A Questionnaire Based Study to Evaluate the Attitude and Awareness Towards Preferring the Method of Recording Occlusal Vertical Dimension of the Patient in the Dentists of Gujarat

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Abstract: **Problem:** A fundamental consideration is the preservation of the occlusal vertical dimension (OVD), which entails maintaining the distance between specific anatomical points during maximal intercuspal position.One of the challenges that dentists often face when recording OVD is the lack of reliable landmarks.These landmarks serve as reference points to determine the correct vertical dimension. **Approach:** A questionnaire-based survey was administered among 164 participants in Gujarat, including postgraduate students, clinicians, and academicians. Logical and validated questions were included in a Google Form, encompassing attitudes and awareness regarding methods for recording OVD. Responses were collected and analysed using descriptive statistics with Microsoft Excel and SPSS Statistics version 24.0 for Windows. **Findings:** The study revealed that a significant majority of dentists favoured physiological methods for recording OVD. However, awareness of newer techniques, specifically anthropometric measurements, was limited among participants. These findings highlight the need for continuous education to keep dentists updated with evolving practices and to enhance their familiarity with various OVD recording methods. The null hypothesis was rejected, indicating a meaningful distinction in attitudes and awareness regarding OVD recording methods among dentists in Gujarat. **Conclusion:** The study underscores the significance of comprehensive dental education and continuous learning to ensure dentists remain well-informed about advancements in their field. By improving awareness and knowledge of various OVD recording methods, dental professionals can offer enhanced patient care and more favourable treatment outcomes. This research provides valuable insights for refining dental education and clinical approaches, ultimately leading to patient well-being.

Keywords: questionnaire study, preference of method, occlusal vertical dimension, anthropometric measurements.

Introduction

There number of the geriatric patients, needing the replacement of their missing teeth are increasing day by day, because of the increase life expectancy since past few decades.[1] The replacement of either single or multiple teeth will require knowledge and awareness regarding restoration of the lost the aesthetics, function and comfort of the patient, without which the treatment will be incomplete and unsatisfactory. Prosthodontics is the branch which mainly deals with the oral rehabilitation of the lost tissues and teeth. Restoring the lost occlusal vertical dimension is associated with multiple factors. According to the Glossary of Prosthodontic Terms, the occlusal vertical dimension is defined as the distance between two selected anatomic or marked points (usually one on the tip of the nose and the other on the chin) when in maximal intercuspal position[2]. While recording the lost vertical dimension, either increase or decrease measurement beyond the adaptive capacity of the stomatognathic system can lead to adverse effects like impaired aesthetics, temporomandibular joint disorders as well as decreased functional efficiency of the masticatory apparatus. In addition, improper dimension can severely affect the patient's ability to perform various facial expressions. In the literature, several techniques are available to determine the vertical dimension of occlusion. The occlusal vertical dimension cannot be determined only objectively since there are no consistent parameters and therefore, combination of more than two different techniques are recommended.Many inexpert juniordentists find it quite difficult to record the vertical dimensions accurately as compared to the senior dentists or the Prosthodontists. To find measurements for the correct vertical dimension of occlusion, several methods have been suggested.

One of the challenges that dentists often face when recording OVD is the lack of reliable landmarks. These landmarks serve as reference points to determine the correct vertical dimension. Some common issues include:

1. Lack of Consistent Landmarks: The anatomy of the oral cavity can vary significantly among individuals. Identifying consistent and reliable landmarks for each patient can be difficult.

2.Variability in Tooth Eruption and Wear: Natural tooth eruption, wear, and dental treatments can alter the original tooth anatomy, affecting the accuracy of landmark identification.

3. Soft Tissue Interference: Soft tissues, such as the lips and cheeks, can influence the positioning of the jaw, making it challenging to measure the true OVD.

4. Muscle Tone and Jaw Position: Muscles play a role in determining the position of the mandible. Changes in muscle tone due to factors like stress or dysfunction can lead to variations in jaw position.

5. Patient Comfort and Cooperation: Patients might not be able to maintain a relaxed and accurate jaw position during the recording process, affecting the reliability of the measurement.

It's important for dentists to address these challenges by combining different techniques and considering individual patient factors to achieve accurate OVD measurements and successful treatment outcomes.

Human body has shown to have proportions. Based on that many anthropometric measurements like length of the index finger, length of the little finger, length of the thumb, length of the nose, interpupillary distance, length of the ear, rima oris to pupil distance, width of the ala of the nose etc.are often taken with callipers and measuring tapes right from the participants which can match the occlusal vertical dimension and help the inexperience students and junior dentists to gain confidence in recording occlusal vertical dimensions.This technique can be easily utilized without any expensive or invasive instruments and the learning curve for this particular technique is quite short and simple, yet predictable.

So to evaluate the attitude and awareness towards preferring the method of recording Occlusal vertical dimension of the patient in the dentists of Gujarat, a questionnaire based survey was conducted. The null hypothesis was there is no deference in the attitude and awareness towards preferring the method of recording Occlusal vertical dimension of the patient in the dentists of Gujarat.

Materials and Method:

Study Design: A questionnaire based survey was undertaken among the dentists in the year 2023 for 45-days in Gujarat. The consent of each participant was obtained from the beginning.Post Graduate students, Dental practitioners (private or government sector) and academicians from Gujarat were included in the study.

Inclusion Criteria: All the volunteers of Post Graduate students, Dental practitioners (private or government sector) and academicians, willing to take part in the survey. Exclusion Criteria: the dentists who were not showing willingness to take part in the survey.

Questions were formed logically and validated by the specialists of the field. After that Google form was created containing all the questions, it was shared among the participants to record their responses.There were total 14 questions in this questionnaire. 9 questions were pertaining to the attitude and awareness towards preferring the method of recording Occlusal vertical dimension of the patient in the dentists of Gujarat. 5 societal questions pertaining to Name, E-mail ID, Age group, sex, and qualifications were asked. The survey had 164 people participate in it all.

Sampling method and Data Analysis

Once a link was generated, the Google Form containing a questionnaire was distributed among all the participants. The gathered responses were then examined. The outcomes of the survey were organized systematically within a Google Sheet. For analysis, the data underwent descriptive assessment through the utilization of Microsoft Excel and SPSS Statistics, specifically version 24.0, designed for Windows operating systems.

Results

In this study, total of 164 dentist participated. Out of 164 participants, 95 were post graduate students, 25 were clinicians, 15 were academician, 20 were private clinic employee, and 21 were Government employee. Table 1 displays the societal information; a total of 39% men and 61% women participated in this study.

Table 1: Societal Characteristics

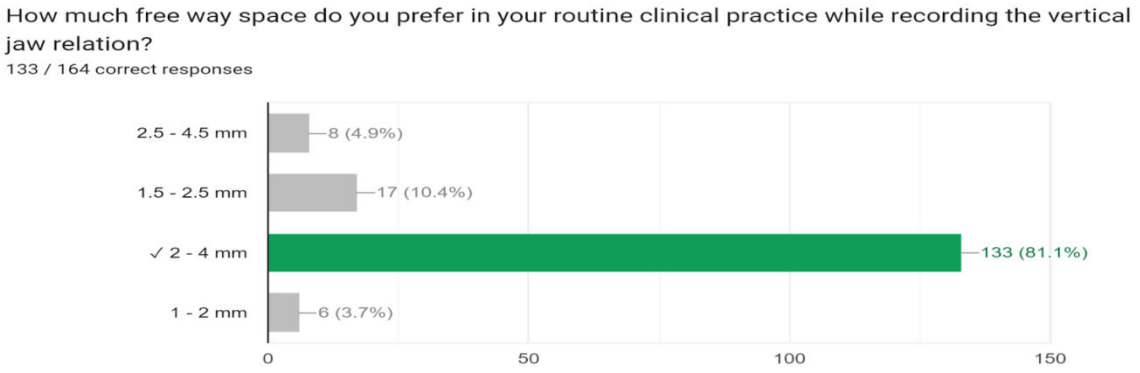
Participants	**N**	**%**
Post graduate students	95	57.09
Clinicians	25	15.2
Academician	15	9.1
Private clinic employee	20	12.2
Government Employee	21	12.08
Total	164	100
Gender	N	%
Male	64	39
Female	100	61

The participants were given the following set of questions.

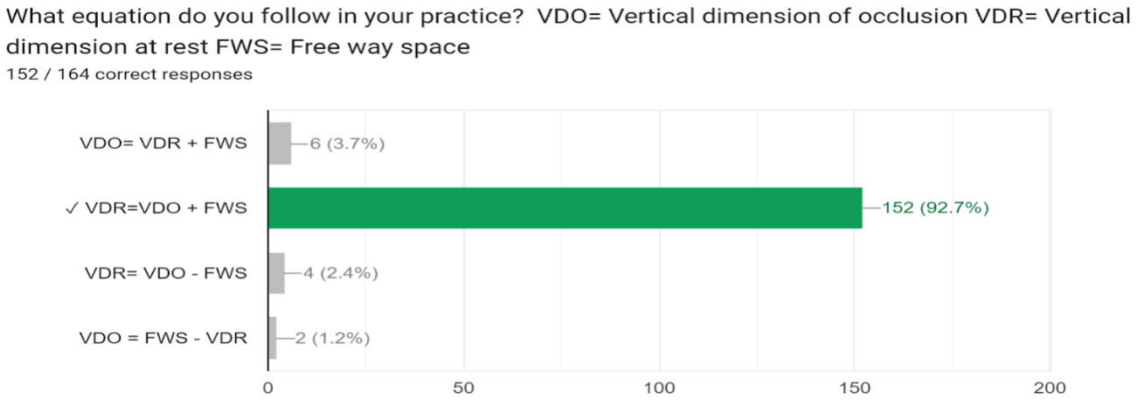
1. How much freeway space do you prefer in your routine clinical practice while recording the vertical jaw relation?
2. What equation do you follow in your practice? [VDO= Vertical dimension of occlusion VDR= Vertical dimension at rest FWS= Freeway space]
3. Which methods of recording the Occlusal vertical dimension do you prefer for your routine clinical practice?
4. Which among the following Mechanical method/methods do you prefer to record the occlusal vertical dimension?
5. Which among the following Physiological methods do you prefer to record the occlusal vertical dimension?
6. How many method/methods do you apply simultaneously to get the occlusal vertical dimensions?
7. Which of the following anthropometric methods are you aware of that can be used to evaluate the occlusal vertical dimensions?

8. While fabricating a complete denture do you find any clinical step that is most challenging/ erroneous?
9. Mention if you use any newer technology to record the occlusal vertical dimension. (One liner)

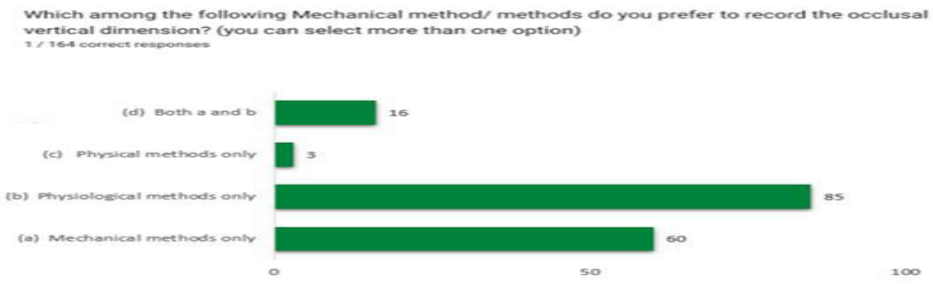
The response of the participants in the form of the Graphs are as follow



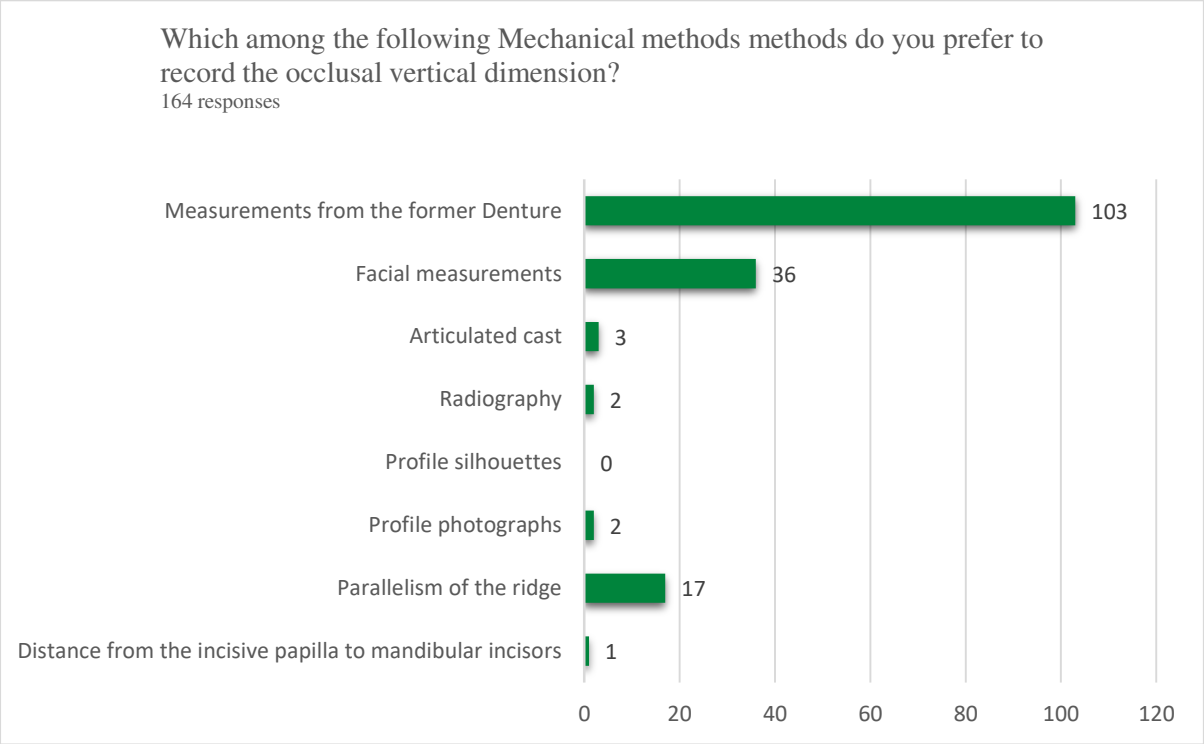
Graph 1



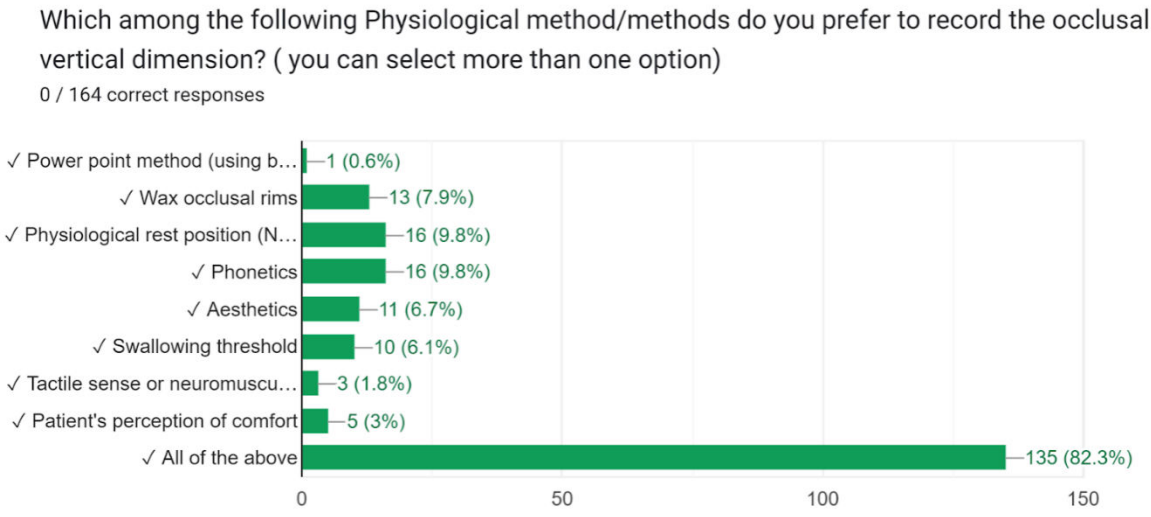
Graph 2



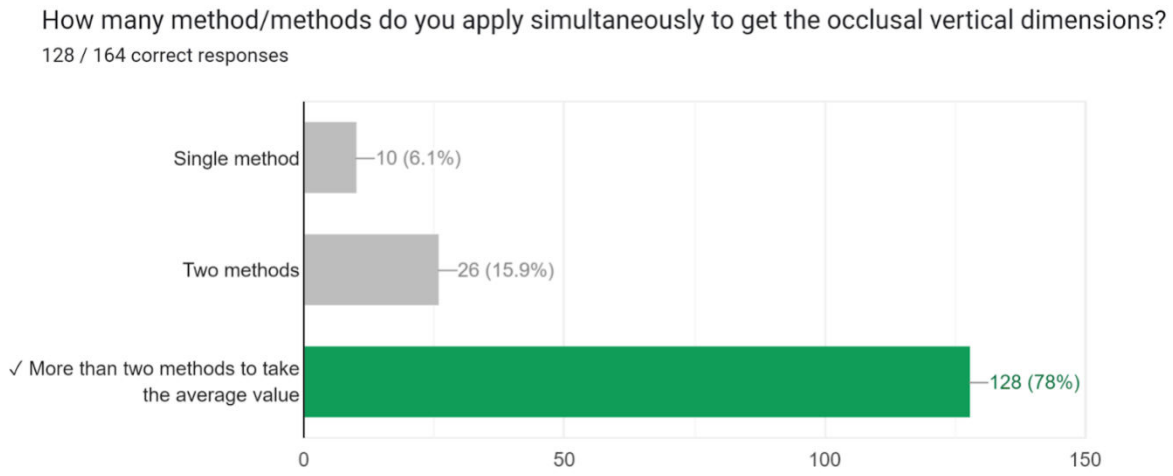
Graph 3



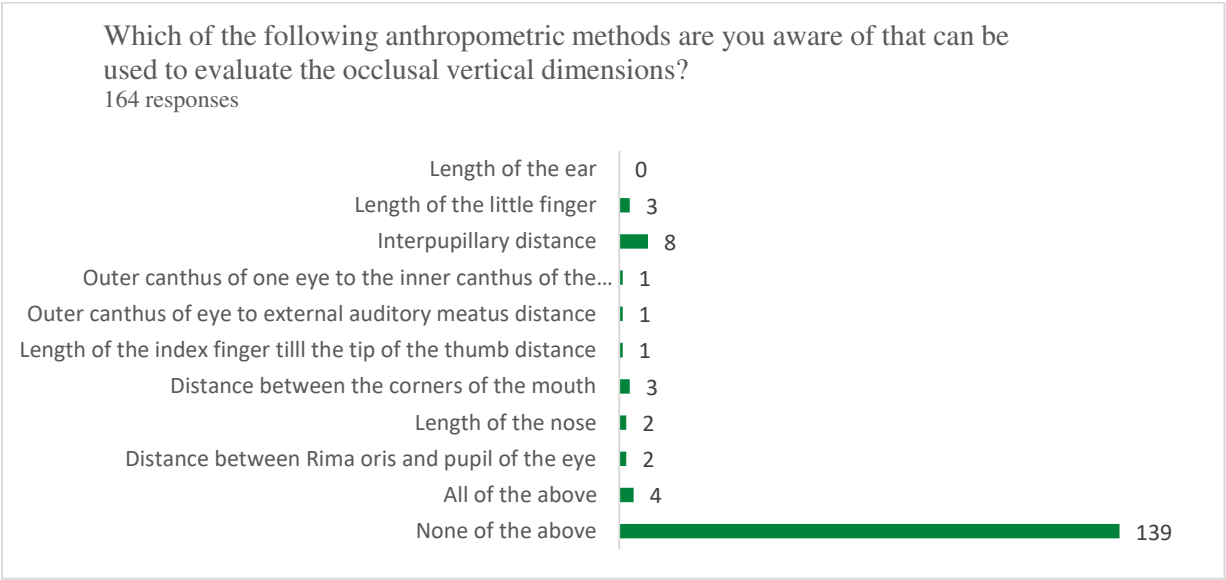
Graph 4



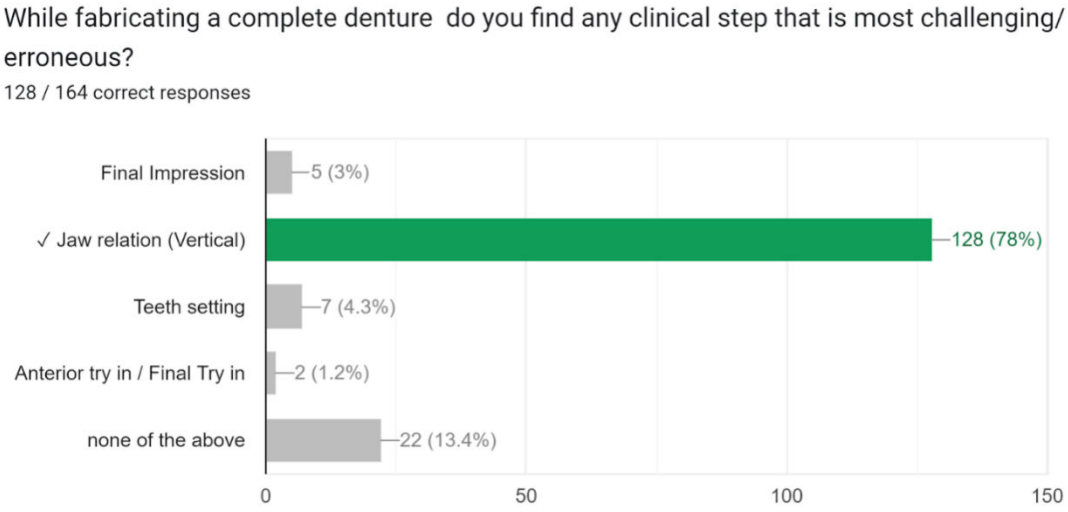
Graph 5



Graph6



Graph7



Graph8

Inference:

From the graphs it was noted that dentists of Gujarat preferred 2-4 mm of freeway space (graph 1) and VDR=VDO+FWS (graph 2). Graph 3 shows that around 85 dentists(51.82%) prefer physiological methods to record the occlusal vertical dimension, while 16 (9.75%)choose to record OVD by the combination of both physiological and mechanical methods.Graph 4 shows that the majority of the dentist preferred measurement from the previous dentures for mechanical methods, while majority of them preferred to use all the methods that are under the physiological category for measuring OVD. (Graph 5).The majority of the dentist combine more than two methods to record OVD. (Graph 6). 84.75% dentists weren't aware about the anthropometric methods, including Length of the ear (0%). While 15.24% were aware about the anthropometric methods (Graph 7). 78% of them have found that relating the jaws, is a most challenging/ erroneous step for them. (Graph 8). In response to question number 9 majority of them were unaware about the newer technology in measuring the OVD.

Discussion

Many studies are currently focusing on the restoration of the altered jaw relationships. Establishing a proper lower face height is crucial because if the vertical dimension occlusion is changed, beyond the adaptive capacity of the stomatognathic system, then there will be permanent damage to TMJ which can affect the quality of life of the patient. Despite the improvements in materials and techniques made in prosthodontics, dentists still lack a reliable method for determining the vertical dimension of occlusion in patients with missing teeth.[8,9]From the results of the study we can infer that the majority of the dentists preferred

the routinely performed techniques to record OVD i.e. mechanical and physiological methods. Only 5 people knew digital technology (digital scanning, virtual face bow and virtual articulator) to register the OVD.84% participants were unaware about recent advancement in techniques for recording vertical dimension. 72.6% participants knew about the anthropometrictechniques. 89.3% was unaware about the same, as per the Graph 7.

The findings of this investigation amply support that, the majority of the dentists of Gujarat lacked a thorough understanding of latest developments and newer measurement methods for measuring the vertical dimensions.Anthropometric measurements are straightforward, affordable, non-invasive, trustworthy, and do not require any radiography, therefore they might be suggested for routine use.[3]

The study's findings can be used as an essential foundation for developing and implementing health education programs. Furthermore, these educational interventions hold the potential to sensitize dentists to the significance of staying abreast of advancements in their field. Dental care is a dynamic and evolving field, with new techniques and technologies frequently emerging. Through expert lectures and workshops, dentists can gain insights into the rationale behind adopting newer methods and the benefits they offer in terms of patient care and treatment outcomes.While the dentists are evidently well-versed with established and traditional methods of performing this task, the study suggests a potential gap in their knowledge about recent advancements and innovations in the field. This highlights the importance of staying updated with the evolving landscape of dental practices and technologies.

To bridge this knowledge gap, the study emphasizes the necessity of implementing continuous education initiatives. These could take the form of organized programs such as workshops, lectures by experts in the field, and interactive sessions.

To increase their knowledge and proficiency, dentists might combine seminars, expert lectures, and studies and clinics that use an evidence-based approach. This study, designed to meet specific needs, adeptly captures a precise overview of the current scenario. It provides a thorough understanding of the existing situation. In the future, conducting studies across multiple centers that account for the diverse training approaches and cultural distinctions prevalent across various Indian states could yield significant insights. Such comprehensive research endeavors have the potential to bring about positive revisions in the curricular frameworks adopted by health science institutions. The null hypothesis of the study was rejected, as there was statistical significant difference in the attitude and awareness towards preferring the method of recording Occlusal vertical dimension of the patient in the dentists of Gujarat.

Conclusion:

Based on the constraints of this descriptive study, it can be inferred that

(1) Majority of the dentist (more than 50%) prefer physiological method to record the OVD. Around 10% preferred the combination of both physiological and mechanical methods.

(2) The majority of the dentist combine more than two methods to record OVD.

(3) Dentists in Gujarat possess awareness regarding conventional practices for recording vertical dimension. However, their familiarity with more contemporary advancements (like anthropometric methods) in this area appears to be lacking.

Additionally, there remains a consistent requirement to arrange ongoing educational initiatives such as specialized sessions, expert talks, and hands-on workshops. These endeavours are essential for enhancing the understanding of dentists on a consistent basis and increasing their awareness about the latest developments in the field. This would lead to a more well-rounded and up-to-date knowledge base among dental professionals in Gujarat.
By actively participating in educational programs, dentists can ensure that their practices remain aligned with the latest trends and advancements, ultimately leading to improved patient care and better outcomes in the field of dentistry.

Conflict of interest
Nil
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References

1. Kumar Y. Understanding the Frontiers of Human Longevity in India: Imperative and Palliative Care. Indian J Palliat Care. 2019 Jul-Sep;25(3):455-461.
2. Glossary of Prosthodontics Terms. 9th ed. J Prosthet Dent 2017; 117: 1-105.
3. Ladda R, Bhandari AJ, Kasat VO, Angadi GS. A new technique to determine vertical dimension of occlusion from anthropometric measurements offingers. Ind. J. Dent. Res. 2013; 24: 316-20.
4. Alhajj MN, Khalifa N, Abduo J, Amran AG, Ismail IA. Determination ofocclusal vertical dimension for complete dentures patients: an updatedreview. J. Oral. Rehabil. 2017; 44: 896–907.
5. Ladda R, Kasat VO, Bhandari AJ. A new technique to determine verticaldimension of occlusion from anthropometric measurement of interpupillarydistance. J. Clin. Exp. Dent. 2014; 6: e395-9.
6. Turrell AJW. Clinical assessment of vertical dimension. J. Prosthet. Dent. 2006; 96: 79-93.
7. Discacciati JA, Lemos de Souza E, Vasconcellos WA, Costa SC, Barros VdeM.Increased vertical dimension of occlusion: Signs, symptoms, diagnosis, treatment andoptions. J. Contemp. Dent. Pract. 2013; 14: 123–8.

8. Rahn AO, Ivanhoe JR, Plummer KD. Textbook of Complete Dentures. 6th ed.Connecticut USA: People's Medical Publishing House Shelton; 2009.
9. Paul MJV, Manimaran P, Kumar CD, Simon EP, Paul V. Knowledge and Awareness of Jaw Relation among Dental Interns: A Questionnaire Survey. J. Pharm. Bioallied. Sci. 2021; 13: S1263–5.
10. Tavano KTA, Seraidarian PI, de Oliveira DD, Jansen WC. Determination of vertical dimension of occlusion in dentate patients by cephalometric analysis – pilot study. Gerodontology 2012; 29: e297-305.
11. Brar A, Mattoo KA, Singh Y, Singh M, Khurana PRS, Singh M. Clinical reliability of different facial measurements in determining vertical dimension of occlusion in dentulous and edentulous subjects. Int. J. Prosthodont.Restor. Dent. 2014; 4: 68-77.
12. Widana, I.K., Dewi, G.A.O.C., Suryasa, W. (2020). Ergonomics approach to improve student concentration on learning process of professional ethics. Journal of Advanced Research in Dynamical and Control Systems, 12(7), 429- 445.
13. Chang, M. O., Peralta, A. O., &Corcho, O. J. P. de. (2020). Training with cognitive behavioral techniques for the control of precompetitive anxiety. International Journal of Health & Medical Sciences, 3(1), 29-34.