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A CROSS- SECTIONAL STUDY ON KNOWLEDGE, ATTITUDE AND PREPAREDNESS OF DENTAL HEALTH CARE PROFESSIONAL TOWARDS PPE (PERSONAL PROTECTIVE EQUIPMENT) AND DECONTAMINATION PROTOCOL DURING COVID-19 AMONG VIDARBH REGION

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INTRODUCTION

A novel coronavirus, also known as COVID-19, was reported at the end of 2019 as the cause of a cluster of pneumonia cases that had infected many people in Wuhan, a town in the Hubei province of China, suspected to be the origins of this novel virus.[1] Coronaviruses (CoV) are a huge group of viruses that cause illnesses range from simple cold to more serious diseases, including such Respiratory Syndrome of the Middle East (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). A novel coronavirus (nCoV) is a new strain which has not been found in humans before. Coronaviruses are a type of zoonotic which means that the both animals and humans are transferred. Comprehensive experiments have shown that SARS-CoV is moving from civet cats to humans, and MERS-CoV from premedical camels to humans. Several other documented coronaviruses exist in species but are not yet human affected. The transfer of COVID-19 between individuals tends to occur mostly via respiratory transfer. It is unclear exactly how easily the virus can be spread between individuals. Clinical signs of COVID-19 show fatigue, nausea and shortness of breath.[2] Concentrated on Middle East Respiratory Syndrome (MERS) incubation time and severe acute respiratory syndrome (SARS) coronaviruses and travel-related COVID-19 observational data, the CDC estimates that COVID-19 symptoms appear within 2–14 days of exposure. Initial findings suggest that older adults and people with underlying health conditions or compromised immune systems may be at elevated risk for severe illness from this virus.[3] Widely accepted signs of the disease include breathing problems, fever, coughing, shortness of breath and breathing difficulties. In more extreme cases, influenza, significant acute respiratory syndrome, kidney failure and even death will contribute to infection. On 30 January 2020, the WHO called the epidemic a Public Health Emergency of International Significance and the virus has now spread throughout all continents except Astatic. Limit direct communication with someone who has respiratory problems such as sneezing or coughing.[4] The nature of health professionals jobs puts them at an increased risk of getting any transmissible diseases, including COVID-19.4 Another-fifth among all cases occurred in 2002 during the SARS epidemic among health-care personnel. If they tend to get sick in large numbers during a disease epidemic this amplifies the already high pressure rates on the health care system. Therefore it is particularly critical that they have clear information of how to properly classify patients, separate them and utilize safety equipment. Personal protective equipment (PPE) such as masks, boots, and gowns aid cover doctors or nurses when handling patients with infectious diseases like COVID-19.

The Centers for Disease Control and Prevention (CDC) advises that healthcare staff use N95 masks to defend against the emerging infection, which clears away infectious contaminants and tiny droplets that could have been coughed up by patients. However, even such masks only shield healthcare workers when used appropriately. They have to be fitted, used and removed with precision. Protecting our battlefield healthcare professionals is essential, and priority should be given to EPP, which includes medical masks, respirators, gloves, gowns, and eye protection for healthcare professionals and others who care for COVID-19 patients.[5] Dentistry research involves the usage of dental and surgical rotary devices, such as headpieces or ultrasonic scalers and air-water syringes. Such devices produce a clear spray that may include water, sweat, blood, micro-organisms, and other debris particle droplets. Surgical masks prevent mouth and nose mucous membranes from spattering droplets but not to provide sufficient protection against air borne infectious agents. Currently no data are available for determining the possibility of transmission of SARS-CoV-2 during dental work. Groupings of health workers who tested positive for COVID-19 have so far been recognized in the United States in medical settings and long-term care facilities, but no clusters have been reported in dental settings or DHCP.[6,7] Specifically for surgical masks and respirators, the existing global stock of PPE is inadequate and there is also limited availability of gowns, helmets and face covers to satisfy market demand. The high appetite – driven not just by the quantity of COVID-19 cases but also by misinformation, panic purchasing and stockpiling – has contributed to intensified supply scarcity of PPE.

The capacity to increase PPE output is restricted, and the current demand for respirators and masks cannot be fulfilled, particularly if widespread improper usage of PPE continues. Although, with manufacturing companies resetting their manufacturing in several of the major exporting countries, and a known relationship of international dependence anticipated by WHO will help address the global shortage. Dedicated guidance and global methods of cooperation are needed to meet the needs of vulnerable countries facing affordability issues in the context of rising prices, determined by an exceptional increase in supply, combined with production and supply disruptions. The use of cloth masks as an option to health care masks or respirators is considered inappropriate for the protection of healthcare workers.[7] Cotton cloth caps, however, are not fluid-resistant and can thus hold moisture, become infected and serve as a possible source of infection.[8] Although some work on fabric masks utilizing organic, hydrophobic materials on the outer layer has been performed, there is really no existing proof to prove that they function adequately as PPE for health settings.[9] Just like other PPE products, the planned PPE must be tested by a local government as per minimum acceptable requirements and criteria if the manufacture of masks for use in healthcare settings is proposed locally in circumstances of scarcity or inventory-out.WHO should correct these criteria correctly as proof is accessible. Hence this study was conducted for the assessment of knowledge, attitude and preparedness of health care professional towards PPE (personal protective equipment) and decontamination protocol during covid-19.

METHODOLOGY- It was a cross -sectional questionnaire based study carried out among the dental professional to assess knowledge, attitude and preparedness of health care professional towards PPE (personal protective equipment) and decontamination protocol during covid-19. Questionnaire consist of 2 sections- Section A and Section B. section A consist of Demographic details of the study participants e.g. Name, Age, Sex and educational qualification, Section B consist of total 32 questions for the assessment of the awareness and knowledge regarding PPE. Questionnaire piloting was done on the 10 general practitioner of Wardha districts and then questioner used for knowledge, attitude and preparedness of health care professional towards PPE (personal protective equipment) and decontamination protocol during covid-19. The sampling was done by complete enumeration method and a total of 192 dental professional around Vidarbha region were includes in this study. Approximately 10-15 minute were given to each participants for the completion of questionnaire. Informed consent were taken prior to the data collection. Study include the dental professional who were willing to take part in the study, incompletely filled questionnaire were excluded for the study. The data collected from the questionnaire was entered on Ms Excel (2007 version developed by Microsoft) and was deployed on SPSS version 21 to carry out statistical analysis, descriptive statistics was used in the study.

RESULT

Table 1: Distribution of study participants.

Variables		n	Percentage
Sex	Male	54	28.1
	Female	138	71.9
Age	Below 25 years	70	36.5
	26-30 years	116	60.4
	31 years and above	6	3.1
Education	General Practitioner (BDS)	114	59.4
	Post Graduate student	78	40.6

Year of Practice	Less than 5 Years	158	82.3
	6-10 Years	12	6.2
	More than 10 Years	22	11.5
Practice Area	Rural	22	11.5
	Urban	170	88.5

Table 1 shows that out of 192 study most were females (71.9%) followed by males (28.1%),most of the study participant were from the age group of 26-30 years (60.4%) followed by Below 25 years (36.5%),31 years and above (3.1%) respectively. Out of 192 most were the general practitioner (59.45%) with the Year of Practice less than 5 years (82.3%) and most were practices in urban area (88.5%).

Table 2: Assessment of awareness and knowledge regarding PPE dental professionals.

variables	Response	n	Percentage
Are you aware of PPE	Yes	190	99.0
	No	2	1.0
PPE is used for	To protect the skin from infected blood or secretion.	40	20.8
	To protect mucosa from infected blood or secretion.	10	5.2
	Both	142	74.0
Can you treat a child patient by wearing PPE kit?	Yes	130	67.7
	No	4	2.1
	May be	58	30.2
Whether the PPE should be designed in such a way that behaviour of the child can be managed?	Yes	140	72.9
	No	4	2.1
	May be	48	25.0
What are the component of PPE kit	Mask, goggles, face shield	2	1.0
	Mask, goggles, face shield, gloves	2	1.0
	Mask, goggles, face shield, gloves, head cover and shoe cover.	188	97.9
Whether the PPE can be re-use?	Yes	70	36.5
	No	56	29.2
	May be	66	34.4
What are the component of PPE can be re-used after proper sterilization?	Gowns, mask	12	6.2
	Gowns, mask, goggles	24	12.5
	Gowns, mask, goggles, face shield	156	81.2
What is proper sequence of donning PPE?	Gown, mask, face shield, gloves.	112	58.3
	Mask, gown, gloves, face shield	14	7.3
	Mask, gown,gloves,face shield	66	34.4
What is the proper sequence of doffing PPE?	Gloves, face shield, gown, mask	62	32.3
	Gloves, gown, face shield, mask	80	41.7
	Face shield, gloves, gown ,mask	50	26.0

Table 2 shows the awareness and knowledge regarding PPE dental professionals, all most all were known about the PPE (99.0%) and Maximus were used PPE foe the Protection of skin from infected blood or secretion and mucosa from infected blood or secretion (74.0%), most were aware about the fact that Gowns, mask, goggles, face shield (81.2%) all are the components of PPE kit.

Table 3: Assessment Attitude of dental professionals toward the use of PPE.

variables	Response	n	Percentage
Whether you had undergone Hand hygiene programme before?	Yes	120	62.5
	No	66	34.4
	May be	6	3.1
What is the recommended time of hand washing with sanitizer?	10-20 sec	86	44.8
	20-30 sec	90	46.9
	30-40 sec	16	8.3
In which colour bags should we dispose PPE	Red	60	31.2
	Yellow	98	51.0

	Blue	34	17.7
Before doffing whether the health care professional should sanitized the hand?	Yes	120	62.5
	No	66	34.4
	May be	6	3.1
N-95 mask can be worn continuously up to	6-8 hours	4	2.1
	8 hours	124	64.6
	12 hours	44	22.9
	24 hours	20	10.4
Do you think N- 95 mask can be re- useable	Yes	98	51.0
	No	46	24.0
	May be	48	25.0
Re-use of N-95 mask should NOT be stored	In a clean, sealable paper bag	36	18.8
	Breathable container	98	51.0
	Air tight plastic bags	58	30.2
Whether VALVE N-95 mask should be used	Yes	92	47.9
	No	24	12.5
	May be	76	39.6

Table 3 shows Attitude of dental professionals toward the use of PPE, 51.0% participants answer that PPE kit should be disposed in Yellow colored BMW bag, same result were found for the question N- 95 mask can be re-useable 51% says that N-95 mask can be reusable and it can be used up to 8hours were said by 64.6% of study participants.

Table 4. Assessment of practices and future preparedness among dental health care workers PPE use.

variables	Response	n	Percentage
Which type of PPE should be prefer for receptionist?	2 layer surgical mask + gloves	92	47.9
	3 layer surgical mask + gloves	86	44.8
	No PPE required	14	7.3
Which type of PPE should be prefer for receptionist?	2 layer surgical mask + gloves	92	47.9
	3 layer surgical mask + gloves	86	44.8
	No PPE required	14	7.3
Whether the clinician should check the SNUG FIT of the N-95 mask before the treatment procedure?	Yes	164	85.4
	No	12	6.2
	May be	16	8.3
Whether the health care professional are aware of ICMR & CDC recommendation for mask rotation?	Yes	104	54.2
	No	44	22.9
	May be	44	22.9
What is the recommended GSM for gowns?	Not less than 90	70	36.5
	Not less than 60	74	38.5
	Not less than 40	48	25.0
Whether 1% sodium hypochloride can be used for disinfection and cleaning	Yes	158	82.3
	No	10	5.2
	May be	24	12.5
Do you think there should be a separate area for treatment which involve aerosol.	Yes	160	83.3
	No	8	4.2
	May be	24	12.5
When should be the fumigation done?	After every patient	86	44.8
	At the end of day	100	52.1
	Not required	6	3.1
How to dispose single use PPE?	Dispose in general waste if it is NOT contaminated.	18	9.4
	Dispose in clinical waste bins if contaminated.	56	29.2

	Both a & b	118	61.5
Whether tele-dentistry should be practiced in order to avoid the contamination?			
	Yes	134	69.8
	No	10	5.2
	May be	48	25.0
Whether the health care professional feel safe at work with the current safety precaution?	Yes	52	27.1
	No	74	38.5
	May be	66	34.4
Afraid of transmission of COVID-19 infection to them and to their families?	Yes	154	80.2
	No	8	4.2
	May be	30	15.6
Whether they feel breathlessness & anxious after wearing PPE?	Yes	116	60.4
	No	14	7.3
	May be	62	32.3
Whether the health care professional feels anxious regarding the possibility of spread of COVID-19 and increase in number of positive patients?	Yes	146	76.0
	No	14	7.3
	May be	32	16.7

Table 4 shows practices and future preparedness among dental health care workers PPE use 82.3% of study participants says 1% sodium hypochloride can be used for disinfection and cleaning, when it comes to fumigation of dental clinic 52.1% participants says fumigation must done at the end of day while 44.8% suggest to fumigation must done after every patient where as 3.1% participant says there were no need to do fumigation in dental clinic. Around 60.4% feel study participants feels breathlessness & anxious after wearing PPE.

DISCUSSION

As the covid-19 virus affecting a wide population, health care professionals are also at high risk to get affected. To treat such increasing numbers of patient's every day, we need better precautionary measures to protect them. Exposed to people infected with the disease in their work leads to the death of a large number of doctors and also affects a wide range of healthcare professionals, while the general population is in lockdown.[9] If the evidence supports that, then sadly, it could have been reduced by keeping full PPE, that is used in nations like China and South Korea. Second, high exposure to viral load was linked to a more severe illness.[10] By providing complete PPE for all patient contacts, we can avoid patients' viral exposure to health care professionals regardless of their status as infected.

This study provides an insight on the level of knowledge, attitude and preparedness of heath care professional towards PPE and decontamination protocol during the out-break of COVID-19. Among the following, 74% of the health professional suggest that the PPE can be used to protect the skin and mucosa from the infected blood and secretions. 67.7% of the health professional agreed that the PPE can be used to treat the child patients and 72.9% of the health professional suggest that the PPE should be designed in such a way that behavior of the child can be managed. About 97.9% of the health professional agreed to that the component of the PPE kit include mask, goggles, face shield, gloves, head cover and shoe cover. 58.3% of the health professional know the proper sequence of donning PPE. The proper sequence of donning is. Among 32.3% of health professional know the proper sequence of doffing the PPE. 36.5% of the health professional suggest that PPE can be reused. 62.5% of the heath care professional suggest that before doffing the hand should be sanitized with the sanitizer. About 81.2% suggested that PPE (gowns, mask, face shield, gloves) can be reused after proper sterilization.

About 62.5% of the health care professional had undergone hand hygiene programme and 34.4% of the health care professional did not undergone any hand hygiene programme before. Among the following 44.8% suggest that 10 – 20 sec is the recommended time of hand washing with the sanitizer. Nearly 64.6% believed that N-95 mask can be worn continuously up to 8 hours and nearly 51% believed that the N-95 mask can re-used.

Among the following 44.8% suggest that (3 layer surgical mask and gloves) should be the PPE for assistant and 47.9% suggest that (2 layer surgical mask and gloves) should be the PPE for the receptionist. The majority (85.4%) of the health care professional reported that the clinician should check for the SNUG fit of the N-95 mask before the treatment. Nearly 54.2% of the health care professional are aware of the ICMR and CDC recommendation of mask rotation. Among the following 36.5% believed that not less than 90 GSM for gowns should be recommended.

The majority of the health care professional (82.3%) reported that 1% sodium hypochlorite can be used for disinfection and cleaning. Among the following 83.3% of the health care professional believed that there should be a separate area for the treatment which involve aerosols. Nearly 44.8% believed that fumigation should be done after every patients. Among the following health care professional 61.5% reported that the single use PPE

should be dispose in general waste if it is not contaminated, but if it get contaminated it should be dispose in clinical waste bins. About 69.8% of the health care professional suggest that tele-dentistry should be practiced in order to avoid contamination.

The majority (80.2%) of the care professional are afraid of transmission of COVID-19 infection to them and to their families. About 38.5% of the health care professional did not feel safe at work with the current safety precaution. Among the following 60.4% of the health care professional feel breathlessness and anxious after wearing PPE. The majority (76%) of the health care professional feels anxious regarding the possibility of spread of COVID-19 and increase in number of the positive patients.

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