

Nigerian dental students' perspectives about their clinical education

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Abstract

Objective: Undergraduate dental education in Nigeria is rapidly expanding with new dental schools being established in different parts of the country. Clinical training forms an important and key component of the undergraduate dental training process. The objective of this paper is to assess the perceptions of Nigerian dental students on the clinical component of their undergraduate training programme.

Method: This was a cross-sectional descriptive study carried out amongst 350 dental students and recent dental graduates from the nine accredited dental schools in the country at that time. Ethical approval for the study was obtained from the Lagos University Teaching Hospital Health Research Ethics Committee (HREC). Data collection was via self-administered questionnaires. The study assessed the dental students' perspectives on different aspects of their clinical training using a validated instrument, which was a slightly modified form of the CLInED IQ questionnaire.

Results: The final study sample was made up of 275 students and recent graduates with a mean age of 24.57 years. The students rated their interactions with their clinical instructors and faculty members favourably, but provided lower ratings for clinical learning opportunities, due to the different challenges faced in the dental school environment. The students also rated their involvement in specific clinical learning activities low, with only three out of the eleven highlighted activities recording a high-level involvement.

Conclusion: Nigerian dental students perceive that interaction with their faculty members is more beneficial to them than the clinical learning opportunities provided in the dental school. This was mainly attributed to inefficiencies in the dental school environment and insufficient infrastructure. They also reported a low level of involvement in specific clinical learning activities.

Key words: Students' perspective, Undergraduate Dental training, Clinical education, Nigeria

Introduction

There is an increasing demand for a higher and better quality of clinical learning in undergraduate training by clinical educators in the health profession¹. This call emanates from the need to ensure best practices or evidence based practices in patient care through the skills and expertise acquired by students in the course of their undergraduate education. This is however contingent on the effectiveness of the clinical teaching strategies utilized by their faculty on a day to day basis. Furthermore, the interaction between the students and their faculty, as well as the teaching/training experience of the faculty are vital

elements in the successful outcome of students' clinical learning especially in the dental school clinical setting.¹ Effective learning is largely influenced and determined by the quality of the educational environment². Dental education is no exception.

The skills and expertise acquired by undergraduate dental students in patient care ought to be objectively evaluated and measured by dental health educators to ascertain that optimal patient care post-graduation is based on best practices. In Nigeria, which currently has 9 accredited dental schools involved in undergraduate dental training, the effectiveness of clinical training has been studied. A recent study among undergraduate dental students by

Isiekwe et al³, identified the major factors found to adversely affect the quality of clinical training received. These were poor electricity supply, insufficient dental chairs and quality of training received. Their study highlighted the fact that the challenges faced in undergraduate dental education in developing countries such as Nigeria may be different from that of more developed countries where infrastructure for training is more likely to be optimal.

Many of the studies on dental education focused on the perspective of the faculty members, alumni and professional organizations⁴. Whereas several studies have shown that the perspective of students is crucial and presents a more robust overview of dental education by the recipients themselves.^{1, 3-5}

Although several studies have looked at the effect of good clinical teaching on students' learning in dental education, majority of these studies did not use a validated clinical teaching assessment, to support the influence that teaching aids and techniques may have on students' learning.¹ In their search for a validated assessment tool, Henzi et al,¹ developed a questionnaire based tool to assess the clinical teaching skills of the faculty and other factors that could influence clinical learning. This is the Clinical Education Instructional Quality Questionnaire (ClinEd IQ). This survey tool was adapted from a previous questionnaire, the Medical Education Instructional Quality Questionnaire (MedEd IQ). The ClinED IQ is an instrument that has been validated to reliably elicit students' perceptions of their clinical learning environment.

In the bid to properly identify what constitutes effective and qualitative educational methods, several investigators have researched extensively on the different clinical teaching strategies¹. This is consistent with the ongoing call for a reorientation and reevaluation of clinical learning strategies employed in undergraduate training in several academic institutions in developed countries by health educators who have and are still conducting extensive research in this field. The timing of this call has never been more important particularly in developing countries, including Nigeria. Majority of the previous studies on dental students' perceptions of their training in Nigeria did not involve the use of standardized evaluation tools/methods^{3,5,6}, while the few studies that did were restricted to a single dental school,⁷ or dental schools located within a region of the country⁸⁻¹⁰.

Hence, the main aim of our study was to determine the perception of dental students across the country on the effectiveness of their clinical training by using a standardized measuring tool: the Clinical Education Instructional Quality Questionnaire (ClinEd IQ).

Materials and Method

Ethical approval for the study was obtained from the Health Research and Ethics Committee (HREC) of the Lagos University Teaching Hospital. It was a cross sectional study involving dental students in the nine accredited dental schools in Nigeria, located in the Universities of Lagos (Unilag), Ibadan (UI), Nigeria (UNN), Ife (OAU), Benin (Uniben), Port-Harcourt

(Uniport), Maiduguri (Unimaid), Bayero University Kano (BUK) and Lagos State University (LASU).

A purposive sampling technique was used in selecting subjects for the study. The inclusion criteria for the study were, all dental students in the dental schools listed above who were willing to participate in the study and who were in their penultimate (500 level) or final year (600 Level) of study. House-officers/recently graduated dentists who had not spent more than two years' post-graduation from the dental school were also included. The exclusion criteria for the study included: Lack of consent to participate in the study; dental students who were not in their penultimate (500 level) or final year (600 Level) of study and dental graduates who had spent over two years since graduation from the dental school. The questionnaires were pretested and later distributed to consenting participants through a representative from each of the dental schools. A total of three hundred and fifty questionnaires were distributed.

A modified form of the Clinical Education Instructional Quality Questionnaire (ClinEd IQ) was the survey instrument used.¹ The ClinED IQ consists of forty-five questions, forty-three of which are in a forced-option (multiple choice) response format and two of which are open ended.¹ The modified form of the ClinED IQ questionnaire used in this study consisted of only the forty-three questions, leaving out the last two questions in the original form. This was because the authors wanted to restrict the study to a purely quantitative study. The ClinEd IQ has IV sections and for the purpose of this study only the first three sections were used, sections: I, II and III, which also correspond with the forty-three questions earlier highlighted. The multiple-choice questions in the ClinED IQ are divided into three subscales: Clinical learning opportunities (fifteen items), Involvement in Specific Learning Activities (thirteen items) and Interaction with Clinical Instructors (fifteen items). These three subscales represent the three sections of the questionnaire used for this study: Section I assessed respondents' clinical learning opportunities with questions based on their learning experience throughout their clinical education. Section II assessed their involvement in specific clinical learning opportunities, while Section III assessed their interactions with clinical instructors. The options for Sections I&III options were: strongly disagree, disagree, mildly disagree, agree and strongly agree, with fifteen items each, while section II had, 'no exposure, involved hardly at all, involved to a small degree, involved to a moderate degree, involved to a considerable degree and involved to a high degree' as options, with thirteen items. For the subscales Clinical Learning Opportunities and Interaction with Clinical instructor, the six possible response items were consolidated into "agree" and "disagree" as follows: Mildly agree, agree and strongly agree were all classified as 'Agree', while mildly disagree, disagree and strongly disagree were classified as "Disagree". For the subscale "Involvement in Specific learning activities, the six response options were consolidated as "low involvement" and "high involvement" as follows: no exposure, involved hardly at all and involved to a small degree; were all classified as: low involvement; while involved to a moderate degree, involved to a considerable degree and involved to a high degree were all

considered as high involvement. A similar classification was used in the study conducted by Henzi et al.¹

The data generated were analyzed using the statistical Package for Social Sciences for windows version 20.0, SPSS Inc. Chicago IL. Data analysis consisted of identifying means and standard deviations within subscales as well as for each dental school. Frequency and percentages were obtained for categorical values. Analysis of variance (ANOVA) was used to compare the mean values for different dental schools. The level of significance was set at $p < 0.05$.

Results

A total of two hundred and seventy-five questionnaires (275) were returned out of the three hundred and fifty (350) questionnaires distributed. Thus, the response rate was 78.57%. The mean age of the respondents was 24.57 years (SD 2.21). The gender distribution of the respondents showed that 117 (42.6%) were males and 125 (45.4%) were females. It was observed that 33 (12%) of the respondents did not indicate their gender in the questionnaires, however, these questionnaires were not invalidated as gender based comparisons were not part of the study objectives and these respondents had filled other aspects of the questionnaire completely.

Table 1 shows the distribution of the students across the nine dental schools surveyed. The University of Lagos recorded the highest number of respondents, 69 (25.1%); while the least number was recorded by Bayero University Kano, 6 (2.2%).

Table 2 shows the mean scores recorded by respondents from each dental school, based on assessments from each of the three subscales in the modified ClinEd IQ questionnaire, namely: Clinical learning Opportunity, Involvement in specific learning activities and Interaction with clinical instructors. An analysis of variance revealed no significant difference ($p > 0.05$) in all the three subscales, for the mean scores recorded by the dental schools. Respondents from Port-Harcourt recorded the highest mean score in both the 'Clinical learning opportunity' (3.95 ± 0.275) and 'Involvement in specific learning activities' ($5.10 \pm$

0.423) subscales; while respondents from Kano recorded the lowest mean score in both subscales (3.38 ± 0.454 and 3.10 ± 0.678 , respectively). In the 'Interaction with clinical instructors' subscale, Maiduguri recorded the highest mean score (4.35 ± 0.368); while Ibadan recorded the lowest mean score (3.75 ± 0.776).

Table 3 shows the response of study participants to questions in subscale 1 of the modified CLInEd IQ questionnaire, which assessed Clinical learning Opportunities. The respondents provided positive ratings for seven of the fifteen items on this subscale. For each of these seven items, at least 70 percent of students provided the desired response, either 'agree' or 'disagree', depending

on whether the item was stated positively or negatively. Students provided less favourable ratings for eight items including: "my experiences were repetitive and offered few new learning experiences" (44.9% agreed), "I have had the opportunity to work in a variety of patient care settings..." (43.3% disagreed), "The clinic functioned so smoothly so that I could efficiently provide patient care" (48.7% disagreed). The greatest percentage agreement was recorded for "I improved my communication skills" (92.4%) while the greatest percentage disagreement was recorded for "I did not feel like a useful member of the health care team" (77.6%).

Table 4 shows the response of study participants to questions in subscale 2 of the modified ClinEd IQ questionnaire, which assessed involvement in specific learning activities. High involvement ratings were recorded by greater than seventy percent of respondents in only three of the thirteen items questions in the subscale, while all the other items received low involvement ratings of thirty percent or more of the students. The only activities which recorded high involvement ratings (over 70%) were: 'taking patients histories' (75.7%); "performing patient examinations" (71.9%), and 'making case presentations' (71.5%). All other clinical activities had over thirty percent of students recording a low involvement, including, "taking the patients' vital signs" (69.6%); assessing radiographic images, (43.7%), "discussing the linkage of basic science concepts and clinic knowledge with my teachers in the clinic" (54.0%), "assisting faculty or residents with advanced procedures (e.g., surgical procedures)" (68.4%) and "discussing the linkage of oral and systemic health problems with clinical instructors" (51.0%).

Table 5 shows the response of study participants to questions on subscale 3 of the modified ClinEd IQ questionnaire, which assessed Interaction with Clinical Instructors. The respondents provided positive ratings for twelve of the fifteen items on this subscale. For each of these twelve items, at least 70 percent of students provided the desired response, either 'agree' or 'disagree', depending on whether the item was stated positively or negatively. The negative ratings were recorded in the following items: "created an environment in which I felt comfortable accepting challenges, even at the risk of making mistakes, and encouraged me to ask questions without fear of being put down" (31.9% disagreed); "discouraged me from taking risks and trying new things" (39.2% agreed) and "did not

Table 1: Distribution of the students based on their different Dental Schools.

Dental School	No. of respondents n (%)
Univ. of Lagos (UNILAG)	69 (25.1)
Obafemi Awolowo Univ (OAU)	51 (18.5)
Univ. of Ibadan (UI)	45 (16.4)
Univ. of Benin (UNIBEN)	44 (16.0)
Univ. of Maiduguri (UNIMAID)	20 (7.2)
Lagos State Univ. (LASU)	16 (5.8)
Univ. of Nigeria (UNN)	12 (0.4)
Univ. of Port Harcourt (UNIPORT)	12 (4.4)
Bayero Univ. Kano (BUK)	6 (2.2)
Total	275 (100)

Table 2: Mean score recorded per dental school for each of the three subscales assessed using the modified ClinED IQ questionnaire

ClinED IQ	Dental School	n	Mean	Std. Deviation	F(Anova)	P value
Subscale			(Max. score of 6)			
Clinical	UI	45	3.62	.450	0.421	1.394
Learning Opportunity	OAU	51	3.50	.405	-	-
	UNILAG	69	3.57	.656	-	-
	UNIPORT	12	3.95	.275	-	-
	BUK	6	3.38	.454	-	-
	UNIBEN	44	3.66	.773	-	-
	LASU	16	3.81	.317	-	-
	UNIMAID	20	3.64	.411	-	-
	UNN	12	3.67	.391	-	-
	Total	275	3.61	.553	-	-
Involvement in specific Learning activities	UI	45	4.21	1.068	4.992	4.931
	OAU	51	4.68	.553	-	-
	UNILAG	69	4.07	1.193	-	-
	UNIPORT	12	5.10	.423	-	-
	BUK	6	3.10	.678	-	-
	UNIBEN	44	4.17	1.098	-	-
	LASU	16	4.75	1.235	-	-
	UNIMAID	20	4.94	1.134	-	-
	UNN	12	4.65	.582	-	-
	Total	275	4.37	1.062		
Interaction with clinical instructors	UI	45	3.75	.776	1.449	3.342
	OAU	51	3.97	.513	-	-
	UNILAG	69	3.66	.758	-	-
	UNIPORT	12	4.23	.264	-	-
	BUK	6	3.81	.862	-	-
	UNIBEN	44	3.86	.741	-	-
	LASU	16	4.11	.479	-	-
	UNIMAID	20	4.35	.368	-	-
	UNN	12	3.67	.473	-	-
	Total	275	3.87	.681	-	-

Table 3: Participants response to questions on Clinical Learning Opportunities in the Dental School using the ClinED IQ questionnaire.

Clinical Learning Opportunities	Disagree %	Agree %
<i>Throughout my clinical education:</i>		
I have experienced a good mix of patients, problems and clinical experiences	11.0	89.0
The learning opportunities and mix of patients were too diverse, preventing me from developing proficiency	73.4	26.6
My experiences were repetitive and offered few new learning experiences	55.1	44.9
I increased my independence in caring for patients	14.4	85.6
I improved my communication skills.	7.6	92.4
I became more proficient in clinical skills because of opportunities to practice and receive feedback	13.7	86.3
I have had the opportunity to work in a variety of patient care settings (e.g., schools' clinic, hospital clinics, community-based clinics, private practitioner offices, mobile health vans, etc)	43.3	56.7
<i>Tell us about your experiences in the clinic:</i>		
I have experienced a good mix of patients, problems and clinical experiences	16.3	83.7
Things moved too fast for me to really learn anything (e.g., the clinic environment was hectic with too many distractions for efficient learning)	61.6	38.4
I felt like my time in the clinic was sometimes wasted with non-educational tasks such as paperwork, calling patients for appointments, doing paperwork, standing in line at the cashier or dispensary, and waiting for faculty to check my work.	65.8	34.2
The clinic functioned smoothly so that I could efficiently provide patient care	48.7	51.3
I did not feel like a useful member of the health care team	77.6	22.4
Support staff have been available and helpful (e.g, staff in patient records, dispensary, patient coordinators, assistants, laboratory technicians).	44.5	55.5
I had adequate resources available to me, which facilitated my learning (e.g., equipment, supplies, assistance when needed, materials, guidance from instructors, reference books)	56.3	43.7
For most of my clinical education, I have been able to work consistently with the same instructors who know my abilities and learning needs, rather than having different instructors almost every day	55.1	44.9

Table 4: Participants response to questions on Specific learning activities using the ClinED IQ questionnaire.

Subscale: Involvement in Specific Learning Activities	Low involvement %	High involvement %
Taking patient histories	24.3	75.7
Performing patient examinations	28.1	71.9
Taking the patients' vital signs (e.g., blood pressure, pulse/respiration, temperature, height & weight)	69.6	30.4
Interpreting laboratory tests	71.5	28.5
Assessing radiographic images	43.7	56.3
Developing my own treatment plans (versus being told what to do by instructors)	45.6	54.4
Making case presentations to instructors	28.5	71.5
Explaining the pathophysiology of patients' health problems to instructors and answering questions about pathophysiology	42.2	57.8
Discussing assessment and diagnosis with patients	38.0	62.0
Providing patient education	37.3	62.7
Discussing the linkage of basic science concepts and clinic knowledge with my teachers in the clinic	54.0	46.0
Discussing the linkage of oral and systemic health problems with clinical instructors	51.0	49.0
Assisting faculty or residents with advanced procedures (e.g., surgical procedures)	68.4	31.6

Table 5: Respondents response to questions on Interaction with Clinical instructors using the ClinED IQ questionnaire.

Interactions with Clinical Instructors	Disagree %	Agree %
My Instructors:		
Established an active role for me in patient care and gave me responsibility for managing patient care that was appropriate for my level of training.	15.2	84.8
Failed to prepare me for patient encounters (e.g. <u>did not</u> review patient histories with me, <u>did not</u> help me with prioritizing problems, <u>did not</u> demonstrate/discussion techniques I needed to use with patients).	81.7	18.3
Gave me specific and practical information that helped me improve my skills.	9.5	90.5
Instructed me at my level of knowledge and expertise rather than at their level of knowledge	19.4	80.6
Provided <u>consistent</u> instruction and feedback (e.g., my instructors have been well calibrated with each other in the advice and feedback they provide to me)	24.7	75.3
Brought to my attention techniques and strategies that I had previously not seen (e.g., willingly shared their clinical experience and expertise with me).	16.3	83.7
Made every patient encounter a positive learning experience	20.9	79.1
Created an environment in which I felt comfortable accepting challenges, even at the risk of making mistakes, and encouraged me to ask questions without fear of being “put down.”	31.9	68.1
My Instructors:		
Improved my understanding of clinical practice (such as decision making, learning new <i>diagnostic methods, selecting treatment options, developing procedural skills, etc.</i>)	11.4	88.6
<i>Discouraged me from taking risks or trying new things</i>	60.8	39.2
<i>Did not check my work frequently and did not provide me with timely feedback when I needed it.</i>	66.5	33.5
Demonstrated the value of respecting patient preferences even when they differed from my <i>own</i>	16.3	83.7
<i>Encouraged me to become increasingly independent over time.</i>	21.3	78.7
<i>Criticized me without offering suggestions for improvement</i>	73.0	27.0
<i>Respond promptly to requests for consultation, assistance, feedback or evaluation</i>	29.3	70.7

check my work frequently and did not provide me with timely feedback when I needed it” (33.5% agreed).

Discussion

The importance of assessing students' feedback on the quality of clinical training they have received cannot be overemphasized. The significance of this study is reinforced by its national outlook, as it captures the perceptions of dental students from all nine accredited dental schools in the country during the study period. Previous studies carried out were restricted to the dental schools in the South western or Northern region of the country.⁵⁻

¹⁰ Furthermore, majority of these studies did not use standardized or validated instruments for data collection,^{3, 5, 6} thus making comparisons difficult, particularly with similar studies carried out elsewhere in the world.

Several studies have been carried out to find out what effective clinical teachers do, particularly with respect to the Dental school environment.¹¹⁻¹⁶ An effective clinical teacher in the dental school, is one who provides specific feedback about performance, demonstrates an interest in teaching, motivates the

students, knows how to translate didactic information into patient care situations, explains difficult concepts clearly and shows compassion, among other attributes.^{13,14} These attributes are mainly based on feedback received from dental students in the Western world, however, similar standards are also expected from dental faculty in a developing country like Nigeria. This is because, despite the environmental challenges faced in the dental school environment in Nigeria,^{3,5} the aim should be to provide the best possible training to undergraduate dental students comparable to what that obtains in more developed countries.

The nine dental schools surveyed could be divided into old and new generation dental schools. The old generation schools are those that had been in existence for over thirty years namely the dental schools in the Universities of Lagos, Ibadan, Ife, Benin and the University of Nigeria, Nsukka, while the other four dental schools (LASU, UNIPORT, BUK and UNIMAID) could be considered the younger generation dental schools, haven all been established within the last twenty years. For a very long time the old generation dentals schools were the only dentals schools in the country and they were all located within the Southern part of Nigeria, particularly the Southwest. The need to extend undergraduate dental education to other parts of the

country led to the establishment of the newer generation dental schools in other parts of the country. A survey of the study participants per dental school showed that the University of Lagos had the highest number and this is not surprising considering the fact that it is the oldest dental school in the country. In addition, this is further buttressed by the fact that it has the highest training quota for dental students in the country by the Medical and Dental Council (MDCN), which is 40 students. Conversely, Bayero University Kano had the lowest percentage of participants and this is underscored by the fact that they also have the lowest quota for undergraduate dental training in the country, which is 10 students.

It is interesting to note that the highest mean scores for 'Clinical learning opportunities' were recorded by the relatively younger generation dental schools, Port Harcourt and LASU respectively. This may be as a result of the availability of newer training facilities and the smaller teacher to student ratio in both schools. The older generation dental schools such as Lagos, Ibadan and Ife recorded comparatively lower mean scores and this may be related to the depreciating infrastructure and larger student populations in these schools, which may have adversely affected the clinical learning opportunities of the students. It is also noteworthy that these training facilities are also shared by a large number of postgraduate resident trainees in these same institutions. These findings are supported by those of a previous study which reported that poor electricity supply and inadequate dental chairs were part of the major infrastructural challenges affecting the training of dental students in these schools.⁵ Similar findings were reported by the students for 'Involvement in specific learning activities', and 'Interaction with clinical instructors. Students in the younger generation dental schools such as Port Harcourt, Maiduguri and LASU recorded the highest mean scores respectively, while those in the older generation schools such as Lagos, Ibadan and OAU recorded relatively lower scores. This finding is in tandem with a previous study carried out in the University of Maiduguri dental school in which the students reported a positive learning and dental school environment.¹⁰ The same reasons may be adduced for these differences as previously highlighted. However, these results portray a worrying trend that requires urgent attention. This is because a conducive learning environment is critical to sound undergraduate training in dentistry.

The percentage distribution of participants' response in respect of clinical learning opportunities also revealed interesting findings. The low mean values recorded by the dental schools for 'Clinical learning opportunities' as compared with 'Interaction with clinical instructors' imply that Nigerian Dental students do not perceive that they gain as much from the whole clinical setting as they do from interactions with the individual instructors. Similar findings were reported in a study carried out

among North American Dental Students.¹ Indeed about one third of the students surveyed in this study, reported that a lot of time in the clinic was spent on non-educational tasks such as calling patients and waiting for faculty to review their work, while over half of the students reported that they had limited infrastructure and materials to work with and insufficient support staff available. Similar findings were reported in a related study carried out in the three oldest dental schools located in Southwestern Nigeria.⁹ All these underscore the environmental difficulties that face undergraduate dental education in Nigeria.

It is also important to note the positive findings from the study with respect to clinical learning opportunities for the students. Majority of these positive ratings can be attributed to the positive influence and training received from the faculty members/clinical instructors. Among these are the marked improvement in communication skills, clinical proficiency, independence in care and the exposure to good patient management. All these have also been previously reported among Nigerian and North American dental Students.^{1, 9} An important finding from this study, which has also been reported in other studies^{1,9} is the limited opportunity for students to work in a variety of patient care settings. A possible remedy to this is increased exposure to Community clinics, General hospitals and private dental clinics as part of the compulsory clinical rotations for dental students in the country.

The fact that only three clinical learning activities, namely: taking patients histories, performing patient examinations and making case presentations to instructors; recorded high involvement by majority (over 70 percent) of the students is quite worrisome. This finding is in contrast with findings from a similar study in dental schools in South western Nigeria, in which a high involvement was recorded in seven activities, including, assessing radiographic images, developing individual treatment plans; providing patient education and discussing and assessing diagnosis with patients⁸. These findings may be a pointer to a possibly negative trend of reduced involvement in clinical learning activities by dental students across the country which needs to be urgently addressed. The findings of this study are also in contrast with a study similar study in North American Dental students, which recorded a greater involvement in clinical learning activities, with a high involvement recorded in eight out of the thirteen items. However, a common thread to all three studies was the fact that students reported limited involvement in discussing the relationship between oral and systemic diseases and also in discussing the linkage between basic science knowledge and clinical cases. Thus, this is an area requiring urgent attention in clinical dental training in Nigeria and indeed worldwide, as the importance of a well-grounded knowledge of the basic sciences cannot be over-emphasized. This is important considering the recent emphasis on the oral-systemic interrelationship. Teaching strategies and educational

organization should therefore be geared towards substantively supporting this oral-systemic link as it relates to patient care in dental curriculums¹⁷.

In this study, the low involvement recorded in activities such taking vital signs, assessing radiographic images and discussing linkage between basic science concepts and clinic knowledge, amongst others may be as a result of the greater emphasis placed on clinical dental procedures, in the different dental schools. This implies that a lot more needs to be done to ensure that students are more actively involved in these key areas of patients' management. A major way of achieving this may be through the inclusion of these activities as part of the required clinical competencies and assessment required of students and in which they are also assessed.

The positive ratings recorded for interaction with clinical instructors indicates that Nigerian Dental Students have a good relationship with their faculty members. Similar findings have been reported for North American and Nigerian dental students^{1,8}. However, about one third of the students reported that their instructors did not check their work frequently or provide them with timely feedback, when needed. This is associated more with the older generation dental schools and may be due to larger student: faculty ratio, which explains why the newer generation schools had better mean ratings. It is important to note that providing prompt, frequent and constructive feedback is very important in dental education. From the dental student's perspective, those faculty members who are able to provide helpful and prompt feedback and accurate evaluations are viewed as the most effective instructors¹.

This study also has some limitations. A major limitation is the fact that the qualitative aspect of the ClinED IQ questionnaire was not used, as that would have provided a qualitative assessment of the students' perception. Furthermore, the ClinED IQ was originally designed for medical students and although there are similarities between medical and dental training, some of the original interpretation in the questionnaire could have been lost in substituting 'medical' for 'dental'. A similar limitation was reported in the study carried out by Henzi et al¹.

Overall, it is hoped that the findings from this study will be utilized in the future planning and improvements of the clinical training curriculum of undergraduate dental students in Nigeria.

Conclusion

Nigerian dental students perceive that they benefit from their interaction with their clinical instructors much more than from the entire clinic setting. Although the dental students have a good interaction with their faculty members and also learn a lot from them, there are a large number of impediments to learning in the

dental school environment and its present level of organization. The students also perceive that they are not actively involved in a large number of specific clinical learning opportunities in the dental school. The findings from this study indicate that a lot more needs to be done to improve on the clinical learning environment for dental students, in the different dental schools in Nigeria.

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