



## RESEARCH ARTICLE

### KNOWLEDGE, ATTITUDE AND TECHNIQUE IN RECORDING VERTICAL DIMENSION TECHNIQUES

\*Leyamathews and Dr. Dhanraj

Saveetha Dental College, Poonamalle High road, India

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#### ABSTRACT

**Background:** Vertical Dimension is defined as the distance between the two selected anatomic or marked points, one on a fixed and one on a movable membrane. A number of techniques is being practiced for the evaluation of vertical dimension occlusion but none of them is scientifically accurate than the other. The purpose of this study is to evaluate the different methods used by practitioners to record the occlusion and the complications faced by it.

**Aim:** To evaluate the different techniques used to record vertical jaw relation

**Methodology:** questionnaire was prepared and a cross sectional survey was conducted among 100 practitioners in Chennai city. The survey included a questionnaire with 10 questions to assess knowledge, attitude and technique of vertical jaw relation by the practitioners

**Conclusion:** In this study, as per statistical analysis, 90% of the candidates preferred Niswonger technique while recording vertical dimension at occlusion where as speech technique while recording vertical dimension at rest.

**Objective:** to view the efficiency and the complications faced by the dental practitioners while recording the vertical dimension occlusion.

#### INTRODUCTION

Glossary of Prosthodontics defines Vertical dimension as “the distance between the two selected anatomic or marked points (usually one on the tip of the nose and the other upon the chin), one on fixed and one on a movable membrane (Glossary of Prosthodontics Terms, 2005). Establishing an appropriate lower facial height is very important because if vertical dimension is registered too high or too low, it would deteriorate the existing patient's condition. Though there are many advances in techniques and materials employed in recording vertical dimension, no technique is scientifically accurate than the other. In assessing the technique required, it is the clinical judgement by the dentist that plays a major role (Ladda *et al.*, 2013). Vertical jaw relation are those established by the amount of separation of the maxilla and the mandible under specified conditions, classified as vertical dimensions of rest and vertical dimension of occlusion. Physiologic rest position of the mandible is not determined by the teeth, but by muscles and gravity. Vertical dimension of occlusion is established by the natural teeth when they are present in occlusion. In denture wearer, it is established by the vertical height of the two dentures when the teeth are in contact (Naveen Raj *et al.*, 2013). A number of guides to the occlusal vertical relation are available. Included among these are the tactile sense of the patient as suggested by Lytle and observations of the relations of the anterior teeth during speech, especially during the production of the speech sounds, S, CH and J (Lytle, 1964).

\*Corresponding author: Leyamathews,  
Saveetha Dental College, Poonamalle High road, India.

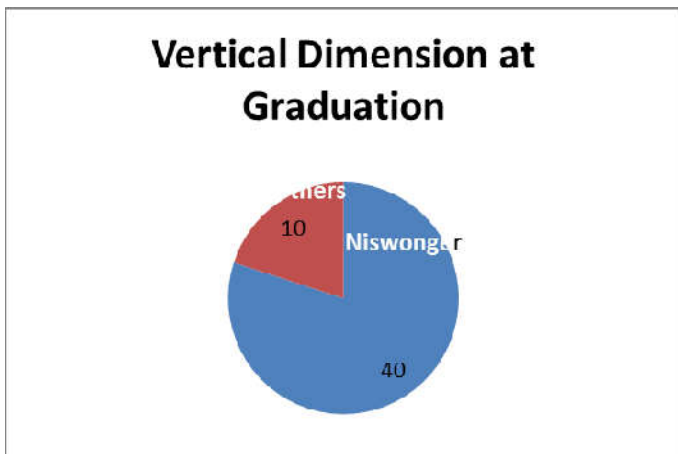
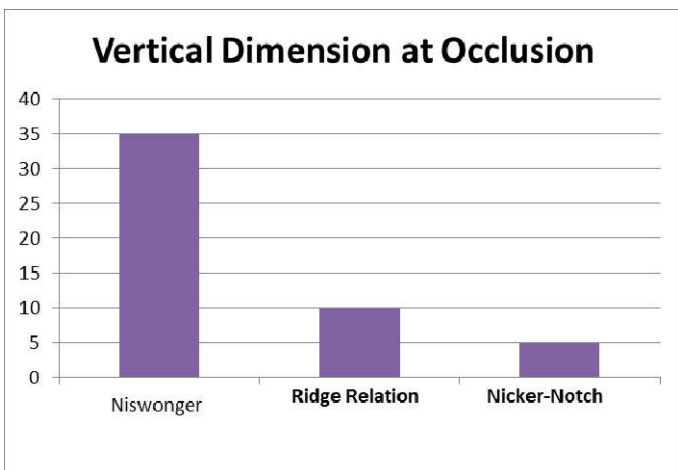
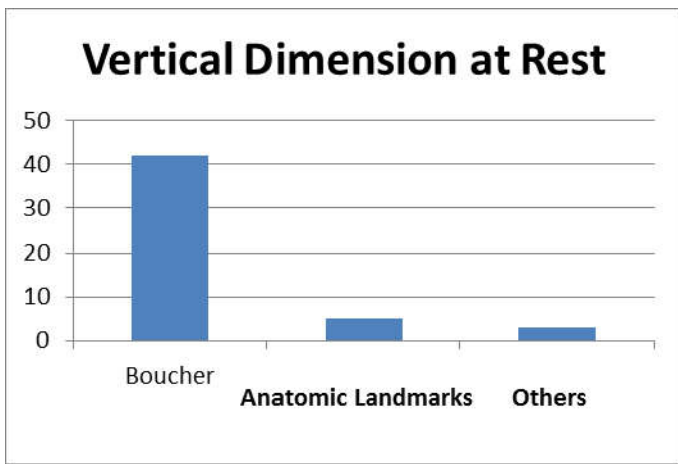
Vertical Dimension has been also correlated with various anthropometric measurements like the distance from the outer canthus of one eye to the inner canthus of the other eye, Vertical height of the ear, vertical length of nose at the midline, length of the fingers. Other techniques may require equipments like lateral cephalographic unit or electromyographic machine (Feldman *et al.*, 1978). In respect to all these observations, this study is done to assess the knowledge, attitude and techniques commonly used by the dental practitioners among the south Indian population. This helps to view the efficiency and the various complications faced while recording vertical jaw relation.

#### MATERIALS AND METHODS

A questionnaire was prepared and a cross sectional survey was conducted among 100 practitioners in Chennai city. The survey included a questionnaire with 10 questions to assess knowledge, attitude and technique of vertical jaw relation by the practitioners and also the choice of base material used. The results were presented in tables and statistically analysed.

#### RESULTS

After the results were statistically analysed, it was found that 90% of the dental practitioners preferred speech technique to record vertical jaw relation at rest followed by 5% who preferred anatomical landmarks. Niswonger method was the most commonly used method to record vertical jaw relation at occlusion followed by tactile and speech method. Difficulties in using this technique were found to be very minimal like pseudo class III



**DISCUSSION**

It has been more than 70 years since Niswonger proposed the method of recording vertical dimension, both at rest and occlusion (Feldman *et al.*, 1978, Turrell, 2006) Using facial measurements) between the chin and tip of the nose) he found a minimum interocclusal space of 3.2mm in a group of 400 dentate subjects ,out of which 200 have highly worn teeth. This method is still in use and still preferred over other physiological methods like swallowing threshold, phonetics because of the ease in recording (Vinnakota *et al.*, 2016) and also it does not involve the use of any sophisticated instruments (Singh *et al.*, 2014). This method is also reliable for patients with poor neuromuscular coordination where physiologic rest position is difficult to achieve (Toolson *et al.*,

1982). However, this method though popular, was debated and questioned by many. It was first questioned by Nairin in 1965 stating that the intraoral VDO dimensions did not match with the extra oral VDO dimensions measured on skin (Kessler, 1954) Mandible ,being a movable membrane could produce some skin alterations, thereby changing the vertical dimensions. This further compromises esthetics resulting from changes in facial appearance, diminished masticatory function, altered phonetics, and pain at the teeth or edentulous ridges (Koka, 2007). Addition, some patients describe a feeling of not having space in their mouth, a sensation akin to “oral claustrophobia (Tavano *et al.*, 2012). Speech is used as an aid in several ways to record maxillomandibularrelationship .Silvermans closest speaking space measures the vertical relation of the mandible in the phonetics method (Silverman, 1956). It calculates the vertical relation of the mandible and its muscles are involved in the physiologic method of speech. The occlusal rims are located in the mouth and height is adjusted until the minimum space between the maxilla occulsal rims when the patient speaks or pronounces few letters (“S”,”M”). This can aid to obtain correct height by guiding the patients mandible to the rest position (Jain *et al.*, 2014).This method can be used to record both vertical dimension at rest and occlusion. Sometimes in spite of being accurate at recording jaw relation, speech problems can exist later because the tongue and lips interact with wax in a different way than the finished dentures. Also, the copious salivary flow also can alter the speech (Pound, 1951). In this study, it was shown that 90% of the candidates preferred to use facial measurements over other methods. Most commonly used method was the Niswonger Method. Due to Patient comfort and ease of the method, this method was more preferable. 45 out of 50 dental practitioners preferred speech technique to record VD at rest. Although, the facial measurements were debatable, it was still used to fabricate dentures. Measurements excluding the mandible membrane, would minimize the chances of errors.

**Conclusion**

Determining occlusal vertical dimension is significant in oral rehabilitation, be it fabrication of complete dentures, orthodontic treatments, crown or bridges whose correction can lead to a change in vertical dimension of occlusion. Physiologic rest and the freeway space form the basis of vertical dimension of occlusion. Various methods have been discussed in the literature which include phonetics, speech, salivary threshold and facial measurements. In this study, it was found that Niswonger was most commonly used inspite being questioned and criticized. Practitioneners preferred it because of the ease of use. Speech was more commonly used in case of vertical dimension at rest.

**REFERENCES**

An Alternative Technique to Determine Vertical Dimension ofOcclusionFrom Anthropometric Study Done in Gujarati Population .RupalShah , IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 16, Issue 1 Ver. II (January. 2017), PP 12-16

Dileep Nag Vinnakota, Krishna ChaitanyaKanneganti, Mahesh Pulagam, Gopala Krishna KeerthiDetermination of vertical dimension of occlusion using lateral profile

- photographs: A pilot study The journal of prosthodontic Society 2016 Oct 1; 16(4):323
- Feldman, S., Leupold, R.J., Staling, L.M. 1978. Rest vertical dimension determined by electromyography with biofeedback as compared to conventional methods. *J Prosthet Dent.*, 40:216-9. [PubMed]
- Feldman, S., Leupold, R.J., Staling, L.M. 1978. Rest vertical dimension determined by electromyography with biofeedback as compared to conventional methods. *J Prosthet Dent.*, 40:216-9.
- Glossary of Prosthodontics Terms, 2005. 8th ed. *J Prosthet Dent.*, 94:10-85. [PubMed] [Ref list]
- Kessler, H.E. 1954. Speech Considerations in Denture Construction, *Dental Survey*, 30: 1570-1572. The
- Koka, S. 2007. Vertical Dimension of Occlusion, *Int J Prosthodont*, 20:342
- Ladda, R., Bhandari, A.J., Kasat, V.O., Angadi, G.S. 2013. A new technique to determine vertical dimension of occlusion from anthropometric measurements of fingers. *Indian J Dent Res.*, 24:316-20. [PubMed] [Ref list]
- Naveen Raj, T., Ashish Meshram, Shantanu Mulay, Honey Jethlia, 2013. Review on methods of recording vertical relation. Month: March Volume: 2 Issue :12
- Lytle, R.B. 1964. Vertical relation of occlusion by the patient's neuromuscular perception. *J Prosthet Dent.*, 14:12-21
- Phonetics in Dentistry Dev Jain, International journal of Oral health and medical research, May-June 2014/VOL1
- Pound, E., 1951. Esthetic dentures and their phonetic values, *Journal of Prosthetic Dentistry*, 1(2): 98-111
- Silverman, M.M. 1956. Determination of Vertical Dimension by Phonetics, *Journal of Prosthetic Dentistry*, 6: 465-471.
- Singh Y, Singh M, Khurana PR Clinical reliability of different facial measurements recording vertical dimension at occlusion in edentulous and dentulous subjects. *International Journal of Prosthodontic and Restorative Dentistry* Toolson LB, Smith DE. Clinical measurement evaluation vertical dimension. *J prosthet Denture* 1982 47:236-41.
- Tavano, K.T., Seraidarian, P.I., de Oliveira, D.D., Jansen, W.C. 2012. Determination of vertical dimension of occlusion in dentate patients by cephalometric analysis – Pilot study. *Gerodontology*, 29:e297-305. [PUBMED]
- Turrell, A. 2006. Clinical assessment of vertical dimension. *J Prosthet Dent.*, 96:79-

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