

# A Cross Sectional Study on Impact of COVID-19 Pandemic on Dental Education and Clinical Training -A Global Perspective

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DOI: [10.36348/jaep.2023.v07i03.003](https://doi.org/10.36348/jaep.2023.v07i03.003)

| Received: 04.02.2023 | Accepted: 10.03.2023 | Published: 15.03.2023

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## Abstract

**Objectives:** 1) To understand the effect of the Covid-19 pandemic on the dental education system. 2) To determine the preparedness of dental educators/ education systems to face the new challenges. **Materials and Methods:** A cross-sectional, questionnaire study involving dental educators from different countries was conducted. The time of conduct of this survey was from Oct 2021 to March 2022. The google form questionnaire used to collect the responses. With the intention to cover most of the global responses, at least one country from each continent was chosen. **Statistical Analysis:** Statistical analysis was performed using SPSS for Windows release 21.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were generated, and Chi-square test was used to examine differences in responses to the questions. The significance level was stated as  $p < 0.05$ . **Results:** Out of 280 invitations sent, 237 responses were received. Among the respondent's 68.4% were male, 28.1% were female and the rest (3.5%) preferred not to mention their gender. There were 63.3% between the age of 36-45 and having teaching experience between 10-19 years. Most of the responses were the faculty members with the designation of Assistant and Associate professor. Responses received from a total of 13 countries. India (96) followed by the Kingdom of Saudi Arabia (78). 96.2% of respondents agreed that the Covid-19 pandemic has influenced the dental education system. Majority (85.7%) believed the pandemic had a negative impact on dental education. Maximum number of respondents cited the social distancing norms (43%), as the reason for such an impact. **Conclusion:** Majority of the respondents agreed that the pandemic had an adverse effect on the existing dental education practices. Effect was mainly because of reasons like implementation of social distancing norms, socioeconomic impact of the pandemic and changes in the government policies for safe practices. Although half of the respondents agree that they lack the knowledge and skills to adapt to the changing needs of the dental education system, there was an overwhelming interest for upgrading their skills to match the evolving requirements.

**Keywords:** Dental Education; Covid-19; Pandemic; Learning Domains.

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## INTRODUCTION

Due to the inherent nature of the conventional education system, various restrictions and lifestyle changes imposed during the covid 19 pandemic had shaken the dental education system. Amid the confinement due to the COVID-19 pandemic, face-to-face classroom educational activities with

undergraduate and postgraduate dentistry students were nearly interrupted worldwide (1). The unprecedented pace with which the pandemic had taken over the planet has provided very little time for the dental education fraternity to change immediately. However, with changing times, the challenge posed by the pandemic has been accepted and numerous universities and educational institutions are preparing to adapt to the

new reality of the post-pandemic world. As the system changes, the dental educators, the key component of the system, also need to upgrade themselves to deal with the challenges effectively. In the present study, we have attempted to collect feedback from numerous dental educators from different parts of the world to understand the Effect of the Covid-19 pandemic on the Dental Education system and preparedness to face the new challenges.

## MATERIALS AND METHODS

In this cross-sectional, questionnaire study, dental educators from different countries were contacted and invited to participate in the study. The questionnaire in the form of google form was sent to their email to seek responses. With the intention to cover most of the global responses, at least one country from each continent was chosen. Out of 280 invitations sent, 237 responses were received. The responses received from Ireland, The United Kingdom (Europe), India, Malaysia (Asia), United States of America (North America), Kingdom of Saudi Arabia, Oman, United Arab Emirates, Kuwait (Middle East), Ethiopia, Egypt and South Africa (Africa) and Australia. None of the responses could be obtained from south America.

## Statistical Analysis:

Statistical analysis was performed using SPSS for Windows release 21.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were generated, and Chi-square test was used to examine differences in responses to the questions. The significance level was stated as  $p < 0.05$ .

## RESULTS

Among the participants, 68.4% were male, 28.1% were female and the rest (3.5%) preferred not to mention their gender.

Among the respondent's majority 63.3% were between the age of 36-45 (Image 1) and had teaching experience between 10-19 years (Image 2). Most of the responses were received from the faculty members with the designation of Assistant professors followed by Associate professors (Image 3).

Responses received from a total of 13 countries in which, highest responses were from India (96) followed by the Kingdom of Saudi Arabia (78).

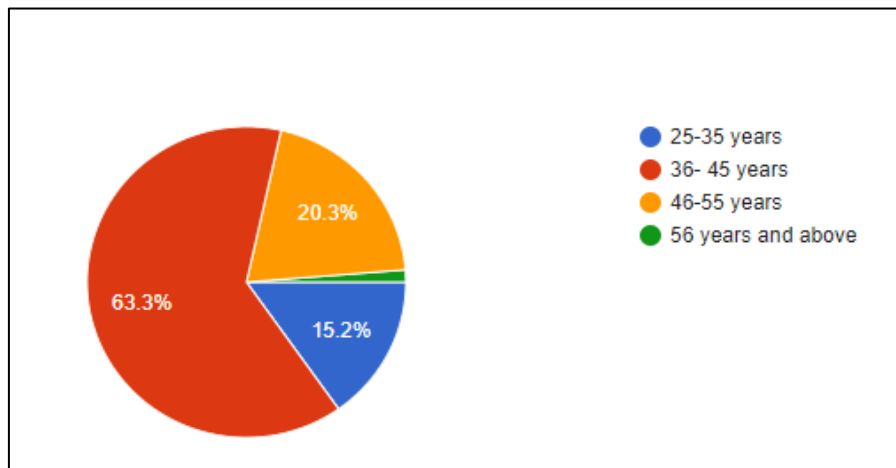


Image 1: Percentage distribution of participant's age

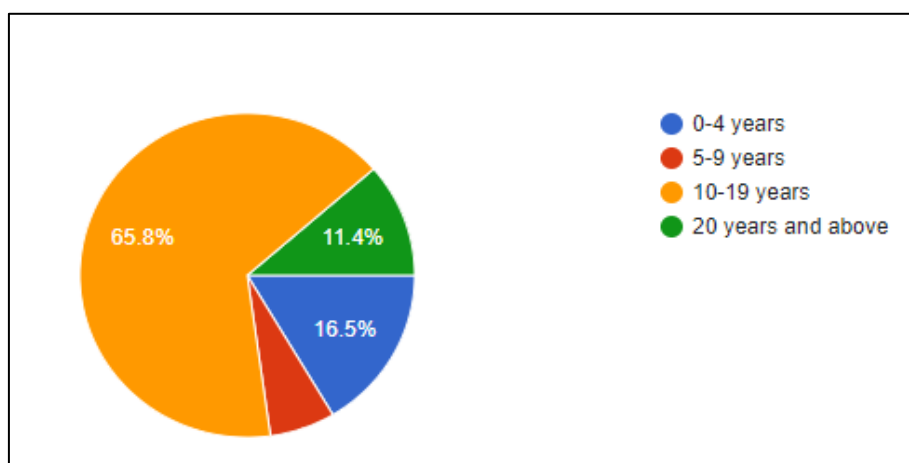
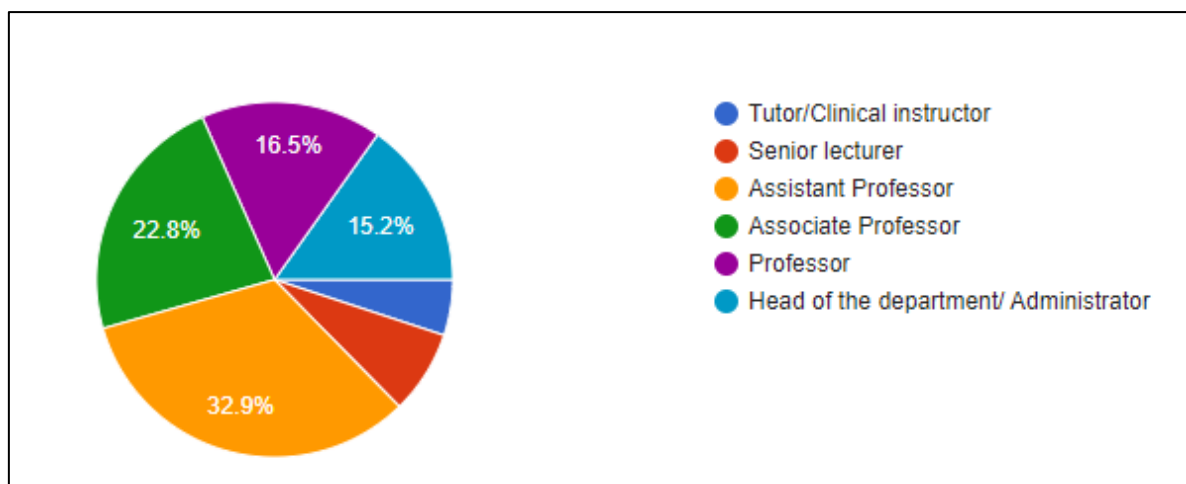
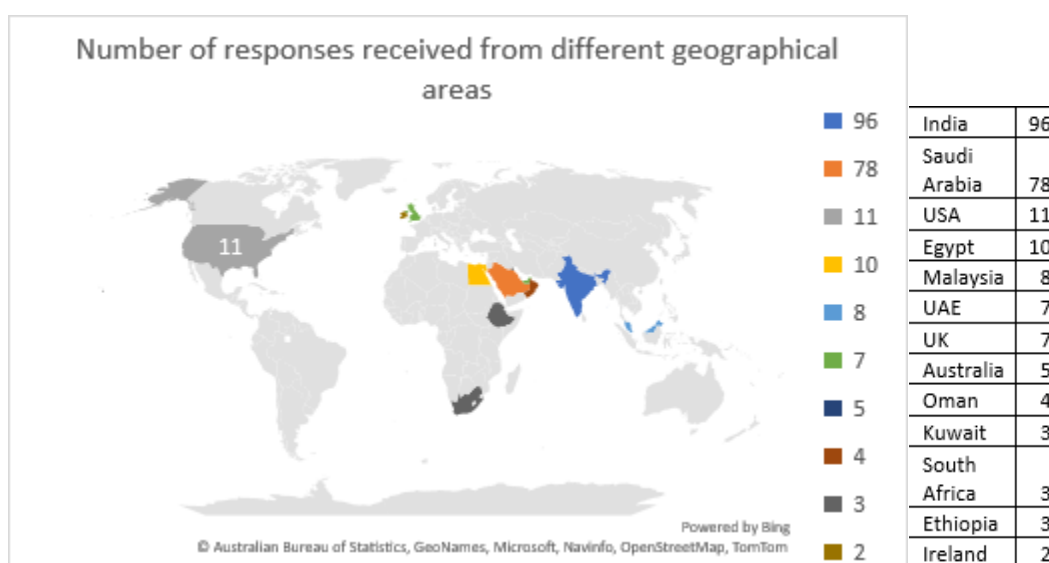


Image 2: Percentage distribution of participant's teaching experience



**Image 3: Academic designation of the participants**



**Image 4: Geographic Distribution of the respondents**

Overwhelmingly high number of participants (96.2%) of respondents agreed that the Covid-19 pandemic has influenced the dental education system. Among these responses Majority (85.7%) believed the pandemic had a negative impact on dental education, whereas the remaining (14.3%) believed it had a positive impact.

When asked for the reason for such impact, the maximum number of respondents cited the social distancing norms (43%), followed by socio-Economic impact, changes in government policies and personal health concerns of teachers and learners. Other reasons mentioned were changes in the cost of dental health care, shift to online teaching etc. (Respondents were given an option to choose multiple reasons).

**Table 1: Questions from the survey**

Question Number from Sections in the google form / Number	Questions from survey [Statistically significant $p < 0.05$ ]	Chi-square	Asymp. Sig
4.1	Do you think the Covid 19 pandemic has influenced the dental education system in any manner? (If your answer is "2" the survey will end with this response. We appreciate your participation)	421.595 <sup>a</sup>	.000
5.1	What kind of influence Covid 19 pandemic make on dental education?	117.857 <sup>b</sup>	.000
5.3	Which of the following sections of dental education are the most affected due to the Pandemic effect?	147.351 <sup>a</sup>	.000
5.4	Which of the following learning domains is the most affected due to the pandemic and global lockdown?	110.177 <sup>b</sup>	.000

Question Number from Sections in the google form / Number	Questions from survey [Statistically significant $p < 0.05$ ]	Chi-square	Asymp. Sig
5.5	Which component of education is the most affected?	197.169 <sup>a</sup>	.000
5.6	Irrespective of the type of influence of the Pandemic, do you think items time to revise/upgrade the existing dental education system? (If your answer is "2" the survey will end with this response. We appreciate your participation)	183.351 <sup>a</sup>	.000
6.2	Do you think your existing knowledge/skill is sufficient to apply these methods in your teaching program?	.602 <sup>a</sup>	.438
6.3	Given an opportunity, are you interested in attending training/workshops to upgrade your teaching skills to match the current requirements?	98.910 <sup>a</sup>	.000

[Statistically significant  $p < 0.05$ ]

## DISCUSSION

Pandemic produced shock to the conventional educational system, and it was sudden and unprecedented, with little time to prepare to face the evolving challenges. The dental educators around the world were in a situation, where the delivery of the different teaching and learning domains needed a strategic planning for the effective delivery. As most of the faculty in the various teaching institutions expected to be in their 30's -60's, this study found the predominant response category was from the age group 36-45 (Image 1). The participants' experience count was asked for and it was found to be 10-19 years of teaching experience (Image 2). The academic designation of the participants was found to be distributed equally among the different designation with the assistant professor category dominant [Image.3]. The global perspective of this study is evident through (Image 4) which shows the geographic distribution of the respondents. The pandemic influences the education system throughout the world at all levels of education. Higher education too was affected in various parts of the world.

### Covid 19 and its effect on dental education

Most of the conventional teaching and learning approaches were affected which were either partially or completely abandoned. The only one solution available for the educators to be creative and engage in an online environment. Prior to the pandemic most of the universities never felt the need to consider the implementation online teaching and learning a priority. One study has shown that there could be a positive effect of the COVID-19 confinement on students' performance (2). The authors concluded that the quarantine changed students' learning strategies to a more efficient productive routine with higher levels of engagement. Contrary to their results, one of the studies showed that most students sensed that they actually missed important learning experiences especially the clinical sessions and felt less engaged in following up with distant learning. (3) This could be explained by the fact that the former study was related to education in basic sciences, whereas dentistry needs practice and

ample clinical exposure. One comparative survey administered to professional dental students indicated that students experienced increased levels of stress and stated that the clinical education suffered from the pandemic (4). The dental educators at professor level definitely had the impact felt especially when it comes to conducting labs and clinics. The professors interviewed in one of the studies were of opinion that the distance learning methods were more suitable for didactical courses but with limited applicability for lab and clinical courses. Therefore, they Opined that it should be used only as a complement to classroom teaching. (5) In this study, the results showed that the impact of covid-19 pandemic was negative throughout the world as perceived by educators around the world (Table 1). The impact was so predominant that the educators felt that the students missed the skills domain and values domain to be learnt during the period of pandemic (Table 1).

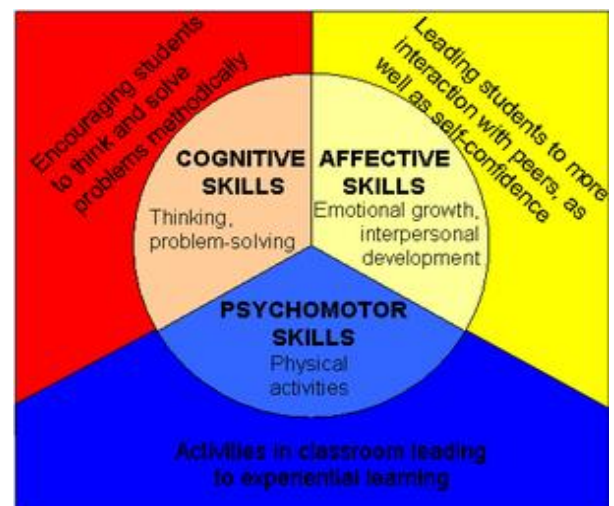


Image 5: Learning domains in dental education

The exploration of the reasons for such a negative impact by the pandemic on the education system revealed the points as mentioned in table 1. 55.8% of the participants believed that the social distancing itself was found to be the major influencing

factor. The limitations related to online teaching had an impact similar to the former with the effect percentage being 53.2%. Another major factor was changes in government policies during the pandemic which accounted for about 51.9%. In a commentary by Bennardo F, [6], the covid-19 pandemic was referred to as a challenge to dental education. The most accepted practices were blended learning as compared to traditional education methods. In our study, the findings are supportive of the same through the questionnaire.

### **Learning domains is the most affected due to the pandemic and global lockdown.**

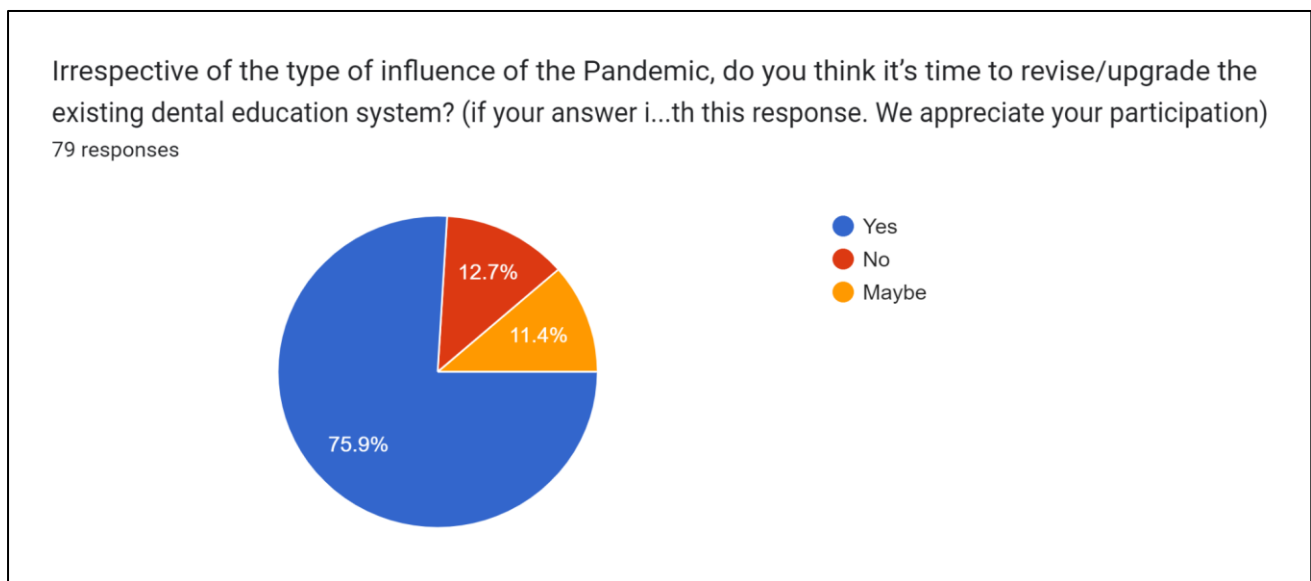
There was a statistically significant opinion from all the respondents about the affected learning domain from the three, which is Skills (Table 1). In an article by Hassan MG and Amer H, [7] they stated that “clinical dental interventions demand the integration of both intellectual and technical skills, including a sensitivity to the patients’ needs as well as technical ability, and most critical, risk consideration”. In other words, dental students learn what should be done, when to intervene effectively, and finally how to critically appraise treatment outcomes. The worldwide temporary

closure of the academic institutions affected around 931,345,922 students in 94 countries representing 54% of total enrolled learners [8]. The effect of covid-19 pandemic on skill domain was evident through the questionnaire and it was statistically significant (Table 1).

### **Components of education, which are the most affected [Teaching and Learning/ Assessment and grading].**

Teaching practical courses remotely requires adequate resources, critical planning, and sufficient infrastructure, which are still lacking in the various developing countries. In addition, this new system requires a fundamental change in the mentality of both the faculty and students to prepare and perform differently in the educational process [9]. The findings of the present study found that the teaching and learning as well as grading components were affected, as most of the respondents chose both above from the questionnaire (Table 1).

### **Is there a need to revise/upgrade the existing dental education system, irrespective of pandemic?**



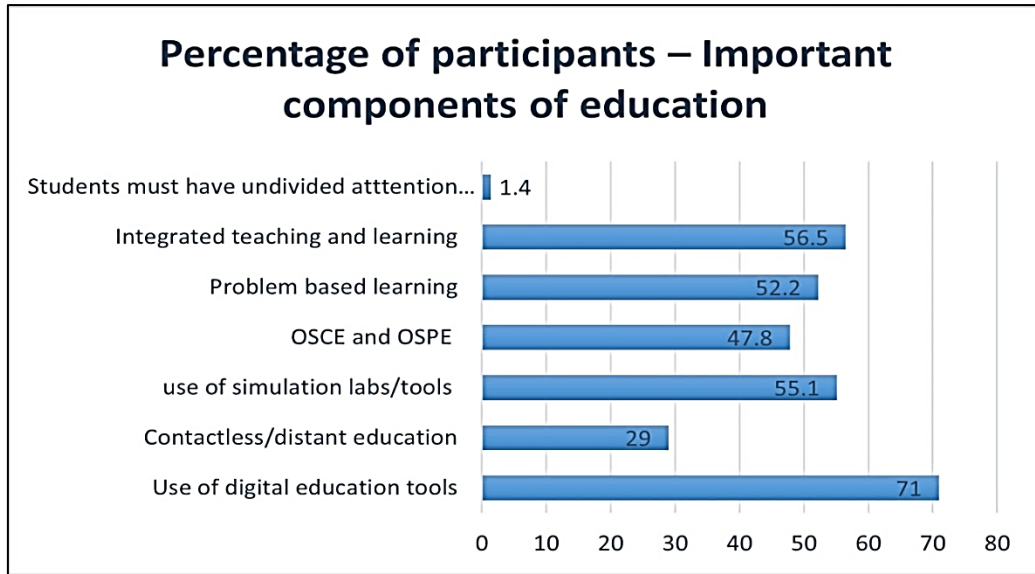
**Fig 6: Percentage of participants - Revise or upgrade curriculum**

A healthcare curriculum must be up to date, fit for purpose and relevant to the population it serves wherever that population might be, worldwide. The authors emphasized the need for continuous improvement in the dental curriculum, according to them which can be achieved by having selection criteria to select on the immutable attributes which develops the other more mutable attributes needed by a dental practitioner. Such attributes can only be determined

thorough analysis of the needs via knowledge of different learning domains and learning activities.

The present study outcome was in accordance with the above-mentioned observation where majority of the respondents of this study are of the opinion that the current dental education needs revision or upgrade irrespective of the pandemic [10].

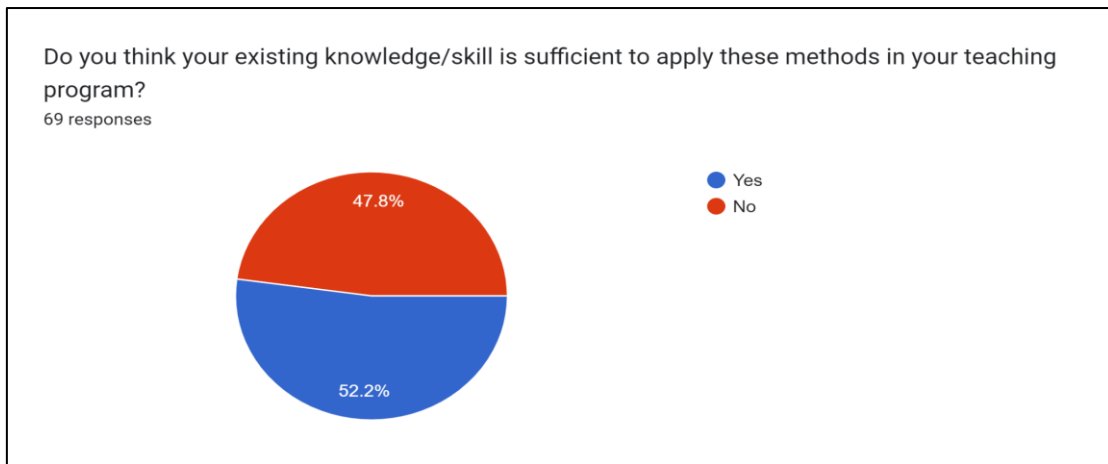
### **Updated dental education system - Components of importance and Training / workshops.**



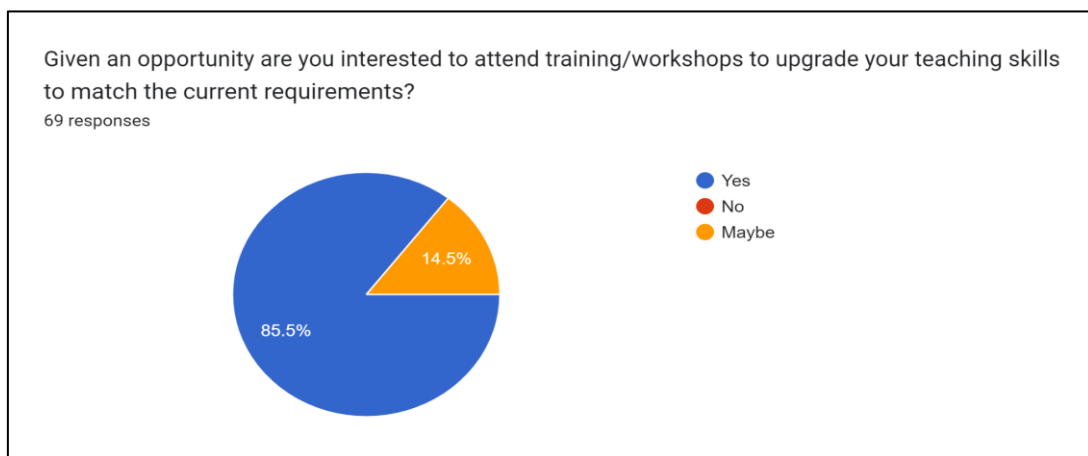
**Fig 7: Percentage of participants – Important components of education**

Use of digital education tools were of more importance for the respondents among the updating of the dental education system which scored 71%. The rest being more important were use of integrated teaching

and learning, simulation tools, and problem-based learning respectively in the order of their importance chosen by the respondents.



**Fig 8: Percentage of participants – Current knowledge/skill sufficient?**



**Fig 9: Percentage of participants – Willingness to attend training/ workshop**

Most of the respondents opined for the strong need for training/ workshops to upgrade their teaching skills to match the current requirements.

## CONCLUSION

Majority of the respondents did agree that the pandemic had an adverse effect on the existing dental education practices. The effect was mainly because of reasons like implementation of social distancing norms, socioeconomic impact of the pandemic and certain changes in the government policies for safe practices.

Although half of the respondents did agree that they lack the knowledge and skills to adapt to the changing needs of the dental education system, there was an overwhelming interest shown for upgrading their skills to match the evolving requirements.

**Conflict of Interest:** None declared

**Funding:** No

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