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Knowledge, Awareness and Attitude on Covid-19 Vaccines among Students of Various Health Care Professionals in India- A Cross Sectional Survey

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***Abstract*: *Background:* Vaccinations have been considered as the most reliable lifesaving tool to control spreading of infectious diseases during pandemics. A significant number of corona virus disease (COVID-19) vaccinated individuals have demonstrated very good efficacy in randomized clinical trials. It is essential that students at health care professional levels are provided with adequate knowledge to inculcate positive attitudes and appropriate practices towards COVID19 vaccines. *Aim:* The present study was aimed to assess the knowledge, awareness and attitude on Covid-19 vaccines among students in health care profession across the state of Tamil Nadu, India. *Methods*: A cross sectional questionnaire-based online-survey was conducted through Google forms among the health care professional students across Tamilnadu. Statistical Package for Social Sciences software (SPSS version 22.0) was used to analyze the statistical data. The $p < 0.05$ was considered statistically significant. *Results:* Of the total health care professionals (HCPs), 108 answered the survey. The mean age of participants was 22.19 years (SD 2.30), and 74 (68.5%) were female. Among the respondents, 101 (93.5%) were familiar with COVID-19 vaccine and 93 (86.1%) admits it is necessary to know vaccination status of their patient before commencing any clinical procedure. Though 86 HCPs (80.18%) had adequate knowledge regarding COVID-19 vaccines 46 (42.5%) were unsure of method of production of vaccines as well as interval period suggested between 2 doses of vaccines (37.9%) and time take for antibody production after second dose (59.25%). 26.8% HCPs showed lack of interest while 39.8% admitted fear of vaccine side effects as reasons for refraining from getting vaccinated. The majority of the subjects (74.53%) had a positive attitude and good practice awareness toward COVID-19 vaccination. *Conclusion*: Besides appropriate education framework and evidence-based studies, more research could further explore the possible association between profession and vaccination willingness and behavior.**

***Keywords*: Attitude, Covid-19 vaccines, health care, pandemics, positive impact, vaccine hesitancy.**

1. Introduction

The first outbreak of novel corona virus disease (COVID-19) caused by severe acute respiratory syndrome-CoV2 (SARS-CoV-2) human corona virus at Wuhan, China in December 2019 created a panic state across the world attributed to its asymptomatic, rapid onset, high transmissibility nature eliciting massive numbers of new cases with alarming complications including death [1, 2]. On March 11, 2020 World health organization (WHO) declared COVID-19 as a highly contagious global pandemic with large number of patients reporting with mild to moderate symptoms such as high degree fever, cold, myalgia, fatigue, dry cough with flu-like signs acquired through respiratory droplets with infected persons or by contact with contaminated objects and surfaces, or asymptomatic virus shedding individuals presenting with rapidly spreading events [3, 4]. COVID-19 largely affects the respiratory system with a range of symptoms from mild rhinorrhea to severe respiratory distress syndrome and more fatal generally for the old aged and those with severe comorbidities, such as hypertension, obesity, diabetes, and renal diseases [5, 6].

Until now, there has not been any reported effective drug approved for the treatment of COVID19 infected patients and numerous research proposals, clinical trials were carried out across the world to control the mortality and morbidity rates. In October 2020, the US Food and Drug Administration (FDA) has approved Remdesivir, a direct acting antiviral drug that inhibits viral RNA synthesis as an Emergency Use Authorization for severely ill adults and pediatric COVID-19 patients (12 years and older and weighing at least 40 kg) with hospitalization requiring immediate mortality care, nonetheless its effectiveness was questionable over prolonged duration resulting in WHO recommendation against its use in November 2020 [7-10]. The WHO along with CDC (Centre for disease

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control and prevention) enforced several preventive measures such as identifying and isolation of suspected and/or contact cases, contact tracing, night curfews, and execution of lockdown and travel restrictions across the state and/or countries as well as setting precautionary guidelines by directing compulsory use of face mask, practicing hand hygiene and respiratory protocol, follow social distancing norms and avoid public mass gathering to control the widespread of the virus [11, 12].

For decades, vaccinations have been considered as the most reliable and cost-effective method to control rapidly spreading infectious diseases and save millions of lives especially during pandemics. A significant number of COVID-19 vaccinated individuals have demonstrated very good efficacy in randomized clinical trials. As at the time of this study, a total of 85 vaccines are in preclinical development animal trial studies and 63 are in clinical development in humans [7] of which 22 were added within the WHO Emergency Usage Listing (EUL)/ Prequalification (PQ) process [12, 13] and one vaccine has been abandoned [14]. Vaccines includes Covishield™ from Serum Institute of India Pvt Ltd and Covaxin™ from Bharat Biotech, India for emergency use in India similar to Pfizer-BioNTech's (BNT162b2) and Moderna (mRNA-1273) mRNA vaccines in United States have been approved and administrated on a large scale through vaccination drives [12-14].

Health Care Professionals (HCPs) and Health Care Workers (HCWs), the frontiers in the control of COVID-19 disease are at increased risk of exposure to SARS-CoV-2 infections and also play an essential role in creating awareness and promoting vaccination drive among the general public across the globe. However, low- and middle-income countries are at risk of vaccination interruptions due to lack of public interest, hesitations, shortage of resources, and lack of confidence in the government's and healthcare workers' strategies. Though the Undergraduate students from health care professionals (Medical, Dental and allied health sciences) are not directly involved in managing COVID-19 patients, they play a key role in sensitizing the people at various community health care prevention level on signs and symptoms of COVID 19 with special emphasis on importance of maintaining personal hygiene measures and ways to prevent its rapid spread [15, 16]. Thus, it is critical that students at health care professional levels are provided with adequate knowledge of COVID-19 prevention policies across different nations to inculcate positive attitudes and appropriate practices that contribute immensely for decreasing the risk of carrying infection. Hence the present study was aimed to assess the knowledge, awareness and attitude on Covid-19 vaccines among students in health care profession across the state of Tamil Nadu, India.

2. Methodology

A cross-sectional questionnaire survey was conducted amongst the dental, medical, physiotherapy and allied health science (health care professional) students across the state of Tamilnadu, India to assess their knowledge, attitude and awareness towards Covid-19 Vaccines. The study was conducted following the Helsinki declaration as revised in 2013. After obtaining the Ethical clearance, the required information was collected through published scientific articles pertaining to the study and self-administered structured questionnaires, comprising of 20 questions in English language along with their demographic details was prepared and evaluated. The questionnaire had both combination of selected response to the certain questions and also few close ended questions (Yes / No/ don't know).

A total of 108 randomly selected health care professional students across Tamilnadu participated in this survey. Since this study was conducted during COVID-19 Pandemic lockdown period, online Google forms were generated and distributed through social media platforms. The internal consistency of the questionnaire was adequate (Cronbach's alpha = 0.894). All the participants were briefed about the purpose of the study and an informed consent was obtained before the survey through Google forms and assured that their participation was purely voluntary.

3. Statistical Evaluation

Non-probability, stratified sampling technique was employed that yielded information from 108 health care professional students were taken into this observational study having a cross-sectional design. Responses recorded among the selected population group were evaluated using SPSS software Version 22.0. In the final analysis, "yes" or correct responses were given a score of 1 and "no" or incorrect responses were given a score of 0; the scores were summed to obtain the overall scores among Dental practitioners under 5 year of experience.

4. Results

On analysis of the given data the mean age of study population was observed as 22.194 ± 2.301 years (mean ± S.D) with 0.439 at 95% confidence level comprising of 34 (31.5%) male and 74 (68.5%) female participants. It was observed most of the study participants 81.48% pursue dentistry (88 out of 108) followed by 10.18% (11) medicine and least being allied health science professionals 2.77% (3) among which 91 out of 108 were undergraduate students (84.26%), 12 were private practitioners and only 5 postgraduate students (4.63%). Chi-square test analysis to correlate interrelationship between the year-wise distribution of the study participant showed chi-square statistic of 126.722 with p value <.00001. The result is significant at $p < .05$.

On assessment on knowledge and awareness towards COVID-19 vaccines majority of participants (93.5%) were familiar with vaccines currently practiced in India that includes Covishield™ and Covaxin™ among which 87% were aware that intramuscular injection as the recommended route of administration of Covid vaccine. About 64% of dental students and 85% of allied health students incorrectly (60.18%) responded these vaccines as live accentuated ones and it is also evident that 78.79% of dental and allied health students acquire information through social media pages and news channels whereas Medical students prefer articles from Internet as their primary source. Nonetheless 86 HCPs (80.18%) had adequate

knowledge regarding COVID-19 vaccines, 46 (42.5%) were unsure of method of production of vaccines as well as interval period suggested between 2 doses of vaccines (37.9%) and time take for antibody production after second dose (59.25%).

On assessment of attitude and practices towards COVID 19 vaccines 89.8% agree these vaccines can be given to individuals above 18years of age among which only 40% were vaccinated with either covishield or covaxin at the time of this study. 26.8% showed lack of interest while 39.8% admitted fear of vaccine side effects as reasons for refraining from getting vaccinated. 70.37% believes Sputnik (foreign) vaccine is likely to be introduced in India in near future. 47% and 48% agrees allergies and Cardiac patients are at high post vaccination risk while 62.04% were unsure about vaccine use in pregnant women and recommends medical consent and guidelines prior to injection. On the other hand, 86.1% admits it is necessary to know vaccination status of their patient before commencing any clinical procedure.

5. Table

Table 1
Distribution of Study participants according to Course of Study

Course of study	Observed Frequency (N)	Frequency (%)
Dental	88	81.48%
Medical	11	10.18%
Physiotherapy	6	5.55%
Allied-Health Sciences	3	2.77%
TOTAL	108	100%

Table 2
Distribution of study participants according to Year of study

Year of study	Observed	Frequency (%)
Under graduate	91	84.26%
Post graduate	5	4.63%
Private practitioner	12	11.11%

6. Figures

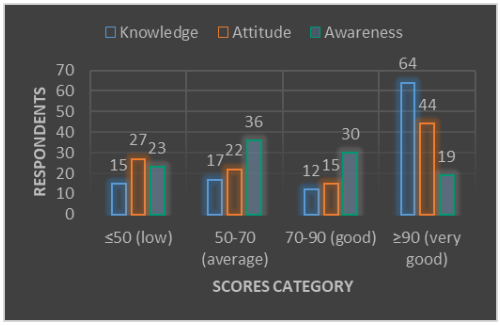

Fig. 1. Overall Knowledge, Awareness, Attitude Score Graph

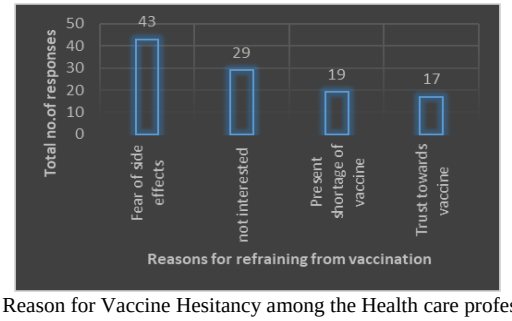

Fig. 2. Reason for Vaccine Hesitancy among the Health care professionals

7. Discussion

Control of COVID-19 infections can be accomplished by vaccination of the population at a larger scale along with setting precautionary guidelines by directing compulsory use of face mask, practicing hand hygiene and respiratory protocol, follow social distancing norms and avoid public mass gathering. Appropriate distribution and reception of the COVID-19 vaccine among health care professionals remains one of the major challenges to impart successful immunization program across India. In this study, majority of health care professionals though lack adequate knowledge awareness but possess positive attitude and practices towards vaccinations and admits it is necessary to vaccinate and also to know vaccination status of their patient before commencing any clinical procedure.

In this study, 93.5% participants were familiar with vaccines currently practiced in India and recommends vaccination as an important strategy to control spread of Corona virus disease which is supported by Dara S et al [15], Chew N et al [17], Gagneux-Brunon A et al [18], Nzaji MK et al [19], Shitu K et al [20] in their respective studies carried out in different parts of the world. Adequate responsiveness and positive attitude may be attributed to increase awareness events, propagandas, community health programs organized by government and non-governmental organization, continuing dental/medical education training sessions and webinars focusing on importance of COVID-appropriate behaviors.

The most important factor associated with lack of knowledge towards method of production of vaccines as well as interval period suggested between 2 doses of vaccines and time take for antibody production after second dose could be the prevalence of several myths or misconceptions on COVID-19 vaccines among healthcare professionals. Studies by Karlsson LC et al [21], Dror AA et al [22], and Lucia VC et al [23] also demonstrated comparable results suggesting that government agencies, policymakers and health care system authorities must ensure recognition and belief from both the public and healthcare professionals since any hesitation or delay can result in vaccination refusal. The low knowledge scores among health professionals illustrates the need for additional enhancement of knowledge and awareness as it is also believed that better knowledge levels could ultimately led to a better attitude towards the COVID-19 vaccination.

Despite adequate familiarity towards vaccines, 26.8% showed lack of interest while 39.8% admitted fear of vaccine side effects as reasons for refraining from getting vaccinated. Similar studies by Gohel KH et al [3], Elhadi M et al [6], Dara S et al [15], Li M et al [16], and Zhang J et al [24] also showed lack of knowledge, insufficient experimental studies and clinical trial results, deficiency of long-tern follow up observations, sufficient and accurate information, concerns about possible complications or adverse effects post-vaccination and presence of co-morbidities were major causes for low acceptance of vaccination among health care professionals. Consequently, educational evidence about vaccination utilization should be framed to personal preferences and emphasize the risks of COVID-19 to individuals. Besides appropriate framework and evidence-based studies, more

research could further explore the possible association between profession and vaccination willingness and behavior.

Our study observed that 78.79% of dental and allied health students acquire information through social media pages and news channels whereas Medical students prefer articles from Internet as their primary source. Studies by Gohel KH et al [3], Kumar L et al [12], Bhagavathula AS et al [25], and Saqlain M et al [26] also showed social media pages as the primary source of information among healthcare professionals followed by official websites of Ministry of health and family welfare. Incorrect and unsure responses in the present study on method of production and time interval on vaccination are result of day-to-day changes in the guidelines proposed by the government and presence of extensive collection of information on the internet, including biased unverified, irrelevant and unreliable resources, which can easily misguide the health care professionals requiring exact apprising in their official websites. Focus should be laid on to educate and provide authentic information to the health science professional students to ensure right information is conveyed at the community level.

8. Conclusion

Within the study limitations, the present observation clearly illustrates deficiency of COVID19 vaccine knowledge and prevalence of vaccine hesitancy among health care professionals. Conversely, positive attitude and practice awareness responses signifies adequacy of easily accessible, satisfactory and improved health education programs on COVID-19 vaccination. Besides appropriate framework towards increasing awareness events, propagandas, community health programs, continuing dental/medical education training sessions, webinars and evidence-based studies, more research could further explore the possible association between profession, vaccination willingness and behavior.

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