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PERCEPTION AND ATTITUDE OF UDAYANA UNIVERSITY MEDICAL STUDENTS TOWARDS CADAVERIC OBSERVATION BY ONLINE AND OFFLINE LEARNING

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ABSTRACT

Human anatomy practicum using cadavers has been carried out for a long time and is considered the gold standard for learning anatomy. Practicum using cadavers has its own advantages and disadvantages and is starting to be replaced by other anatomical practicum methods. Students have their own perceptions of practicum using cadavers. This research aims to determine the perceptions and attitude of students in the Undergraduate Medicine Study Program at Udayana University regarding human anatomy practicum using cadavers with online and offline learning. This research is a descriptive observational study with a cross-sectional approach. The sample collection technique used was purposive sampling and 216 students were taken as minimum samples. Data collection was carried out by distributing questionnaires with a Likert scale online and offline. The results of research from 301 samples show that students of the Undergraduate Medicine Study Program at Udayana University have a positive perception of human anatomy science practicum using cadavers, both with online and offline learning. The majority of students agreed that cadaver observation deepens understanding (69.5%), increases respect for the human body (88.1%), makes learning more interesting (82.7%), and helps remember what is learned (65.4%). Students also accept cadaver as a learning method and have respect and empathy for cadavers. Students have a positive perception of human anatomy science practicum using cadavers. Cadaveric observation should not be replaced by other practical methods and more time should be allocated for cadaveric observation.

Keywords: Anatomy practicum., cadaver., online learning., offline

INTRODUCTION

The COVID-19 pandemic (coronavirus disease 2019) has caused social restrictions around the world, including in education. To prevent transmission, the curriculum has changed from offline to online. Effective online learning requires technological innovation such as learning management systems and video conferencing.[1,2] During the pandemic, students were unable to learn Anatomy directly, especially with cadavers, which have become the gold standard of Anatomy. Before the COVID-19 pandemic, the time for Anatomy practicums had already been reduced.[3] Sources of offline Anatomy learning include cadaver dissection, prosected specimens, plastination, textbooks, and atlases.[4,5] Sources of online Anatomy learning include Anatomy videos, 3D Anatomy computer models, augmented reality (AR), and virtual reality (VR).[6,7] However, cadaver dissection remains the key component in the learning of human Anatomy at the beginning of medical education.[8]

Online learning methods have their own advantages and disadvantages compared to offline learning methods. Some challenges of online learning include reducing learning experiences and interactions, causing anxiety and mental health disorders, and reducing mobility for school activities.[9] Medical schools have their own difficulties in online learning, one of which is for practical and clinical learning. Meanwhile, research conducted at the Faculty of Medicine and Dentistry in Pakistan also mentions some aspects related to the advantages of online learning. These advantages include flexibility in terms of convenience and accessibility, as well as student-centered learning in terms of asynchronous learning that can be accessed by students anywhere and anytime.[1]

Practical Anatomy in medical schools in Indonesia is still considered important to improve the effectiveness of student Anatomy learning outcomes.[10] This is evidenced by the results of a study on the effect of Anatomy learning at the Muhammadiyah University of Semarang. The study concluded that the group with Anatomy practical in the experiential learning method improved Anatomy learning outcomes compared to the control group of conventional methods.[11] Anatomy learning and practicum in the Bachelor of Medicine Program at the Faculty of Medicine, Udayana University, begins from the first semester by conventional method (teacher-centred).[12] This Anatomy learning is block-based and are conducted per system, musculoskeletal, cardiovascular, respiratory, nervous, sensory, endocrine, urinary, reproductive, and digestive systems.

The lecture and practicum system in the Bachelor of Medicine Program at the Faculty of Medicine, Udayana University, continued during the COVID-19 pandemic from

2020 to 2021 using the Moodle learning management system and WebEx video conferencing. Online lectures had some problems such as network problems, lack of interaction, lack of student readiness, and others. Offline lectures resumed in 2022. During offline lectures, the low cadaver-to-student ratio (60 students per cadaver) was felt to be one of the problems.[13]

The objective of this research is to understand how the perceptions and attitudes of students in the Bachelor of Medicine Program at the Faculty of Medicine, Udayana University, are towards human Anatomy practicum using cadavers by online and offline learning. Perception itself is a mental formation based on the five senses, namely sight, hearing, touch, smell and taste.[14]

MATERIALS AND METHODS

This research is a descriptive observational study with a cross-sectional approach. The subjects of this research are pre-clinical students at the Faculty of Medicine, Udayana University. The research sample is the class of 2021 students (attending online lectures) and the class of 2022 students (attending offline lectures) who are willing to be research samples and meet the inclusion criteria. The inclusion criteria were pre-clinical students of the Undergraduate Medical Study Program, Faculty of Medicine, Udayana University, batch 2021 and 2022, students who had attended Anatomy lectures and practicums, and students who had taken the Biomedical Block I exam. The exclusion criteria were students who withdrew from the study. The sampling technique used in this research is purposive sampling using limited population calculation formula and resulting a minimum sample size of 216 people. The research materials needed are paper containing questionnaire questions and writing tools for research participants to fill out the research-related question list. The research instrument that will be used in this research is a questionnaire adapted from the Ethiopian Journal of Health Sciences journal with the journal title Perception and Attitude of Medical Students towards Cadaveric Dissection in Anatomical Science Education.[15] The analysis carried out in this research is univariate analysis. The study has been approved by the Ethics Committee of the Faculty of Medicine, Udayana University with the number 239/UN14.2.2.VII.14/LT/2023.

RESULT

Demographic characteristics of research participants: Table 1 shows the results of the questionnaire, 301 primary data were obtained. Out of the 301 participants, 153 students (50.8%) came from the class of 2021 and 148 students (49.2%) from the class of 2022. A total of 113 students (37.5%) were male and 188 students (62.5%) were female. Most respondents were aged 19 to 20 years (88%). Out of the total 178 people (59.1%) embraced Hinduism.

Table 1. Demographic characteristics of research participants

Variable	Frequency	Percent (%)
Class of		
2021	153	50,8
2022	148	49,2
Sex		
Male	113	37,5
Female	188	62,5
Age in years		
17-18	27	9
19-20	265	88
21-22	9	3
Religion		
Hindu	178	59,1
Christian	45	15
Islamic	34	11,3
Catholic	31	10,3
Buddhist	13	4,3
TOTAL	**301**	**100**

Students' positive perceptions of Anatomy learning using cadaver: Table 2 shows whether respondents agree or disagree with the positive perception of learning Anatomy using cadavers. Both class of 2021 and 2022 have a positive perception of learning anatomy using cadavers. Out of 301 students, majority agreed that cadaver observation deepens understanding (69.5%), increases respect for the human body (88.1%), makes learning more interesting (82.7%), and helps remember what is learned (65.4%).

Table 2. Students' positive perceptions of Anatomy learning using cadaver.

Variable		Class of 2021 f (%)	Class of 2022 f (%)	Total f (%)
My first experience of cadaver observation was enjoyable.	D	19 (12,4)	7 (4,8)	26 (3,3)
	N	79 (51,6)	29 (19,6)	108 (35,9)
	A	55 (36)	112 (75,7)	167 (55,5)
Cadaver observations deepened my understanding.	D	12 (7,8)	5 (3,4)	17 (5,7)
	N	57 (37,3)	18 (12,2)	75 (24,9)
	A	84 (54,9)	125 (84,5)	209 (69,5)
Cadaver observations increased my respect for the human body.	D	0 (0)	1 (0,7)	1 (0,3)
	N	26 (17)	9 (6,1)	35 (11,6)
	A	127 (83)	138 (93,2)	265 (88,1)
Cadaver observation makes learning more interesting.	D	4 (2,6)	2 (1,4)	6 (2)
	N	33 (21,6)	13 (8,8)	46 (15,3)
	A	116 (75,8)	133 (89,8)	249 (82,7)
Cadaver observations help me remember what I learn.	D	10 (6,6)	5 (3,4)	15 (5)
	N	54 (35,3)	35 (23,6)	89 (29,6)
	A	89 (58,2)	108 (93)	197 (65,4)
Cadaveric observations gave me lasting knowledge.	D	21 (13,8)	20 (13,5)	41 (13,6)
	N	80 (52,3)	57 (38,5)	137 (45,5)
	A	52 (33,9)	71 (48)	123 (40,8)
Cadaveric observations provide a three-dimensional perspective of the Anatomical structure.	D	6 (3,9)	1 (0,7)	7 (2,3)
	N	37 (24,2)	9 (6,1)	46 (15,3)
	A	110 (71,9)	138 (93,3)	248 (82,4)
TOTAL		**153 (100)**	**148 (100)**	**301 (100)**

f: frequency; D: Disagree; N: Neutral; A: Agree

Students' negative perceptions of Anatomy learning using cadaver: Table 3 shows whether respondents agree or disagree with the negative perception of learning Anatomy using cadavers. The class of 2021 does not have a negative perception of learning using cadavers. They do not agree with negative perception statements such as cadaver observations against respondent's culture (67.3%) and against respondent's religion (69.9%). Class of 2021 answered neutrally to the statement that cadaver observation was tense (47.1%) and time consuming (45.1%). The class of 2022 has a negative perception of learning using cadavers that is observing cadavers takes time (37.2%). However, the

class of 2022 did not agree that cadaver observation was against respondent's culture (79%) and against respondent's religion (83.8%). The Class of 2022 answered neutrally to the statement that cadaver observation was tense (41.2%).

Table 3. Students' negative perceptions of Anatomy learning using cadaver.

Variable		Class of		Total
		2021 f (%)	2022 f (%)	f (%)
Cadaver observation is tense.	D	37 (24,2)	50 (33,8)	87 (28,9)
	N	72 (47,1)	61 (41,2)	133 (44,2)
	A	44 (28,8)	37 (25)	81 (26,9)
Cadaver observation is time consuming.	D	29 (18,9)	39 (26,3)	78 (22,6)
	N	69 (45,1)	54 (36,5)	123 (40,9)
	A	55 (36)	55 (37,2)	110 (36,6)
I felt that cadaver observation was against my culture.	D	103 (67,3)	117 (79)	220 (73,1)
	N	48 (31,4)	29 (19,6)	77 (25,6)
	A	2 (1,3)	2 (1,4)	4 (1,3)
I feel that cadaver observation is against my religion.	D	107 (69,9)	124 (83,8)	231 (76,8)
	N	44 (28,8)	23 (15,5)	67 (22,3)
	A	2 (1,3)	1 (0,7)	3 (1)
TOTAL		**153 (100)**	**148 (100)**	**301 (100)**

f: frequency; D: Disagree; N: Neutral; A: Agree

Students' emotional impact on learning using cadaver: Table 4 shows whether respondents agree or disagree with the emotional impact on learning using cadaver. The class of 2021 answered neutrally to the statement of experiencing anxiety before and after the first cadaver observation (48.4%) and mentally preparing for the cadaver observation (45.8%). Most of the class of 2021 had never seen a cadaver before (52.3%) and agreed that the experience of seeing a cadaver helped respondents (56.2%). The class of 2022 did not experience anxiety before and after cadaver observation (58.8%), but still prepared mentally for cadaver observation (38.5%). Most of the class of 2022 had never seen a cadaver before (68.9%) and agreed that the experience of seeing a cadaver helped respondents (86.5%).

Table 4. Students' emotional impact on learning using cadaver.

Variable		Class of		Total
		2021 f (%)	2022 f (%)	f (%)
I experienced anxiety before and after the first cadaver observation.	D	63 (41,2)	87 (58,8)	150 (49,8)
	N	74 (48,4)	42 (28,4)	116 (38,5)
	A	16 (10,5)	19 (12,9)	35 (11,7)
I mentally prepared for the cadaver observation.	D	30 (19,6)	37 (25)	67 (22,3)
	N	70 (45,8)	54 (36,5)	124 (41,2)
	A	53 (34,7)	57 (38,5)	110 (36,6)
I've seen cadavers before.	D	80 (52,3)	112 (68,9)	182 (60,4)
	N	38 (24,8)	17 (11,5)	55 (18,3)
	A	35 (22,8)	29 (19,6)	64 (21,2)

The experience of seeing cadavers helped me.	D	7 (4,6)	4 (2,7)	11 (3,6)
	N	60 (39,2)	16 (10,8)	76 (25,2)
	A	86 (56,2)	128 (86,5)	214 (71,1)
TOTAL		**153 (100)**	**148 (100)**	**301 (100)**

f: frequency; D: Disagree; N: Neutral; A: Agree

Students' acceptance and attitudes towards cadaver observation: Table 5 shows whether respondents agree or disagree with Anatomy learning with cadaver acceptance and attitudes towards cadaver observation. Both class of 2021 and 2022 accept cadaver as a learning method and have respect and empathy for cadavers. Out of 301 students, majority agreed that they would be missing out if they didn't attend the cadaver observation (84.1%), more time should be allocated for cadaver observation (61.8%), and respondents attended cadaver observation regularly (70.4%). Both of their attitudes were positive as shown by their affirmative answers to the statement of having respect and empathy for cadavers (92.2%).

Table 5. Students' acceptance and attitudes towards cadaver observation.

Variable		Class of		Total
		2021 f (%)	2022 f (%)	f (%)
I would be missing out if I didn't attend the cadaver observation.	D	4 (2,7)	87 (58,8)	5 (1,6)
	N	26 (17)	42 (28,4)	42 (14)
	A	123 (80,4)	19 (12,9)	254 (84,1)
More time should be allocated for cadaver observation.	D	5 (3,3)	37 (25)	14 (4,7)
	N	54 (35,3)	54 (36,5)	101 (33,6)
	A	94 (61,5)	57 (38,5)	186 (61,8)
I attend cadaver observations regularly.	D	14 (9,1)	112 (68,9)	17 (5,7)
	N	56 (36,6)	17 (11,5)	72 (23,9)
	A	83 (54,3)	29 (19,6)	212 (70,4)
I have respect and empathy for cadavers.	D	0 (0)	4 (2,7)	1 (0,3)
	N	18 (11,8)	16 (10,8)	21 (7)
	A	135 (88,2)	128 (86,5)	279 (92,2)
TOTAL		**153 (100)**	**148 (100)**	**301 (100)**

f: frequency; D: Disagree; N: Neutral; A: Agree

DISCUSSION

Students have a positive perception of learning Anatomy using cadavers, including deepening understanding, increasing respect for the human body, making learning more interesting, helping to remember what is learned, and providing a three-dimensional perspective of anatomical structures. This positive perception is in accordance with Dissabandara's research which states that learning Anatomy using cadavers improves the learning experience, deepens understanding of Anatomy, and can provide good learning memories.[16] The advantage of cadavers that cannot be obtained from textbooks is that they can see the three-dimensional structure of human body organs.[17] In addition, this experience can increase a sense of professionalism, empathy, respect and appreciation for the human body and make learning more interesting.[16,18] The class of 2022 agrees with the statement that the first experience of cadaver observation was enjoyable, while the class of 2021 has a neutral opinion. This may occur because of the obstacles of online learning, that is reducing learning experiences and interactions.[9,19]

Students do not have a negative perception of learning Anatomy using cadavers, such as observing cadavers contrary to culture and contrary to the respondent's religion. They answered neutrally to the statement cadaver observation is tense. This contrasts with cadaveric dissection which can cause discomfort from psychological factors such as stress, depression, and emotional trauma.[15] However, the class of 2022 has a negative perception that is cadaver observations is time consuming compared to the class of 2022 who have a neutral opinion. This is similar to the results of Asante's research in 2021 which found that cadaveric dissection took a lot of time.[15]

Student perceptions regarding the emotional impact of learning using cadavers vary. The class of 2021 has a neutral opinion regarding the statement of experiencing anxiety before and after the first cadaver observation and preparing mentally for the cadaver observation. Class of

2022 disagrees with the statement of experiencing anxiety before and after the first cadaver observation and agrees with the statement of preparing mentally for cadaver observation. This may be different because the learning methods of the two classes are different. Anxiety can also be influenced by several factors such as gender, religion, and beliefs in each culture.[15] Meanwhile, research by Mulu and Tegabu stated that cadaver dissection requires mental and emotional preparation of students.[20] The majority of the classes of 2021 and 2022 answered that they had never seen a cadaver before and agreed that the experience of seeing a cadaver helped them. This is supported by Dissabandara's research which proves that the experience of seeing cadavers helps during both oral and written exams.[16]

Students accept learning using cadavers as an Anatomy learning method. The majority of both groups agreed with the statement that there would be a loss if they did not attend regular cadaver observations and that more time should be allocated for cadaver observations. Research by Dissabandara stated that learning anatomy becomes more interesting by using cadavers and students will lose out if they do not attend the practicum.[16] Regarding students' attitudes towards cadaver observation, the majority of both classes also strongly agreed with the statement of having respect and empathy for cadavers. This is in accordance with research by Houser and Kondrashov which stated that the use of cadavers makes medical students more sensitive and can increase professionalism, empathy and human values.[18]

CONCLUSION AND RECOMMENDATION

Students' perceptions of human anatomy practicum using cadavers are not too different between online and offline learning. Students agree with the positive perception of the practicum using cadavers which deepens understanding, increases respect for the human body, helps remember anatomy, and provides a three-dimensional perspective of anatomical structures. Students do not agree with negative perceptions such as being contrary to the culture and religion that the respondents have. Students also disagreed with the emotional impacts experienced such as anxiety during practicum using cadavers. The majority of students had never seen a cadaver before practicum and agreed that the experience of seeing a cadaver helped respondents. Students received Anatomy learning using cadavers which conveyed the statement of agreement that it would be a loss if they did not attend cadaver observations regularly and more time should be allocated for cadaver observations. Students also have an attitude of respect and empathy towards cadavers. The suggestion from this research is to continue using cadavers as anatomy learning materials for medical students because it has many benefits. Learning time using cadavers can also be increased to make students deepen the anatomical structure of the human body. This research can also be researched again by expanding its reach to the classes before and after 2021 and 2022 and analytical research can be carried out.

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