

The Need of Modifying Current Teaching in Pathology Practical Classes – A Study from Second Professional MBBS Student's Perspective in North India

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Abstract

Background: The main goals of teaching in second professional MBBS Pathology practical classes is to provide a framework for the description of the disease and to provide students with knowledge of the functional and structural changes in order that disease pathogenesis is well understood. **Aims:** It was a cross sectional descriptive study which aimed to find out the importance of teaching in pathology practical classes in the MBBS curriculum as well as to assess the student's perception regarding subject understanding. **Materials and Methods:** Two hundred and sixteen students of 2nd MBBS who had already completed 1st year and were about to appear in university examination in the year 2020 were included. An extensive questionnaire was prepared regarding 2nd-year pathology teaching. The feedback from students was obtained and analyzed. **Results:** About 67.5% of students found pathology practical classes more interesting than theory classes. 88% of students were confident to interpret CBC reports. Almost half (50%) did not visit the histopathology section while; only 12% and 38% of students were confident to collect blood and urine samples of the patient. About 83% and 93% of students found gross specimen and clinical charts useful in teaching. 63.88% of students suggested to increase the number of practical hours in pathology. **Conclusion:** Our study has emphasized the importance of teaching in pathology practical classes as important for better understanding in clinical subjects. As the competency-based curriculum is being starting from 2019 batch and onward, this elaborative study, especially in the practical aspects in the subject Pathology can act as a baseline to get access to the effectiveness of the new curriculum in the coming years.

Keywords: Integrated teaching, pathology practical classes, perception, 2nd-year MBBS students

INTRODUCTION

As quoted by Kelly "Curriculum is all the learning planned and guided by the school, whether carried out in groups or individually, inside or outside the school, in an attempt to carry the essential principles and features of an educational proposal in such a form that it is open to critical scrutiny and capable of effective translation into practice."^[1] The curriculum should be structured to balance learning opportunities and to integrate the learning of basic and clinical sciences, enabling students to link theory and practice.^[2] It should be able to empower a medical student with a broad base of knowledge and practical skills to make a good clinician. Compared to the traditional, course-centered approach to curriculum, there is a need for more modern content and outcome-centered approach in the current scenario. There has been a need-based curriculum

required since long time in India. It is an often-repeated criticism that our medical colleges are producing graduates who are not well equipped to tackle the health care needs of society.^[3,4]

The loop of education gets completed with the mechanism of giving an opportunity to medical teachers to give proper and timely feedback to the students as well as to receive the same

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from them on the mode of teaching and curriculum.^[4] Thus, we need to establish an efficient feedback circuit which addresses the concern of each of the stakeholders in the education system to prepare a strong medical professional person in future.

It is a fact that the pathways are complex and students have little training in diagnostic services and laboratory medicine.^[5] Most of them have little understanding of what tests to order and how they should be interpreted.^[6] Furthermore, there is no synchronization with the modern methods of investigations and the teaching in practical classes. Although there is a tremendous amount of research and the addition of new knowledge in every laboratory test and its application in clinical practices recently, the students are not able to interpret the results of modern parameters. It was concluded that in the absence of this, the medical students will not be competent in requesting and interpreting investigations during their clinical practices.^[6,7]

Mere change in any field is not enough if not followed by assessment and feedback. Assessment is one of the most important driving factors of students learning. Research shows that in the context of medical education, the type of assessment method adopted can influence student learning.^[8,9] Feedback supports students in moving from the stage of unconscious competent (feedback aids students in identifying their weaknesses) to conscious competent (assist students to define and refine their skills) to consciously competent (through further refinement of the skills with further help of reconstructive feedback) and finally to unconsciously competent in which students further strengthen their positive aspects.^[10]

The present study was conducted with the objective of addressing the changes that pathology practical classes should undergo for better conceptualization and understanding of the subject while applying the same in clinical postings and thereafter as clinicians. Based on the findings, pathology practical teaching can further be upgraded by reviewing contents and teaching strategies.

Aims and objectives

1. To understand student's perspectives regarding the current practical curriculum
2. To incorporate the new laboratory tests and methods for better understanding and clinical implication
3. To emphasize the need of assisting the outdated manual tests with automation
4. To shift the paradigm from passive observers to active performers
5. To understand students' feedback and suggestions for the betterment of next batches in future.

MATERIALS AND METHODS

It was a cross-sectional descriptive study conducted at Sawai Man Singh (SMS) Medical College, Jaipur, Rajasthan, a tertiary care medical institute in North India. A total of 259 students of second professional MBBS who had already completed 1st-year

MBBS and were about to appear in university examination were included. The students having <75% of attendance ($n = 32$) and those who refused to participate ($n = 3$) were excluded from the study. An extensive questionnaire was prepared comprising questions related to the subject understanding, teaching methodology, content and quality of the lecture, quality of practical classes and assessment criteria to gather the maximum possible required information. The questionnaire was already prevalidated before conducting the study. The students were asked to respond to all statements based on their own judgment. The incompletely filled questionnaire ($n = 8$) was discarded and finally analysis of 216 forms was done. The exact procedure has been shown in the consort flow chart [Figure 1].

Ethics

The study protocol was approved by the Institute Ethics committee of SMS Medical College, Jaipur, letter number 565/MC/EC/2020, dated September 29, 2020. The informed consent of each student was obtained and all the responses were kept anonymous.

Statistical analysis

Data were recorded using Microsoft Excel and analyzed using SPSS Version 17.0 (IBM Corp. Released 2011. IBM Statistics for Windows, Version 20.0: Armonk, New York, United States) and graph pad PRISM 5.0. Categorical variables were expressed in terms of number and percentage.

RESULTS

One hundred and thirty seven (63.4%) were male while,

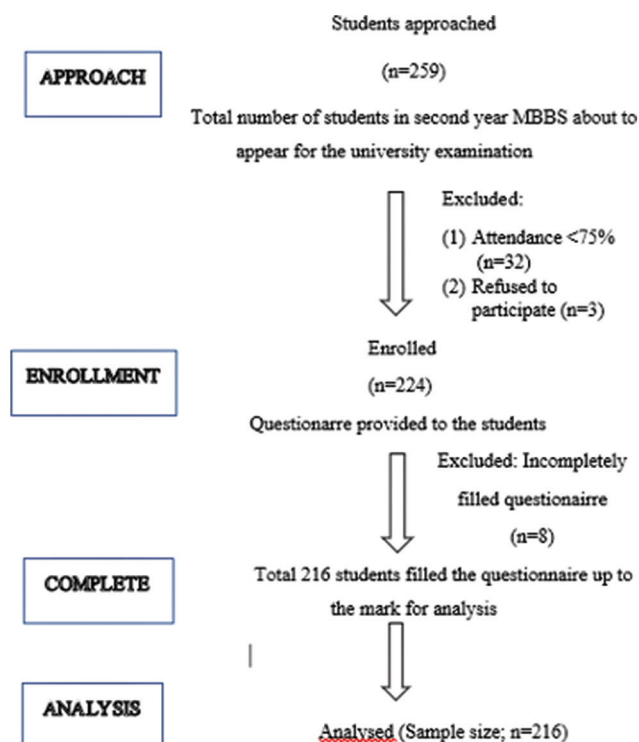


Figure 1: Consort flow diagram of sample size of the study

79 (37.6%) were female students amongst 216 eligible students in our study. 90.6% of students found the pathology subject as either lengthy or interesting or a combination of both while the rest 9.4% found it boring and difficult in the second professional MBBS curriculum. Although marginally, more (56%) of students found general pathology easier over systemic pathology (44%). About 83.8% of students accepted that they were able to implement the knowledge gained in general pathology to study diseases in systemic pathology.

About 67.5% of students found that practical classes were more interesting than theory lectures while; 32.8% were in favor of theory teaching hours. At the end of practical classes, 80% of students were able to perform the tests independently. However, not all of them were able to interpret the results confidently. If provided a complete blood count report, 88% were able to interpret the report. Almost half of the students (50.92%) have visited the histopathology workstation and only 13% have seen the demonstration of fine-needle aspiration procedure in the department. Among 216 students, only 38% have visited the blood and urine collection center in the hospital. Only 21% of students were confident to perform phlebotomy procedures and 29% were aware how to collect urine sample properly.

Seventy one percent students agreed that histopathology slides helped them in better understanding of a pathological lesion. However, a large number of students ($n = 180$, 83%) responded that gross specimens were more helpful in understanding and correlating the pathology. And even greater number of them ($n = 201$, 93%) agreed that charts of the diseases helped them not only in thorough understanding of topic but were also in clinical postings. According to 77% students, clinical pathology lectures were very useful in clinical postings. Sixty-nine percent of students responded that blood bank topics helped them not only in clearing their concept but also in making public awareness regarding blood donation, clearing the myths among common people and get blood transfused if needed. Only 32% of students were able to understand the importance of autopsy findings in a clinical autopsy report [Table 1].

Regarding the number of hours of practical classes, 63% of students advised to increase, 30% asked to decrease while; 6% answered neutrally for the same. Eighty-eight percent of students agreed that monthly museum visit should be made compulsory to keep students updated with the recently added gross specimens. Eighty-one percent of students wanted to introduce clinical autopsy to better understand the subject. Assessment done in the form of viva voce in practical

Table 1: Students perception regarding teaching in pathology practical classes

Question	Answer (%)	
	Yes	No
Are practical classes more interesting than theory lectures?	67.59	32.40
Are you able to perform the test independently at the end of the practical classes?	80.09	19.90
Are you able to interpret CBC report?	87.96	12.03
Have you ever visited histopathology section?	50.92	49.07
Have you ever visited FNA room and know how to do FNA?	12.96	87.03
Have you ever visited sample collection room (blood/urine)?	37.96	62.03
Can you collect blood sample of a patient?	20.83	79.16
Can you collect urine sample of a patient?	29.16	70.83
Do histopathology slides help you to understand and correlate the pathology?	70.83	29.16
Do watching gross specimens help you to understand and correlate the pathology?	83.33	16.66
Do clinical charts shown to you are helpful in understanding disease pathogenesis and clinical correlation?	93.05	6.9
Do clinical pathology lectures help you in clinical postings?	76.85	23.14
Do blood bank lectures help in interaction with patients in spreading awareness about blood donation?	69.44	30.55
Is writing autopsy report helpful to you in any sense?	32.40	67.59

CBC: Complete blood count, FNA: Fine needle aspiration

Table 2: Students overall suggestions regarding teaching in pathology practical classes

Question	Answer (%)		
	Increased	Decreased	Neutral
Number of hours of practical classes should be	63.88	30.09	6.01
Should monthly museum visit to see the gross specimens arranged?	Yes 88.42	No 4.1	Neutral 7.4
Should clinical autopsy be introduced in Pathology?	Yes 81.94	No 10.18	Neutral 7.8
Assessment done in the form of viva voce in examination help to improve the subject knowledge and its clinical application?	Yes 79.62	No 7.8	Neutral 1.8

examination helped 80% of students to improve their subject knowledge and its clinical application [Table 2].

Some practical classes were labeled as most interesting by students like peripheral blood film preparation, staining and correlation with complete blood count (88%), clinical case study with charts (93%), blood grouping and cross-matching (95%), gross specimen study (83%) and histopathology slides and correlation with pathologic lesion (71%). On contrary, there were some tests which should be obsoleted as per student's perspective. These include manual total red blood cell count (TRBC) (76%), total leukocyte count (TLC) (72%), hemoglobin estimation by Sahli's method (79%) and manual urine examination (61%) [Table 3].

DISCUSSION

There are few studies emphasizing the importance of integrated, case and competency-based medical education (CBME) in the literature in different subjects in the undergraduate course.^[3,11,12] There is a need for the same in the pathology practical training and the need to address this issue cannot be ignored at the current stage of transformation in medical education in India. Pathology is a vast subject covering a wide spectrum of diseases and investigations used for the diagnosis and only a part of it is taught to undergraduate students in the MBBS curriculum. So, it is better that we start teaching the latest, productive, and clinically relevant tests for a better understanding of students and producing good clinicians who have sound knowledge of the subject and can apply the same whenever needed. It's time to drop out the outdated and old unnecessary tests which are no longer used even at peripheral medical facilities.

The practical curriculum in medical schools in India seems to be outdated and obsolete and have failed to achieve the objective for which they were instituted primarily. There are many studies suggesting that practical curriculum in basic sciences should be made clinically relevant, and outdated

and clinically irrelevant topics should be culled.^[5,7,13] This can take the subject pathology from benches in the classroom to the bedside, and truly impart the basics of clinical medicine in tomorrow's physicians. Basic and laboratory sciences (integrated with their clinical relevance) would be maximum in the initial years and will progressively decrease in later years of the training when the clinical exposure and learning would be dominant.^[14,15]

After analyzing students' feedback, we found that it is important to teach practical knowledge related to different sections of pathology including histopathology, cytopathology, blood banking, and clinical pathology. There is poor response related to it as per our study as students do not visit these sections in their second professional curriculum [Table 1]. We also observed that many practical classes included in the current curriculum (like manual TLC/TRBC/Hemoglobin estimation by Sahli's method, urine examination) are not in context with the rapidly developing modern diagnostic methods. Some advanced and appropriate parameters of diagnostic importance should be added instead of these old parameters which will not only be more accurate but also safe and easy to perform. Diagnosis of diseases should be taught through hematological parameters along with charts, gross as well as photomicrographs correlating with the pathologic lesion and clinical history.

There are many studies which emphasize the accuracy of automation over manual methods but simultaneously signifying the importance of verifying the same under the microscope to avoid any technical error.^[16-18] We are also in favor that laboratory instruments can be used as spots rather than the outdated manual instruments as suggested by Dandekar *et al.*^[7] Based on students' feedback, we have developed a proforma for strengthening the practical curriculum [Table 4].

Wader *et al.*^[19] implemented the concept of 12-point guidelines for studying gross specimen and microscopy slides in practical classes at the Department of Pathology at India and found it useful. This is a small group activity where students will prepare answers to a 12-point question set at the end of each topic. It includes most of the aspects starting from organ identification to its clinical implications. We also found large numbers of students were interested in the gross specimen and histopathology slides when taught with pathologic lesions in our study.

Currently, there are no criteria for the assessment of individual tests in practical examination. A checklist suggesting a systematic approach to awarding marks should be incorporated. Since the examination is a major drive to learn, a lack of assessment may fail to change the behavior and attitude in the learner.^[20] It is of utmost importance to know what students need and whether they are really happy with the ever-expanding course with limited duration of time and they themselves undoubtedly are in the best position to comment on the effectiveness of any teaching system.

Table 3: Most interesting and relevant tests found by students in pathology practical classes and suggestions to obsolete tests

	Number of students (%)
Interesting and relevant tests found by students	
Peripheral blood film preparation, staining and correlation with complete blood count	87.96
Clinical case study with charts	93.05
Blood grouping and cross matching	94.90
Study with gross specimen	83.33
Histopathology slides and correlation with pathologic lesion	70.83
Suggestions to obsolete tests by students	
Manual total red blood cell count	75.92
Manual total leucocyte count	72.22
Hemoglobin estimation by Sahli's method	79.16
Urine examination	61.11

Table 4: Objectives made on the basis of student's feedback for strengthening pathology practical curriculum

Objectives	Key points
To conduct clinically oriented practical classes and lectures	Include commonly used investigations, charts, photomicrographs, gross and automation in practical classes to make learning fun, dynamic, interesting and clinically relevant.
Experience of working in pathology laboratory	Students should learn sample collection, storage, transport, handling, staining and reporting in laboratory only. Waste management training will be a side by and continuous procedure.
Knowledge of modern laboratory instruments and equipments	Expose them to work with and handle modern equipment like coulter, analyzers, coagulometers, electrophoresis machine, microtome, tissue processor, cytospin etc.
More emphasis should be given to modern method of diagnosis with principles	In this way they will be used to the investigations done and how to interpret them with confidence
To enhance the knowledge of students through practical experiences	Students should get experience by correlating the report with the clinical details. Once they have seen and correlated it, they will retain that knowledge for longer duration

Frequent feedback may help teachers to plan the curriculum and improve upon the teaching methodologies adopted in their institutions.^[21]

We found few studies emphasizing the importance of integrated and CBME, especially in practical classes in different subjects such as pharmacology, physiology and biochemistry in undergraduate MBBS course.^[3,11-14,20] However, even after an extensive literature search, we could not find any Indian study pertaining to pathology practical classes in particular. This is the first study in Indian literature pertaining to the pathology subject as per our knowledge.

CONCLUSION

There is a dire need for restructuring of the current undergraduate practical curriculum in pathology subjects so that old and outdated curriculum could be replaced with innovative ones with more conceptual and global views to improve the attitude of Indian medical students in pathology subjects. It is easy to delete irrelevant and obsolete practical exercises but difficult to substitute them with equally relevant, meaningful and feasible exercises without modifying the framework, revising the evaluation methods, and timely feedback.

We are aware that National Medical Commission has started the CBME from the 2019 batch. Hence, this valuable feedback on traditional teaching can act as a reference for evaluating the effectiveness of CBME. However, we still feel that practical classes need to be addressed separately and elaborately in the new curriculum along with detailed assessment criteria for individual tests.

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Conflicts of interest

There are no conflicts of interest.

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