

A study to assess communication hindrances by the means of work authorization for fixed dental prosthesis: A survey

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Abstract

Aim: The aim of the study was to assess the hindrances in communication between the prosthodontic office and the laboratory technicians through work authorization.

Setting and Design: A questionnaire-based survey was carried out to assess communication gap between dentist and lab technicians through work authorization for FDPs.

Materials and Methods: A total of 114 dental laboratory technicians were provided with a questionnaire regarding work authorization form via Google doc files. The survey focused questions pertaining to fulfilling the following areas of work authorization: patient's information, name of the prescribing dentist, material for the prosthesis, pontic design of the prosthesis, shade description, and date of completion of work.

Statistical Analysis Used: The number of responses received was statistically evaluated using Fisher's *t*-test and nonparametric Spearman's correlation coefficient ($P \leq 0.05$).

Results: Eighty-five (74.5%) out of 114 laboratory technicians surveyed responded to the questionnaire. The patient's general information was satisfactorily filled in 75%–100% of the forms. Information regarding the pontic design, staining diagram, and preferred margin were on the lower side of the scale ranging between 25% and 50%.

Conclusions: The survey concluded that areas of work authorization with respect to fixed dental prosthesis require attention and need to be adequately filled by the dentist. In addition, the study suggests that the foundation of communication skill training programs in work authorization should be laid from the undergraduate curriculum. The concerned authorized bodies/specialty organizations should formulate a standardized work authorization format which can bridge the wide gap between the crown and bridge office and laboratory.

Keywords: Dentist, fixed dental prosthesis, laboratory technicians, work authorization

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Submitted: 23-Dec-2019, **Revised:** 08-Feb-2020, **Accepted:** 27-Mar-2020, **Published:** 07-Apr-2020

Access this article online	
Quick Response Code:	Website: www.j-ips.org
	DOI: 10.4103/jips.jips_475_19

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How to cite this article: Shetty SH, Pawashe KG, Sanyal P, Sushma R. A study to assess communication hindrances by the means of work authorization for fixed dental prosthesis: A survey. J Indian Prosthodont Soc 2020;20:208-13.

INTRODUCTION

Clinically acceptable prosthesis lies a dependency on well-designed laboratory procedures, attainable solely through a harmonious communication between the dental office and laboratory.^[1,2]

Prosthodontics is a branch involving inter-relation of dentist-technician-patients. Communication gaps affect in toto all the three bodies. The most effective way of communication is by means of work authorization form. The purpose of well-completed work authorization form is to achieve and provide a unique, distinctive prosthesis for each individual patient.^[3]

Literature revealed trends of poor communication in terms of inadequacy of information provided, which is not new to dentistry.^[4,5] Hence, this survey was undertaken to evaluate the frequently missed out factors in the work authorization forms by the dental office and laboratory.

MATERIALS AND METHODS

A questionnaire covering specific areas of work authorization forms was used for the survey. The questionnaire was a Google doc file consisting of 11 rating types of questions in English language. The title of the document explained the purpose of the study [Table 1].

Specific areas of the work authorization concerned with fabrication of fixed dental prosthesis were covered in the survey. The questionnaire included questions to be answered in percentages for indication in work authorizations received by the laboratory for the following: patient's general information, referring dentist's name and signature, selected shade, material of the prosthesis, preferred margin design, design of pontic, diagrammatic representation for shade, are the forms printed in regional language, date of completion, mentions need of try-in, and additional photographs provided.

The distribution of the Google form was facilitated through the Association of Dental Technicians of Maharashtra to all licensed dental laboratory technicians ($n = 114$) using a random sampling technique, with a 2-month deadline for answers. The questionnaire asked for anonymous responses to ensure confidentiality and overcome possible reservations about participation. One month after the first mailing, a reminder was issued by the Association of Dental Technicians to all member laboratories restating the request for a reply. A total of 114 dental technicians received the

mailed questionnaire, out of which 85 responses were received at the end of the survey.

The questionnaire was pilot-tested on-site by in-house laboratory technicians before mailing them to the dental laboratory technicians in western Maharashtra region.

Frequency distribution and percentage were done to check responses for 11 questions [Table 2]. Fisher's exact test was used to check the association between responses to two questions [Table 3]. Two groups were correlated for their responses by nonparametric Spearman's correlation coefficient [Table 4]. All analyses were performed using the Statistical Package for the Social Sciences software version 20 (IBM Corporation, India).

RESULTS

Eighty-five out of 114 technicians surveyed answered the questionnaire showing a yielding rate of 74.5%. Patient's general information was provided in almost all forms received by the technicians ranging from 75% to 100%. However, questions pertaining to referring dentist's information, date of completion of prosthesis, shade selection, and material of prosthesis showed a similar response percentage of 51%–75%. Information regarding margin design, pontic design, different shade in sections, need of additional try-in, and photographs were on the lower side of the percentage scale.

The correlation between two responses tested by Fisher's exact test showed that the responses of question 1 and question 2, questions 4 and 5, questions 4 and 6, and questions 1 and 9 were statistically significant ($P \leq 0.05$) [Table 2].

Correlations checked among the responses of each question revealed that correlation of question 3 (selected shade) with questions 1 and 2 (patient's and dentist's general information), correlation of question 5 (preferred margin) to question 4 (material of prosthesis), question 7 (staining diagram) to questions 5 and 6 (preferred margin and pontic design), question 8 (are forms in regional language) to questions 4 and 5 (preferred margin and material type), question 9 (date of completion) to question 3 (selected shade), and question 10 (need for try-in) to question 6 and 7 (pontic design and staining diagram) were statistically significant ($P \leq 0.05$) [Table 3].

DISCUSSION

Laboratory work authorizations have been called the most frequently used and abused form of communication

Table 1: Questionnaire for the survey**Questions pertaining to information provided by the dentist to the laboratory technicians through work authorization for fixed dental prosthesis.**

1.	How many work authorization forms coming for fixed dental prosthesis to your laboratory indicates patient's general information?
a.	<25%
b.	25%-50%
c.	51%-75%
d.	76%-100%
2.	Indicates the referring dentist's general information?
a.	<25%
b.	25%-50%
c.	51%-75%
d.	76%-100%
3.	Indicates the shade and shade guide used for the prosthesis?
a.	<25%
b.	26%-50%
c.	51%-75%
d.	76%-100%
4.	Indicates the prosthesis type (All metal/PFM/All ceramic)?
a.	<25%
b.	26%-50%
c.	51%-75%
d.	76%-100%
5.	Mentions the required (chamfer/shoulder) margin design for prosthesis?
a.	<25%
b.	26%-50%
c.	51%-75%
d.	76%-100%
6.	Indicates the type of pontic design preferred?
a.	<25%
b.	26%-50%
c.	51%-75%
d.	76%-100%
7.	Gives a staining diagram for the prosthesis?
a.	<25%
b.	26%-50%
c.	51%-75%
d.	76%-100%
8.	Are the forms printed in regional language?
a.	<25%
b.	25%-50%
c.	51%-75%
d.	76%-100%
9.	Mentions the date for completion of the prosthesis?
a.	<25%
b.	25%-50%
c.	51%-75%
d.	76%-100%
10.	Mentions the need for try-in before fabrication of final prosthesis?
a.	<25%
b.	25%-50%
c.	51%-75%
d.	76%-100%
11.	Provides photographs with the authorization form?
a.	<25%
b.	25%-50%
c.	51%-75%
d.	76%-100%

between the dentist and the laboratory technician. The findings of this investigation are quite revealing as to the attitudes and habits of dental practitioners in western Maharashtra region in the field of fixed prosthodontics. This survey showed that the finer details of a work authorization form (such as margin design, need for try-in,

staining, and photographs) are most often poorly provided by dentists.

Technicians' dissatisfaction by the information provided by the dentists has been reported in a survey done on fixed prosthodontics.^[6] A survey of dental laboratories in

1991 mentioned frequent complaints regarding incomplete information on work authorization by the technicians.^[7]

From this survey, it was evident that <25% of the prescriptions received by the dental technicians were legible to render good service. Information regarding

Table 2: Frequency distribution and valid percentages for each questions

Questions	Options opted (%)	Frequency (valid percentage)
Indicates patient's general information	<25	5 (6.0)
	26-50	8 (9.5)
	51-75	31 (36.9)
	76-100	40 (47.6)
Indicates dentist's general information	<25	5 (6.0)
	26-50	2 (2.4)
	51-75	50 (59.5)
	76-100	27 (32.1)
Indicates selected shade	<25	13 (15.5)
	26-50	48 (57.1)
	51-75	23 (27.4)
	76-100	0 (0)
Indicates material of the prosthesis	<25	4 (4.8)
	26-50	22 (26.2)
	51-75	42 (50)
	76-100	16 (19)
Indicates preferred margin design	<25	58 (69)
	26-50	21 (25)
	51-75	5 (6)
	76-100	0 (0)
Indicates pontic design	<25	47 (56)
	26-50	28 (33)
	51-75	5 (6)
	76-100	4 (4.8)
Provides staining diagram	<25	60 (71.4)
	26-50	18 (21.4)
	51-75	6 (7.1)
	76-100	0 (0)
Are forms in regional language	<25	47 (56)
	26-50	25 (29.8)
	51-75	9 (10.7)
	76-100	3 (3.6)
Date for completion	<25	6 (7.1)
	26-50	11 (13.1)
	51-75	44 (52.4)
	76-100	23 (27.4)
Indicates need for try-in	<25	43 (51.2)
	26-50	25 (29.8)
	51-75	12 (14.3)
	76-100	4 (4.8)
Provides photographs	<25	51 (60.7)
	26-50	21 (25)
	51-75	11 (13.1)
	76-100	1 (1.2)

referring dentist, patient's general information, and date for completion of prosthesis was reported 51%–75% of the times.

Proper pontic design is important for cleansability, good tissue health, and good esthetics; fifty-six percent of the laboratory technicians did not mention the type of pontic design in their prescription. Although dental technicians are important and valuable members of the oral health provider team, they are not trained to diagnose or manage the patient.^[8]

About 34% of the work authorization form lacked information regarding the preferred margin design. Margin design configurations depend on various clinical situations. Hence, dentists should have knowledge of the same and be in a position to put forward the same to the laboratory technician to meet patients' esthetic and functional needs. These results are comparable to previous studies done on fixed prosthodontics.^[9]

Tooth shade information is essential to the dental technician. A staining diagram of a tooth that allows the specification of multiple shades is very helpful to the dental technician, especially in the fabrication of crowns in the anterior region. For example, by designating a cervical shade, an incisal shade allows for proper individual characterization of patients' teeth. Seventy-four percent of the laboratories reported that dentists did not usually provide a diagram for staining which indicates poor information provided by dentists. Wherever shade was mentioned, it was a single tab shade, the finding similar to a study by Berry *et al.*^[10]

Fifty-six percent of laboratories lacked information regarding the regional language used to fill the form. Language becomes a barrier in communication because all laboratory technicians are not well versed with English language. Hindi being the national language of India, considerations should be made in these regards to improve communication gap.

In their study information was received relating to 241 items (145 PFMs, 96 FPDs). Poor or no written instructions were provided for 65% of PFMs ($n=94$). Only 25% of

Table 3: Association between responses to two different questions by Fisher's exact test

Question A	Question B	P
Question no 4 (material of prosthesis)	Question no 5 (preferred margin design)	<0.001*
Question no 4 (material of prosthesis)	Question no 6 (pontic design)	0.011*
Question no 5 (preferred margin design)	Question no 6 (pontic design)	0.701
Question no 1 (patient's general info)	Question no 2 (dentist's general info)	0.016*
Question no 1 (patient's general info)	Question no 9 (date for completion)	0.009*
Question no 2 (dentist's general info)	Question no 9 (date for completion)	0.413

*Statistically significant ($P \leq 0.05$)

Table 4: Correlation between responses to two different questions by Spearman's correlation

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Q1	-										
Q2	$r=0.083$ $P=0.454$	-									
Q3	$r=0.228$ $P=0.037^*$	$r=0.268$ $P=0.014^*$	-								
Q4	$r=0.245$ $P=0.025^*$	$r=0.065$ $P=0.558$	$r=0.148$ $P=0.178$	-							
Q5	$r=-0.329$ $P=0.002^*$	$r=-0.167$ $P=0.128$	$r=-0.109$ $P=0.325$	$r=0.291$ $P=0.007^*$	-						
Q6	$r=-0.233$ $P=0.033^*$	$r=0.051$ $P=0.643$	$r=-0.076$ $P=0.490$	$r=-0.031$ $P=0.777$	$r=-0.077$ $P=0.488$	-					
Q7	$r=-0.307$ $P=0.005^*$	$r=-0.088$ $P=0.428$	$r=0.023$ $P=0.834$	$r=-0.075$ $P=0.497$	$r=0.361$ $P=0.001^*$	$r=0.273$ $P=0.012^*$	-				
Q8	$r=-0.051$ $P=0.464$	$r=-0.036$ $P=0.748$	$r=0.055$ $P=0.621$	$r=0.260$ $P=0.017^*$	$r=0.089$ $P=0.422$	$r=0.262$ $P=0.016^*$	$r=0.158$ $P=0.150$	-			
Q9	$r=0.159$ $P=0.147$	$r=0.079$ $P=0.474$	$r=0.318$ $P=0.003^*$	$r=0.074$ $P=0.502$	$r=0.011$ $P=0.918$	$r=-0.276$ $P=0.011^*$	$r=-0.072$ $P=0.518$	$r=-0.057$ $P=0.605$	-		
Q10	$r=-0.176$ $P=0.110$	$r=-0.192$ $P=0.080$	$r=0.031$ $P=0.779$	$r=-0.086$ $P=0.435$	$r=-0.071$ $P=0.523$	$r=0.266$ $P=0.014^*$	$r=0.336$ $P=0.002^*$	$r=0.161$ $P=0.144$	$r=-0.48$ $P=0.662$	-	
Q11	$r=-0.162$ $P=0.140$	$r=-0.292$ $P=0.007^*$	$r=0.038$ $P=0.735$	$r=0.184$ $P=0.094$	$r=-0.177$ $P=0.107$	$r=0.247$ $P=0.024^*$	$r=0.105$ $P=0.341$	$r=0.112$ $P=0.311$	$r=-0.253$ $P=0.020^*$	$r=0.534$ $P<0.001^*$	-

*Statistically Significant ($P \leq 0.05$)

FDPs ($n=24$) were accompanied by poor or no written instructions. In 14% of PFM and FDP prescriptions ($n=21$ and $n=13$, respectively) the technician had to contact the dentist to clarify the written instructions supplied. It is also of note that 86% of prescriptions for PFMs ($n=125$) did not identify the surfaces that were to be covered with metal only.^[11] Leith *et al.*^[12] in their study mentioned that technicians still rely on contacting the prescribing dentist by telephone to clarify instructions and are often forced to make decisions without the necessary information, and the standard of communication between dentists and laboratory technicians is inadequate, although it has improved over recent years.

It is disappointing that even though the problems of inadequate prescription and communication between clinicians and laboratory technicians were first highlighted almost 40 years ago,^[13] there is still evidence to demonstrate that these problems still persist. The reasons for this are not entirely clear. However, Christensen^[14] has suggested that principles improve dentist-technician integration and communication.

In 1990, Goodacre^[15] in his article addresses the ramifications and responsibilities of a future dentist with regard to the dental laboratory. A program was developed in 1994 to improve the quality of laboratory submissions and the returned product, facilitating laboratory communication.^[16] Recently, the American Dental Association (2011) has issued updated guidelines to improve the relationship between the dentist and the laboratory technician.^[17] These guidelines not only advance the communication between

dentists and laboratory technicians but also the efficiency and the quality of care for the patient.

Surveys considering knowledge of infection control amongst lab technicians concluded laboratory technicians lacked the knowledge of basic infection control protocol.^[18] Only about half of the dentists communicated the desired information (contact relation, crown contour, margin and pontic design of the prostheses) to the dental laboratory technician even after taking the decision of repeating the prostheses.^[19]

Several accreditation standards for dental education programme are mentioned out of which 2-23g mentions communicating and managing dental laboratory procedures in support of patient care.^[20] There was an improvement in the completion of request forms submitted to the laboratory after educating students and staff on the information that should be provided to technicians.^[21] Studies have focused on the development of guidelines and utilization of interprofessional education to develop a prescription-writing module in all dental school curricula.^[22,23]

It is fundamental that the dentist and the laboratory technician should collaborate effectively as a team possessing a sound understanding of each other's roles with regard to prosthesis fabrication.^[24] Good communication between clinicians and dental technicians is vital if a good end result is to be achieved. This must continue to be taught and reinforced to undergraduate dentists.^[25,26]

CONCLUSIONS

1. Trends indicated large laboratories citing lack of communication by the dentists.
2. Work authorization forms should contain specific informations as requested by the laboratory technicians.
3. Inclusion of teaching programs on work authorization in undergraduate curriculum and implementation of standardized format by authorized body.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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