DOI: 10.22037/jds.v42i2.45147
Original Article
ISSN 2645-4351

Investigating the Quality of Communication between Dentists and Dental Technicians in Iran

Sepehr Norikhah[a], Neda Mahdavifar[b], Mohammadhasan Mashayekhi[a], Somayeh Allahyari[c], Mohamadmahdi Mohamadian[a]

[a]Dental Technology Student, Dept. Dental Technology, Dental School, Tehran University of Medical Science, Tehran, Iran.
[b]Assistant professor, Dept. Dental Technology, Dental School, Tehran University of Medical Science, Tehran, Iran.
[c]PhD Students School of Public Health, Dept. Public health, Tehran University of Medical Science, Tehran, Iran.
Correspondence to Somayeh Allahyari (Email: allahyari_s@sina.tums.ac.ir).
(*Submitted: 28 April 2024 – Revised version received: 23 June 2024 – Accepted: 24 June 2024– Published online: Spring 2024*)

Abstract

Objectives: Well-formed communication between dentists and dental technicians is an important factor for the fabrication of dental prostheses. Numerous articles have highlighted the lack of sufficient communication between dental clinics and laboratories. The present study aimed to assess the communication between dentists and dental technicians in Iran.

Methods: In this cross-sectional study, a structured questionnaire containing 23 questions about the effectiveness of communication between dentists and dental laboratories was distributed among 154 dental technicians. After data collection, the data were entered into SPSS-24 software and analyzed. Independent t-tests and analysis of variance (ANOVA) were used to analyze the data with independent variables.

Results: The communication between dental laboratory and clinic had a significant relationship with gender, job characteristics, laboratory location, and laboratory activity in all areas (p-value <0.001). Moreover, 77.3% of the participants perceived their communication as constructive and encouraging, and 50% believed that the dentist followed their opinion after consulting with the dental prosthesis laboratory.

Conclusion: Training in medical professionalism, as an essential element contributing to communication between dentists and dental technicians, must be included in the dental schools' curricula.

Keywords: Dental laboratory; Dental prosthesis; Medical professionalism; Professionalism education

How to cite:
Norikhah S, Mashayekhi M, Mahdavifar N, Allahyari S, Mohamadian M. Investigating the Quality of Communication between Dentists and Dental Technicians in Iran. J Dent Sch 2024;42(2):75-79.

Introduction

Making a successful dental prosthesis requires sufficient knowledge and skills in both the dentist and the dental technician. Obviously, well-formed communication in the process of prosthetic treatment is an essential factor for better results and higher patient satisfaction.[1]

A good prescription leads to improving the final prosthesis, reducing delays, and miraculously increasing the treatment prognosis. In contrast, poor communication, including lack of prescription or no information exchange, eventually culminates in inappropriate clinical outcomes.[2]

Obviously, the dentist must inform the dental technician of the details of the design and materials used in dental prostheses. On the other hand, the technician is expected to implement it with some consultation.[3,4] However, several articles have indicated the lack of sufficient communication between the dental clinic and the dental laboratory. Some have identified this problem as the lack of proper education in the university and the neglect of professionalism in the dental curriculum, and others in the lack of proper guidelines and laws.[5] Otherwise, some dental technicians believe that they are more qualified for advised design and material, particularly in removable partial dentures.[6]

Questionnaires in the literature filled out by dental laboratories indicated dentists' lack of knowledge or communication about well-written prescriptions, which could not completely guide dental technicians.[7,8] Clark suggests in his study that dental schools have reduced the time spent on dental technology to a level where competency cannot be achieved. Some studies concluded that the aims of the General Dental Council (GDC), which should be spelled out as the GDC for qualified dentists, have not been met regarding the preparation of dental students to communicate with the dental laboratory.[9-11]

McGarry suggests that if dental education in laboratory fields is decreased, it is crucial for dentists to improve their communication with dental technologists.[12-13]

No research has currently been conducted in Iran on the relationship between technicians and dentists. Considering the importance of this subject for further professional and educational planning, it seems necessary to obtain information on this matter, so this study aimed to assess the communication between dentists and dental technicians in Iran.

Methods

A structured questionnaire containing 23 questions about the effectiveness of communication between the dentist and the dental laboratory, including demographic information of dental technicians, was distributed among 154 dental technicians at the dental laboratory congress in paper form. They attended the Annual Congress of the Iranian Dental Technician Association, an annual gathering of dental technicians nationwide. A pilot study was conducted to assess the content validity and face validity of the questionnaire. The fields of the questionnaire included means of communication, quality and satisfaction of communication, financial interaction, effects of work

experience and age on communication, completeness of the treatment plan sheet, reaction to not receiving the treatment plan, and shortcomings of what is received from the clinic. In order to determine the questionnaire's validity, the content validity index (CVI) and content validity ratio (CVR) were both calculated as 100%, and the questionnaire's reliability was also obtained at 0.65 through Cronbach's alpha test. After data collection, the data were entered into SPSS-24 software and analyzed. Descriptive statistics (relative frequency, mean, and standard deviation) were used to determine the relationship between the dental laboratory and clinic. Independent t-tests and analysis of variance (ANOVA) were used to analyze data with independent variables at $p<0.05$.

Results

Based on the findings of this research, the communication between dental laboratory and dental clinic had a significant relationship with gender, job position, laboratory location, and laboratory activity field (p-value < 0.001). There was no correlation between the communication and other demographic and work-related variables (p-value < 0.05) (Tables 1 and 2); 49% of the participants in the questionnaire were 20-30 years old, 31.1% were 30-40 years old, and 19.8% were over 40 years old. 68.6% of the participants were male, and 31.4% were female; in addition, 59.5% were laboratory owners, 53.9% lived in Tehran, and 46.1% lived in other cities. In terms of activity field, 33.3% worked in both removable and fixed prostheses, 53.7% worked only in the fixed prosthesis, and 13% worked only in the removable field. The ANOVA was conducted (Tables 3-6) to verify the assumptions of normality and homogeneity of variances. Using visual methods and a Q-Q plot, the data were found to be normal (Figure 1).

Table 1- Mean and standard deviation of the total sample (N=154)

	Minimum	Maximum	Mean± SD
Communication	46.00	100.00	78.80± 9.30

Table 2- Frequency distribution of the independent variables with communication between laboratory and dental clinic

Variable		Mean and Std. Deviation	P value
Age	20-30	78.8 (7.7)	0.962
Gender	Man	77.6 (10.3)	0.027
	Woman	81.2 (5.9)	
Job position	Owner	77.1 (10.8)	0.009
Location of laboratory	Tehran	77.0 (11.1)	0.014
	Other cities	80.7 (6.0)	
Fixed prosthesis	Yes	78.2 (8.9)	0.133
	No	81.1 (10.3)	
Removable laboratory	Yes	80.0 (6.6)	0.093
	No	77.5 (11.2)	
Fixed and removable	Yes	81.2 (5.8)	0.021
	No	77.5 (10.4)	
Laboratory depended to clinic	Yes	82.1 (5.8)	0.195
	No	78.5 (9.5)	
Independent laboratory	Yes	78.4 (9.2)	0.056
	No	84.5 (9.9)	

Table 3- Mean and standard deviation for job position

	N	Mean	Std. Deviation	95% Confidence Interval for Mean	
				Lower Bound	Upper Bound
Laboratory owner	91	77.15	10.80	74.90	79.40
Dental technician	40	82.55	5.16	80.90	84.2
Not graduated	22	78.81	6.51	75.93	81.70
Total	153	78.80	9.33	77.31	80.3

Table 4- ANOVA analysis for job position

Sum of Squares		Df	Mean Square	F	Sig.
Between Groups	809.099	2	404.549	4.881	0.009
Within Groups	12433.019	150	82.887		
Total	13242.118	152			

Table 5- Mean and standard deviation of age

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
20-30	74	78.8649	7.77126	0.90339	77.0644	80.6653
30-40	47	78.1702	10.58777	1.54438	75.0615	81.2789
40-50	18	79.2778	11.66597	2.74969	73.4764	85.0791
over 50	12	79.3333	10.79001	3.11481	72.4777	86.1890
Total	151	78.7351	9.37564	0.76298	77.2275	80.2427

Table 6 - ANOVA analysis for age

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.839	3	8.613	0.096	0.962
Within Groups	13159.565	147	89.521		
Total	13185.404	150			

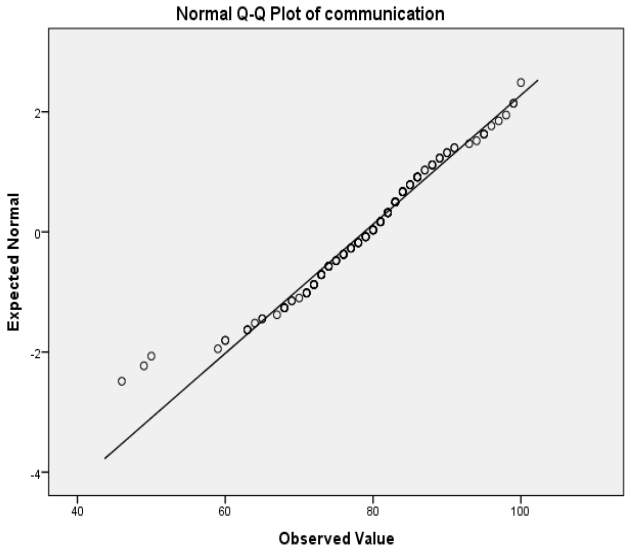

Figure 1: Normal Q-Q Plot of communication

In general, 55.3% of the participants needed to contact the dentist before making prostheses, 77.3% perceived their communication as constructive and encouraging, and 50% believed that the dentist followed their opinion after consulting with the dental prosthesis laboratory. Furthermore, 55.2% of the participants believed that more experienced dentists established better communication with the laboratory, 53.9% believed that less experienced dentists lacked enough knowledge of dental prosthesis laboratory techniques, 48% did not accept the work without a treatment sheet, and 24.1% proceeded with the work without a treatment plan according to the laboratory opinion. Additionally, 79.8% of the participants referred to the problems caused by clinicians, and 38.5% refused to resume the process if the clinic did not address the problems. 67.1% believed that dentists did mention the details of the prosthesis in the treatment sheet and left it to the laboratory, and 62.1% stated that the dentist incompletely filled out the treatment sheet, leaving most of the design responsibility to the laboratory. Regarding financial issues, only 18.8% stated that the dentist sent financial invoices to the laboratory on time.

Discussion

In order to achieve successful fabrication of intra-oral prosthetic appliances, it is crucial to establish precise and effective communication between the dentist and the dental technician. This issue entails providing accurate prescriptions that encompass the appropriate materials, employing effective techniques, and meticulously designing the prosthetics to ensure optimal aesthetics and functionality.[14]

This study aimed to comprehensively analyze the connection between dental laboratories and dental clinics using a questionnaire. Within this research, various factors impacting the inter-professional relationship between dental clinicians and dental laboratory technicians were identified, including means of communication, quality of communication, financial interaction, effects of work experience and age on communication, completeness of the treatment plan sheet, reaction to not receiving the treatment plan, and shortcomings of what is received from the clinic.[15]

The present findings aligned with a previous study on UK dental laboratory technicians, highlighting the importance of clinical-laboratory communication and its impact on productivity and satisfaction.[10] However, there were discrepancies in the results. While the UK study emphasized

direct contact between dental technicians and dentists, the current study found that most laboratories received treatment plan sheets from the clinics and consulted with the relevant dentist before initiating treatment. Additionally, 77.3% of the participants perceived their communication as constructive and encouraging. In line with the current study, it was noted in both Juszczyk's study and another article that newly graduated dentists might have a limited understanding of laboratory techniques.[10,12] Afsharzand et al.'s research also indicated a prevalent sentiment of discontent among technicians regarding the adequacy of details provided on the work orders, as mentioned by some participants (67%) in the current study.[16] According to Sheikh et al., modern means of communication are still less used compared to traditional methods, such as a written copy (98.1%) or telephone (63.6%).[5]

Delivering optimal patient care is considered a shared goal, highlighted in this article. Dental laboratories and clinics depend on each other to provide patients with satisfying and high-quality dental care. Dental clinics rely on the expertise of dental technicians to create dental prosthetics meeting the needs of their patients. This collaboration ensures that patients receive high-quality and aesthetically satisfying restorations, leading to improved treatment outcomes and overall patient satisfaction. Effective communication is identified as a crucial factor in the dental laboratory-dental clinic relationship. The findings of the recent inquiry align with those of an antecedent investigation, indicating that the work authorization documents utilized in dental practices are not sufficiently tailored. They often encompass only essentials information and commonly necessitate a follow-up communication with the prescribing dentist.[17,18] In Afzal et al.'s study, it was observed that 92.1% of dentists entrusted the design of removable partial prostheses to prosthetic technicians.[13] Pressed by time constrains, many practitioners in the dental field resort to expedient measures, such as assigning tasks to dental laboratory technicians, that rightly fall within their own professional purview. Laboratory technicians, aiming to accommodate the requests of dentists, frequently acquiesce to undertake these tasks. Dental laboratories, through their analysis of the work authorization documents and associated materials received from dentists, are at a unique vantage point in assessing the adequacy of the directives they receive for the successful creation of dental prostheses.[16] Dental clinics must provide well-detailed and written instructions to dental laboratories mentioning specific requirements and preferences. On the other hand, dental laboratories should maintain their lines of communication open in order to get additional information and ask for clarification. This approach to providing patient care not only reduces chair time but facilitates efficient coordination and enhances patient satisfaction as well. [19]

One of the challenges faced by dental clinicians and dental laboratories is a lack of comprehensive understanding of each other's roles and capabilities. Without proper educational courses in university education, both dental technicians and dentists have limited knowledge about the complications involved in the process of fabricating a dental prosthetic, laboratory workflow, or patient preparation. So, it can be concluded that miscommunication and unrealistic expectations can be considered challenging problems stemming from this knowledge gap. The cultivation of teamwork and inter-professional relationships has been recognized as crucial elements contributing to professionalism in various fields.[20,21]

Lack of research in this regard during university education can negatively affect the ability of dental professionals to give and receive feedback and limit professionals' improvement. Maxson proposed an educational framework where learners undertake a critical assessment of their projects before dispatching them to the dental laboratory. Furthermore, they are required to compose detailed work authorizations. This approach is designed to enhance the caliber of the output and to facilitate clear communication with dental laboratory technicians.[22,23] It is imperative to nurture these qualities from the outset of professional training. Contemporary research has determined that inadequate communication in dentistry can often be rooted in the educational phase, where dental students exhibit a lack of proficiency in drafting proper prescription requests. To address this foundational issue, it is imperative to integrate robust communication training into dental schools' curricula. By instilling precise and effective communication techniques, future dental professionals can be better equipped to convey critical information accurately and efficiently.[24,25]

Conclusion

Fostering teamwork and inter-professional relationships is recognized as essential elements contributing to professionalism between the dental technician and the dentist. Currently, there is an urgent need to teach this significant subject in dental schools.

Acknowledgement: We acknowledge the Iranian community of dental technologist.

Author Contributions: S.N.: conceptualized the study, developed the methodology, and wrote the original draft. N.M.: was responsible for data collection and manuscript editing. M.M.: contributed to data analysis and interpretation of results. S.A.: provided critical revisions and supervised the research.

M.M.: assisted with methodology development and data collection. S.N. and S.A.: assisted with manuscript preparation and review.

Funding: No funding.

Ethical Approval Code:
IR.TUMS.DENTISTRY.REC.1403.031

Informed Consent Statement: Signature form was attached.

Data Availability Statement: Is available.

Conflict of Interest: No Conflict of Interest Declared. ■

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