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THE RELATIONSHIP BETWEEN DENTAL TECHNICIAN COMMUNICATION AND DENTIST SATISFACTION WITH THE COLOR OF FIXED DENTURE

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ABSTRACT
Background: *The high rate of tooth loss increases the demand for the fabrication of dentures, both fixed dental prostheses (FDP) and removable dental prostheses (RDP). Anterior tooth loss causes aesthetic and phonetic disturbances, so rehabilitation using a denture is needed. In aesthetics, color is one of the things that need to be considered, if the color of the resulting denture is not suitable, it will result in dissatisfaction. Color accuracy depends on effective communication between dentists and dental technicians. Research by Natassa J & Ayuningsih R stated that there were 51.7% of dentists who were dissatisfied with laboratory made results. Lack of communication can lead to dissatisfaction with the results of a fixed dental prostheses.* ***Purpose:*** *Knowing the relationship between dental technician communication and dentist satisfaction with denture color.* ***Methods:*** *This study used an analytic observational design with a cross sectional approach. The samples in this study were 40 dentists in the Banjarmasin area and 7 laboratories where dentures were made by Banjarmasin dentists selected using simple random sampling. Data collection was carried out by distributing questionnaires. Data analysis using the Spearman correlation test.* ***Results:*** *The results of data analysis using the Spearman correlation test produced data with a significance value of 0.00 (ρ<0.05). The correlation coefficient value in the study was found to be 0.523, indicating a significant relationship between the two variables.* ***Conclusion:*** *There is a significant relationship with a moderately strong relationship between the communication of dentists and dental technicians with dentists satisfaction with the color of dentures in Banjarmasin.*

Keywords: *communication, dentist satisfaction, dental technician, dentist, fixed denture color*

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INTRODUCTION

Tooth loss is a condition of detachment of one or more teeth from their sockets. Tooth loss significantly affects a person's quality of life and can disrupt their overall well-being.[1] According to the results of the Indonesian Health Survey (SKI) in 2023 stated that the prevalence of dental and oral problems in Indonesia was 56.9%, including the problem of tooth loss. The prevalence of tooth loss due to extraction or self-dropping in Indonesia is at a percentage of 21% and in South Kalimantan Province it is 21.1%.[2] The high incidence of tooth loss in society increases the demand for denture fabrication.[3]

The use of dentures is one of the primary options for addressing the effects of tooth loss, particularly in cases of anterior tooth loss, which is closely related to aesthetic and phonetic functions. The loss of anterior teeth can reduce a patient's self-confidence and impair speech ability, especially in pronouncing labiodental sounds. Therefore, rehabilitation with dentures becomes essential to restore the patient's masticatory, phonetic, and aesthetic functions.[4,5] In dental practice, dentures are classified into two main types: Fixed Dental Prostheses (FDP) and Removable Dental Prostheses (RDP), which can be either Partial (PRDP) or Complete (CRDP). In recent years, FDP has gained popularity as it is considered more aesthetic compared to RDP.[3,5]

In aesthetics, color is one of the key aspects that must be considered. If the color of the fabricated denture does not match the adjacent natural teeth, it will lead to patient dissatisfaction.[6] Precision in shade selection is one

of the critical factors influencing the final aesthetic outcome of a fixed dental prosthesis.[7] The success of achieving high-quality denture shade matching depends on several factors related to the dentist, the dental technician, or both.[8] Clear and effective communication between the dentist and the dental technician is essential to obtain the correct shade and produce a well-fitting, high-quality fixed prosthesis.[9]

Ineffective communication can lead to errors in the fabrication of fixed dental prostheses, resulting in dissatisfaction among dentists, dental technicians, and patients.[8] A study by Natassa J & Ayuningsih R found that 51.7% of dentists were dissatisfied with the laboratory work produced by a dental lab in Pekanbaru.[10] This data highlights the critical role of communication in ensuring the quality of final prosthetic outcomes. Dentists and dental technicians must proactively foster effective collaboration to avoid fabrication errors and maintain satisfaction for all parties involved dentists, technicians, and patients.[8]

Based on the aforementioned issues, the researcher is interested in conducting a study examining the relationship between dental technicians communication and dentists satisfaction in influencing the color outcome of fixed dental prostheses in Banjarmasin. This study will utilize two questionnaires: a communication assessment questionnaire to be administered to both dentists and dental technicians, and a satisfaction evaluation questionnaire to be given to dentists.

MATERIALS AND METHODS

This study employs a cross-sectional research design to examine the relationship between dentist-dental technician communication and dentists' satisfaction with the color of fixed dental prostheses. The study has received ethical approval from the Health Research Ethics Commission of the Faculty of Dentistry at Lambung Mangkurat University, with Ethical Clearance Letter No. 001/KEPKG-FKGULM/EC/I/2025. The study population consists of dentists practicing in Banjarmasin and dental laboratories where fixed prostheses for Banjarmasin dentists are fabricated. Based on sample size calculations, the study includes 40 dentist respondents and 7 dental technicians from laboratories identified through dentist interviews.

The sampling technique in this study uses simple random sampling. The research locations include dental practices throughout Banjarmasin and collaborating dental laboratories that fabricate fixed prostheses for these practitioners. The tools and materials used are research explanation and information sheets, informed consent sheets, questionnaires, data analysis applications in the form of SPSS, and internet communication tools.

There are two questionnaires given to dentists. The first questionnaire focuses on communication aspects to understand dentists perspectives regarding communication with dental technicians. The second questionnaire is used to assess dentists satisfaction levels with the results of fixed denture fabrication by dental technicians. One questionnaire is given to dental technicians, which aims to understand technicians perspectives regarding communication with dentists.

The data on dentist with dental technician communication and dentists satisfaction with the color results of fixed dental prostheses obtained from questionnaire responses were then analyzed using bivariate testing with Spearman's correlation test.

RESULTS

1. General Data

The research entitled “The Relationship Between Dental Technician Communication and Dentists Satisfaction with The Color of Fixed Denture (A Review of Dentist Practices in Banjarmasin)” was conducted through face-to-face meetings with dentists at Banjarmasin Dental Clinics in December 2024, where informed consent forms and questionnaires were distributed. The research involving dental technicians was carried out online in January 2025 by distributing research information documents and questionnaires in the form of Google Form links. The respondents characteristics in this study can be seen in the following diagram:

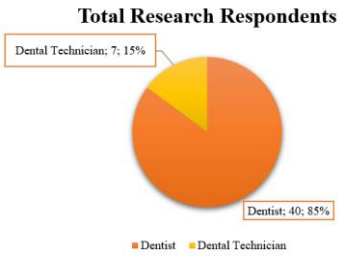

Figure 1. Respondent Characteristics Based on Profession

Figure 1 displays the respondent characteristics by profession, showing a sample of 40 dentists (85%) and 7 dental technicians (15%).

2. The Relationship Between Message Content in Dentist Communication and Dentist Satisfaction

Based on the results of answers from the dentist satisfaction questionnaire with a total of 40 respondents, obtained 32 respondents with complete messages and felt satisfied, 7 respondents with incomplete messages and

felt satisfied, and 1 respondent with incomplete messages and felt not satisfied obtained the distribution of dentist satisfaction according to table 1.

Table 1. The Relationship Between Message Content in Dentist Communication and Dentist Satisfaction

Message Content in Dentist Communication	Dentist Satisfaction		R	*P Value*
	Satisfied	Not Satisfied		
Complete	32 (80%)	0 (0%)	**0,391**	**0,013**
Incomplete	7 (17,5%)	1 (2,5%)		

According to table 1, the more complete the message in dentist communication, the more satisfied dentists are with the color results of fixed dental prostheses. The statistical analysis test shows a P Value = 0.013 ($p<0.05$), indicating a significant relationship between the completeness of messages in dentist communication and dentists satisfaction level with the color outcomes of fixed dental prostheses.

3. The Relationship Between Media in Dentist Communication and Dentist Satisfaction

Based on the results of answers from the dentist satisfaction questionnaire according to the communication media used, obtained 4 respondents using verbal media and feeling satisfied, 21 respondents using online media and feeling satisfied, and 15 respondents using work order media with a total of 14 respondents feeling satisfied and 1 respondent feeling not satisfied according to table 2.

Table 2. The Relationship Between Media in Dentist Communication and Dentist Satisfaction

Media in Dentist Communication	Dentist Satisfaction		R	*P Value*
	Satisfied	Not Satisfied		
Verbal	4 (10%)	0 (0%)	**0,351**	**0,026**
Online	21 (52,5%)	0 (0%)		
Work order	14 (35%)	1 (2,5%)		

According to table 2, online media emerged as the most effective communication method for information delivery, based on dentists satisfaction with fixed dental prosthesis color outcomes. Statistical analysis shows a P Value = 0.026 ($p<0.05$), indicating a significant relationship between the effectiveness of dentist communication media types and dentists satisfaction levels with prosthesis color results.

4. The Relationship Between Facilities and Infrastructure in Dentist Communication and Dentist Satisfaction

Based on the results of answers from the dentist satisfaction questionnaire with a total of 40 respondents, obtained 7 respondents with complete facilities and infrastructure and felt satisfied, 32 respondents with incomplete facilities and infrastructure and felt satisfied, and 1 respondents with incomplete facilities and infrastructure and felt not satisfied obtained the distribution of dentist satisfaction according to table 3.

Table 3. The Relationship Between Facilities and Infrastructure in Dentist Communication and Dentist Satisfaction

Facilities and Infrastructure in Dentist Communication	Dentist Satisfaction		R	*P Value*
	Satisfied	Not Satisfied		
Complete	7 (17,5%)	0 (0%)	**0,389**	**0,013**
Incomplete	32 (80%)	1 (2,5%)		

According to table 3, the more complete the facilities and infrastructure in dentist communication, the more satisfied dentists are with the color results of fixed dental prostheses. The statistical analysis test shows a P Value = 0.013 ($p<0.05$), indicating a significant relationship between the completeness of facilities and infrastructure in dentist communication and dentists satisfaction level with the color outcomes of fixed dental prostheses.

5. The Relationship Between Dentist Communication and Dentist Satisfaction

Based on the results of answers from the dentist communication with dental technician questionnaire with a total of 40 respondents, obtained 38 respondents with clear communication and feeling satisfied, 1 respondent with unclear communication and feeling satisfied, and 1 respondent with clear communication and feeling not satisfied, resulting in the distribution of dentist satisfaction according to table 4.

Based on table 4, shows the results of correlation test of two variables using Spearman correlation test seen at Sig. 2 tailed is < 0.000 which has value less than equal to 0.05 (Sig. 2 tailed < 0.05) thus having decision that H_0 is rejected or hypothesis is accepted which means there is significant relationship with value R= 0.523. This

means there is significant relationship with relationship strength that is quite strong between dentist and dental technician communication with dentist satisfaction toward fixed dental prosthesis color in Banjarmasin.

Table 4. The Relationship Between Dentist Communication and Dentist Satisfaction

Dentist Communication	Dentist Satisfaction		R	*P Value*
	Satisfied	Not Satisfied		
Clear	38 (95%)	1 (2,5%)	**0,523**	**0,000**
Unclear	1 (2,5%)	0 (0%)		

DISCUSSION

1. The Relationship Between Message Content in Dentist Communication and Dentist Satisfaction

The research results show that communication between dentists and dental technicians is strongly influenced by the clarity and completeness of the conveyed message with a percentage of 85%. As many as 85% of respondents stated that the instructions for making fixed dental prostheses from dentists were complete, while 15% stated they were incomplete, generally related to the lack of clarity from dentists in writing instructions for making connectors and specifications of pontic translucency in fixed dental prostheses.

The writing of the connector type is important because the connector is a structural part that connects the elements of fixed dental prostheses, such as pontics and retainers. The selection of a connector type that does not match the clinical conditions or design plan can cause mechanical weakness, instability, or even restoration failure. The specification of pontic translucency also plays a role in determining the final aesthetics of fixed dental prostheses. Translucency that does not match the patient's natural teeth can cause obvious visual discrepancies, especially in the anterior area, which has high aesthetic demands.[8,9] Dentists must provide complete instructions regarding the fabrication of fixed dental prostheses so that dental technicians can produce prostheses that meet expectations.[11,12]

The research results show that the majority of dentists have provided complete messages, but there are still issues with instructions that are not detailed enough, potentially leading to different interpretations by dental technicians, which can ultimately affect the quality of the final prosthetic outcome. These findings align with the study by Afzal H, et al., which states that communication between dentists and dental technicians with complete information is crucial because dental technicians do not have access to information related to the nature and health of periodontal and oral tissues. This can negatively impact the accuracy of prosthetic fabrication and may cause damage and injury to dental and periodontal tissues. Detailed written and oral instructions to dental technicians regarding case design can serve as an effective communication tool.[13] The research results also show that there are still dentists who are satisfied with the fixed dental prostheses made by dental technicians, even though some dentists did not convey complete messages. This indicates that the experience, skills of dental technicians, as well as informal communication or good working relationships, can contribute to satisfactory restoration outcomes, even when the documentation or instructions provided are not fully complete.[8]

2. The Relationship Between Media in Dentist Communication and Dentist Satisfaction

The research results show that the media used by dentists and dental technicians in communication greatly influences the effectiveness of message delivery. The communication media used include verbal communication (face-to-face/telephone), online communication (chat applications such as WhatsApp, Telegram, email), and work orders.[12] The results of the study indicate that dentists and dental technicians more frequently use online communication. Online communication has become the primary choice because it allows dental technicians and dentists to send instructions more accurately, concisely, and clearly with various perspectives, as well as supports the delivery of images or additional references that can help dental technicians understand the specifications for fabricating fixed dental prostheses.[14]

This aligns with research conducted by Ali AH, et al., which explains that instructions through online communication are important for dentists and dental technicians because they forget details of instructions if these instructions are given to them only orally. Another advantage of online communication instructions is that these instructions can be considered legal documents.[15] Oral communication is useful when technicians need additional information or clarification. This oral communication also has weaknesses, namely miscommunication between the dental laboratory and clinic due to lack of visual interactivity, and handwritten instructions that are illegible or unclear.[11,16]

3. The Relationship Between Facilities and Infrastructure in Dentist Communication and Dentist Satisfaction

The research results show that the facilities and infrastructure used by dentists in their clinics are still inadequate. The facilities and infrastructure used in determining color measurements for dental prostheses from dentists to dental technicians include shade guides, spectrophotometers, colorimeters, and digital cameras.[17] As many as 83% of dentist respondents stated that the facilities and infrastructure used were incomplete, while only 17% stated that the facilities and infrastructure were complete. As many as 57% of dental technician respondents stated that the facilities and infrastructure they had were complete, while 43% stated they were incomplete.

Respondents who stated they were incomplete referred to questionnaire questions regarding the availability of tools such as colorimeters and spectrophotometers. These two tools play an important role in determining tooth color more precisely and objectively. Without these tools, the color selection process relies only on subjective views or conventional shade guides, which risks causing color mismatches between the dental prosthesis and the patient's natural teeth. Dental technicians have more complete facilities and infrastructure than dentists, but miscommunication can still occur due to the lack of standards in interpreting the colors produced by these tools.[18] The lack of these facilities indicates that there are still limitations in the technical communication support facilities between dentists and dental technicians, especially in ensuring that the color of fixed dental prostheses meets the dentist's expectations.[8]

This aligns with research by Azizah N, et al., which shows that one of the factors affecting color matching in fixed dental prostheses is the color measurement determination factor at the dentist's clinic and laboratory.[6] The limitations of color measurement tools in clinics often cause dentists to rely on subjective visual perceptions, which can result in significant color differences between the prosthesis and the patient's natural teeth.[17,19] The use of conventional shade guides without support from digital tools such as spectrophotometers or colorimeters can lead to different color interpretations between dentists and dental technicians.[19] The lack of visual documentation with high-resolution digital cameras can hinder the dental technician's understanding of the desired aesthetic details. Dental technicians who document prosthesis colors with low resolution or inadequate lighting can also reduce the accuracy of the colors displayed in communication with dentists.[9,19]

The majority of dentists and dental technicians stated that their facilities and infrastructure were incomplete, especially spectrophotometers and colorimeters. However, the research also shows that many dentists remain satisfied with the fixed dental prostheses made by dental technicians. This indicates that the success of restorations is not only determined by the sophistication of tools but also by other factors such as the dental technician's skills, the working experience between dentists and technicians, and effective informal communication.[8] Spectrophotometers and colorimeters have high precision in color determination, but their limitations in clinical practice include high costs, complexity of use, and the need for consistent calibration. Conventional shade guides used carefully, under good lighting conditions and with clear visual communication, can still produce satisfactory aesthetic results when supported by experience and mutual understanding between dentists and dental technicians.[20,21]

4. The Relationship Between Dentist Communication and Dentist Satisfaction

The research results show a significant relationship between dentist with technician communication and dentist satisfaction with fixed dental prosthesis color. From respondents participating in this study, 97% of dentists expressed satisfaction with the resulting fixed dental prosthesis color, while only 3% expressed dissatisfaction. The reason for dentist dissatisfaction with fixed dental prosthesis color results was shown by one respondent (3%), originating from low questionnaire item scores, namely the dental technician was assessed as less proactive in providing optimal color selection advice and lacking deep understanding of color theory and its application to dental prostheses. This shows that dissatisfaction relates not only to final results but also to the lack of active role and technical communication from dental technicians in the color selection process. Based on statistical analysis results, it was found that the better the communication between dentists and dental technicians, the higher the dentist satisfaction level with obtained final results.[9,22]

These findings align with Bin-Shuwais theory stating that dentist-technician communication can prevent errors in fixed dental prosthesis fabrication processes, consequently impacting patient, technician, and dentist satisfaction.[8] Dentist satisfaction is partly influenced by service quality provided by dental technicians. Services involving deep understanding of technical specifications, processing speed for prostheses, and professional appearance will help increase dentist trust in technician work results.[23,24] Technicians capable of providing professional services while carefully following dentist instructions can minimize fixed dental prosthesis fabrication errors, impacting dentist satisfaction with obtained results.[22,25]

Research results show that even when dentists have communicated clearly and completely, dissatisfaction with fixed dental prosthesis results may still occur. This could be caused by technical interpretation differences between dentists and technicians. Although dentist instructions were written in detail, technician understanding of desired aesthetic or technical expectations might differ, especially without follow-up discussion or visual confirmation.[9,22]

This indicates that dentist satisfaction depends not only on communication completeness but also on active two-way communication, enabling further efforts to enhance dentist-technician communication through more effective media use, facility and infrastructure improvements, and developing more systematic and structured communication systems. Better communication is expected to increase dentist satisfaction with technician work results, thereby producing fixed dental prostheses better aligned with dentist expectations and patient needs.[8]

The limitation of this study is the limited number of respondents, particularly from dental technicians, which impacts the restricted sources of information that can be obtained. The researchers did not communicate directly with dental technicians but only interacted through customer service, so the information obtained does not fully represent the direct perspective of the technicians.

The results of this study indicate that there is a significant relationship between the communication aspects of dentists and their satisfaction level with the color outcome of fixed dental prostheses. The communication aspects, including message completeness, the effectiveness of communication media types, and the availability of communication facilities and infrastructure, have been proven to influence dentists satisfaction levels. Additionally, there is a quite strong relationship between the quality of communication between dentists and dental technicians and dentists satisfaction with the color outcome of fixed dental prostheses.

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