

**Protective Practices and Willingness to Work among Staff of Government Dental Colleges Across Kerala during Covid-19 Pandemic**

<sup>1</sup>Divya KS, MDS, Assistant Professor, Department of Pedodontics and Preventive Dentistry Government Dental College, Kozhikode.

<sup>2</sup>Kannan Vadakkepurayil, MDS, Professor and Head, Department of Pedodontics and Preventive Dentistry, Government Dental College, Kozhikode.

<sup>3</sup>Jeeva PP, MDS, Associate Professor, Department of Pedodontics and Preventive Dentistry Government Dental College, Kottayam.

<sup>4</sup>Smitha LR, MDS, Assistant Professor, Department of Prosthodontics, Government Dental College, Thiruvananthapuram.

**Corresponding Author:** Divya KS, MDS, Assistant Professor, Department of Pedodontics and Preventive Dentistry Government Dental College, Kozhikode.

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**Abstract**

**Background:** COVID 19 leads to a higher workload and the attitude of healthcare staff will preparedness to work.

**Introduction:** Studies on HCWs show that being a doctor or nurse, prior knowledge and training, availability of personal protective equipment (PPE), and family care concerns influenced work willingness. The current study was conducted therefore the assess knowledge, protective practices, and willingness to work among dental HCWs.

**Material and Methods:** This cross-sectional study on dental HCWs was conducted across three Government Dental Colleges of Kerala. The study tools were socio-demographic questionnaire, the pandemic influenza:

staff attitudes survey, and knowledge, Attitudes and Practices towards Pandemic Influenza questionnaire. All participants after written informed consent filled up the questionnaires. The data was analysed using chi-square tests and ANOVA.

Results: Of the 308 HCWs, 86% had sufficient knowledge of COVID, 19. 79.5% were willingness work, 97.4% wore mask, 98% washed their hands often and 95.1% covered their mouth while coughing. 79.9% avoided crowded places, 87.4 % avoided social gatherings, 98.9% expected PPE to be provided, 63.7% had childcare and 68.9% elderly care responsibilities. 88% wanted regular health monitoring and 92.2% wanted rapid diagnosis and treatment. 77.9% personal

health concern and 84.8% family's health concern affected their decision to work. 55.2% doctors were worried COVID 19 admissions in the hospital and 72.1% had no reservation to treat patients with flu like symptoms. There was no significant association of sex, occupation, marital status urban status, full or part-time, permanent or contract type and work willingness.

**Conclusion:** HCWs have good knowledge, have excellent preventive practice adherence, and high willingness to work.

**Keywords:** COVID 19, Dental HCWs, Work willingness, Safety practices

## Introduction

COVID 19 (Corona Virus Disease 19) is a pandemic of unimaginable proportion. Kerala state with 3.5 crore population is facing the third wave with a daily test positivity of 44.65% at the time of writing this article.<sup>1</sup> Kerala's health infrastructure despite high population density seemed to hold as the death rate was 1.94 times lesser than national and 2.9 times lesser than the world rate.<sup>2,3</sup> Pandemics lead to higher workload and the knowledge and attitude of health care workers (HCWs) determines the rate of absence.<sup>4</sup> WHO recommended hygiene practices like hand washing, alcohol based sanitizers, surgical masks, N95 respirators, and personal protective equipment (PPE) are important safeguards.<sup>5-9</sup> Previous studies during the severe acute respiratory syndrome (SARS) have shown factors associated with a willingness to work as being a doctor or nurse, working in clinical or emergency department, prior influenza education and training, availability of PPE, and confidence in one's employer.<sup>10</sup> Across studies, these risk factors showed a significant association with willingness to work despite study heterogeneity.<sup>9-18</sup> The current study was conducted to assess the knowledge level, protective practices and willingness to work

among different levels of HCWs during the pandemic. The study was conducted during the peak of the second wave of the pandemic when no clear treatment protocols or vaccines were available.

## Materials and methods

This cross-sectional study including three Government Dental Colleges (Kozhikode, Kottayam and Thiruvananthapuram) was conducted from September 2020 to April 2021. Ethical approval was obtained from Institutional ethics committees (IEC NO:184/2020/DCC dated 5/10/2020) of all the three institutions. The HCWs were further classified into doctors and other HCWs. Based on an earlier study, it was determined that to get an adequate sample within each group was 132 (264 in all).<sup>12</sup>

All HCWs across dental colleges who consented were included. The study tools employed included a socio-demographic questionnaire to get basic data. The Pandemic Influenza Staff Attitudes Survey –to assess the staff attitude. This questionnaire is a standardized tool with good consistency and validity.<sup>4</sup> Knowledge, Attitudes and Practices towards Pandemic Influenza, a validated questionnaire was used to assess knowledge attitude and practice parameters.<sup>12</sup> The Malayalam version of both tools prepared by back-and-forth translation and pilot studies which showed a Cronbach's alpha of 0.82 and 0.88 respectively.

All participants after written informed consent filled up the socio-demographic questionnaire (maintaining anonymity). Then they completed the Pandemic influenza: staff attitudes survey questions and the practice subset knowledge, attitudes, and practices towards pandemic Influenza.

The data was tabulated and categorical data was analysed using the chi-square test, and continuous data

was analysed using ANOVA. The analysis was done using SPSS version 21 for windows

## Result

In total 500 questionnaires were distributed across the three dental colleges, of which 419 people consented for the study. Of these 364 questionnaires were returned and excluding those which were ambiguous or incomplete data, a final tally of 308 questionnaires was included.

The sample had 64% females and 36% males. The study had 43.2% interns and postgraduates, 10.7% dental faculty, 11.4% nurses, 7.5% office, technical and lab assistants and 22.8% support staff (janitors, security, drivers etc.). Of the sample 32% were single, 63.3% were married while rest 4.5% were divorced/separated or widowed. The rural to urban population divide was 51% to 49%. Of the sample 93.8% were full time and 6.2% were part time employees.

86% of the sample agreed or strongly agreed that they had sufficient knowledge regarding COVID 19. There was no significant difference in knowledge about COVID 19 among doctors (89.1%) and other HCWs (82.9%). ( $\chi^2=5.8$ ,  $p=0.35$ )

Of the sample only 7 people (2.3%) had COVID 19 infection before or at the time of filling the study. 65.3% of the sample lived within 5 km of the workplace, 15.6% lived within 6-10 km, 9.1% lived within 11-20 km and 10.1% lived more than 20 km away. Private transport or walking to the workplace was adopted by 84.1% of the sample while 15.1% had to rely on public transport.

Distance from workplace did not significantly influence the willingness to work among doctors. (60.7% Vs. 39.3%;  $\chi^2=15.8$ ,  $p<0.001$ ) This is reflected by the fact that more other HCWs had to travel via private or public transport than campus-based doctors who could afford to walk. (68.1% Vs. 31.9%,  $\chi^2=15.8$ ,  $p<0.001$ ) (Table 2)

A sizeable 79.5% people responded that they would be willing to work even if there was COVID 19 in their area. (Figure 1) There was no significant difference among doctors (80%) and other HCWs (79%) on willingness despite staying further away. ( $\chi^2=7.5$ ,  $p=0.17$ ) HCWs of higher age group strongly disagreed to working during the pandemic. ( $F=10.09$ ,  $p<0.001$ ) There was no significant association of sex, occupation, marital status urban status, full or part-time, permanent or contract type and with work willingness. (Table 1) An interesting fact was that all HCWs who were infected during this period were willing to work.

## Protective Practices

Of the sample 97.4% wore a mask while going out in public always or most often. Significantly more doctors (97.7%) wore masks in public than other HCWs (90.1%) which was significant ( $\chi^2=11.3$ ,  $p=0.02$ ). 90.5% wore no mask or sometimes wore a mask at home. There was no difference among doctors and other HCWs on this practice. 56.8% used an N95 mask, while 30.8% used a surgical mask and only 12.3% used a cloth mask. When it comes to mask type, significantly more doctors (64.5%) wore N95 than other HCWs (43.3%) who wore other types also ( $\chi^2=28.8$ ,  $p<0.001$ ) (Table 2)

79.9% avoided crowded places always or often and 87.4% avoided social gatherings always or often. 61.8% always or often avoided going outdoors other than to workplace. There was no difference among doctors and other HCWs on avoiding travel to affected places, crowded places, and social gatherings. 69.1% always or often avoided public transport. However, doctors (58.3%) to a lesser extent than other HCWs (66.4%) avoided public transport. ( $\chi^2=9.85$ ,  $p=0.04$ ). 89.9% of the respondents wanted restrictions on eating together and socialization restriction on staff in the hospital for infection prevention. This demand was significantly

more in doctors. (60.5% Vs. 39.5%;  $\chi^2=21.8$ ,  $p<0.001$ ) (Table 2)

98% of the sample washed their hands with soap often or always, while 95.1% covered their mouth while coughing. There was also no significant difference in protective practices like washing with soap and covering mouth while coughing among doctors and other HCWs.

34.4% of the sample always or often monitored for temperature and symptoms and 61.7% sought consultation for symptoms always. Of them, 51% tended to avoid hospitals and clinics and went to home based practitioners. Doctors when compared to other HCWs (46.6% Vs. 30.7%) almost never monitored temperature or symptoms. ( $\chi^2=15.07$ ,  $p=0.005$ ) And doctors never consulted for minor symptoms probably due to self-treatment. (26% Vs. 13%;  $\chi^2=14.08$ ,  $p=0.007$ ) Doctors almost never avoided clinics or hospitals for consultations. (35.8% Vs. 13.9%;  $\chi^2=23.5$ ,  $p<0.001$ ) (Table 2)

### Knowledge and Attitude

Of the staff 98.9% opined that they expected PPE to be provided in case of contact with infected patients and 89.3% opined that they expected PPE while seeing patients regardless of COVID status. Significantly more doctors strongly favoured PPE to all staff in contact with patients (59.5% Vs. 40.5%;  $\chi^2=13.98$ ,  $p=0.007$ ) and did not favour PPE to staff regardless of COVID contact. (35.8% Vs. 13.9%) 61.8% wanted PPE while using public transport. Significantly more doctors were not sure regarding the need for PPE while using public transport. (55.2% Vs. 28.26%;  $\chi^2=10.68$ ,  $p=0.03$ ) (Table 2)

63.7% were in strong agreement that childcare environment might influence their work decision, and 68.9% opined that the care of elderly at home would affect their ability to work. Effective childcare

significantly influenced the willingness to work for other HCWs than doctors. (85.29% Vs. 14.71%;  $\chi^2=25.04$ ,  $p<0.001$ ). Effective care of elderly significantly influenced the willingness to work for other HCWs than doctors. (82.3% Vs. 17.7%;  $\chi^2=19.85$ ,  $p<0.001$ ) (Table 1 and 2)

### Health and Safety

88% wanted regular provision for health monitoring during then pandemic, and 92.2% wanted rapid provision for diagnosis and treatment. 93.3% wanted anonymised information on the number of staff affected by COVID 19. These demands were significantly more in doctors than other HCWs. (58.2% Vs. 41.8%;  $\chi^2=10.51$ ,  $p=0.015$ ) (Table 2) 85.4% wanted effective prophylactic treatment in case of exposure. This demand was similar among doctors and other HCWs. Preventive drugs were taken by 28.9% of the sample and there was no significant difference among other HCWs and doctors.

77.9% agreed or strongly agreed that personal health concern would affect their work decision, while 84.8% opined that concern about family's health would affect their decision to work. Significantly more doctors were unsure as to whether personal health concerns influenced the willingness to work than other HCWs. (85.2% Vs. 14.8%;  $\chi^2=20.2$ ,  $p<0.001$ ) Significantly more doctors were unsure that family health concerns would influence their willingness to work than other HCWs. (55.7% Vs. 44.3%;  $\chi^2=9.52$ ,  $p=0.04$ ) (Table 2)

58.8% said that they would be concerned by the prospect of patients being treated in the centres where they worked. However significantly more doctors (55.2%) were not influenced by the prospect of COVID 19 admissions in the hospital than other HCWs (44.7%). ( $\chi^2=10.16$ ,  $p=0.017$ ) And doctors (72.1%) tended to have lesser reservation to close contact than other HCWs

(27.9%) with patients with flu like symptoms. ( $\chi^2=12.11$ ,  $p=0.01$ ) This is even though they had significantly more exposure to infected people. (63% Vs. 13%; ( $\chi^2=22.51$ ,  $p<0.001$ ) (Table 2)

## Discussion

The current study showed a high willingness to work among HCWs in the state. There was no significant association of sex, occupation, marital status urban status, full or part-time, permanent or contract type and work willingness. This disagrees with an earlier study on SARS and influenza pandemics that found being female, being in a supportive staff position, married and working part-time were associated with unwillingness to work.<sup>10</sup> People of higher age group strongly disagreed to working during the pandemic. This is in keeping with an earlier study that showed that comparatively young physicians showed higher interest to during COVID-19 pandemic than their older colleagues.<sup>18</sup> Of our population only 2.3% developed COVID 19 and all of them expressed work willingness.

## Protective Practices

This study showed a very high mask adherence (97.4%), which is echoed by an Indian study that showed that observed that 97.8% will not remove mask during clinics and everyone said that they wear surgical masks in public places.<sup>13</sup> Of the types of masks used significantly more doctors wore N95. However, there was no difference among doctors and other HCWs on mask wearing at home. And both doctors and other HCWs used preventive medications to the same measure. We were unable to find studies to corroborate these data.

Majority (69.1%) avoided going outdoors other than to workplace. This is lower than an earlier study which observed that adherence to staying at home was mentioned by 91.4% of the participants.<sup>14</sup> There was no difference among doctors and other HCWs on avoiding

travel to affected places, avoiding public transport, crowded places, and social gatherings. No studies seemed to have examined this variable, so we are unable to compare these findings with existing research

98% of the sample washed their hands with soap often or always. This was much higher than a meta-analysis from Ethiopia where the pooled hand hygiene compliance HCWs was 38% (95% CI: 0.16-0.59).<sup>15</sup> There was also no significant difference in protective practices like washing with soap among doctors and other HCWs. There are no studies to corroborate this data.

34.4% of the sample always or often monitored for temperature and other symptoms and 61.7% said they sought consultation for symptoms often or always. Of them, 51% tended to avoid hospitals and clinics and went to home based practitioners. This is like a study where nearly two-thirds of the participants (65.0%) reported safe practices in the case of early onset COVID-19 signs and symptoms.<sup>14</sup> Further no comparative studies exist to corroborate the findings that doctors tended to monitor symptoms less, did not seek treatment for minor symptoms and did not avoid seeking hospital consultations.

## Knowledge and Attitude

86% of the sample agreed or strongly agreed that they had sufficient knowledge regarding COVID 19 while the rest were not sure or claimed insufficient knowledge. This is roughly like a study from China where 89% HCWs surveyed demonstrated sufficient knowledge of COVID-19. However, in contrast to our study which showed no difference among doctors and other HCWs, the Chinese study observed that doctors showed higher knowledge scores among doctors ( $38.56 \pm 3.31$ ) than nurses ( $37.85 \pm 2.63$ ) and paramedics ( $36.72 \pm 4.82$ ).<sup>16</sup> 58.8% said that they would be concerned by the prospect of patients being treated in the centres where they

worked. This is slightly lower than a study on HCWs that showed 85% of the surveyed HCWs were afraid of becoming infected at work.<sup>16</sup>

A sizeable 79.6% people responded that they would be willing to work even if there was COVID 19 in their centre. There was no significant difference among doctors and other HCWs on willingness. This is much higher than a study on HCWs from Australia which showed that A total of 42% of participants suggested they felt their willingness to work during the pandemic was less than pre-pandemic times. Doctors were more likely to suggest this compared to both nurses and paramedics (doctors 54%, nurses 44%, paramedics 44%).<sup>17</sup> This was also higher than a study from Bangladesh where 69.7% of the participating physicians reported that they were willing to work during initial lockdown due to the COVID-19 pandemic.<sup>18</sup> Regarding provision of PPE almost more than 90% wanted it provided at work and more than 70% wanted it despite presence of infected people. The participants in the Australian study also suggested that access to PPE was the factor most heavily impacting on their willingness to work at the present time.<sup>17</sup> Significantly more doctors were strongly in favour of issuing PPE to all staff in contact with patients than other employees, similar to the Australian study, paramedics were less concerned about access to PPE than doctors and nurses.<sup>17</sup> Another study showed that almost 79% of the participants believed that proper PPE would protect healthcare providers from COVID-19, while 61% believed that it would protect the visiting patients too.<sup>18</sup>

### **Health and Safety**

Regular provision for health monitoring (88%) and rapid provision for diagnosis and treatment (92%) were common demands. This demand was significantly more in doctors than other employees. Significantly more

doctors were unsure that family health concerns would influence their willingness to work than other HCWs. A study pointed that not having rapid access to testing if they develop COVID-19 symptoms and concomitant fear of propagating infection at work and to family was a significant concern impacting work willingness.<sup>19</sup>

Effective childcare influenced the willingness to work for other HCWs than doctors. Effective care of elderly influenced the willingness to work for other HCWs than doctors. Significantly more doctors were unsure as to whether personal health concerns influenced the willingness to work.<sup>19</sup> Influenza pandemics have shown childcare obligations can significantly affect frontline HCWs willingness to work.<sup>20</sup> Australian data also shows that concern for family members, and caring responsibilities did affect work decision to varying degrees.<sup>17</sup> Concern for family and risk of transmitting the infection to family members from themselves were most cited as a major barrier in the Bangladeshi study.<sup>18</sup> There are however no studies to compare the attitudes of doctors and other HCWs to aspects of their personal health concern, family health concern, childcare, and care of elderly.

This study brings out the concerns of the health care professionals who despite a relentless pandemic have shown a commendable willingness to work which is better than any comparable first or third world country. They should feel valued and supported in their endeavour to defeat this pandemic. Policies and guidelines for the health care workforce and public health need to include these considerations to improve the perception of our HCWs regarding the work they put in despite tremendous physical and mental hardships. The recognition that it is this workforce more than any that will lead us out of this war against one of the greatest threats mankind has ever faced will go a long

way in implementing meaningful plans that truly acknowledges the service of these warriors.

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### Legend Figures

Figure 1: Willingness to Work.

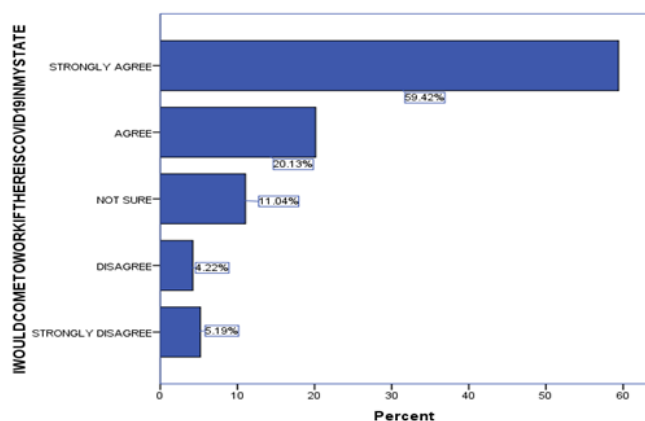


Table 1: Factors Determining Willingness to Work

Variable	Divisions	Percentage	$\chi^2$ / Sig.
Sex	Male	76.57%	$\chi^2=9.06$ p=0.06
	Female	81.21%	
Marital Status	Single	73.73%	$\chi^2=13.34$ p=0.34
	Married	82.05%	
	Widowed/ Separated	85.71%	
Residence	Urban	78.14%	$\chi^2=$

	Rural	80.89%	3.84 p=0.42
Employment Type	Permanent	80.46%	$\chi^2=4.13$ p=0.38
	Contract	77.72%	
Employment Terms	Full Time	80.62%	$\chi^2=8.32$ p=0.08
	Part Time	63.15%	
HCW	Doctors	80%	$\chi^2=6.68$ p=0.15
	Other HCW	79.02%	
Covid Infection	Infected	100%	$\chi^2=1.89$ p=0.75
	Non-infected	79.07	

Table 2: Knowledge, Attitude and Willingness to Work Among Doctors and Other HCWs

Variable	Divisions	Percentage	$\chi^2$ / Sig.
Wearing Mask in Public	Doctors	98.78%	$\chi^2=11.35$ p=0.02
	Other HCWs	93.60%	
Mask Type (N95)	Doctors	68.48%	$\chi^2=28.86$ p<0.001
	Other HCWs	43.35%	
Would not avoid patients with Flu	Doctors	6.66%	$\chi^2=12.12$ p=0.02
	Other HCWs	1.39%	
Avoid Going Outdoors	Doctors	39.26%	$\chi^2=9.85$ p=0.043
	Other HCWs	52.44%	
Monitoring Temperature	Doctors	13.9%	$\chi^2=15.07$ p=0.005
	Other HCWs	27.97%	
Avoid Hospital Consult	Doctors	64.75%	$\chi^2=23.34$ p<0.001
	Other HCWs	87.88%	

Contact with Infected Material	Doctors	63.63%	$\chi^2=22.50$ $p<0.001$
	Other HCWs	42.65%	
Concerned About Covid 19 in Hospital	Doctors	30.4%	$\chi^2=10.16$ $p=0.01$
	Others	43.36%	
PPE during Public Transport	Doctors	58.53%	$\chi^2=10.68$ $p=0.03$
	Other HCWs	74.82%	
PPE for all staff with Patient Contact	Doctors	80%	$\chi^2=13.98$ $p=0.007$
	Other HCWs	62.9%	
Distance to workplace (<5 Km)	Doctors	73.93%	$\chi^2=14.68$ $p=0.005$
	Other HCWs	55.24%	
Disagree to use Public Transport	Doctors	53.65%	$\chi^2=29.46$ $p<0.001$
	Other HCWs	35.66%	
Concerned about Childcare and Willingness	Doctors	60%	$\chi^2=14.87$ $p<0.001$
	Other HCWs	37.06%	
Effective Care of Elderly not Possible	Doctors	82.93%	$\chi^2=19.85$ $p<0.001$
	Other HCWs	95.91%	
Unsure about Personal Health Concern and Willingness	Doctors	13.93%	$\chi^2=20.2$ $p<0.001$
	Other HCWs	2.79 %	
Unsure about Family Health Concern and Willingness	Doctors	8.48%	$\chi^2=9.52$ $p<0.049$
	Other HCWs	3.49%	