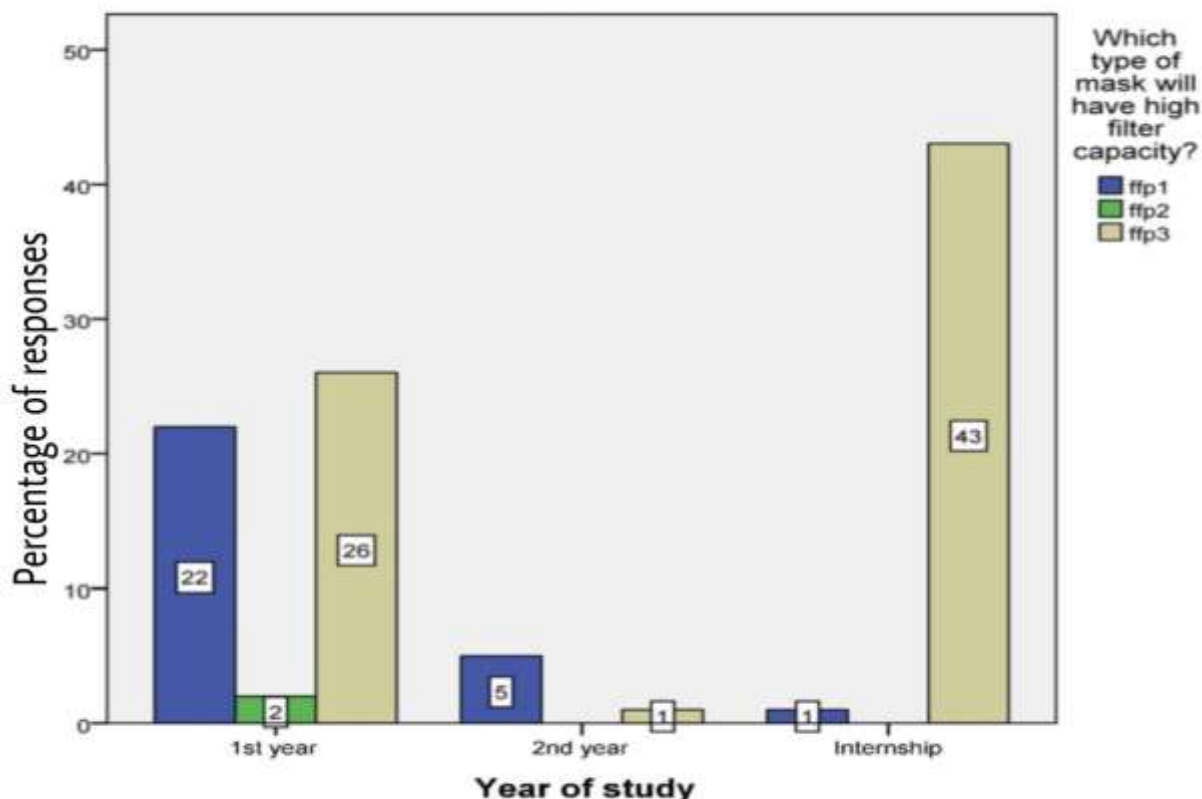


Fig 6: The bar graph represents the association between the year of study and mask with highest filter capacity. X axis represents the year of study and Y axis represents the percentage of responses. Green denotes ffp2, brown denotes ffp3, blue denotes ffp1. Interns had better knowledge in this than preclinical UG students. Pearson chi square value was found 0.000. Hence, the association was found to be statistically significant. (Pearson chi square value -69.481; p value - 0.000)

**DISCUSSION:**

In a study by Ravichandra Ravi, when questioned whether cloth masks and surgical masks are as effective as N95 respirators, 81.1% (411) disagreed with the question. Regarding the type of mask with the best filter capacity of the particles (i.e.,0.3 microns or larger), 55.1% of practitioners and 44.9% of post graduates with a total of 53.6% (272) answered it as FFP3. A total of 175 participants (34.5%) answered FFP2, and 60 participants answered FFP1.

When the side effects of usage of masks were inquired, 76.1% (386) of participants answered as yes, and 79.1% (401) of the study population accepted that there will be a reduction in O2 and Co2 levels with prolonged use of masks. When a question was asked as to which mask is suitable for COVID-19

patients, 50.7% (257) of the participants answered as valved N95, and the remaining 49.3% (250) of the participants advised the usage of non-valved N95 Masks.(28)

When coming to the three-layered mask whose layer acts as a filter, there is a mixed response, 50 percent of general dentists and When we enquired about whether they felt difficulty breathing while wearing a mouth mask, 76.1% had problems breathing while wearing the mouth mask, 49 percent of post graduates answered correctly that the middle layer acts as a filter. There is a strong need to implement periodic educational interventions and training programs on infection control practises among preclinical UG students.(29) Conducting regular educational webinars with customary guidelines and contents to create more awareness amongst the dental fraternity is important for them to stay safe and protect our society from transmissible diseases such as COVID-19.

#### **CONCLUSION:**

The present study thus concluded that interns have more knowledge about the masks than preclinical UG students. Female study participants were more aware than male study participants.

#### **CONFLICT OF INTEREST**

The author declares that there was no conflict of interest in the present study

#### **SOURCE OF FUNDING**

The present project is supported by Saveetha Institute of Medical and Technical Sciences, SaveethaDental College and Hospitals, Saveetha University

#### **REFERENCES**

1. Robinson L. Disposable Face Masks: Breathable Mouth Mask Protection 3 Ply Masks 50 PCS Indoor and Outdoor Use. 2020. 54 p.
2. Reszke R, Matusiak Ł, Krajewski PK, Szepietowska M, Białyński-Birula R, Szepietowski JC. The Utilization of Protective Face Masks among Polish Healthcare Workers during COVID-19 Pandemic: Do We Pass the Exam? *Int J Environ Res Public Health* [Internet]. 2021 Jan 19;18(2). Available from: <http://dx.doi.org/10.3390/ijerph18020841>
3. Bragazzi NL, Mahroum N, Damiani G, Kong JD, Wu J. Effectiveness of community face mask use on COVID-19 epidemiological trends and patterns in Italy: evidence from a “translational” study. *Infect Dis*. 2021 Mar 9;1–3.
4. Ortelan N, Ferreira AJF, Leite L, Pescarini JM, Souto AC, Barreto ML, et al. Cloth masks in public places: an essential intervention to prevent COVID-19 in Brazil. *Cien Saude Colet*. 2021 Feb;26(2):669–92.
5. Singh S, Ahuja U, Kumar M, Kumar K, Sachdeva M. Face mask detection using YOLOv3 and faster R-CNN models: COVID-19 environment. *Multimed Tools Appl*. 2021 Mar 1;1–16.
6. Tierno PM, Jr. *First, Wear a Face Mask: A Doctor’s Guide to Reducing Risk of Infection During the Pandemic and Beyond*. Rodale Books; 2020. 144 p.

7. Xi J, Si XA, Nagarajan R. Effects of mask-wearing on the inhalability and deposition of airborne SARS-CoV-2 aerosols in human upper airway. *Phys Fluids* . 2020 Dec 1;32(12):123312.
8. Mathew MG, Samuel SR, Soni AJ, Roopa KB. Evaluation of adhesion of *Streptococcus mutans*, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: randomized controlled trial. *Clin Oral Investig*. 2020 Sep;24(9):3275–80.
9. Samuel SR. Can 5-year-olds sensibly self-report the impact of developmental enamel defects on their quality of life? *Int J Paediatr Dent*. 2021 Mar;31(2):285–6.
10. Samuel SR, Kuduruthullah S, Khair AMB, Al Shayeb M, Elkaseh A, Varma SR, et al. Impact of pain, psychological-distress, SARS-CoV2 fear on adults' OHRQOL during COVID-19 pandemic. *Saudi J Biol Sci*. 2021 Jan;28(1):492–4.
11. Samuel SR, Kuduruthullah S, Khair AMB, Shayeb MA, Elkaseh A, Varma SR. Dental pain, parental SARS-CoV-2 fear and distress on quality of life of 2 to 6 year-old children during COVID-19. *Int J Paediatr Dent*. 2021 May;31(3):436–41.
12. Samuel SR, Acharya S, Rao JC. School Interventions-based Prevention of Early-Childhood Caries among 3-5-year-old children from very low socioeconomic status: Two-year randomized trial. *J Public Health Dent*. 2020 Jan;80(1):51–60.
13. Vikneshan M, Saravanakumar R, Mangaiyarkarasi R, Rajeshkumar S, Samuel SR, Suganya M, et al. Algal biomass as a source for novel oral nano-antimicrobial agent. *Saudi J Biol Sci*. 2020 Dec;27(12):3753–8.
14. Chellapa LR, Rajeshkumar S, Arumugham MI, Samuel SR. Biogenic Nanoselenium Synthesis and Evaluation of its antimicrobial, Antioxidant Activity and Toxicity. *Bioinspired Biomim Nanobiomaterials*. 2020 Jul 23;1–6.
15. Samuel SR, Mathew MG, Suresh SG, Varma SR, Elsubeihi ES, Arshad F, et al. Pediatric dental emergency management and parental treatment preferences during COVID-19 pandemic as compared to 2019. *Saudi J Biol Sci*. 2021 Apr;28(4):2591–7.
16. Barma MD, Muthupandiyan I, Samuel SR, Amaechi BT. Inhibition of *Streptococcus mutans*, antioxidant property and cytotoxicity of novel nano-zinc oxide varnish. *Arch Oral Biol*. 2021 Jun;126:105132.
17. Muthukrishnan L. Nanotechnology for cleaner leather production: a review. *Environ Chem Lett*. 2021 Jun 1;19(3):2527–49.
18. Muthukrishnan L. Multidrug resistant tuberculosis - Diagnostic challenges and its conquering by nanotechnology approach - An overview. *Chem Biol Interact*. 2021 Mar 1;337:109397.
19. Sekar D, Auxilia PK. Letter to the Editor: H19 Promotes HCC Bone Metastasis by Reducing Osteoprotegerin Expression in a PPP1CA/p38MAPK-Dependent Manner and Sponging miR-



- 200b-3p [Internet]. *Hepatology*. 2021. Available from: <http://dx.doi.org/10.1002/hep.31719>
20. Gowhari Shabgah A, Amir A, Gardanova ZR, Olegovna Zekiy A, Thangavelu L, Ebrahimi Nik M, et al. Interleukin-25: New perspective and state-of-the-art in cancer prognosis and treatment approaches. *Cancer Med*. 2021 Aug;10(15):5191–202.
  21. Kamala K, Sivaperumal P, Paray BA, Al-Sadoon MK. Author response for “Identification of haloarchaea during fermentation of *Sardinella longiceps* for being the starter culture to accelerate fish sauce production” [Internet]. Wiley; 2021. Available from: <https://publons.com/publon/47375106>
  22. Ezhilarasan D, Lakshmi T, Subha M, Deepak Nallasamy V, Raghunandhakumar S. The ambiguous role of sirtuins in head and neck squamous cell carcinoma. *Oral Dis* [Internet]. 2021 Feb 11; Available from: <http://dx.doi.org/10.1111/odi.13798>
  23. Sridharan G, Ramani P, Patankar S, Vijayaraghavan R. Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma. *J Oral Pathol Med*. 2019 Apr;48(4):299–306.
  24. R H, Hannah R, Ramani P, Ramanathan A, Jancy MR, Gheena S, et al. CYP2 C9 polymorphism among patients with oral squamous cell carcinoma and its role in altering the metabolism of benzo[a]pyrene [Internet]. Vol. 130, *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*. 2020. p. 306–12. Available from: <http://dx.doi.org/10.1016/j.oooo.2020.06.021>
  25. J PC, Pradeep CJ, Marimuthu T, Krithika C, Devadoss P, Kumar SM. Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study [Internet]. Vol. 20, *Clinical Implant Dentistry and Related Research*. 2018. p. 531–4. Available from: <http://dx.doi.org/10.1111/cid.12609>
  26. Wahab PUA, Abdul Wahab PU, Madhulaxmi M, Senthilnathan P, Muthusekhar MR, Vohra Y, et al. Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study [Internet]. Vol. 76, *Journal of Oral and Maxillofacial Surgery*. 2018. p. 1160–4. Available from: <http://dx.doi.org/10.1016/j.joms.2017.12.020>
  27. Mudigonda SK, Murugan S, Velavan K, Thulasiraman S, Krishna Kumar Raja VB. Non-suturing microvascular anastomosis in maxillofacial reconstruction- a comparative study. *Journal of Cranio-Maxillofacial Surgery*. 2020 Jun 1;48(6):599–606.
  28. Umer F, Haji Z, Zafar K. Role of respirators in controlling the spread of novel coronavirus (COVID-19) amongst dental healthcare providers: a review. *Int Endod J*. 2020 Aug;53(8):1062–7.
  29. Ciotti C, Bouvet E, Abiteboul D, le Geres et l’INRS. [Use of respiratory masks in healthcare workers]. *Med Mal Infect*. 2008 Aug;38(8):452–6.