

Perceptions of Medical Students in Bandung towards Online and Offline Learning in the Anatomy Laboratory during the COVID-19 Pandemic

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Abstract

Background: Coronavirus Disease 2019 (COVID-19) that surged throughout the world in 2019 and engulfed Indonesia in 2020 had changed many aspects of people's activities significantly, when altering the offline anatomy laboratories to online. This study aimed to determine the perspective of medical students in Bandung regarding the learning process in online and offline anatomy laboratories during the COVID-19 pandemic.

Methods: This descriptive study had used modified questionnaires with a Likert scale. The respondents were 184 students from the 2018 or 2019 class of the Faculty of Medicine in Bandung, who participated in both online and offline anatomy laboratory learning methods. Sampling was carried out using the purposive sampling method. The data were presented in a frequency table and calculated by SPSS.

Results: Regarding 'material understanding', most students (57.0%) disagreed that online anatomy laboratory activities were better than offline. In terms of 'facilities and infrastructure', 38.0% students disagreed that online anatomy laboratory learning facilities were more adequate than offline. On the aspect of 'teacher's perception', most students agreed (39.0%) that teacher's performance was better in online anatomy laboratory activities.

Conclusion: This study shows that medical students prefer to combine online and offline anatomy laboratory activities.

Keywords: Anatomy laboratories, online and offline learning, student's perception

Introduction

COVID-19 is an infectious disease caused by the SARS-CoV-2 which spreads through droplets of infected people. COVID-19 can attack the respiratory tract, ranging from mild to severe symptoms and can even cause death. Therefore, the rapid spread of COVID-19 must be prevented immediately by adhering the health protocols set by the government, such as staying away from crowds, washing hands, wearing masks, reducing mobility, and maintaining distance.^{1,2}

Furthermore, many aspects of life have changed. Activities that are usually conducted face-to-face are now difficult to do, such as working indoors, shopping, eating at

restaurants, music events, and even visiting public places such as hospitals, are considered as triggers to increase spread of COVID-19. Many activities are carried out as much as possible using the online methods. One of the activities that was strongly affected by COVID-19 was in the education sector. COVID-19 has caused education to no longer be implemented with conventional face-to-face pattern. The Ministry of Education and Culture Republic of Indonesia has issued Circular Letter No.4 of 2020 on the Implementation of Education Policies in the Emergency Period of the Spread of Coronavirus Disease, one of which is by conducting learning from home through online learning.³

Although it looks new, online education methods have actually started to be used in

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previous learning methods, such as E-learning, YouTube, the Ministry of Educational and Culture website, Edmodo, and even WhatsApp. There are various educational methods in higher education that are applied in Indonesia, but due to the current conditions, all learning methods are carried out online.

Similarly, the anatomy laboratory learning process in several medical faculties was delayed at the beginning of the emergence of the pandemic, and online learning was thus conducted entirely in their respective homes.⁴⁻⁸ However, the implementation of online learning is still not as maximized as face-to-face conventional learning, even though there are some obstacles that occur in the conventional face-to-face learning process.⁹ The online and offline learning processes must be beneficial for lecturers and students to achieve learning objectives. The use of online learning technology must be utilized optimally to develop the clinical abilities of medical students or doctors.¹⁰ In addition, the use of conventional face-to-face learning processes technology can be more effective when combined with online learning.^{11,12} Technological advances are expected to facilitate online learning and telemedicine utilization after the end of the COVID-19 pandemic.⁵

The existence of a curriculum in higher education is very important. The implementation of online and offline education methods as a whole in higher education involve a curriculum that need to be planned to get better results and to adjust the educational progress while suppressing the spread of COVID-19.¹¹ The curriculum has an important role to carry out quality education, and create people who master certain knowledge and skills.^{12,13} The establishment of a good higher education with a good curriculum will produce qualified college graduates to build the Indonesian nation. Perception retrieval is useful for knowing people's experience, thus, the perception can be used as evaluation material to improve and find solutions to existing problems.¹¹ Conventional anatomy learning requires offline sessions to enhance the experience of studying cadaveric models in the anatomy laboratory. In the online anatomy laboratory, the method is transformed into an indirect experience of learning cadaveric models through anatomy videos, schematic pictures, 3D anatomical atlases, and more. This online activity is experienced at all levels of education. This study aimed to explore the perspective of medical students in Bandung

on the learning process online and offline in anatomy laboratories during the COVID-19 pandemic.

Methods

This study was a descriptive study. The population in this study was medical students in the Bandung area class of 2018 or 2019 who took part in the online and offline anatomy laboratory learning methods. Sampling was calculated using purposive sampling method, one of the non-random sampling methods that was carried out by taking respondents as samples by determining certain conditions with a minimum sample size of 86 people.

The data were obtained using a questionnaire with the Likert scale, consisting of questionnaire on aspects of material understanding (7 questions), aspects of facilities and infrastructure (1 question) and perception of teachers (6 questions). Questionnaire was disseminated through social media Line and WhatsApp. The aspects asked in the questionnaire included students' perspective in the learning process, supporting facilities for learning anatomy, and the lecturers' position in the learning process. Before distribution, the questionnaire was tested for validity and reliability to 30 respondents who were a sample of the population from three medical faculty in Bandung, including Universitas Padjadjaran, Pasundan University, and Bandung Islamic University to obtain a distribution of values close to the normal curve.¹⁴ This research was conducted online from August to December 2021.

Course Study Guide (CS) was distributed to the medical students to understand and had the knowledge on anatomy. CSG was used by lecturers to teach students using various strategies. Students used CSG to guide the learning process, especially anatomy.¹⁶

The respondent's data were processed using Microsoft Excel software and presented in tabular form. The result of the study was analysed from the percentage students' answer.¹⁵ This research has been approved by the Research Ethics Committee of Universitas Padjadjaran, Ethical Approval No. 786/UN6. KEP/EC/2021.

Results

In a total of 830 medical school students in the Bandung area class of 2018 or 2019, 184 students were included with age range of

19–23 years, predominantly female students (69%). The distribution of the students among medical schools in the Bandung area was depicted in Table 1.

The overall response rate in the population was 28.7%. In the knowledge aspect of the CSG, there were many students who did not memorize or know the CSG (36.4%). Students who were lacked of knowledge about CSG tended to be less able to capture material more effectively. The students needed to be informed that understanding CSG was important for the continuity of the anatomy learning process both online and offline to make it more effective.

In the aspect of understanding the material, students (56.0%) disagreed that online anatomy laboratory learning activities were more motivating than offline; students (58.0%) did not agree that online anatomy laboratory activities made it easier for students to understand the purpose of learning compared to offline. Furthermore, students (61.0%) did not agree that online anatomy laboratory activities added more knowledge and conclusion than offline. There were students (55.0%) did not agree that online anatomy laboratory activities were more effective for learning objectives than offline. In addition, students (50.0%) disagreed that anatomy laboratory materials taught online were more effective for Learning objectives than offline, students (53.0%) did not agree that anatomy laboratory materials taught online were more supportive of learning activities. Furthermore, students (47.0%) disagreed that anatomy

laboratory materials taught online are more supportive of problem-solving on exams than offline. In terms of material understanding, the majority of students (54.5%) disagreed that online anatomy laboratory activities were better than offline (Table 2).

For facilities and infrastructure, 38.0% students did not agree that online anatomy laboratory learning facilities were more adequate than offline. However, the results of this aspect of understanding the material had a slight difference in the answer agree, with a percentage of 37.0% students agreeing that online anatomy laboratory learning was more adequate than offline (Table 3).

As for questions about perception of teachers, the majority of students agreed that material explanations (45.0%) and preparation of teaching materials (47.0%) were better in online anatomy laboratory activities, as well as the opportunity to discuss and to ask questions about anatomy laboratory activities. Teachers provided more opportunities (42.0%) and provided more clearer answer (42.0%) to online anatomy laboratory activities. However, students did not agree that in terms of giving examples of anatomical materials (42%) and interaction between teachers and students (46%), it was better and more effective in online anatomy laboratory activities. The majority of students (39.0%) agreed that the teacher performance was better in online anatomy laboratory activities. This result had a slight difference with regard to teaching performance, students did not agree if teaching performance was

Table 1 Characteristics of Respondents

Characteristic	Number (n)	Percentage (%)
Gender		
Male	57	31.0
Female	127	69.0
Origin of the University		
Universitas Padjadjaran	84	45.7
Bandung Islamic University	49	26.6
Maranatha Christian University	0	0.0
Jenderal Achmad Yani University	23	12.5
Pasundan University	28	15.2
Knowledge of CSG		
Yes	117	63.6
No	67	36.4
Total	184	100

Note: CSG: Course study guide

Table 2 Questionnaire on Aspects of Material Understanding, Facilities and Infrastructure, and Perception of Teachers

Questionnaire	Strongly Disagree n (%)	Disagree n (%)	Agree n (%)	Strongly Agree n (%)
Aspects of material understanding				
Online anatomy laboratory activities motivate me to learn anatomy by objective learning in each laboratory topic rather than offline	25 (14.0)	104 (56.0)*	39 (21.0)	16 (9.0)
Online anatomy laboratory activities make it easier for me to understand each item that is by the purpose of learning objective learning rather than offline.	31 (17.0)	106 (58.0)*	32 (17.0)	15 (8.0)
Online anatomy laboratory activities further add to my knowledge and skills, by the purpose of learning objective learning rather than offline	31 (17.0)	112 (61.0)*	32 (17.0)	9 (5.0)
Online anatomy lab activities make me more effective at learning objectives than offline	28 (15.0)	102 (55.0)*	40 (22.0)	14 (8.0)
Anatomical laboratory materials that have been taught online are more by objective learning in modules than offline	18 (10.0)	93 (50.0)*	59 (32.0)	14 (8.0)
Anatomy laboratory materials that have been taught online are more supportive of other learning activities (lectures and tutorials) than offline	20 (11.0)	98 (53.0)*	50 (27.0)	16 (9.0)
Anatomy laboratory materials that have been taught online are more supportive of problem solving on exams than offline	20 (11.0)	87(47.0)*	59(32.0)	18(10.0)
Aspects of facilities and infrastructure				
Online anatomy laboratory learning facilities (video, power point, atlas, LMS) are more adequate than offline (anatomical models, atlases, textbooks, modules)	22 (12.0)	70 (38.0)*	68 (37.0)	24 (13.0)
Perception of teachers				
In online anatomy laboratory activities, teachers explain the material better than offline	10 (5.0)	66 (36.0)	83 (45.0)*	25 (14.0)
In online anatomy laboratory activities, teachers prepare teaching materials better than offline	7 (4.0)	54 (29.0)	86(47.0)*	37 (20.0)
In online anatomy laboratory activities, teachers give students more opportunities to discuss and ask questions than offline	7 (4.0)	68 (37.0)	77 (42.0)*	32 (17.0)
In online anatomy laboratory activities, teachers respond to questions better and more clearly than offline	11 (6.0)	70 (38.0)	78 (42.0)*	25 (14.0)
In online anatomy laboratory activities, teachers provide examples of anatomical materials better and clearer than offline	17 (9.0)	78 (42.0)*	67 (36.0)	22 (12.0)
In online anatomy laboratory activities, teaching interaction with students is more effective than offline	31 (17.0)	86 (46.0)*	47 (26.0)	20 (11.0)

Note: * the most prevalent result

better in online anatomy laboratory activities. Based on the survey there were several obstacles experienced in the online anatomy laboratories learning process, one of the

obstacles most felt by most students was internet problem (n=139, 76%). In addition, 131 students (71.0%) experienced a lack of motivation. Other problems were the less

conductive (62.0%) and the limitations of gadgets (29.0%). Other technical problems also occurred, such as students not having proper applications used by teachers because the applications were paid, so students did not have access to anatomical laboratory props. This caused obstacles for students such as being unable to visualize anatomical structures in three dimensions and could not directly edit anatomical models that resulted in a lack of understanding of the online anatomy learning process.

As a result of COVID-19, the anatomy laboratory learning process became an obstacle for students. Although students preferred the offline learning process of anatomy in aspects of understanding materials and infrastructure facilities, the offline learning process had more obstacles than the online learning process. The most common obstacles experienced by students were the distance to campus (39.7%) and the cost of living which was more expensive (32.6%) compared to the online learning process in the anatomy laboratories. In addition, offline anatomy laboratory activities were also considered to be less flexible and requires more time and effort to implement. Offline anatomy laboratory activities with a lot of material in a limited time was also one of the obstacles that must be overcome, this caused the material explained by lecturers to be too fast and cannot be repeated as can be done in the online of anatomy laboratories learning process. This caused the anatomy laboratory activities to become less directed and some materials needed to be corrected. As a result, students felt that the material provided was incomplete and very much imposed things because they had to study independently on anatomical pre-lab tasks.

Sitting position was also considered to affect the teaching and learning process in offline anatomy learning because the voice of lecturers tended not to be heard by students sitting behind so that students were less able to capture the material clearly. The capture of material by students was also influenced by the classroom atmosphere which was often less conducive and made other students less focused on paying attention, so the implementation of anatomical laboratories was not maximal, and students needed to repeat the lesson after the lab session.

For facilities and infrastructure, materials and cadavers were considered inadequate by students. The facilities provided by the faculty were considered insufficient for a

large number of students, such as there was only 1 anatomical model that could be used simultaneously by 12 people. Lack of technological updates was also one of the obstacles that students felt. In addition, several universities did not have anatomy laboratory facilities on their campuses, thus students had to go to other campuses to use anatomy laboratory facilities.

Discussion

This study shows that most of the respondents disagree that the online method in learning anatomy increases learning motivation, knowledge, and effectiveness. A similar study that compared online and offline learning processes at the medical faculty in India had a similar result to this study, which stated that students tended to prefer online rather than offline anatomy laboratory activities in the aspect of facilities and infrastructure.¹⁶ In other research, students were more satisfied with the online anatomy learning process because students could contact the lecturer at any time and recordings of learning activity material were available which made it easier for students to repeat learning at any time.¹⁷⁻¹⁹ Statistically, there is no significant difference between the online and offline learning process. Students can ask questions to lecturer at any time, students are equally involved in the online and offline learning processes due to the teacher's equally good performance in the online and offline anatomy learning process.^{17,20}

The limitations of this research are the relatively low total response rate, the difficulty of equalizing the number of respondents at each university and also the need for interpersonal communication with each student to meet the number of respondents.

In conclusion, students tend to prefer a combination of online and offline anatomy laboratory activities. There are several aspects that are superior to online activities, such as visualization and simple schematic picture to increase the anatomy learning process. In offline activities, students can discuss and interact with the lecturer using the cadaver models. In this study, in terms of material understanding and infrastructure facilities, online anatomy laboratory activities are superior and in the aspect of the perception of teaching, online anatomy laboratory activities are excel.

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