

## **Knowledge, Attitude and Perception of dental students towards E-Learning**

Type of manuscript: Original study

Running title: KAP towards e- learning

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### **ABSTRACT**

**BACKGROUND:** E-learning comprises all forms of electronically supported learning and teaching. The information and communication systems, whether networked or not, serve as a specific media to implement the learning process. Hence this study aims to assess the knowledge and attitude of healthcare professional students towards e-learning.

**MATERIALS AND METHODS:** A cross - sectional study was conducted among 160 health care students. A pre-validated questionnaire containing 12 questions items were mailed to the health care professional students who were

studying in the first year. The responses were collected and tabulated. Descriptive statistics and inferential statistics of the responses was performed using SPSS version 23.0

**RESULTS:** The findings of this study show that 37.5% of the respondents were more than 20 years old. Majority of the respondents were males (56.8%). A majority of 20% of BDS students strongly agreed that e-learning should be used as a supplementary tool ( $p < 0.05$ ). On doing chi square correlation, it was found that majority of the BDS and MBBS students agreed that e-learning is crucial for acquiring more competency. This difference was statistically significant (Chi-square test;  $p$ -value = 0.008)

**CONCLUSION:** Within the limitations of the present study, majority of the students participating agreed that e-learning is a method of teaching and learning and majority of the participants agreed that e-learning is crucial for acquiring competency.

**KEYWORDS:** Attitude, E-learning, Knowledge, Practice, Innovative technique

### **INTRODUCTION:**

Medical education is constantly growing at a rapid speed and to keep the upcoming doctors and established physicians in par with the competitive world, e-learning has become a necessary tool and the platform most commonly used is the learning management system (1). One of the major goals of medical education is to encourage students to maintain their knowledge of medical science by becoming lifelong learners. Adequate skills in information seeking and regular use of original scientific sources are key elements in this process (2). Studies have shown that the Use of information and communication services was high, as about 60% of the delta students used email services daily (3). E-learning is also called web-based learning, online learning or internet based learning. The media in e-learning included text, images, animation, live streaming of videos and audios which are made for an easy understanding. Students do not see e-learning as replacing traditional instructor-led training but as a complement to it, forming a part of a blended learning strategy (4).

Recent study led by Moberg et al (5) showed that use of educational technology in medical schools is increasing rapidly and recommended that each school develop a strategic approach that will guarantee that it can meet the future educational technology needs of its students (6). Researchers (7) suggested that some students may lack the necessary skills to use web based learning platforms effectively and are therefore handicapped. This issue is often discussed in the context of gender differences (8). In a study done by Roschmann T (9) it was shown that computers offer the most powerful means of fostering the forms of termless learning that students will need to practice medicine in future (10). KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS E-LEARNING AMONG HEALTH CARE PROFESSIONAL STUDENTS

It has a lower cost compared to paper-based dissemination of information and also has an added advantage of being available worldwide instantly on demand. Therefore, there is a need not only to equip medical fraternity with adequate skills for use of the Internet but also to make Internet facilities available in institutions providing medical education and health care (11). Few studies are available on this topic from the Indian subcontinent. Our team has extensive knowledge and research experience that has translate into high quality publications(12–16)(17–21)(22–26)

This study has been conducted with the objective to know the knowledge regarding computer and Internet and patterns of and barriers to Internet use among the medical students. Hence the aim of the present study is to assess the knowledge and attitude of healthcare professionals towards e-learning.

### **MATERIALS AND METHODS:**

This study was conducted among students of BDS, MBBS, Nursing, BPT and BOT studying in the first year of college. This study was approved by the institutional ethical committee. The inclusion criteria for the study were all

students studying in the first year of BDS, MBBS, Nursing, BPT and BOT. Those who were willing to participate in the study were included. Exclusion criteria were students who were not willing to participate in the study. An online questionnaire containing 12 questions which included the students' proforma and questions regarding awareness and attitude towards e-learning in the medical field. The validity of the questionnaire was purely based on logical reasoning. The responses were collected during one week's period and the data was tabulated.

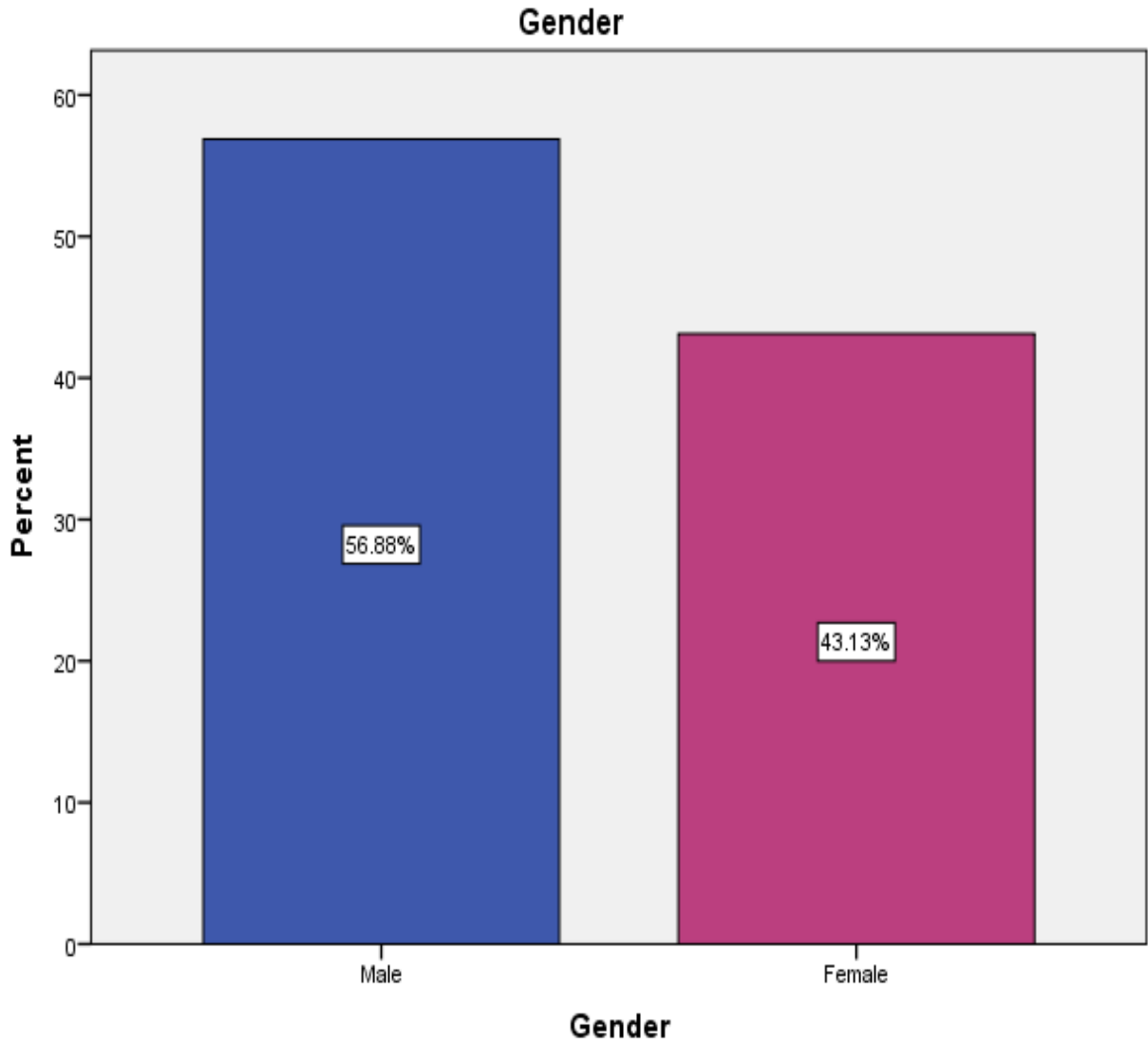
Oral consent from the participants had been obtained after explaining the need for the study. The pros of the study is that it was done through online google forms and it was less time consuming than offline surveys. The cons of the survey is that it took place in only one geographical area (Chennai city). Data was collected and analysed using SPSS v23.0 software. Descriptive and inferential statistics were performed to report the responses of the students.

### **RESULTS:**

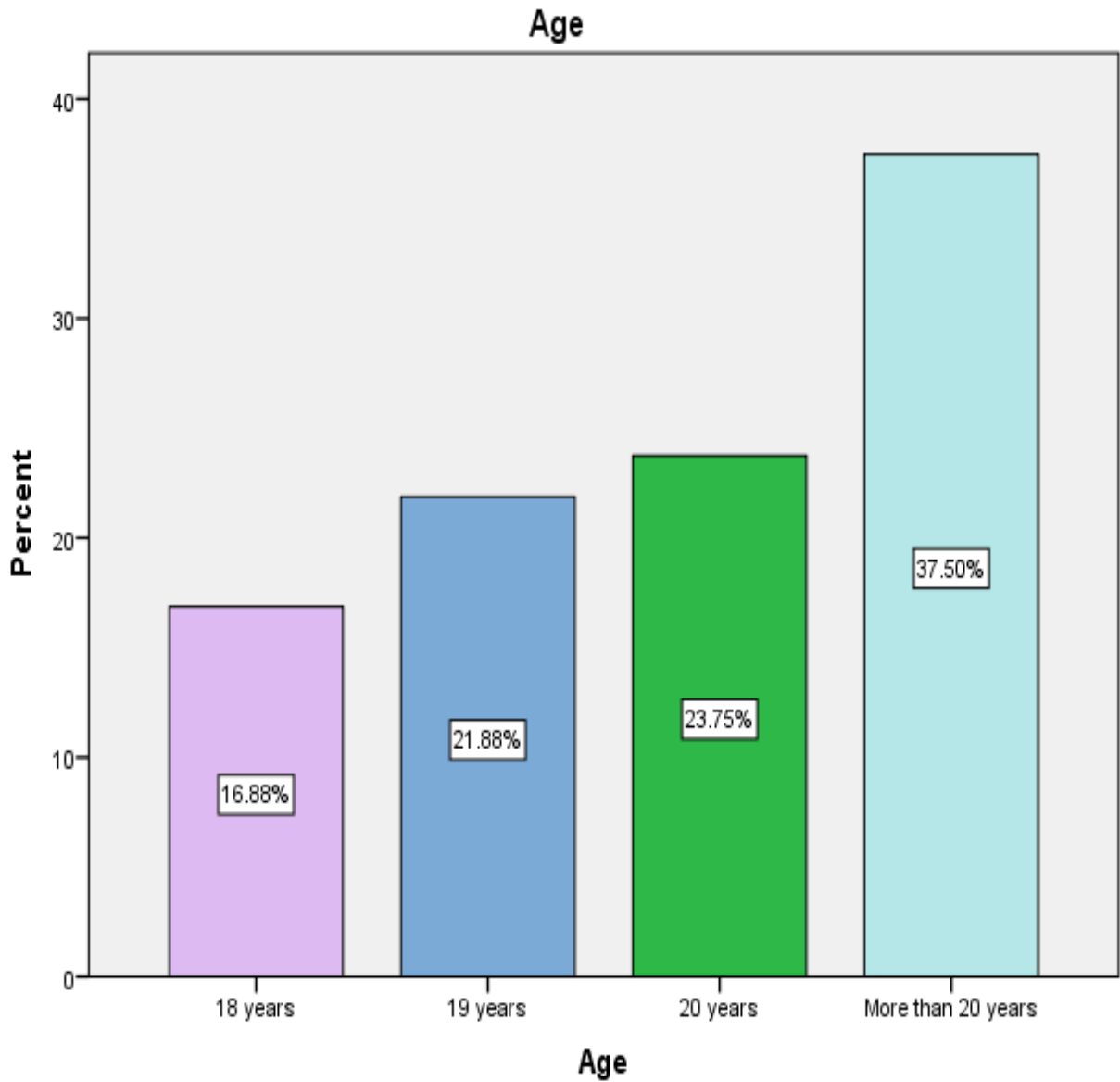
A total of 160 undergraduate health care professional students participated in the study. Out of them, 57% were males and 43% were females [Figure 1]. About 37.5% of the participants were more than 20 years old and 17% of them were 18 years old [Figure 2]. Majority of the students were MBBS students (31%), 29% of them were BDS students, 18% of them were nursing students, 14% were BPT students and only 7% of them were BOT students [Figure 3]. Out of the 160 participants, 51% of them agreed that e-learning is a method of teaching and learning using electronic media whereas 27% of them strongly agreed and 19% of them disagreed. When asked about the application of e-learning in medical/dental evaluation, 44% of the participants agreed that learning has limited applications whereas 39% of them disagreed. Out of all the participants, 47.5% of them agreed that e learning is crucial for acquiring more competency whereas 36% of them disagreed. 65% of them agreed that lectures should not be replaced by e-learning whereas 16% of them had no opinion [Figure 4 A to D]. About 60% of the participants agreed that e learning should be used as a supplementary tool whereas only 19% of them disagreed and 8.7% of them strongly disagreed. 58% of them thought that availability of the computers and internet affects the usage of e-learning, whereas only 20% of them disagreed [Figure 5 A to D].

On doing correlation, it was found that the majority of the students who were more than 20 years old agreed that E-learning has a limited application in medical/dental evaluation. This difference was not statistically significant (Chi-square test; p-value = 0.241) [Figure 6]. It was noted that the majority of the students in all age groups thought that all lectures should not be replaced by E-learning. This difference was also found to be statistically not significant (Chi-square test; p-value = 0.834)[Figure 7]. It was also noted that the majority of the students in all age groups agreed that e-learning should be encouraged in teaching institutions and this difference was also found to be statistically not significant (Chi-square test; p-value = 0.874)[Figure 8].

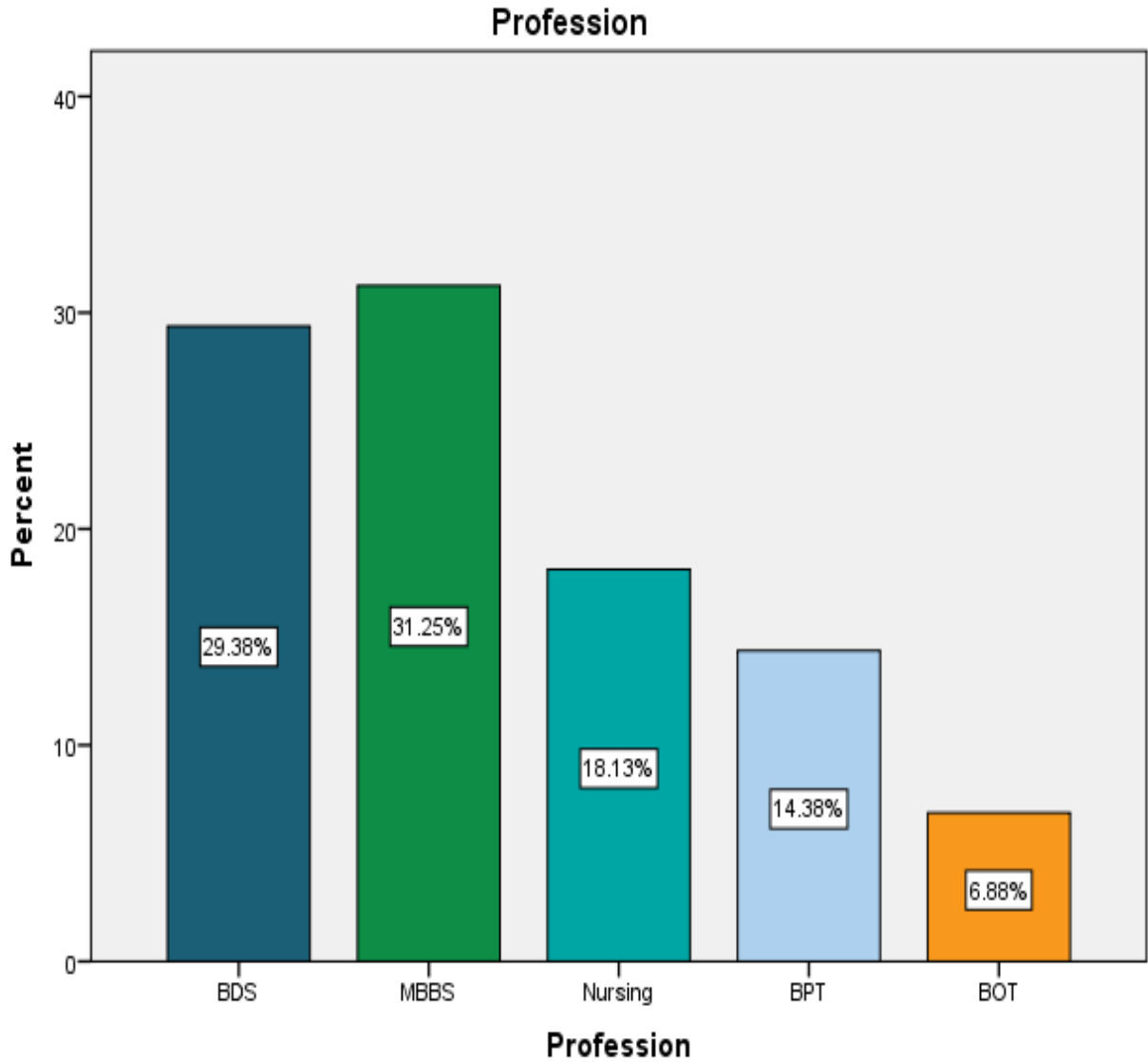
On doing chi square correlation, it was found that majority of the BDS and MBBS students agreed that e-learning is crucial for acquiring more competency. This difference was statistically significant (Chi-square test; p-value = 0.008) [Figure 9]. It was also noted that the majority of the students in all the professions agreed that e-learning should be used as a supplementary tool. This difference was also found to be statistically significant (Chi-square test; p-value = 0.004) [Figure 10]. It was found that the majority of the BDS students strongly agreed that e-learning should be encouraged in teaching institutions. This difference was statistically significant (Chi-square test; p-value = 0.011) [Figure 11]. On doing the chi square test it was also found that majority of the males and females agreed that e-learning is crucial for acquiring more competency. This difference was not statistically significant (Chi-square test; p-value = 0.654) [Figure 12].



**Figure 1:** Bar graph showing gender wise distribution of the students. The X axis represents the gender and the Y axis represents the number of students. Males dominated the study population.



**Figure 2:** Bar graph showing age wise distribution of the students. The X axis represents the age and the Y axis represents the number of students. Most of the students participating in the study were in the age group of more than 20 years.



**Figure 3:** Bar graph showing profession wise distribution of the students. The X axis represents the profession and the Y axis represents the number of students. Most of the students participating in the study were studying MBBS.

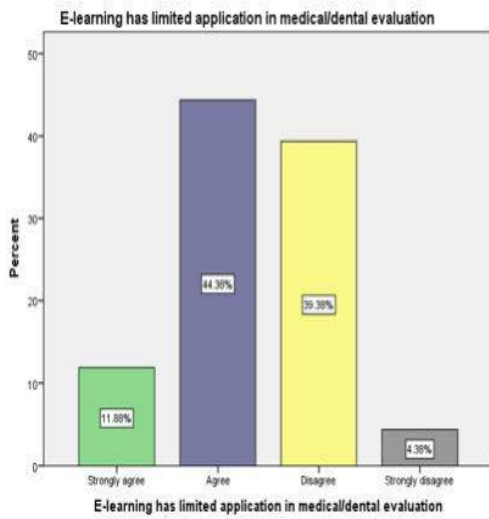


Figure 4A

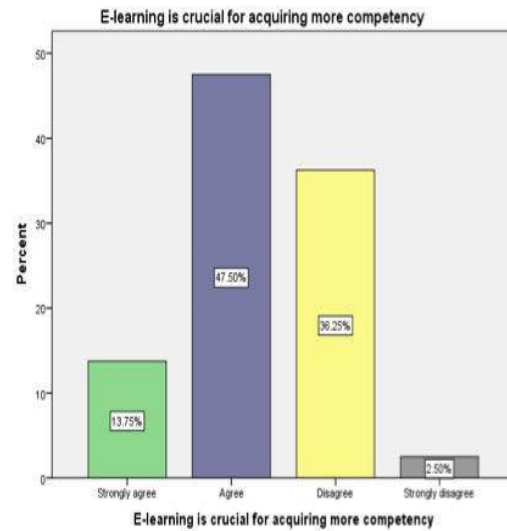


Figure 4B

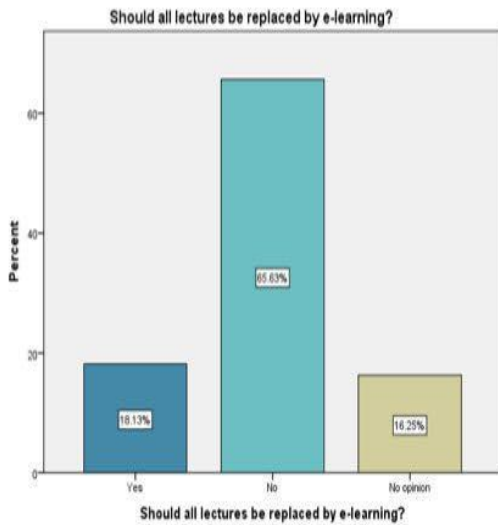


Figure 4C

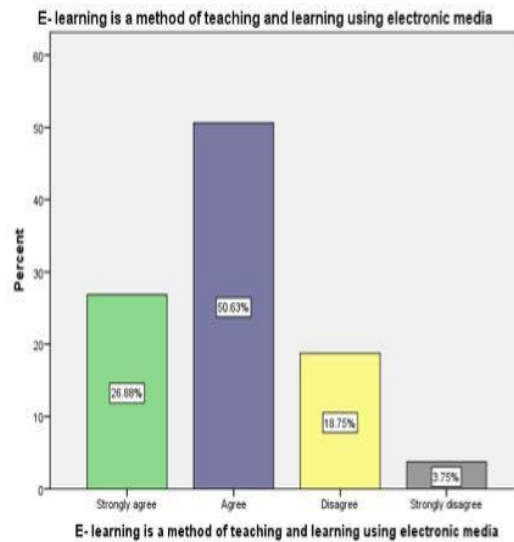


Figure 4D

**Figure 4A to D:** (A) Responses for the question "E-learning has limited application in medical/dental evaluation" ; (B) Responses for the question "E-learning is crucial for acquiring more competency"; (C) Responses for the question "Should all lectures be replaced by e-learning?"; (D) Responses for the question "E- learning is a method of teaching and learning using electronic media"

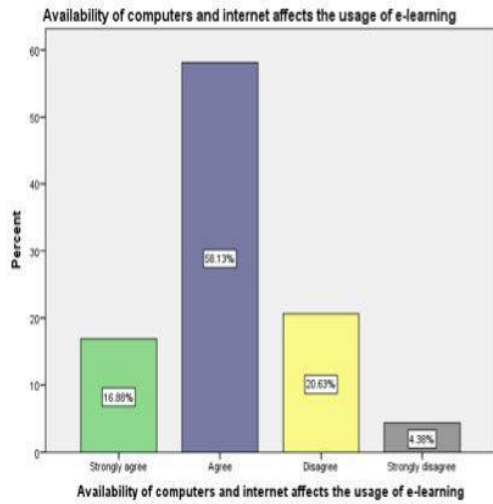


Figure 5A

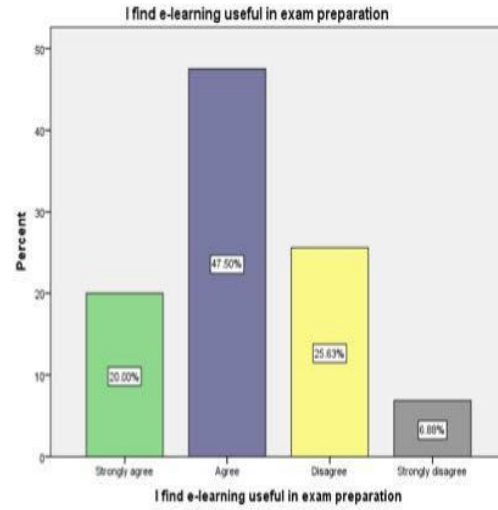


Figure 5B

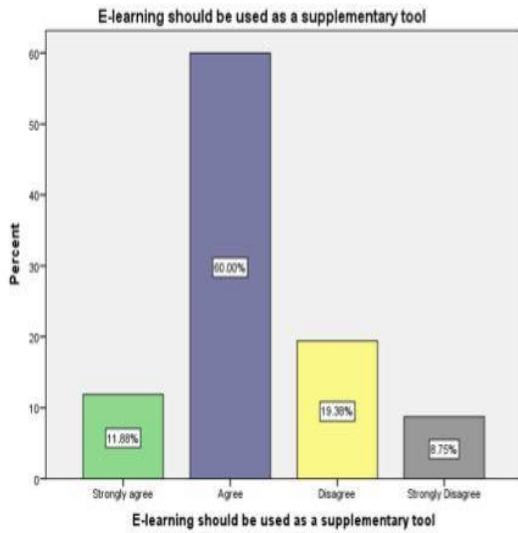


Figure 5C

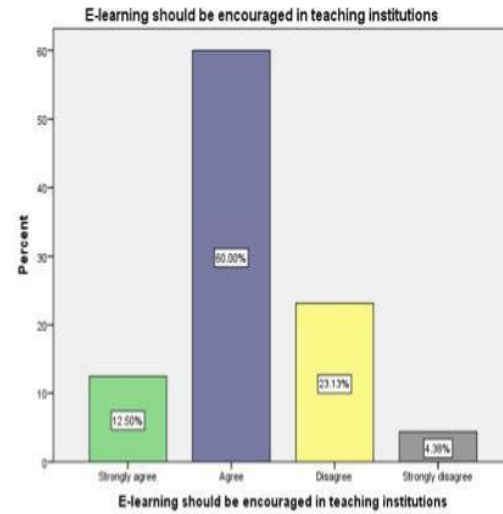
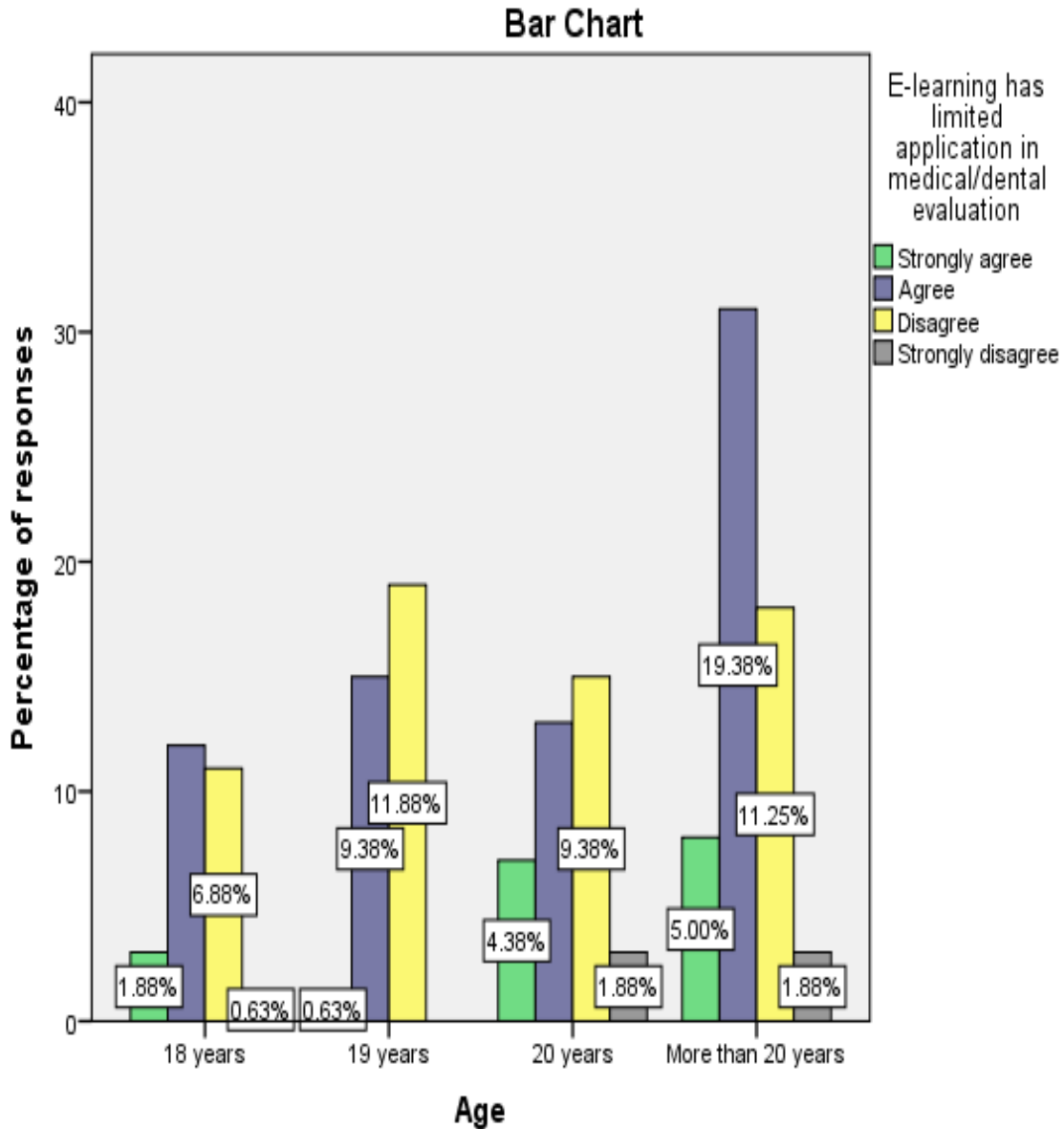
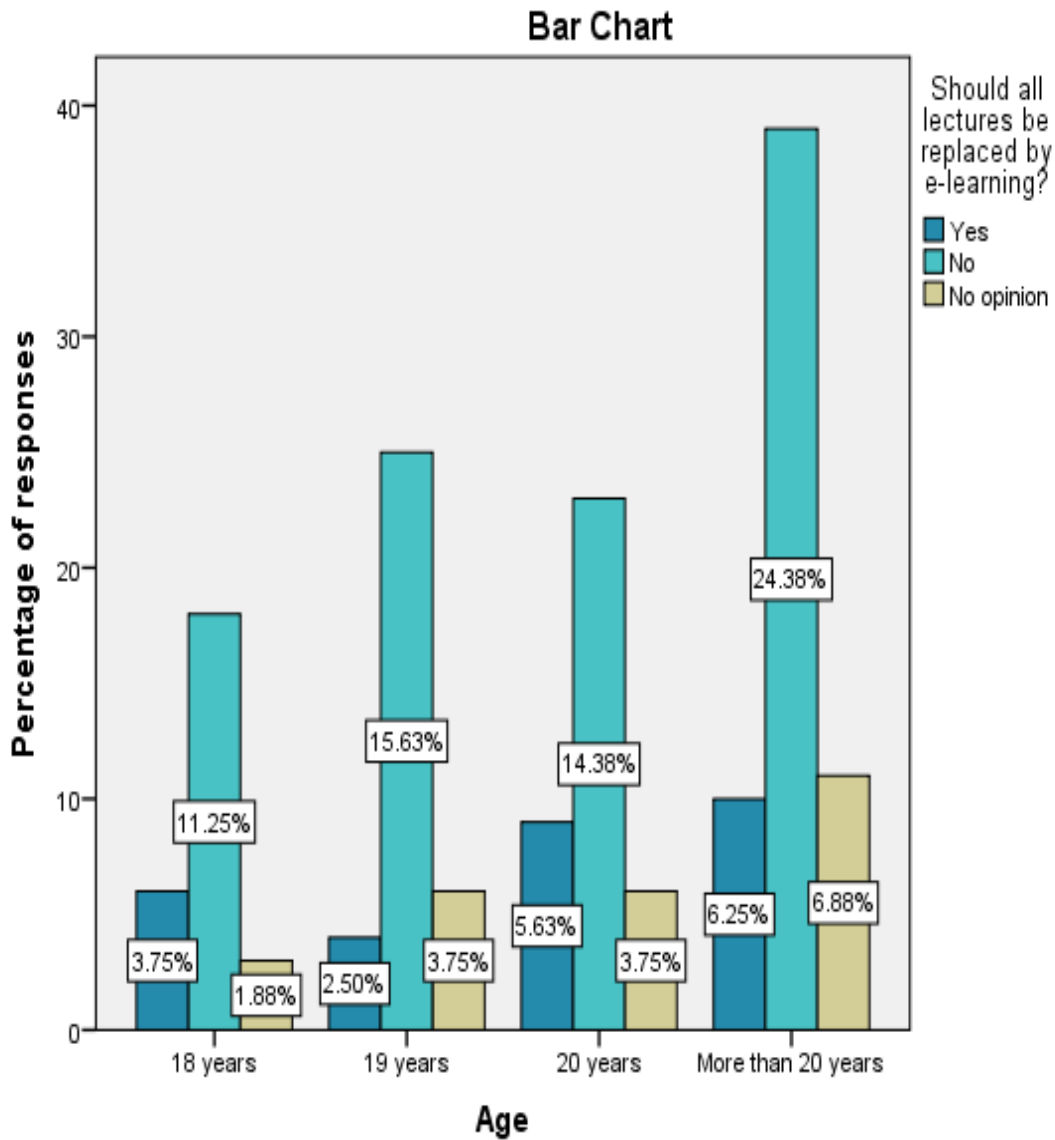


Figure 5D

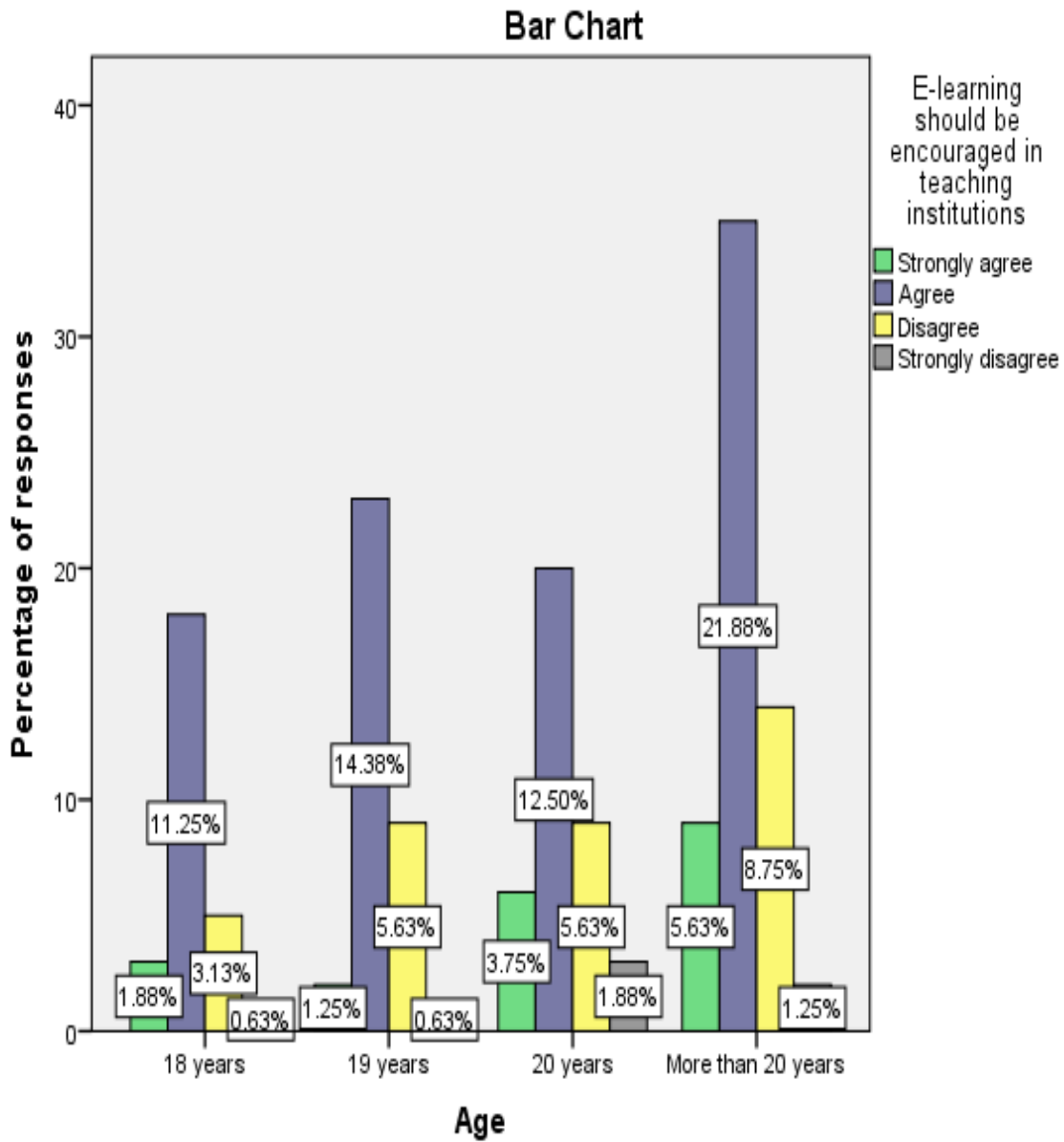
Figure 5A to D: (A) Responses for the question "Does availability of computers and internet affect the usage of e-learning" ; (B) Responses for the question "I find E-learning useful"; (C) Responses for the question "E-learning should be used as a supplementary tool"; (D) Responses for the question "E-learning should be encouraged in teaching institutions"



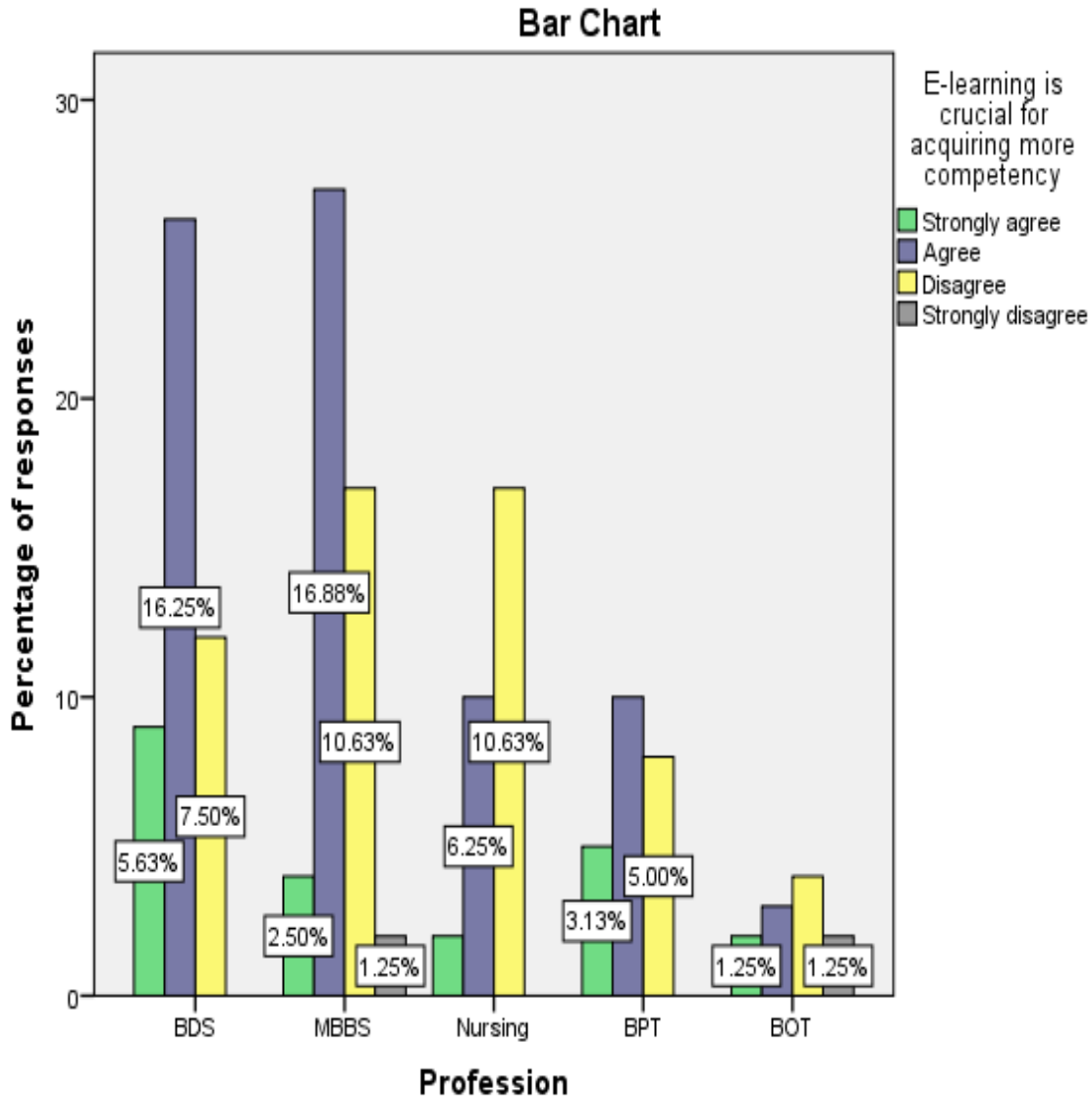
**Figure 6:** Cluster graph showing association of age with the question "E-learning has limited application in medical/dental evaluation?". X axis shows the age group in years, Y axis shows number of students responding for the above question. Chi square association was done and found to be not significant [p value : 0.241 > 0.05]. However, more disagreement was noted in the age group of 19 years.



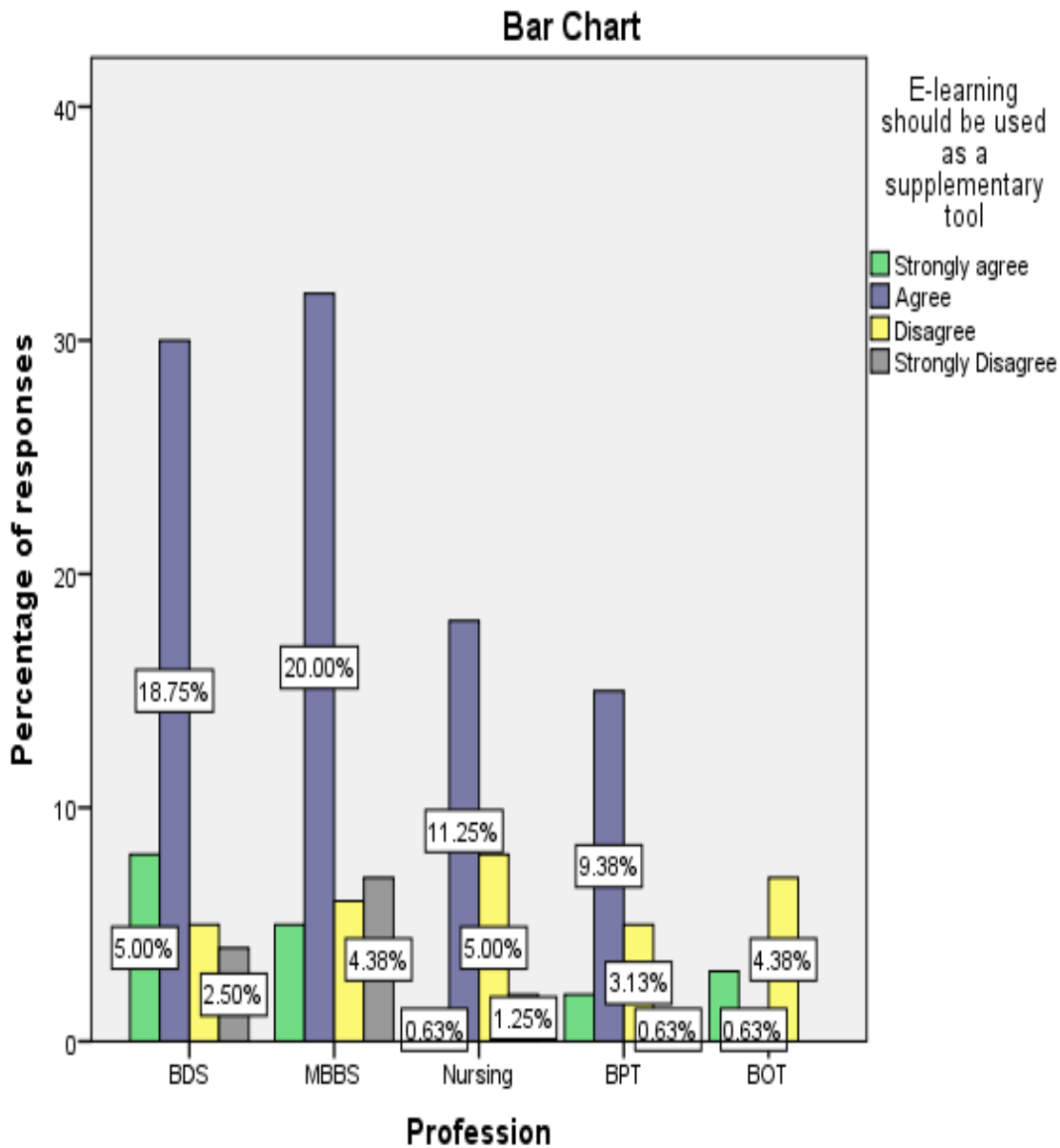
**Figure 7:** Cluster graph showing association of age with the question "Should all lectures be replaced by e-learning?". X axis shows the age group in years, Y axis shows number of students responding for the above question. Chi square association was done and found to be not significant [p value : 0.834 > 0.05]. However, the majority of the students in all age groups thought that lectures should not be replaced by e-learning.



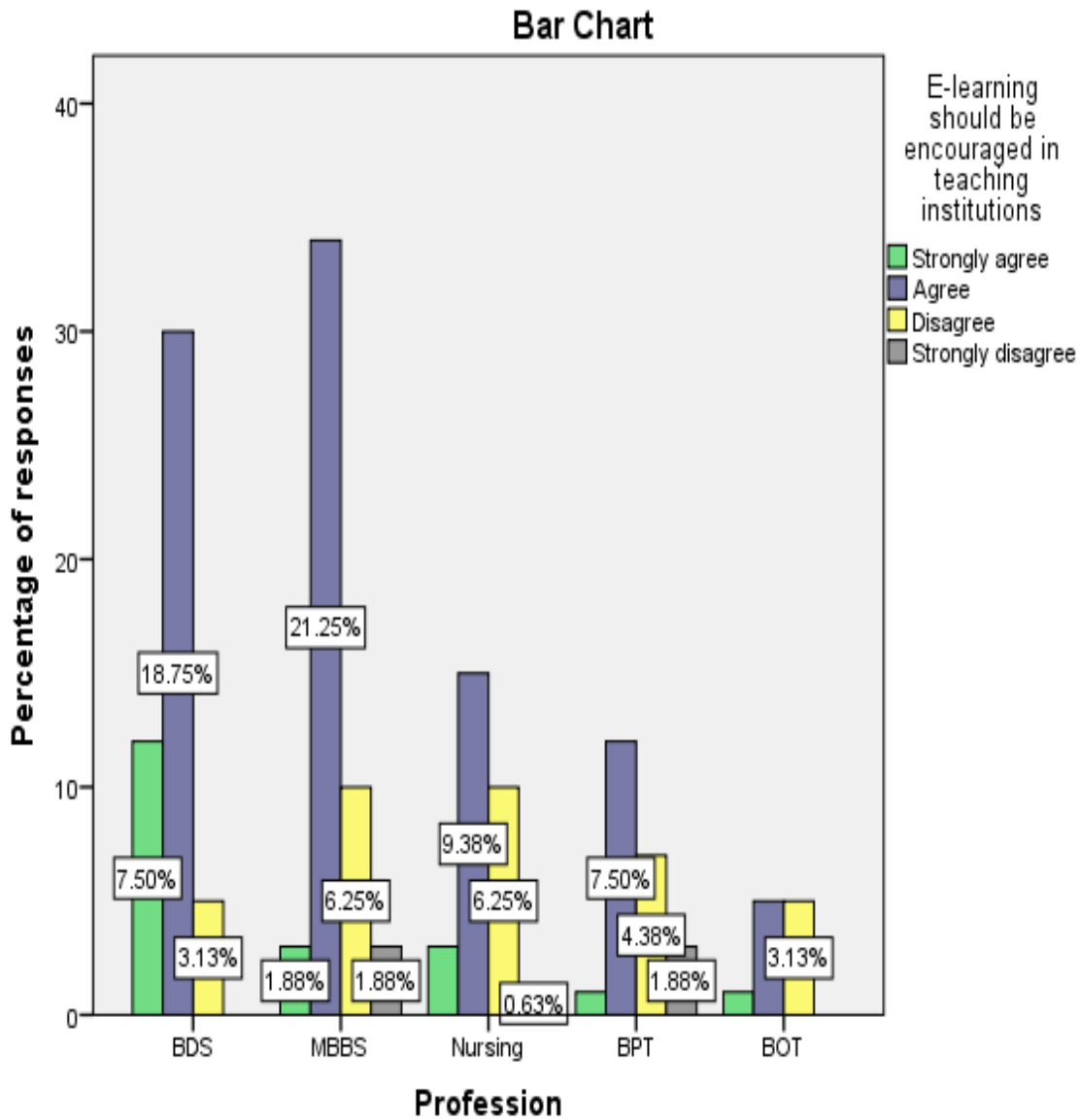
**Figure 8:** Cluster graph showing association of age with the question "E-learning should be encouraged in teaching institutions?". X axis shows the age group in years, Y axis shows number of students responding for the above question. Chi square association was done and found to be not significant [p value : 0.874 > 0.05]. However, the majority of the students in all age groups agreed that E-learning should be encouraged in teaching institutions.



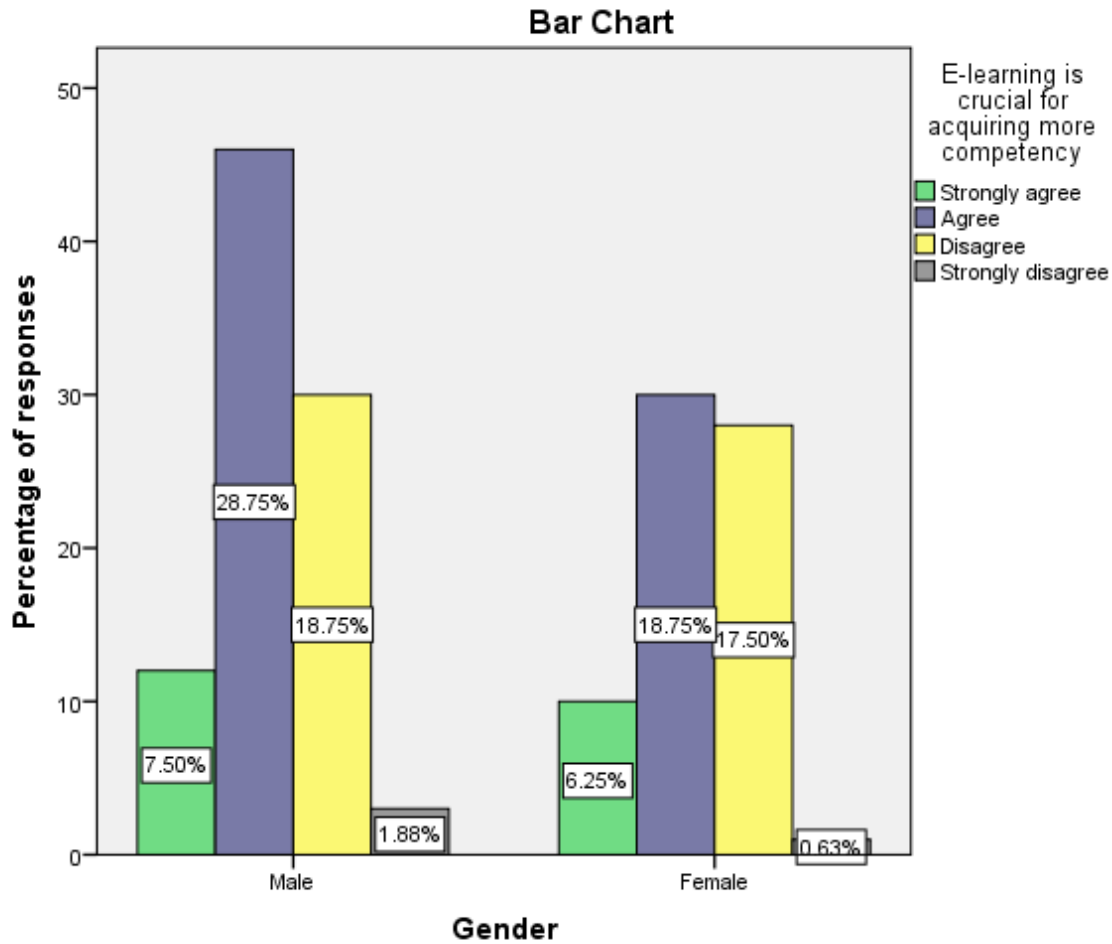
**Figure 9:** Cluster graph showing association of profession with the question "E-learning is crucial for acquiring more competency?". X axis shows the profession of the students, Y axis shows number of students responding for the above question. Chi square association was done and found to be significant [p value : 0.008 > 0.05]. Majority of the students studying BDS strongly agreed that E-learning is crucial for acquiring more competency.



**Figure 10:** Cluster graph showing association of profession with the question "E-learning should be used as a supplementary tool?". X axis shows the profession of the students, Y axis shows number of students responding for the above question. Chi square association was done and found to be significant [p value : 0.004 > 0.05]. Majority of the students studying BDS strongly agreed that E-learning should be used as a supplementary tool.



**Figure 11:** Cluster graph showing association of profession with the question "E-learning should be encouraged in teaching institutions?". X axis shows the profession of the students, Y axis shows number of students responding for the above question. Chi square association was done and found to be significant [p value : 0.011 > 0.05]. Majority of the students studying BDS strongly agreed that E-learning should be encouraged in teaching institutions.



**Figure 12:** Cluster graph showing association of gender with the question "E-learning is crucial for acquiring more competency?". X axis shows the gender of the students, Y axis shows number of students responding for the above question. Chi square association was done and found to be not significant [p value : 0.654 > 0.05]. However, the majority of the male and female students agreed that E-learning is crucial for acquiring more competency.

**DISCUSSION:**

In the present study, among 160 undergraduate students, out of them 57% of them were males and 43% of them were females. About 31% of the participants were MBBS students, 29% were BDS students, 18% were nursing students, 14% were BPT students and 7% were BOT students. In the studies done by Yapa et al., Silva et al., Jawaid et al. regarding attitude towards e-learning among medical students, majority of the students agreed that e-learning is a method of teaching and learning using electronic media (27–29). The study showed that only 50% agreed that they were satisfied with the available infrastructure in the institution. This identifies the need to build up infrastructure to increase accessibility and availability for the purpose of e-learning. Availability of internet is considered a major limitation for E- learning by 76% of students as in India the accessibility and the speed of internet is still under the developing arena (30).

About 66% of the participants in this study preferred lectures for the purpose of learning when compared to digital gadgets and e-learning which was only 18%. This is similar to studies done by Chowdary et al (31) among Bangladeshi medical students and Chudasama et al (8,31). This shows that there is a need to train the students to improve their knowledge in utilization of software applications for better computer or web based learning (32).

Among the different aspects of e-learning and lectures, the majority of students agree that they learn more by descriptive texts when compared to images and videos. This finding is similar to the findings of a study done by Yapa et al (33). The previous study showed that most of the students perceived e-learning as a supplementary tool that should be encouraged in institutions for acquiring clinical skills similar to study done by Gormbey et al (34) among medical students.

This is a pilot study with a sample size of 160 students belonging to the same college which in turn implies that they belong to the same cultural background and same socio economic group leading to a biased result. Knowledge, attitude and practice towards E- learning among faculty and postgraduate students could not be assessed. Before beginning the process of creating awareness in any given community, it is first necessary to assess the environment in which awareness creation will take place (35) and conducting this type of KAP will serve as an educational diagnosis of the community.

#### **CONCLUSION:**

The study has emphasized that E-Learning can be a useful tool in enhancing the learning experience and students are more open towards the upcoming change in teaching methods. The lack of knowledge in computer skills along with poor technological infrastructure and resources can be a challenge for implementation of E – learning.

#### **AUTHOR CONTRIBUTIONS**

Author 1: Neha Sharma, carried out the study by collecting data and drafted the manuscript after performing the necessary statistical analysis and in the preparation of the manuscript.

Author 2: Arthi Balasubramaniam, aided in conception of the topic, designing the study and supervision of the study, correction and final approval of the manuscript.

#### **ACKNOWLEDGEMENT**

We take immense pleasure to thank Saveetha Dental college and hospital, Chennai for giving us permission to conduct the study.

#### **CONFLICTS OF INTEREST**

None declared

#### **FUNDING**

The present project is sponsored by Saveetha Institute of Medical and Technical Sciences, Saveetha Dental College and Hospitals, Saveetha University

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