Covid-19 Awarness among Dental Interns, Postgraduates and Faculty of Dental College, Nellore, India – A Cross Sectional Study

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Abstract:
Introduction The rapid and extensive spread of the COVID-19 pandemic has become a major cause of concern for the healthcare profession. The aim of this study is to assess the awareness of COVID-19 disease and related infection control practices among healthcare professionals and students in Nellore India.
Materials and methods A total of 235 respondents from a dental college completed a questionnaire-based survey on the awareness, knowledge, and infection control practices related to COVID-19 infection in the healthcare setting. The questionnaire was adapted from the current interim guidance and information for healthcare workers published by the US Centers for Disease Control and Prevention (CDC). Convenient sampling method was used for data collection and the distribution of responses was presented as frequencies and percentages. Descriptive statistics were performed for all groups and subgroups based on the percentage of correct responses.
Results Only 35% of the respondents were aware that the virus causing COVID-19 as syndrome coronavirus 2 (SARS-CoV-2). The main mode of transmission of the virus is via respiratory droplets which were answered correctly by 81.2% of the responders, with the lowest percentage of correct answers coming from the postgraduates 78.6%. 79% (n = 235) of the total respondents were able to correctly define "close contact". Only 65.5% of the responders were aware of the isolation procedures necessary for a confirmed COVID-19 patient (Airborne Infection Isolation Room without exhaust). Overall, 20.8% of the responders were aware of the right sequence for the application of a mask/respirator. Among them, the highest number of correct responses were from the faculty (37.5%) whereas the lowest number was from the interns 14.3%.
Conclusion There is a need for regular educational interventions and training programs on infection control practices for COVID-19 among all the study participants.
Keywords. COVID-19, Dental professionals, Knowledge.

I.   Introduction

A novel coronavirus disease was identified in December 2019 and responsible for the new cases of pneumonia in Wuhan, China. The virus was initially named as 2019 novel coronavirus (2019nCOV) by the WHO, then was later on updated as SARS-CoV-2 and the name of the disease as coronavirus disease 2019 (COVID-19). [1] On the 11th of March 2020, the WHO has declared COVID-19 as a global pandemic and most of the countries worldwide have registered COVID-19 cases, including India. According to recent reports, COVID-19 positive cases have crossed 460000 in India, taking the total number of deaths to 15350 [2]

COVID-19 is a single stranded RNA virus, spread by human-to-human transmission through droplet, feco-oral, and direct contact and has an incubation period of 2-14 days. [3] Elderly and patients who suffered with chronic medical conditions like diabetes and cardiovascular diseases are more likely to get severe infection. The main manifestations of COVID-19 are fever, dry cough, dyspnoea, myalgia, fatigue, hypolymphaemia, and radiographic evidence of pneumonia. Complications like acute respiratory distress syndrome, arrhythmia, shock, acute cardiac failure, secondary infection, acute kidney failure and death may occur in severe cases.

Presently, no antiviral therapy or vaccine is explicitly recommended for COVID-19 and implementation of preventive measures to control COVID-19 is the mainstay critical intervention [5] World

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Health Organization (WHO) recommends prevention of human-to-human transmission by protecting close contacts and health care workers from being infected and stopping infections from animal sources. Primary preventive measures include regular hand washing, social distancing, and respiratory hygiene (covering mouth and nose while coughing or sneezing)

Health care workers are amongst the most vulnerable group who has the greatest risk of getting infected. The dental operatory poses a riskier environment because of high possibility of cross infection between dental practitioners and patients. [7] A COVID-19 positive case can go symptomless for many days; therefore, various guidelines are recommended by Centre for Disease Control and Prevention (CDC) and World Health Organization (WHO) for dental health care workers that adequate precautions can be taken. [8] It is important to implement sound prevention measures in dental clinics and to increase the level of awareness among dentists to improve their prevention. Hence, this study aimed to assess the level of awareness, perception, and attitude regarding COVID-19 and infection control among Dental interns, Postgraduates and Faculty in Dental college

II.   Materials And Methods

A descriptive cross-sectional study was conducted to assess CoVID-19 awareness among dental Intern, Post graduates and Faculty of Dental College, in NelloreThe source of data was primary in nature and it was obtained through questionnaire .The study was conducted in a Dental college of Nellore district of Andhra Pradesh.The Study population includes students studying in a dental college

INCLUSION CRITERIA
 Patient who will be willing to participate in the study.

EXCLUSION CRITERIA
Subjects who are not willing to participate in this study.

ETHICAL CLEARANCE
Ethical approval for the study was obtained from the institutional ethics committee, Narayana Dental college and Hospital, Nellore

VALIDITY AND RELIABILITY OF THE QUESTIONNAIRE

The 23 item questionnaire which was designed for this study was validated for CoVID -19 Awareness among Dental interns, Postgraduates and Faculty in Dental college in Nellore, India – A Cross sectional study by checking content validity. Content validity was assessed using content validity index with Davis criteria 1992 (1- not relevant, 2- somewhat relevant, 3- quite relevant, 4- highly relevant). It was given to 5 experts in the field of dental research and their responses was recorded, item and scale content validity score was 1,0.9,1, 0.8,1 for 5 experts respectively and scale content validity Index score was 0.9 for 5 experts which was acceptable.

PILOT STUDY

A pilot survey was conducted on one of the Medical colleges to assess the reliability of the questionnaire by using test – retest design. It was given to 10 subjects, twice with seven days apart. Reliability was assessed for CoVID -19 Awareness among Dental interns, Postgraduates and Faculty in Dental college in Nellore, India – A Cross sectional study in the questionnaire. The internal consistency of the questionnaire using Cronbach's alpha statistics was 0.7

SAMPLE SIZE
Convenience Sampling method was used for data collection

STATISTICAL ANALYSIS
Distribution of responses was presented as Frequency and Percentage to assess the awareness between intern's postgraduates and Faculty.

III.   Results

A total of 235 people participated in our study, including 158 females (67.2%) and 77 males (32.8%). Distribution of the participants were divided in to three categories based on the educational status.

Table 1   : Socio-demographic and professional profile of study subjects

Profile		Number	Percentage
Gender	Male	77	32.8
	Female	158	67.2
Educational status	Intern	91	38.7
	Postgraduate (MDS)	112	47.7

	Faculty	32	13.6
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Table 2 :Distribution of Sample according to the department

S.NO	Name of the Department	Post graduate n=112	Faculty n=32
1	OMR	11(9.8)	5(15.6)
2	OMFS	17(15.2)	2(6.2)
3	PROSTHODONTICS	17(15.2)	7(21.9)
4	ENDODONTICS	19(17.0)	4(12.5)
5	ORTHODONTICS	14(12.5)	4(12.5)
6	PERIODONTICS	12(10.7)	3(9.4)
7	PEDODONTICS	14(12.5)	4(12.5)
8	PUBLIC HEALTH DENTISTRY	6(5.3)	0
9	ORAL PATHOLOGY	2(1.8)	3(9.4)
	TOTAL	112(100)	32(100)

Table 3 : Distribution of Correct responses according to Gender

Q- No	MALE	FEMALE
Q-1	41(53.2)	88(55.7)
Q-2	73(94.8)	158(100)
Q-3	60(77.9)	131(82.9)
Q-4	59(76.6)	127(80.4)
Q-5	61(79.2)	135(81.4)
Q-6	69(89.6)	146(92.4)
Q-7	34(44.2)	60(38.0)
Q-8	21(27.3)	60(38.0)
Q-9	71(92.2)	152(96.2)
Q-10	37(48.1)	91(57.6)
Q-11	44(57.1)	60(38.0)
Q-12	27(35.1)	37(23.4)
Q-13	71(92.2)	151(95.6)
Q-14	70(90.9)	149(94.3)
Q-15	64(83.1)	129(81.6)

Table 4 : Distribution of correct responses according to educational status

Qualification	INTERN	POST GRADUATE	FACULTY
Q-1	61(67)	55(49.1)	13(40.6)
Q-2	91(100)	110(98.2)	30(93.8)
Q-3	76(83.5)	88(78.6)	27(84.4)
Q-4	79(86.8)	81(72.3)	26(81.3)
Q-5	77(83.6)	97(86.6)	22(68.8)
Q-6	85(93.4)	102(91.1)	28(87.5)
Q-7	38(41.8)	52(46.4)	4(12.5)
Q-8	13(14.3)	24(21.4)	12(37.5)
Q-9	87(95.6)	109(97.3)	28(87.5)
Q-10	51(56.0)	57(50.9)	20(62.6)
Q-11	28(30.8)	59(52.7)	17(53.1)
Q-12	35(38.5)	39(34.8)	24(75.0)
Q-13	85(93.4)	107(95.5)	30(93.8)
Q-14	85(93.4)	105(93.8)	29(90.6)
Q-15	69(75.8)	102(99.1)	22(68.8)

54.8% of the responders were aware that the virus causing COVID-19 was initially called as 2019-nCoV and was later termed as Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The main mode of transmission of the virus is via respiratory droplets which were answered correctly by 81.2% of the respondents. 79.1%the total respondents were able to correctly define "close contact". Forty percent of the participants were aware of the isolation procedures necessary for a confirmed COVID-19 patient (Airborne Infection Isolation Room without exhaust). Twenty percent of the respondents were aware of the right sequence

for the application of a mask/respirator whereas 54.4% of the respondents were aware of the right sequence of P.P.E. Forty four percent of the respondents believed that avoiding exposure was the most effective method for prevention of COVID-19 infection in the health care setting.41.7% of the total respondents used alcohol-based sanitizer with at least 90% alcohol for visibly soiled hands.

Table 5 : Distribution of correct responses according to the department

Q-NO	OMR	OMFS	PROSTHO	ENDO	ORTHO	PEDO	PERIO	PHD	O. P
Q-1	6(37.5)	9(47.4)	17(70.8)	8(33.3)	8(44.1)	3(20.0)	11(61.6)	3(50)	3(60.0)
Q-2	16(100)	17(89.5)	23(95.8)	23(95.8)	18(100)	15(100)	17(94.4)	6(100)	5(100)
Q-3	12(75.0)	16(84.2)	22(91,7)	18(75.0)	14(77.8)	13(86.7)	13(72.2)	4(66.7)	3(60.0)
Q-4	12(75.0)	13(68.4)	20(83.3)	16(66.7)	15(83.3)	9(60.0)	13(72.2)	4(66.7)	4(80)
Q-5	13(81.3)	15(78.9)	20(83.3)	21(87.5)	14(77.8)	12(80.0)	14(73.7)	6(100)	4(80.0)
Q-6	15(93.8)	16(84.2)	21(87.5)	22(91.7)	16(88.9)	12(80.0)	17(77.8)	6(100)	5(100)
Q-7	4(25.0)	9(47.4)	9(37.5)	13(54.2)	5(27.8)	5(33.3)	8(44.4)	2(33.3)	1(20.0)
Q-8	3(18.8)	7(36.8)	4(16.7)	9(37.5)	3(16.7)	3(20)	3(16.7)	2(33.3)	2(40.0)
Q-9	16(100)	19(100)	23(95.8)	22(92.5)	16(88.9)	14(93.3)	17(94.4)	6(100)	5(100)
Q-10	7(43.8)	8(42.1)	13(54.2)	10(41.7)	7(38.9)	9(56.3)	14(77.8)	6(100)	3(60.0)
Q-11	8(50)	11(59.5)	18((75.0)	14(58.3)	10(52.6)	7(46.7)	5(27.8)	3(50)	1(20)
Q-12	8(50.0)	7(35.0)	10(41.7)	6((25.0)	6(33.3)	5(33.3)	17(94.4)	2(33.3)	2(40.0)
Q-13	16(100)	18(94.7)	22(91.7)	22(91.7)	16(88.9)	14(93.3)	18(100)	6(100)	5(100)
Q-14	16(100)	16(84.2)	24(100)	23(95.8)	13(77.2)	13(86.7)	18(100)	6(100)	5(100)
Q-15	10(62.5)	17(89.5)	22(91.7)	23(95.8)	16(88.9)	14(93.3)	13(72.2)	6(100)	4(80.0)

Regarding the correct responses according to the department wise

Seventy-one percentage of respondents from the prosthodontics department were aware of the correct name of COVID-19 19 virus causing virus and least by Pedodontics department twenty percent. 91.7 % of respondents from the prosthodontics department correctly identified the main mode of transmission of virus from person to person is via respiratory droplets and least by public health dentistry department sixty-six percent. Eighty-three percentage of the respondents from the prosthodontic and orthodontic department correctly define closed contact and least pedodontics department sixty percentage. 54.5% of the respondents from the endodontics department were aware of the isolation procedures necessary for a confirmed COVID-19 patient (Airborne Infection Isolation Room without exhaust) and least by oral pathology twenty percentage. Forty percentage of the respondents from the Oral pathology department correctly identified sequence of wearing face mask and least by Prosthodontics, Orthodontics and periodontics sixteen percentage. Hundred percentage of the respondents from the department of public health dentistry, Oral medicine and Oral maxilla facial surgery department stated that there was no specific treatment available for COVID-19 at present situation and least by endodontic department ninety-two percentage. Hundred percentage of the respondents from the public health dentistry department correctly identified sequence of wearing PPE and least by orthodontics department (38%). Seventy percentage of the respondents from the departments of the prosthodontics correctly identified that avoiding exposure was the most effective method for prevention of COVID-19 infection in the health care setting and least by periodontics department twenty percentage. Ninty four percentage of the respondents from the department of periodontics correctly identified preferred method of hand hygiene for visibly soiled hands and least by Orthodontics, pedodontics and Public health dentistry. Hundred percentage of the respondents from the respondents from the public health dentistry department correctly identified the recommended infective prevention and control measures and least by Oral medicine sixty-two percentage.
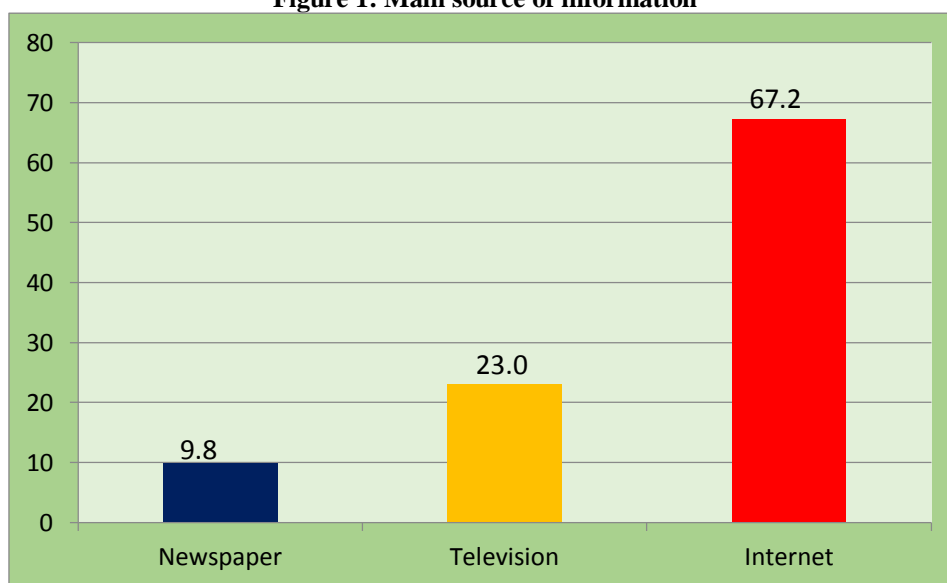
Graphs

Figure 1: Main source of information
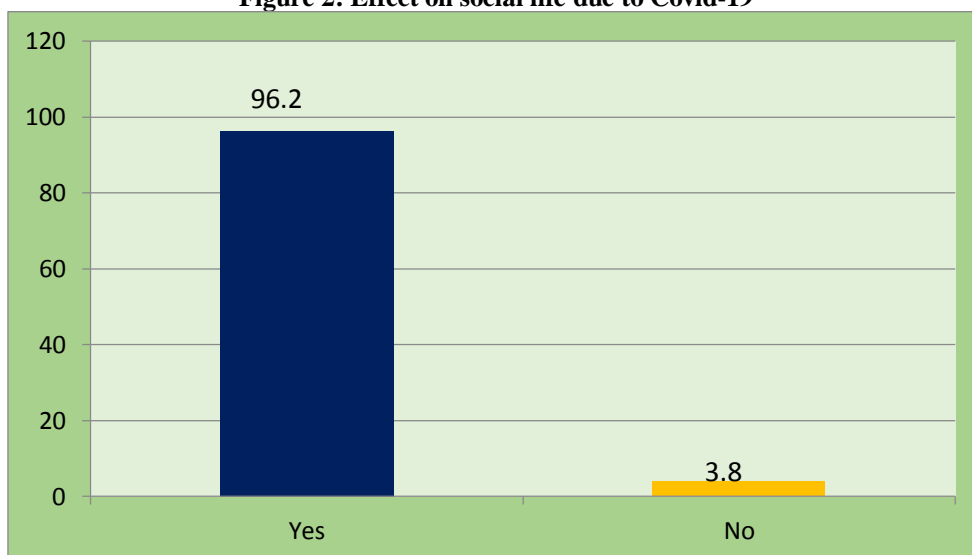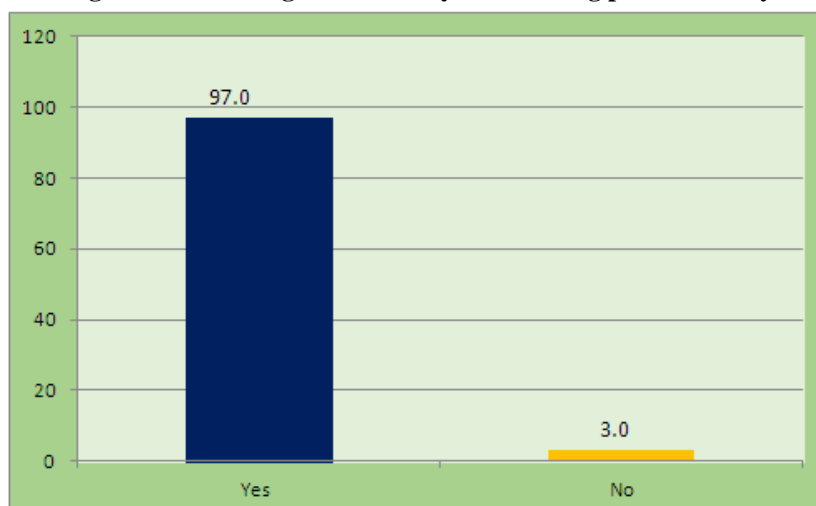

Figure 2: Effect on social life due to Covid-19
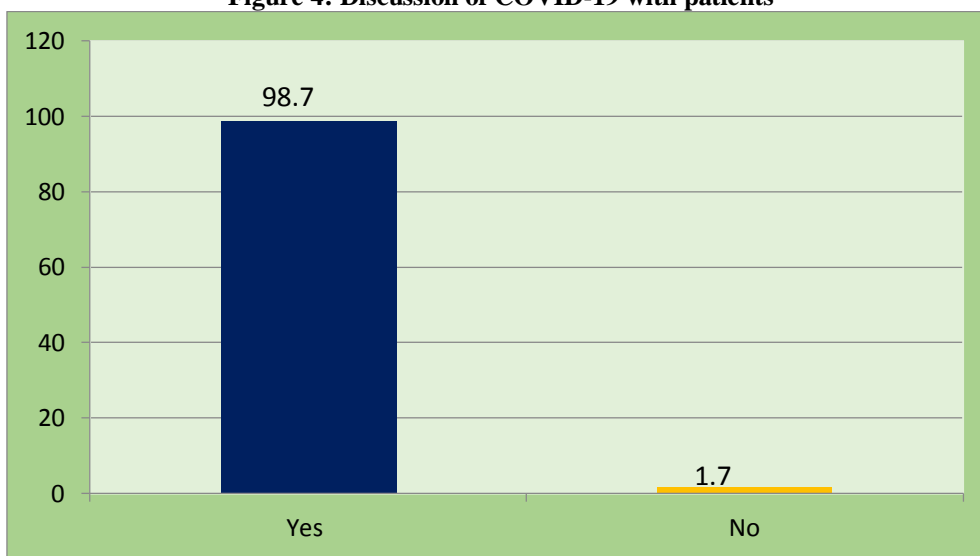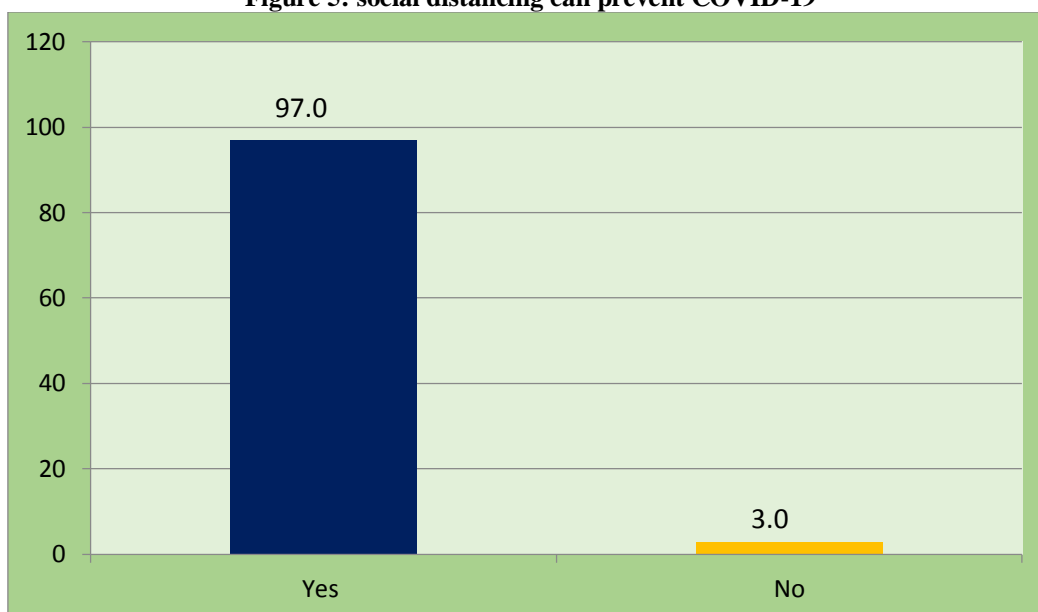

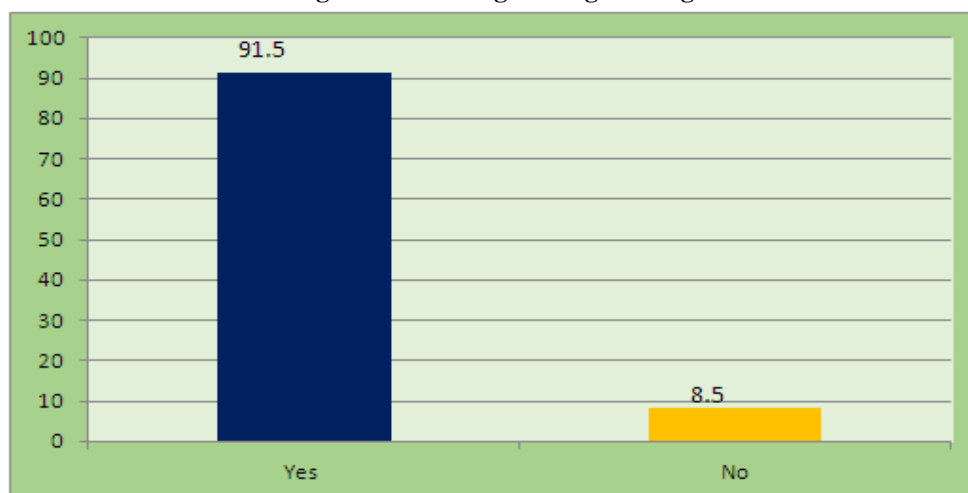**Figure 3: Recording travel history while taking patient history**

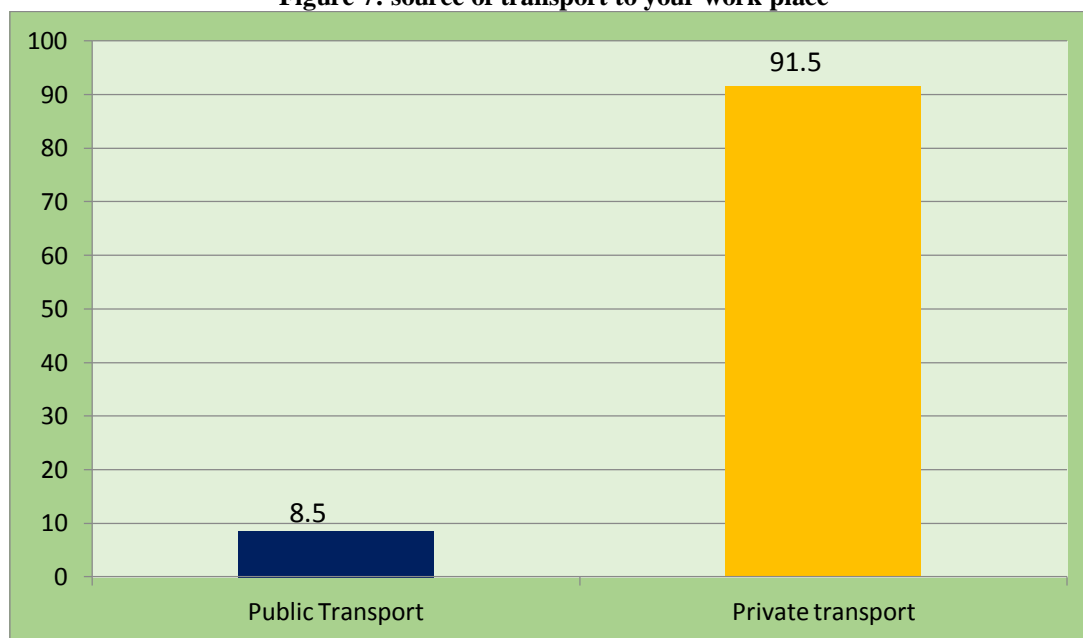**Figure 4: Discussion of COVID-19 with patients**

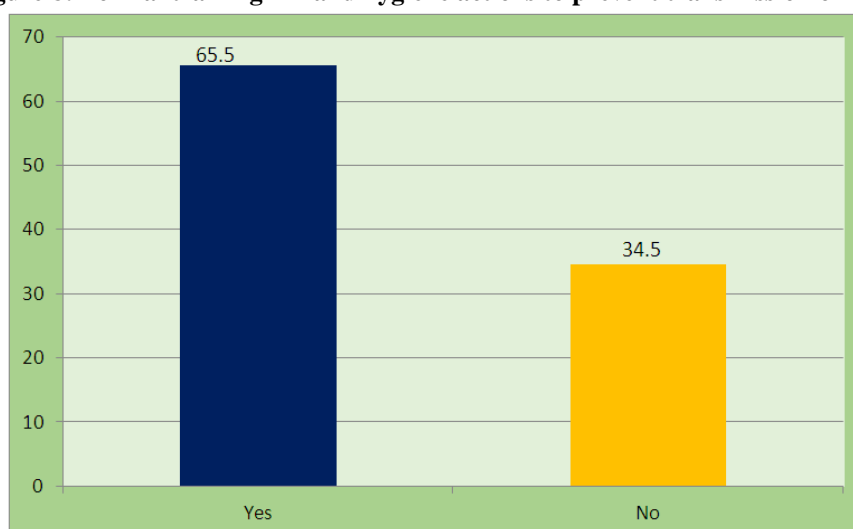**Figure 5: social distancing can prevent COVID-19**

Figure 6: Avoiding social gathering

Figure 7: source of transport to your work place

Figure 8: Formal training in hand hygiene actions to prevent transmission of virus

IV.   Discussion

This study analyses the attitude, knowledge and practices of dental health professionals of Nellore city, Andhra Pradesh, India regarding COVID-19. A closed-ended questionnaire was used in this study. It was observed in the study that the majority of the participants had fair knowledge regarding COVID-19, and there were noteworthy deficiencies in some of the important aspects. According to the US CDC, a "close contact" is defined as: "being within approximately 6 feet (2 meters) of a COVID-19 case for a prolonged period or having direct contact with infectious secretions of a COVID19 patient for a prolonged period or having direct contact with infectious secretions of a COVID19 case. However, in our study, nearly eighty percent of the responders were aware of defining a "close contact." The highest responses are from interns (83.6%) and the least were among post graduates (72.3%).

Correct hand hygiene practices play a crucial role in preventing the spread of infection. The WHO "Five Moments of hand hygiene" defines key moments when healthcare providers must carry out hand hygiene. Two primary methods to clean hands are hand washing and hand rubbing as recommended by W.H.O. The CDC recommends alcohol-based hand rub (ABHR) in most situations. However, in the present study, less than half of the respondents correctly responded. The highest response rate from faculty (75.0%) and least from the post graduates (34.5%) which were similar to the study done by K.P. Joshie et al. [9]

Health Professionals had fair knowledge regarding the usage of P.P.E according to the study done by Modi et.al [10] in Mumbai population. Besides being aware how to wear PPE, it is also essential to know the correct sequence of "donning and doffing" of PPE. In the present study the highest correct sequence of wearing P.P.E. were from faculty (62.6%) and least from post graduates (50.9%)

The CDC sequence of donning a face mask is as follows: securing ties or elastic bands at the middle of head and neck, fitting the flexible band to the nose bridge, fitting snug to face and below the chin, fit-check respirator. In this study less than forty percent of the respondents were aware of the correct sequence of the face mask's donning and the highest response rate from the faculty (37.5%) and the least from the interns (14.3%) similar to the study done by Modi et.al and Ramandeep singh et.al [10] [11]

Patient isolation and aerosol performing procedures should be carried out in the Airborne Infection Isolation Room (AIIR). These are rooms kept under negative pressure. Suspected or confirmed patients should not be placed in a room with an exhaust that recirculates air within the hospital building as it spread the disease from infected persons to the healthy population. Air from these rooms should be filtered through a high-efficiency particulate air (HEPA) filter directly before recirculation. In this study less than half of the responders in our survey were aware of this concept.

The overall percentage of correct answers from our study participants was 71.2%. Among them the highest percentage of correct responses from undergraduate dental students (74.10%). The major limitation of the present study is that the sample sizes are limited to the students of a private dental college, and hence the results based on the used sample sizes could not be generalized to all the dental health professionals of Andhra Pradesh and India as well, although it can certainly help the state and the country to enhance the awareness regarding KAP in the general population. Due to the questionnaire being self-answered by the participants, there is also a high chance of errors or misrepresentation of information. In view of these, more studies should be conducted in the near future to investigate the KAP for COVID-19 at various states and countries.

V.   Recommendations

Even though the results are very positive towards KAP, we have some suggestions for both the government and residents of India:

(1) Few participants have stored the government-issued helpline number, so it is recommended that Indian authorities raise awareness among residents of the helpline number;

(2) 2.2% of the participants in this study still did not use protective items (like masks, etc.). Therefore, there is a need to emphasize the importance of these items;

(3) The findings of this study will help to establish public-health policies that target particular low-KAP groups and improve their KAP through well-planned, appropriate, and personalized strategies.

In order to boost KAP against COVID-19, health promotion activities are vital, and it is recommended to perform interventional studies using the findings of this report. Positively, India will be able to tackle COVID-19 in the near future by joint efforts of the governments of India and all Indian citizens.

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KNOWLEDGE 1.**The virus causing COVID -19 infection is called** .	☐ A. Severe Acute Respiratory Syndrome Coronavirus (SARS) ☐ B. Severe Acute Respiratory Syndrome Coronavirus -2 (SARS-CoV -2) ☐ C. 2019-nCoV ☐ D. Both B and C
2.. **First reports of cases were from Wuhan city in the Hubei Province of China**	☐ A. **True** B . False
3. The Main mode of transmission of virus from person to person is via	☐ A. Respiratory droplets ☐ B. Spread from contact with contaminated surfaces or objects ☐ C.Airborne (Dust particles containing infectious agent ☐ D. Transmitted by contaminated items such as food, water and medical equipment's
4. Which of the following is considered as Close contact?	☐A. Being with in approximately 10 feet (3 meters) of a patient with COVID -19 for a prolonged period of time ☐ B. Being within approximately 6 feet (2 meters) of a patient with COVID -19 for a prolonged period of time ☐ C. Having direct contact with infectious secretions (sputum, serum, blood) from a patient with COVID-19 D. B and C
5. Reported illness have ranged from mild to severe symptoms of cough, fever, brittleness which can appear 2-14 days after exposure. For which of the following situations is medical advice indicated?	☐ A. Have been in close contact with a person known to have COVID-19 ☐ B. Currently residing in an area with ongoing COVID-19 infection ☐ C. Recent travel from an area with ongoing spread of COVID-19 ☐ D. All of the above
6. Which of the following hand hygiene action prevents transmission of the virus to the health care worker?	☐ A. After touching a patient ☐ B. Immediately after exposure to body fluids ☐ C. A fter exposure to immediate surroundings of the patient ☐ D. Before putting on and up on removal of personal protective equipment (PPE) ☐ E. All of the above
7. Which of the following is recommended for isolation of a patient with confirmed COVID-19 and those under investigation for COVID-19?	☐ A. Air borne infection isolation Room (AIIR) with exhaust ☐ B. Air borne infection isolation Room (AIIR) without exhausts
8. The CDC sequence of donning a face mask is as follows:	☐ A.1.Securing ties or elastic bands at the middle of head and neck 2 fit snug to face and below the chin 3.fit snug to face and below the chin,4. Fit-check respirator ☐ B.1.fitting the flexible band to the nose bridge 2.fit snug to face and below the chin 3.fit-check respirator 4. Securing ties or elastic bands at the middle of head and neck ☐ C.1.fit snug to face and below the chin 2. Fit-check respirator 3. 1.Securing ties or elastic bands at the midd le of head and neck 4. Fitting the flexible band to the nose bridge ☐ D.1. Fit-check respirator 2. fit snug to face and below the chin 3. fit snug to face and below the chin 4. Securing ties or elastic bands at the middle of head and neck
9.Clinical management includes prompt implementation of recommended infection prevention and control measures and supportive management of complications. No specific treatment for COVID-19 is currently available	☐ A. True ☐ B. False
10. Sequence for putting on PPE	☐ A.1. Gown 2. Mask or respirator 3. Googles or Face Shield 4. Gloves ☐ B.1.Mask or respirator 2. Googles or Face Shield 3. Gloves 4. Gown ☐ C.1. Googles or Face Shield 2. Gloves 3. Gown 4. Mask or respirator ☐ D.1.Gown 2. Mask or respirator 3. Googles or Face Shield 4. Gloves
ATTITUDE **11.Which of the following is the most effective method for prevention of COVID-19 infection in the health care setting?**	☐ A. Avoid exposure (Use standard precaution, Contact precaution and airborne) ☐ B. Vaccination ☐ C. Hand Hygiene ☐ D. Avoid touching the eyes, nose or mouth with unwashed hands
12.Preferred method of hand hygiene for visibly soiled hand is	☐ A. Hand rub with soap and water for at least 10 seconds ☐ B. Hand rub with soap and water for at least 20 seconds ☐ C. Use of alcohol based hand sanitizer with at least 60% alcohol ☐ D. Use of alcohol based hand sanitizer with at least 90% alcohol
13. What personal protective equipment (PPE) should be worn by individuals transporting patients who are confirmed with or under investigation for COVID-19 with a heath care facility?	☐ A. Gloves. Gown ☐ B. Eye protection ☐ C.Respirator-N95 mask ☐ D. All of the above
14.Which of the following are recommended infection control measures up on arrival of a patients with suspected COVID-19 infection?	☐ A. Rapid triage of symptomatic patients ☐ B. Implement respiratory hygiene and cough etiquette (i.e placing a face mask over the patients nose and mouth if that has not already been done) ☐ C. Have a separate well ventilated space that allows waiting symptomatic patients to be separated by 6 or more feet. ☐ D. All of the Above
15. A recommended infection prevention and control measure is to perform aerosol- generating procedures, including collection of diagnostic respiratory specimens, in an AIIR (Airborne infection isolation Room)	☐ A. True ☐ B. False