

# Knowledge, Attitude and Practice among Dental Practitioners about the "All on four" Concept of Dental implants Practicing in Pimpri Chinchwad, Pune, Maharashtra, India: A Questionnaire Study

Dr. Varun Bhatt<sup>1</sup>, Dr. Nilesh S. Bulbule<sup>2</sup>, Dr. Akanksha N Bhandari<sup>3</sup>, Dr. Akanksha Shinde<sup>4</sup>, Dr. B Gayathri<sup>5</sup>, Dr. Amit K Jagtap<sup>6</sup>

<sup>1,2,3,4</sup>Department of Prosthodontics, Crown and Bridge and Implantology, Dr. D. Y. Patil Dental College and Hospital, Dr D.Y Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India

<sup>5</sup>MDS-II, Department of Prosthodontics, Crown and Bridge and Implantology, Dr. D. Y. Patil Dental College and Hospital, Dr D.Y Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India

<sup>6</sup>MDS, Department of Prosthodontics, Crown and Bridge and Implantology, Dr. D. Y. Patil Dental College and Hospital, Dr D.Y Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India

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## Abstract

**Background:** Successful rehabilitation of a dentition having a poor prognosis with implant-supported fixed prosthesis is a multi-stage process involving an edentulous period before prosthetic rehabilitation of the patient. The period of transformation from natural teeth to fixed implant prosthesis is sometimes not accepted by the patients. This concept has been in clinical use since 1998. This treatment is cost-effective and time-saving in order to rehabilitate patients with an interim prosthesis in which 4 implants were placed two placed vertically in the anterior region and two placed up to an angle of 45 degrees in the posterior region.

**Purpose:** To evaluate Knowledge, Attitude and Practice among Dental practitioners about the "All on four" Concept of Dental implants practicing in Pimpri Chinchwad, Pune, Maharashtra, India.

**Methods:** This quantitative-type descriptive survey was conducted between February to April 2022 in Pimpri Chinchwad, Pune, Maharashtra, India. A self-designed, pre-tested and validated questionnaire assessing the Knowledge, Attitude and Practice among Dental practitioners about the "All on four" Concept of Dental implants. Data were collected and entered into a spreadsheet (Excel 2010: Microsoft office) and analyzed using SPSS software (version 19-SPSS Inc. Chicago, IL, USA).

**Results:** All 205 participants responded. When asked if dental practitioners considered the "All on four" concept a viable option 74.1% of practitioners (152) agreed while about 25.9% of practitioners (53) did not agree on the same

**Conclusion:** Despite the presence of knowledge and attitude among dental practitioners the presence of practice among practitioners seems to be insufficient towards the "All on Four Implant" Concept.

**Keywords:** Implants, All-On-Four, Prosthesis, Fixed.

## INTRODUCTION

A Successful rehabilitation of a dentition having a poor prognosis with implant-supported fixed prosthesis is a multi-stage process involving an edentulous period before prosthetic rehabilitation of the patient. The period of transformation from natural teeth to fixed implant prosthesis is sometimes not accepted by the patients.<sup>1</sup>

Direct Sinus lift bone augmentation procedures and nerve repositioning are some

of the complex procedures which are generally indicated in a completely edentulous patient without that fixed implant prosthesis are almost impossible. So in these cases, all on four concept by Paulo Malo is a viable treatment option.<sup>2</sup>

This concept has been in clinical use since 1998. This treatment is cost-effective and time-saving in order to rehabilitate patients with an interim prosthesis in which 4 implants were placed two placed vertically in the anterior region and two placed up to an angle of 45 degrees in the posterior region.<sup>1</sup>

General considerations

- When the minimum width of bone is 5mm or minimum in order to achieve primary stability insertion torque should be

35 to 45 Ncm.

- In the maxillary arch available height of bone from the canine to the canine region should be 10mm and in the mandibular arch 8 mm.
- Splinting of angulated Implants when angulation is 30 degrees or more.
- For posterior angulated implants, the distal screw access holes should be present at the occlusal face of the first molar, the second premolar, or the first premolar.<sup>2</sup>

Implants are generally placed parallel to the anterior maxilla and mandible in cases of implant overdentures whereas in cases of implant-supported fixed prosthesis masticatory loads are shared equally among the implants and anterior implants generally take loads from extensions of the posterior cantilever. Therefore load distribution is always an important aspect, by increasing the quantity of maxillary and mandibular anterior implants. Though some literature believes that the number of implants placed in the anterior region does not matter in terms of the formation of heavy loads in distal cantilever cases, forces are generally absorbed by the distal implants.<sup>3</sup>

Many researchers wrote articles about the all-on-four implant concept but still there lack of literature regarding questionnaire studies among dentists regarding their current knowledge, attitude and approach towards this "All on four" concept. Also how often they are using this concept in their dental practice. Therefore, this questionnaire survey aims to evaluate Knowledge, Attitude and Practice among Dental practitioners about the "All on four" Concept of Dental implants Practicing in Pimpri Chinchwad, Pune, Maharashtra, India.

Aim of the Study: To evaluate Knowledge, Attitude and Practice among Dental practitioners about the "All on four" Concept of Dental implants practicing in Pimpri Chinchwad, Pune, Maharashtra, India.

Objective of the Study:

- To evaluate Knowledge among Dental practitioners about the "All on four" Concept of Dental implants Practicing in Pimpri Chinchwad, Pune, Maharashtra
- To evaluate Attitude among Dental practitioners about the "All on four" Concept of Dental implants Practicing in Pimpri Chinchwad, Pune, Maharashtra
- To evaluate Practice among Dental practitioners about the "All on four" Concept of Dental implants Practicing in Pimpri Chinchwad, Pune, Maharashtra

#### MATERIALS AND METHOD:

This quantitative-type descriptive survey was conducted between February to April 2022 in Pimpri Chinchwad, Pune, Maharashtra, India. The study received formal review and approval from the Institutional Ethical Committee before starting the study. Written informed consent was obtained from the participants by briefing them regarding the outline of the study and providing them with the assurance of maintaining anonymity. List of all dental practitioners practicing in Pimpri Chinchwad, Maharashtra, India obtained from Indian Dental Association (IDA) Pimpri Chinchwad. The minimum sample calculated was 205 using the formula,

$$N = \frac{4PQ}{L^2}$$

Where, P- prevalence (50% assumed prevalence)

Q- (100-P)

L- Precision/allowable error (7%)

Inclusion Criteria: Dental practitioners practicing in Pimpri Chinchwad, Pune, Maharashtra, India, those providing consent. The questionnaires which were partially answered for whatever reason were excluded from the study.

Questionnaire Development and assessment: A self-designed, pre-tested and validated questionnaire assessing the Knowledge, Attitude and Practice among Dental practitioners about the "All on four" Concept of Dental implants practicing in Pimpri Chinchwad, Pune, Maharashtra, India was used to collect the data. The questionnaire consisted of two sections, the first section assessing the demographic details such as age, gender, MDS branch and years of experience of the study participants and the second section consisting of 15 questions, 5 questions each for knowledge, attitude and practice. The content validity of the questionnaire was done. For content validity questions were distributed among 10 panelists. Content Validity Ratio (CVR) was calculated for all questions to mark the question as essential and nonessential based on relevance, clarity and brevity, minimum score was set at 0.62 for 15 questions. The content validity ratio for each item was obtained. All questions

that scored more than the minimum set value were included in the survey. None of the questions required to be eliminated from the questionnaire. The final version of the questionnaire was then administered to 205 dental practitioners.

The questionnaire was constructed in English. Pretesting of the questionnaire was done by administering it to 10 dentists. This was done to check the feasibility and relevance of the questionnaire and to get an idea regarding the approximate time taken by each participant to fill out the questionnaire. This questionnaire was pilot tested on 15 participants who were not involved in the main study. As there were no changes recommended, the data collection was done by distributing the self-administered questionnaire to the study participants in their dental clinics. On average, the participants required 7-10 minutes to complete the questionnaire.

Data were collected and entered into a spreadsheet (Excel 2010; Microsoft office) and analyzed using SPSS software (version 19-SPSS Inc. Chicago, IL, USA). A descriptive analysis was done.

List of questions:

1. Do you practice dental implants?
2. Do you place dental implants with "All on four" treatment concept with straight and angled multiunit abutments.
3. Do you prefer using Surgical Guide for "All on four" implant procedure
4. Do you prefer immediate loading for all on four implants
5. Patient satisfaction after receiving "All on four" prosthesis
6. If the tilting of implants is beyond 30 degrees do you think splinting of implant is necessary?
7. Is Position of the neck of the implant more important than the inclination of the implant themselves.
8. How do you consider all on four as advantageous
9. Do you consider angulated implants are more useful in compromised cases ?
10. How do you consider all on four as disadvantageous
11. When patient comes to you for consultation do you consider "All on four" as one of the selected choices for full mouth rehabilitation?
12. Which is Better option for completely edentulous patients in terms of stress distribution?
13. If the patient is not aware about All on Four how do you go about it
14. Do you think designing all on four implant prosthetic planning is more complex than for routine implant prosthetics
15. Do you think All on four concept is a viable option?

## RESULTS & DISCUSSION:

Two hundred and five questionnaires were filled. The "all-on-four" treatment concept was developed to make use of available remnant bone in atrophic jaws, allowing immediate function and avoiding regenerative procedures that might increase the treatment costs and patient morbidity, as well as the complications related to these procedures. The original concept by Branemark protocol advised the placement of four implant fixtures for the restoring resorbed mandible and 6 implant fixtures on mandibles that demonstrated minimal to moderate resorption.

The present study attempted to evaluate knowledge, attitude, and practice scores among dental practitioners about the "All on four" concept of dental implants practicing in Pimpri Chinchwad, Pune, Maharashtra, India

Out of total 205 dental practitioners, 96.6% of participants (198) chose option 1 where they practice dental implants and 3.4% (7) chose option 2 where they do not practice dental implants.

The "All-on-Four" concept is based on the placement of four implants in the anterior part of fully edentulous jaws to support a provisional, fixed, and immediately loaded full-arch prosthesis. All-on-4 style dental implant treatment is a multistep process with many potential complications. This application is based on the placement of two of these implants to the anterior region so as to be perpendicular to the occlusal plane, and on the placement of two implants to the posterior region so as to be inclined 30-45 degrees. This concept is much better than the routine treatment alternative of conventional dentures and has been reported to have successful outcomes in short term, long term and retrospective studies that have been performed in the past. It is necessary to carry out longer term clinical and laboratory studies to determine long term success criteria in all on four implant designs and to use new ceramic systems. The patient can also be benefited with the immediate rehabilitation of edentulous arches which helps maintaining self-confidence and quality of life. In cases that have poor quality of bone or less amount of bone available, in these cases strain to the alveolar bone residual can be decreased by increasing the antero posterior spread of the implants along with implants of longer dimension in addition to more number of implants can be used in biomechanically compromised cases. The all on four concept is one of the treatment modality which can be used in completely edentulous cases.

In the present study when practitioners were questioned for their knowledge of dental implants with the "All on four" treatment concept with the use of straight and angled multiunit abutments about 73.7 % of practitioners (151) practised this way while 9.8% (20) did not practice this way and about 16.6% of practitioners were unaware of the way in which they practice this concept.

When the dental practitioners were questioned about their usage of the surgical guide for the "All-On-Four" Concept 86.8% of practitioners (178) agreed using the surgical guide while the rest i.e.13.2% (27) practitioners did not make use of any such surgical guide.

When questioned regarding the knowledge of loading protocol in the All-on-Four implant concept about 69.8% of practitioners (143) followed the immediate loading protocol while the rest i.e. 30.2% i.e. about 62 practitioners followed the delayed loading protocol.

On asking about patient satisfaction on receiving All-on-Four implant to the dental practitioners, all of them responded well i.e.100 % well satisfaction was noted.

When the dental practitioners were questioned regarding their practice of splinting implants if the tilting of implants was beyond 30 degrees about 83.4% of practitioners (171) agreed while 3.4 % of practitioners (7) did not follow such protocol and about 13.2%(27) were unaware of such procedure.

When dental practitioners were questioned about If the Position of the neck of the implant more important than the inclination of the implant themselves 73.2% of practitioners (150) agreed while about 6.3% (13) did not agree on this and about 20.5% (42) of practitioners were clueless about the same as they were unaware of implant position or neck inclination.

When questioned regarding the advantages of such concept of practice about 60.5% of practitioners(124) commented that Angled Posterior implants avoid anatomical structures while 19.5% of practitioners (40)commented that it Reduces Posterior Cantilever ; about 17.1% of dental practitioners (35) commented that Angled Posterior Implants allow longer implants anchored in better quality bone.

When dental practitioners were asked if they considered angulated implants more useful in compromised cases about 66.3% of dental practitioners (136) agreed while 17.1% of dental practitioners (35) did not agree and about 16.6% of dental practitioners (34) did not know about the angulation protocol at all.

When asked if angulated implants are more useful in compromised cases about 66.3% of dental practitioners (136) agreed so; 17.1% of practitioners (35) did not agree so while the rest 16.6% of practitioners (34) did not have any knowledge regarding the same

When asked about the disadvantages of the All-On-Four concept about 30.7% of dental practitioners (63) said that the Length of the cantilever in the prosthesis cannot be extended beyond the limit; 26.3% of dental practitioners (54) said that a Special surgical guide was required; 42.9% of dental practitioners (88) said that is Very technique sensitive.

When dental practitioners were asked if a patient comes to them for consultation do they consider "All on four" as one of the selected choices for full mouth rehabilitation 86.8% of dental practitioners (178) agreed while 13.2% of dental practitioners (27) did not consider this as an option.

When dental practitioners were asked about a better option for completely edentulous patients in terms of stress distribution 60.5% of practitioners (124) suggested "All on four" prosthesis; 32.7% of practitioners (67) suggested Conventional full mouth implant prosthesis; 6.8% of practitioners (14) suggested implant overdenture.

When the dental practitioner was asked if the patient is not aware of "All on four" how you go about it about 80.5% of practitioners (165) said that they would educate the patient regarding all on four concept; about 19.5% of practitioners (40) said that they would consider other alternatives.

When dental practitioners were asked if designing all-on-four implant prosthetic planning is more complex than for routine implant prosthetics about 86.3% of practitioners (177) said yes while 13.7% of practitioners (28) did not agree so.

When asked if dental practitioners considered the "All on four" concept a viable option 74.1% of practitioners (152) agreed while about 25.9% of practitioners (53) did not agree on the same

## CONCLUSION:

Despite the presence of knowledge and attitude among dental practitioners the presence of practice among practitioners seems to be insufficient towards the "All on Four Implant" Concept. This study was an attempt to evaluate Knowledge, Attitude, and Practice among Dental Practitioners about the "All on four" Concept of Dental implants practicing in Pimpri Chinchwad, Maharashtra

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## REFERENCES

1. Gurralla S, Dhupar V, Akkara F. All-on- 4 dental implant concept in immediate rehabilitation of failing dentition—a prospective study to evaluate the efficacy and cost effectiveness in Indian population. *J Dent Health Oral Disord Ther.* 2020;11(1):12–16.
2. Taruna M, Chittaranjan B, Sudheer N, Tella S, Abusaad M. Prosthodontic perspective to all-on-4® concept for dental implants. *J Clin Diagn Res.* 2014 Oct;8(10):ZE16-9. doi: 10.7860/JCDR/2014/9648.5020. Epub 2014 Oct 20. PMID: 25478475; PMCID: PMC4253293.
3. Soto-Peñaloza D, Zaragozı-Alonso R, Peñarrocha-Diago MA, Peñarrocha-Diago M. The all-on-four treatment concept: Systematic review. *J Clin Exp Dent.* 2017;9(3):e474-88.
4. Ben Hadj Hassine M, Bucci P, Gasparro R, Di Lauro AE, Sammartino G. Safe approach in "All-on-four" technique: a case report. *Ann Stomatol (Roma).* 2015 Feb 9;5(4):142-5. PMID: 25774250; PMCID: PMC4333602.
5. Holtzclaw D. All-on-4® Implant Treatment: Common Pitfalls and Methods to Overcome Them. *Compend Contin Educ Dent.* 2016 Jul;37(7):458-465;quiz466. PMID: 27548398.
6. Durkan R, Oyar P (2017) All-On-Four Concept in Implant Dentistry: A Literature Review. *J Dent Oral Care Med* 3(2): 205. doi: 10.15744/2454-3276.3.205. doi: 10.15744/2454-3276.3.205
7. Adnan Ege K, Serkan S, Fatih Mehmet C. The Rehabilitation of Edentulous Maxilla with the Use of All-on-Four Implants. *Mod App Dent Oral Health* 1(4)- 2018. MADOHC.MS.ID.000119.
8. Durkan R, Oyar P, Deste G. Maxillary and mandibular all on four implant designs: A review. *Niger J Clin Pract* 2019;XX:XX-XX.
9. Shakhawan M. A, Zanyar M. A, Rebwar A H, Hawbash O M, Rozhyna P K, PaymanKh M. All-On-Four Treatment Concept in Dental Implants: A Review Articles. *Sur Cas Stud Op Acc J.* 2(4)- 2019. SCSOAJ.MS.ID.000142.
10. Singh R, Sharma S, Sultan K, Dadwal R, Kaushal A, Mongra A. Concept of all on four for dental implants: A review. *IP Int JMaxillofac Imaging* 2020;6(4):93-96.