ORIGINAL ARTICLE

PRE-CLINICAL OPERATIVE DENTISTRY: STUDENTS VIEWPOINTS

[1]ALIA AHMED, BDS (Punjab University), FCPS
[2]MARYAM HASAN, BDS
[3]ADIL SHAHNAWAZ, BDS

ABSTRACT

The aim of the study was to evaluate the pre-clinical operative dentistry course from a student's viewpoint in order to monitor the academic environment and give recommendations for improvement. A questionnaire was completed by second year dental students on the last lecture day of the year. The questionnaire consisted of questions evaluating different aspects of the course. 46 out of 50 students completed the questionnaire. The course was considered by almost all to be of benefit. Opinion was divided regarding formal assessment in the final professional examination. Quality of teaching was reported to be good although teaching sessions were perceived to be disorganized and prone to repetition. Exercises on plaster models were widely condemned. Improvements in pre-clinical teaching can be brought about by a more structured course, adding more topics and assigning more faculty to supervise the exercises.

Key words: *Dental education, pre-clinical operative dentistry, questionnaire*

INTRODUCTION

The present curriculum used by Dental Colleges in Pakistan has been approved by the Pakistan Medical & Dental Council (PMDC)[1] and the Higher Education Commission (HEC).[2] Both allocate 25 lecture hours and 110 practical hours for pre-clinical instruction in second year and 20 lecture hours and 80 practical hours to pre-clinical operative dentistry in third year. This usually translates to 4 hours per week in second year. There are an optional 15 marks which can be allocated to pre-clinical operative dentistry in the second professional examination in the subject of Dental Anatomy.

16 dental institutions throughout Pakistan follow the PMDC curriculum and none has their own.[3]

Dental colleges in Pakistan are not required by the PMDC to hire separate faculty for pre-clinical operative dentistry training[4], though a separate phantom-head lab is mandatory for approval of the college.[5]

One reason for this lack of interest is that dental education has little impact in raising overall health of the world[6] and particularly the developing countries, where provision of enough food and clean drinking water is the overriding concern. Pre-clinical training in restorative procedures does not directly contribute to lowering mortality from preventable diseases.

However, nationwide, 36.25% of Pakistani children aged 12 years suffer from dental caries and 90% of these lesions remain untreated. The mean dmft was calculated as 0.9.[7] In child patients visiting the Pakistan Institute of Medical Sciences, the DMFT rate of 6-9 year olds was reported to be a mean of 6.33. The mean for untreated decayed teeth was 4.95.[8] In urban areas, this results in a great demand for restorative and other forms of dental treatment.

[1] Associate Professor, Department of Operative Dentistry, Islamic International Dental College, G-7/4, Islamabad
[2] General Dentist, Dima Dental Center, Riyadh, Saudi Arabia
[3] Senior Registrar, Department of Operative Dentistry, Islamabad Medical & Dental College, Islamabad
Correspondence: Dr Alia Ahmed, Islamic International Dental College, G-7/4, Islamabad. E-mail: aliaahmedtoosy@yahoo.co.uk, Tel: 0333 4372772

The potential suffering to an individual receiving treatment from a non-safe student dentist must be minimized. The way to achieve this is to ensure a certain standard of knowledge and practical skill is attained prior to introducing the student to the clinic.

Students are major stakeholders in their own education. A participant oriented approach[9] was used to evaluate the academic environment. This paper describes a retrospective student evaluation of their pre-clinical operative dentistry course in order to identify areas in the academic environment requiring improvement.

METHODOLOGY

The course consisted of pre-clinical exercises for restorations in amalgam and light-cured composite resin on plaster teeth, extracted teeth and phantom head teeth according to the classification given by G.V. Black. The classification of carious lesions was also taught according to that of Graham Mount. A proportion of the course was also spent in the department assisting seniors and mixing materials in order to familiarize the students with the clinical environment, thereby providing the second year students with early clinical experience.

The subjects of this study were 50 second year students who had completed their second annual academic session and were about to go for their preparation leaves prior to the send up and then second professional examinations. This was a cross-sectional survey of a single group without a control group.

A questionnaire was devised. It was distributed amongst the 50 students of second year BDS during the last one-hour pre-clinical lecture. 46 students were present on that day out of 50 in the whole class. All consented to complete the questionnaire. Students were told that it was not necessary to write their names on the questionnaire, therefore assuring them of anonymity in case they would like to report anything they would feel hesitant to otherwise. However they were given the choice to write their names if they wanted to.

The questionnaire consisted of 19 questions out of which some were simply given choices to mark against and some were yes/no questions after which space was provided for stating opinions, observations or suggestions.

Questions were not grouped under separate headings according to the characteristic of the course they intended to evaluate but were thrown together as a whole.

When analyzing closed-ended questions, percentages of each response were calculated. When analyzing open-ended questions, each response was categorized and the percentage was calculated. Relevant single responses were also noted separately. Some of the closed-ended questions were accompanied by comments and these were also noted.

Since only five of the 50 students in this class were male and out of these five only three completed the questionnaire, we could not analyze the responses for gender differences.

This was a cross-sectional survey of a single group of students without any control group.

RESULTS

Out of a class of 50 students, 46 were present and all consented to complete the questionnaire giving a response rate of 100%. Because the second professional examination was very close, questionnaires were sent to but could not be retrieved from the remaining four students giving a response rate of 0%. The net response rate was 92%.

Out of 46 students, 20 (43.5%) decided to remain anonymous and 26 (56.5%) wrote down their names and/or roll numbers.

Out of 46 responses, 37(80.4%) said that the course content was adequate, 1(2.2%) student thought it was too extensive and 8(17.4%) students thought that it was too easy.

All 46 students said the course would help in final year though one student said it would help "somewhat".

All 46 were also positive about the course having motivated them to increase their knowledge about techniques used in operative dentistry.

42 (91.3%) students thought that the course would help in patient handling and care and 4 (8.7%) students said that the course did not achieve this objective.

25 (54.3%) students were of the opinion that more topics should be added and 21 (45.7%) students said that no more topics should be added.

Out of 46 students, 37(80.4%) thought that it was adequate, none thought that it was too difficult and 6(13%) thought that it was too easy. 3(6.5%) students did not reply.

27 (58.7%) students thought that the environment was conducive to learning and 16 (34.8%) said that it was not. 3 (6.5%) students did not answer.

41 (89.1%)students felt that they would be capable of evaluating their own work after the course, 4 (8.7%) said they could not and one student (2.2%) did not answer.

Difficulty level of the above learning resources was reported to be easy to understand by 37(80.4%) students and too difficult by 4(8.7%). 2(4.3%) students reported that they did not study at all and 3(6.5%) said that notes and lectures were easy but the books were difficult.

TABLE 1: EDUCATIONAL RESOURCES USED BY STUDENTS

Which books did you use for studying?	
Notes	27(58.7%)
Lecture handouts	12(26.1%)
Student assignments	2(4.3%)
Selected pages from Sturdevants Art & Science	6(13%)
McCabe's Dental Materials	5(10.6%)
Copied Multimedia presentations	8(17.4%)
Practical Manual of Operative Dentistry	1(2.1%)
Students reporting more than one source of study	15(%)

TABLE 2: ADEQUACY OF FACILITIES AS REPORTED BY STUDENTS

Adequacy of facilities	
Adequate	3(6.5%)
Getting extracted teeth was a great problem	31(67.4%)
Problem getting plaster models at the right time	15(32.6%)
Separate classroom should be available	3(6.5%)
Each lecture exercise to be accompanied by visits to the clinic to see the procedure being done	2(4.3%)
Syllabus would be a good idea	1(2.2%)
Did not reply	3(6.5%)

TABLE 3: STUDENT RESPONSES REGARDING THE TEACHER'S ABILITY TO CLARIFY CONCEPTS

Ability of the teacher to clarify concepts	
Excellent	28(60.9%)
Between excellent and satisfactory	3(6.5%)
satisfactory	12(26.1%)
Between satisfactory and not good enough	2(4.3%)
Not good enough	1(2.2%)

TABLE 4: RESPONSES TO THE QUESTION OF RECEIVING ENOUGH ATTENTION BY THE TEACHER

Receiving enough attention by the teacher	
Enough	33(71.7%)
More than enough	7 (15.2%)
Not enough	3(6.5%)
Did not reply	1(2.2%)

38 (82.6%) students mentioned that a manual specially tailored for the course should be available, 6 (13%) did not feel that it was necessary and two (4.3%) did not answer.

Reasons for saying no for the question mentioned in table 4 included "concept was missing", "not enough time given by senior teacher", "haphazard lectures", and "no organized way".

DISCUSSION

All students present consented freely to participate but the four questionnaires which were distributed later were not retrieved because the students had proceeded on leave prior to preparation for their send-up examination.

Students opinions must be given importance when deciding to implement academic programs[1]. Differences in opinions exist between clinical staff which supervised and the students which were supervised regarding their clinical learning period. Even students of different years have different perceptions of the

usefulness of the training received according to their learning needs at the level they were.[2] Therefore perceptions of supervising faculty cannot be reliable in ascertaining the students' viewpoint.

Motivation

Assessment drives learning. When evaluations associated with increased stress, this may actually decrease the motivation in a student. In second year the students are not evaluated in the much-feared professional examination. So where does the motivation to complete pre-clinical restorative exercises come from? Student motivation factors are not assessed during entry tests and no such analysis is carried out during any part of the admission process. Furthermore, motivation of students to choose dentistry comes from expectations regarding their profession rather than the academic courses they have to go through.[3]

Students do share a desire to learn and be proficient in their field. Even when the assessment is not very important, other motivational factors play a part. Any perception that an educational experience will contribute to their being a better professional will result in interest and enthusiastic participation. All 46 (100%) of students held a belief that it would help them in final year and that it had motivated them to increase their knowledge of operative dentistry. Secondly, anticipation of the clinical phase of Operative Dentistry in third and final year is a source of stress, especially when the student is uncertain of what to expect when faced with a real live patient. 42(91.3%) believed that they would be able to achieve better patient handling after this course. Pre-clinical exercises and observation of restorative procedures are seen as necessary to give confidence to the student for future clinical exercises. Pre-clinical practice may also result in less time taken by the student to complete the clinical task so the quota is taken care of faster. Among advantages of the course students cited increased confidence, easier to work in the clinics and better understanding of the subject.

Students show the most positive motivation and learning patterns when their school settings emphasize mastery, understanding, and improving skills and knowledge. Whereas school environments that are focused on demonstrating high ability and competing for grades can increase the academic performance of some students, research suggests that many young people experience diminished motivation under these conditions[12].

'Haphazard' lectures

Karibe[4] found that 28% of Japanese students wanted their 6-year course to be shortened by curriculum delivery was better organized. Henzi et al.[5] reported that students complained about disorganized lectures and great time wastage in the clinical time. Students tended to value organization and clarity of the curriculum. 3(6.5%) students cited disorganization of the curriculum to hinder communication with the teacher. 7(15.2%) students claimed that disorganized lectures were one of the disadvantages of having this course.

12 (26.1%) students felt that there was no disadvantage in having the course. They thought that the course was important. On the other hand, 7(15.2%) still felt that their time was being wasted and could have been used for examinable subjects and 4 (8.7%) actually claimed that the practicals were an extra burden because they had no representation in the final professional examination.

Early clinical contact

2 (4.3%) students, when questioned about facilities said they would like to go to the department after every pre-clinical exercise to see the procedure being done. Henzi et al[14] also reported that students also liked going to the clinic to observe procedures being done. This reportedly enhanced their learning of pre-clinical procedures. In second year, the students were taken into the main clinical department to assist and mix materials.

Stress indicators

Stress in dental students can lead to adverse symptoms which further hinder their ability to cope with their burden of studies[6]. A common source of stress is meeting academic requirements especially if perceived by the student to be excessive or too difficult[7]. In addition unethical behaviour may result when trying to find a way out[8]. Faculty-student relationships and feed back received in order to correct deficiencies are also quoted high on the list by students as stress

inducers. One of the characteristics of a good academic environment is enough time to complete academic goals[10].

In this study 37(80.4%) students considered that the content and it's difficulty level were adequate. In fact, some considered that the course was not challenging enough. 25(54.3%) further recommended that more topics be added.

Another source of stress is anticipatory; even before facing patients, as early as the pre-clinical years. The best way to tackle this type of stress is to introduce the students into the dental clinics as assistants and observers during the pre-clinical years.[16]

Learning Resources

Learning resources should be varied in order to suit the learning styles of all students[10]. Some students preferred more difficult textbooks while others relied on notes and handouts. The different approaches of students in the selection of learning material reflect their different learning styles.

Student Self-Evaluation

Regarding self evaluation, the literature is replete with instances which illustrate that self evaluation skills of students are not accurate[9,10]. Expert opinion and feedback is needed for accurate evaluation. Yet 41(89.1%) of the second year students professed their ability to evaluate their own work.

This is in direct contrast with studies assessing the self assessment skills of students. It shows that students are too confident when assessing their own self assessment skills[18,11]. Skilled clinical supervision is very important as in the absence of corrective feedback the wrong concepts and clinical skills are reinforced.

Faculty requirements and teaching methodology

Though preclinical training is given adequate time in the form of practical hours and number of lectures, there are no PMDC faculty allocations for pre-clinical operative students[4] despite the documented need for constant supervision.[20]

The use of effective teaching aids such as videos and simulators will in future become necessary as the number of students in dental colleges increases and similarly the teaching staff will have to cope with increasing demands to make students learn according to a competency-based curriculum[12] But teaching aids can only help, they cannot replace feedback from faculty.[20] The ideal faculty:student ratio for teaching suturing skills has been calculated to be as high as 1:4.[13]

Communication with teachers and quality of teaching

Karibe[13] reported that 5% Swedish students said that they had no good teachers, others were satisfied with the level of teaching they received. In the same study, 20% of Japanese students were not satisfied with their level of teaching. Research has yet to define what constitutes good quality clinical teaching.[23]

In this study, 5(10.6%) of students stated that they had problems communicating with the teacher and 3(6.5%) said that they did not receive enough attention. Only one student believed that the teacher was not able to clarify concepts.

CONCLUSION

Overall, students seemed genuinely interested in having the course as they thought it was essential preparation for clinical dentistry and "made them feel like dentists for the first time". Many appreciated that they would not have to go directly onto patients without prior practice.

Though course content, difficulty level and ability of the teacher to clarify concepts were generally not a problem, "disorganized lectures" were complained about. Most students welcomed a structured program for pre-clinical training with a specially prepared manual for guidance and were also very comfortable with the subject not being assessed at the end of the year. Another source of complaint was "not enough time given by the senior teacher", which highlights a need for induction of experienced faculty exclusively for teaching pre-clinical techniques. Otherwise ability of the teachers to communicate and convey conceptual knowledge was accepted well by students.

REFERENCES

1 Pakistan Medical & Dental Council. Regulations for the degree of Batchelor of Dental Surgery (B.D.S). 2006. [cited

2011 October8]. Available from: http://dev.plexushosting.com/pmdc/LinkClick.aspx? fileticket= 06HF%2blta1uc% 3d&tabid=102&mid=556

2 Higher Education Commission of Pakistan. Curriculum of BDS. 2005. [cited 2011 October 13]. Available from: http://www.hec.gov.pk/InsideHEC/Divisions/AECA/CurriculumRevision/Documents/BDS%202005.pdf

3 Khan AA. Dental Education in Pakistan: A case for re-engineering. Proceedings of the International Conference on Medical Education (ICME); 2009 Jan 25-27. Islamabad, Pakistan

4 Pakistan Medical & Dental Council. Appointment of teachers and examiners regulations. 2003. [Cited 2011 October 8]. Available from: http://dev.plexushosting.com/pmdc/LinkClick.aspx?fileticket=YNKDw4E8csQ%3d&tabid=102&mid=554

5 Pakistan Medical & Dental Council. Minimum criteria, requirements and guidelines including faculty requirements/checklist of infrastructure and equipment for medical and dental institutions training for a medical or dental qualification and rules and requirements regarding their attached teaching hospitals. 2009. [Cited 2011 October 8]. Available from: http://dev.plexushosting.com/pmdc/Portals/0/GuidelinesAndCriteria/CRITERIA.pdf

6 Shanley DB. Convergence towards higher standards in international dental education. N Y State Dent J. 2004;70(6):35-9.

7 Haleem A, Khan AA. Dental caries and oral hygiene status of 12 years old school children in Pakistan. Pak J Med Res 2001;40(4):138-42.

8 Abdullah S, Qazi HS, Maxood A. Dental caries status in 6-9 years old children. Pakistan Oral & Dental Journal 2008;28:107-12.

9 Goldie J. AMEE Education guide no. 29: Evaluating educational programmes. Med Teacher 2006;**28**:210-224.

10 Divaris K, Barlow PJ, Chendea SA, Cheong WS, Dounis A, Dragan IF, Hamlin J, Hosseinzadeh L, Kuin D, Mitrirattanakul S, Mo'nes M, Molnar N, Perryer G, Pickup J, Raval N, Shanahan D, Songpaisan Y, Taneva E, Yaghoub-Zadeh S, West K, Vrazic D. The academic environment: the students' perspective. Eur J Dent Educ. 2008 Feb;12 Suppl 1:120-30.

11 Polyzios I, McLoughlin J, Kelly A, Claffey N. Clinical teaching in restorative dentistry and the variation between students' and supervisors' perceptions of its effectiveness. Eur J Dent Educ 2010;14:92-98.

12 Kristensen BT, Netterstrom I, Kayser L. Dental students' motivation and the context of learning. Eur J Dent Educ. 2009 Feb;13(1):10-4.

13 Karibe H, Kawakami T, Suzuki A, Warita S, Ogata K, Aoyagi K, Agholme MB, Dahllöf G. Career choice and attitudes towards dental education amongst dental students in Japan and Sweden. Eur J Dent Educ. 2009 May;13(2):80-6.

14 Henzi D, Davis E, Jasinevicius R, Hendricson W. In the students' own words: what are the strengths and weaknesses of the dental school curriculum? J Dent Educ. 2007 May;71(5):632-45.

15 Alzahem AM, van der Molen HT, Alaujan AH, Schmidt HG, Zamakhshary MH. Stress amongst dental students: a systematic review. Eur J Dent Educ. 2011 Feb;15(1):8-18.

16 Polychronopoulou A, Divaris K. A longitudinal study of Greek dental students' perceived sources of stress. J Dent Educ. 2010 May;74(5):524-30.

17 Monica M, Ankola AV, Ashokkumar BR, Hebbal I. Attitude and tendency of cheating behaviours amongst undergraduate students in a Dental Institution of India. Eur J Dent Educ. 2010 May;14(2):79-83.

18 Nance ET, Lanning SK, Gunsolley JC. Dental anatomy carving computer-assisted instruction program: an assessment of student performance and perceptions. 2009;73(8):972-979

19 *Curtis DA, Lind SL, Dellinges M, Setia G, Finzen FC. Dental students' self-assessment of preclinical examinations.* J Dent Educ *2008; 72(3):265–77.*

20 Pandey VA, Wolfe JHN, Black SA, Cairols M, Liapis CD, Bergqvist D. Self assessment of technical skill in surgery: the need for expert feedback. Ann R Coll Eng 2008;90:286-290.

21 Hanson C, Mossey P, Macluskey M. The assessment of suturing skills of dental undergraduates. Eur J Dent Educ 2010;14:113-117.

22 Dubrowski A, MacRae H. Randomized controlled study investigating the optimal instructor;student ratios for teaching suturing skills. Med Educ 2006;40:59-63.

23 Conigliaro RL, Stratton TD. Assessing the quality of clinical teaching: a preliminary study. Med Educ. 2010;44(4):379-86.