


Knowledge and Practice of Face Mask Use and Handling during COVID-19 Pandemic among Dental Students and Intern at B.P. Koirala Institute of Health Sciences

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Abstract

Background: The outbreak of Corona Virus Diseases (COVID-19) has been deemed a global public health emergency by the World Health Organization. Face mask is one of the prevalent used methods to reduce the spread of infection. Due to their widespread use, it is crucial to use these masks properly because improper use or disposal could potentially speed up the pace of transmission. The objective was to assess the knowledge and practice of face mask use and handling in undergraduate dental students.

Methods: A web based cross sectional study was conducted among BDS third, fourth, fifth year and interns at College of Dental Surgery, B. P. Koirala Institute of Health Sciences between May - June 2021. A structured proforma was prepared and modified based on relevant literature and expert's advice. The Google Forms with questionnaires were created using docs.google.com/forms, and the link was shared with the signed-up participants via messaging apps Viber and WhatsApp. Statistical Package for the Social Sciences software, version 21 was used to analyse descriptive statistics such as frequency and percentage.

Results: A total of 144 participants responded to the questionnaire. Eighty-five (59.03%) participants responded that minimum number of layers in face mask that work better to help stop the spread of COVID-19 outside health care setting is three. Sixty-seven (46.53%) participants responded that they touch front surface of the face mask while taking it off.

Conclusion: Campaigns to raise awareness about the proper use of face masks during this pandemic will be useful in educating dentistry students and interns.

Keywords: COVID-19; Face mask; Students

Declarations

Ethics approval and consent to participate: This study was conducted with prior ethical approval from Institutional Review Committee of BPKIHS (IRC/2093/020) and informed consent has been obtained from participants prior to the enrollment.

Consent for publication: Informed consent was obtained from the participants for the publication of identifying features along with the manuscript.

Availability of data and materials: The full data set supporting this research is upon request by the readers.

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BACKGROUND

The World Health Organization (WHO) received a report of pneumonia in Wuhan, China, on December 31, 2019, from Chinese officials. The virus was soon known as or severe acute respiratory syndrome coronavirus-2 (SARSCoV-2) [1]. The WHO proclaimed the coronavirus disease (COVID-19) pandemic on March 11, 2020, based on its severity and spread [2]. The disease can be transmitted by respiratory droplets which is released during coughing, sneezing or talking [3].

Dental/oral and other healthcare personnel in particular should be very vigilant in preventing against the spread of the disease as SARSCoV-2 has been found in the saliva of infected individuals. Patients, dentists, and support workers are all at danger from routine dental procedures that release aerosols [4]. The inhalation of airborne particles and ocular transmission can result in direct exposure to the virus as most of the dental procedures are high-risk (aerosol generating) procedures for these persons [5]. As a result, dentists are more likely to get the virus due to direct patient contact as well as ongoing exposure to blood and saliva; this puts dental care professionals at an increased risk of COVID-19 infection. As a result, the layout of a dental practice might increase the risk for the dentist and clinic employees, and there will also be a greater chance of cross-infection [6].

A type of personal protection equipment called a medical mask or face mask is used to stop the spread of respiratory illnesses. When worn properly, these masks can help stop the spread of respiratory viruses and bacteria by covering the user's mouth and nose [7]. As a result, using a face mask and washing your hands are two preventive measures that dentists and dentistry students should take very seriously [8]. Data on knowledge and practice of face mask use and handling among dental students is scarce. Therefore, the present study was conducted to assess the knowledge and practice of face mask use and handling in undergraduate dental students.

METHODS

A web based cross sectional study was conducted at College of Dental Surgery, B. P. Koirala Institute of Health Sciences (BPKIHS), Nepal between May-June 2021. Every year 50-60 students are enrolled in Bachelor of Dental Surgery (BDS) and duration of this course is 5.5 years including one year of internship. The participants were third, fourth, fifth year and interns studying BDS. The study was approved by Institutional Review Committee, BPKIHS (IRC/2093/020). A structured proforma was prepared and modified based on relevant literature and expert advice [9]. It consisted of

socio-demographic data and eight close ended items on knowledge with three options: "Yes," "No," and "Do not know" and six close ended items regarding practice of face mask use having two response "Yes" and "No." The Google Forms having participation information sheets and 14 close ended questions were created using docs.google.com/forms, and the link was shared with the signed-up participants via messaging apps Viber and WhatsApp. From Google Forms, the completed questionnaires were exported to Microsoft Excel 2016. Statistical Package for the Social Sciences software (version 21) was used to analyse descriptive statistics such as frequency and percentage.

RESULTS

Out of 160, 144 participants responded to the questionnaire resulting in a response rate of 90%. Sixty-two (43.05%) participants were males, and 39 (27.08%) were fifth year students (Table 1).

Table 1: Socio-demographic characteristics of the students (n = 144)

Variables	No of students (n)	Percentage (%)	
Age group in years	20 - 24	116	80.55
	25 - 30	26	18.05
	31 - 35	2	1.38
Gender	Male	62	43.05
	Female	82	56.94
Academic year	Third year	37	25.69
	Fourth year	36	25.00
	Fifth year	39	27.08
	Intern	32	22.22

Out of 144, 85 (59.03%) participants responded that minimum number of layers in face mask that work better to help stop the spread of COVID-19 outside health care setting is three. Fifty-nine (40.97%) participants responded that face mask be should not be worn by people aged less than two years. Seventy-two (50.0%) participants responded that mask with exhalation valve or vent should not be used (Table 2).

Out of 144, 67 (46.53%) participants responded that they touch front surface of the face mask while taking it off. Eighty (55.56%) participants responded that they do not store reusable non-dirty mask in a paper bag (Table 3).

DISCUSSION

Face masks are worn in public in Asian nations not just to prevent respiratory infections but also to lessen disease transmission from the wearer. At times of epidemics and outbreaks, use of facemask frequently

Table 2: Knowledge of face mask use and handling among the students (n = 144)

SN	Questions on knowledge	Responses	No of students (n)	Percentage (%)
1	What should be the minimum number of layer/s in face mask that work better to help stop the spread of COVID-19 outside health care setting?	1 layer	8	5.56
		2 layers	45	31.25
		3 layers	85	59.03
		I do not know	6	4.17
2	Should face mask be worn over nose, mouth and secure under chin?	Yes	137	95.14
		No	6	4.17
		I do not know	1	0.69
3	Should face mask be worn by people aged less than 2 years?	Yes	39	27.08
		No	59	40.97
		I do not know	46	31.94
4	Should face mask be worn by people who have troubled breathing, or who cannot remove mask without assistance?	Yes	28	19.44
		No	86	59.72
		I do not know	30	20.83
5	Should the mask fit snugly against the side of face without any gap?	Yes	123	85.42
		No	18	12.50
		I do not know	3	2.08
6	Should mask with exhalation valve or vent be used?	Yes	48	33.33
		No	72	50.00
		I do not know	24	16.67
7	Does cloth mask be washed in regular detergent?	Yes	79	54.86
		No	49	34.03
		I do not know	16	11.11
8	What is the color code of the waste management bag to dispose the face mask?	Blue	27	18.75
		Green	20	13.89
		Red	43	29.86
		Yellow	31	21.53
		I do not know	23	15.97

Table 3: Practice of face mask use and handling among the students (n = 144)

SN	Questions on practice	Responses	No of students (n)	Percentage (%)
1	Do you touch front surface of the face mask while taking it off?	Yes	67	46.53
		No	77	53.47
2	Do you untie the string behind your head or stretch the ear loop while taking off the mask?	Yes	85	59.03
		No	59	40.97
3	Do you fold outside together while putting the face mask in a bag?	Yes	92	63.89
		No	52	36.11
4	Do you wash your hand immediately after removal of the face mask?	Yes	61	42.36
		No	83	57.64
5	Do you put wet/dirty mask in the plastic bag?	Yes	63	43.75
		No	81	56.25
6	Do you store reusable non-dirty mask in a paper bag?	Yes	64	44.44
		No	80	55.56

increases. Typically, the filtering capacity determines the materials used and the exact designs for masks. Because the primary goal of producing the masks is to protect the wearer from infectious particles, various standards are employed while evaluating the masks in the healthcare sector. By preventing the droplets that the wearer exhales when speaking and coughing, masks not only protect the wearers but also the others [10, 11]. In light of this, dentistry students' familiarity with masks and its use were assessed in the present article.

In present study majority of the participants (59.03%) responded that three layers in face mask work better to help stop the spread of COVID-19 outside the health care setting. Three layered face masks block the cough aerosol better than two or one layered face mask [12]. Medical masks (N95 respirators and surgical masks) are mainly used by healthcare professionals to protect against the SARS-CoV-2 [13]. Surgical masks have three layers and it delivers protection from droplets as well in a clinical setting. Its external layer repels water droplets, the middle layer serves as a filter and the interior layer absorbs moisture [14]. Therefore, surgical mask is much better and be more useful in obstructing transmission of the virus in comparison to homemade cloth masks (single layered) [15]. Three-layered cloth mask is an outstanding filtering mask with a hydrophilic inner layer, filter in the middle layer and a hydrophobic outer layer. Two-layered and single layered cloth mask allow the leakage of a considerable percentage of components to infiltrate via the mask [16]. Therefore, most protective cloth face masks must have at least three layers with a hydrophilic inner layer to consume moisture from the wearer's breathing and hydrophobic outer layers.

The face mask should be worn over nose, mouth and secure under the chin. The correct method of wearing face mask was known to most of the participants (95.14%) which was higher than a study done by Kumar et al (74.7%) [17]. Approximately two-fifths (40%) of the participants responded that face mask should not be worn by people aged less than two years. According to WHO, children aged ≤ 5 years do not need to wear a mask because in this age group, they may not be able to wear a mask properly without help or supervision [18]. According to CDC, Children aged ≥ 2 years can wear masks or respirators to protect themselves and others from COVID-19 [19]. Similarly, more than half of the participants (59.72%) responded that face mask should not be worn by people who have troubled breathing, or who cannot remove mask without assistance. According to CDC guideline, certain people with disabilities who, because of their disability, cannot wear a mask, or cannot safely wear a mask, are exempted from CDC's mask-wearing requirement [20]. CDC also recommends that the face mask should be snugly fit against the side of the face without any gap and this was known to 85.42% of the participants in our study

[21]. Half of the participants responded that mask with exhalation valve or vent should not be used. According to Ippolito et. al., exhalation valve or vent should not be used as they allow droplets out of the mask, putting others nearby at risk [22]. Only 21.53% participants responded correctly for the color code of the waste management bag to dispose the face mask which is yellow and this finding was in contrast to other studies [17, 23].

Almost half (46.53%) of the responded that they touch the face mask front side while taking it off and 59.03% participants untie the string of the face mask behind the head or stretch the ear loop while taking off the mask. According to environmental health and safety, University of Washington, removal of the mask from the face should be done carefully, touching only the loops and the front of the mask should not be touched [24]. Only 42.36% participants wash their hands immediately after removal of the face mask which was in the line with a study done by Nagarajan et. al. (36.5%) [25]. According to CDC hand should be washed after removal of the face mask [26]. Almost half (44.44%) of the participants responded that they do store reusable non dirty mask in a paper bag which was higher than the study done by Kumar et. al., (20.2%) [17]. Almost half (43.75%) responded that they put wet/dirty mask in plastic bag. According to CDC guideline, dirty and/or wet cloth mask should be put in a sealed plastic bag until wash that would keep it from getting

mouldy [19].

The results of the present study indicate that, in COVID-19 pandemic crisis, there is a critical need to establish ongoing educational interventions and training programs on facemask use among dental students in particular. To keep the dental fraternity safe and safeguard our society from communicable diseases like COVID-19, it is crucial that they hold frequent instructional webinars with the usual norms and material. This study has some limitations, such as its cross-sectional design and focus on a single hospital. Before the findings may be applied broadly, additional long-term research involving a larger sample size and both commercial and public hospitals should be conducted. Additionally, masks of various kinds can be contrasted.

CONCLUSION

The present study concluded that the knowledge and practice of face mask among the participant was optimal in half of the participant. Facemasks are crucial but poorly understood PPE that provide defence against respiratory diseases. During this pandemic, awareness campaigns about the proper usage of face masks using all available resources would be helpful to educate dental students and intern.

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