RESEARCH ARTICLE

Medical students' attitudes towards the clinical importance of embryology

Naureen Waseem,[1] Khadija Iqbal,[2] Noreen Anwar,[3] Irum Rehman,[4] Hina Kundi,[5] Abdullah Qamar[6]

Abstract

Objective: To identify the attitudes of medical students towards the clinical importance of embryology.

Method: The cross-sectional questionnaire-based study was conducted from September to November 2019 at the private-sector Islam Medical College, Sialkot, Pakistan, and comprised first and final year medical students. A validated questionnaire, consisting of 20 statements, was used to collect data. Students had to tick only those statements with which they were in full agreement. Prior to data-collection, a median score was taken of 50 anatomy teachers regarding their opinion on each statement. Data was analysed using Microsoft Excel.

Results: Of the 194 subjects, 97(50%) each were from the first and final years. The medical students as well as the faculty were found to be appreciative of the importance of embryology in medical studies, with female students showing better attitudes in both the first and the final year groups ($p<0.05$).

Conclusion: The attitude of students and faculty was found to be positive towards the importance of embryology in medical education.

Keywords: Attitude, Clinical, Embryology, Medical students. (JPMA 71: 1167; 2021)

DOI: https://doi.org/10.47391/JPMA.015

Introduction

There are a number of studies evaluating medical students' attitudes towards the relevance of anatomy in the medical curriculum,[1-5] and most students show positive attitude towards the subject.[3] However, there are only a few studies on students' perception about embryology, which has a very important role in medical education as it relates to the understanding of developmental changes in prenatal life and the development and organisation of the human body.[6] Embryology has theoretical as well as clinical significance. It is a discipline that is relevant to prenatal diagnosis, as it deals not only with morphogenesis but also with developmental disorders that cause birth defects.[7] The study of embryology also facilitates in explaining the emergence of anatomical anomalies, variations and tetrology.[8] The knowledge of embryology provides important information in obstetrics and gynaecology (OB-GYN), like factors affecting the development of the embryo, assisted reproduction techniques (ARTs), infertility disorders and structure and function of the placenta, as well as in paediatrics, surgery and general medical practice, like problems of anatomical variations and congenital developmental defects.[9]

According to Pakistan Medical and Dental Council (PMDC) regulations, there are 500 allocated study hours for anatomy in the 1st and 2nd years of medical curriculum; 50% each for practical content and theory. In most medical schools in Pakistan, anatomy is divided into gross anatomy, histology and embryology courses separated in both time and space. In some colleges, anatomical sciences are integrated with other subjects. Teaching of embryology varies not only from country to country, but also from university to university within a country, varying from integrated to stand-alone courses.[10] Embryology is taught as a lecture-based course in some medical schools with no laboratory, although different curricular models exist for teaching embryology.[11] In terms of teaching methodologies, large-group interactive sessions, small-group discussions (SGDs) and self-directed learning (SDL) approaches are used for teaching embryology. Team-based learning (TBL) is also considered a helpful tool.[12,13] However, this strategy alone cannot be useful for embryology.

There is a need to bring changes in the anatomy curriculum in medical schools as the place of anatomy in medical curriculum has been re-defined over the last two decades.[14] The current study was planned to identify the attitude of medical students towards the clinical

[1]Department of Anatomy, Islam Medical College, Sialkot, [2]Department of Anatomy, Al Nafees Medical College, ISRA University, Islamabad, [3]Department of Anatomy, Quetta Institute of Medical Sciences, Quetta, [4]Department of Physiology, Margalla Institute of Health Sciences, Rawalpindi, [5]Department of Anatomy, Fazaia Medical College, AIR University, Islamabad, [6]Department of Anatomy, Army Medical College, Rawalpindi, Pakistan.

Correspondence: Naureen Waseem. Email: naureenwaseem82@gmail.com

relevance of embryology.

Subjects and Methods

The cross-sectional questionnaire-based study was conducted from September to November 2019 at the private-sector Islam Medical College (IMC), Sialkot, Pakistan. IMC follows a traditional curriculum and delivers 40 hours of embryology lectures. After approval from the institutional ethics review board, students of either gender from the first final years were approached using convenience sampling technique. The participation was voluntary, and those who were not present at the time of data-collection or unwilling to participate were excluded.

The subjects were provided with a questionnaire incorporating 20 statements regarding embryology's relevance to clinical medicine. The questionnaire was based on the attitude analysis protocol mentioned and validated in literature.[15] Permission from the author of the protocol was obtained for the study. The statements covered a range of opinions from positive (pro) statements to negative (anti) statements, that were all randomly arranged (Annexure). Students had to only tick the statements with which they were in full agreement. Prior to conducting the survey, a group of 50 faculty members teaching anatomy were requested to score the questionnaire on a 1-11, where 1 represented 'strongly agree' and 11 represented 'strongly disagree'. Modified Likert scale was used for scoring of questionnaires within the same range. The median score on each statement provided a numerical value that was used to quantify students' attitudes. A pilot study was also conducted on a group of 10 students before the commencement of the main survey.

Statistical analysis of the data was done using Microsoft Excel.

APPENDIX: The study questionnaire.

	Tick box
Embryology needs little understanding in the clinic	----
Terminologies of Embryology develops the basis of medicine	----
Embryology is an essential tool for practice in medicine	----
Embryology is an "essential evil" for Medical practice	----
Embryology is of little use in the clinic, but its relevance may be emphasized	----
Embryology is of benefit only in some medical fields	----
Embryology has no significance in contemporary medicine	----
Embryology is wastage of time in the basic medical years	----
Embryology needs to be modernized to be considered useful in Medicine	----
Every doctor must have a sound understanding of embryology	----
If Western Medicine can exist without embryology, so can Eastern Medicine	----
It is not possible to achieve good training of Medicine practice without Embryology	----
It is not possible to make a diagnosis without embryology	----
Existence of medicine is not possible without sound knowledge of embryology	----
Most medical diseases do not require a great understanding of embryology	----
Embryology is most clinically relevant, of all the basic sciences	----
For satisfactory medical practice only limited knowledge of anatomy is required	----
Medical students should concentrate on clinical practice rather than learning anatomy	----
A doctor is of limited effectiveness, without good knowledge of embryology	----

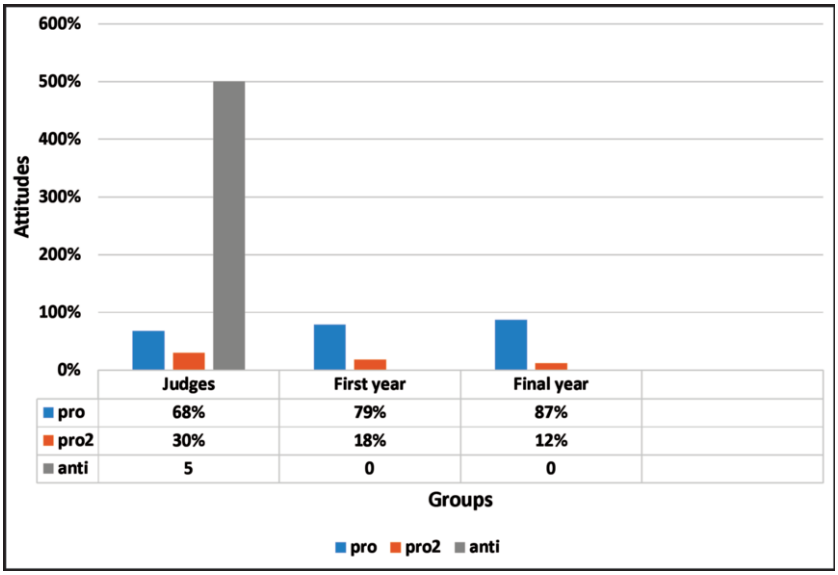
Results

Of the 194 subjects, 97(50%) each were from the first and final years. The medical students as well as the faculty were found to be appreciative of the

Table: Attitude of faculty, first and final year students towards learning anatomy.

Groups	Ranges of median scores related to attitude			
	1-6 pro*	7 pro	8 anti	9-11 anti
First Year	79/97=81%	18/97=18%		
Final Year	85/97=87%	12/97=12%		
Judges	34/50=68%	15/50=30%	1/18=5%	

*pro: Positive attitude.



*Pro: Positive attitudes. *Pro 2: Borderline attitudes.

Figure: Attitude of first year, final year students and faculty towards importance of learning embryology.

importance of embryology in medical studies (Table), with female students showing better attitudes in both the first and the final year groups ($p<0.05$).

The subjects also agreed that effective teaching of medicine was not possible without embryology, that it was a useful tool for medical practice and for becoming a good doctor (Figure).

Discussion

Embryology is taught in most medical colleges of Pakistan in the first two years. Anatomy as a subject is difficult to learn.[1] It is a composite of four domains; general anatomy, embryology, histology and gross anatomy. Gross and general anatomy form the basis of surgery, while embryology is relevant for understanding Ob-GYN concepts as well as neonatology and paediatrics.[16]

Learning embryology is important because interpretation of radiological and sonographic imaging of a developing newborn is dependent on sound knowledge of embryology.[17] Prescribing a medicine in pregnancy requires a doctor to understand the timeline of organogenesis. The incidence of congenital anomalies reported in the past have been linked with the administration of drugs in the period of organogenesis, like thalidomide.[17]

The successful treatment of a patient in the fields of Ob-GYN and paediatrics depends on the clarity of concepts related to the development of foetus before birth.[18] Modern advancements, such as foetal surgeries, gene therapies, regenerative medicine, molecular embryology etc., have resulted in the removal of consequences of many congenital anomalies by novel operating techniques which is only possible through a core understanding of the discipline and application of embryological knowledge into clinical practice.[19] Scientific basis to prevent anomalies caused by alcoholism, rubella and other prenatal exposures are also being prevented.[20] A new laboratory discipline, clinical embryology, has also gained popularity with progression in the methods of reproductive medicine where clinical embryologist co-works with a gynaecologist. A sound knowledge of basic embryology contributes to the understanding of clinical embryology.[21]

Studies have shown that even some institutions in the developed world do not have a separate department of embryology, even there are no experts with research experience in embryogenesis and organogenesis[21] Because of rapid development of molecular and clinical embryology, it is necessary to link genetics with congenital anomalies. To a significant extent, this depends on the place of embryology in the medical curriculum.[22,23]

As medical students in the basic years underestimate the clinical importance of embryology, it is desirable to add "clinically oriented embryology" lectures in the clinical years of a medical school to reinforce the concepts.[24,25]

Conclusion

The attitude of students and faculty was found to be positive towards the importance of embryology in medical education. Better clinical integration can be done by proper dispersion of content of embryology across the five years.

Acknowledgement: We are grateful to Professor Bernard John Moxham for allowing us to use the questionnaire which was the data-collection tool for the current study.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

1. Drake RL, Lowrie Jr DJ, Prewitt CM. Survey of gross anatomy, microscopic anatomy, neuroscience, and embryology courses in medical school curricula in the United States. Anat Rec. 2002; 269:118-22.
2. Kerby J, Shukur ZN, Shalhoub J. The relationships between learning outcomes and methods of teaching anatomy as perceived by medical students. Clin Anat. 2011; 24:489-97.
3. Moxham BJ, Moxham SA. The relationships between attitudes, course aims and teaching methods for the teaching of gross anatomy in the medical curriculum. Eur J Anat. 2019; 11:19-30.
4. Ofayoku OA, Moxham JB. Comparisons between the attitudes of medical and dental students toward the clinical importance of gross anatomy and physiology. Clin Anat. 2014; 27:976-87.
5. Waterston SW, Stewart IJ. Survey of clinicians' attitudes to the anatomical teaching and knowledge of medical students. Clin Anat. 2005; 18:380-4.
6. Carlson BM. Embryology in the medical curriculum. Anat Rec.2002; 269:89-98.
7. Cassidy KM. Embryology in medical education: a mixed methods study and phenomenology of faculty and first year medical students (Doctoral dissertation).
8. Kazzazi F, Bartlett J. Condensing embryology teaching for medical students: can it be taught in 2 hours? Adv Med Educ Pract. 2017; 8:797.
9. Moxham BJ, Plaisant O. Perception of medical students towards the clinical relevance of anatomy. Clin Anat.2007; 20:560-4.
10. Moxham BJ, Nikoloussi EE, Standley H, Brenner E, Plaisant O, Brichova H, et al. The attitudes of medical students in Europe toward the clinical importance of embryology. Clin Anat. 2016; 29:144-50.
11. Drake RL, McBride JM, Lachman N, Pawlina W. Medical education in the anatomical sciences: The winds of change continue to blow. Anat Sci Educ. 2009; 2:253-9.
12. Nieder GL, Parmelee DX, Stolfi A, Hudes. Team-based learning in a medical gross anatomy and embryology course. Clin Anat. 2005;18: 56-63.

13. Shankar N, Roopa R. Evaluation of a modified team based learning method for teaching general embryology to 1st year medical graduate students. Indian J Med Sci. 2009; 63:4-12.
14. Patel KM, Moxham BJ. Attitudes of professional anatomists to curricular change. Clin Anat. 2006; 19:132-41.
15. Thurstone LL, Chave EJ. The measurement of attitude: A psychophysical method and some experiments with a scale for measuring attitude toward the Church. Chicago, USA: The University of Chicago Press, 1970.
16. Chaudhary P, Arora K, Dhir SK. Combining traditional embryology lectures with technology and perception of students toward it. CHRISMED J Health Res. 2018; 5:290-6.
17. Varga I. Embryology teaching: an often-neglected part of the medical curriculum. Revista Argentina de Anatomía Clínica. 9:47-51.
18. Hamilton J, Carachi R. Clinical embryology: is there still a place in medical schools today? Scott Med J. 2014; 59:188-92.
19. Scott KM, Charles AR, Holland AJ. Clinical embryology teaching: is it relevant anymore? ANZ J Surg. 2013; 83:709-12.
20. Shepard TH, Barr M Jr, Brent RL, Hendrickx A, Kochhar D, Oakley G, et al. An updated history of the Teratology Society. Birth Defects Res A Clin Mol Teratol. 2010; 88: 263-85.
21. Borg J, Stabile I. Attitudes of medical students in Malta to the teaching of embryology and histology. Malta Med J.2015; 27:159.
22. Zaletel I, Marić G, Gazibara T, Rakočević J, Borović ML, Puškaš N, et al. Relevance and attitudes toward histology and embryology course through the eyes of freshmen and senior medical students: Experience from Serbia. Ann Anat. 2016; 208:217-21.
23. Emmanouil-Nikoloussi EN, Moxham B. The attitudes of medical students towards the clinical relevance of embryology and histology. Clin Anat. 2012; 221:74-5.
24. Scott KM, Charles AR, Holland AJ. Clinical embryology teaching: is it relevant anymore? ANZ J Surg.; 2013; 83: 709-12.
25. Hamilton J, Carachi R. Clinical embryology: is there still a place in medical schools today? Scott Med J. 2014; 59: 188-92.