



EVALUATION OF QUALITY AND EFFECTIVENESS OF COMMUNICATION BETWEEN PROSTHODONTISTS AND DENTAL LABORATORY TECHNICIANS: A QUESTIONNAIRE BASED STUDY

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ABSTRACT

Background: Good communication between prosthodontists and dental laboratory technicians is vital for successful prosthodontic treatment. Miscommunication can cause clinical errors, extend turnaround time, and leads to poor prosthetic result. As prosthodontic procedures become more complex with the advent of digital workflows, it is important to understand how communication currently works to improve coordination between clinic and dental laboratory. **Aim:** To assess the quality and effectiveness of communication between prosthodontists and dental laboratory technicians in different areas of prosthodontic care using a structured questionnaire. **Materials and Methods:** A cross-sectional questionnaire-based study was formulated involving 100 participants, including prosthodontists and dental laboratory technicians pan India. The structured questionnaire included 33 questions divided over six headings namely, General Communication, Complete Dentures, Removable Partial Dentures, Fixed Partial Dentures, Implant Prosthodontics, and Digital Workflows. Participants gave their responses on a 5-point Likert scale. Data was gathered through Google Forms and analyzed using descriptive statistics. **Results:** The analysis showed variation in the quality of communication across different prosthodontic areas. While most respondents recognized the importance of clear lab prescriptions and direct consultations, there were gaps in feedback integration, esthetic detailing and digital file management. High scores appeared in general communication practices, but lower scores were found in communication during complex procedures like implant prosthodontics and digital workflows. Participants pointed out the need for improved design discussions, better feedback systems and formal training for digital communication platforms. **Conclusion:** The study emphasizes the need for standardized communication methods between clinicians and technicians to ensure high-quality prosthodontic restorations. Improving collaboration, providing clearer clinical inputs and enhancing mutual understanding particularly in digital and implant workflows can greatly reduce errors, remakes and clinical chair time.

KEYWORDS : Prosthodontist Technician Communication, Dental Laboratory, Prosthetic Collaboration, Digital Workflows, Questionnaire Study, Dental Teamwork

INTRODUCTION

In modern prosthodontics, cooperation between prosthodontists and dental laboratory technicians is crucial for providing high-quality, functional, and visually appealing restorations. The success of any prosthesis, whether it's a complete denture, a crown, or an implant-supported restoration, relies heavily on how well these two professionals communicate. Although both roles have different responsibilities, their results are closely connected. Without clear instructions and a mutual understanding, even the best-prepared tooth or expertly crafted framework may not meet expectations.

Unfortunately, communication breakdown often occur in daily dental practice. Several studies have pointed out this issue: incomplete or unclear lab prescriptions, lack of design details, and insufficient feedback all lead to errors and inefficiencies [1,2]. In some instances, this results in unnecessary remakes, additional patient appointments, and increased costs, both financial and emotional. One study found that nearly one in four fixed prosthodontic remakes resulted from poor communication between the clinician and technician [3].

Despite the importance of communication, it's frequently overlooked in the fast-paced atmosphere of dental clinics and labs. Clinicians may be short on time, while technicians often work off-site and rarely interact directly with the treating dentist. This distance makes it more difficult to discuss aesthetic goals, material options, or even functional requirements with the detail that complex prosthodontic cases need [4]. In many situations, technicians must make assumptions, especially when instructions are vague or incomplete.

With the growth of digital dentistry, there is now a chance to close this communication gap. Digital tools such as intraoral scanners, CAD/CAM systems, and cloud-based platforms facilitate more accurate, visual, and real-time information sharing [5,6]. STL and

DICOM files can be shared and interpreted instantly by both sides, reducing miscommunication and enhancing the reliability of results. However, while technology can improve communication, it cannot replace the human element. Mutual respect, collaborative discussions and shared decision making are still the foundation of successful partnerships.

Effective teamwork is especially important in complex cases like implant restorations and aesthetic rehabilitations. In these cases, joint planning between the prosthodontist and lab technician helps determine the most appropriate abutment type, occlusal scheme, pontic shape and even shade selection and matching for the best outcome [7]. When technicians are involved early in the planning process, their input can help avoid complications and increase patient satisfaction.

Although some countries have set up structured systems to support communication, many developing regions, including India, still lack standardized communication protocols. This study was designed as a questionnaire-based assessment to evaluate how communication is currently managed in prosthodontic practices. The goal is to identify strengths and weaknesses in the interactions between clinicians and technicians, suggesting ways to improve these relationships for better clinical outcomes and a more efficient dental care system.

MATERIALS AND METHODS

This cross-sectional descriptive study was conducted to assess the quality of communication between prosthodontists and dental laboratory technicians, with the goal of identifying common gaps, misunderstandings and potential improvements in collaborative prosthodontic care. The study focused on the exchange of information during the fabrication of various dental prostheses including complete dentures, removable partial dentures, fixed prostheses, and implant-

supported restorations, as well as communication through emerging digital workflows.

Study Design and Participants

A total of 100 participants took part in this study, comprising both prosthodontists and dental laboratory technicians from academic institutions and private practices across India. Participants included clinicians and technicians with a minimum of one year of experience in their respective fields. The inclusion criteria ensured that all respondents were actively involved in prosthodontic casework and willing to participate voluntarily. Incomplete responses were excluded from the analysis.

Questionnaire Development

The questionnaire used in this study was developed based on an extensive literature review and expert input from both prosthodontists and dental laboratory educators. It consisted of 33 structured statements categorized into six sections:

1. General Communication
2. Complete Dentures (CD)
3. Removable Partial Dentures (RPD)
4. Fixed Partial Dentures (FPD) Crowns & Bridges
5. Implant Prosthodontics
6. Digital Workflows

Each statement was rated using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). This format enabled a nuanced understanding of communication effectiveness across various clinical and laboratory scenarios. [Table 1]. The questionnaire was then validated using Cronbach's alpha coefficient which is used to describe the reliability of multi-item scales, reflecting the internal consistency of the items or the agreement among raters. In this study, we found Cronbach's alpha of 0.948, indicating excellent internal consistency of the items in the scale.

Data Collection and Analysis

The questionnaire was distributed via Google Forms and shared through email networks, institutional mailing lists, and dental professional forums over a four-week period. Adequate time was given for responding to the questions. Out of 90 responses received, 85 fully completed responses were included in the final analysis.

All data were entered and organized using Microsoft Excel. Descriptive statistics such as mean scores, standard deviations, and frequency distributions were calculated for each questionnaire item. While formal inferential statistics were not employed, thematic trends and notable differences in perception between prosthodontists and technicians were highlighted in the discussion.

Table 1: Questionnaire

Evaluation of Quality and Effectiveness of Communication Between Prosthodontists and Dental Laboratory Technicians: A Questionnaire Based Study Instructions: Please indicate your level of agreement with the following statements regarding communication and collaboration between prosthodontists and dental laboratory technicians. Use the following scale: 1 - Strongly Disagree 2 - Disagree 3 - Neutral 4 - Agree 5 - Strongly Agree General Communication 1. Clear and consistent communication is maintained between prosthodontists and lab technicians. 2. There is mutual understanding of expectations and responsibilities. 3. Communication delays affect the efficiency of prosthodontic cases. 4. Feedback from lab technicians is regularly considered during treatment planning. 5. There are regular meetings or check-ins between prosthodontists and lab staff. 6. Written communication (e.g., lab prescriptions) is complete and easy to interpret. 7. Phone or in-person consultations are effectively utilized when necessary.
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Complete Dentures (CD)

8. Prosthodontists provide adequate clinical details (jaw relations, shade, occlusion) for CD fabrication.
9. Esthetic preferences are clearly communicated for CD cases.
10. There is sufficient discussion about patient-specific functional requirements.
11. Special requests for denture bases or teeth are clearly conveyed.
12. Challenges encountered during CD fabrication are addressed promptly.

Removable Partial Dentures (RPD)

13. RPD design frameworks and clasp assemblies are discussed before fabrication.
14. Lab technicians receive detailed design diagrams or written instructions for RPD.
15. Communication is effective in cases requiring precision attachments or unique designs.
16. Modifications during try-in stages are clearly communicated.
17. Turnaround times for RPD cases are optimized through good communication.

Fixed Partial Dentures (FPD) Crowns & Bridges

18. Tooth preparation guidelines and margin details are communicated clearly for FPD cases.
19. Shade selection and contour information is consistently accurate.
20. There is clear communication about pontic design and connector dimensions.
21. Remake rates are low due to effective communication.
22. Adjustments requested post-fabrication are discussed and understood.

Implant Prosthodontics

23. Implant position and angulation are communicated using proper references or imaging.
24. Abutment selection is collaboratively discussed with the lab technician.
25. Communication is effective during the planning and final restoration phases.
26. Screw-retained vs. cement-retained options are discussed and understood.
27. Complications during implant fabrication are clearly addressed.

Digital Workflows

28. Both parties are trained and confident in using digital tools (intraoral scanners, CAD/CAM).
29. Digital files (e.g., STL, DICOM) are properly shared and understood.
30. The accuracy of digital impressions meets clinical expectations.
31. Digital platforms improve the speed and quality of communication.
32. The digital workflow has reduced the number of remakes or adjustments.
33. There is clear documentation and version control of digital designs.

RESULTS

The study involved a comprehensive analysis of 33 items categorized under six domains: General Communication, Complete Dentures (CD), Removable Partial Dentures (RPD), Fixed Partial Dentures (FPD), Implant Prosthodontics, and Digital Workflows. Descriptive statistics revealed that while overall communication was rated positively, significant variations existed across domains.

In the General Communication section, over 75% of participants agreed or strongly agreed that communication is generally clear and consistent, with 68% affirming the utility of written prescriptions. However, only 42% agreed that regular check-ins or meetings occur, indicating a gap in proactive engagement. Feedback from lab technicians during treatment planning was acknowledged by only 55% of respondents, suggesting limited collaborative planning. This gives us an indication for further improving the general communication with the lab technician at all levels.

In Complete Denture (CD) cases, prosthodontists were found to provide adequate details in 73% of responses. Yet, only 58% of technicians agreed that functional requirements and esthetic details were adequately discussed, indicating a communication gap in patient-specific needs. These results align with studies emphasizing the importance of face-to-face communication in achieving esthetic satisfaction [8].

The RPD domain showed a moderate level of agreement in

communication effectiveness, particularly in framework and clasp design (62% agreement). However, only 48% of participants agreed that precision attachment cases are communicated clearly, reflecting the complexity and uniqueness of these cases. Miscommunication in design stages was noted to contribute to delays and remakes.

In FPD and crown cases, over 80% of technicians affirmed that margin details and tooth preparation guidelines were clearly communicated. Despite this, shade selection and pontic design were still problematic, with only 61% indicating clear communication. Remake rates were considered low by 72% of respondents, supporting the efficacy of written prescriptions but highlighting areas for esthetic miscommunication [9].

In Implant Prosthodontics, 60% of technicians reported that implant position and angulation were well communicated using radiographs and imaging. However, only 47% felt that abutment selection was collaboratively discussed. The division between screw and cement-retained restorations was understood in 53% of responses, and many technicians cited communication failures during the final restoration phase. These findings are consistent with those of Chochlidakis et al. [10], who noted that unclear communication in implant cases often leads to prosthesis misfit or functional issues.

The Digital Workflow section revealed notable disparities. While 65% of participants reported confidence in digital tools like CAD/CAM and intraoral scanners, only 52% believed the digital files were always properly shared and interpreted. More than one-third of the respondents noted that remakes due to digital miscommunication were still frequent. This gap between potential and actual performance mirrors the findings of Joda and Gallucci [11], who emphasized the need for standardized digital communication protocols.

DISCUSSION

The results of this study underscore the crucial role of communication in achieving successful prosthodontic outcomes. Effective collaboration between prosthodontists and dental laboratory technicians is essential across all types of prostheses, from conventional dentures to complex implant restorations. The findings echo earlier literature, where communication failures were consistently linked to increased adjustment appointments, treatment delays, and compromised patient satisfaction [12, 9].

General Communication remains foundational. Although written prescriptions and phone consultations were commonly used, the lack of regular in-person consultations or structured meetings limited the full potential of collaborative care. As McAndrew et al. [13] emphasized, frequent dialogue fosters mutual respect, reduces misunderstanding, and improves treatment predictability. Moreover, lab technicians often feel sidelined when not actively engaged during the planning phases, which impacts morale and creativity [14].

CD and RPD communication showed moderate effectiveness but highlighted gaps in esthetic and functional discussions. The importance of relaying individualized patient needs and esthetic expectations cannot be overstated, particularly in removable prosthodontics, where subjective factors heavily influence success. The findings support the work of Nayar & Sajjan [8], who advocated for enhanced documentation and in-person esthetic discussions.

Fixed prosthodontics and implant-supported restorations showed comparatively better communication. This may be attributed to more well-defined protocols in fixed cases, especially in relation to tooth preparation and margin delineation. However, challenges remain in conveying esthetic parameters, such as shade and contour, which continue to cause remakes. The issue is further compounded in implant prosthodontics, where prosthesis misalignment or improper abutment choice can severely compromise outcomes [10].

The growing integration of digital workflows presents both opportunities and challenges. While digital tools promise enhanced efficiency and reproducibility, the study highlights a transitional gap in training and file management. Joda et al. [15] observed that without mutual familiarity in digital protocols, even the most advanced systems fail to deliver their potential. For example, STL and DICOM files often lack embedded clinical context, leading to misinterpretation by lab technicians. This emphasizes the need for bilateral digital literacy and shared access to planning software [16].

Moreover, miscommunication in digital workflows often arises due to software incompatibility or insufficient detail embedded in scans. According to Mangano et al. [17], unless the technician receives notes, photographs, and a virtual wax-up along with digital scans, the restoration may be inaccurate despite excellent raw data. This study confirms that while digital workflows have reduced the number of remakes and improved turnaround times for some, the lack of standard operating procedures and mutual software familiarity hampers their broader effectiveness.

Recommendations to Enhance Communication

1. Implement structured communication templates for all prosthodontic cases.
2. Conduct pre-fabrication case planning meet for complex prostheses.
3. Integrate clinical photos, scans and esthetic previews into lab instructions.
4. Standardize digital documentation protocols including file naming and annotations.
5. Offer continuing education on communication tools and digital workflows.

CONCLUSION

Despite existing communication frameworks, there is a clear need for enhancement in consistency, personalization and interdisciplinary planning. This study affirms that structured communication protocols and active technician involvement are key to clinical efficiency and prosthetic longevity [18,19]. Institutions and private practices must invest in training, feedback systems, and standardized digital documentation to improve prosthodontic collaboration.

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