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THE EFFECTIVENESS OF E-LEARNING IN ANATOMY DURING COVID-19 LOCKDOWN-A SURVEY

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ABSTRACT

E-learning is a learning environment that uses information and communication technology as a platform for teaching and learning activities. E-Learning targets the mobility of the learner, interacting with compact technologies and learning that indicates a focus on how society and its institutions can sustain and support an increasingly mobile population. The effectiveness of e-learning in anatomy is very difficult. Learning anatomy by the e-learning method is not comfortable for students.In the e-learning method, there is a lack of visual observation of arteries and veins. A questionnaire was Prepared and administered to 100 participants through Google forms, an online platform. The study participants included a student population belonging to Saveetha Dental College and hospitals. From the results, the majority of the study population answered positive responses regarding the effectiveness of e-learning in anatomy during COVID-19 lockdown. A significant majority of the population were aware that the learning

anatomy by e-learning method is very difficult and uncomfortable, yet a needed one with improvisations from existing technologies. The survey research helps to find a possible way to learn anatomy during COVID-19 lockdown. This study helps us to understand the students' perspective on the current situation, and the effectiveness of E-learning methods.

Keywords: E-learning method; learning anatomy; COVID-19; lockdown period

INTRODUCTION

A literature system based on characterized teaching but with the help of electronic resources is known as e-learning **[1]**. While guidance can be established in or out of the workshop, the use of laptops and Internet forms is a major incorporation of e-learning **[2]**. TE-learning manage also be denominated as a network-permit transmission of skills and knowledge and inflection of education is made to a huge number of the legatee at the same or different times **[3]**. The priority and effectiveness of e-learning all technological expansion and the Internet have changed people's lives in different ranges including for occurrence teaching and learning **[4, 5]**. The net has converted one of the channels of learning that opens the door for people around the world to approach education for free or for fewer costs **[6]**. The IT boom on the Internet has freed the door to largely ingress knowledge, high-quality education and practice **[7]**. This easy access using information systems on the web can enhance people's skills for a lesser cost. The benefits of e-learning are online learning provides everyone's needs, lectures can be taken any number of times, offers access to modernize our content, quick delivery of lessons, scalability, consistency and reduced cost **[8]**. The effectiveness of learning anatomy by E-learning is anatomy education has conventionally relied on cadavers and this remains a sustainer **[9]**. However, many educational institutions are integrating computer-based modalities into their curricula **[10]**. Computer-based modalities into their curricula **[11]**. Computer-based resources do not require the vast upkeep, money and space of cadavers and can be accessed for self-study purposes at any time or place. During this method, there is a lack of visual observation of dissection of cadavers, arteries and veins. Without the direct observation of cadavers that the students were uncomfortable **[12]**.

MATERIALS AND METHODS

An online survey was conducted with a self-administered questionnaire with a sample size of 100 participants comprising college students. The questionnaire consisted of

questions that help in providing awareness among the participants. The questionnaire was validated in a standard manner. Measures such as the selection of participants randomly to prevent asking irrelevant questions to the participants' group and taken to minimize the bias occurring in sampling. The questionnaire was evaluated using the online survey "google forms". Descriptive analysis was corrected using the statistical software "SPSS SOFTWARE version 20".The result of the survey was represented in the form of pie charts and bar charts.

RESULTS AND DISCUSSION

Figure 1 showing responses to the question about awareness of e-learning - 100% positive response shown in blue color is noted. **Figure 2** showing responses for the question on the idea that e-learning is one of the best learning methods available, for which the participants responded with a 98% positive response shown in blue colour and 2% of a negative response shown in red colour. **Figure 3** showing responses for the question on the participant's prior experience in e-learning methods - 95% responded positively as depicted in blue color and 5% gave a negative response in red color. **Figure 4** showing responses for the question on effectiveness of e-learning in anatomy, only 9% were affirmative in their response depicted in blue colour and 91% of the responses were negative as shown in red colour. **Figure 5** showing responses for the question about awareness of the risks involved in e-learning methods - 98% responded positively as shown in blue colour and 2% negative response was recorded as shown in red colour. **Figure 6** shows responses for the question on their views on learning anatomy without direct observation of arteries, veins - 10% of a positive response is in blue colour and 90% of a negative response in red colour. **Figure 7** showing responses for the question on awareness of the difficulties in employing e-learning methodologies for a complex topic like Neuroanatomy - 96% marked a positive response as shown in blue colour and 4% with a negative response shown in red colour. **Figure 8** showing responses for the question about the possibility of e learning as an effective learning methodology for histology - 97% accepted with a positive response as shown in blue colour and 3% of a negative response was recorded in red colour. **Figure 9** showing responses for the question about the possibility of e learning as an effective learning methodology for embryology - 98% of a positive response is in blue colour and 2% of a negative response in red colour. **Figure 10** showing responses

for the question on the awareness of the impact of e-learning- 100% marked a positive response which is shown in blue colour.

In this present scenario, the result was collected and analyzed. The majority of respondents understood learning anatomy is very difficult by the e-learning method during COVID-19 lockdown period **[13, 14]**. The majority of participants were uncomfortable with the e-learning method for learning anatomy **[15, 16]**. Many attempts to find other different ways to make students comfortable were reiterated by many **[17-19]**. From **Figure 1**, 98% of participants think that the best learning method is e-learning while 2% of participants do not think so **[20, 21]**. **Figure 2**, 95% of participants were experienced in e-learning methods while 5% of participants were not experienced about it **[22, 23]**. From **Figure 3**, 5% of participants thought that e-learning of anatomy is effective while 91% of participants do not think so **[24, 25]**. **Figure 4**, represents 98% of participants are aware of the risk of e-learning methods while 2% of participants were unaware of it **[26, 27]**. **Figure 5**, 90% of participants think that without direct observation of arteries, veins are effective learning in anatomy while 10% of participants don't think so **[28, 29]**. **Figure 6**, 96% of participants are aware that neuroanatomy is the complex topic of your anatomy, so using e-learning methods to use it is very difficult while 4% of participants were unaware of it **[30, 31]**. From **Figure 7**, 97% of participants think that an effective learning method of histology of anatomy is practically or e-learning while 3% of participants don't think so **[32, 33]**. From **Figure 8**, 98% of participants are aware of the impact of learning, development of embryology of anatomy by e-learning while 2% of participants were unaware of it **[34–38]**. Another study talks about how learning anatomy by the e-learning method is not the best way **[39, 40]**. In future scope, it helps to understand students' perspective, awareness of the effectiveness of e-learning in anatomy during COVID-19 lockdown. In **Figure 9**, the bar graph shows an association between gender and awareness of e-learning as the best learning method was done using chi-square test. Out 98% of the participants are aware 30% constitutes male and 68% constitutes female. Hence females are more aware that e-learning of anatomy is effective than males. In **Figure 10**, the bar graph shows an association between gender and awareness on e-learning of anatomy is effective was done using chi-square test. Out 9% of the participants are aware 7%

constitutes male and 2% constitutes female. Hence males are more aware of e-learning as the best learning method than females. In **Figure 11**, the bar graph shows an association between gender and awareness of awareness of the risk of e-learning methods was done using chi-square test. Out 98% of the participants are aware 31% constitutes male and 67% constitutes female. Hence females are more aware of the risk of e-learning methods than males. In **Figure 12**, the bar graph shows an association between gender and awareness of Neuroanatomy as the most complex topic in anatomy was done using chi-square test. Out 96% of the participants are aware 30% constitutes male and 66% constitutes female. Hence males are more aware of neuroanatomy as the most complex topic in anatomy, than females. In **Figure 13**, the bar graph shows an association between gender and awareness on the need for direct observation of arteries and veins for effective learning in anatomy was done using chi-square test. Out of the participants are aware 9% constitutes male and 1% constitutes female. Hence males are more aware of the need for direct observation of arteries and veins for effective learning in anatomy than females.

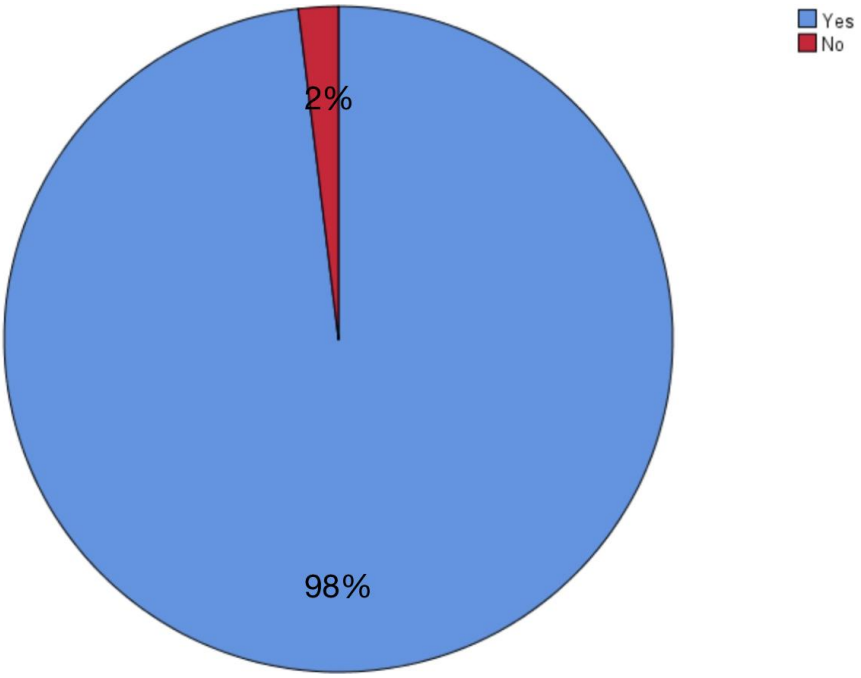

Figure 1: Pie chart showing percentage distribution of responses about awareness of e-learning,. A vast majority of the respondents of about 98% were aware (blue) and only 2% were not aware(red) about e-learning.

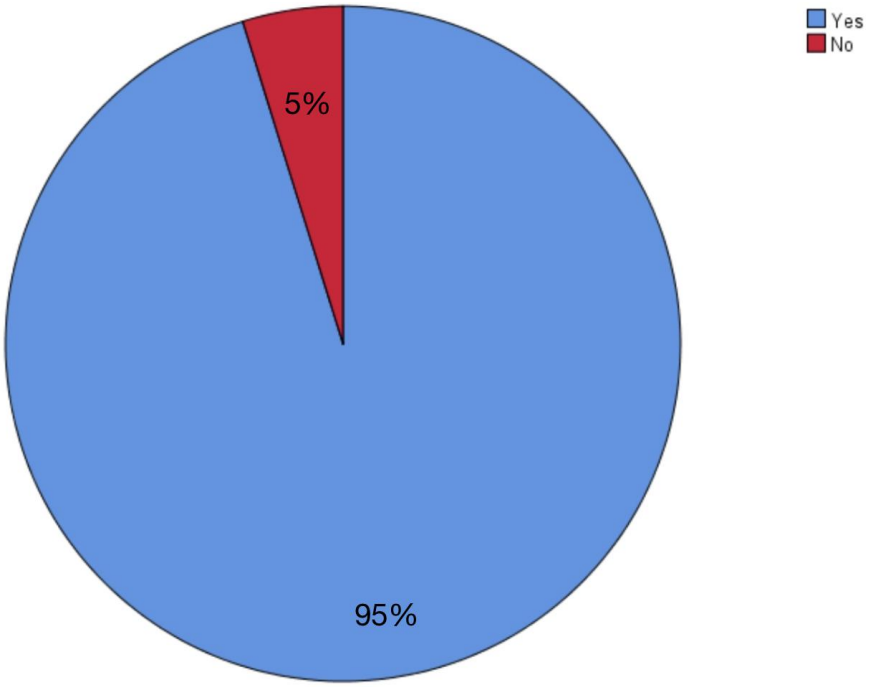

Figure 2: Pie chart showing percentage distribution of responses on individual experience in e-learning methods. A vast majority of the respondents of about 98% have experienced (blue) and only 2% have not yet experienced (red) e-learning.

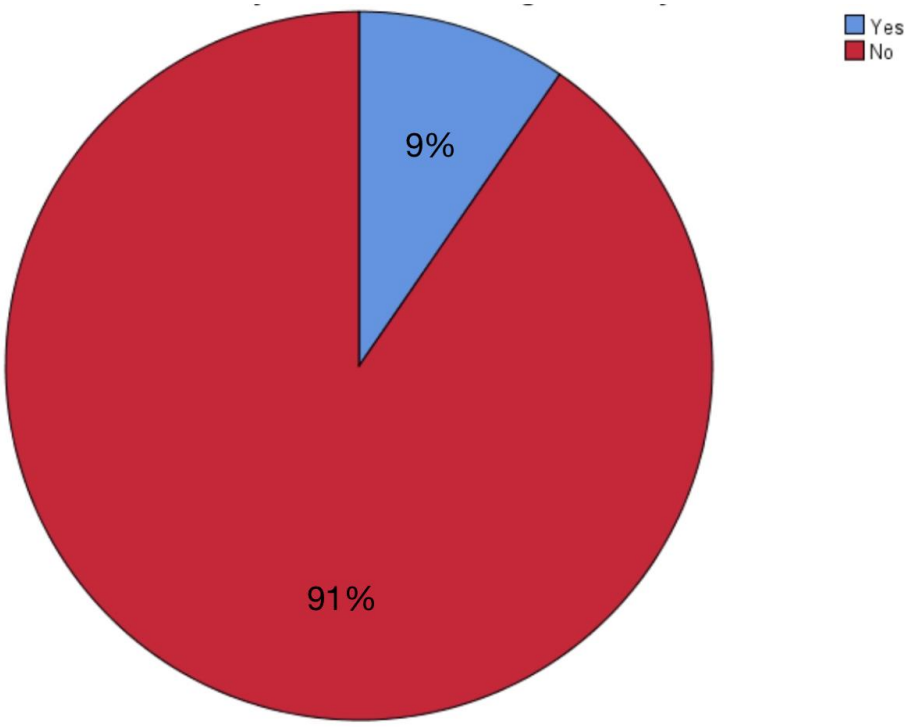

Figure 3: Pie chart showing percentage distribution of responses on effectiveness of e-learning in anatomy. A majority of the respondents of about 91% agreed (blue) to it and 9% gave a negative response(red) for it.

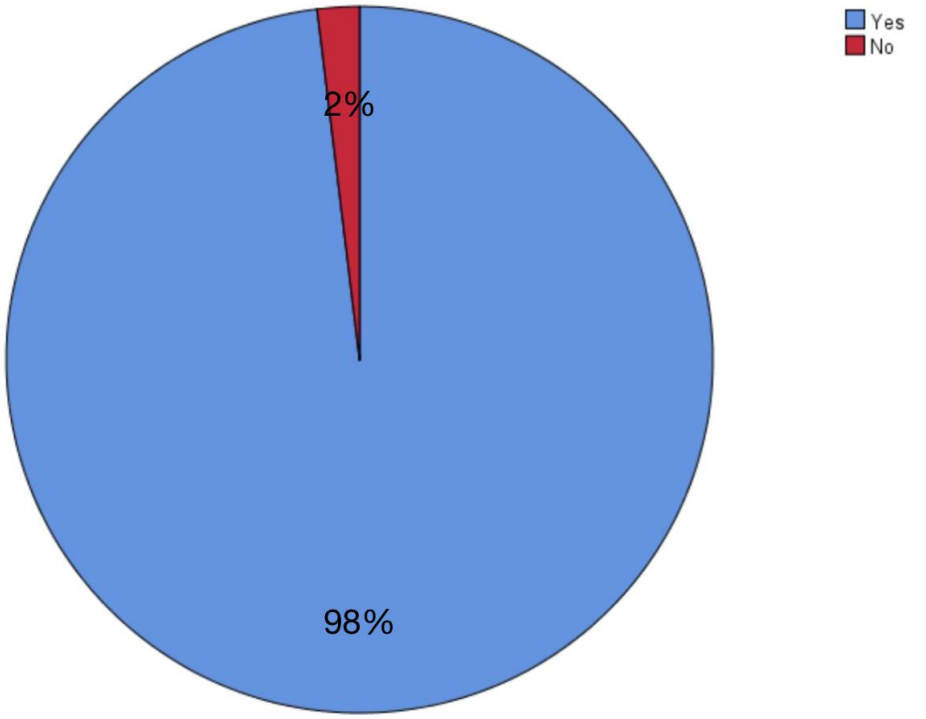

Figure 4: Pie chart showing percentage distribution of responses about the risks of e-learning in anatomy. A majority of the respondents of about 98% were aware (blue) of the risks and 2% were not aware(red) of it.

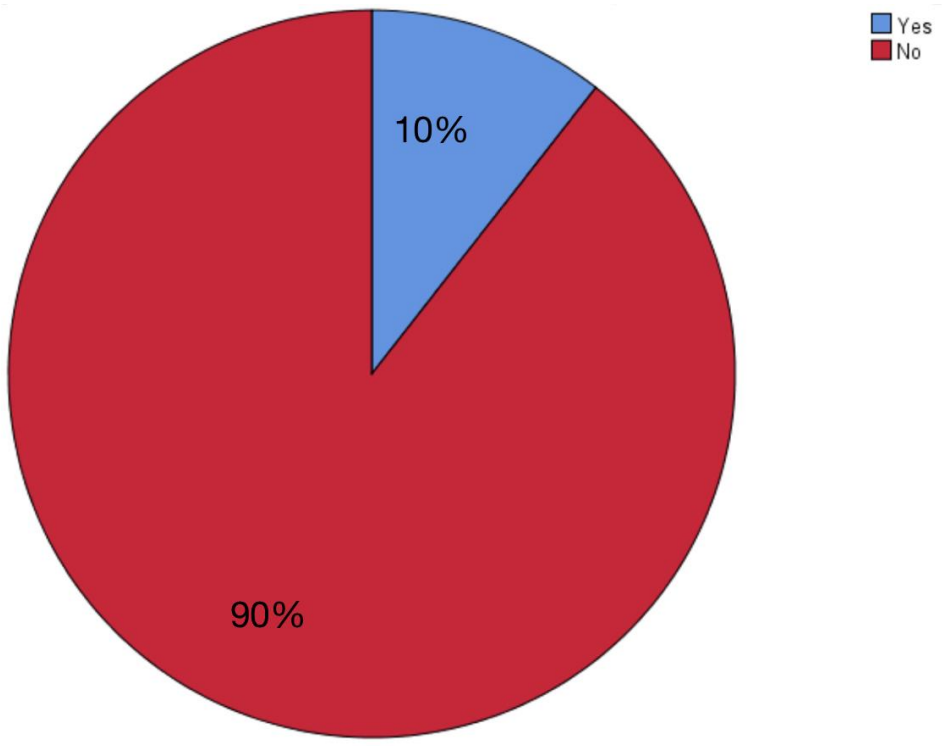

Figure 5: Pie chart showing percentage distribution on the participants views on learning anatomy without direct observation of arteries, veins for which 90% held a positive view (red) and 10% held a negative response (blue).

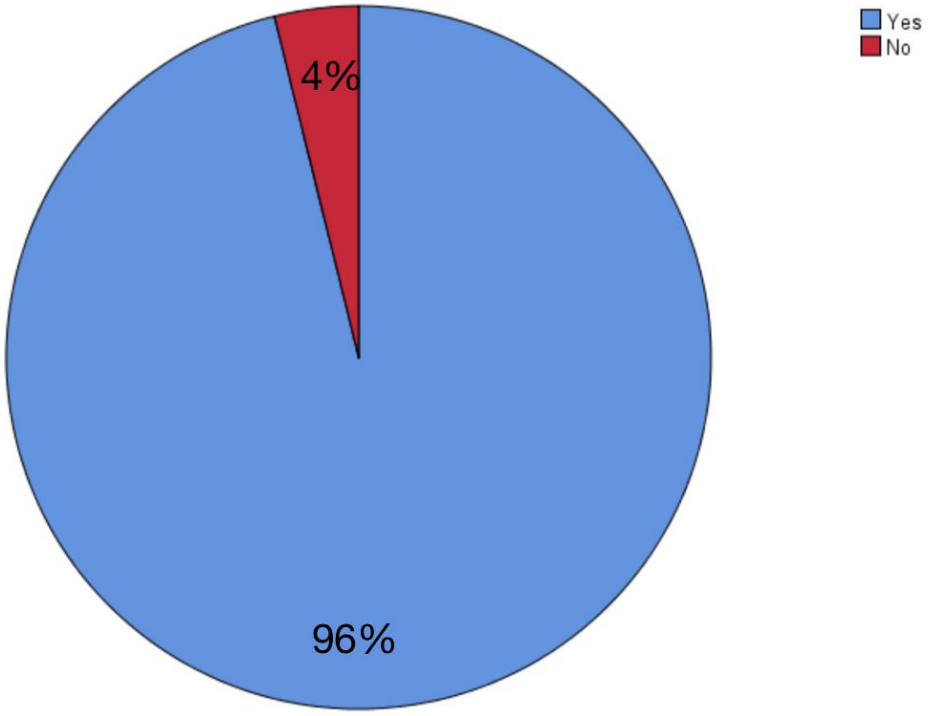

Figure 6: Pie chart showing responses of awareness of the difficulty in using e-learning methodologies in neuroanatomy where 96 % of respondents(blue) were aware of the difficulties and 4% (red) were not aware.

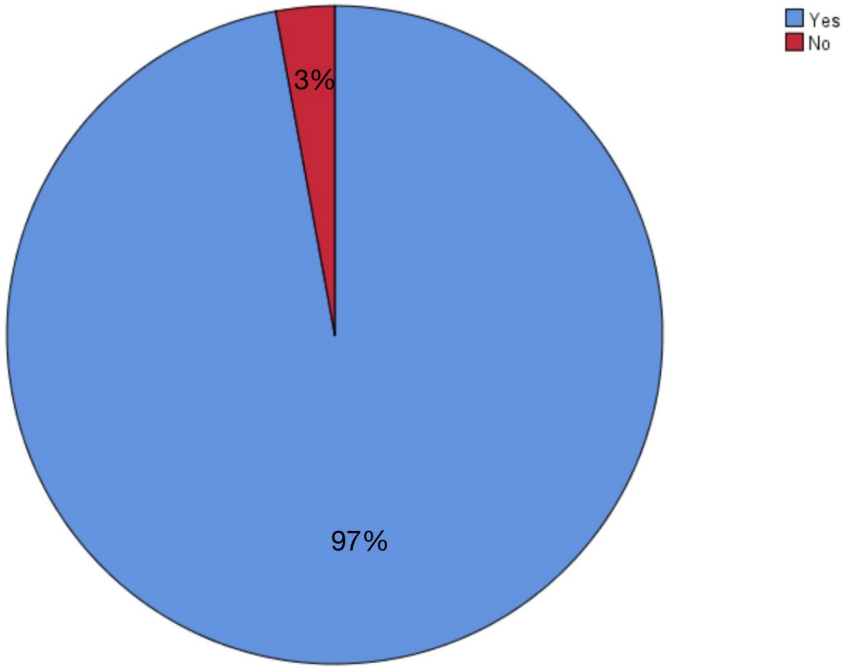

Figure 7: Pie chart showing responses for the question about the possibility of e learning as an effective learning methodology for histology - 97% accepted with a positive response as shown in blue colour and 3% of a negative response was recorded in red colour.

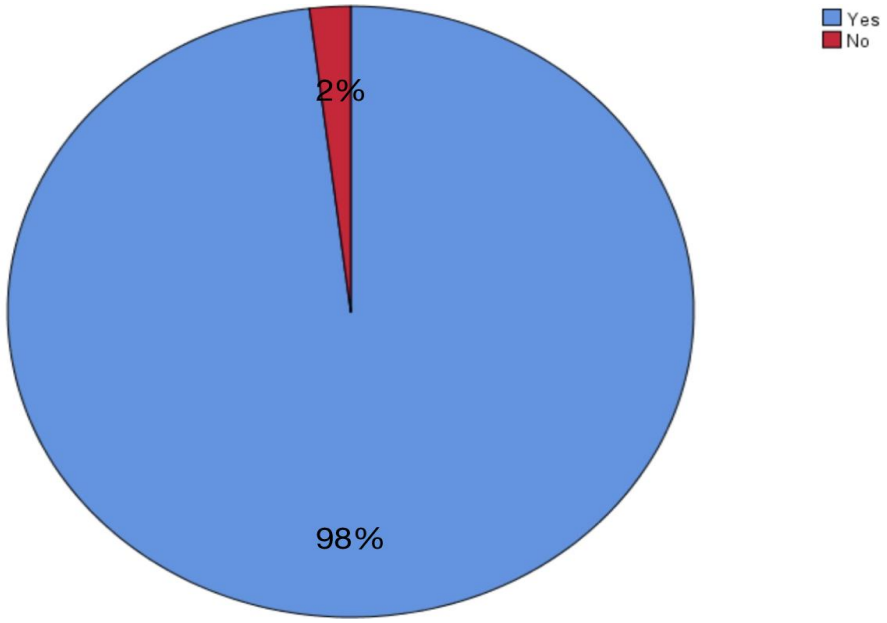

Figure 8: Pie chart showing responses for the question about the possibility of e learning as an effective learning methodology for embryology - 98% accepted with a positive response as shown in blue colour and 2% of a negative response was recorded in red colour.

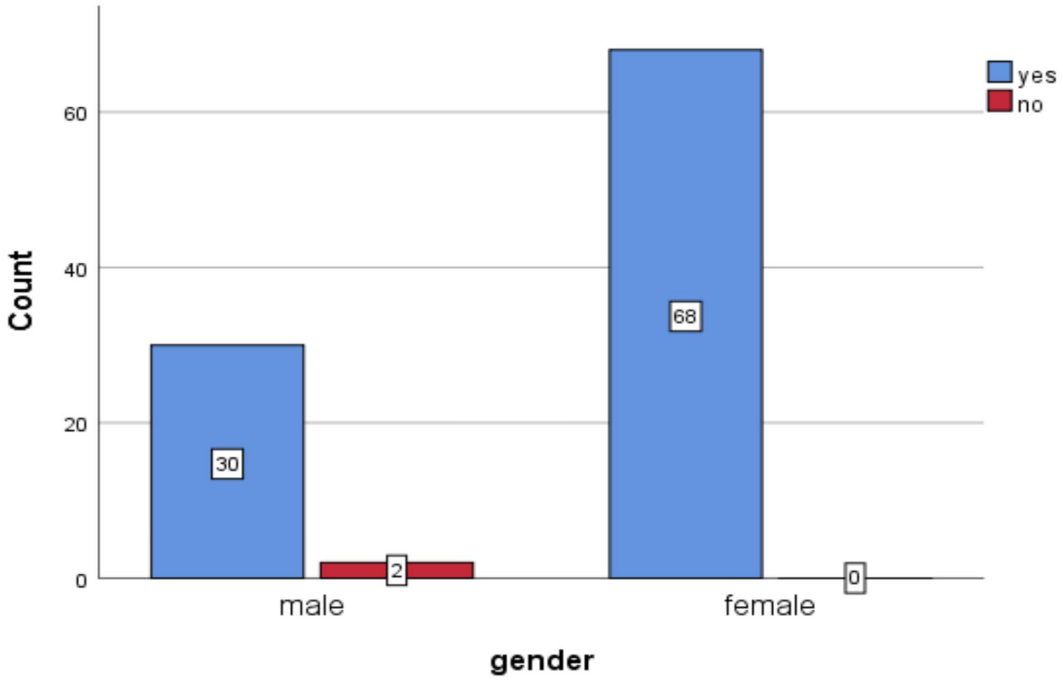

Figure 9: Bar chart representing association between gender and awareness of e-learning as the best learning method where blue colour denotes "yes" and red denotes "no". X-axis represents gender and the Y-axis represents awareness of e-learning as the best learning method. Out of 98% of the participants who were aware, 30% constitutes male and 68% constitutes female . Hence females are more aware of the benefits in e-learning than males.Association between gender and the awareness of e-learning as the best learning method was done using chi square test, Pearson chi square is 4.116 - dF-1, p- value - 0.016 (≤ 0.05) and found to be statistically significant.

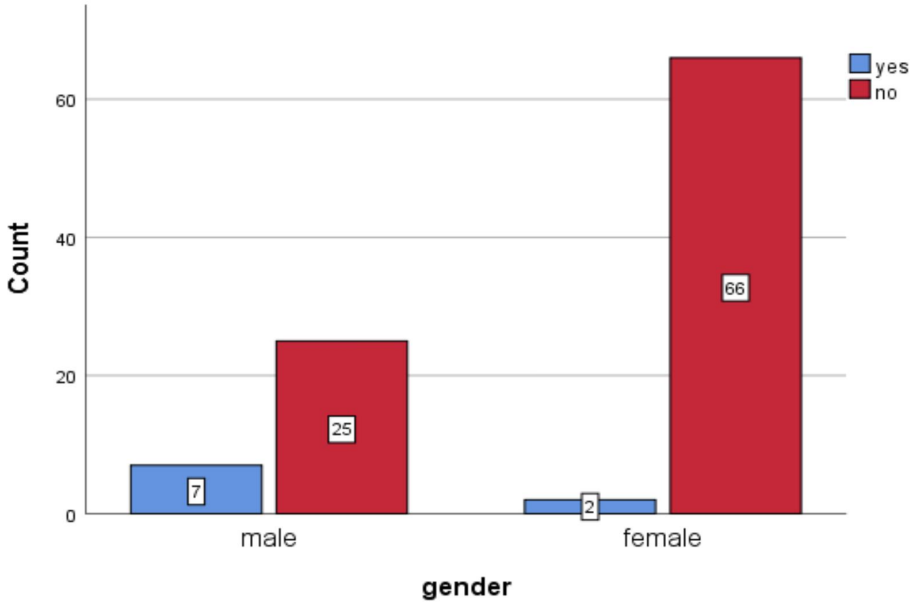

Figure 10: Bar chart representing association between gender and awareness on e-learning of anatomy is effective, where blue colour denotes "yes" and red denotes "no". X-axis represents gender and the Y-axis represents awareness e-learning of anatomy is effective. Out of 9 % of the participants who were aware, 7% constitutes male and 2% constitutes female. Hence females are more aware of e-learning of anatomy is effective than males. Association between gender and the awareness e-learning of anatomy is effective was done using chi square test, Pearson chi square is 4.864 - dF - 1, p-value - 0.024 (≤ 0.05) and found to be statistically significant.

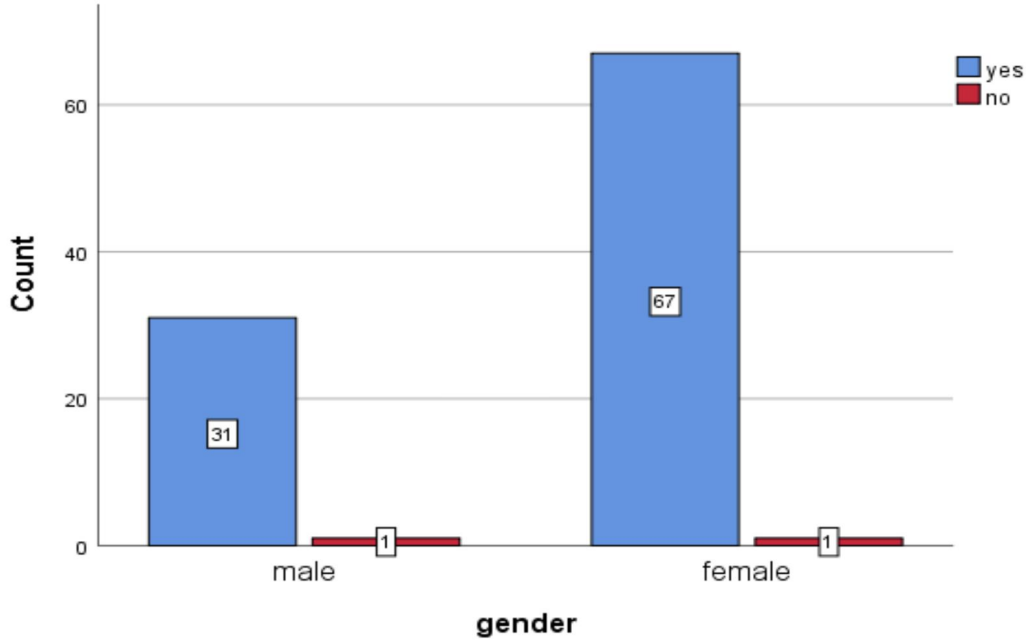

Figure 11: Bar chart representing association between gender and awareness of the risk of e-learning methods , where blue colour denotes "yes" and red denotes "no". X-axis represents gender and the Y-axis represents awareness of the risk of e-learning methods. Out of 98% of the participants who were aware, 31% constitutes male and 67% constitutes female. Hence females are more aware of the risk of e-learning methods than males.Association between gender and the awareness of the risk of e-learning methods was done using chi square test, Pearson chi square is 4.476 - p- value - 0.010 (≤ 0.05) and found to be statistically significant.

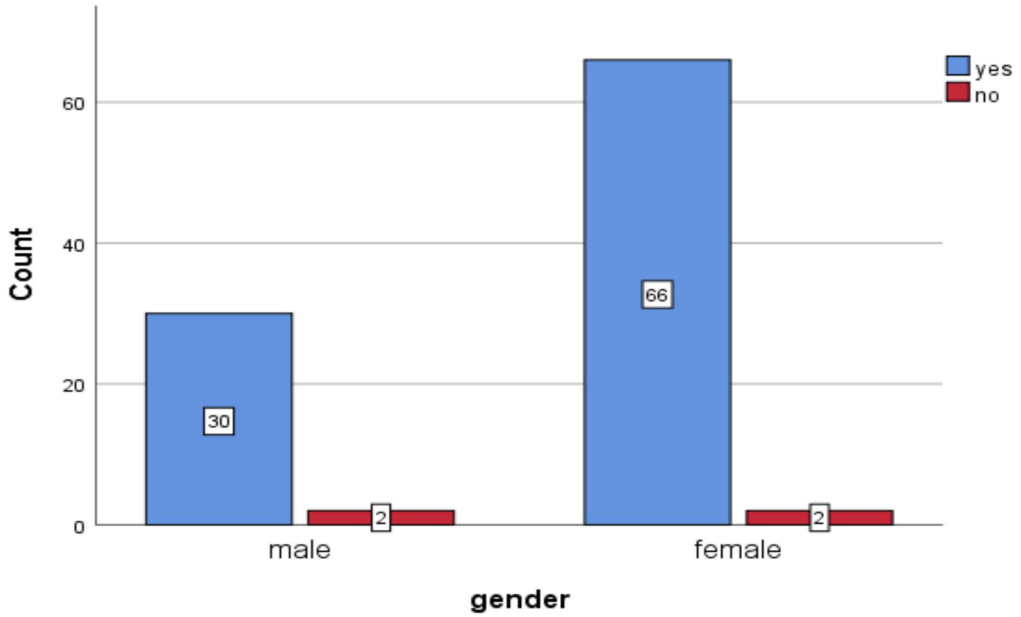

Figure 12: Bar chart representing association between gender and awareness of Neuroanatomy as the most complex topic in anatomy, where blue colour denotes "yes" and red denotes "no". X-axis represents gender and the Y-axis represents awareness of Neuroanatomy as the most complex topic in anatomy . Out of 96% of the participants who were aware, 30% constitutes male and 66% constitutes female . Hence females are more aware of Neuroanatomy as the most complex topic in anatomy than males. Association between gender and the awareness of Neuroanatomy as the most complex topic in anatomy was done using chi square test, Pearson chi square is 5.621 - p- value - 0.036 (≤ 0.05) and is statistically significant.

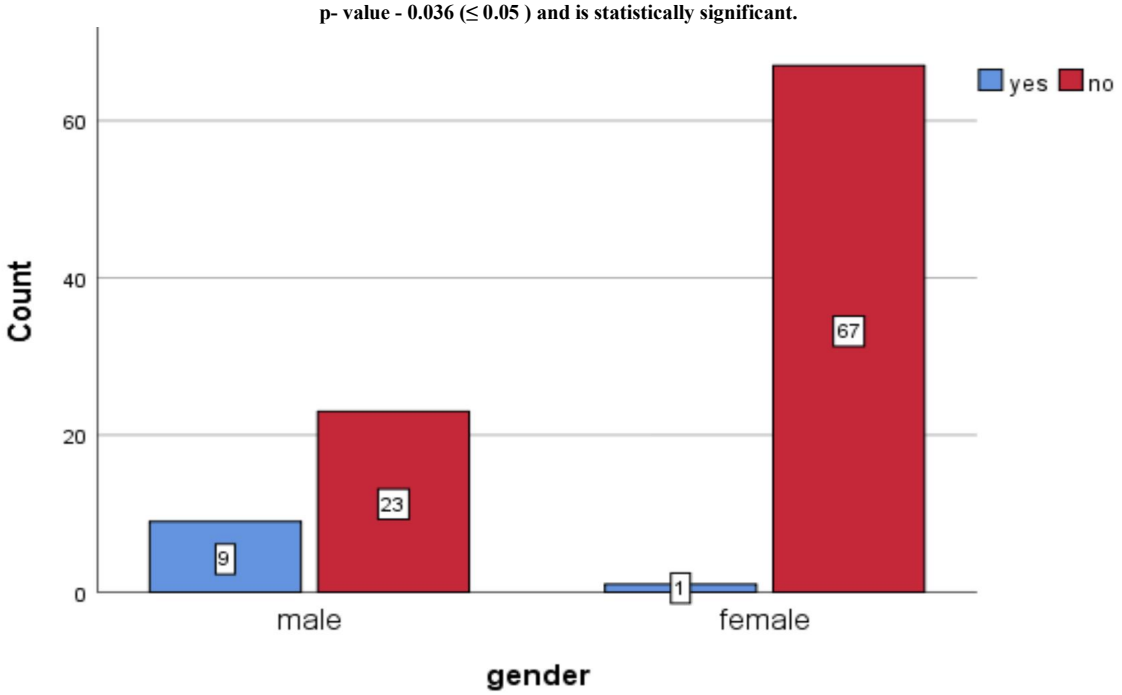

Figure 13: Bar chart representing association between gender and awareness on the need for direct observation of arteries and veins for effective learning in anatomy , where blue colour denotes "yes" and red denotes "no". X-axis represents gender and the Y-axis represents awareness on the need for direct observation of arteries and veins for effective learning in anatomy. Out of the 10 % participants who were aware, 9% constitutes male and 1% constitutes female . Hence males have more awareness on the need for direct observation of arteries and veins for effective learning in anatomy than females. Association between gender and the awareness of the need for direct observation of arteries and veins for effective learning in anatomy was done using chi square test, and is found to be statistically significant at a p- value - 0.009. (≤ 0.05) .

CONCLUSION

Learning anatomy by e-learning methods might be difficult during COVID-19 lockdown but nevertheless will be rewarding. This study gives an insight of the same from students perspective and from this study, it can be seen that a positive perception has been attained among the students towards e-learning methodologies in studying anatomy.

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