

## BRIDGING THE GAP. QUALITY OF COMMUNICATION BETWEEN PROSTHODONTISTS AND LAB TECHNICIANS

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### ABSTRACT

*This descriptive study was carried out at dental out-patient department of Liaquat medical University Hospital Hyderabad from January 2013 to December 2013. Thirty-five patients wearing auto polymerized (self-cured) fixed partial dentures provided by unqualified and qualified dental practitioners were assessed. Condition of oral health was evaluated on the basis of proper history and clinical examination. Prosthesis condition was also assessed. Oral health of underlying soft and hard tissues was carefully evaluated after removing the prosthesis with the help of slow speed hand piece without jeopardizing oral tissues. It was evident in this study that fixed partial dentures made from auto polymerized (self cure) acrylic resins had adversely affected the oral tissues compelling the patients to visit the qualified dentist for proper treatment of their problems.*

**Key Words:** Fixed auto polymerized acrylic partial denture, complications.

### INTRODUCTION

The significance of a good communication between dentists and dental technicians cannot be overemphasized.<sup>1</sup> A quality prosthodontic restoration is an amalga-

mation of the skills of both the prosthodontist and the dental lab technician.<sup>2</sup> Such a prosthesis results from an effective communication between the two. However, owing to the advancements in the patients' awareness about their dental treatment needs, a successful dental treatment requires not only an effective but also an interactive relationship between all members of the dental team.<sup>3</sup>

Strict ethical and legal guidelines govern the provision of a prosthesis to the patient.<sup>4</sup> Optimal aesthetics and function, the hallmarks of a successful prosthetic treatment, depend on the careful selection of appropriate materials, effective techniques and a suitable prosthesis design.<sup>5</sup> As per the "British Society for the Study of Prosthetic Dentistry: Guides to standards in prosthetic dentistry", it is the clinician's and not the technician's responsibility to design a prosthesis.<sup>6</sup> "European Union's Medical Devices Directive (Directive 93/42/EEC)" states that "It is the responsibility of the dental practitioner to provide clear instructions for the production of a prosthesis to the dental technician, and that the technician should then produce the prosthesis as per the required specifications".<sup>7</sup> Poor communication of design information from the dentist to the technician poses the threat of producing a restoration that can have deleterious effects on the oral tissues and hence, the health of the patient.<sup>8</sup>

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Limited or inadequate consultation between the dentist and the technician regarding design details of prosthodontic work is still an on-going problem.<sup>9</sup> Failures to establish such a communication between the dentists and dental technicians have been investigated and reported over the past four decades in many countries.<sup>10</sup> These studies described the work authorization forms as “the frequently used and abused form of communication” between the dentists and the technicians, usually lacking in the finer design details.<sup>11</sup> Lynch and Allen reported that despite laid-down ethical, legal and scholastic guidelines that require a dentist to design a prosthesis unambiguously, design problems with removable partial dentures still persist, largely because of poor exchange of information between the dentists and technicians.<sup>12</sup> The aim of this study was to assess the quality of written instructions provided by the prosthodontists to the dental lab technicians for both fixed and removable prosthodontics at four renowned dental schools in Islamabad/Rawalpindi. No such work has previously been carried out in Pakistan.

**METHODOLOGY**

Five dental schools in Rawalpindi/Islamabad were invited to participate in the study. Four schools agreed, two in each city. A structured questionnaire having 50 close ended questions was distributed to the dental lab technicians of these schools. The technicians were requested to return the questionnaires anonymously, with no identification of the respondent or his place of work. The questionnaires sought information pertaining to the written instructions for prosthodontic cases provided by the dentist to the lab technician. Using a strategy similar to previous studies<sup>2-4,15</sup>, the written instructions, depending upon their quality, were categorized as follows: Clear – adequately describe the prosthesis design. A guide only – some design details are left to the technician. Poor – most of the design details are left to the technician. No written instructions are provided.

Technicians were also asked if they were needed to contact the dentist for clarifications about the prosthesis design. Information was also required about the design details usually incorporated in a work authorization form for both removable and fixed dental prosthesis. Technicians were also questioned whether the dentist, for any type of prosthesis, ever approached the technician himself to discuss the case. Data from the received questionnaires was analyzed using SPSS) version 21. Descriptive statistics are reported.

**RESULTS**

All the questionnaires were completed and returned with a response rate of 100 %. 64% of the responses were based on records, 30% responses were based on memory alone while 6% respondents did not specify the method of recall.

All the four dental schools used a work authorization form for prosthodontic cases. Age of patient was indicated in 68% of the cases. Gender of the patient was indicated in 76% of the cases and a return date for each case was provided for 91% of the cases. However, 58% of the technicians regarded the time provided to finish the case as ‘insufficient’. The quality of written instructions provided to the technicians are detailed in Fig. 1.

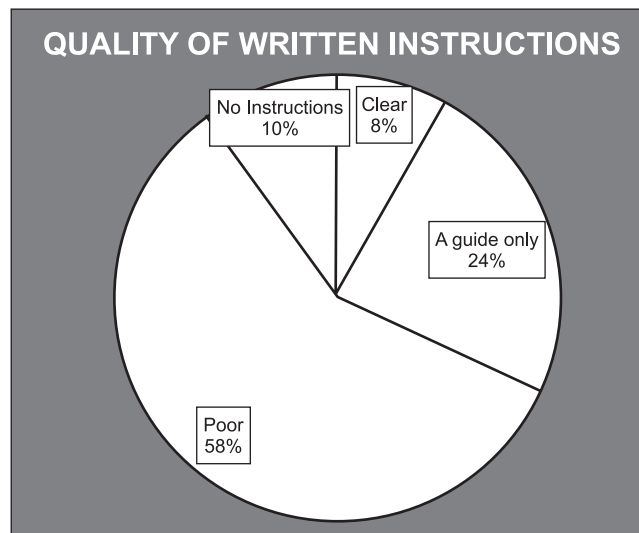


Fig 1: Quality of written instructions

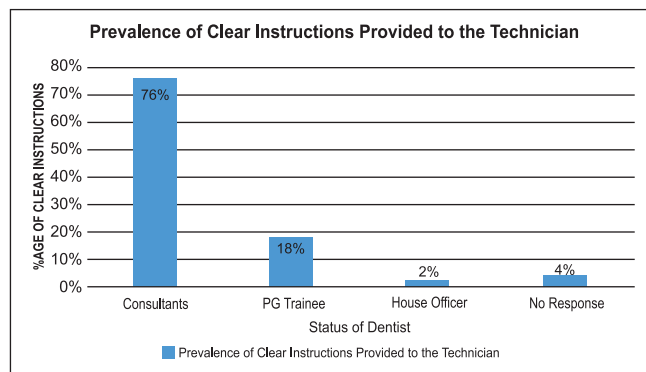


Figure 2: Prevalence of Clear Instructions

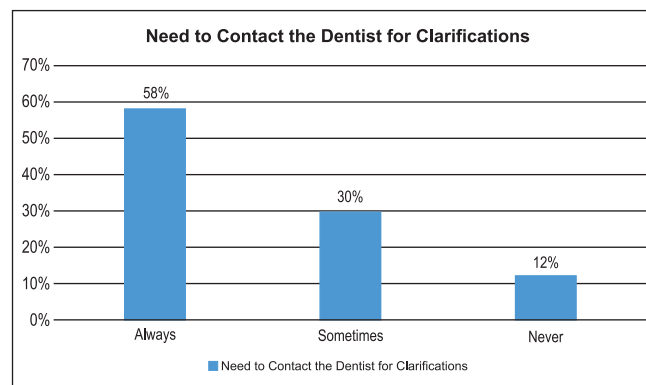


Fig 3: Need to Contact the Dentist for Clarifications

TABLE 1: DETAILS ABOUT PROSTHODONTIC CASES

Removable Prosthodontics	Yes (%)	No (%)	Fixed Prosthodontics	Yes (%)	No (%)
A design diagram is provided.	36	64	Metal alloy to be used is indicated.	32	68
The design is color coded.	0	100	Margin design is indicated.	84	16
A surveyed cast is provided.	22	78	Number and design of pontics is given.	70	30
Shade of teeth is indicated.	90	10	Surfaces to be covered by metal only are specified.	24	76
Occlusal scheme is indicated.	76	24	Occlusal scheme is indicated.	56	44
Posterior palatal seal is carved by the dentist.	32	68	Shade is indicated.	88	12
Info about finishing and contouring of acrylic is provided.	14	86	Type of porcelain glaze to be used is specified.	02	98
The teeth to be clasped are indicated (for interim prosthesis).	66	34			

Of the 8% clear adequate instructions provided to the technician, most (76%) were provided by the consultants (Fig 2) compared to postgraduate trainees (18%) and house officers (1%).

58% of the technicians always needed to contact the dentist to clarify design details, 30% sometimes needed to consult the dentist while 12% never needed to clarify any design details Fig 3.

In 70% of the cases, the dentist himself never contacted the technician to discuss the design details, 21% contacted the technician only when requested, 6% sometimes approached the technician and only 3% always discussed the cases with the technician.

Table 1 gives the statistics for the design details provided for removable and fixed prosthodontic cases in the work authorization form.

## DISCUSSION

Numerous studies have been carried out to ascertain the level of communication between the dentists and the dental lab technicians. However, no appreciable work has so far been done in this regard on the local population. This study aimed to assess the quality of communication between prosthodontists and dental lab technicians by conducting a survey at four renowned dental schools of Islamabad and Rawalpindi.

The present study confirmed the use of work authorization forms for all types of prosthodontic cases. About 64% of the responses were based on previous records and 30% on memory alone. Since majority of the responses are based on sound previous records, any personal bias of technicians towards the dentists affecting the accuracy of information can be safely overlooked. A study considered personal bias as a limiting factor to accurate information since only 18% of

their respondents used records to complete the survey but on the other hand, did not specify the methods of information recall used in their survey.<sup>12</sup>

In this study, 58% of the written instructions were deemed 'poor' by the technicians, leaving most of the design details to the lab technician. This is in agreement with the findings of a similar study carried out in Sudan by Mahmood et al, which revealed poor or no instructions in about 54.5% of the cases.<sup>2</sup> The findings are also endorsed by those of Kilfeather et al<sup>4</sup> who reported a lack of written instructions in 37% of the cases. Similar results were reported by Juszczuk et al.<sup>9</sup> in 2009 stating that up to 62% of the cases came with blank prescription forms and by Radhi et al<sup>11</sup> who described the quality of written instructions as inadequate for majority of the cases. Poor quality of written instructions have been reported by numerous other authors as well.<sup>6,7</sup> However, a recent study carried out in Saudi Arabia showed adequate results, with only 7.2% of instructions falling in the 'poor' category.<sup>3</sup> This may be attributed to a better awareness and an interactive relationship between the dental team members.

In the present study for 70% of the cases, the dentist himself never approached the technician to discuss the case details, and for 20% of the cases, dentist communicated only upon request by the technician. Owing to the poor quality of written instructions, the technician always felt the need to consult the concerned dentist for more than half of the cases (58%). The results are comparable to those of Juszczuk et al.<sup>9</sup> where by 64% of technicians of UK dental laboratories needed to request guidance from the concerned clinician.

The results of this study showed that the decision concerning important design parameters for removable prosthodontic cases was delegated to the dental lab technicians in more than half of the cases. A poorly



designed and constructed prosthesis poses serious threats of potential tissue damage to the patient.<sup>13</sup> The UK General Dental Council considers “designing effective indirect restorations and partial dentures” a basic requirement for all fresh graduates.<sup>6</sup> Contrary to all the laid down guidelines, current study found that a design diagram was provided for only 36% of the cases, and the diagram was never color coded. Color coding different RPD components can help alleviate mistakes in prosthesis design.<sup>3</sup> Moreover, according to the results of this study, the technician was expected to carve the posterior palatal seal in 68% of the cases, survey the cast in 78% of the cases and decide the finishing and contouring details of acrylic work for up to 86% of the cases. Lynch and Allen in their study on removable partial dentures revealed that up to 70% of the dentists usually faced problems with the designing and surveying of cobalt-chromium removable partial dentures (CCRPD) and that more than 35% of the CCRPDs were designed by lab technician alone.<sup>13</sup>

The positive findings of the present study included shade of teeth being indicated in 90% of the cases and occlusal scheme specified for 76% of the cases. Lynch et al<sup>13</sup> described tooth shade as one of the most significant parameters contributing to the success of a dental prosthesis.

The present study revealed that for fixed dental prostheses as well, most design details were left to the technician’s decision in majority of the cases. In 76% of the cases, the dentist did not specify the surfaces to be covered by metal alone. These findings, unfortunately, compare favorably with those of Jenkins et al<sup>6</sup> who argued that incorrect placement of porcelain on the occlusal surfaces of crown can cause accelerated attrition of the enamel of opposing natural teeth. In this study, although the shade for fixed restoration was indicated for 88% of the cases, the type of porcelain glaze to be used was hardly ever mentioned (in 2% cases only). This can affect the final outcome of the restorations esp. in the anterior region.<sup>3</sup> Another study on fixed partial dentures reported that 91% of the dental laboratories received no information regarding the type of glaze to be used.<sup>13</sup>

The design of any dental prosthesis, either removable or fixed, involves complex biological and mechanical principles.<sup>3,13</sup> While dental lab technicians, an esteemed member of the dental team, may be highly skilled in executing the prescribed prosthesis design in the laboratory, they are not equipped with knowledge and skill sufficient to design a prosthesis with reference to a patient’s dental and periodontal status.<sup>4</sup> It is the dentist’s responsibility to design the required prosthesis and to communicate the design effectively to the lab technician. Poor quality of communication between the dentist and dental lab technician is a worldwide phenomenon.<sup>2,3</sup>

The trends recognized in this study are clearly inappropriate. Emphasis needs to be placed on improving the quality of interaction between the prosthodontists

and the dental lab technicians through both paper and web-based modes of communication.<sup>13</sup> Christensen put forward some suggestions to improve the dentist-technician interaction that include attending education courses together, initiating joint study clubs, holding private meetings etc.<sup>14</sup>

## CONCLUSION

The quality of written instructions provided by prosthodontists to the dental lab technicians was poor. Majority of prosthodontists, neglecting their ethical and legal obligations, relied on the lab technician to design the required prosthesis. Quality prosthodontic restorations can only be achieved by improving the level of communication between these two members of the dental team. The results of this study can serve as a base for further research in this area in other dental institutions in Pakistan in order to gather detailed information about the quality of communication existing between the prosthodontists and the lab technicians.

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