

# Assessment of Difficulties Faced By Dental Students in Preparation of a Three Unit FPD Clinically and Preclinically

S.Subashree Rathi

IV BDS, Saveetha Dental College and Hospitals, Chennai.

---

## Abstract:

### **Aim:**

To assess the difficulties in preparation of a three unit fixed partial denture clinically and preclinically by third year dental students.

### **Objective:**

To assess the difficulties in preparation of fixed partial dentures by third year dental students and to compare the difficulty levels clinically and preclinically.

### **Background:**

49 subjects were involved in this study who were preferably third year dental students. They were provided with a questionnaire containing a set of nine questions for self assessment of their preparations based on the following variables: incisal/occlusal reduction, axial reduction, retention and resistance form, taper, margins and finish lines. The collected data were then submitted for statistical evaluation.

### **Conclusion:**

The confidence level of everyone who participated in this study was almost higher before preparing on a patients mouth, but not everyone who were confident were able to produce an excellent preparation. Margin placement and finish line was found to be more difficult to obtain and the comparative result suggests that tooth preparation on a patients mouth was found to be difficult with that of preclinical tooth preparation which can be contributed to a wide range of factors.

**Keywords:** fixed partial denture, preclinical tooth preparation, clinical tooth preparation.

---

## INTRODUCTION:

Dental education is a four year curriculum which is different from other professions. A dental student must understand the anatomy, physiology and pathology of the oral structures as well as develop skills to restore the defective tooth. The dental preclinical technique helps in developing these skills which require hand-to-eye coordination and fine motor dexterity. The student gains more knowledge incrementally as they proceed through their curriculum. In preclinical practice, the dental students use manikins which has synthetic teeth and cheeks, to learn the technical skills prior to treating actual patients. They are designed to reproduce the key aspects of dental patient such as mirror positioning in the physical environment of a dental operator.<sup>1</sup> The manikins provide a more realistic setting for learning the practice of dentistry than the bench environment and they are believed to increase the transfer of learning.<sup>2,3,4</sup>

The use of simulators in teaching technical skills is not new. More recently, computer-assisted-simulators are being utilized for teaching even complex surgeries.<sup>8</sup> With appropriate demonstration. Training and repeated exposure, the student becomes more familiar with the technical skills such as positioning the mouth mirror, patient positioning, using a handpiece).<sup>1</sup>

Predicting future professional achievement has been an elusive goal in dental education.<sup>5</sup> Previous investigations have evaluated the predictive value of preclinical performance in a speciality to clinical performance in same speciality.<sup>6,7</sup> Chan *et al* studied the pre and post simulation performance of dental students at the university of Georgia.

It was found that the percentage of A grades given to students decreased from 22.7% to 4.5% while the percentage of Bs and Cs rose significantly. These changes were attributed to the increased difficulty and realism of performing on a dental simulator.<sup>9</sup>

James *et al*, compared the scores of two fixed preparations for full cast crowns made in the simulation clinic manikin and the other on the bench top. They also compared the performance of three classes: one with no experience in simulation clinic, one with one year of experience and one with two years of experience. The results were mixed in that students with more bench top experience scored better on the bench top, and students with more manikin experience scored equally in both environments. It was concluded that students' perceptions of their preparation for actual patient care is not dependent on the type of their preclinical experience.<sup>1</sup>

Accordingly, the purpose of this investigation was to assess the difficulties faced by dental students in preparing a three unit fixed partial denture and also to compare the difficulty levels clinically and preclinically.

## MATERIALS AND METHODS:

The objectives of this study was to assess the difficulties faced by dental students in preparation of a three unit fixed partial denture and to compare the difficulty levels clinically and preclinically.

The study was carried out on the third year dental students of saveetha dental college and hospitals Chennai. 50 out of the total 100 third year students, who have practiced tooth preparation both preclinically and clinically in the patients

mouth were selected for this study. A self assessing questionnaire was provided to the students which had a set of nine questions. The variables evaluated were: incisal/occlusal reduction, axial reduction, proximal reduction, taper, margin placement and finish line. A question on their perception of clinical readiness was also provided. The grading scale for each variable were represented as excellent, good, average and poor whereas the variables for clinical readiness was provided as very confident, somewhat confident, less confident and not confident. The data finally collected was entered in a computer and subjected to statistical evaluation.

#### INCLUSION CRITERIA:

- Third year dental students
- Experience in preparation of a three unit FPD preclinically on a typhodont model.
- Experience in preparation of three unit FPD clinically in a patients mouth.

#### EXCLUSION CRITERIA:

- No experience in preclinical tooth preparation.
- No experience in clinical tooth preparation on a patients mouth.

#### RESULTS:

Out of 50 students who duly filled in the questionnaire, most of them were somewhat confident(54%) in their first tooth preparation on patients mouth, whereas 28% were less confident and 18% were very confident. Each of them graded their tooth preparation on individual aspects. Of the total 100percent, a maximum of 44% graded their incisal/occlusal reduction as good, 44% graded axial reduction as good, 58% graded average on their proximal reduction without damaging the adjacent structures, 54% graded average on proper taper, 58% graded average on margin placement without abrading the gingiva, 46% graded average on producing finish line. On comparing the preclinical and clinical tooth preparation 56% considered themselves good in tooth preparation preclinically on a typhodont model whereas only 40% graded themselves as good and a maximum of 54% graded themselves as average on patients mouth.(TABLE 1 and 2). The comparison between their preclinical and clinical work is represented in table 3.

**TABLE 1:**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	Excellent	11	22.0	22.0	22.0
	Good	28	56.0	56.0	78.0
	Average	10	20.0	20.0	98.0
	Poor	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

**TABLE 2:**

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Valid</b>	Excellent	2	4.0	4.0	4.0
	Good	20	40.0	40.0	44.0
	Average	27	54.0	54.0	98.0
	Poor	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

**TABLE 3: Comparison between preclinical and clinical tooth preparation**

		III				Total
		Excellent	Good	Average	Poor	
<b>IV</b>	Excellent	2	0	0	0	2
	Good	5	14	1	0	20
	Average	4	14	9	0	27
	Poor	0	0	0	1	1
	Total	11	28	10	1	50

Question	Excellent	Good	Average	Poor
1. Incisal/occlusal reduction	24 percent	44 percent	32 percent	0 percent
2. Axial reduction	12 percent	44 percent	42 percent	2 percent
3. Proximal reduction without damaging adjacent structures	10 percent	30 percent	58 percent	2 percent
4. Taper	6 percent	38 percent	54 percent	2 percent
5. Margin placement without abrading gingiva	6 percent	26 percent	58 percent	10 percent
6. Finish line	8 percent	36 percent	46 percent	10 percent
7. Tooth preparation preclinically on a typhodont model	22 percent	56 percent	20 percent	2 percent
8. Tooth preparation clinically in patients mouth	4 percent	40 percent	54 percent	2 percent
<b>Level of confidence</b>	Very confident- 18%	Somewhat confident- 54%	Less confident- 28%	Not confident- 0%

**DISCUSSION:**

The background of this survey is to analyse the difficulties faced by third year dental students in preparation of a three unit fixed partial denture in a patients mouth clinically compared to preclinical work on a typhodont model.

Several studies were carried out to correlate student performance in preclinical and clinical prosthodontics work. In a study conducted by Curtis *et al*, they correlated student performance on three unit fixed prosthodontics examinations taken by eighty junior dental students. It included a knowledge-based objective structured clinical examination (OSCE), a manual skills exercise completed on a typhodont and a competency casting exam (casting CE) on a patient. Their results indicate that there is no correlation between a typhodont preparation examination designed to provide a measure of students clinical skill and a clinical competency exam involving the preparation of a full crown.<sup>5</sup> This study was supported by another study conducted by James *et al*, stating that students' perceptions of their preparation for actual patient care is not dependent on the type of their preclinical experience<sup>1</sup>, where they compared student performance in a simulation clinic and a traditional laboratory environment.

Self-evaluation is an important attribute for dental professionals that is helpful in developing and refining the curriculum. This study is based on the self evaluation of the students over their tooth preparations. One limitation of this study was that we considered only the self evaluation of the students and their exact preparations were not assessed by trained professionals to definitely prove the result.

**CONCLUSION:**

Our study led to three main conclusions:

1. The confidence level of the students' tooth preparation was definitely higher than the not confident category which reveals that everyone were confident in their preparation. Not everyone who were confident could produce an excellent tooth preparation.
2. A proper margin placement without abrading the gingiva and finish line production were found to be more difficult to achieve compared to other aspects of tooth preparation.
3. On comparing the preclinical tooth preparation to the clinical tooth preparation, it was found that clinical tooth preparation was considered more difficult than the other. This can be attributed to the operatory status which includes the patient positioning, mouth mirror positioning, hand piece orientation etc.

**REFERENCES:**

1. James M.S. Clancy, Terry J. Lindquist, Joyce F. Palik, Lynn A. Johnson. A Comparison of Student Performance in a Simulation Clinic and a Traditional Laboratory Environment: Three-Year Results. *Journal of dental education*. 2002 dec.
2. Gagne RM. Training devices and simulators: some research issues. *Am Psychol* 1954;9:95-107.
3. Wolfe J. the teaching effectiveness of games in collegiate business courses. *Simulation & games update*, 1973-1983.
4. Schneider W. training high-performance skills:fallacies and guidelines. *Hum Factors* 1985;27:285-300.
5. Donald A. Curtis, Samuel L. Lind, Sheila Brear, Frederick C. Finzen. The correlation of student performance in preclinical and clinical prosthodontics assessments. *Journal of dental education*. 2007 march.
6. Rich SK, Keim RG, Shuler CF. Problem based learning versus a traditional methodology: a comparison of preclinical and clinical periodontics performance. *J Dent Educ* 2005;69:649-62.
7. Bellanti ND, Mayberry WE, Tira DE. Relation between selected predictor variables and grades in fixed prosthodontics laboratory. *J Dent Educ* 1972;36:16-21.
8. Alessi SM, Trollip SR. *Multimedia for learning: methods and development*, 3<sup>rd</sup> ed. Boston: allyn & Bacon, 2000.
9. Chan DC, Frazier KB, Caughman WF. Simulation with preclinical operative dentistry course: three year retrospective results. *J Dent Educ* 2000;64(3):abstract 190.