

Assessment Of Knowledge, Attitude And Practice Regarding Interocclusal Record Materials And Techniques Among Dental Practitioners With Different Training Levels: A Survey Based Study

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Abstract: **Background:** Objective: This study was designed to evaluate the knowledge, attitude and practice regarding interocclusal record materials and techniques among dental practitioners with different training levels like undergraduate and postgraduate and those undergoing post graduation training. **Material And Methods:** In this survey based study total 152 dentist participated via Google forms. Survey questions were framed aiming to collect general information and knowledge, attitude and practice towards interocclusal record materials. The results obtained from the survey Google forms were analysed. **Result:** The results show that majority of the participants in the study were PG students (53.3%) followed by BDS (34.2%) and MDS (12.5%). Most of the participants (94.7%) possessed knowledge about interocclusal record materials and 96.7% participants believed that it is necessary for fabrication of prosthesis. Among all participants 75.7% used interocclusal record materials routinely in their practice and having the knowledge of various materials available in market. **Conclusion:** Within the limitations of the study, it was concluded that most of the practitioners(94.7%) having knowledge about interocclusal record material but not having a knowledge about recently available material like polyether / polyvinylsiloxane and digital intraoral scanner / T scan. Most of the practitioners used wax in their clinical practice routinely. This survey shows that MDS and PG student have greater overall understanding regarding interocclusal record material than BDS. Hence, providing more extensive training related to this topic during undergraduate curriculum will be beneficial. [Shah R Natl J Integr Res Med, 2024; 15(1): 04-11, Published on Dated: 26/01/2024]

Key Words: Attitude, Interocclusal record material, KAP survey, Knowledge, Practice.

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Introduction: The specialty of prosthodontics deals with the rehabilitation of structure, function and esthetics with the help of an appropriate prosthesis. For fabrication of a successful prosthesis, it is necessary to record the maxillomandibular jaw relation and accurately transfer it to dental technician for prosthetic rehabilitation of the patient¹. While in some cases, casts can be mounted into maximum intercuspation by hand articulation but in majority cases, for maxillomandibular relationship to be accurately transferred to the articulator, an interocclusal record material is required².

According to GPT 10, "The interocclusal record is a registration of the positional relationship of the opposing teeth or arches³." Materials used to record interocclusal relation are known as interocclusal record materials or bite registration materials. As early as in 1756, Phillip Pfaff made the first interocclusal records using natural

waxes⁴. Over a time dental plaster, zinc oxide eugenol paste, autopolymerizing acrylic resin, and elastomeric materials like polyether and polyvinylsiloxane materials were introduced in clinical practice^{5,6}.

The characteristics of a material are determined by a number of factors, including its shelf life, dimensional stability, and ease of manipulation.

However, in addition to the material's characteristics, the interocclusal record material's accuracy is also affected by the recording method and the mandibular position's reliability, which is determined by occlusal contacts, muscle movement, and changes in tissue around the joint⁷. With so many choices of materials available in market, clinicians often struggle to decide which is best for the patient. The main purpose of this article was to evaluate the knowledge, attitude and practice of dental practitioners with different levels of training like

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undergraduate(BDS), postgraduate(MDS) and those undergoing post graduation towards various interocclusal record materials.

Material & Methods: The present study was conducted to assess the knowledge, attitude and practice of dental practitioners with different level of training like undergraduate(BDS), postgraduate(MDS) and those undergoing post graduation training towards interocclusal record materials.

A total of 152 dentists participated in the study. Questions were framed aiming to collect general information about the qualification, specialty of the dentist and knowledge, attitude and practice towards interocclusal record materials, techniques for manipulation of particular interocclusal material, handling and storage of records and mode of transfer of records to the laboratory technicians. The results obtained from the survey Google Forms were analysed. The questions included in survey are shown in Table 1.

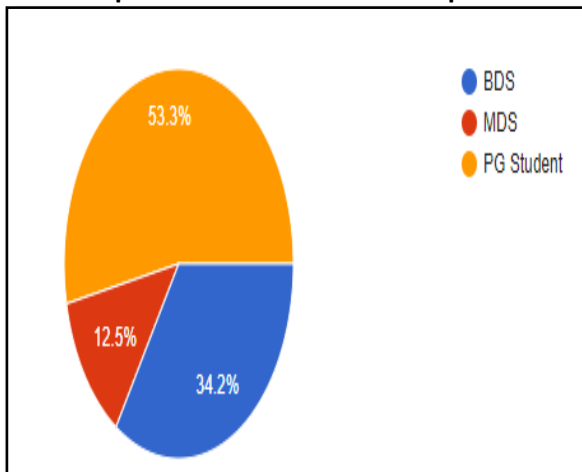
Table 1 : Survey Questionnaire

Do you have any knowledge about taking interocclusal records? A)Yes B)No
Do you agree that interocclusal records are necessary for fabrication of prosthesis? A)Yes B)No
Do you take interocclusal records routinely in your practice? A)Yes B)No
Do you have knowledge about various interocclusal record materials available in market? A)Yes B)No
Do you think choice of material is importance for taking interocclusal records? A)Yes B)No
Which kind of materials do you choose? A)Wax B)ZOE C)Acrylic resin D)Polyether E)Polyvinylsiloxane F)Combination of different materials G)Depends on case
Do you have knowledge about different types of wax available for taking interocclusal records? A)Yes B)No
Which type of wax do you use? A)Modelling wax B)Aluwax C)Depends on case
Are you aware about different manipulation technique for wax as interocclusal record material? A)Yes B)No
How do you manipulate the wax for interocclusal record? A)Hot water B)Controlled water bath at heating temperature of 50 ⁰ C -55 ⁰ C C)By direct heating on
Do you have knowledge about use of ZOE as interocclusal record material? A)Yes B)No
Are you aware about manipulation technique of ZOE as interocclusal record material? A)Yes B)No
How do you manipulate ZOE for interocclusal record? A)Using a metal foil B)Using wax as a medium and relining it with ZOE
Do you have knowledge about polyether/ polyvinylsiloxane as interocclusal record material? A)Yes B)No
Are you aware about manipulation technique of polyether/ polyvinylsiloxane? A)Yes B)No
How do you manipulate polyether/ polyvinylsiloxane as interocclusal record material? A)By direct syringing on occlusal surface of the teeth using a mixing dispenser B)Using tray to carry it into position
Do you know where to place interocclusal record material during recording procedure? A)Yes B)No
Where do you prefer to place an interocclusal recording material during recording procedure? A)Over the teeth which are prepared B)All around the quadrant which is involving the prepared teeth C)Over the full arch D)Depends on case

Do you trim or finish the interocclusal recording material after it has set and before sending to laboratory? A)Yes B)No
Do you disinfect the interocclusal record material before send it to laboratory? A)Yes B)No
In what time interval do you transfer the interocclusal record to the laboratory? A)Within 1 hr B)1-24 hr C)24-48 hr D)48-72 hr
When you transfer the interocclusal record to the laboratory, you use A)Hand articulated cast with interocclusal record between the casts B)You mount the casts by yourself with record in between the casts C)Separate casts and interocclusal record D)Impression and record
If you do not send the material to the laboratory for a particular time, how do you store the record? A)Cold water B)Tap water C)Room temperature D)Polyethylene bag filled with water and sealed
Does your lab technician insist for usage of interocclusal record? A)Yes B)No
Do you have knowledge about use of intraoral scanner for interocclusal record making? A)Yes B)No
Do you think intraoral scanner is a viable / accurate option for interocclusal record making? A)Yes B)No
Do you use intraoral scanner for taking interocclusal records? A)Yes B)No
Do you know about T scan? A)Yes B)No
Are you aware about use of T scan for taking interocclusal records? A)Yes B)No
Do you use T scan for recording interocclusal records? A)Yes B)No
Are you aware about any other newer advances in interocclusal record making? A)Yes B)No
If yes , please specify

Result: The data was collected and represented graphically from the survey form. The distribution of participants according to their training level is depicted in Graph 1.

Graph 1: Distribution Of Participants



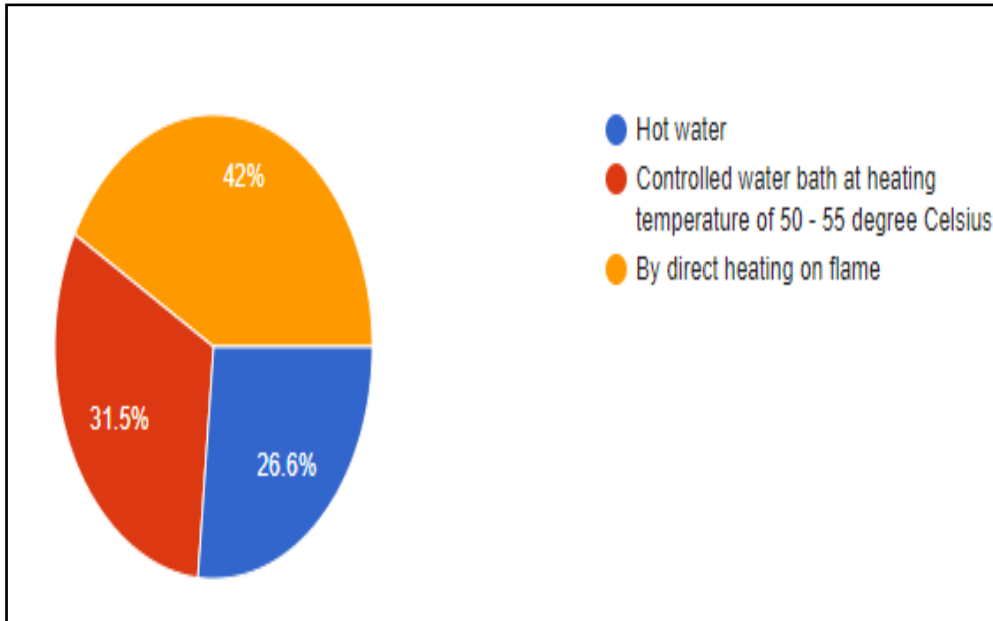
Most of the participants (94.7%) possessed knowledge about interocclusal record materials and 96.7% participants believed that they are necessary for fabrication of prosthesis.

Among all participants 75.7% used interocclusal record materials routinely in their practice and were having the knowledge of various materials available in market. Almost all (94.1%) participant agreed that choice of material is an importance consideration while taking interocclusal records.

Most of the participants used materials depending on case. 90% of the participants had knowledge about different waxes available for interocclusal records and among them majority (37.1%) used modelling wax , followed by the 35.8% who chose material depending on the case and 27.2% used aluwax for interocclusal records.

The preferred technique by the participants for manipulation of wax as interocclusal record material is depicted in Graph 2.

Graph 2: Participant's Preferred Technique For Manipulation Of Wax



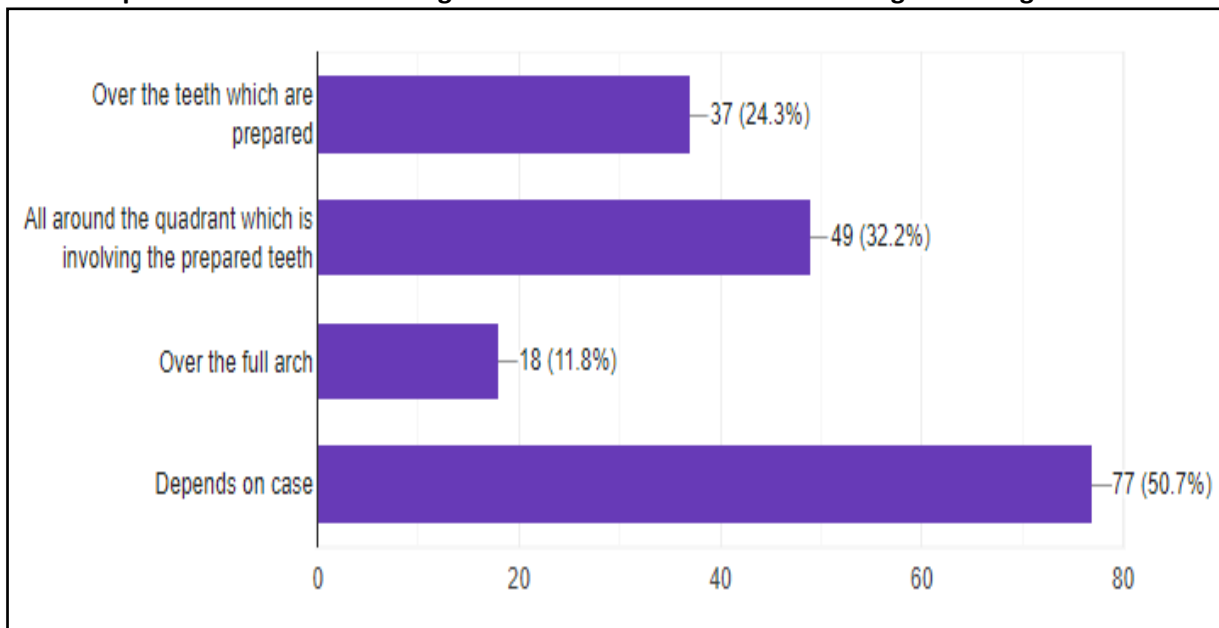
69.7% participants exhibited knowledge about the use of ZOE as an interocclusal record material. 60.5% participants aware about different manipulation technique out of which majority manipulated using wax as a medium and relined it with ZOE and whereas others used metal foil as the medium.

Almost 3/4th of the participants had knowledge about the use of polyether / polyvinylsiloxane as interocclusal record materials while 67.8%

participants were aware about manipulation technique for it. Among them, 68.5% practitioners manipulated by direct syringing on occlusal surface of the teeth using a mixing dispenser and others used tray to carry it into position.

Most of the participants (87.5%) possessed knowledge about where to place interocclusal record material during recording procedure. Their preference is depicted in Graph 3.

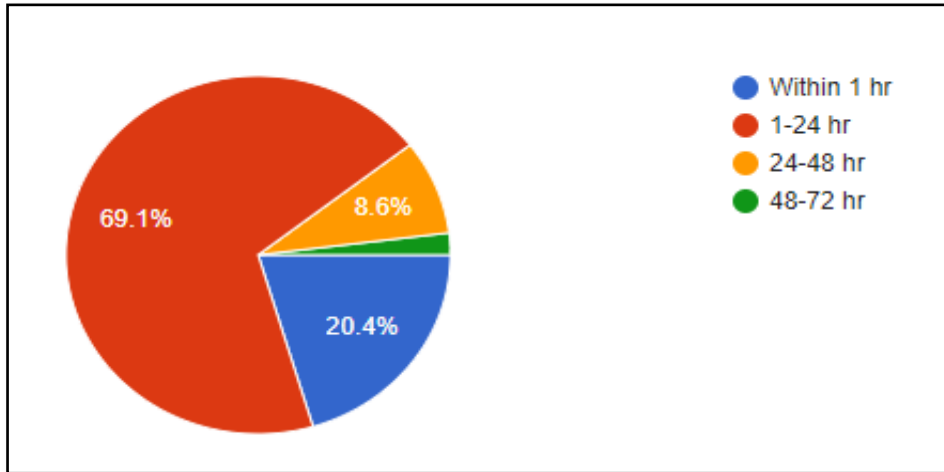
Graph 3: Preference Of Placing Interocclusal Record Material During Recording Procedure



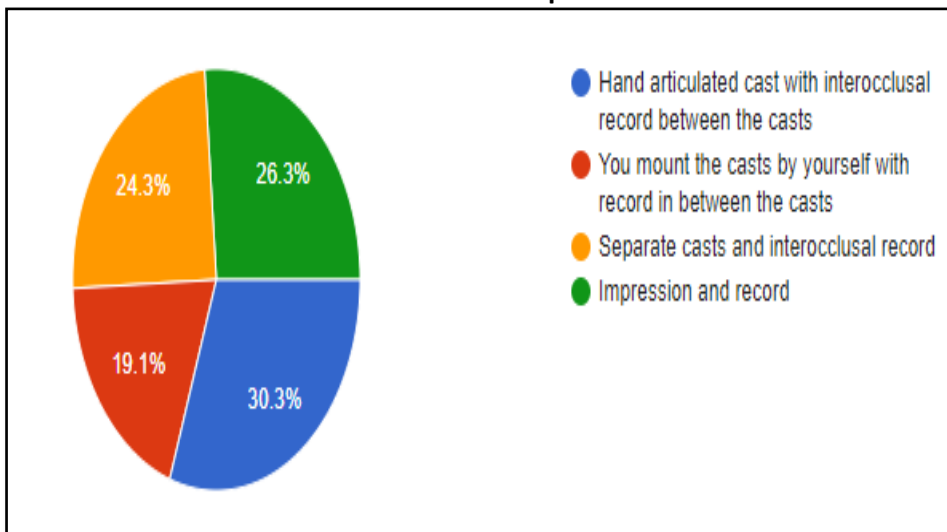
63.2% participants trimmed or finished the interocclusal record after it had set before sending to laboratory whereas 88.8% participants disinfected the interocclusal record material as well.

The time taken in transferring the record to the laboratory by the participants is shown in Graph 4. Also, the preference of manner in which the participants sent the records to the laboratory is depicted in Graph 5.

Graph 4: Time Taken By The Participants In Transferring The Record To The Laboratory



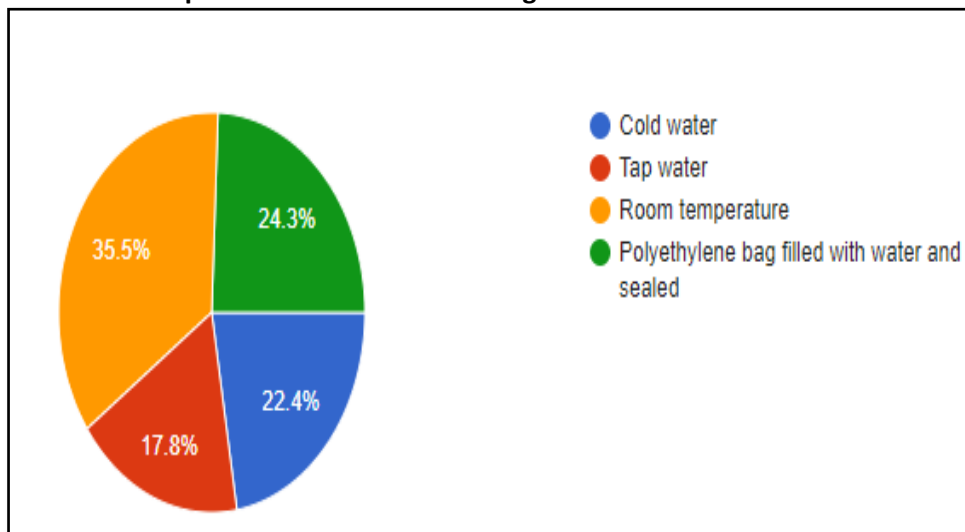
Graph 5: Preference Of Manner In Which The Participants Sent The Records To The Laboratory



The medium of storing the interocclusal record by the participants is shown in the Graph 6. 84.2% of the participants also mentioned that

their lab technician insisted for usage of interocclusal record.

Graph 6: The Medium Of Storing The Interocclusal Records



84.2% of the participants had knowledge about use of intraoral scanner for interocclusal record and among them 64.8 % practitioners believed that it is viable / accurate for interocclusal record.

But only 57.9% of participants personally used intraoral scanner for interocclusal record. Only 59.2% of participants had knowledge about T scan and among them 51.4% of participants were

aware about use of T scan for interocclusal record making. However, only 17.8 % participants were using it in clinical practice.

Discussion: Majority of the dental practitioners deal with prosthetic rehabilitation of patient in their day to day practice⁸. So for successful rehabilitation, interocclusal record plays a crucial role because it is most important factor of any prosthesis fabrication. Having an accurate interocclusal record reduces the need for intraoral corrections while inserting a prosthesis and also delivering a high-quality restoration and reducing the chair side time and expense of treatment^{9,10}.

According to survey results, majority (89%) of dentist had the knowledge; attitude and practice towards interocclusal record materials but among them MDS (91%) and PG student (90%) have higher knowledge, attitude and frequent practice than BDS (85.6%). Only 72% of the practitioners are aware about recently available materials like polyether and polyvinylsiloxane and digital technique like intraoral scanner and T scan compare to convention material like wax(90%).

Most of the participants (37.1%) used modelling wax for interocclusal records in their practice. A reason of its wide acceptance is that it is cost effective and easy to manipulate.⁶ But disadvantage of it is dimensional instability because of greater coefficient of thermal expansion¹¹. Also, they show distortion while removal from mouth and considerable contraction on cooling¹². Ideally, wax should be manipulated using water bath at a temperature of 54°C–60°C before record making^{13,14}.

According to results, MDS and PG student (33%) have more awareness regarding proper manipulation method than BDS (23%) as they practiced controlled water bath. Zinc oxide eugenol paste is simple to use, sufficiently rigid and easy to store but because of its brittleness it is easily fractured. Most of the practitioners (85.7%) manipulated it as relined on wax which is ideal method for its manipulation¹³.

According to results, all BDS, MDS and PG student have equal awareness regarding manipulation of ZOE. Polyether and polyvinylsiloxane are the least used material (67%) by practitioner according to this study. These materials have good accuracy, adequate flow as well as stability after

polymerization and during storage¹⁵. Majority of practitioners (68.5%) manipulated polyether and polyvinylsiloxane by direct syringing on the occlusal surface of teeth. According to Fattore, polyether interocclusal recording medium without a carrier was the most accurate¹⁶.

According to present survey result only 59% used intraoral scanner while only 17.8% used Tscan for interocclusal record making. This digital technique is not used commonly because its lesser availability and greater cost¹⁷. But recently available intraoral scanner is more accurate than conventional material¹⁸.

Almost all of the practitioners (63.2%) are trimming and finishing the record before sending to laboratory. If finishing of record is not done, it may cause interference during mounting which may cause changes in the final prosthesis^{19,20,21}.

According to Lassila, a tightly sealed plastic bag was clearly superior for the storage of interocclusal record²². According to results majority participants(35.5%) stored interocclusal records at room temperature followed by 24.3% who stored it in sealed polyethylene bag filled with water. Majority of practitioners (69.1%) transferred the record to laboratory within the 1st 24 hrs.

In order to obtain proper interocclusal record, the optimal time required to articulate a record is within 48 hours for polyether interocclusal records, 24 hours for polyvinylsiloxane interocclusal records, and 1 hour for wax and zinc oxide eugenol records. Failure to articulate the wax within a one-hour period may result in distortion due to the loss of volatiles and the release of stress⁸. For taking interocclusal record in fabrication of implant prosthesis, bite registration material is place directly on the abutment or over impression coping^{23,24}.

The interocclusal registration process is improving in precision and quality as a result of the development of newer materials and procedures, which lessens the difficulties in the function and aesthetic rehabilitation process. It was observed through the survey that the practitioners lack knowledge regarding recently available and alternative materials like T-scan, Pressure-sensitive films, Typewriter ribbon, Transparent acetate sheet, Occlusion sonography^{17,25}.

According to this survey results MDS and PG student showed more knowledge, better attitude and also practiced the use of various interocclusal record materials than BDS. This can be addressed by incorporating more topics related to materials and application of interocclusal record making in the undergraduate curriculum.

Conclusion: This study investigated the knowledge, attitude and practice of dental practitioners towards interocclusal record materials. Within the limitations of the study, it was concluded that most of the practitioners (94.7%) were having knowledge about interocclusal record material but lacked knowledge about recently available material like polyether / polyvinylsiloxane and digital intraoral scanner / T scan.

Most of the practitioners used wax in their clinical practice routinely. This survey shows that MDS and PG student have an overall greater understanding regarding interocclusal record material than BDS. This necessitates the need for more extensively training the undergraduates in interocclusal record making and awareness regarding recently available materials.

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