

## FIXED AND REMOVABLE PROSTHODONTICS ETHICAL SENSITIVITY SCALE-FARPESS: A VALID AND RELIABLE TOOL TO EVALUATE ETHICAL SENSITIVITY IN PROSTHODONTICS

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### ABSTRACT

*In Prosthodontic services the dentist is responsible for all the phases of prosthesis fabrication. This includes all steps from mouth preparation to prosthesis fabrication, insertion and even follow up, despite the fact that some phases related to prosthesis fabrication have to be done by technicians in the dental laboratory. But many studies have shown that the dentists are often negligent to even the basic principles of Prosthesis construction such as impressions and master cast sent to the laboratory for the fabrication of removable prosthesis without any prior mouth preparation and adequately explained written job description*

*This cross sectional study was designed to develop a valid and reliable tool to evaluate ethical sensitivity of the freshly graduated dentists regarding fixed and removable Prosthodontics at the completion of bachelor's of dental surgery program.*

*This scale has been developed on the basis of seven step approach to develop an instrument. FARPESS is based on questions related to three domains of ethics i.e. Autonomy, Beneficence, Non-maleficence and Professionalism. The Content Validity Index (CVI) and Angoff's method were used to determine the validity and cut-off passing Score respectively. Whereas, we analyzed reliability of this instrument through Cronbach's alpha.*

*Mean age of the participants was 23.6 with age range 7. About 94.8% freshly graduated dentists were found sensitive compared to 5.4% insensitive or partially sensitive to the ethical issues involved in the provision of fixed and removable prosthesis. Also, there was insignificant relation between gender and ethical sensitivity of the freshly graduated dentists.*

*FARPESS is a valid and reliable tool to measure dental ethical sensitivity in Prosthodontics.*

**Key Words:** Fixed partial dentures, Removable prosthesis, Dental Ethical sensitivity.

### INTRODUCTION

In clinical practice, Prosthodontic rehabilitation is very important in partial or completely edentulous patients in the ultimate management outcome as it not only improve esthetics and oral functions but improve quality of life at the same time.<sup>1</sup>

Therefore, in Prosthodontic services a dentist is considered responsible for all phases of prosthesis despite the fact that some phases related to prosthesis fabrication have to be done by the technicians in dental laboratory.<sup>2</sup> Such as, in case of removable partial den-

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tures if the treatment plan was inappropriate or the prosthesis was inappropriately designed or inserted, dentist have the responsibility for any disturbance of oral health such as caries or periodontal disease etc.<sup>3</sup> The clearly written work authorization is of fundamental importance in achieving successful prosthesis fabrication. Similarly dentist is responsible for ensuring cleaning and disinfection of the impression before sending to the dental laboratory so as not to put the laboratory staff at risk of contacting communicable diseases.<sup>4</sup> Diagnosis, treatment plan, management and prognosis are the responsibility of the dentist according to the Code of dentistry ethics in Brazil.<sup>3</sup>

But many studies have shown that the dentists are often negligent to even the basic principles of prosthesis construction such as impressions and master cast sent to the laboratory for the fabrication of removable prosthesis without any prior mouth preparation and adequately explained written job description.<sup>5</sup> Therefore dentists frequently fail to fulfill the legal and ethical requirements.<sup>5</sup> Similar problems have been identified

through studies worldwide both in developing and developed countries such as South Africa<sup>6</sup>, Kingdom of Bahrain<sup>5</sup>, United Kingdom<sup>7</sup>, Canada<sup>8</sup>, Ireland<sup>9</sup> and United States.<sup>10</sup>

Among the instruments used to measure ethical sensitivity Defining Issues test (DIT) was most extensively studied in the dental education from ethical perspective, and it was designed by a famous psychologist James Rest in 1974.<sup>11</sup> DIT was revised in 1999 in order to have more clarity and validity criteria and named as DIT-2. This instrument helps to measure decision making competency of a person in relation ethics and moral development. Dental Ethics Reasoning and Judgment Test (DEJRT) is still another version of Defining Issues Test which uses dental prompts in order to identify dentists ethical reasoning and judgment.<sup>11</sup>

Then later on Bebeau has developed different tests and extensively used these in dental context.<sup>12</sup> for instance Dental ethical sensitivity test (DEST), Role concept essays (RCE) and Professional role orientation inventory (PROI).<sup>13</sup> Another instrument with the name Dental value scale was primarily developed to evaluate values of the dental students and practitioners with particular focus on conscientiousness, altruism and personal satisfaction.<sup>14</sup> However, there was no instrument designed so far to evaluate the principal domains of ethics in relevance to fixed and removable Prosthodontics particularly appealing the cultural issues and dental practice patterns in our local community.

Therefore it was finalized to construct a valid and reliable research instrument portraying the Prosthodontic ethical issues faced by dentists in every day clinical practices. By virtue of this research tool we will be able to evaluate ethical sensitivity of dentists working in our community regarding ethical issues involved in fixed and removable Prosthodontics.

## METHODOLOGY

This cross sectional analytical study after being approved from the Ethical committee and Research Board of Gandhara University, conducted at Prosthodontic Department Sardar Begum Dental College, Peshawar for the purpose of this study operational definition of ethical sensitivity considered was the ability of an individual to identify the ethical issues.<sup>15</sup>

To evaluate ethical sensitivity of the freshly graduated dentists related to prosthodontics primary step was to design a validated instrument. A data collection instrument was finalized to be a questionnaire based on close ended questions, which can capture the higher cognitive abilities of the sample participants. The FARPESS was developed following AMEE guide 87 which is about developing the questionnaires for an educational research.<sup>16</sup> So a seven step approach was followed to develop and validated instrument.

In the first step of literature search study construct was defined and elaborated, despite the fact there were very few studies in the literature where ethical sensitivity is evaluated in particular relevance to Prosthodontics. But there was no instrument available which can fulfill all the requirements of this study i.e. to evaluate Fixed and Removable Prosthodontics related ethical sensitivity of dentists. As ethical sensitivity is a broad term, so we have only selected the Autonomy, Beneficence, Non-maleficence and Professionalism which are the principal domains of ethics.

Then we identified the Focal Group for discussion which was finalized to be comprised of six members. For designing a valid questionnaire I including myself made a focal group comprised of six members. Out of these two were ethics teachers available in Peshawar while rest of the four members of the focal group was Prosthodontists having special interest and knowledge in medical education and ethics.

As a third and fourth step group synthesized the literature search in order to have a final construct. The group focused on an instrument that encompasses the four domains of ethics i.e. Autonomy, Beneficence, Non maleficence and Professionalism. Then based on using the vocabulary collected through past experience of teaching clinical Prosthodontics to the target population we started writing the ethical issues in question format from the scratch. So in the earliest draft we made twenty question based statements. The focal group distilled each statement with five point likert scale options so as to limit the answer evaluation to a more manageable and quantifiable categories.

And ultimately agreed on the fifteen questions upon which 100% agreement among all the experts existed. In the next step, content validation of FARPESS conducted through experts of the focal group and content validity ratio (CVR) was evaluated. Each expert rated every test item as either essential, important or not important. Then content validity ratio was calculated for each test item (Table 1) through the formula derived by Lawshe.<sup>17</sup> Based on the agreement of the expert panel content validity index calculated to be 0.92, which shows that construct of the testing items, are valid. As according to a general consensus when the raters are more than five, construct of the testing items will be considered essential or valid if the overall CVI is  $>0.78$ .<sup>18</sup>

Pre-testing for response process validation was the step six of the instrument development. The questionnaire was pre-tested on five subjects in order to get response process validity i.e. to assess how participants interpret these test items. So it went through minor modifications related to language, and was finalized based on the feedback from the pre-test. Sample participants from pre-testing were eliminated from the study.

After pre-testing Angoff's method used as an assessment criteria for testing items which is a method used for establishing absolute passing standards.<sup>19</sup> For this purpose again focal group did thorough discussion to define the group of borderline examinees (those who have a 50% chance of passing). Each of the judge estimated the percentage of the borderline examinees respond correctly to the FARPESS- test items. The judge's estimates were averaged for each test item (Table 2). And percent passing score was evaluated to be 66.8%, which in terms of score is 40 out of 60 in this study. So those participants who scored 40 and above will be considered sensitive to ethical issues regarding fixed and removable Prosthodontics. Whereas, those who scored less than 39 will be considered inadequately sensitive to ethical issues in Fixed and Removable

Prosthodontics.

The FARPESS questionnaire was further pilot tested as a seventh step in the continuation of collecting the validity and reliability evidence. For the sake of reliability analysis I measured out Internal consistency/ item correlation of Fixed and Removable Dental Ethical Sensitivity Scale (FARPESS) through Cronbach's alpha which found out to be 0.866. Values of Internal consistency within range of  $0.6 \leq \alpha < 0.7$  are considered acceptable.<sup>20</sup>

#### Data Collection Procedure

As a last step towards questionnaire validation, data collected from the freshly graduated dentists of session 2015 after taking an informed consent, from the participants who fulfill the inclusion criteria. That is

TABLE 1: FREQUENCIES OF OPTIONS SELECTED TO SOME GENERAL QUESTIONS RELATED TO FIXED AND REMOVABLE PROSTHODONTICS BY THE PARTICIPANTS AND ITS RELATIVE ASSOCIATION WITH GENDER

Testing items	Options	Gender of the participants		Total	P Value
		Male	Female		
Q 1 Consent taking regarding choice of treatment options; in regards to chief complaint and other existing problems in the oral cavity is mandatory?	Disagreed	0	3	3(5.4%)	0.12
	Uncertain	1	0	1(1.8%)	
	Agreed	15	36	51(92.7%)	
Q 2 Ultimate selection of the treatment option is the right of a dentist because of having more knowledge?	Disagreed	3	3	6(10.9%)	0.42
	Uncertain	1	7	8(14.5%)	
	Agreed	12	29	41(74.5%)	
Q 3 Do you believe in addition to the diagnosis, treatment planning and treatment, dentist is also responsible for the prognosis of the treatment?	Disagreed	1	1	2(3.6%)	0.37
	Uncertain	1	5	6(10.9%)	
	Agreed	14	33	47(85.4%)	
Q 4 To ensure disinfection of the impression before pouring the cast and sending to laboratory is the responsibility of a dentist?	Disagreed	1	2	3(5.4%)	0.48
	Uncertain	1	0	1(1.8%)	
	Agreed	14	37	51(92.6%)	
Q 5 Counseling for the hygiene maintenance with the prosthesis is mandatory and considered to be the dentist responsibility?	Disagreed	0	2	2(3.6%)	0.36
	Uncertain	2	1	3(5.4%)	
	Agreed	14	36	50(90.9%)	
Q 6 Job card being work authorization must be made in duplicate and both dentist and dental laboratory technician should retain a copy for certain period of time for any complaint or legal issue?	Disagreed	0	1	1(1.8%)	0.10
	Uncertain	1	0	1(1.8%)	
	Agreed	15	38	53 (96.3%)	
Q 7 Dentist has ultimate responsibility for all dental treatment, including material of any prosthesis produced by dental laboratories as per requirement?	Disagreed	2	1	3(5.4%)	0.32
	Uncertain	1	7	8(14.5%)	
	Agreed	13	31	44(79.9%)	
Q 8 Counseling the patient for scheduled follow-up is also the responsibility of a dentist?	Disagreed	1	1	2(3.6%)	
	Uncertain	1	3	4(7.2%)	
	Agreed	14	35	49(89%)	

those house officers who joined Sardar Begum Dental College either at 1st Year or at the start of 2nd Year (studied ethics in this institute) and has worked at least for 3 months in any clinical department of major subject.

Data from each participant was obtained through a standardized questionnaire containing close ended questions by the author in his own presence. Total response rate of the participation was 73.1%.

**Data Analysis Procedure**

Data were analyzed using the statistical package for social sciences (SPSS) version 16.0. Mean±SD were used for age. Frequencies and percentages were

calculated for variables like gender, ethical sensitivity score/ level. Chi square test was applied to find out association between ethically sensitive / insensitive group and gender. To simplify the data we pooled the option strongly disagree with disagree and strongly agreed with agreed. In order to elaborate the results further we applied Chi square test to find out association between reply of each test item and gender.

**RESULTS**

Mean age of the participants was 23.6 with age range 7. The Content Validity Index of the FARPESS found to be 0.92 whereas internal consistency was 0.86. This study shows total 94.5% of the participant

TABLE 2: FREQUENCIES OF OPTIONS SELECTED IN QUESTIONS SPECIFIC TO REMOVABLE CAST PARTIAL DENTURES (REMOVABLE PROSTHODONTICS) BY THE PARTICIPANTS AND ITS RELATIVE ASSOCIATION WITH GENDER

Testing items	Options	Gender of the participants		Total	P Value
		Male	Female		
Q 9 Surveying the master cast should be done by the dentist.	Disagreed	3	5	8(14.5%)	0.50
	Uncertain	1	2	3(5.4%)	
	Agreed	12	32	44(79.8%)	
Q 10 Designing of the Removable partial denture should be done on the job card by the dentist?	Disagreed	1	0	1(1.8%)	0.17
	Uncertain	2	1	3(5.4%)	
	Agreed	13	38	51(92.6%)	
Q 11 Designing of the Removable partial denture should also be done on the master cast after being surveyed by the dentist before sending to the laboratory?	Disagreed	0	1	1(1.8%)	0.25
	Uncertain	2	2	4(7.2%)	
	Agreed	14	36	50(90.8%)	

TABLE 3: FREQUENCIES OF DIFFERENT OPTIONS SELECTED IN QUESTIONS SPECIFIC TO FIXED PARTIAL DENTURES (FIXED PROSTHODONTICS) BY THE PARTICIPANTS AND ITS RELATIVE ASSOCIATION WITH GENDER

Testing items	Options	Gender		Total	P Value
		Male	Female		
Q12 Fixed partial denture Pontic design should be discussed with the patient?	Disagreed	1	1	2(3.6%)	0.85
	Uncertain	2	6	8(14.5%)	
	Agreed	13	32	45(81.7%)	
Q 13 Preparation of subgingival cervical finish line needs extreme care. Avoidance of irreversible damage to the periodontium is the responsibility of the dentist?	Disagreed	0	1	1(1.8%)	0.25
	Uncertain	2	1	3(5.4%)	
	Agreed	14	37	51(92.7%)	
Q 14 Communication of exact shade to the laboratory is the responsibility of the dentist?	Disagreed	0	1	1(1.8%)	0.28
	Uncertain	0	0	0(0%)	
	Agreed	16	38	54(98.1%)	
Q 15 Provision of prosthesis having exact shade to the patient is the dentist responsibility?	Disagreed	1	1	2(3.6%)	0.78
	Uncertain	1	4	5(9%)	
	Agreed	14	34	48(87.2%)	

TABLE 4: ASSOCIATION BETWEEN PARTICIPANTS GROUP AND GENDER

Participants Groups Based on Test Results	Gender		Total	P Value
	Male	Female		
Participants sensitive to ethics related to Fixed and Removable Prosthodontics (who scored 40-60 in the test)	15(93.7%)	37(94.8%)	52(94.5%)	
Participants insensitive/partially sensitive to ethics related to Fixed and Removable Participants (who scored 1-39 in the test)	1(6.25%)	2(5.1%)	3(5.4%)	0.86

dentist were sensitive compared to 5.4% partially or insensitive to the ethical issues related to Fixed and Removable Prosthodontics (Table 4). Overall relation between gender and ethical sensitivity related to fixed and removable Prosthodontics was insignificant.

## DISCUSSION

Overall 94.8% of the participants found to be ethically sensitive compared to only 5.4% partial or insensitive to ethical issues related to fixed and removable Prosthodontics. Despite of difference in the sample population, our results were in agreement to those of Kazemian et al who also noticed that majority of participant dentists in his study were ethically concerned about overtreatment.<sup>21</sup> Reason might be the fact that he also evaluated dentist's knowledge instead of practice similar to our study. Relation between gender and ethical sensitivity related to Prosthodontics was also insignificant. Reason might be that number of female participants was more as compared to male. But our results were in agreement to those of Hebert et al<sup>22</sup> as well as Chughtai et al<sup>23</sup> who also found insignificant relation between ethical sensitivity and gender.

Specific to the testing items, majority of the participants were agreed to the most of ethical issues such as consent taking, impression disinfection, counseling for hygiene maintenance as well as scheduled follow-up, completion of work authorization and material used for the prosthesis fabrication as dentists responsibility, except for the test item related to the autonomy of the patient regarding selection of the treatment option. About, 74.5% agreed that it is the right of a dentist to select the treatment option because of having more knowledge related to the matter. In contrast, dentists should consider alternative therapies available to provide quality oral health care to the patient, and to weigh benefits of each against potential harm or risks, but ultimate selection any treatment option and this is the principle of Autonomy.<sup>24</sup> Our study result points towards the deficient knowledge of participants related to the patients autonomy.

Some of the study results were in partial disagreement to those of Omo Jo et al who found none of the written instructions in his study clearly showing about impression disinfection.<sup>4</sup> In contrast, our study results show 92.6% of the participants agreed to consider it as the dentist responsibility. Most probable reason is that we only have recorded the perception of the dentists

as compared to Omo who examined their practices.

Similarly our study show 96.3%, 79.9%, 79.8%, 92.6% and 90.8% agreement of the dentists regarding completion of job card/ work authorization, quality of material used in prosthesis fabrication, surveying the master cast, designing of removable partial denture on the job card and master cast as the dentist responsibility respectively. Whereas, our findings contradict to those of Farias-Neto et al who found 51% master casts without any design information drawn by the dentist. 3 No casts was surveyed by the dentist, in short these tasks were designated to the technician. 3 Similarly Radhi based on his study, also claimed poor quality of written instructions by the dentists in the Kingdom of Bahrain.<sup>5</sup> Despite the fact that written instructions ideally should reinforce clear and effective communication between dentist and dental technician, but at many places, practically situation is upside down.<sup>4</sup> So, again the reason for these contradiction among the study results was the difference in the way of assessment i.e. they have observed the dentists in real life practice instead of notifying their attitudes. However, despite of limitations, our study pinpoints the ambiguous situation between dentist's attitude and their practices.

In another study Fayyaz et al claimed that majority of dentists delegate the task of prosthesis designing to the dental technician.<sup>25</sup> Reason for this contradiction to his assumption is the difference of sample population. Our study population was freshly graduated dentist who recently completed their professional education so knowledge related to Prosthodontics was relatively fresh compared to Fayyaz et al where sample population was primarily based on senior dental practitioners (77%) having mean work experience of 8.3 years.

In response to testing item 7, 14 and 15, somewhat less number of participants were agreed to take responsibility for material used including shade match for the prosthesis on behalf of laboratory technician, this probe towards the deficiency in the concept of beneficence, non-malaficence in the participants mind. Whereas, in developed countries such as in US dentist is considered as ultimately responsible for complete dental treatment which includes not only shade matching and design but even material of the prosthesis used by dental laboratory.<sup>26</sup> These findings highlight the importance of distinction between the dentists and dental technicians responsibilities which must be clearly understood and practiced.<sup>3</sup>

## Limitations of the Study

Like clinical competence dental ethics can be evaluated in three main domains i.e. attitudes, knowledge and behavior. In this study we tried to address only the cognitive component of Prosthodontics related dental ethics. But in future follow-up studies we hope to explore other domains of dental ethics further.

## CONCLUSION

FARPESS is a valid and reliable tool to measure ethical sensitivity related to Fixed and Removable Prosthodontics in freshly graduated dentists.

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## CONTRIBUTIONS BY AUTHORS

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|---------------------------------|--|
| <b>1 Mohammad Ali Chughtai:</b> | Study designing, conduction, formulation of results and corresponding author |
| <b>2 Syed Nasir Shah:</b>       | Study conduction and review.   |
| <b>3 Mariya Khalid:</b>         | Writing of the manuscript and study conduction.                              |
| <b>4 Amjid Naseer:</b>          | Reviewed the study.  |