APPROPRIATENESS OF KNOWLEDGE AND PRACTICES OF DENTISTS RELATING TO USING CLASPS IN REMOVABLE PARTIAL DENTURES

Muhammad Fayyaz, Fazal Ghani

Department of Prosthodontics, Dental Section, Ayub Medical College, Abbottabad, *Khyber College of Dentistry, Peshawar, Pakistan.

Objectives: To investigate the knowledge and appropriateness of practices relating to RPD clasps of dentists working in NWFP. **Study Design & Setting:** A questionnaire-based-survey conducted at the Department of Prosthodontics, Khyber College of Dentistry Peshawar. **Subjects & Methods:** Participant's qualifications, experience in dental practice and the proportions of practice time they devoted to RPD services were recorded. Their knowledge and practices appropriateness relating to RPD clasps were documented as responses to statements pertaining to use, design and type of clasps and problems, causes and management methods for replacing RPD clasps. **Results:** One hundred out 153 dentists completed questionnaires. Participants were house officers (23%), dental practitioners only BDS qualified (63%), and specialists (14%). Their mean practice experience was 8.4 years with <30% time given to RPD services. Delegation of RPD design to technicians was routine. Seventy-four percent dentists preferred wrought-wire-clasps. Circumferential and projection clasps were used by 52% and 40% respectively. Sixty-nine percent were not surveying jaw-cast with 62% not knowing correct cast-tilt for identifying undercuts for clasps. Correct amount of undercut was not known for cast-cobalt-chromium and steel-wire clasps on molars to 68% and 52% dentists respectively. Seventy-six percent and 66% were unfamiliar with using Adams and RPI design clasps respectively. Some more than half of dentists were experiencing clasp fit and clasp seating problems or their RPD eliciting the complaint of pain in abutments. Many did not know methods for adjustment or replacement of RPD clasps. **Conclusion:** Appropriateness of knowledge and practices of local dentists were considered poor. Need for enhancement of RPD clasp understanding is highlighted.

KEYWORDS: Removable partial dentures, Clasps, Knowledge, Practices.

INTRODUCTION

A removable partial denture (RPD) is considered retentive by its ability to resisting its dislodgment from the mouth along a path perpendicular to the plane of occlusion. Both physical, neuro-physiological and mechanical principles and methods are utilized for deriving effective retention for RPDs.[1] Components such as clasps and precision attachments enhance denture retention by mechanical action. However, clasps being the easiest to fabricate and the most economical components, are the most commonly used direct retainers in RPDs. Many types and designs of clasps have been advocated for use but clinical experiences lead us to suspect that irrespective of their type and design, many will function inadequately either immediately or after a period of service and thereby becoming less efficient or damaging to the adjacent oral and dental tissues. This has been confirmed as early as 1963 by Professor John Bates (Late) who found that the clasps of almost all dentures were not touching the teeth when in mouth.[2,3] He speculated that all such clasps were probably deformed permanently from the very first occasion on which RPDs were fitted in the patient's mouth. These finding were further reinforced in 1968, when Firtell[4] noted a 25% loss in the retention forces of his test RPDs after a number of insertions and removals. Later, Ghani and Mahood further affirmed that the load required to deflect clasps of identical design by 0.25 mm was not only highly variable but they also exhibited substantial permanent deformation during a six months period of simulated denture wearing.[5,6]

A subsequent survey of RPDs in UK also showed a more disappointing situation by confirming that about 40% of the RPDs made by specialist and consultant prosthodontists were actually never worn by patients.[7] The most common reason for this was the pain and discomfort, insecurity and functional inefficiency associated with those new RPDs in the patient's mouth. Other studies have shown the effect on retention of removable partial denture of the number of clasps and amount of undercut to be engaged by the retentive free terminal part of the clasp on abutment tooth.[8–10] These findings indicate that despite clasps being the most commonly used retaining devices in RPDs, their behaviour, and principles of construction and incorporation have not been properly understood. In a follow-up study spanning over 8-years, on the fit of direct retainers in RPDs by Keltjens *et al*[11], it was found that 60% of the clasps studied showed a space between their fitting surfaces and abutments. The age of removable partial denture, the type of opposing dentition and a non-rigid extension base of the denture were considered as the most significant factors influencing their results.

All the above quoted studies conducted in countries of the developed world highlight that neither clinicians nor dental laboratory technical personnel have been knowledgeable and aware enough about the principles, design and positive attributes of clasps in RPDs that are routinely recommended and emphasized.[1,12,13–20] Therefore, it could be reasonably expected that our local dentists could be even more poorly prescribing clasps and not properly utilizing their benefits. They could also be less able to cope with problems related to clasps in RPDs. The aim of the present survey is thus to collect information from local practicing dentists of varying clinical experience, skill and educational background regarding the appropriateness of their knowledge and practices relating to the use of clasps in RPDs.

SUBJECTS AND METHODS

A questionnaire containing questions/statements was structured and following a purposive convenience sampling method to obtain data about the knowledge, and practices of dentists working in the North-West Frontier Province (NWFP) regarding the use of clasps in RPDs. The names and contact details of those working for government were obtained from the Directorate General Health Services of the Government of NWFP. A covering letter was attached with each questionnaire requesting them to return the questionnaire as early as possible with a note of thanks for cooperation on their side. A self-addressed, pre-stamped envelope ensuring the receipt of the filled questionnaire by the investigators from the participant was also included. The survey involved dentists holding recognized and register-able qualification of the Pakistan Medical and Dental Council (PM&DC) and also those working as senior house job trainees who had completed their first six months of house job training in a teaching hospital/institution. Sufficient time (2-months) was given to participants so that they could fill the questionnaire with answers to all the questions/statements. To avoid the chances of having duplicate sets of data from the same dentist, no questionnaire was sent as repeat. Those who were sent the questionnaire were followed and pursued till complete data sets were received from 100 dentists. In all cases anonymity and confidentiality of the participants personal and practice information as well as of their responses to questions and statements were assured.

The questionnaire was structured to collect data of the participants practice experience and qualification, proportion of practice time they devoted to RPD making, type and design of clasp employed, cast-surveying, cast-tilt selection for identification of undercut for clasps, amount of undercut recommended for cast cobalt-chromium-clasp and for wrought wire stainless steel clasp, use of Adams and RPI clasps in RPDs, fit and adaptation of the clasp to abutment teeth, pain in abutment tooth with a clasp, causes of clasp problems and approaches to clasp adjustment and replacement. Descriptive statistics in the form means and standard deviations, percentages and proportions were computed for the quantitative and qualitative data.

RESULTS

A total 153 questionnaires were distributed by both mail (n= 132) and personal contact (n= 21) to dentists working in the various hospitals and health centres or practices in the province. The study continued till the receipt of 100 completed questionnaires from dentists. This required the sending of questionnaires to 153 dentists thus giving a response rate of 65%. The respondent dentists had a widely varying practice involvement experience ranging between 0.5–35 yeas with a mean experience of dental practice of 8.4 years. The data collected from participant dentists are summarized in Tables 1–3.

Table-1 details the distribution of different dentists in terms of their qualification and length of clinical experiences. It also details the proportions of practice time they devoted to the provision of RPDs and their preferences for the various types and designs of RPD clasps.

Table-1: Descriptions related to participating dentists.

Description	%age
Response rate of dentists.	65
Dentists details:	
House-officers.	23
General Dental Practitioners.	63
Specialist dentists.	14
Practice time devoted to RPD services.	<30
Wrought clasps preferred by.	74
Cast clasps preferred by.	18
Occlusally-approaching clasps preferred by.	52
Gingival-approaching clasps preferred by.	40

Table-2 details the proportions of dentists following the mentioned aspects and practices considered as inappropriate regarding RPD clasps. These included inappropriate practices related to undercut selection without jaw-cast surveying, use of inappropriate cast-tilt for selecting undercut for clasps, use of inappropriate amount of undercut for a particular clasp design and situation and their unfamiliarity and knowledge regarding special design clasps that could be considered in RPDs in specific clinical situations.

Table-3 details the data relating to the proportions of dentists experiencing clasp and RPD retention related problems and of their knowledge about the causes and management approaches for the mentioned problems. It is clear that not only a great majority of dentists were experiencing clasp and RPD fit related problems in the RPD they were providing to their patients but they were also unaware of the management approaches, specifically to clasp adjustment and clasp replacement techniques.

Table-2: Inappropriate aspects related to RPD practice.

Dentists aspect of RPD practice	Percentage
Not surveying jaw-cast themselves for clasp undercut selection.	69
Using inappropriate cast-tilt for clasp undercut selection.	62
Inappropriate undercut selection for cast Co-Cr clasps on molars.	68
Inappropriate undercut selection for stainless-steel wire clasps on molars.	52
No experience of using Adam's clasp in RPDs.	76
No knowledge or experience of using RPI clasp in mandibular DES RPDs.	66

Table-3: Dentists experiencing RPD clasp problems and knowledge of their causes & management.

RPD Problems and their causes and management	Percentage
Dentist experiencing the problem of inappropriate fit of clasps at RPD fitting stage.	55
Dentists experiencing the problem of inappropriate clasp-seating RPD fitting stage.	58
Dentists receiving post-insertion complaint of pain in abutment from patients.	42
Dentists experiencing their RPDs as poor-fitting	40
Dentists not knowing about adjustment & replacement of deformed / broken clasp.	45
Dentists not knowing a recommended method for clasp replacement in RPD.	99

DISCUSSION

Some of the data presented in Tables 1–3 clearly depict findings that could be considered of serious concern. Irrespective of the qualifications and length of clinical experiences of the dentists, the proportions of practice time they were giving to RPD services were very small (<30%). From the very low proportions of dentists preferring the use of cast-clasps in RPD, one could indirectly estimate the very low level on their involvement in cast RPD work. This is a finding that supports those of another local study that investigated the dentist's experiences, practices and understanding of some design statements regarding mandibular Kennedy class-I RPDs.[21] However, these are in contrast to what has been found a routine in developed countries. In these countries dentist are more involved in cast RPD work.[22–24] The more involvement of our local dentist in the acrylic RPD related work could reflect on the lack of availability of skilled technical and clinical personnel, lack of facilities and even poor economic conditions of local patients.

Similarly, inspection of the data in Table-2, could clearly indicate that a very large proportion of dentists were either unaware of or were following practices that could hardly ensure appropriate designing of RPDs for patients. Of specific concerns were the large proportions of dentists not doing jaw-cast surveying, not knowing the selection method and amount of undercut for a particular type and design of clasp as well as not familiar with the use of special clasp designs (Table-2). Extremely worrying are also the large proportions of dentists who were experiencing, in the RPDs of their patients, problems related to clasp fit, RPD fit and were not knowing the causes for these as well as their management approaches (Table-3).

On many events, the responses given by dentists were inappropriate or they preferred no response/no reply. Even many were unable to appropriately respond to some very basic aspects of RPD clasps (Tables 1–2), inappropriate responses or the lack of responses were more evident among the general dental practitioners who had a prolonged involvement in independent dental practice. This could be no doubt considered highly unacceptable, but may be explained by the fact that for dentists, even in developed countries, clasp selection has remained a difficult task, except for those having accumulated successful clinical experience in RPD related services. To many dentists, it has also been difficult because the application of exact scientific knowledge governing clasp designing is confusing and subject to individual interpretational skills and personal choices and preferences.[14]

The present study not only enabled the availability of information regarding the appropriateness or otherwise of clasp aspects and of their practices by some local dentists but the information collected could also indirectly reflect on the extent of dissatisfaction the RPD patients treated by dentists could have. These finding could be regarded as supportive to the observations made in a UK based study that showed that even some 40% of RPDs made by specialists and consultant prosthodontists were never worn by patients.[7] The most common reason was pain, discomfort, insecurity and functional inefficiency associated with the wearing of those prostheses.

A great majority of the dentists were either using insufficient or too deep an undercut for clasps in their RPDs or they were delegating RPD designing to laboratories not having skilled technicians. The effects of these was clearly seen, by many dentists, in the form of poorly fitting clasps to abutments, poorly-fitting RPDs in patients mouth, pain in the abutment and events of deformed, bent and broken clasps. These could again support the finding that many RPDs were not worn by patients because they were felt insecure, painful to wear and functionally inefficient to use.[7]

There were apparent differences (although not statistically tested for their levels of significance) in the

level of understanding and for the appropriateness of practices related to RPD clasps among the house-officers, dental practitioners with only basic dental qualification and specialist dentists. These could be explained by the differences in their clinical experiences, level of skills and educational backgrounds and their level of being up-to-date in the area through participation in continuing dental education activities. House-officers were generally more knowledgeable followed by general dental practitioners and specialists dentists. The fresh and current knowledge and more involvement in RPD work during their training in academic institution could be some variable that positively affected the performance of house-officers. The relatively poor performance of dentists in the other categories, especially of the specialist dentists could be explained by their general reluctance to providing RPDs to their patients, lack of having fresh knowledge in the area of RPD making and having specialist qualifications in disciplines other than prosthodontics.

A possible limitation of the study is the inclusion of only a smaller proportion of dentists (100/1278) from NWFP that are currently registered with the PMDC.[25] This may not only limit the generalization of the gathered information on the topic to be relevant and applicable for reflecting both the local or national situation. Furthermore, as the direct interviewing method has not been used for collection of information from dentists, the possibility of biased information through consultation with colleagues of the participating dentists is likely.

CONCLUSIONS

Nevertheless, within these limitations, the following could be concluded:

1. An alarmingly poor level of knowledge and practices regarding the use of clasps in RPD among local practicing dentists became evident.
2. Specific areas of concerns that appeared included the limited involvement of local dentists in cast RPD related work, lack of their familiarity with the use of clasp design recommended for specific situations as well as lack of skills and knowledge of the methods of clasps adjustment and replacement. All these emphasize the need for reorganizing and reinforcing educational and teaching and training strategies related to RPDs. A need for the implementation of regular refresher courses and continuing dental education programmes is also emphasized so as to ensure that the available clinical and technical dental man-power is current in skills and practices related in the area.

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Address for Correspondence:

Dr. Fazal Ghani, Head of Department of Prosthodontics, Khyber College of Dentistry, Peshawar, Pakistan. Tel: +92-91-9216206/ Ext: 193, Fax: +92-91-9216217.

Email: f.ghani@yahoo.co.in, fazalg55@hotmail.com