



Correlation between Academic and Psychomotor Skills Performances of Dental Students in Complete Denture Prosthodontics

A. O. Arigbede^{1*}

¹Department of Restorative Dentistry, Faculty of Dentistry, College of Health Sciences, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria.

Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/BJMMR/2016/24775

Editor(s):

(1) Hai Ming Wong, The University of Hong Kong, 2/F, Prince Philip Dental Hospital, Hong Kong.

Reviewers:

(1) Ketij Mehulic, University of Zagreb, Croatia.

(2) Anonymous, University Sultan Zainal Abidin, Malaysia.

Complete Peer review History: <http://sciencedomain.org/review-history/13751>

Original Research Article

Received 31st January 2016

Accepted 26th February 2016

Published 18th March 2016

ABSTRACT

Aims: This study was designed to determine if there is correlation between academic performance of students in complete denture prosthodontics and psychomotor skills for record blocks fabrication/complete denture teeth set up.

Study Design: It was a cross-sectional study conducted at the Department of Restorative Dentistry of the University of Port Harcourt between July and October 2015.

Methodology: Departmental examination records of all dental students who had done complete denture prosthodontic course and sat for professional examination in the subject since 2011 when the very first was organized were reviewed. The examination involved written, test of psychomotor skills for fabrication of record blocks/complete denture teeth set up and viva. The practical evaluation was conducted by experienced external and internal examiners using already prepared checklist. The checklist includes occlusal vertical dimension, occlusion (inter-digitations, overbite & overjet), setting up on the ridge, adaptation and thickness of the denture base, extension of the flange and finishing. Spearman's rank test was used to assess the correlation between academic and psychomotor skills performances.

Results: Six sets and a total number of 65 students had taken the course and sat for professional examination since the very first was organized in 2011. Spearman's correlation coefficient was

*Corresponding author: E-mail: arisabbey@gmail.com;

very low (0.237) and the relationship was almost statistically significant (P value was 0.06).

Conclusion: There was poor correlation between academic and psychomotor skills performances of dental students as it relates to complete denture prosthodontics. Conscious efforts should be made to recognize candidates who lag behind in psychomotor skills acquisition and to assist them.

Keywords: Academic performance; complete dentures; correlation; psychomotor skills.

1. INTRODUCTION

The challenge for modern dental educators is to train dentists who are competent in oral healthcare delivery [1]. Clinical professions generally do emphasize acquisition of knowledge, skills and their application [2]. Clinical skills acquisition is a major focus of education for health professionals, extending from undergraduate to postgraduate level and even beyond [3]. Curriculum time devoted to preclinical teaching in the clinical sciences helps to provide foundation knowledge and develop psychomotor skills essential for general dental practice [4]. Dental training institutions had been using simulations for many years [5-7] to complement clinical skills acquisition by their trainees, minimizes irreversible iatrogenic damages when the students are eventually exposed to clinical dental surgery and also for examination purposes [5-9]. In our university, dental students undergo 3 and a half months intensive pre-clinical training in clinical skills laboratory during which they are taught the arts and science of tooth cavity preparation and restoration on phantom heads. The students are also taught the arts and science of making complete dentures in prosthetic laboratory. The training in both cases encompasses didactic and psychomotor skills components.

Dentistry requires specific motor skills in association with good visual acuity [10]. Dental school curriculum requires students to be grounded in laboratory procedures involved in making dentures particularly the process of setting up teeth for this prosthesis [9-16]. This demand could be part of the reason why test of psychomotor skills are often conducted by some institutions during recruitment exercises into dental programme [11] with the hope that candidates with sufficient general motor skills will do well in motor skills exercises required in dentistry. However, some other institutions depend on academic performance in high school and science-based common entrance examination [17]. Opinions are divided on the relationship between academic and psychomotor

skills performances. At the moment, it is not clear whether academic performance in complete denture prosthodontics is a predictor of psychomotor skills for fabrication of record blocks and complete denture teeth set up. Both procedures are laboratory- based psychomotor exercises. This study was therefore designed to determine if there is correlation between academic performance of students in complete denture prosthodontics and psychomotor skills for record blocks fabrication/complete denture teeth set up.

2. METHODOLOGY

This was a cross-sectional study conducted at the Department of Restorative Dentistry, Faculty of Dentistry, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria. Departmental examination records of all dental students who had done complete denture prosthodontic course and sat for professional examination in the course since 2011 when the very first was organized by the department were reviewed. The professional examination comprises the following: written (objective and essay), practical (test of psychomotor skills) and viva. The psychomotor skills examination involved fabrication of upper and lower record blocks and complete denture teeth set up. Each evaluation was conducted by at least one external examiner and two internal examiners. The external and internal examiners were experienced and used already prepared checklist to assess the candidates. The checklist includes occlusal vertical dimension, occlusion (inter-digitations, overbite & overjet), setting up on the ridge, adaptation and thickness of the denture base, extension of the flange and finishing. Candidates who scored less than 50% when the written and practical are combined and those who scored less than 50% in the practical are judged to have failed the examination, but they have opportunity to resit the examination after three months. The results of the resit examination were excluded from the study. Candidates who successfully completed the course would proceed to full clinical dental training.

For confidentiality, information that could lead to direct identification of the students like name, age, sex, and matriculation number were excluded from the study. The data was coded and treated with discreet. Ethical clearance certificate for the study was obtained from Research Ethics Committee of University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers State, Nigeria (UPTH/ADM/90/S.II/VOL.X/839).

2.1 Statistical Analysis

The data was analyzed using SPSS for Windows version 20.0, (SPSS Inc. Chicago Illinois, USA). Spearman's rank test was used to determine the correlation between academic performance in complete denture prosthodontics and psychomotor skills for fabrication of upper and lower record blocks/setting up teeth for complete dentures. Performance in the written examination was the independent variable while performance in the psychomotor skills evaluation was the dependent variable. The level of significance was set at $P=0.05$.

3. RESULTS

Six sets and a total number of 65 students had taken the complete denture prosthodontics course since the very first was organized by the department in 2011. The lowest number of students (5) was seen in the second set while the highest number (16) was encountered in the 5th

set (Fig. 1). All of them sat for written and practical professional examination at the end of the course. Spearman's rank analysis of the academic and psychomotor skills performances of the students showed that Spearman's correlation coefficient was very low (0.237) and P value was 0.06. This suggests a poor correlation between academic and psychomotor skills performances and the relationship was almost statistically significant.

4. DISCUSSION

Predicting future professional achievement has been an elusive goal in dental education [11].

Opinions are divided regarding the correlation between the outcomes of general motor skills assessment often employed for dental schools admission and subsequent dental school performance [12,17,18]. Similarly, there are contradictory reports regarding whether students who displayed brilliant academic performance before dental school admission will display good psychomotor skills.¹² In addition, a few investigators found poor correlation between psychomotor skills performances in preclinical and clinical environments [8,11].

Our study revealed weak relationship between academic performance in complete denture prosthodontics and psychomotor skills for making record blocks and setting up complete dentures. This finding corroborates the report of

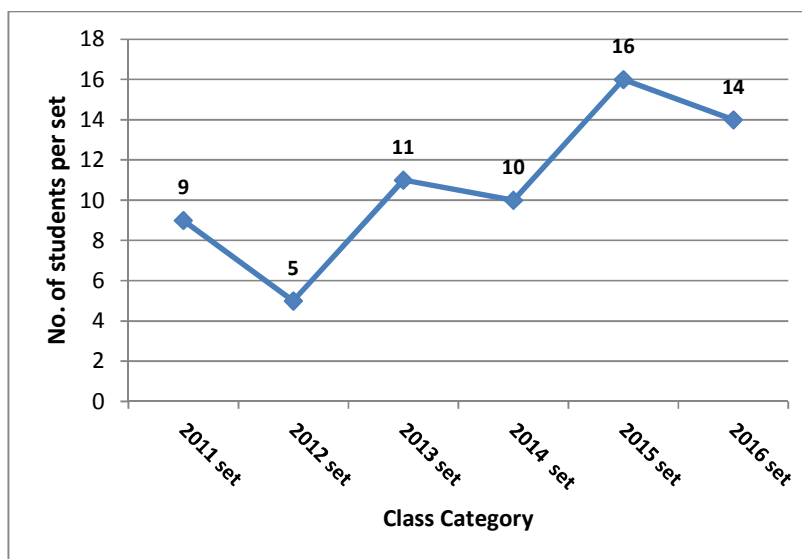


Fig. 1. Distribution of number of students vs. class category

Atify et al. [12] where didactic performance did not correlate well with the students' psychomotor skills for removable prosthodontics and orthodontics specialties. Giuliani et al. [19] observed that university students with excellent academic records struggled at the beginning of laboratory and clinical based practical training thus confirming the poor correlation. They stated further that many authorities also failed to convincingly correlate manual dexterity with academic and preclinical success [19]. However, it is believed that manual dexterity is not entirely practical and mechanical, rather, it is a matter of both 'hand' and also of 'head' [19]. It is not clear why academic performance in a particular subject does not correlate with psychomotor skills. A possible reason could be error in assessment of psychomotor skills [2]. This is a long recognized anomaly in medical and dental education. Deliberate efforts should always be made to achieve a balance between cognitive, affective and psychomotor capabilities of dental students. The limited sample size employed for this study could have introduced bias.

5. CONCLUSION

There was poor correlation between academic and psychomotor skills performances of dental students as it relates to complete denture prosthodontics. Conscious efforts should be made to recognize candidates who lag behind in psychomotor skills acquisition and to assist them.

CONSENT

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Lynch CD, Allen PF. The teaching of removable partial dentures in Ireland and the United Kingdom. *Br Dent J*. 2007;203(E17). DOI:10.1038/bdj.2007.581
2. Taylor CL, Grey N, Satterthwaite JD. Assessing the clinical skills of dental students: A Review of the Literature. *Journal of Education and Learning*. 2013;2(1). DOI: <http://dx.doi.org/10.5539/jel.v2n1p20>
3. Omer R, Amir AA, Ahmed AM. An experience in early introduction of clinical teaching in a clinical skills laboratory. *Sudanese Journal of Public Health*. 2010;5(2):29-31.
4. Allen KL, More GF. Clinical simulation and foundation skills: An integrated multidisciplinary approach to teaching. *J Dent Educ*. 2004;68(4):468-474.
5. Laurence J. Walsh, Lei Chai, Camile Farah, Hien Ngo, Mr Gary Eves. Use of simulated learning environments in dentistry and oral health curricula. *Health workforce Australia*; 2010. Accessed 25 October 2015. Available:<http://www.hwa.gov.au/sites/uploads/sles-in-dentistry-oral-health-curricula-201108.pdf>
6. Perry S, Bridges SM, Burrow MF. A review of the use of simulation in dental education *Simul Healthc*. 2015;10(1):31-7. DOI: 10.1097/SIH.0000000000000059
7. Damassa DA, Sitko TD. Simulation technologies in higher education. Uses, trends, and implications. *ECAR research bulletin* 3; 2010. Accessed on 25 Oct 2015. Available:<https://net.educause.edu/ir/library/pdf/ERB1003.pdf>
8. Arigbede AO, Denloye OO, Dosumu OO. Transferability of clinical skills acquired on simulator to real life clinical practice. *OHDM*. 2014;13(2):1-5.
9. Arigbede A, Denloye O, Dosumu O. Use of simulators in operative dental education: Experience in Southern Nigeria. *Afr Health Science*. 2015;15(1):269-277.
10. Narula K, Kundabala M, Shetty N, Shenoy R. Evaluation of tooth preparations for class II cavities using magnification loupes among dental interns and final year BDS students in preclinical laboratory. *J Conserv Dent*. 2015;18(4):284-287.
11. Curtis DA, Lind SL, Brear S, Finzen FC. The correlation of student performance in preclinical and clinical prosthodontic assessments. *J Dent Educ*. 2007;71(3):365-272.
12. Afify AR, Zawawi KH, Othman HI, Al-Dharrab AA. Correlation of psychomotor skills and didactic performance among dental students in Saudi Arabia. *Advances in Medical Education and Practice*. 2013;4:223-226.
13. Cameron D, McKerlie R, Matthew B. A comparison of teaching methods for teaching dental technology to

- undergraduate dental students: A pilot study. Practice and Evidence of Scholarship of Teaching and Learning in Higher Education. 2006;1(2):73-93.
14. Montero J, Castillo-de Oyagüe R, Albaladejo A. Curricula for the teaching of complete dentures in Spanish and Portuguese dental schools. Med Oral Patol Oral Cir Bucal. 2013;18(1):e106-114.
 15. Clark RK, Radford DR, Juszczak AS. Current trends in complete denture teaching in British dental schools. Br Dent J. 2010;208(5):E10. DOI: 10.1038/sj.bdj.2010.210.
 16. General dental council. The first five years. The undergraduate curriculum. 3rd ed. Interim report. London General Dental Council; 2008.
 17. Al-Johany S, AlShaafi M, Bin-Shuwaish M, Alshahrani F, Alazmah A. Correlation between handwriting, drawing skills and dental skills of junior dental students. J Contemp Dent Pract. 2011;12(5):327-332.
 18. Gray SA, Deem LP. Predicting student performance in preclinical technique courses using the theory of ability determinants of skilled performance. J Dent Educ. 2002;66(6):721-727.
 19. Giuliani M, Layolo C, Clemente L, Querqui A, Viotti R, Boari A, Miani CM. Is manual dexterity essential in the selection of dental students? Br Dent J. 2007;203(3):149-155.

© 2016 Arigbede; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

*The peer review history for this paper can be accessed here:
<http://sciencedomain.org/review-history/13751>*