

**Safe line anatomy teaching in College of Medicine,
Hawler Medical University**

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Abstract:

Background and objectives: Anatomy is the bedrock of medicine and now has also evolved as a specialized area of science that can stand on its own and not just an appendage of a medical school for the training of medical students. The overall aim of this study was to determine the students' and graduate doctors' views on the relevance of anatomy teaching and find out the minimal safe core curriculum for anatomy to be taught to undergraduate students.

Methods: A cross-sectional study was conducted at College of Medicine, Hawler Medical University from the period of 1st June 2016 to 15th September 2017. A convenient sample of 220 respondents participated in the study, which included 180 undergraduate medical students from second and third years and 40 doctors. A self-administered questionnaire was used for data collection and the collected data was analyzed using SPSS software.

Results: Almost all (95.6%) the students and about 60% of the doctors were significantly satisfied with studying anatomy in the medical curriculum. More than half (55.6%) of the students and 35% of the doctors preferred studying anatomy in an integrated system and more than half of the doctors preferred both integrated and regional systems, in addition to clinical anatomy courses. Nearly 70% of the doctors and 44.4% of the students preferred all system or regions of the body that should be concentrated on more in teaching the anatomy; also, 90% of the doctors and 75.6% of the students preferred small group teaching and 90% of the doctors and about 81% of the students preferred cadaveric dissection in practical sessions with more students involvement. While 96.7% of the students and 100% of the doctors stated that it is necessary for anatomy lecturer to have a clinical background.

Conclusion: Majority of the participants were satisfied with the current anatomy curriculum, preferred more system- based integration with more small group teaching and students involvement in cadaveric dissection.

Introduction:

Anatomy is the bedrock of medicine and now has also evolved as a specialized area of science that can stand on its own and not just an appendage of a medical school for the training of medical students.¹ Anatomy in undergraduate education has been in decline for many years. Some suggest that it has fallen below a safe level.² Balances between detail and safety and assimilation and application of anatomy have yet to be established as the methods of teaching undergo another metamorphosis.^{2,3} For doctors, the human body is the core focus of investigation and intervention on a daily basis; for this reason, the study of anatomy in some form will continue to be essential to safe medical practice.⁴ It is necessary for core knowledge of anatomy to be assimilated by all doctors in order to practice and communicate safely.^{5, 6} It may be true that most doctors do not need to dissect a cadaver or study a pro section in order to practice, but if it can improve their understanding of what they do and why they do it, this surely has to be of benefit both to the safety of the patient and satisfaction of the doctor as a professional.^{5, 6} It becomes imperative for medical schools to re-evaluate their own curriculum in terms of what the students need to learn.¹

Integration of newer teaching modalities and modern technology will encourage interest and retention of anatomical knowledge and its clinical relevance, also; anatomy has a promising future in postgraduate specialist and surgical training.⁶⁻⁸

Simply covering anatomy sessions with didactic lectures followed by dissection may fail to produce long-lasting understanding of the subject and the students are also unable to appreciate the importance of clinical anatomy integrated within various medical disciplines, accordingly medical schools should look at restructuring medical curriculum with an anatomy resource center which can have a key influence on self-directed learning, so that a student must achieve sufficient knowledge, skill and attitude.⁹ Non planned changes in the anatomy study also observed in the UK, the condition stated an urgent co-working to save what can be possible to create strong and safe anatomy as the main entering door to medical faculty.¹⁰ As Anatomy curriculum is undergoing international reformation but the current framework lacks uniformity among various institutions in different parts of the world and due to the importance of this topic in the curriculum of undergraduate students in our college and recent upgrading of curriculum modules, in addition to lack of valid data on this important subject at local or national level, gave an impetus to address this topic to provide more baseline data on this subject and to provide a safe guide to curriculum

development committee at the college level, to best address this topic in the future. The overall aim of this study is to determine the students' and the doctors' views on the relevance of anatomy teaching and find out the minimal safe core curriculum for anatomy to be taught to undergraduate students of the College of Medicine, Hawler Medical University.

Methods:

This cross-sectional study was conducted at College of Medicine, Hawler Medical University and affiliated teaching hospitals from the period of 1st June 2016 to 15th September 2017. A convenient sample of 220 respondents participated in the study, which included 180 undergraduate medical students from second and third years and 40 doctors from different specialities including faculty staff affiliated to teaching hospitals in Erbil city.

A self-administered structured questionnaire was used for data collection. The questionnaire was prepared based on the review of the books, journals, and similar published articles. It included different sections; as certain demographic characteristics, questions on respondent's opinion and satisfaction about anatomy sessions, how to be delivered to the students through theoretical and practical sessions, at which stage and which leaning program should be included such as small group teaching with cadaveric dissection. To test the validity of the questionnaire, a pilot study was done on ten students and doctors revealed that it was clear and understandable and respondents had no difficulty in answering the questions.

A verbal consent was obtained from the doctors and the students before being included in the study. Participation was voluntary and the data was collected by self-administered questionnaire. Participants were provided with an explanation about the objective of the study and were assured of privacy of the study too. The study protocol was approved by the research ethics committee of College of Medicine- Hawler medical university.

The collected data was entered into excel sheet, then filtered and transferred into (SPSS version 20) for further analysis. The descriptive approach was used to determine frequencies and percentages. Chi-square test used to find out the association between categorical variables. P value ≤ 0.05 considered as statistically significant.

Results:

Regarding satisfaction on studying anatomy in the medical curriculum; 95.6% of students and 60% of doctors were significantly ($P= 0.001$) satisfied with it and all (100%) participants stated that studying anatomy was necessary for medical students. On the other hand, 18.9% of the students showed that the suitable time to study anatomy should be in 1st, 2nd & 3rd years, followed by 2nd and 1st years (15.6% and 14.4%, respectively) and about 33% of doctors stated that anatomy should be studied in 1st and 2nd years, with significant statistical difference ($P= 0.001$), Table 1.

Table 1: Perception of participants regarding different aspects of anatomy teaching

Variables	Students (N=180)		Doctors (N=40)		P value
	No.	(%)	No.	(%)	
Are you satisfied with your anatomy study in medical curriculum?					
Yes	172	(95.6)	24	(60.0)	0.001
No	8	(4.4)	16	(40.0)	
Is studying anatomy is necessary for medical students?					
Yes	180	(100)	40	(100.0)	1.0*
No	0	(0.0)	0	(0.0)	
In which academic year (stage) anatomy should be studied?					
1 st	26	(14.4)	6	(7.5)	0.001 *
2 nd	28	(15.6)	4	(5.0)	
3 rd	12	(6.7)	0	(0.0)	
4 th	4	(2.2)	0	(0.0)	
1 st & 2 nd	10	(5.6)	22	(32.5)	
1 st , 2 nd & 3 rd	34	(18.9)	4	(5.0)	
2 nd & 3 rd	26	(14.4)	0.0	(0.0)	
4 th & 5 th	14	(7.8)	2	(2.5)	
All the stages	26	(14.4)	2	(2.5)	

*: Fischer exact test

The current study revealed that more than half (55.6%) of the students and 35% of the doctors preferred studying anatomy in an integrated system. On the other hand more than half of the doctors stated that anatomy should be studied by both integrated and regional systems, Figure 1.

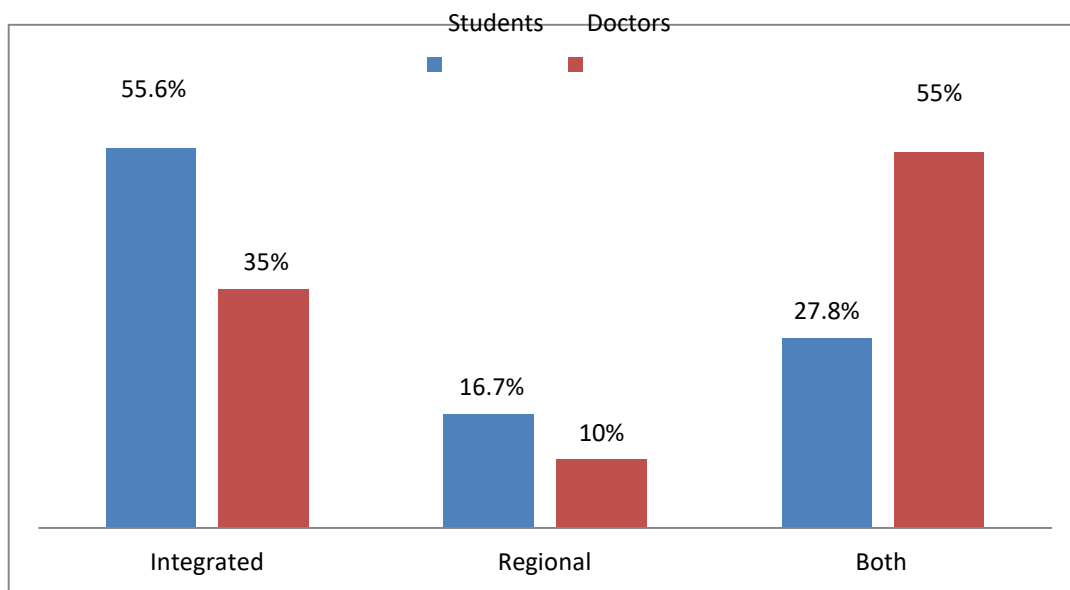


Figure 1: Preferred learning program implementation by the students and the doctors

This study also revealed that about 59% of the students preferred to study full anatomy course, while 60% the doctors preferred to study only clinical anatomy course, Figure 2.

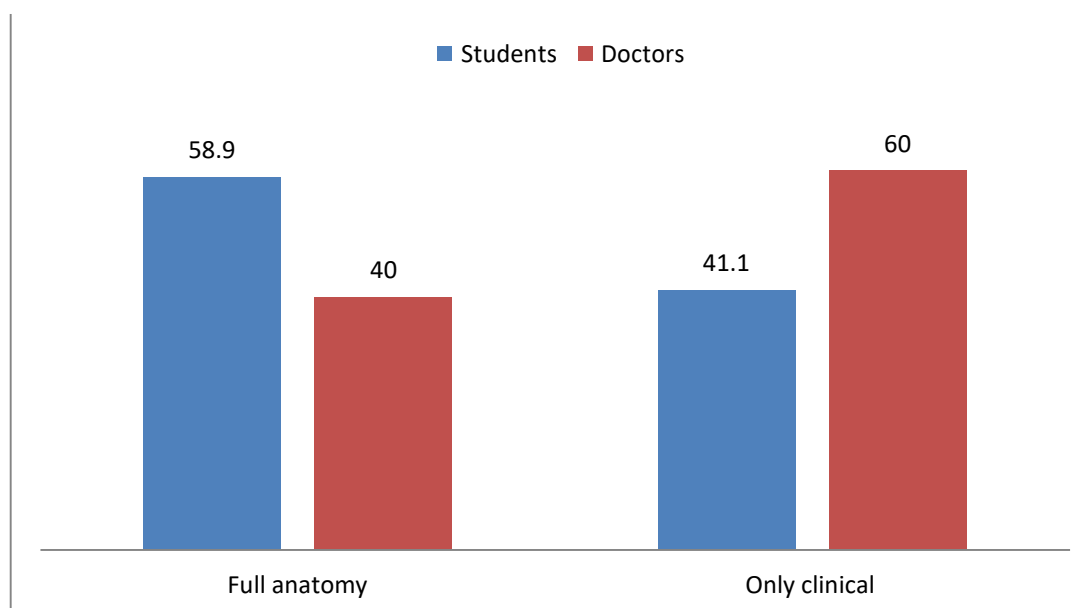


Figure 2: Preferred anatomy course by the students and the doctors

All (100%) the doctors and majority (91.1%) of students agreed to have both theoretical and practical session in anatomy teaching, Figure 3.

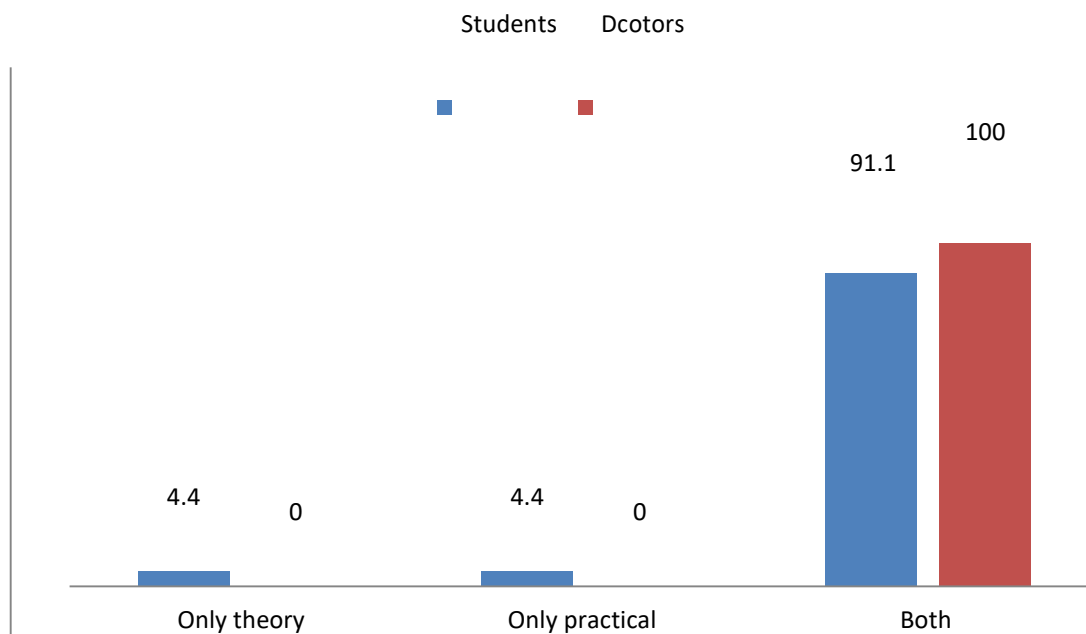


Figure 3: Preferred anatomy teaching sessions by the students and the doctors

In this study, 70% of the doctors and 44.4% of the students preferred all system or regions of the body that should be concentrated on more in teaching the anatomy sessions, Table 2.

Table 2: Preferred systems or regions of the body to be concentrated on during anatomy teaching

Variables	No.	(%)
All	80	(44.4)
Head and Neck	2	(1.1)
Nervous system	22	(12.2)
Chest	4	(1.1)
Students		
Cardiovascular system	12	(6.7)
Gastrointestinal system	12	(12.2)
Musculoskeletal system	6	(3.3)
None	6	(3.3)
Nervous system and Gastro intestinal system	8	(4.4)
Nervous system and Cardiovascular system	20	(11.1)
Total	180	(100.0)
All	28	(70.0)
Nervous system	4	(10.0)
Doctors		
Gastro- intestinal system	4	(10.0)
Abdomen, chest and Muscul- skeletal system	4	(10.0)
Total	40	(100.0)

Regarding preferred anatomy system or region to be studied by short notes, about 31% of the students and 25% of the doctors stated that none of the regions or systems should be studied by short notes, Table3.

Table 3: Preferred system or region of the body to be studied by short notes

Variables	No.	(%)
None	56	(31.1)
Head and neck	8	(4.4)
Nervous system	14	(7.8)
Chest	20	(11.1)
Gastrointestinal system	6	(3.3)
Urinary system	2	(1.1)
Students Endocrine	20	(11.1)
Musculoskeletal system	28	(15.6)
Limbs	2	(1.1)
All	14	(7.8)
Organs	2	(1.1)
Lymphatic	8	(4.4)
Total	180	(100.0)
None	10	(25.0)
Nervous system	4	(10.0)
Chest	2	(5.0)
Doctors Gastrointestinal system	2	(5.0)
Urinary system	6	(15.0)
Musculoskeletal system	6	(15.0)
Limbs	2	(5.0)
All	6	(15.0)
Organs	2	(5.0)
Total	40	(100.0)

This study revealed that 90% of the doctors and 75.6% of the students preferred small group teaching in anatomy, Figure 4.

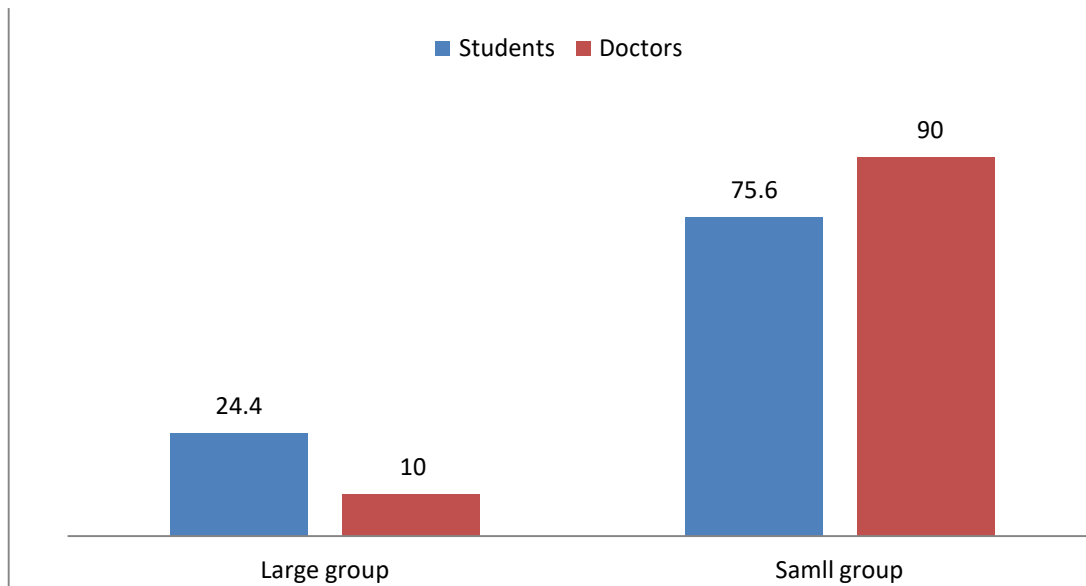


Figure 4: Preferred group theory teaching by the students and the doctors

Regarding implementation of practical sessions, 90% of the doctors and about 81% of the students preferred cadavers, Figure 5.

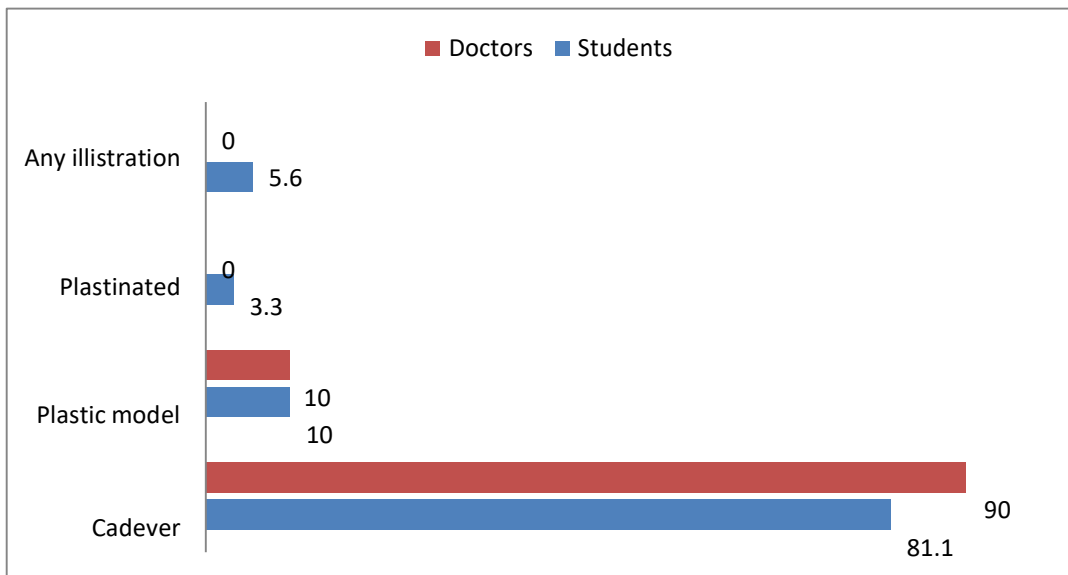


Figure 5: Preferred practical sessions to implementation by the students and the doctors

Also, the study showed that about 84% of the students and 75% the of doctors preferred students involvement in dissection. On another hand, 96.7% of the students and 100% of the doctors stated that it is necessary for anatomy lecturer to have a clinical background. Details of other statements are illustrated in Table 4.

Table 4: Response of participants to certain questions regarding anatomy

Statements	Students		Doctors		P value
	No.	(%)	No.	(%)	
Is it necessary for students to be involved in dissection?					
Yes	152	(84.4)	30	(75.0)	0.152
No	28	(15.6)	10	(25.0)	
Is it necessary for anatomy lecturer to have a clinical background?					
Yes	174	(96.7)	40	(100.0)	0.594*
No	6	(3.3)	0	(0.0)	
Is it necessary; final stage students have review anatomy lectures?					
Yes	148	(82.2)	34	(85.0)	0.674
No	32	(17.8)	6	(15.0)	
Is it necessary to have anatomy review sessions for postgraduates according to their speciality?					
Yes, theory	118	(65.6)	34	(85.0)	0.01*
Yes, practice	38	(21.1)	6	(15.0)	
None	24	(13.3)	0	(0.0)	
Is it time now to do a national academic cadaver donation encouraging programs?					
Yes	140	(77.8)	36	(90.0)	0.123*
No	40	(22.2)	4	(10.0)	
Is it right linking or mixing both anatomy with surgery or/ and radiology					
Never	34	(18.9)	10	(25.0)	0.376
Yes	120	(66.7)	22	(55.0)	
Interlaced	26	(14.4)	8	(20.0)	
Total	180	(100.0)	40	(100.0)	

*: Fischer exact test

Discussion:

Anatomy teaching methods have developed as the medical undergraduate curriculum has been modernized. Traditional teaching methods of lectures, tutorials, dissection and prosection; are now supplemented by e-learning facilities and anatomical models. Even though, the preferences of medical students and anatomy faculty towards both traditional and contemporary teaching methods and tools are largely unknown.¹¹

In our study, almost all the students and about two-thirds of the doctors were significantly satisfied with studying anatomy in the medical curriculum; and all the participants stated that studying anatomy was necessary for medical student`s future practice. A study in Taiwan revealed that more than half of the students were satisfied with the two-stage anatomy course.¹² Other studies in United Kingdom and USA showed that that clinically correlated anatomical teaching was relevant to clinical practice and nearly all of the topics taught in the anatomy course were deemed important by the clinicians.^{2, 13} In contrast to another study in Nigeria, where about

73.4% of the respondents believed that the present anatomy curriculum is not career-friendly.¹ A higher satisfaction with anatomy course among the students and the teachers in our college could be due to the recent changes in the anatomy curriculum and implementation of small group teaching by the anatomy faculty. On the other hand, around one-fifth of the students showed that the suitable time to study anatomy should be in 1st, 2nd & 3rd years, followed by 2nd and 1st years and about one-third of doctors stated that anatomy should be studied in 1st and 2nd years, with a significant statistical difference (P= 0.001). In a study in India, the majority of the students felt that the curriculum can be taught in one-year duration (65.11%) and 21.7% agreed for a scheme of one & half year, but they did not assign the preferred academic year.¹⁴

Another study in the United Kingdom reported that to facilitate learning, anatomy should be taught throughout the curriculum and use human cadavers.⁶

Also, the study revealed that more than half of the students and more than one-third of the doctors preferred studying anatomy in the integrated system. On the other hand, more than half of the doctors stated that anatomy should be studied by both integrated and regional systems. Almost similar results were reported in a study in the USA, where the results support the growing call for vertical integration of anatomy across the preclinical and clinical years.¹³ This may be due to a well- designed curriculum

taking into consideration modern teaching methods like skills laboratories and plastinated cadavers.

This study also revealed that about two-thirds of the students preferred to study full anatomy course, while the doctors preferred to study only clinical anatomy course. All doctors and majority of students agreed to have both theoretical and practical sessions in anatomy teaching and three-fourths of the doctors and less than half of the students preferred all system or regions of the body that should be concentrated on more in teaching the anatomy sessions, with more concentration on small group teaching. A study in Netherland revealed that different educational principles have a stronger impact on students' perceived and actual anatomical knowledge.¹⁵

Regarding implementation of practical sessions, the majority of the doctors and the students preferred cadavers and they preferred direct involvement of the students in the cadaveric dissection. Similar results were reported among medical students from Pakistan, who revealed that dissecting cadaver is an effective way of learning anatomy.¹⁶ Another study in the United Kingdom revealed that a cadaveric dissection is a favourable approach for achieving important learning objectives in the field of anatomy.¹⁷ Similarly, another study in Australia revealed that Full body dissection would be best reserved for medical students, especially those with surgical career intentions, while teaching based on prosections and plastination is more suitable for dental, pharmacy and allied health science students.¹⁸

Conclusions: Majority of the participants were satisfied with the current anatomy curriculum, with more preference towards the system- based integration. However, it needs more improvement and the best way to teach modern anatomy is by combining multiple educational resources to complement one another through spending more time in practical sessions with more cadaveric dissections and application of small group teaching.

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