Does periodical department audit really works to make things fall in place: A Geriatric/General Oral Health Assessment Index based audit in prosthodontics

Varsha Murthy, Yuvaraj Vaithilingam¹, Soorya Shivaprasad², Naveen Yadav³, Shivaprasad Dayalan⁴

Departments of Prosthodontics and ¹Oral and Maxillofacial Surgery, Indira Gandhi Institute of Dental Sciences, ²Department of Periodontics, Mahatma Gandhi Postgraduate Institute of Dental Sciences, ⁴Department of Dental Surgery, Private Practitioner (Vijaya Dental Clinic and Research Centre), Puducherry, ³Department of Prosthodontics, Peoples Dental Academy, Bhopal, Madhya Pradesh, India

Abstract

Purpose: The purpose was to assess the outcome of improved staff supervision on the efficiency and quality of complete dentures delivered by clinical students. **Materials and Methods:** The audit was performed in two parts. In the first cycle, retrospective analysis for complete dentures delivered by clinical students was undertaken, and patient's satisfaction was graded using Geriatric/General Oral Health Assessment Index (GOHAI). All the impeding factors encountered in the first cycle were identified, and corrective measures were implemented. Subsequently, a prospective analysis for the dentures delivered under strict staff supervision was undertaken in the second cycle. Patient satisfaction was graded again using GOHAI. **Results:** Improved staff supervision increased the patient satisfaction significantly. **Conclusions:** The quality of care had improved in leaps and bounds compared to the first cycle due to increased level of supervision and strict adherence to the recommendations made at the end of the first cycle.

Key Words: Clinical audit, complete denture, Geriatric/General Oral Health Assessment Index, oral health related quality of life

Address for correspondence:

Dr. Varsha Murthy, Department of Prosthodontics, Indira Gandhi Institute of Dental Sciences, Mahatma Gandhi Medical College Campus, Pondy-Cuddalore Main Road, Pillayarkuppam, Puducherry - 607 402, India. E-mail: drvarshamurthy@gmail.com

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INTRODUCTION

Edentulism is regarded as a poor health outcome since it may compromise an individual's quality of life. Majority of these edentulous patients are treated in teaching institutes in which a large number of complete dentures are delivered by final year students and interns guided by staff members. A successful treatment depends on three factors namely efficient work by the clinical student, appropriate guidance by staff members and

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patient cooperation and satisfaction. The confluence of these factors leads to a successful treatment [Figure 1]. Both final years and as well as interns work under the supervision of staff, therefore evaluating the quality and efficiency of the treatment procedures and the treating doctor becomes mandatory for the welfare of any department. Furthermore, patients with identical clinical problems receive the dissimilar care, therefore, to arrive at a consensus with regards to the various clinical and treatment aspects of edentulous patients, clinical audit can be performed. Clinical audit is a quality improvement process, which seeks to improve patient care wherein the process and outcome of care are selected and systematically evaluated against explicit criteria.^[1] It is a cyclic and multidisciplinary process involving a series of steps ranging from planning the audit (by measuring the performance) to implementing and sustaining the change. Audit is defined as "the systematic appraisal of the implementation and outcome of any process in the context of prescribed targets

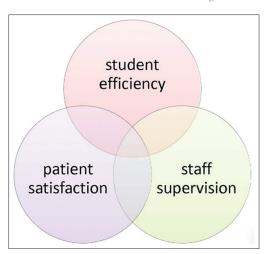


Figure 1: VENN diagram showing correlation of factors responsible for a successful treatment

and standards."^[2] For doing an audit, various methods can be utilized as tools to assess the self-perception of oral health and its impact on the quality of life of individuals, e.g., Oral health related quality of life questionnaires like the Oral Health Impact Profile (OHIP), Oral Impacts on Daily Performance etc.^[3-8] One of such instruments is the Geriatric/General Oral Health Assessment Index questionnaire (GOHAI).^[9]

Dental clinical auditing is nowadays evolving worldwide, but still with many areas unfolded. Although there are plenty of studies^[10-12] for assessing patient satisfaction/quality of complete dentures and concluding correlation between oral health related quality of life and denture satisfaction but there are very few clinical dental audits conducted dealing with quality of complete dentures in prosthodontics.^[13-15] Changes indicated from such audit process can be implemented at an individual, team, or service level and further monitoring can be done to confirm improvement in healthcare delivery. Since we encountered more number of postinsertion complaints from elderly complete denture wearers treated by final years and interns in our institution, therefore it was mandatory to assess the reason for the same and initiate necessary measures for correction.

Therefore, an audit was designed to assess the efficiency and quality of complete dentures delivered by final year students and interns after improved staff supervision.

MATERIALS AND METHODS

After obtaining Research and ethical committee approval, we performed a clinical audit in our Department. We encountered more number of postinsertion complaints from complete denture wearers treated by final years and interns in our institution, therefore to assess the reason and to initiate necessary measures for correction, we planned for a clinical audit in two cycles wherein patient satisfaction was assessed using GOHAI [Figure 2].

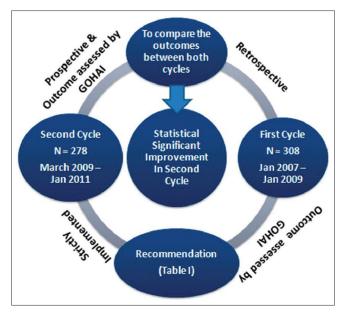


Figure 2: Audit cycle in complete denture

All the complete denture patients for whom complete data were available were included. Complete denture wearers who had incomplete records and those who could not be contacted were excluded. Patients were explained about the study, and informed consent was taken. Since the study was time bound, so we included all the patients who fulfilled our inclusion criteria for a stipulated (around 2 years) time both in first and second cycle. The age of the participants ranged from 42 to 75 years, with the mean age of 58 ± 8.12 years.

In the first cycle of the audit, all the complete denture patients treated from January 2007 to January 2009 by interns and final years were recalled. These patients were given the GOHAI questionnaire, and the scores were obtained. A single investigator interviewed the study subjects based on preference of their language. The investigator was trained and calibrated in the department before the commencement of the study and a kappa consistency of <0.05 was maintained. Of 430 patients treated during that period, only 308 (76 males and 232 females) fulfilled our selection criteria.

Detailed analysis of the GOHAI responses obtained in the first cycle was done and based on that recommendations were suggested for improvement, circulated to the staff members of the Department, and their consensus was taken. The recommendations included increasing the number of clinical demonstrations for students, by teaching lab procedures and aiding students in improving their communication skills with patients. These recommendations [Table I] were strictly implemented.

To assess the progress, a second cycle of audit was planned from March 2009 to January 2011, which consisted of the

Table 1: Recommendations implemented after analyzing results of first cycle

Preprosthetic phase

All patients having systemic diseases were asked to get medical opinion before starting of the procedure

Requisition to the department of oral and maxillofacial surgery to do alveoloplasty (if necessary) at the time of extraction and to refer completely edentulous patients immediately after the extraction to the department of prosthodontics so that patients could be educated regarding the importance of fabricating a denture over a healthy residual ridge

Personalized counseling and training of the patients during and after the administration of the dentures by showing educational videos Impression making

Marking of denture extension in the master cast and get the same verified before making the temporary/permanent denture base Accurate recording of posterior palatal seal during preliminary as well as final impression stage

Jaw relation

Compulsory use of face bow transfer and semi-adjustable articulators Confirmation of vertical dimension was with the help of two or three methods

Patient training for centric relation from the first appointment Final try-in

Compulsory selection of the teeth set and approval from the patient before starting tooth arrangement

Obtaining consent from the patient and family member regarding shade and size of the teeth on final try appointment

Denture construction

Compulsory lab remounting for all cases

The fabricated dentures were thoroughly checked for any irregularities

Postinsertion

Patients were made aware about the disadvantages of using denture adhesives and the importance of periodic follow-up appointments Worried, nervous and self-conscious patients were especially counseled in a sympathetic manner by the staff and the students Patients were made aware about the limitations of the dentures as artificial prosthesis

Pre and postoperative e photographs were taken to explain the improvement in esthetics

different set of complete denture patients treated during that period by interns and final years. Again the quality of denture delivered during this period was assessed using same GOHAI questionnaire. A total of 278 patients (92 males and 186 females) were included who satisfied the inclusion criteria; GOHAI questionnaire was administered to them and scores were obtained. In the entire study, two calibrated staffs were employed to avoid bias and a kappa consistency of <0.05 was maintained between them. They were instructed about the problems encountered and the difficulties faced by the patients in the first cycle.

All the patients participating in both the cycles were told to complete the questionnaire and their satisfaction responses were graded from I (Never) to 5 (Always). Standardized GOHAI questionnaire in English^[9] was used for the study. It is composed of 12 items that deal with oral health conditions, by self-perception in three dimensions: The physical, psychosocial and that of pain or discomfort. The physical dimension includes eating, speech and swallowing. The psychosocial

includes worry/concern about and interest in oral health, dissatisfaction with appearance, self-consciousness about oral health, and avoidance of social contacts because of oral problems. The dimension of pain and discomfort includes the use of medications to relieve pain or discomfort from the mouth. For each question, the questionnaire offers the alternatives never, seldom, often sometimes and always which are given scores 1, 2, 3, 4 and 5, respectively. The index is the result of the sum of scores to the questions on a scale from 12 to 36 so that the higher the score, the better the oral health self-evaluation. Last question deals with sensitivity to hot, cold or sweet food which is not applicable to edentulous patients.

Geriatric/General Oral Health Assessment Index scores obtained from both the cycles were compared to find out if any improvement was there in the level of patient satisfaction owing to the recommendations implemented. The data obtained were compared and subjected for statistical analysis using Statistical Package for Social Science (SPSS, Version 19; IBM SPSS Inc., Chicago, Illinois, USA) software and appropriate conclusions were drawn. Student's *t*-test was performed and the Kruskal–Wallis test was used to assess score differences among the GOHAI domains.

RESULTS

The above study dealt with the assessment of the efficiency and quality of complete dentures delivered by clinical students after improved staff supervision. The study was carried out in two cycles. In the first cycle which was retrospective, GOHAI scores were obtained, and it was found that the problems were due to lack of proper patient education and inappropriate execution of procedures by the students. Therefore, keeping this in mind recommendations were made for correction of these problems [Table I]. After implementing the recommendations, the second cycle was planned, and GOHAI scores were obtained from another set of patients. Scores obtained from both the cycles were compared.

The mean scores of each domain between two cycles using t-test were tabulated [Table 2]. It was found that the lower the score, the better was the satisfaction of the patients with the dentures. It was observed that the second cycle patients were more satisfied as shown by mean (\pm standard deviation) score 3.8I (\pm 1.4I) than in the first cycle 5.19 (\pm 1.23). This difference was found to be statistically significant (P<0.001).

The frequencies and percentages of the distribution of subjects according to the different responses for GOHAI items were calculated [Tables 3 and 4]. Patients who limited contact with people in the first and second cycle also reduced significantly by 29%. Patients who were uncomfortable eating in front of others also reduced by 9.4% as compared to the first cycle.

There was a significant decrease of 25.4% in patients who complained of the problem with speaking clearly.

There was a significant decrease of 39.2% in patients who complained of limiting the kind of food. There was a significant decrease of 37.9% in patients who faced the discomfort while eating any kind of food in the second cycle. 67.5% of patients had difficulty in swallowing comfortably

Table 2: Comparison of mean scores of each domain between two cycles using student's *t*-test

Domain	Cycle	n	Mean	SD	t	Р
Behavioral	1	308	5.195	1.417	12.509	<0.001*
	2	278	3.817	1.231		
Functional	1	308	8.276	1.679	13.002	<0.001*
	2	278	6.378	1.855		
Pain	1	308	6.789	1.573	10.58	<0.001*
	2	278	5.410	1.577		
Psychological	1	308	11.101	1.952	16.28	<0.001*
	2	278	8.424	2.025		

^{*}Statistically significant as P<0.001. SD: Standard deviation

in the first cycle whereas in the second cycle it showed a decrease of 43.4%. 32.4% reduction was found in the patient who used medication to relieve pain as compared to the first cycle.

Worry or concern about the dentures in first cycle reduced by 38.8%. Patients who were nervous/self-conscious in first cycle also reduced by 36.8%. A significant increase of 18% was noticed in patients who were pleased with the appearance in second cycle. In the first cycle patient who complained of trouble while biting or chewing in the first cycle also showed a reduction of 22%. Last question (patients who were sensitive to hot, cold or sweet foods) was not significant as the patients were edentulous.

Therefore the results show a significant improvement in the GOHAI scores in the second cycle (statistically significant as P < 0.001) thereby indicating an improvement in patient satisfaction level.

Table 3: Distribution of subjects according to the responses for GOHAI items (1-6) in the first and second cycle and results of Kruskal–Wallis test

GOHAI items	Cycle	Never	Seldom	Sometimes	Often	Always	Kruskal-Wallis test
							H
1. Limits contact with people	First (n=308)						
	n	41	97	129	32	9	70.89**
	%	13.3	31.5	41.9	10.4	2.9	
	Second (<i>n</i> =278)						
	n	113	92	61	10	2	
	%	40.7	33.1	21.9	3.6	0.7	
2. Uncomfortable eating in front of others	First (<i>n</i> =308)						
	n	41	59	149	29	30	52.14**
	%	13.3	19.2	48.4	9.4	9.7	
	Second (n=278)						
	n	110	62	68	34	4	
	%	39.6	22.3	24.5	12.2	1.4	
3. Problems to speak clearly	First (n=308)						
	n	39	91	130	41	7	17.16 * *
	%	12.7	29.6	42.2	13.3	2.3	
	Second (n=278)						
	n	59	129	33	48	9	
	%	21.2	46.4	11.9	17.3	3.2	
4. Limit the kinds of food	First (n=308)						80.81**
	n	43	98	112	45	10	
	%	14	31.8	36.4	14.6	3.3	
	Second (n=278)						
	n	89	147	22	18	2	
	%	32	52.9	7.9	6.5	0.7	
5. Discomfort while eating any kind of food	First (n=308)						82.51**
	n	46	91	116	52	3	
	%	14.9	29.6	37.7	16.9	1	
	Second (n=278)						
	n	98	131	35	11	3	
	%	35.3	47.1	12.6	4	1.1	
6. Problems to swallow comfortably	First (n=308)						107.65 * *
•	n	28	72	97	77	34	
	%	9.1	23.4	31.5	25	11	
	Second (n=278)						
	n	97	114	32	25	10	
	%	34.9	41	11.5	9	3.6	

^{**}P<0.01-significant at 1% level. There is a significant difference between two cycles. GOHAI: Geriatric/general oral health assessment index

Table 4: Distribution of patients according to the responses for GOHAI items (7–11) in the first and second cycle and results of Kruskal–Wallis test

GOHAI items	Cycle	Never	Seldom	Sometimes	Often	Always	Kruskal-Wallis test
							Н
7. Used medication to relieve pain	First (n=308)						
	n	62	41	139	59	7	55.63**
	%	20.1	13.3	45.1	19.2	2.3	
	Second (n=278)						
	n	141	42	59	23	13	
	%	50.7	15.1	21.2	8.3	4.7	
8. Worried about teeth, gums or dentures	First (n=308)						
	n	32	42	17 1	41	22	100.75**
	%	10.4	13.6	55.5	13.3	7.1	
	Second (n=278)						
	n	103	72	89	13	1	
	%	37.1	25.9	32	4.7	0.4	
9. Self-conscious of teeth, gums or dentures	First (n=308)						
	n	30	44	169	47	18	93.78**
	%	9.7	14.3	54.9	15.3	5.8	
	Second (n=278)						
	n	101	68	94	10	5	
	%	36.3	24.5	33.8	3.6	1.8	
10. Pleased with look of teeth	First (n=308)						
	n `	53	109	120	20	6	18.85**
	%	17.2	35.4	39	6.5	2	
	Second (n=278)						
	n	98	102	31	37	10	
	%	35.3	36.7	11.2	13.3	3.6	
11. Trouble while biting or chewing	First (n=308)						
5 3	n `	39	108	109	44	8	55.30 * *
	%	12.7	35.1	35.4	14.3	2.6	
	Second (n=278)						
	n	101	93	75	8	1	
	%	36.3	33.5	27	2.9	0.4	

^{**}P<0.01-significant at 1% level. There is a significant difference between two cycles. GOHAI: Geriatric/general oral health assessment index

DISCUSSION

It is of paramount importance that we constantly reevaluate our performance, identify deficiencies and rectify them. Audit is one of the many ways by which we can perform effective self-evaluation. In this study, we correlated the dissatisfaction of the patients (based on the grading of GOHAI) with the reasons for the same veiled in denture construction and insertion procedures. In our audit, it can be well appreciated that increased supervision helped in improving the quality of work rendered. This finding is in concurrence with many studies.^[18-20] A significant improvement in quality of life of patients was observed based on their satisfaction level. Valuable improvements were achieved in carrying out this clinical audit. In particular, importance of improved staff supervision and the impact it has created in improving the quality of dentures delivered cannot be over emphasized.

Audit on the provision of dentures is not uncommon.^[13-15] These audits focused on the referral letters, perceptions of care by patients and the quality of the prosthesis. Dable *et al.*^[11] evaluated the oral health related quality of life before and after administration of the prosthodontic care in 63 patients.

Similar study was done by Viola et al.[12] in 70 patients treated by undergraduate students wherein OHIP-EDENT was conducted before and after 3 months of receiving new dentures. However in our study, we evaluated the problems encountered in the first cycle using GOHAI questionnaire and after doing modifications as well as increased staff supervision, the improvement in oral health related quality of life was determined. GOHAI consists of questions that reflect on the aspects which are considered to have an impact upon the quality of life of the older population, such as functional limitation, esthetic dissatisfaction, chewing discomfort, avoidance of certain food, the avoidance of social contacts and selfmedication administered for dental pain. [21] The 12th question dealing with sensitivity to hot, cold or sweet food did not yield significant results and so can be eliminated from the questionnaire as the patients were completely edentulous.[11,17]

In our study it was observed that audit ultimately helped us to find out common hiccups faced by students in clinical procedures (like border molding and recording accurate final impression, posterior palatal seal, face-bow transfer, recording of vertical jaw relation, centric relation, and focus more on these issues by increasing the number of clinical demonstrations), lab procedures (increasing

demonstrations for the use of semi-adjustable articulators, lab remounting to the students and concentrating more on these lab procedures by strict guidance by staff members), lack of communication skills in the students (students were motivated to increase rapport with the patient by explaining and educating patients with videos, clinical preoperative and postoperative photographs regarding motivation toward treatment, steps in the denture construction, time involved in the procedures, postinsertion counseling with the help of videos, photographs and models).

The difficulties observed in the above steps were rectified in second cycle by strictly implementing the recommendations. Following which it was found that there was more satisfaction of patients (as evident from statistically significant results as P < 0.001), difference in GOHAI scores in terms of function, speech, pain and discomfort and psychosocial aspects and also a positive change in undergraduate training as well as quality of work (Reduction in GOHAI scores, number of visits for denture construction, number of postinsertion visits, etc). Feedback forms were given to the patients and told to fill in their language during the postinsertion checkup, regarding the treatment experience in the department. The feedback forms were analyzed by all the staff members, and steps were taken for implementation of the suggestions given by the patient.

Audit certainly has its own limitations such as it is time taking and involves patience from the patients in filling the questionnaire and cooperation from the staff in implementing the modified changes. Furthermore, GOHAI is not an instrument to detect the quality of the prosthesis.

CONCLUSION

As a quality improvement tool, audit can demonstrate that real efforts are being made by dedicated hard pressed staff to deliver high-quality professional care to all their patients. Although this audit focused on denture delivery system, but the recommendations suggested can be applied to other prosthodontics procedures as well. Although an audit of this nature is demanding of clinician's time but it does show where improvements can be made in patient management which will result in better health care resulting in improved quality of life. If the use of audit is conducted efficiently, it can result in wide-ranging benefits for both patients and practitioners, by ensuring the best use of limited resources and constantly evaluating and improving the quality of care.

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