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Original Research Article

Students perception on teaching methods in anatomy- A comparative study before and during covid era

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ABSTRACT

Background: COVID-19 pandemic result of changes in current teaching methodology due to cancellation of classical "classroom teaching". Considering its implications on the students different online teaching methodology of anatomy during Covid to meet the educational need of the students.
Aims: To assess the student's perception about the teaching methods, problems in understanding anatomy before (offline)and during covid era(online) and the solutions to overcome the problems in teaching anatomy.
Settings and Design: Observational cross sectional study, Universal sampling, Bhaskar medical college, Hyderabad.
Materials and Methods: Online teaching sessions were conducted every day during pandemic to 150 students of 1^{st} year M.B.B.S of 2019-2020 batch. The student's attitude regarding traditional teaching (before covid- off line) and online teaching of anatomy is tested by perception based questionnaire on 124 students using pre validated.
Statistical Analysis: Data was recorded as percentage of student's perception regarding the questions and was compared before and during Covid era using SPSS software version 22.
Results and Conclusions: It was observed that the results shown in relation to preferred teaching method for practical, teaching methodology were statistically significant. Multimedia online teaching was preferred only 2(1.6%) students before covid but it was lower than during covid 15(12.1%) and the difference was found to be statistically significant.
Though little evidence on the educational impact, using different methods to enhance the students learning during covid is a major part of our programme. Students are still more inclined towards face to face teaching particularly for practicals rather than online teaching.

1. Introduction

The impact of COVID-19 pandemic is profound not only on physical health but also on routine medical students teaching worldwide. As a result of changes in current teaching methodology due to cancellation of classical "classroom teaching" students develop problems like difficulty in studying and understanding the Anatomy.[1]

Considering its implications on the students, and no face to face option, motivated all the faculty to try different online teaching methodology during Covid to meet the educational need of the students regarding the knowledge, attitude and the skill.

It is observed that new curriculum implementation, teaching methodology, evaluations have changed the learning process of the students and faculty and it is more challenging during covid pandemic. Internet can serve as

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an important learning tool in medical education.[2] Though E-learning is not well established in India, innovative curriculum has been developed during covid times. Overall, at the initial stage of COVID ERA in medical profession, computer assisted learning system has offered flexibility, enable students to choose the place, time, pace and process of learning and is feasible, time saving, cheap and became part of the undergraduate training.[2,3] in addition to traditional teaching. Disadvantages are like power failures, technical aspects like internet connection will change students' abilities to use it efficiently.

The anatomy curriculum is one of the pillars in the medical education. It is no stranger to reform in the changing landscape of pandemics and it is still evident that cadaveric dissection will help student in understanding anatomy.[4] Most challenging aspect of teaching anatomy online is the inability of the students to participate in anatomical dissections.

In addition, the use of cadaveric dissections were also limited during covid, for teaching practicals. This has led to the use of substitute prosections,[5] anatomical models, artificial organs and audio-visual aids like PPT's, videos, online media like GoToMeeting, Google meet, Google class room and Zoom etc. Many of these changes reflect new ways of thinking about the best ways to deliver the knowledge about anatomy.

Complete suspension from attending classes lasted more than 3 months, after which an in person training was given in anatomy and other disciplines.

Student's feedback is a useful basis of modifying and improving medical education. Through feedback, we can identify areas of strength and weakness of teaching methodology. In this article, we would like to share our experience regarding training in histology and embryology and gross anatomy during Covid(on line).

Keeping in mind with these ideas, the present study was conducted to know the views of the students for various teaching methods of understanding Anatomy in traditional teaching and online teaching which is implemented during covid era. It is also necessary to know the best teaching methodology which will facilitate the anatomy learning during traditional classroom teaching as well as on online teaching. It is also important to know the opinion of the students regarding the best assessment techniques to measure their knowledge and skills.

2. Aims and Objectives

1. To assess the student's perception about the teaching methods in anatomy.
2. To assess the student's perception about problems in understanding anatomy before (offline) and during covid era(online).
3. To assess the students perception regarding the solutions to overcome the problems in teaching anatomy.

3. Materials and Methods

1. The 150 students of 1^{st} year M.B.B.S of 2019-2020 batch of Bhaskar medical college were participated in the study. The study was conducted in the department of Anatomy.
2. Consent was obtained from students to take the feedback. Ethical committee approval was also taken.

3.1. Exclusion criteria

Students who were absent, not filling the form and multiple submission of the form.

3.2. Inclusion criteria

Students who were willing to participate (124).

3.3. Methodology

1. Considering its implications on our students, an online teaching sessions were conducted every day during pandemic.
2. The student's attitude regarding traditional teaching (before covid- off line) and online teaching of anatomy is tested by perception based questionnaire using pre validated,[6,7] but designed questionnaire and questions were validated internally also.
3. These questionnaires comprising of methods of teaching related to theory and practical.
4. Data was recorded as percentage of student's perception regarding the questions and was compared before and during Covid era using SPSS software version 22.

4. Results

An observational cross-sectional study was undertaken among the 1^{st} year students of Bhaskar medical college to assess the perception regarding teaching learning methods and attitude towards the teaching approaches of anatomy before and after the Covid pandemic.

Out of 124, 69% were females and males were 31% (Figure 1).

5. Discussion

COVID-19 pandemic caused all educational institutions all over the world to close down and thus gives rise to multiple challenges at all stages and levels of education. Stake holders involved including institutional administrators, teachers, students etc are making considerable efforts to optimally utilise the available technology for continuing the process of education and minimising the gaps in anatomical knowledge. Many medical and dental college administrators

Table 1: Association between Covid and teaching method of practical

			Preferred teaching method for Practical				Total
			Dissection	Prosection	Videos	Anatomical models	
Groups	Before Covid	Count	108	1	8	7	124
		%	87.1%	.8%	6.5%	5.6%	100.0%
	During Covid	Count	77	1	32	14	124
		%	62.1%	.8%	25.8%	11.3%	100.0%
Total		Count	185	2	40	21	248
		%	74.6%	.8%	16.1%	8.5%	100.0%

Chi-Square Value = 21.928
P-Value = 0.00006

Table 2: Distribution according to source of study material

			"Best Source of study material"				Total
			Teachers notes	Textbook	Question banks	Internet	
Groups	Before Covid	Count	50	54	8	12	124
		%	40.3%	43.5%	6.5%	9.7%	100.0%
	During Covid	Count	39	55	14	16	124
		%	31.5%	44.4%	11.3%	12.9%	100.0%
Total		Count	89	109	22	28	248
		%	35.9%	44.0%	8.9%	11.3%	100.0%

Table 3: Association between covid (before& during) and preferable teaching methodology

			"Preferable teaching methodology"				Total
			Dissection hall teaching with Chalkboard	Dissection hall teaching with multimedia	Chalkboard teaching and models	Only multimedia online teaching	
Groups	Before Covid	Count	35	80	7	2	124
		%	28.2%	64.5%	5.6%	1.6%	100.0%
	During Covid	Count	37	68	4	15	124
		%	29.8%	54.8%	3.2%	12.1%	100.0%
Total		Count	72	148	11	17	248
		%	29.0%	59.7%	4.4%	6.9%	100.0%

Chi-Square Value = 11.788
P-Value = 0.008

Table 4: Distribution according to problem in understanding Embryology

			".Main problem In understanding embryology"				Total
			Inability to visualize	Inability to comprehend sequence of events	Inadequate time	All of the above	
Groups	Before Covid	Count	14	15	12	83	124
		%	11.3%	12.1%	9.7%	66.9%	100.0%
	During Covid	Count	15	10	10	89	124
		%	12.1%	8.1%	8.1%	71.8%	100.0%
Total		Count	29	25	22	172	248
		%	11.7%	10.1%	8.9%	69.4%	100.0%

Table 5: Distribution according to problem in understanding Histology

			"Main problem In understanding histology"				Total
			Difficult confusing concepts	Lack of audio-visual aids	Insufficient time in lectures and practicals	Difficult to identify the structures on slide	
Groups	Before Covid	Count	15	17	12	80	124
		%	12.1%	13.7%	9.7%	64.5%	100.0%
	During Covid	Count	14	25	8	77	124
		%	11.3%	20.2%	6.5%	62.1%	100.0%
Total		Count	29	42	20	157	248
		%	11.7%	16.9%	8.1%	63.3%	100.0%

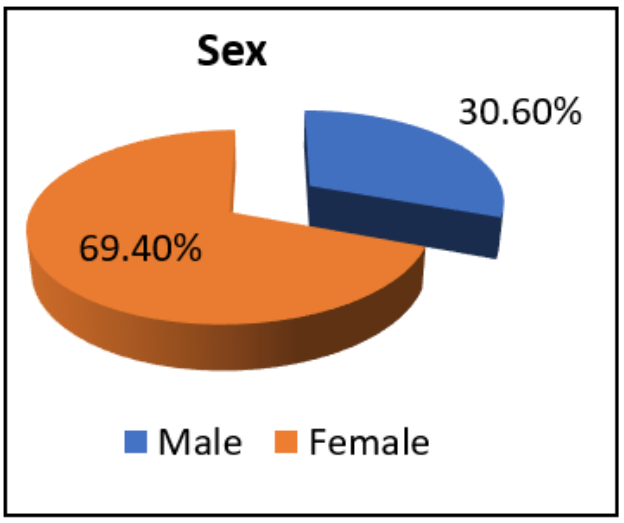

Fig. 1: Distribution of male and female

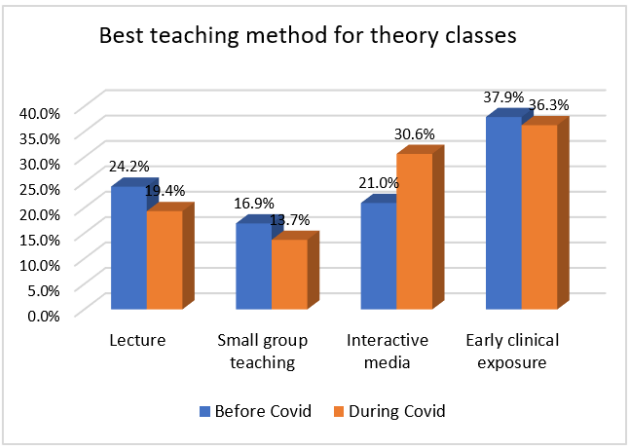

Fig. 2: Distribution according to the best teaching method for theory classes

and teachers are taking appropriate measures to conduct effective e- learning via e- lectures e- tutorials, e- case based learning etc.also various e- teaching learning soft wares are being explored by teachers to bring maximum possible ease for their students.[2]

Covid pandemic made us realize the importance of online training for MBBS students. A study by Sakshi Agarwal on students' perception of online learning during covid pandemic, students responded to satisfaction levels with online teaching were comparable to the previous studies as well as before.[8]

COVID-19 pandemic proved to be a serious challenge in terms of practical classes, techniques in anatomy like microscopy and cadaveric dissection.[9]

In the darkness of COVID-19, most medical students have lost not only the cadaveric experience, but a number of other modalities such as models, museum specimens, bones and microscopic slides. This may have impact on the student's anatomical knowledge. The anatomical community has responded relatively well to the COVID -19 crisis by rapidly finding innovative ways to alter pedagogical methods, share resources and support each other to facilitate the transition to online platforms.[4]

Till March 18^{th} 2020, students were exposed to the normal traditional teaching of cadaveric dissection, histology labs for microscopic structures, osteology classes, surface anatomy classes etc. An online teaching programme was started in our institution from then by didactic lectures conducted every day. Initially we tried with Goto Meeting platform which enable us to take uninterrupted classes and attendance for 150 students. Later we also used Google classrooms to upload any information to students and from students as well. Google meet and Zoom technology was also used for small group teaching, online mentoring, Viva and seminars etc. Although 1^{st} MBBS students responded well to these measures, the perception of students was undertaken regarding the teaching learning methods used during online teaching.

In the present study before covid 47(39.4%) students opined ECE was the best method and 30 (24.2%) students preferred lecture to correlate and remember

anatomy followed by interactive media and small group teaching. Rashmi etal in her study 2015 reported that majority of the students preferred small group teaching with interactive media. In contrast, during covid 45(36.3%)students chose Early clinical exposure and interactive media 38(30.6%).(Figure 2)

It was observed from the study majority of students that 108(87.1%) preferred dissection method for practical is a favourable approach before covid than during covid that 77(62.1%) to improve practical knowledge of spatial and variation anatomy. 32(25.8%) students preferred videos during COVID when compared to before COVID that is 8(6.5%). The dissection was done live and sometimes dissection recorded videos were shared to the students and the difference was found to be statistically significant(p=0.00006)(Table 1).[6,10,11]

In present study it was observed majority of students have chosen text book as study material 55(44.4%) during covid and before covid 54(43.5%) followed by teacher notes 50(40.3%)before covid when compared to during covid 39(31.5%). The difference is statistically not significant (p=0.311) but PPTs which were able to recorded during the class and given to the students[9] (Table 2)

It was observed that 80(64.5%) students preferred dissection hall teaching with multimedia before covid than during covid 68(54.8%) and dissection hall teaching with chalkboard preferred before and during covid 35(28.2%)& 37(29.8%) . Multimedia online teaching was preferred only 2(1.6%) students before covid but it was lower than during covid 15(12.1%) and the difference was found to be statistically significant(p=0.008. Using multimedia TV projector, in which dissection techniques were used prior to the dissection. This is contrast with Rasmhi J study in which, students preferred dissection hall teaching with chalk and board and multimedia.(Table 3)

83% (103)students felt best multimedia teaching methods are easily accessible and get immediate feed back, safe, comfortable, enjoyable, and alternative to traditional teaching during Covid pandemic. And these methods depends on mainly by teaching methods like PPTs, videos, skill of the teacher with clear instructions (Rashmi Jaiswal).

When we take perception about the main problem in understanding Embryology, it is almost similar during and before covid.(66.9% and 71.8%). It is in the form of inability to visualize and comprehend the sequence of events within inadequate time of lecture. Where as during Covid 15(12.1%) it was due to inability to visualize on line. In relation to the understanding of Histology majority felt difficult to identify the structures on the slide before and during Covid80(64.5%) and 77(62.1%). This is may be because of lack of proper audio visual aids(20.2%) and this is supported by Rashmi.J.when we have give high quality pictures of histology in PPT still students felt difficult to identify online during covid with difficult confusing concepts.[12] Majority mentioned simplify the information with less details, using more visual aids & models is the best possible solution for problems in Histology and Embryology. Perception is similar in both.[9] (Tables 4 and 5)

When we consider the perception regarding the understanding of theory and practical anatomy classes majority opined dissection table teaching preferred but with multimedia effectively in the form of recorded videos or Live dissections.[13–15] We used multimedia along with 3D models for embryology and gross anatomy helped to 41.1% and 33.9% of the students, though people still prefer traditional teaching like Lab and dissection abdul et al (2008).

Though for an assessment, LAQ, SAQ, MCQs all are agreed by 73.4% (91) and 82.3%(102) before and during Covid, more number of students agreed MCQ's 26(21.1%) only during Covid.

Before pandemic acquiring knowledge in Anatomy mainly by gross anatomy structure and is slightly during covid also. A study done by Bankim[16] showed 72.8% showed good knowledge in gross anatomy.

To assess the knowledge in practical we take viva on dissected body, viva on bones, viva on specimen, viva on models and x-rays. During pandemic the same methods were liked all mainly viva on dissected body.because we used real specimens, Bones, X-rays without labeling helped to assess the knowledge during formative & internal assessments.[5]

In a study done by Kumud N.Harley showed majority of the students felt teachers teaching style is most important rather than the aids used in lecturing.[17] And use of prosections were at least as effective as use of dissection in anatomy teaching.[10]

Students also made an attempt of experience of surface anatomy during covid by involving peer examination using body paint.

6. Conclusion

Although little evidence on the educational impact on medical learning of teaching without cadavers, using different methods to enhance the students learning during covid is a major part of our programme. Through feedback, we can identify areas of strength and weakness of teaching methodology. Online teaching can be a part of the undergraduate programme in addition to traditional teaching to help them to the recent advancements in the field of medicine and enable them to compete with the students around the world. Students are still more inclined towards face to face teaching particularly for practicals rather than online teaching.

7. Source of Funding

None.

8. Conflicts of Interest

None

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