KNOWLEDGE, ATTITUDE, AWARENESS OF DENTAL IMPLANT AMONG COMMON PEOPLE, DENTAL UNDERGRADUATE STUDENTS AND GENERAL DENTAL PRACTITIONERS

Dissertation Submitted to

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BRANCH III

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DECLARATION BY THE CANDIDATE

I hereby declare that the dissertation title **"ATTITUDE, AWARENESS OF DENTAL IMPLANT AMONG COMMON PEOPLE, DENTAL UNDERGRADUATE STUDENTS AND GENERAL DENTAL PRACTITIONERS"** is a bonafide record and genuine research work carried out by me under the guidance of **Prof. Dr. B. VIKRAMAN M.D.S.,** Professor of Department of Oral & Maxillofacial Surgery, Ragas Dental College and Hospital, Chennai.

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This is to certify that this dissertation titled **"KNOWLEDGE, ATTITUDE, AWARENESS OF DENTAL IMPLANT AMONG COMMON PEOPLE, DENTAL UNDERGRADUATE STUDENTS AND GENERAL DENTAL PRACTITIONERS"** is a bonafide record of word done by **Dr. N.Veeraragavan** under our guidance and to our satisfaction during his postgraduate study period 2017 – 2020.

This Dissertation is submitted to **THE TAMILNADU Dr. M.G.R MEDICAL UNIVERSITY**, in partial fulfilment for the award of Degree of **Master of Dental Surgery – ORAL AND MAXILLOFACIAL SURGERY, BRANCH-III**. It has not been submitted (partial or full) for the award of any other degree or diploma.

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LIST OF ABBREVIATIONS

SPSS	Statistical Package For Social science software
GDP	General dental practitioners
SES	Socioeconomic status scale
UG	Undergraduate
PG	Postgraduate
IRB	Institutional Review Board
RPD	Removable partial denture
FPD	Fixed partial denture

Introduction

INTRODUCTION

Dental Implantology is a rapidly expanding technique in the field of dental specialty. In the last five decades, Implant dentistry has evolved into an indispensable part of prosthetic procedures and also as the most noteworthy advancement in dentistry worldwide. There are various treatment options which have been employed to resemble natural teeth includes removable partial denture, cast partial denture, fixed partial denture and dental implants. In the practice of modern dentistry, implant-supported prosthesis is considered as the first of choice of rehabilitation option for a missing tooth or teeth from the perspective of occlusal support, preservation of adjacent teeth, high predictability and avoidance of a removable partial denture.

In the present scenario, it is common to see a patient coming to the dental clinics for dental implants opinion. In developing states like Tamilnadu, besides, the number of dental implants placed each year, the information available to the patients regarding the procedure and success rate is more compounded. In our state, people have low levels of awareness regarding dental implants and their use; there is a paucity of information regarding the awareness of patients about dental implants. Hence there is a need to improve the patient awareness regarding available treatment options, pros, and cons of each option so that they can choose accordingly. Patients rely on their dentists to provide more reliable information and service means that private dental

practitioners should have sound knowledge and a comprehensive understanding of the complete implant treatment protocol.

General dental practitioners have undertaken additional training, gaining the necessary skills and competences to promote implant dentistry in their practice. The growing demand and applicability have led to wider adoption of implants in clinical practice. Currently, the practice of implant dentistry is no longer considered as solely belonging to the specialist domain.

The problem with the available training courses offered are neither standardized nor they are regulated and validated which most of them differ substantially in duration, their aims and objectives, course contents, and the quality of education may lack the detailed theoretical inputs and deliberations. Furthermore, the dental practitioners need to be aware of their limits in terms of adequate knowledge and technical skills in the management of advanced and complicated cases. As the dental implant sales continue to rise and as public awareness and demand increase, many more general dental practitioners will inevitably want to provide dental implant treatment [1].

Although implant dentistry has evolved to become an important part of the dental practice, unfortunately, the coverage of dental implant study in the undergraduate curriculum has been rather slow, unstructured and certainly limited. To transform students into competent and skillful dental practitioners, it is important that undergraduate education follows the pace of innovations

and stays well attuned with everyday professional practice. All in all, the future of implant dentistry looks very bright and full of hope.

Therefore our goal was to assess the level of awareness and need for information about dental implants, which could throw light upon the region where we have to concentrate to improve the quality and availability of dental implant practice to the common people.

Aims & Objectives

AIMS AND OBJECTIVES

AIM: The aim of this study is to assess the Knowledge, Attitude, Awareness about dental implants to replace tooth among Common people, Dental Undergraduate students and General Dental practitioners using questionnaire.

OBJECTIVES: The primary objective of this study is to assess the level of knowledge, attitude and awareness of dental implant as a treatment modality for replacing missing teeth among common people, dental undergraduate students and general dental practitioners by evaluating their knowledge with questionnaire.

Secondary objective was to arrive to the limiting factors and programs that can improve dental implant treatment in modern practice.

Review of Literature

REVIEW OF LITERATURE

Finlay Sutton, Zvi N Ellituv, Rachel Seed (2005)[67] surveyed the randomly selected general dental practitioners (GDP) of Merseyside region on their perceptions for need of dental implant education. A total of 75 dentist has responded, of which only 30 GDP (40%) has provided dental implant as treatment option even though majority of them felt they had good knowledge. About 74 (98.7%) of the dentist are motivated towards Continuing professional developmental courses.

J.Rustemeyer, A Bremerich (2007) [50] assessed the patient's knowledge and expectation regarding dental implants by questionnaire in 315 patients before a professional consultation. 85% of the patients thought that implants needs same care as natural teeth. The willingness of patients towards dental implants are high in contrast to cost.

P.Harrison, L.Polyzois, F.Houston and N.Claffy (2009)[36] has evaluated patient satisfaction relating to implants treatment by undergraduate and postgraduate dental students at Dublin Dental School and Hospital among 100 individuals randomly selected from records of patients who had received implant treatment via student clinics in previous 5 years which showed high overall level of satisfaction with 68% rate.

I.R.Blum, D.J.O'sullivan and D.C.jagger (2008)[31] survived the UK dental schools about undergraduate education in dental implantology

providing information on teaching modalities such as departments involved in teaching, format of teaching, use of adjunctive teaching aids, different types implant system used by means of questionnaire. Based on 100% response rate, it indicated that all dental schools in UK , however there is marked variation in content and delivery of the teaching.

Patricia A.Akeredolu, Waisu L.Adeyemo, Med.dent Olalekan M.Gbhopotolorun, Olutayo James,Babatunde. O lorunfemi,Gotwin T Aroriba (2007)[27] done a cross – sectional study to assess the knowledge, attitude and practice of dental implantology among dentist practicing in Nigeria using self-administered questionnaires. The overall response rate was 77% , about 98.7% (152 respondents) have never used implants for replaced , only 1.3% (2 respondents) employed dental implants, 46.1% have suggested implants for full/partial denture patients, 31.8% has suggested for single tooth replacement ,89.6% willing with backed up adequate training, 83.1% believed as multidisciplinary approach, 42.9% rated as best option for replacement.

Christopher Ogunsalu, MBBS BDS, Med, Kenneth Judy, DDS, Ambrose Obiechina, BDS. Hubert Daisely,MBBS, DM, Arlana K. Bisson, DDS., Marius Steigmann, Dr med dent OluwoleDosumu,BDS, Victoria Okojie,BDS, and Patricia Akeredolu, BChD (2009) [61] conducted 6 day mini residency postgraduate dental implant course to analyze the outcome of the formative feedback and summative assessment in 2 different groups of dentists. Both the groups were expressed good and similar response to the

overall quality of the presentation, comprehensiveness of topics covered. The performance was below average for both groups in multiple choice question assessment.

H.De.Bruyn, S. Koole, N.Mattheos, N.P.Lang(2009)[55] conducted a survey assessing the european implant dentistry education in undergraduates through e-mail. It was performed among 73 opinion leaders from 18 european countries whom was invited for the ADEE workshop on implant dentistry. About 49 survey (67%) were returned after theoretical and pre-clinical courses given to undergraduates which reported that 70% assist or treat patient with prosthetics; 53% assist with surgery and only 5% is operating patients showing the lack of training in undergraduates.

N Mattheos, S Ivanovski, P Sambrook, I Klineberg (2010)[68] assessed the knowledge and competencies for graduating dentist in Australian dental curricula by consenus workshop, which showed varying instructional methods and strategies , concluded needs further development needed by individual dental schools.

Sulieman Al-Johany, Hamad A.Al Zoman, Mohammad Al Juhaini, Mihammed Al Rafeai, (2010)[21] done survey of 379 subjects to assess the level, sources and need for information about dental implants among dental patients in Riyadh, Saudi Arabia at 2 places , one at Military hospital and College of Dentistry and second at King Saud University. About 66.4% of subjects has knowledge about dental implants, where friends and their

relatives were the main source of information. 82.4% of the subjects need more information on dental implants, 74.4% did not know the regular dentistist use dental implants.

Pragati kaurani, Mayank kaurani (2010)[30] done a survey on 200 urban dental patients about the awareness of dental implants as a treatment modality amongst people residing in Jaipur about only 38% had heard about dental implants as a dental treatment modality with mean age group of 25-44 years with statistical significance difference between males and females. All of these, 55.2% had heard from dentist following magazines and electronic media. About 29% of people were willing to undergo treatment and 61.1% citied high costs a main reason for refusal of treatment.

Frauke Muller, kamel Salem, Clindy Barbezat, Francois R. Herrmann and Martin Schimmel (2011)[44] done a semi-structured interview in Geriatic hospitals, two long term care facilities and private clinics about knowledge and attitude towards dental implants in elder persons among 92 persons with average age of 81.2 ± 8.0 years. Over 27 participants never heard of dental implants, 13 patients could not describe them. He concluded cost , lack of perceived necessity and old age are the strongest apprehensions.

Anurag Satpathy, Amit porwal, Pratap kumar sahu (2011)[8] conducted a cross sectional survey among patients visiting various dental outpatient departments of hospitals and private dental clinics using self explanatory questionnaire assessing the patient awareness, acceptance and

perceived cost of dental implants as treatment modality for tooth replacement in Bhuvaneshwar and Cuttack over 723 patients. Only 15.91% of the patients knew about dental implants, 60.44% expressed as unaffordable procedure, while 71.23% disproved removable prosthesis as replacement of missing tooth showing majority of patients are unaware of dental implants .

Bich hue Lang-Hua, Niklaus P. Lang, Edward C.M. Lo, Colman P.J. McGrath(2012)[69] done a study on general dental practitioners in Hong kong selected randomly to determine the attitude towards implant dentistry . The total of 246 eligible practitioners are taken into study, were the response rate is 46.3%. About 80% of dentist perceived implants are superior replacement for single posterior tooth, 67% for replacement of single anterior tooth. There is variation in attitudes with respect to implant training factors, place of graduation and years in practice.

S.Vandeweghe, S.Koole, F.Youmes, P.De coster and H.De Bruyn (2013)[34] assessed the clinical outcomes, patients satisfaction and students perceived level of competence using questionnaires after implant dentistry programme for undergraduate students, where 36 students had placed one implant each under one to one supervision. The patients were satisfied by the treatment and majority would repeat the treatment by a student. The students had valuable experience and realized that additional knowledge is necessary to perform implant surgery without supervision.

B Suprakash, AR Yusuf Ahammed, Amit Thareja, Raghavendra kandasamy, Nilesh kumar,Sarvesha Bhondwe(Mahajan) (2013)[45] done an epidemiological study among 440 subjects about knowledge and attitude of patients towards dental implants as an option for replacement of missing teeth using close ended questionnaire who attended outpatient department in which about only 33.3% had heard of implants , were dentist are the main source of information and awareness level increased with education, very few had undergone dental implants.

Fazal Ghani Faisal Moeen, Saleha Nisar (2013)[35] assessed the knowledge and awareness levels for implant supported dental prosthesis among 210 patients in Islamabad teaching dental hospital between Dec 2011 – Mar 2012 by questionnaire based consisting of nine questions. Results showed out of 210 patients only 35 (16.6%) patients had prior knowledge of dental implants, 175 (83.4%) patients have no idea of dental implants. About 161 (92%) are interested to precieve knowledge about dental implants. 115 (54.7%) patients believed dental implants as better replacement option , about 188 patients has rejected conventional prosthesis.

Josip Kranjcic, Anja Mikus, Ketij Mehulic, , Denis Vojvodic, (2013) [48] examined the knowledge and awareness of dental implants among 301 elderly people in Croatia who are wearing complete removable prostheses from care homes with average age of 74 years. About 82.4% of the

participants who had completed college/university or high school had heard of dental implants but information are insufficient about procedure and cost.

Ziad N Al-Dwairi, Bilal Mohammed El Masoud, Sanna A. Al-Afifi, Ali Borzabadi-Farahani, MOrth, Edward Lynch, BDentsci (2013)[28] assessed the awareness and expectations of dental implants in 300 removable denture patients . Of these 300 patients, 96% of the patients were aware of dental implants, friends and relatives of the participants are main source of information. Fear of unknown side effects was the main limiting factor followed by high cost as approximately 89% of patients had received no information or were poorly informed.

Ashistaru saha, Sudipto dutta, V Vijaya, N Rajnikant(2013)[42] conducted the pilot survery on awareness of dental implants among patients as treatment option for replacement of missing among 483 subjects using self-administered structured questionnaire in Chhattisgarh population which showed 41.7% are aware of Dental Implants but only 4.1% had undergone for Dental Implants stating high cost of procedure as obstacle for treatment.

S.Koole, H.De Bruyn (2013)[55] done a systematic review in contemporary undergraduate implant dentistry education where the students perceptions, patients satisfaction are evaluated from the publications done between 2008 – 2013 which included 37 of 420 papers which showed patient had high satisfaction and student appreciation. There are few barriers such as funding, limitations in time or staff competence and lack of ideal patients.

Mattheos, H.de bruyn, M.hultin, S.jepsen, B.Klinge, S.Koole, M.Sanz, C.Ucer and N.P.Lang (2013)[60] conducted two European wide questionnaire surveys to better document the current state of education in implant dentistry. This study concluded that implementation of implant dentistry in the undergraduate curriculum has improved significantly, but still lags behind the benchmarks set in 2008 and the diversity between institutions remains big.

Elhadi Mohieldin Awooda, Amel Salah Eltayeb, SagaAbass Hussein, Salma IbnomerDayelnaiem, Maha Awad Abdelhamied, Leina Abdulwahab Mohammed, Sara Mohammed Taha (2014)[47] done a descriptive cross sectional study among 384 patients attended OP dental clinics in Khartoum dental teaching hospital about knowledge, attitude and acceptance of dental implants. 68.5% of the patients were aware of dental implant as treatment ooption,29.1% high expenses is the barrier for Dental implants.

Ng PC, Pow EH, Ching SH, Lo EC, Chow TW(2014)[3] described the dental implant practice profile of Hong Kong general dental practitioners in 2008 and the trend since 2004 with self-administered questionnaire was mailed to 630 dentists A total of 290 completed questionnaires were returned (response rate, 53%). Implant dentistry was practiced by 61% of the respondents. The survey also revealed that 84% of those respondents who own their private practice performed implant dentistry. About half of the dentists (49%) who performed

implant dentistry placed or restored 5 or more implants per quarter. Among those dentists not practicing implant dentistry, the majority (85%) were interested in attending continuing education courses in dental implantology. There has been a significant increase in the number of general dental practitioners practicing implant dentistry in Hong Kong since 2004. By 2008, more than half of the general dental practitioners (61%) are practicing implant dentistry. Most of them not practicing implant dentistry expressed a desire to learn more about dental implants. This survey revealed a high demand for continuing professional development in implant dentistry in Hong Kong.

Raghavendra Nagappa, Vijay P Sunil reddy, T naga Rajesh Naidu, Amit Shivakant, Swapnil Sopan Jadhav, Gajanan Kalidasrao Jadhav (2015) [52]studied the knowledge, attitude and practice of dental and medical practitioners regarding dental implants in 565 participants comprising 323 dental and 242 medical practitioners. Results showed dental practitioners has more knowledge than medical practitioners, where the urban practitioners has more knowledge than rural practitioners

Sandeep Kumar, Astha chauhan (2015) [46]conducted the study on 620 patients aged more than years 15 years assessing the level of knowledge and awareness towards the use of implant treatment among patients in Indore with pretested questionnaire. Results showed 25.8% were aware of dental implants. 70% of patients selected Esthetics as the common factor for treatment..

Shivani kholi, Shekhar Bhatia, Arvinder Kaur, Tiviya Rathakrishnan (2015)[14] conducted the nationwide survey on patient awareness and attitude towards dental implants among Malaysian population visiting hospitals and dental clinics. A Total of 1013 responses were retrieved, 27% of patients are moderately well informed about dental implants, 17% were well informed about different alternatives of replacing the teeth and only 9% of patients had dental implant treatment

Sunitha Mathuriya , SurendraAgarwal (2015)[29] done a survey about awareness and willingness of patients for dental implants in Bhopal city using questionnaire for a period of 6 months in patients who are attending outpatient department of prosthodontic department in People's college of dental science and private dental clinics. Only 32.5% of the people are aware about dental implants, this study population consists mostly of less educated, unemployed and unskilled workers with mean age of 42.99 ± 16.273. High cost is the limiting factor for willingness to implants and majority of the studied patients were not aware of dental implant, procedure, advantages and disadvantages.

Rajesh Hosadurga, Shanti Tenneti, Shashikanth Hedge, Rajesh Shankar Kashyap, Arun Kumar (2015)[40] done a web-based questionnaire study assessing the awareness, knowledge and attitude of patients toward dental implants in total of 106 edentulous or partially edentulous patients aged between 18-60 years. The study showed severe deficit in level of information

were 57.54% of participants are <30 years of age, 34.90% were between 31 and 50 years and 7.54% were >50 years of age.

Bhoomika Khosya, Devaraj CG(2015)[24] Conducted a cross sectional study among 114 patients visiting mahatma gandhi dental college and hospital using a self explanatory questionnaire out of 114 patients 40.4% had heard about implants as a treatment modalities, 25.4% had heard it from their dentist rest had heard it from internet and friends.18.4% were willing to undergo treatment if needed 75.4% cited high costs as the main teason for refusal of the treatment.

Vohra F, Habib R (2015)[26] assessed the attitude of dentists in Saudi Arabia towards implant restorations between specialist(SP) and general practitioners(GDP) using questionnaire by hand and emails. A total of 552 respondents, of which 64% are SP and 36% were GDP. About 75% SP and 80% GDP used Screw retained restoration in <50% and <25% respectively , were Cement retained restoration in comparison to Screw retained restoration.

Sohini Chaudhary, Triveni, Gowda, Tarun, B.Kumar, Dhoom S.Mehta (2015)[18] done an all india survey in undergraduate dental students gauging the knowledge, attitudes and perceptions on dental implants with 2041 responses out of 2800 questionnaires. About 81.1% of the residents has believed there were not sufficient knowledge about implants and 91.7% coverted more information in undergraduate curriculam

Alireza Pournasrollah, Ramin Negahdari, Seyyed Mahdi Vahid Pakdel (2015)[64] evaluated the knowledge of general dental practitioners in Tabriz about implant treatment planning using questionnaire in 272 participants showed mean knowledge score of 19.4 of treatment planning , 1.1% od dentists had low knowledge level, 79% had moderate knowledge and 19.9% had good knowledge level.

Monique Charlene Cheung,Peter Kao,Neller Lee, Dhanya Sivathasan, Chen Wen Vong, Jamie Zhu, Anu Polster, Ivan Darby (2015) [63]studied the interest and preferences for implant therapy in Victorian dentist in 600 randomly selected dentist through postal response and got the response from 166 dentist , showed no differences were found between city and country practitioners and different graduation decades.

S. Jayachandran, B.S.Bhandal, K.B. Hill and A.D. Walmsley (2015)[66] assessed the knowledge of general practitioners about the dental implants as an option in UK dental practice based on questionnaire study in 101 dentists. Out of this only 91 dentist has responded , where 77% of them stated that they had learnt only theoretical aspects during UG and the training is not sufficient for practice. They had few barriers as making implant as an options such as risk of failures (56.3%), complications(65.5%) and cost of learning(51.7%).

Maria sohail, Giba Aslam, Naswwr Ahmed, Saba Faruqui, Afsheen Maqsood, Mohammed Asif Ali Ansari and Hudebia Allah Buksh

(2016) [51] done a questionnaire based study over 100 patients who came to Altamash institute of dental medicine, Pakistan about awareness, knowledge and reluctance regarding dental implants. The study showed about only 28% of patients were aware of dental implant where high cost is main barrier for treatment option. Dental professional was the prime source of information.

M.P. Santhosh kumar, M.Monicka Gayathri(2016)[[32] done descriptive cross sectional study the knowledge and awareness among patients about dental implants in 100 adults , about 58% of patients are not aware of implants and more than 50 % of patients heisted dental implants due to cost factor.

Venkatesan Narayanan, Prabhu Karuppiah, Arunkumar Rajasekar, Lakshmi D Mayavan (2016)[9] done a survey on Melmaruvathur population in 480 people through a printed questionnaire about their awareness and willingness towards dental implants. Of the 480 responses, 331 were aware of dental implant, 304 were aware of teeth replacement option, 41% assumed that it lasts for lifetime and 35% of respondents believed poor hygiene as cause for dental implant failure. Most of them believed implants are placed in jaw bone, followed gums.

Md Sirajur Rahman(2016)[22] conducted cross sectional, questionnaire study among 100 edentulous patients visited to neodent dental hospital, Hyderabad from january2015 to December 2015.The data was statistically analyzed by using EPI-info statistical software version 6. 150

patients were included in the study, out of which, 76 were females and 14 males. The number of patients awareness of treatment options was 112(74.66%), 85(56.66%) and 20 (13.33%) patients were aware for removable partial denture and implants respectively.

Monique Charlene chaung, Peter kao, Nelly lee, Dhanya sivathasan, Chen wen vong, Jamie zhu, Anu polster, Ivan darby (2016)[63] was assessed gauge dentists interest, knowledge and training in implantology and compared their treatment preferences with current literature. There was no difference found between city and country practitioners and different graduation decades. The level of continuing education significantly influenced treatment preferences.

Supriya Murkutte, Amol Beldar, Priya Thakkar, Mithali Thamke(2017)[54] done a cross sectional epidemiological study of Nashik population evaluated the awareness of patients and dental practitioners. A total of 472 patients and 241 dentist were taken the study with separate questionnaire for two groups. Among patient , about 31% heard about dental implant as tooth replacement option , in practitioners group about 92 % felt their knowledge was not adequate at undergraduate level and 44% need more training at internship , while 23% stated need of training at 4^{th} year and concluded there is lack of awareness for patients and need for knowledge at undergraduate level.

Khalid Mahmood Siddiq, Muhammad Zeeshan Baig, Zarmina Ifzal (2017)[59] has conducted the survey on awareness of dental implants among undergraduate medical and dental students using self administrated questionnaire in 277 (189-Medicine, 88-Dentistry) participants. The overall response rate was 92.3% , were 178(64.3%) participants knows dental implants as treatment option for replacement of teeth; friends and relatives were main source of information (55.1%). Out of 178 participants 131 showed the willingness towards implant treatment in future and fear of surgical procedure is the main barrier for treatment.

M Angeles Sanchez-Garces, Esther Berastegui-Jimeno, Cosme Gay-Escoda(2017)[65] developed a questionnaire survey to evaluate the knowledge, aptitudes and preferences in implant dentistry teaching/training among undergraduate dental students at University of Barcelona. A total of 177 students are taken into study, Group A (Third year) 76 students and Group B (Final year) 31 students were answered. Students of Group A and Group B 98.68% and 93.54% respectively was believed they were poorly informed, 100% of the students prefer to receive more training as part of degree or postgraduate program

Hashmaih Al Hashim, Fatima salaeh, Rahab Al Essa, Yassmeen Taher, Mahaer Khalifa, Doaa Al Yaseen and Shahzab Hasan Ansari (2017)[37] has conducted survey among the General public of Saudi about knowledge and awareness of dental implants using closed ended questionnaire

including 364 peoples in a duration of 2 months where majority of participants reported dental implant better treatment modality , of which females and participants aged more than 50 years had better knowledge about dental implants. The high cost is the only barrier for implant treatment.

Ahmed Areashi, Kholod Algarni and Colonel Misfer Alwadie (2017)[33] conducted a cross-sectional study about knowledge and attitude of patients towards dental implant in Asser region, Saudi arabia among patients with and without implants including 212 subjects using self-questionnaire. The study observed significant difference in knowledge of implants between patients with and without implant.

George Deeb , DDS, MD, Bryan Wheeler, DMD Margaret jones, BS Caroline Carrico, PhD, DDS,MS, JanninaGolob Deeb, DMD,MS (2017)[49] conducted a cross sectional survey on public and patient knowledge about dental implants as two groups, Group 1 are general population and Group 2 are the patients presenting for an implant consultation. Total of 126 patients; 76 belongs to group 1 ,50 belongs to group 2. Group 2 patients are well informed than general population, but received information from less reliable sources and both group presented cost of procedure as a primary barrier to receiving dental implants.

Bhageshwar Dhami, Priti Shrestha, Bikash Lamichhane, Anuj Kumar Sharma, Sujaya Gupta(2017) [1] done a cross sectional study to evaluate the existing knowledge and need for further education in dental

implants among 110 general dental practitioners in Nepal population using three categories of questionnaire . Out of 110 general dental practitioners , 72.7% had basic knowledge, 65.5% were not aware of advanced procedures and overall 95.5% of GDP's were positive towards implant training and education.

Anjana Maharajan, Sagun Regmi, Agrawal Sagtan(2018)[53] conducted this study to know the status of knowledge and awareness of dental implant. 79 patients visiting dental department of prosthodontics were included in this study. Total 33(41.8%) of study populations choose dental implants as treatment plan. 22(30.4%) choose fixed prosthesis.36 (45.6% and 32(40.5%) of population stated that long treatment time and high coat respectively as the disadvantage of dental implants. Only 12(15.2%) were aware that dental implants are anchored in jaw bone.

Khyati Barot , Bela dave, Jinal Patel, Chirag Vaghasiya Hardik Brahmbhattin (2018)[25] cross sectional study in Gujarat population about awareness and attitude of patients regarding dental implants as a treatment modality among 400 patients over a period of 2 months. It showed 64% of the patients had awareness of dental implants where mostly the dentist is the source of information.

Arati Sharma, Bijay Kumar Chaudhari, Bidhan Shrestha , Pramita Suwal, Prakash Kumar Parajuli, R.K.Singh, Surya Raj Niraula(2018)[20] has done a cross sectional questionnaire study about

knowledge and perception about dental implants among undergraduate dental students in Nepal dental schools. 59.2% of 5th year students had moderately well-informed about implants and they had believed advantages of implants such as longevity (53.1% as total and 48.4% by 5th year students), conservative procedure than other replacement (27.6% as total and 42.2% by 5th year students). Implant success were believed based on implant type and material (31.9%), case selection (59.8%). The limiting factor for dental implants are economic feasibility (67.5%). The perception of difficulty to place implants was 56.8% in total and 58.1% in 5th year students.

Pramita Suwal, Bishal Babu Basnet, Bidhan Shrestha, Prakash kumar Parajuli, Raj Kumar Singh (2019)[41] assessed the knowledge, attitude and awareness about dental implants in a tertiary care and its outreach centers in Nepal among 192 patients . Among 52.6% of respondents were aware of dental implants, only 24.5% had attribute jaw as implant site. Friends and acquaintances (30.2%) are main source of information, dental professionals (17.7%) comes the next.

Rachana J Shah, Sujal G Shah, Ghanshyam C Patel (2019)[39] done a survey to determine the attitude of private dental practitioners towards dental implants by postal questionnaire sent to 150 private clinics in 5 different regions of Gujarat. Of these , about 95.91% dentist offered dental implants, but only 30.61% dentist practice implant themselves.

Amit S Gharpure, Prasad D Bhange, Arti S Gharpure (2019)[5] assessed the public awareness in Mumbai general population about dental implant as treatment option and its demographic distribution around 1000 individuals usin questionnaire consisting of 12 questions. It showed one third of the population were aware of dental implants as a treatment option for replacement of tooth without variance in gender and age group ranges from 18 to 70 years.

Materials and Methods

MATERIALS AND METHODS

This study was conducted at the Department of Oral and Maxillofacial Surgery, Ragas Dental College and hospital during the period of July 2018 to July 2019. The study protocol was accepted and Ethical clearance was obtained from the Institutional Review Board (IRB) in July 2018 prior to commencing the study. All the participants were informed about the study. The study was conducted in 750 participants and as three different groups with three different self-administered questionnaires for each group. Group I -Common people, Group II - Dental Undergraduate students, Group III - General Dental Practitioners. Each group consists of 250 participants. The responses obtained by direct approach and online forms (google forms).

INCLUSION AND EXCLUSION CRITERIA

INCLUSION CRITERIA

- All the common people met in different situations, dental undergraduate students and general dental practitioners.
- Age group above 18 years
- Both sexes to be included

EXCLUSION CRITERIA

- Subject having psychological disorders

Methodology

There were three individual sets of self-administered questionnaire for each group. Group I – Common people, closed end questionnaire has consists of 16 questions on their basic knowledge and perceptions towards dental implants and 10 questions on perception towards bone grafts and quality of life towards dental implant treatment. The demographic details were also obtained and classified their attitude towards dental implants based on socioeconomic status (Modified kuppuswamy scale-Feb 2019[2])

Occupation of head of family	Score
Legislators, Senior Officials & Managers	10
Professionals	9
Technicians and Associate Professionals	8
Clerks	7
Skilled Workers and Shop & Market Sales Workers	6
Skilled Agricultural & Fishery Workers	5
Craft & Related Trade Workers	4
Plant & Machine Operators and Assemblers	3
Elementary Occupation	2
Unemployed	1

Education of head of family	Score
Profession or Honours	7
Graduate	6
Intermediate or diploma	5
High school certificate	4
Middle school certificate	3
Primary school certificate	2
Illiterate	1

Monthly income of family (In Rupees)

Updated Monthly Family Income in Rupees (2012)	Updated Monthly Family Income in Rupees (2018)	Updated Monthly Family Income in Rupees (2019)	Score
≥ 30,375	≥ 126,360	≥ 78,063	12
15,188–30,374	63,182–126,359	39,033–78,062	10
11,362–15,187	47,266–63,181	29,200 –39,032	6
7594–11,361	31,591–47,265	19,516–29,199	4
4556–7593	18,953–31,590	11,708–19,515	3
1521–4555	6327–18,952	3,908–11,707	2
≤ 1520	≤ 6326	≤2,640	1

Socioeconomic class		Total score
I	Upper	26-29
II	Upper middle	16-25
III	Lower middle	11-15
IV	Upper lower	5-10
V	Lower	01-04

Group II – Dental Undergraduate students, consists of 21 questions to assess the level of basic knowledge and their perception towards dental implants.

Group III – General Dental Practitioners consists of 30 questions assessing their depth of knowledge about dental implants in aspects of various implant types and the components, their indications and cost, imaging and software experiences with their dental practice.

Statistics

Statistical analyses were preformed using Statistical Package For Social science software (SPSS) for windows, version 20.0(Armonk,NY). Data comparison was done by applying specific statistical test to find out statistical significance of obtained results. Frequencies were obtained to describe the response distribution of the questionnaire and the dental record abstracted items.

KNOWLEDGE, ATTITUDE, AND AWARENESS REGARDING

DENTAL IMPLANTS AMONG COMMON PEOPLE

Demographic details

Name:

Address:

Age

18-25 years ☐ 25 -30 years ☐ 30–50 years ☐ Above 50 years ☐

Gender

Male ☐ Female ☐ Others ☐

Educational level

☐ High school or below ☐ Diploma ☐ Bachelor

☐ Master ☐ Ph.D ☐ Others

Occupation

☐ Student ☐ Homemaker ☐ Labour ☐ Self employed

Professional ☐ Retired ☐

Income

☐ >10000 ☐ >25000 ☐ > 50000 ☐ >100000 ☐ <100000

Knowledge and awareness

1. Are you aware of dental implants? Yes / No
2. What were your first sources of information about dental implants?
3. Is it a easy affordable procedure? Yes / May be / No

4. What do you estimate as the functional life of a dental implant (years)?

<10 /10–20/ 21–25/ > 25/ No idea

5. Up to which amount are you prepared to pay for dental implants?

None/ < Rs 2500 / < Rs 5000 / < Rs 10000 / < Rs 15000 / No idea

6. Do you know dental implants can replace removal full denture ? **Yes/ No**

7. Do you know dental implants can be placed to fix removable denture? **Yes/ No**

8. In your view what are the advantages of non removable over removable prosthesis?

Less annoying in mouth / looks good/ good as natural teeth in function / don't feel like foreign body

9. What do you anticipate as oral hygiene for care of dental implants compared with natural teeth? **More/ Similar/ Less/ No idea**

10. Have you heard about experiences with dental implants from your friends? **Yes/No**

11. When yes, how successful was the dental implant?

Successful/ Partially/ Not successful

12. Do you think dental implant procedure need to done by specialist? **Yes / No / don't know**

13. Where do you think dental implants are anchored?

Jaw bone / Gums / Neighboring teeth / don't know

14. Are you aware of dental insurance plans in India? **Yes/ No**

15. Are your dental implant expenses covered under any insurance scheme? **Yes/No**

Reason for electing to have implants

1. Dissatisfied with removable dentures ☐
2. To improve appearance ☐
3. To improve eating ☐
4. To improve self-confidence ☐
5. To replace missing tooth ☐
6. Others? Please specify _____.

Common people perspectives on dental implant and bone graft surgery

1. Would you accept to undergo bone graft surgery to enable dental implant placement? **Yes/No**

2. Would you prefer the use of synthetic bone substitute material / own bone grafts**?**

3.Would you accept additional costs for bone graft ? **Yes/ No**

4."Would you seek a second opinion if you were told that …"

… fixed dentures are not possible without placement of dental implants?

Yes/ No

… placement of dental implants is not possible in your specific case? **Yes/ No**

… placement of dental implants is not possible without previous bone graft surgery? **Yes/ No**

… placement of dental implants needs computed tomography **Yes/ No**

Quality of life

1. Comfort **Yes / Better / No**
2. Esthetics **Yes / Better / No**
3. Function **Yes / Better / No**
4. Speech **Yes / Better / No**
5. Self image **Yes / Better / No**
6. Oral hygiene **Yes / Better / No**

KNOWLEDGE AND AWARENESS OF DENTAL IMPLANTS AMONG GENERAL DENTAL PRACTITIONERS

1. Have you undergone any implant training course? **Yes / No**
2. What is your most preferred treatment modality in rehabilitating missing tooth which is bounded by healthy natural tooth adjacent to it?

   a. RPD
   b. FPD with conventional tooth supported bridge
   c. FPD with implant supported crown

3. What is your most preferred treatment modality in rehabilitating distal extension edentulous situation?

a. RPD
b. FPD with cantilever bridge
c. FPD with implant supported crown/bridge
d. Cast partial denture

4. What is your most preferred treatment modality in rehabilitating complete edentulous jaws?

a. Conventional Complete denture
b. Implant supported removable denture
c. Implant supported fixed prosthesis

5. Do you suggest implant supported prosthesis as a treatment options in rehabilitation any kind of edentulous jaw? **Yes / No**
6. Most common reason for patient not accepting implant treatment for replacing missing teeth?

a. Cost
b. Surgical procedure
c. Both

7. Do you provide dental implant treatment in your clinic? **Yes / No**

8. Diagnosis, treatment planning and decision about treatment cost will be decided by

a. Myself alone
b. Team work with implantalogist
c. Implantalogist takes major decision

9. Do you know about different kind of implants like, single piece implant, two piece implant, pteriygoid implant and zygomatic implant? **Yes / No**

10. You know about indications, variation in treatment procedure and cost expenditure for different kind of implants used? **Yes / No**

11. Do you know about different kind of abutment for implants, like angulated abutment and custom made abutment? **Yes / No**

12. Do you know about indications and variation in treatment procedure and cost expenditure for different kind of abutment used? **Yes / No**

13. Do you know about different kind of attachment systems like locator and bar retained attachment for implant supported prosthesis in rehabilitation of completely edentulous situation? **Yes / No**

14. Do you know about indications and variation in treatment procedure and cost expenditure for different kind of attachment system in treating implant supported dentures? **Yes / No**

15. Do you think general dentists have a role in maintenance of implant restorations? **Yes / No**

16. Do any patients approach you for the maintenance of his implant restoration that was placed in your clinic or by from some other dentist in different city? **Yes / No**

17. Do you have any special equipment for maintenance of implant restorations? **Yes / No**

18. Do you think implant training should be included in undergraduate studies? **Yes / No**

19. Do you think that dental implants are an acceptable solution for missing teeth in the Indian scenario?

a. Yes, implants are here to stay
b. No, economic feasibility will limit its usage
c. No, too invasive for patient acceptance
d. No, other reasons..... (please specify)

20. Will systemic disease affect implant osseointegration ? **Yes / No**

21. Is periodic maintenance needed for dental implant ? **Yes / No**

22. In your view, Which kind of prosthesis is better? Screw retained / cement retained

23. What about your patient satisfaction?

Highly satisfied / somewhat satisfied / somewhat dissatisfied / highly dissatisfied

24**.** Do you think advanced imaging is necessary for dental implant placement? **Yes / No**

25. Which is better imaging for dental implants? **CBCT / CT ,** Why?_____

26. Do you have any experience with any of the software? **Yes / No**

If Yes, mention the software _____

27. Do you need a stent for dental implant placement ? **Yes / No**

If Yes, How many companies in your city do stent _____

28. Have you ever seen a failed implant? **Yes / No**

If Yes, Why? _____

29. Has anyone of your patients claimed dental insurance for surgical procedures? **Yes / No**

If Yes, For what procedure insurance claimed _____

30. Years of Experience ? _____

KNOWLEDGE, ATTITUDE, AWARENESS TOWARDS DENTAL IMPLANTS AMONG DENTAL UNDERGRADUATE STUDENTS

1. Present year of study ? **I / II / III / IV / Intern**
2. Are you aware of dental implants ? **Yes / No**
3. Do you ever seen a dental implant ? **Yes / No**
4. What does a dental implant made up of ? **Titanium/ Nickel- cobalt / Stainless steel**
5. Can anyone have dental implant? **Yes / No**

   If No, specify reason ? _____
6. How a dental implant is better than other replacement?

   Esthetic / function / comfort / durability / others
7. On a scale of 1-10, how difficult you feel to place dental implant as compared with other procedure ? **1 – easy / 5 – average / 10 – very difficult**
8. Are aware of term osseointegration ? **Yes / No**

   If Yes, how long it will take to osseointegrate ?

   1month / 3 months / 6 months
9. How long you expect the life span of dental implants?

   5 years / 10 years / 15 years / 20 years / lifetime
10. What do you expect the cost of dental implant ?

    >1000 / >3000 / >5000 / <5000

11. Do you know different companies producing dental implants?**Yes / No**

12. Are you aware of special instrument kit for dental implant? **Yes / No / Somewhat**

13. Do you have any personal experience on dental implant? **Yes / No**

If Yes, please specify _____

14. Do you think is there any other types of implants in craniofacial region other than dental Implants? **Yes / No / May be**

15. Do you know about complications of dental implant ? **Yes / No**

16. Will you recommend dental implants to others? **Yes / No**

17. Do you think dental implant is an extensive procedure? **Yes / No**

18. Do you think regular dental visit required after dental implant placement **Yes / No**

19. Do you think can undergraduate able to place dental implants?

Yes / No

20. Do you think special training required for dental implant placement ? **Yes / No**

21. Are you aware of dental insurance plans for dental implants in India? **Yes / No**

Results

RESULTS

This cross sectional study was done as three groups which comprises of 250 participants in each group. Group I – Common people, Group – II Dental undergraduate students and Group III – General Dental Practitioners

Total number of participants – 750 participants

Common people	Dental undergraduate students	General dental practitioners
250	250	250

Group I – Common people

Total number of participants are 250 common people. There were 126(50.4%) Males and 124(49.6%) Females in this group (Table 1). The common people are classified into 5 sub-groups based on socioeconomic status as Upper class, Upper middle class, Lower upper class, Lower middle class, Low class peoples (Modified Kuppuswamy scale – Feb 2019)

Table 1: Distribution of participants based on Sex

Males	Females
126(50.4%)	124(49.6%)

Modified Kuppuswamy scale (FEB 2019)

Occupation of head of family	**Score**
Legislators, Senior Officials & Managers	10
Professionals	9
Technicians and Associate Professionals	8
Clerks	7
Skilled Workers and Shop & Market Sales Workers	6
Skilled Agricultural & Fishery Workers	5
Craft & Related Trade Workers	4
Plant & Machine Operators and Assemblers	3
Elementary Occupation	2
Unemployed	1

Education of head of family	**Score**
Profession or Honours	7
Graduate	6
Intermediate or diploma	5
High school certificate	4
Middle school certificate	3
Primary school certificate	2
Illiterate	1

Monthly income of family (In Rupees)

Updated Monthly Family Income in Rupees (2012)	Updated Monthly Family Income in Rupees (2018)	Updated Monthly Family Income in Rupees (2019)	Score
≥ 30,375	≥ 126,360	≥ 78,063	12
15,188–30,374	63,182–126,359	39,033–78,062	10
11,362–15,187	47,266–63,181	29,200 –39,032	6
7594–11,361	31,591–47,265	19,516–29,199	4
4556–7593	18,953–31,590	11,708–19,515	3
1521–4555	6327–18,952	3,908–11,707	2
≤ 1520	≤ 6326	≤2,640	1

Socioeconomic class		Total score
I	Upper	26-29
II	Upper middle	16-25
III	Lower middle	11-15
IV	Upper lower	5-10
V	Lower	01-04

Based on socioeconomic status: About awareness of the dental implant, 100% of upper class, 73% of the upper middle class, 65.3% of lower middle class, 36.4% of upper lower class and 15.6% of Lower class people has known about dental implants (Table 3). 84.4% of the Lower class, 63.6% of the Upper middle and 34.7% of the Lower middle class has not known about dental implants. The results showed that there is strong willingness and affordability towards dental implants in upper class (85.7%), 66.7% people of upper middle class, 56.9% people of lower middle class has willingness and

the affordability varies with 43.1% of people. About 25.5% people of upper lower class show willingness and 74.5% of the people not affordable for dental implant treatment (Table 4). Majority of the lower class (81.3% people) are lack in their knowledge, perceptions and willingness towards dental implant.

Table 2: Distribution of participants based on socioeconomic status

Upper class	Upper middle class	Lower middle class	Upper lower class	Low class
28 (11.2%)	63 (25.2%)	72(28.8%)	55 (22.0%)	32 (12.8%)

Table 3: Distribution about Awareness of the dental implant

	Upper class (N= 28)	Upper middle class (N= 63)	Lower middle class (N= 72)	Upper lower class (N= 55)	Low class (N= 32)
AWARE	28 (100%)	46 (73%)	47 (65.3%)	20 (36.4%)	5 (15.6%)
NOT AWARE	0	17(27%)	25(34.7%)	35(63.6%)	27(84.4%)

Table 4: Distribution on affordability of dental implant treatment

	Upper class (N= 28)	Upper middle class (N= 63)	Lower middle class (N= 72)	Upper lower class (N= 65)	Low class (N= 32)
AFFORDABLE	24 (85.7%)	42 (66.7%)	41 (56.9%)	14 (25.5%)	2 (6.3%)
UNAFFORDABLE	4 (14.3 %)	21 (33.3%)	31 (43.1%)	41 (74.5%)	30(81.3%)

Table 5: Distribution based on willingness towards bone graft surgery

	Upper class (N= 28)	Upper middle class (N= 63)	Lower middle class (N= 72)	Upper lower class (N= 65)	Low class (N= 32)
WILLING	26 (92.7%)	43 (68.3%)	6 (10.9%)	31 (43.1%)	4 (12.5%)
NOT WILLING	2(7.3%)	19(31.7%)	66(81.1%)	34(56.9%)	28(87.5%)

Level of knowledge and perceptions: Overall result showed that 206(82.4%) of the participants know about dental implants, 109(54.5%) were female and 117 (58.5%) were male, while 44(17.6%) of participants did not know about implants before. The majority of the people 196(78.4%) has said

dentist was their first source of information, followed by friends, family, internet (social medias).

Regarding the durability of implants, 28(11.2%) of the respondents expected the durability less than 10 years, 94(37.6%) of the respondents expected the durability to last between 10 and 20 years, 65(26%) of the respondents expected the durability between 21 and 25 years, and 17(6.8%) of the respondents expected the durability more than 25 years and 46(18.8%) of the respondents had No idea about it.

Regarding the oral hygiene for the care of the implants compared with natural teeth, 70(28%) of the respondents do not have any idea ("no idea), while 98(39.2%) thought that the implants need more care compared with natural teeth, 51(20.4%) thought both are similar, and 31 (12.4%) thought that it needs less care compared with natural teeth.

Level of attitude: About 79(31.6%) thought advantage of dental implants as it looks like natural teeth followed by 67(26.8%) as it looks Good and also over two third people has believed that dental implants have role in quality of life. About 111(44.4%) of the people has the positive prospective towards bone graft surgery (Table 5). About 149(59.6%) people opted for their own bone grafts and 101(40.4%) of the people are prepared for synthetic bone graft.

Group II – Dental Undergraduate Students

The total number of students was 250. Distribution of students was made according to the year of study Interns, Final year, Third year, Second year and First year (Table 6).

Table 6: Distribution of participants based on year of study

Interns	Final year	Third year	Second year	First year
50 (20%)	50 (20%)	50(20%)	50 (20%)	50 (20%)

Level of knowledge and perceptions: The overall results showed that majority of the students perceived to be well informed about dental implants. There were differences in the perception and knowledge at different academic levels. About 154 (61.6%) of the dental students are aware of dental implants and the awareness varies as Interns (100%), Final year (86%), Third year (62%), Second year (32%) and First year(28%). 161 (64.4%) of the dental students perceived the difficulty encountered to place implants as an average and 48 (19.2%) of the dental students to be a very difficult procedure. About 182 (72.8%) of the dental students were not aware of the complications and there is lack of any experience with dental implants in 223 (89.2%) of the dental students (Table 9).

Table 7: Distribution about Awareness of dental implants

	Interns (N=50)	**Final year (N =50)**	**Third year (N =50)**	**Second year (N =50)**	**First year (N = 50)**
AWARE	50(100%)	43(86%)	31(62%)	16(32%)	14 (28%)
NOT AWARE	0	7(14%)	19(38%)	34(68%)	36(72%)

Table 8: Experience with dental implant programs

	Interns (N=50)	Final year (N =50)	Third year (N =50)	Second year (N =50)	First year (N = 50)
ATTENDED	47(94%)	31(62%)	3(6 %)	0	0
NOT ATTENDED	3(6%)	19(38%)	47(94%)	50(100%)	50(100%)

Table 9: Personal experience with dental implant

	Interns (N=50)	Final year (N=50)	Third year (N=50)	Second year (N=50)	First year (N=50)
EXPERIENCED	26(52%)	1(2%)	0	0	0
NOT EXPERIENCED	24(48%)	49(98%)	50(100%)	50(100%)	50(100%)

Level of attitude: 100% of the participants felt the necessity to undergo special training for dental implant placement. Although the students believed to be an extensive specialty about 117(46.8%) student's shows positive attitude towards dental implant placement as an undergraduate and 81(32.4%) has attended the dental implant programs, where majority 47(94%) of Interns had attended some dental implant programs (Table 8).

Group III - General Dental Practitioners

The total numbers of participants were 250 general dental practitioners.

Table 10: Distribution of General dental practitioners based on experience

Less than 5 years of experience	5 – 15 years of experience	More than 15 years of experience
49	161	40

Table 11: Distribution of General dental practitioners based on who undergone training

Trained	Non – trained
66	184

Table 12: Distribution of General dental practitioners based on experience and who undergone training

Less than 5 years of experience		5 – 15 years of experience		More than 15 years of experience	
Trained	Non trained	Trained	Non trained	Trained	Non trained
10	39	47	114	9	31

Level of knowledge: Out of 250 practitioners 26.4% (66) has undergone dental implant training and 73.6% (184) has not undergone any dental implant training(Table 11). The General dental practitioners based on their experience of dental practice 1-5 years (39 GDP), 5-15years (114 GDP), more than 15 years (31 GDP) (Table 10). There is significant difference in knowledge between the general dental practitioners who had undergone training and who had not undergone any training. The knowledge was assessed based on implant types, their indications and cost, imaging and software experiences. All the trained General dental practitioners (26.4% of total) have a sound knowledge and attitude towards dental implant options. About two third (138 GDP)of non-trained general dental practitioners has moderate knowledge about dental implant and they lacks the depth of knowledge in the aspects of cost, indications of certain types of dental implant components and software handling. One third of non-trained general dental practitioners (46 GDP) lacks the knowledge in all aspects and shows the limitation of opting dental implant treatment in their practice. The knowledge

of general dental practitioners based on their experience of dental practice has shown better knowledge with 5-15 years of practice.

Table 13: Distribution of General Dental practitioners about the dental implant treatment providing in their clinic

	Less than 5 years of experience		5 – 15 years of experience		More than 15 years of experience	
	Trained (n = 10)	Non trained (n = 39)	Trained (n = 47)	Non trained (n = 114)	Trained (n = 9)	Non trained (n = 31)
PROVIDED	10	26	47	84	9	28
NOT PROVIDED	0	13	0	30	0	3

Table 14: Distribution about experience of failed implant in their practice

	Less than 5 years of experience		5 – 15 years of experience		More than 15 years of experience	
	Trained (n = 10)	Non trained (n = 39)	Trained (n = 47)	Non trained (n = 114)	Trained (n = 9)	Non trained (n = 31)
Had experienced	3	9	11	34	2	10
Had not experienced	7	30	36	80	7	21

Level of attitude: In 204(81.6%) of the dental clinics, dental practitioners have offered dental implant treatment (Table 13), where about 47.6% (119) of the general dental practitioners had made team work with implantologist when making decision. About 54.4% (136) of the general dental practitioners showed positive attitude towards dental implant treatment options. A majority 93.6% (234) of the general dental practitioners felt that dental implants require additional oral hygiene maintenance and care by the general dentist. Over 54.8% (137) of the general dental practitioners thought that dental implants are affordable treatment option and 42.4% (106) economic feasibility will limit use of dental implants in Indian scenario where 34%(85) of their patients had claimed insurance for their dental implant treatment. The Majority of dental practitioners 75.6% (189) of the general dental practitioners have said their patients have highly satisfied with dental implant treatment. Almost 94.6% (235) of the general dental practitioners have stated to include dental implant training in their undergraduate curriculum.

Tables and Pie Charts

Table 1 : Group 1 (Common people)

Question	Options	Upper class	Upper middle class	Lower middle class	Upper lower Class	Lower class	Total
Are you aware of dental implants	Yes	28(100%)	62(98.1%)	65(90.2%)	43(78.1%)	8 (25%)	206
	No	0	1(1.9%)	7 (9.8%)	12 (21.9%)	24(75%)	44
Is it an easy affordable procedure	Yes	24(85.7%)	42(66.7%)	41 (56.9%)	14 (25.5%)	2 (6.3%)	123
	No	4 (14.3%)	21(33.3%)	31 (43.1%)	41 (74.5%)	30(81.3%)	127
	May be	0	0	0	0	0	0
Functional life time of implants	<10 yrs	1 (3.6%)	23(36.5%)	2 (2.8 %)	2 (3.6%)	0	28
	10-20 yrs	13(46.4%)	24(38.1%)	11 (15.2%)	42(76.4%)	4 (12.5%)	94
	21-25 yrs	12(42.8%)	9 (14.2%)	40 (55.6 %)	1 (1.8%)	3 (9.4%)	65
	>25 yrs	2 (7.2%)	0	15 (20.8 %)	0	0	17
	No idea	0	7 (11.2%)	4 (5.6 %)	10 (18.2%)	25(78.1%)	46
Amount prepared to pay for dental implant	None	0	0	0	0	0	0
	<Rs.2500	0	18(28.6%)	2 (2.8%)	0	0	20
	<Rs.5000	1 (3.6 %)	30(47.6%)	8 (11. 1 %)	6 (10.9 %)	4 (12.5%)	49
	<Rs.10000	10(35.7%)	15(23.8%)	19 (26.4 %)	9(16.4 %)	2(6.3%)	55
	<Rs.15000	16(57.1%)	0	29 (40.3 %)	3 (5.5 %)	2 (6.3%)	50
	No idea	1 (3.6 %)	0	14 (19.4 %)	37(67.3 %)	24(75%)	66
Dental implants can replace removable full denture	Yes	26(92.9%)	44(69.8%)	8 (11. 1%)	13 (23.6%)	3 (9.4%)	94
	No	2 (7.1%)	19(30.2%)	64 (88.9 %)	42 (76.4%)	29(90.6%)	156

Dental implants can be placed to remove fixed denture	Yes No	26(92.9%) 2 (7.1%),	26(41.3%) 37(58.7%)	20 (27.8%) 52 (72.2 %)	9 (9.4%) 46 (90.6%)	3 (9.4%) 29(90.6%)	84 166
Advantages of non removable over removable prosthesis	Less annoying in mouth Looks good Good as natural teeth in function Don't feel like foreign body	5(17.9%) 7 (25 %) 10(35.7%) 6 (21.4%)	23(36.5%) 9(14.3%) 27(42.9%) 4 (6.3 %)	0 44 (61.1 %) 12 (16.7%) 16 (22.2 %)	40(72.7%) 7 (12.7%) 5 (9.1%) 3 (5.5%)	7 (21.9%) 0 25(78.1%) 0	75 67 79 29
Do you anticipate as oral hygiene for the care of implants compared with natural teeth	More Similar Less No idea	4(14.3%) 21 (75%) 1(3.6%) 2(7.1%)	14(22.2%) 27(42.8%) 6(9.5%) 16(25.5%)	52 (72.2%) 0 8 (11.1%) 12 (16.7%)	23(41.9%) 3(5.4%) 9 (16.4%) 20(36.3%)	5 (15.6%) 0 7 (21.9%) 20(62.5%)	98 51 31 70
Have you heard about experience with implants from your friends	Yes No	24(85.7%) 4 (14.3%)	58(92.1%) 5 (7.9 %)	44 (61.7%) 28 (38.9%)	10 (18.2%) 45 (81.8%)	7 (21.9%) 25(78.1%)	143 107

If, yes how successful was the implant	Successful	16(66.8%)	34(58.7%)	22 (50%)	3 (30 %)	3 (42.8%)	78
	Partially	4 (16.6%)	16 (27.5%)	8 (18.2%)	7 (70%)	2 (28.5%)	37
	Not successful	4 (16.6%)	8 (13.8%)	14 (31.8%)	0	2 (28.5%)	28
Do you think implant procedure need to be done by specialist	Yes	27(96.4%)	42(66.7%)	45 (62.5%)	10 (18.2%)	3 (9.4%)	127
	No	0	0	15 (20.8%)	10 (18.2%)	9 (28.1%)	34
	Don't know	1 (3.6%)	21(33.3%)	12 (16.6%)	35 (63.5%)	20(62.5%)	89
where do you think dental implants are anchored	**Jaw bone**	18(64.3%)	23(36.5%)	30 (41.7%)	2(3.6%)	0	75
	Gums	9 (32.1%)	27(42.9%)	16 (22.2%)	0	0	52
	Neighbouring teeth	0	11(17.5%)	15 (20.8%)	8 (14.5%)	5 (15.6%)	39
	Don't know	1 (3.6%)	2 (3.1%)	7 (9.8%)	47 (85.4%)	27(84.4%)	84
Are you aware of dental insurance plan in India	**Yes**	26(92.9%)	43(68.3%)	7(12.7%)	27(37.5%)	2 (6.3%)	105
	No	2 (7.1%)	20 (31.7%)	48 (87.3%)	45(62.5%)	30 (93.8%)	145
your dental expenses covered under any insurance scale	**Yes**	24(85.7%)	39(61.9%)	4(7.2%)	21(29.1%)	2 (6.3%)	90
	No	4 (14.3%)	24 (38.1%)	51 (92.8%)	51 (70.8%)	30 (93.8%)	160
Reasons for electing to have implants	**Dissatisfied with removable dentures**	4 (14.3%)	10 (15.9%)	0	10 (13.8%)	0	24
	To improve appearance	8(28.6%)	3(4.8%)	0	62(86.2%)	0	73
	To improve eating	7 (25%)	8 (12.7%)	0	0	0	15

	To improve self-confidence	8 (28.6%)	19 (30.2%)	11 (20%)	0	5 (15.6%)	43
	To replace missing tooth	1 (3.6%)	23(36.5%)	39 (70.9%)	0	25 (78.1%)	88
	Other	0	0	5(9.1%)	0	2 (6.3%)	7
Would you accept to undergo bone graft surgery to enable dental implant placement	**Yes**	26 (92.7%)	43 (68.3%)	6 (10.9%)	31 (43.1%)	4 (12.5%)	111
	No	2 (7.3%)	20 (31.7%)	49 (89.1%)	41 (56.9%)	28 (87.5%)	139
Would you accept additional cost for dental implant	**Yes**	24 (85.7%)	30 (47.6%)	8 (14.5%)	25 (34.7%)	3 (9.4%)	90
	No	4 (14.3%)	33 (52.4%)	47(85.5%)	47(65.3 %)	29 (90.6%)	160
Would you seek a second opinion if a fixed dentures are not possible without dental implants	**Yes**	28 (100%)	50 (79.4%)	8 (14.5%)	28 (38.9%)	6 (18.8%)	120
	No	0	13 (20.6%)	47(85.5%)	44 (61.1%)	26 (81.2%)	130
placement of dental implants is not possible in your specific cases	**Yes**	28 (100%)	50 (79.4%)	7 (12.6%)	28 (38.9%)	5 (15.6%)	118
	No	0	13 (20.6%)	48 (87.4%)	44 (61.1%)	27 (84.4%)	132
Placement without bone graft surgery	**Yes**	27 (96.4%)	48 (76.2%)	8 (14.5%)	25 (34.7%)	4 (12.5%)	112
	No	1 (3.6%)	15 (23.8%)	47(85.5%)	47(65.3 %)	28 (87.5%)	138
placement of dental implants needs CT	**Yes**	28 (100%)	44 (69.8%)	9 (16.4%)	40 (55.5%)	6 (18.8%)	127
	No	0	19(30.2%)	46 (83.6%)	32 (44.6%)	26 (81.2%)	123

Quality of life							
Comfort	**Yes**	27 (96.7) 0	40 (63.5%)	0	31 (43.1)	0	98
	No	1 (3.6 %)	1 (1.6%)	34 (61.8%)	41 (56.9)	18(56.3%)	94
	Better	28 (100%)	22 (34.9%)	21 (38.2%)	0	14(43.8%)	58
Esthetics	**Yes**	0	39 (61.9%)	0	22 (30.6%)	0	89
	No	0	3 (4.8%)	38 (69.1%)	50 (69.4%)	25(78.1%)	116
	Better	27 (96.7)	21 (33.3%)	17 (30.9%)	0	7 (21.9%)	45
Function	**Yes**	0	49 (77.8%)	0	19 (26.6%)	0	95
	No	1 (3.6 %)	2 (3.2%)	28 (50.9%)	45 (62.5%)	18(56.3%)	93
	Better	27 (96.7)	12 (19%)	27 (49.1%)	8 (12.5 %)	14(43.8%)	62
Speech	**Yes**	0	39 (61.9%)	1 (1.8%)	17 (23.6%)	1 (3.1%)	85
	No	1 (3.6 %)	2 (3.2%)	31 (56.4%)	43 (59.7%	21(66.5%)	97
	Better	28 (100%)	22 (34.9%)	23 (41.8%)	12 (16.6 %)	10(31.4%)	68
Self image	**Yes**	0	44 (69.8%)	1 (1.8%)	18 (25%)	1 (3.1%)	92
	No	0	2 (3.2%)	22(40%)	47 (65.2%)	20(62.5%)	91
	Better	27 (96.7)	17 (27%)	32 (58.2%)\	7(9.8%)	11(34.4%)	67
Oral hygiene	**Yes**	0	43 (68.3%)	0	27 (37.5%)	0	97
	No	1 (3.6 %)	2 (3.2%)	23 (41.8%)	37 (51.3%)	13(40.6%)	75
	Better	0	18 (28.6%)	32 (58.2%)	8 (11.2%)	19(59.4%)	78

TABLE 2: Group II (Undergraduate students)

Question	**Total number of participants**	**Year of study**	**Frequency (%)**
Present year of the study	N=250	FIRST YEAR SECOND YEAR THIRD YEAR FINAL YEAR INTERNSHIP	50 (20%) 50 (20%) 50 (20%) 50 (20%) 50 (20%)
Are you aware of dental implants	N=250	YES NO	154(61.6%) 96(38.4%)
Do you ever seen a dental implant	N=250	YES NO	216(86.4%) 34(13.6%)
What does a dental implant made up of?	N=250	TITANIUM NICKEL STAINLESS STEEL	184(73.6%) 22(8.8%) 44(17.6%)
Can anyone have dental implant	N=250	YES NO	203(81.2%) 47(18.8%)
How a dental implant is better than other replacement	N=250	ESTHETIC FUNCTION COMFORT DURABILITY	42(16.8%) 25(10.0%) 182(72.8%) 1(4%)

On a scale of 1-10, how difficult you feel to place dental implant as compared with other procedure	N=250	EASY AVERAGE VERY DIFFICULT	41(16.4%) 161(64.4%) 48(19.2%)
Are aware of term osseointegration	N=250	YES NO	211(84.4%) 39(15.6%)
If yes, how long it will take to osseointegrate?	N=250	1 MONTH 3MONTHS 6MONTHS	68(27.2%) 86(34.4%) 96(38.4%)
How long you expect the life span of dental implants	N=250	5YEARS 10YEARS 15YEARS 20YEARS LIFETIME	18(7.2%) 71(28.4%) 114(45.6%) 36(14.4%) 11(4.4%)
What do you expect the cost of dental implant	N=250	>1000 <3000 >5000	66(26.4%) 93(37.2%) 91(36.4%)

Do you know different companies producing dental implants	N=250	YES NO	219(87.6%) 31(12.4%)
Do you aware of special instrument kit for dental implant	N=250	YES NO	215(86.0%) 35(14.0%)
Do you have personal experience with dental implant	N=250	YES NO	27(10.8%) 223(89.2%)
Do you think is there any other dental implants in craniofacial region other than dental implants	N=250	YES NO MAY BE	121(48.4%) 128(51.2%) 1(4%)
Do you know about complications of dental implant	N=250	YES NO	68(27.2%) 182(72.8%)

Will you recommend dental implants to others	N=250	YES NO	234(93.6%) 16(6.4%)
Do you think implant is an extensive procedure	N=250	YES NO	209(83.6%) 41(16.4%)
Do you think regular dental visit required after implant placement	N=250	YES NO	212(84.8%) 38(15.2%)
Do you think an undergraduate can able to place dental implants	N=250	YES NO	218(87.2%) 32(12.8%)
Do you think special training is required for implant placement	N=250	YES NO	250(100.0%) 0
Are you aware of dental insurance plans in India	N=250	YES NO	205(82.0%) 45(18.0%)
Do you attended any programs on implant	N=250	YES NO	81(32.4%) 169(67.6%)

Table 3 : Group III – General dental practitioners based on training

UNDERGONE TRAINING - 66

Question	Total number of participants		Frequency (%)
What is your most preferred treatment modality in rehabilitating missing tooth which is bounded by healthy natural teeth adjacent to it	N- 66	RPD FPD With Conventional Tooth Supported Bridge FPD With Implant	2 (3%) 23 (34.8%) 41(62.1%)
Distal extension edentulous situation	N- 66	RPD FPD With Cantilever FPD With Implant supported crown Cast partial denture	5 (7.6%) 11 (16.7%) 50 (75.8%) 0

Complete edentulous jaws	N- 66	Conventional Complete denture Implant supported RPD Implant supported FPD	14 (21.2 %) 22 (33.3%) 30 (45.5%)
Do you suggest implant supported prosthesis as a treatment options in rehabilitating any kind of edentulous jaws	N- 66	YES NO	50 (75.8%) 16 (24.2%)
Most common reason for patient not accepting implant treatment for replacing missing teeth	N- 66	Cost Surgical procedure Both	18 (27.3%) 3 (4.5%) 45 (68.2%)
Do you provide dental implant treatment in your clinic	N- 66	YES NO	66 (100%) 0 (0%)

Diagnosis, treatment planning and decision about treatment cost will be decided by	N- 66	Myself Team work Implantologist advice	34 (51.5%) 24 (36.4%) 8 (12.1%)
Do you know about different kinds of implants like single piece implant, two piece implant, pterygoid implant and zygomatic implant	N- 66	YES NO	64 (97%) 2 (3%)
Do you know about indications, variations in treatment procedures and cost, expenditure for different kind of implants used	N- 66	YES NO	56 (84.8%) 10 (15.2%)

Do you know about different kind of abutment for implants , like angulated abutment and custom made abutments	N- 66	YES NO	61 (92.4%) 5 (7.6%)
Do you know about different kind of attachment systems like locator and bar retained attachment for implant supported prosthesis in rehabilitation of completely edentulous situation?	N- 66	YES NO	54 (81.8%) 12 (18.2%)
Do you know about indications and variation in treatment procedure and cost,	N- 66	YES NO	54 (81.8%) 12 (18.2%)

expenditure for different kind of attachment system in treating implant supported dentures?			
Do you think general dentists have a role in maintenance of implant restorations?	N- 66	YES NO	59 (89.4%) 7 (10.6%)
Do any patients approach you for the maintenance of his implant restoration that was placed in your clinic or by from some other dentist in different city?	N- 66	YES NO	40 (60.6%) 26 (39.4%)
Do you have any special equipment for maintenance of implant restorations?	N- 66	YES NO	48 (72.7%) 18 (27.3%)

Do you think implant training should be included in undergraduate studies?	N- 66	YES NO	64 (97%) 2 (3%)
Do you think that dental implants are an acceptable solution for missing teeth in the Indian scenario?	N- 66	YES NO, Economic feasibility No , too invasive	36 (54.5%) 27 (40.9%) 3 (4.5%)
Will systemic disease affect implant osseointegration ?	N- 66	YES NO	66 (100%) 0
Is periodic maintainence needed for dental implant ?	N- 66	YES NO	61 (92.4%) 5 (7.6%)
In your view, Which kind of prosthesis is better?	N- 66	Screw retained Cement retained	55 (83.3%) 11 (16.7%)
What about your patient satisfaction?	N- 66	Highly satisfied Somewhat	57 (86.4%) 9 (13.6%)

Do you think advanced imaging is necessary for dental implant placement?	N- 66	YES NO	54 (81.8%) 12 (18.2%)
Which is better imaging for dental implants? CBCT / CT	N- 66	CBCT CT	57 (82.4%) 9 (13.6%)
Do you have any experience with any of the implant software?	N- 66	YES NO	29 (43.9%) 37 (56.1%)
Do you need a stent for dental implant placement?	N- 66	YES NO	27 (40.9%) 39 (59.1%)
Have you ever seen a failed implant?	N- 66	YES NO	16 (24.5%) 50 (75.5%)
Has anyone of your patients claimed dental insurance for dental implant procedures?	N- 66	YES NO	34 (51.5%) 32 (48.5%)

GENERAL PARTICITIONERS WHO HAD NOT UNDERGONE TRAINING – 184

Question	Total number of participants		Frequency
What is your most preferred treatment modality in rehabilitating missing tooth which is bounded by healthy natural teeth adjacent to it	N- 184	RPD FPD With Conventional Tooth Supported Bridge FPD With Implant	9 (4.7%) 97 (52.7%) 78 (42,.4%)
Distal extension edentulous situation	N- 184	RPD FPD With Cantilever FPD With Implant supported crown Cast partial denture	42 (22.8%) 42 (22.8%) 99 (53.8%) 1 (0.5%)

Complete edentulous jaws	N- 184	Conventional Complete denture Implant supported RPD Implant supported FPD	78 (42.4%) 38 (20.7%) 68 (37%)
Do you suggest implant supported prosthesis as a treatment options in rehabilitating any kind of edentulous jaws	N- 184	YES NO	113 (61.4%) 71 (38.6%)
Most common reason for patient not accepting implant treatment for replacing missing teeth	N- 184	Cost Surgical procedure Both	76 (41.3%) 14 (7.6%) 94 (51.1%)
Do you provide dental implant treatment in your clinic	N- 184	YES NO	138 (68.5%) 46 (31.5%)

Diagnosis, treatment planning and decision about treatment cost will be decided by	N- 184	Myself Team work Implantalogist advice	59 (32.1%) 89 (48.4%) 36 (19.6%)
Do you know about different kinds of implants like single piece implant, two piece implant, pterygoid implant and zygomatic implant	N- 184	YES NO	155 (84.2%) 29 (15.8%
Do you know about indications, variations in treatment procedures and cost, expenditure for different kind of implants used	N- 184	YES NO	93 (50.5%) 91 (49.5%)

Do you know about different kind of abutment for implants , like angulated abutment and custom made abutments	N- 184	YES NO	53 (28.8%) 131 (71.2%)
Do you know about different kind of attachment systems like locator and bar retained attachment for implant supported prosthesis in rehabilitation of completely edentulous situation?	N- 184	YES NO	83(45.1%) 101(54.9 %)
Do you know about indications and variation in treatment procedure and cost,	N- 184	YES NO	78 (42.4%) 106 (57.6%)

expenditure for different kind of attachment system in treating implant supported dentures?			
Do you think general dentists have a role in maintenance of implant restorations?	N- 184	YES NO	152 (82.6%) 22 (17.4%)
Do any patients approach you for the maintenance of his implant restoration that was placed in your clinic or by from some other dentist in different city?	N- 184	YES NO	86 (46.7%) 98 (53.3%)
Do you have any special equipment for maintenance of implant restorations?	N- 184	YES NO	48 (26.1%) 136 (73.9%)

Do you think implant training should be included in undergraduate studies?	N- 184	YES NO	169 (91.8%) 15 (8.2%)
Do you think that dental implants are an acceptable solution for missing teeth in the Indian scenario?	N- 184	YES NO, Economic feasibility No , too invasive	95 (51 .6%) 83 (45.1%) 6 (3.3%)
Will systemic disease affect implant osseointegration ?	N- 184	YES NO	178 (96.7%) 6 (3.3%)
Is periodic maintainence needed for dental implant ?	N- 184	YES NO	167 (90.8%) 17 (9.2%)
In your view, Which kind of prosthesis is better?	N- 184	Screw retained Cement retained	118 (64.1%) 66 (35.9%)
What about your patient satisfaction?	N- 184	Highly satisfied Somewhat	141 (76.6%) 43 (23.4%)

Do you think advanced imaging is necessary for dental implant placement?	N- 184	YES NO	155 (84.2%) 29 (15.8%)
Which is better imaging for dental implants? CBCT / CT	N- 184	CBCT CT	155 (84.2%) 29 (15.8%)
Do you have any experience with any of the implant software?	N- 184	YES NO	27 (14.7%) 157 (85.3%)
Do you need a stent for dental implant placement ?	N- 184	YES NO	42 (22.8%) 142 (77.2%)
Have you ever seen a failed implant?	N- 184	YES NO	53 (28.9%) 131 (71.1%)
Has anyone of your patients claimed dental insurance for dental implant procedures?	N- 184	YES NO	67 (36.4%) 117 (63.6%)

Table 4 : Based on years of experience

UNDERGONE TRAINING - EXPERIENCE LESS THAN 5 YEARS

Question	Total number of participants		Frequency
What is your most preferred treatment modality in rehabilitating missing tooth which is bounded by healthy natural teeth adjacent to it	N- 10	RPD FPD With Conventional Tooth Supported Bridge FPD With Implant	0 5 (50%) 5 (50%)
Distal extension edentulous situation	N- 10	RPD FPD With Cantilever FPD With Implant supported crown Cast partial denture	3 (30%) 0 7 (70%) 0

Complete edentulous jaws	N- 10	Conventional Complete denture Implant supported RPD Implant supported FPD	5 (50%) 2 (20%) 3 (30%)
Do you suggest implant supported prosthesis as a treatment options in rehabilitating any kind of edentulous jaws	N- 10	YES NO	7 (70%) 3 (30%)
Most common reason for patient not accepting implant treatment for replacing missing teeth	N- 10	Cost Surgical procedure Both	3 (30%) 7 (70%)
Do you provide dental implant treatment in your clinic	N- 10	YES NO	10 (100%) 0 (0%)\

Diagnosis, treatment planning and decision about treatment cost will be decided by	N- 10	Myself Team work Implantalogist advice	1 (10%) 5 (50%) 4 (40%)
Do you know about different kinds of implants like single piece implant, two piece implant, pterygoid implant and zygomatic implant	N- 10	YES NO	9 (90%) 1 (10%)
Do you know about indications, variations in treatment procedures and cost, expenditure for different kind of implants used	N- 10	YES NO	6 (60%) 4 (40%)

Do you know about different kind of abutment for implants , like angulated abutment and custom made abutments	N- 10	YES NO	10 (100%) 0
Do you know about different kind of attachment systems like locator and bar retained attachment for implant supported prosthesis in rehabilitation of completely edentulous situation?	N- 10	YES NO	6 (60%) 4 (40%)
Do you know about indications and variation in treatment procedure and cost,	N- 10	YES NO	5 (50%) 5 (50%)

expenditure for different kind of attachment system in treating implant supported dentures?			
Do you think general dentists have a role in maintenance of implant restorations?	N- `10	YES NO	10 (100%) 0 (0%)
Do any patients approach you for the maintenance of his implant restoration that was placed in your clinic or by from some other dentist in different city?	N- 10	YES NO	6 (60%) 4 (40%)
Do you have any special equipment for maintenance of implant restorations?	N- 10	YES NO	5 (50%) 5 (50%)

Do you think implant training should be included in undergraduate studies?	N- 10	YES NO	9 (90%) 1 (10%)
Do you think that dental implants are an acceptable solution for missing teeth in the Indian scenario?	N- 10	YES NO, Economic feasibility No , too invasive Other	5 (50%) 4(40%) 1 (10%)
Will systemic disease affect implant osseointegration ?	N- 10	YES NO	10 (100%) 0
Is periodic maintainence needed for dental implant ?	N- 10	YES NO	10 (100%) 0
In your view, Which kind of prosthesis is better?	N- 10	Screw retained Cement retained	6 (60%) 4 (40%)

What about your patient satisfaction?	N- 10	Highly satisfied Somewhat	7 (70%) 3 (30%)
Do you think advanced imaging is necessary for dental implant placement?	N- 10	YES NO	8 (80%) 2 (20%)
Which is better imaging for dental implants? CBCT / CT	N- 10	CBCT CT	10 (100%) 0
Do you have any experience with any of the implant software?	N- 10	YES NO	6 (60%) 4 (40%)
Do you need a stent for dental implant placement ?	N- 10	YES NO	4 (40%) 6 (60%)
Have you ever seen a failed implant?	N- 10	YES NO	3 (70%) 7 (30%)
Has anyone of your patients claimed dental insurance for dental implant procedures?	N- 10	YES NO	5 (50%) 5 (50%)

UNDERGONE TRAINING - EXPERIENCE 5 TO 15 YEARS

Question	Total number of participants		Frequency
What is your most preferred treatment modality in rehabilitating missing tooth which is bounded by healthy natural teeth adjacent to it	N- 47	RPD FPD With Conventional Tooth Supported Bridge FPD With Implant	2 (4.3%) 16 (34%) 29 (61.7%)
Distal extension edentulous situation	N- 47	RPD FPD With Cantilever FPD With Implant supported crown Cast partial denture	2 (4.3%) 11 (23.4%) 34 (72.3%) 0

Complete edentulous jaws		Conventional Complete denture Implant supported RPD Implant supported FPD	8 (17%) 15(31.9%) 24 (51.1%)
Do you suggest implant supported prosthesis as a treatment options in rehabilitating any kind of edentulous jaws	N- 47	YES NO	39 (83%) 8 (17%)
Most common reason for patient not accepting implant treatment for replacing missing teeth	N- 47	Cost Surgical procedure Both	10 (21.3%) 3 (6.4%) 34 (72.3%)
Do you provide dental implant treatment in your clinic	N- 47	YES NO	47(100%) 0

Diagnosis, treatment planning and decision about treatment cost will be decided by	N- 47	Myself Team work Implantalogist advice	32(68.1%) 15 (31.9%) 0
Do you know about different kinds of implants like single piece implant, two piece implant, pterygoid implant and zygomatic implant	N- 47	YES NO	47 (100%) 0
Do you know about indications, variations in treatment procedures and cost, expenditure for different kind of implants used	N- 47	YES NO	45 (95.7%) 2 (4.3%)

Do you know about different kind of abutment for implants , like angulated abutment and custom made abutments	N- 47	YES NO	42 (89.4%) 5 (10.6%)
Do you know about different kind of attachment systems like locator and bar retained attachment for implant supported prosthesis in rehabilitation of completely edentulous situation?	N- 47	YES NO	40 (85.1%) 7 (14.9%)
Do you know about indications and variation in treatment procedure and cost,	N- 47	YES NO	25 (53.2%) 22 (46.8%)

expenditure for different kind of attachment system in treating implant supported dentures?			
Do you think general dentists have a role in maintenance of implant restorations?	N- 47	YES NO	45 (95.7%) 2 (4.3%)
Do any patients approach you for the maintenance of his implant restoration that was placed in your clinic or by from some other dentist in different city?	N- 47	YES NO	30 (63.8%) 17 (36.2%)
Do you have any special equipment for maintenance of implant restorations?	N- 47	YES NO	37 (78.7%) 10 (21.3%)

Do you think implant training should be included in undergraduate studies?	N- 47	YES NO	46 (97.9%) 1 (2.1%)
Do you think that dental implants are an acceptable solution for missing teeth in the Indian scenario?	N- 47	YES NO, Economic feasibility No , too invasive	24 (51.1%) 21 (44.7%) 2 (4.3%)
Will systemic disease affect implant osseointegration ?	N- 47	YES NO	47 (100%) 0
Is periodic maintainence needed for dental implant ?	N- 47	YES NO	42 (89.4%) 5 (10.6%)
In your view, Which kind of prosthesis is better?	N- 47	Screw retained Cement retained	40 (85.1%) 7 (14.9%)
What about your patient satisfaction?	N- 47	Highly satisfied Somewhat	42 (89.4%) 5 (10.6%)

Do you think advanced imaging is necessary for dental implant placement?	N- 47	YES NO	38 (80.9%) 9 (19.1%)
Which is better imaging for dental implants? CBCT / CT , Specify Why?	N- 47	CBCT CT	38 (80.9%) 9 (19.1%)
Do you have any experience with any of the implant software?	N- 47	YES NO	20 (42.6%) 27 (57.4%)
Do you need a stent for dental implant placement?	N- 47	YES NO	20 (42.6%) 27 (57.4%)
Have you ever seen a failed implant?	N- 47	YES NO	11 (23.5%) 36 (76.5%)
Has anyone of your patients claimed dental insurance for dental implant procedures?	N- 47	YES NO	26 (55.3%) 21 (44.7%)

UNDERGONE TRAINING - EXPERIENCE MORE THAN 15 YEARS

Question	Total number of participants		Frequency
What is your most preferred treatment modality in rehabilitating missing tooth which is bounded by healthy natural teeth adjacent to it	N- 9	RPD FPD With Conventional Tooth Supported Bridge FPD With Implant	0 3 (33.3%) 6 (66.7%)
Distal extension edentulous situation	N- 9	RPD FPD With Cantilever FPD With Implant supported crown Cast partial denture	0 0 9(100%) 0

Complete edentulous jaws	N-9	Conventional Complete denture Implant supported RPD Implant supported FPD	1(11.6%) 5 (55.6%) 3 (33.3%)
Do you suggest implant supported prosthesis as a treatment options in rehabilitating any kind of edentulous jaws	N- 9	YES NO	4 (44.4%) 5 (55.5%)
Most common reason for patient not accepting implant treatment for replacing missing teeth	N- 9	Cost Surgical procedure Both	6 (66.7%) 0 3 (33.3%)
Do you provide dental implant treatment in your clinic	N- 9	YES NO	9 (100%) 0 (0%)

Diagnosis, treatment planning and decision about treatment cost will be decided by	N- 9	Myself Team work Implantalogist advice	2 (22.2%) 4(44.4%) 3 (33.3%)
Do you know about different kinds of implants like single piece implant, two piece implant, pterygoid implant and zygomatic implant	N- 9	YES NO	8(88.9%) 1 (11.1%)
Do you know about indications, variations in treatment procedures and cost, expenditure for different kind of implants used	N- 9	YES NO	6 (66.6%) 3 (33.3%)

Do you know about different kind of abutment for implants , like angulated abutment and custom made abutments	N- 9	YES NO	9 (100%) 0
Do you know about different kind of attachment systems like locator and bar retained attachment for implant supported prosthesis in rehabilitation of completely edentulous situation?	N- 9	YES NO	8 (88.9%) 1 (11.1%)
Do you know about indications and variation in treatment procedure and cost,	N- 9	YES NO	8 (88.9%) 1 (11.1%)

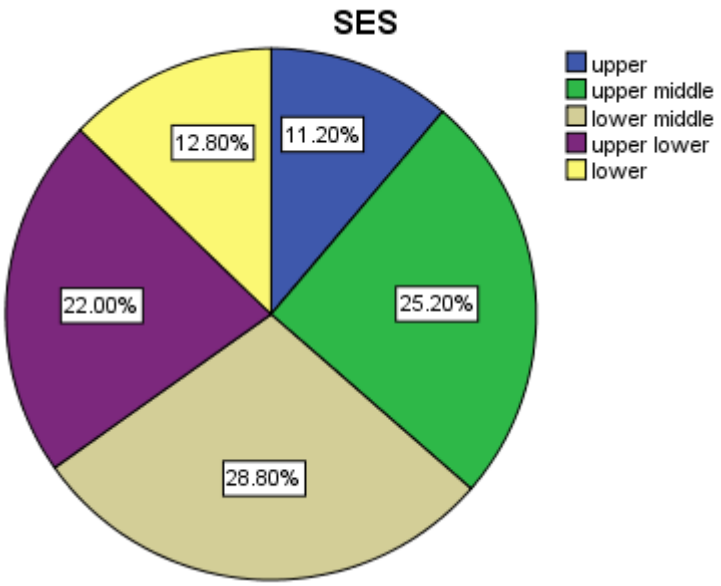
expenditure for different kind of attachment system in treating implant supported dentures?			
Do you think general dentists have a role in maintenance of implant restorations?	N- 9	YES NO	6 (66.6%) 3 (33.3%)
Do any patients approach you for the maintenance of his implant restoration that was placed in your clinic or by from some other dentist in different city?	N- 9	YES NO	4 (44.4%) 5 (55.5%)
Do you have any special equipment for maintenance of implant restorations?	N- 9	YES NO	6 (66.6%) 3 (33.3%)

Do you think implant training should be included in undergraduate studies?	N- 9	YES NO	9 (100%) 0
Do you think that dental implants are an acceptable solution for missing teeth in the Indian scenario?	N- 9	YES NO, Economic feasibility No , too invasive	6 (66.6%) 3 (33.3%) 0
Will systemic disease affect implant osseointegration ?	N- 9	YES NO	9 (100%) 0
Is periodic maintainence needed for dental implant ?	N- 9	YES NO	9 (100%) 0
In your view, Which kind of prosthesis is better?	N- 9	Screw retained Cement retained	9 (100%) 0
What about your patient satisfaction?	N- 9	Highly satisfied Somewhat	7 (77.8%) 2 (22.3%)

Do you think advanced imaging is necessary for dental implant placement?	N- 9	YES NO	7 (77.8%) 2 (22.3%)
Which is better imaging for dental implants? CBCT / CT , Specify Why?	N- 9	CBCT CT	9 (100%) 0
Do you have any experience with any of the implant software?	N- 9	YES NO	3 (33.3%) 6 (66.6%)
Do you need a stent for dental implant placement ?	N- 9	YES NO	3 (33.3%) 6 (66.6%)
Have you ever seen a failed implant?	N- 9	YES NO	2 (22.2%) 7 (77.8%)
Has anyone of your patients claimed dental insurance for dental implant procedures?	N- 9	YES NO	5 (55.5) 4 (44.5%)

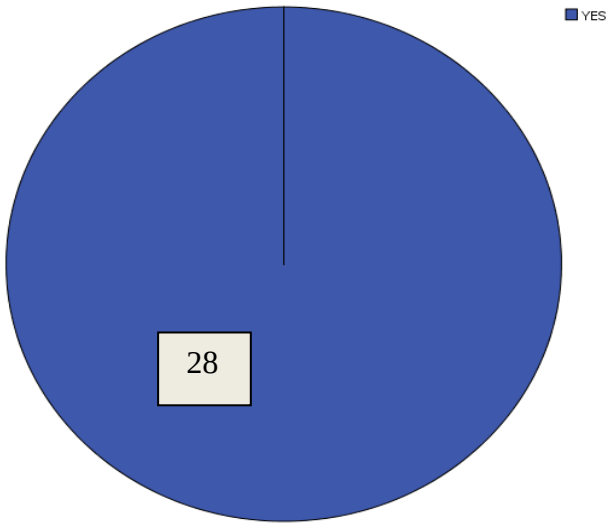
GRAPHS

Graph 1 : Group I (Common people) – Distribution based on SES scale

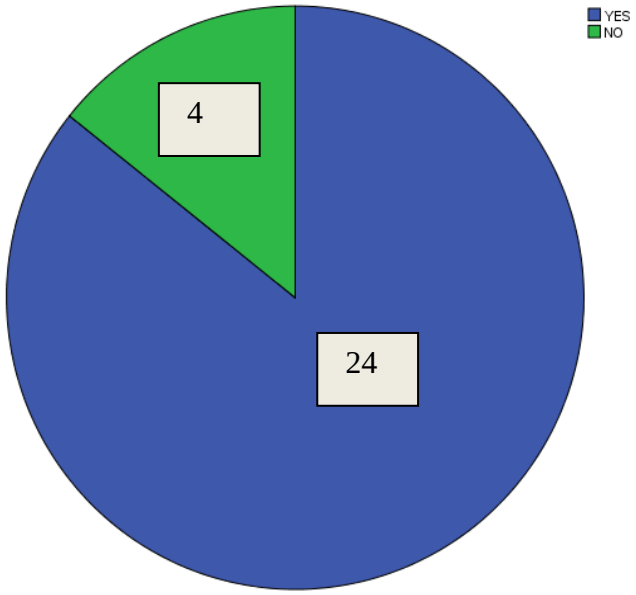


Graph 2 : Knowledge, attitude and awareness of Upper class people

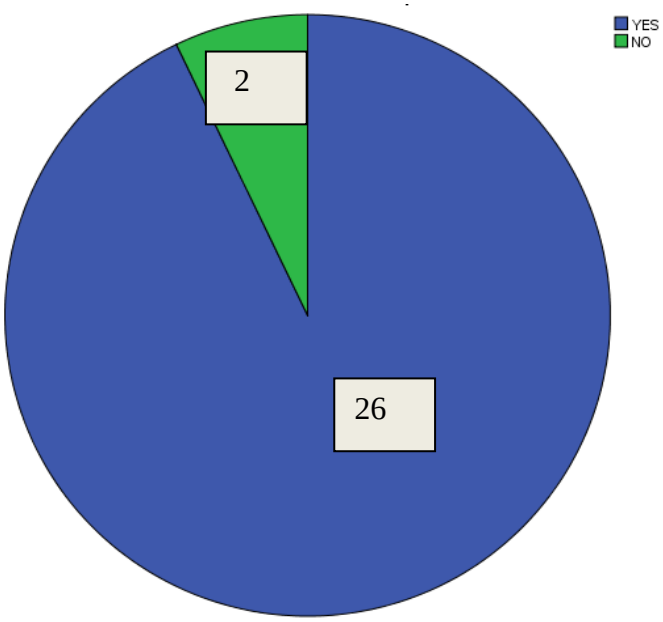
Are you aware of dental implants



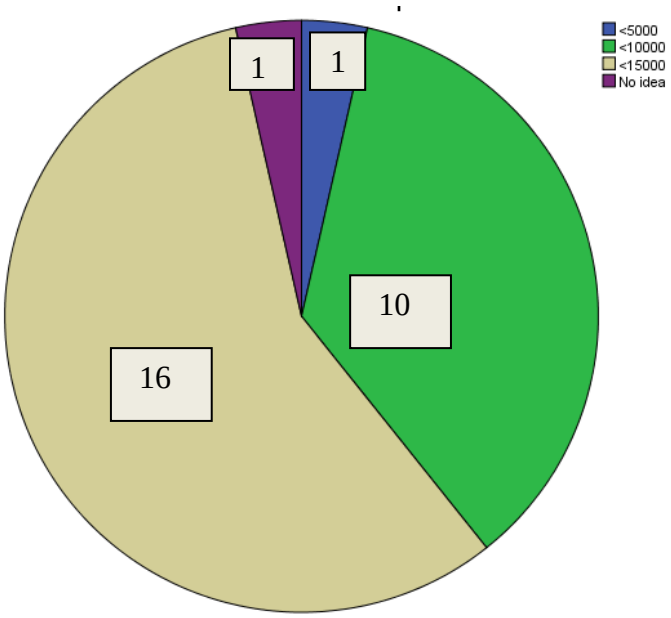
Is it an Easy affordable procedure



Acceptance to undergone bone graft surgery

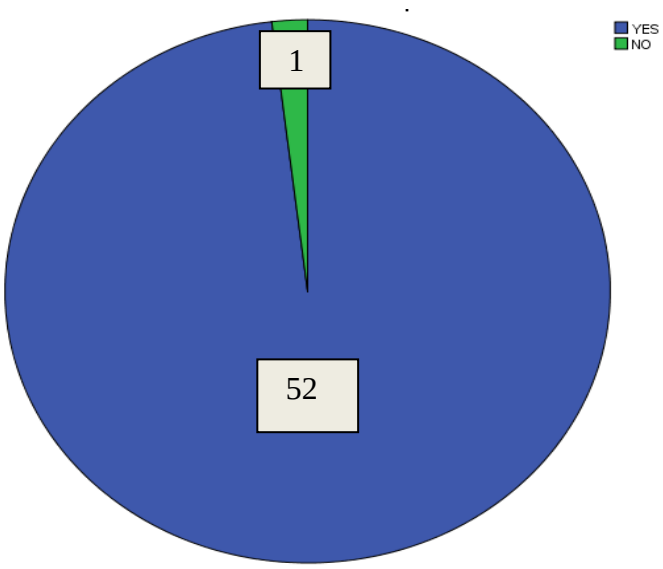


Amount prepared to pay for dental implant

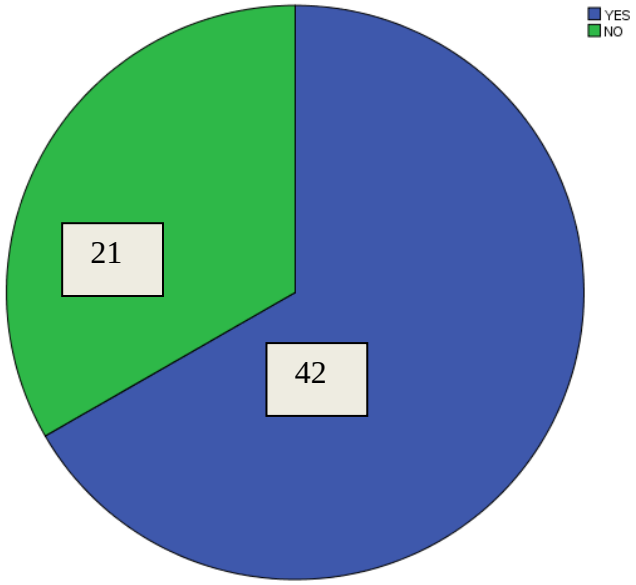


Graph 3 : Knowledge, attitude and awareness of Upper middle class

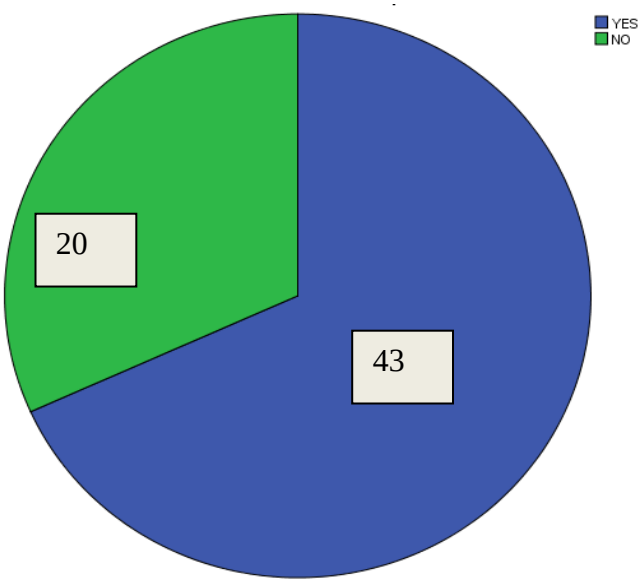
Are you aware of dental implant



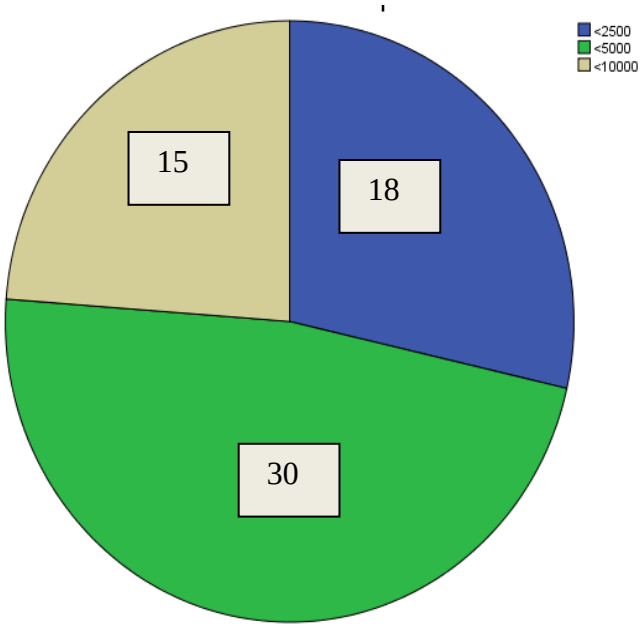
Is an Easy affordable procedure



Accept for undergone bone graft surgery

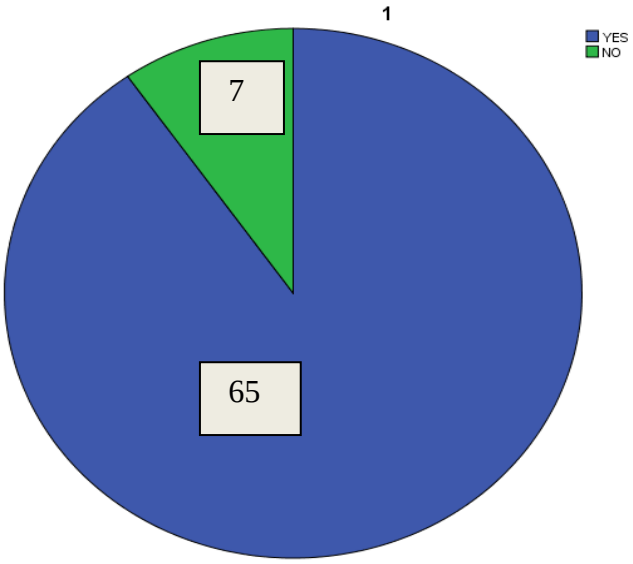


Amount prepared to pay for dental implant

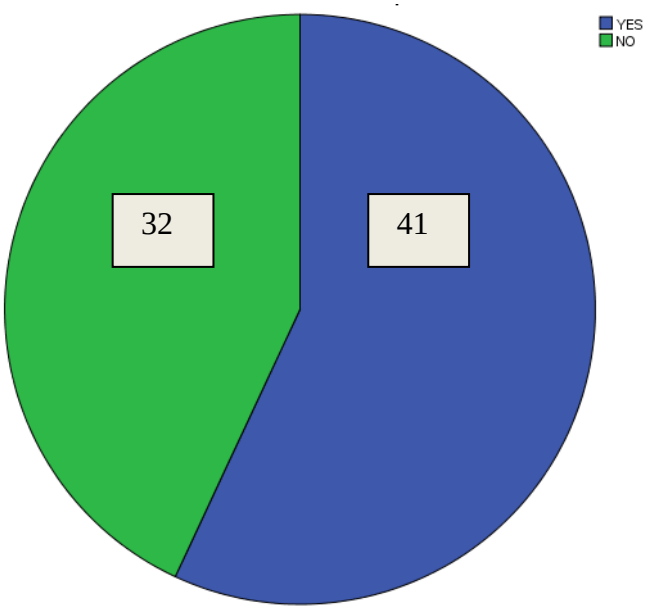


Graph 4 : Knowledge, attitude and awareness of Lower middle class

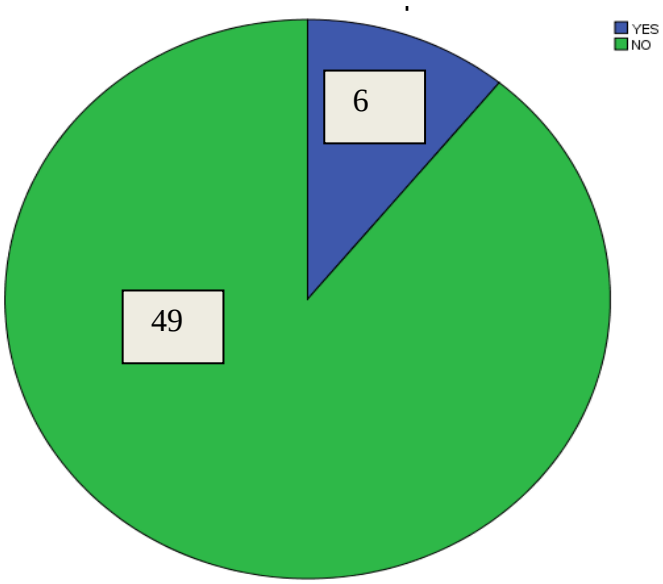
Are you aware of dental implants



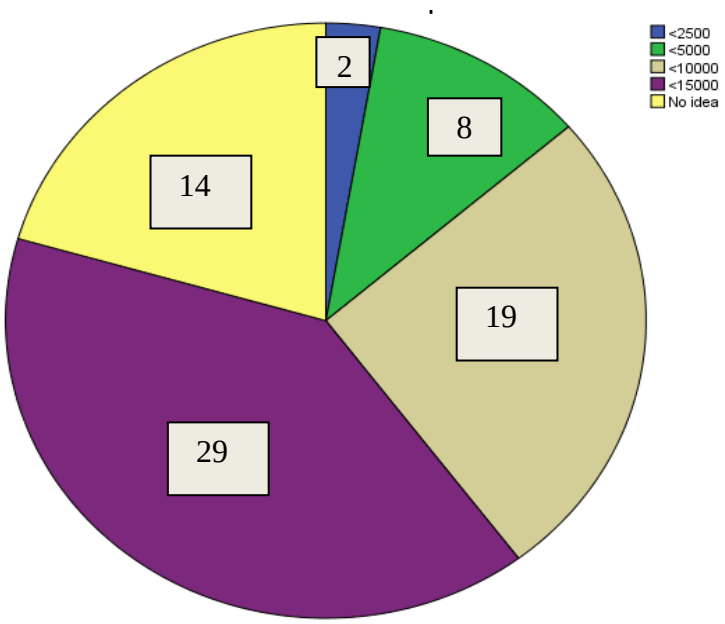
Is an Easy affordable procedure



Accept for undergone bone graft surgery

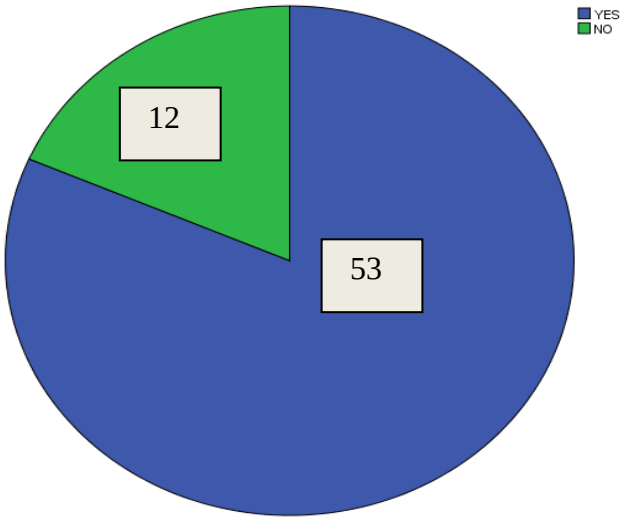


Amount prepared to pay for dental implants

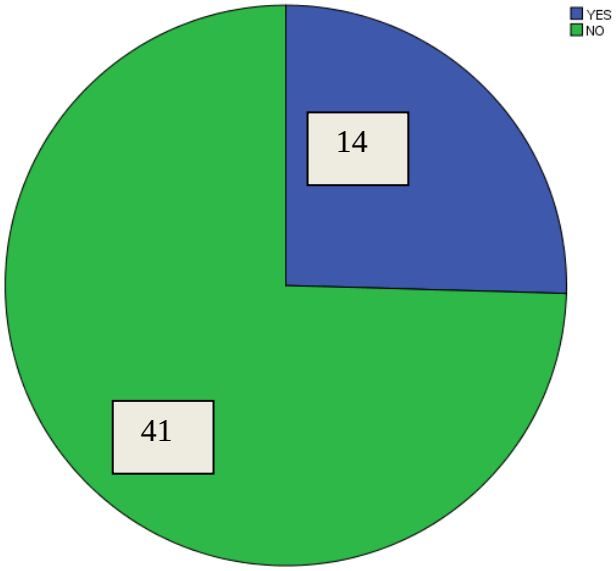


Graph 5 : Knowledge, attitude and awareness of Upper Lower class

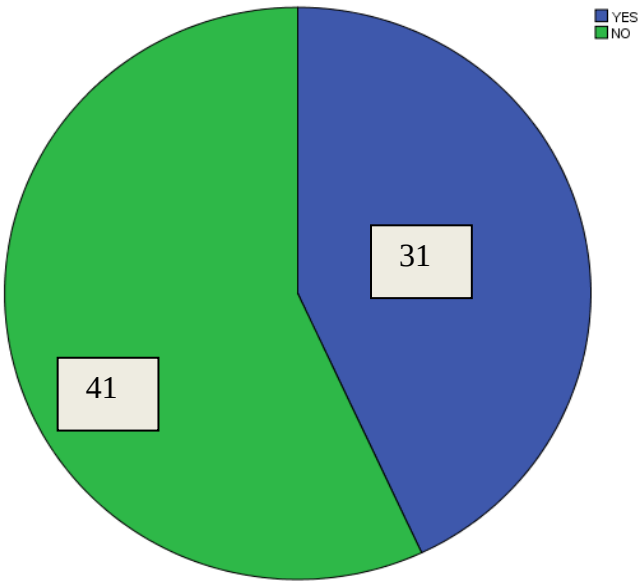
Are you aware of dental implants



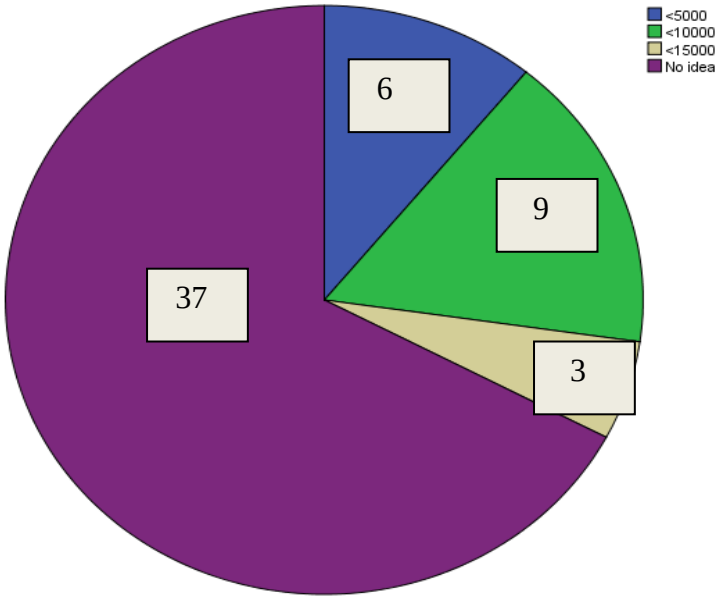
Is an Easy affordable procedure



Accept for undergone bone graft surgery

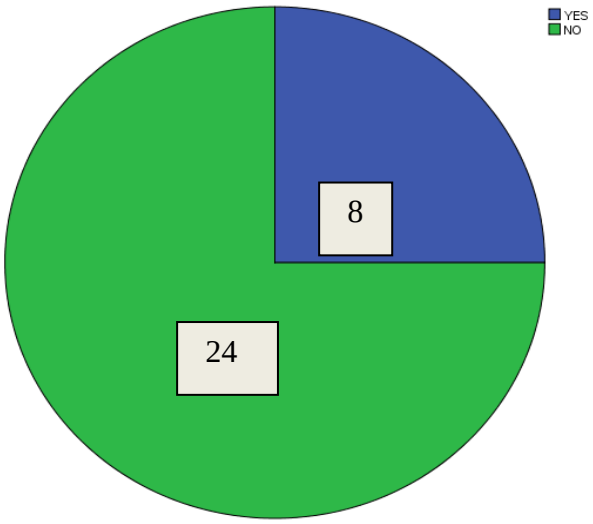


Amount prepared to pay for dental implant

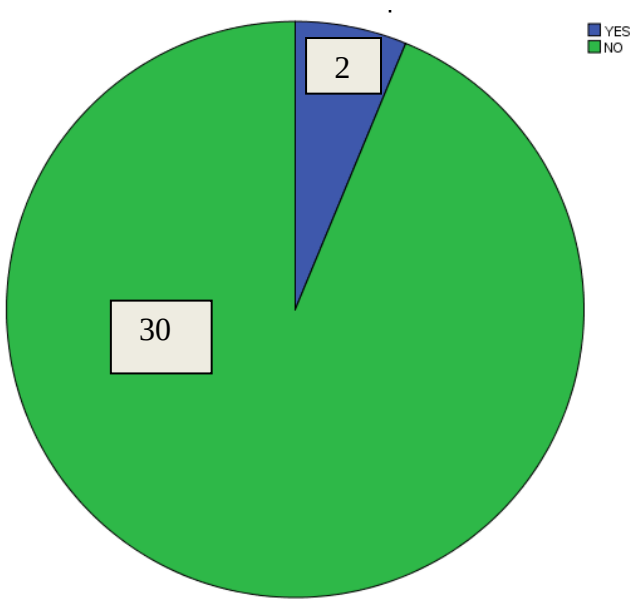


Graph 6 : Knowledge, attitude and awareness of Lower class

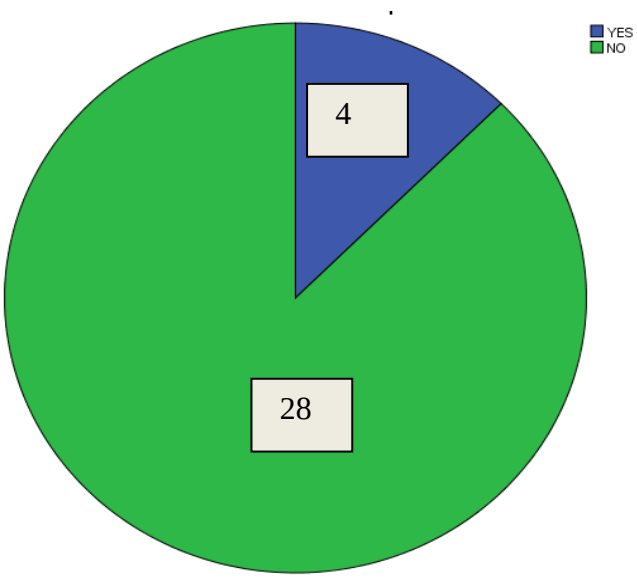
Are you aware of dental implants



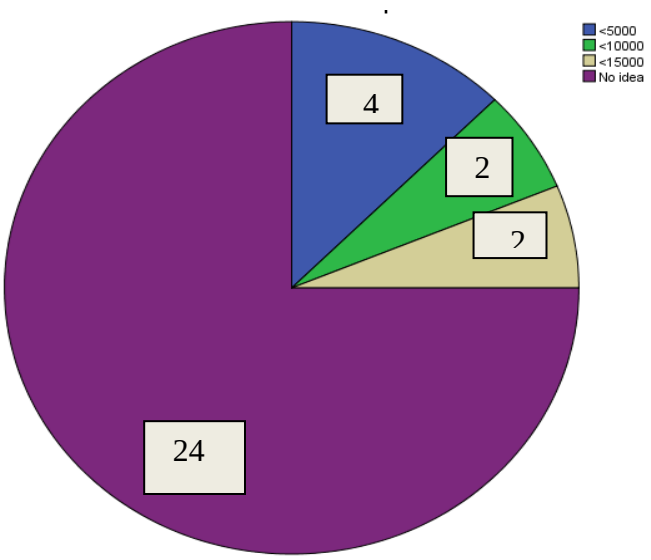
Is an Easy affordable procedure



Accept for undergone bone graft surgery

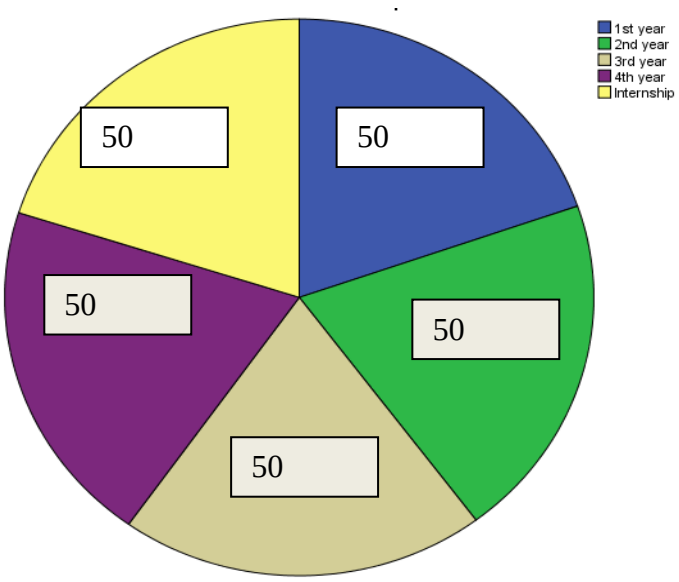


Amount prepared to pay for dental implant

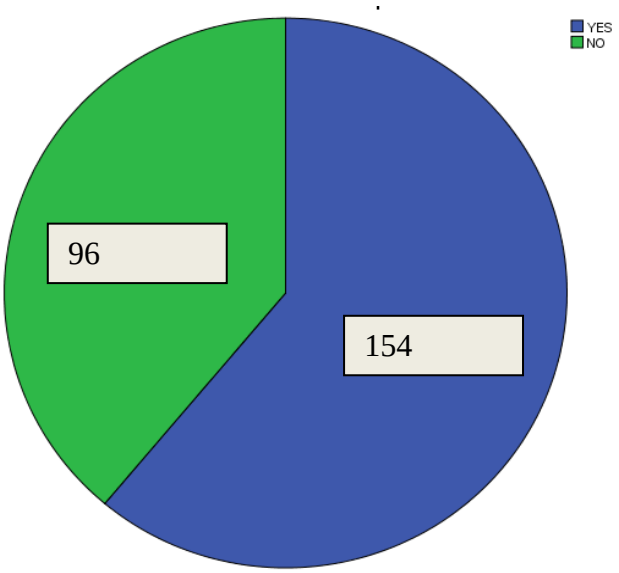


Graph 7: Group II Dental undergraduate students

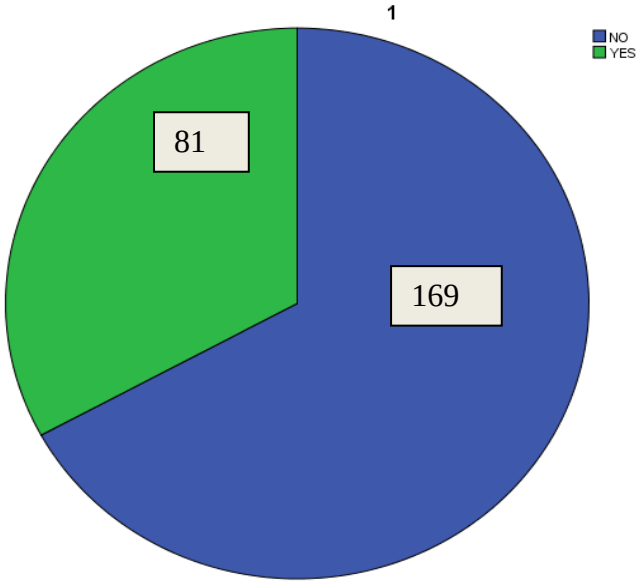
Distrubution of students based on year of study



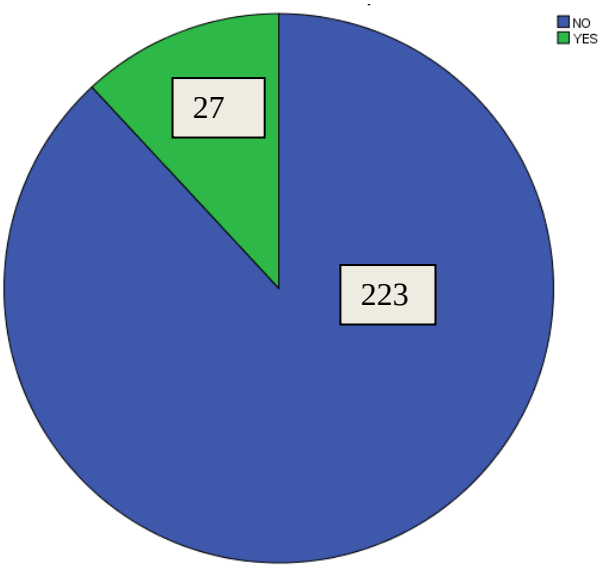
Are you aware of dental implants



Do you have attend any programs on dental implant

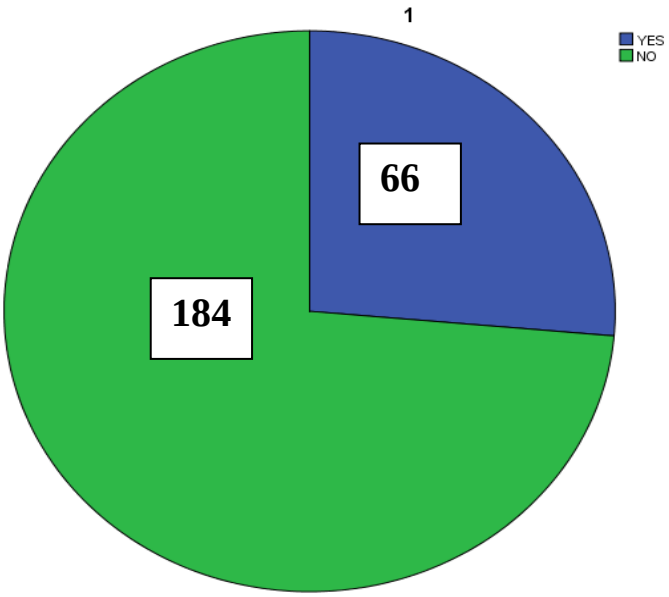


Do you have personal experience with dental implants

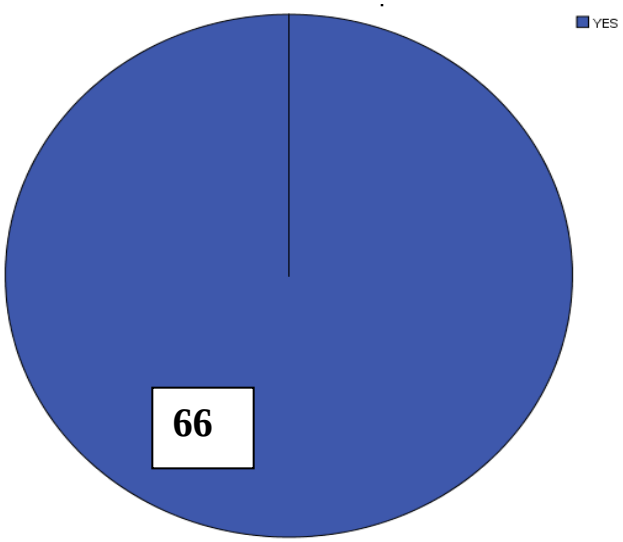


Graph 8: Group III – General dental practitioners

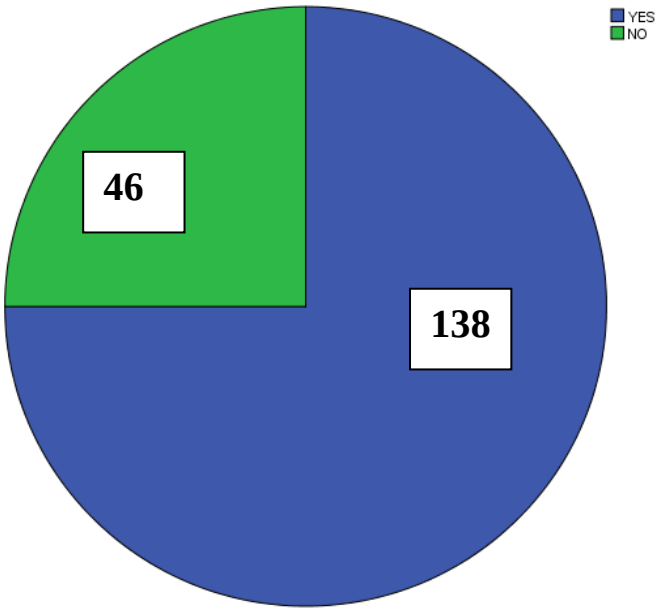
Distribution based on undergone dental implant training



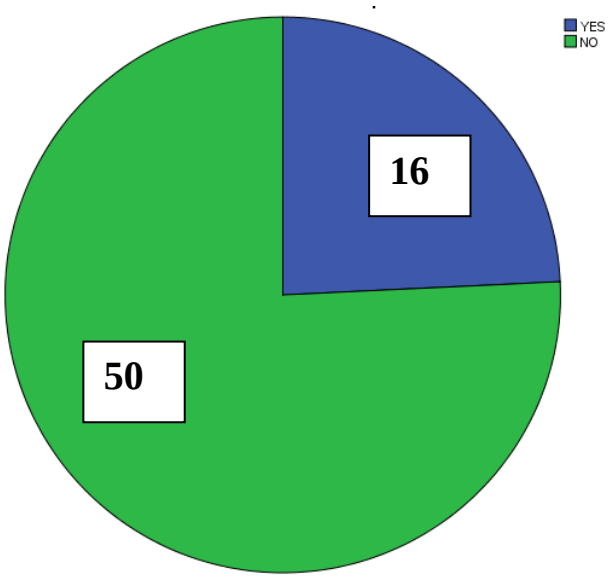
Do you provide dental treatment in clinic – UNDERGONE TRAINING



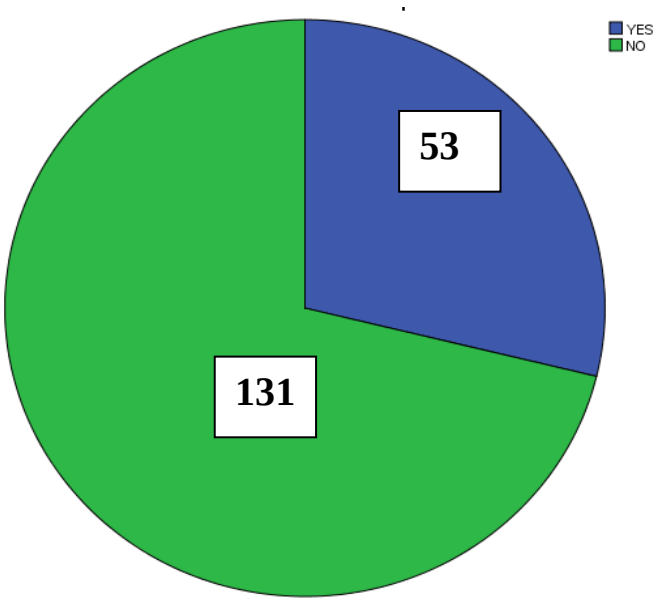
Do you provide dental treatment in clinic – NOT UNDERGONE TRAINING



Ever seen a failed implant ? UNDERGONE TRAINING



Ever seen a failed implant ? NOT UNDERGONE TRAINING



Discussion

DISCUSSION

The dental implants have become the treatment of choice from the perspective of occlusal support, preservation of adjacent teeth, and avoidance of a removable partial denture. The patient's satisfaction also changed the perspective of dental implant following the long-term successful outcomes. Dental implant sales continue to rise as public awareness and demand increases, which led to widespread acceptance and popularity of dental implants within the dental professional community. Treatment with Dental Implants has been rapidly increasing worldwide (Ng et al. 2011[3]). According to data published in China, 200,000 implants were installed in 2013 and the annual growth rate was more than 20% (Han 2013). At the same time, In Tamilnadu, the rapidly growing dental implant treatment presents both opportunities and challenges. The huge size of India populace and the sustained rapid economic growth, the state is experiencing a continuing demand to create a better health care system. Consequently, the potential domestic scope of India's dental market is high. To cater to this escalating demand, India has roughly above 290 dental colleges and in Tamilnadu about 30 dental colleges , which is the largest number in the world, with well over 20,000 fresh graduates entering the workforce annually. In Tamilnadu, dental implants have become an increasingly accepted treatment modality. To keep up with the increasing demand and expectations of the patients, several universities, dental institutions, and implant companies have started various

dental implant courses to educate and train the dentists regarding the simplicities and complexities of dental implant treatment procedure; however, there is still minimal undergraduate training in the use of dental implants. Although many regional studies were performed over our country, about dental implant awareness and knowledge, very few studies have been conducted in Tamilnadu region.

The present survey gives information about common people's initial information, level of perceptions and as well as expectations towards the dental implant as treatment option for replacing missing tooth and the attitude of General dental practitioners and dental undergraduate students towards dental implant dentistry.

Common people: The awareness of the common people and their knowledge plays a major role in providing dental implant treatments. There is varying level of knowledge and awareness with socioeconomic status of people and our study sub-classified the common people based on socioeconomic status (Modified Kuppuswamy Scale) into 5 classes.

In our study, about 82.4% of total participants of our study group know about dental implants as an option for replacing missing teeth, where 17.6% of the participants, had not known about dental implant options, of this two third of the participants belongs to low socioeconomic status class. This is in contrast with the previous study results conducted by Rupal shah *et.al.*,[4] Gharpure *et al*., [5] Venkata *et al*.,[6], chaudary et.al.,[7] and Satpathy *et al*.,[8] which showed

low levels of awareness at 41%, 32%, 29%, 23.24% and 16%, respectively. A statistical difference existed between the level of education and the awareness about dental implants, with greater awareness in people with higher education. Most of our study people (44.4%) were graduate. Our study also showed significant association of education and level of occupation as more of the educated and well occupied persons were known to dental implant options. There was significant difference in dental implant awareness with previous studies, and in accordance with recent studies by Venkatesan Narayanan et.al (2016) [9] reported as high as 69% of awareness about dental implant in Melmaruvathur, Tamilnadu.

In our study, Most of the participants (61.6%) felt that dental implant appears good as natural teeth in function and less annoying in mouth. 37.6% of the participants felt that dental implants would last for 10-20 years, whereas 26% felt it would last for 21-25 years. This is in contrast to the studies conducted by Tepper *et al*. [10], Akagawa *et al*., [11] and Tomruk *et al*. [12] where almost 46%, 28%, and 33% of the participants felt that dental implants lasted for a lifetime. Only 6.8% of the participants who felt that dental implants lasted for more than 25 years.

On oral hygiene care of dental implants compared to natural tooth, 39.2% felt that implants needed more care than natural teeth. This shows that the participants who were aware had some idea about the maintenance of the prosthesis. Whereas in a most of previous studies, most of the participants felt

that there was no need to take care at all and a few felt equal importance should be given for both natural teeth and implants.

More than half of the participants (54.8%) felt, dental implant treatment as a different entity and need to be done by specialist.

About 49.2% of participants felt dental implants as an easy affordable procedure which is contrast in Regional Indian studies. Surprisingly, about 42.5% of participants aware of dental insurance plans in India, where 36 % of them had covered their dental implant expenses.

This survey showed that the main source of information about dental implants was dentists, followed by friends and relatives, Internet, and last the newspapers and magazines. In accordance to our results, Many studies found that dentists were the main source of information of the subjects conducted by Esfahani and Moosaali [13] , Kohli et al., [14] and Tomruk et al. (40.7%, 53.6%, and 44.5% respectively).This finding is different from those Indian studies published by Mayya, *et al*.[15] showed that friends were the main source of information and Zimmer *et al*., [16] , Berge et al. [17] survey showed that the media was the main source of information about dental implants.

Undergraduate students: The aim of the questionnaire was to identify the current knowledge and perceptions of dental undergraduate students towards dental implants and they were chosen as the target population because they

represent the future of dentistry, and it is therefore important to assess their understanding and outlook towards implant dentistry.

There is sufficient literature to confirm that uncontrolled diabetes, alcoholism, heavy smoking, post irradiated jaws, and poor oral hygiene are some factors that influence the dental implant survival, but only 18.8 % of the students are aware of limiting factors to dental implant treatment. To the question about the cost of a dental implant and highest percentage of the total respondents (37.2%) said cost less than 3000 rupees and 36.4% as more than 5000 rupees, the cost of procuring a dental implant. Such responses show their poor clinical exposure related to dental implants and a need to expose them to dental implant cases. They have perceived the need and shown a positive attitude towards gaining more information about dental implant procedures by (79.2%) attending dental implant programs, which is in seen in accordance with consensus workshop study in European and Australian dental schools. Majority of the dental students lack their personal experience with dental implants in undergraduate level, very few has experience of dental implant placement as it was a part of their curriculum which make it think dental implant as moderate difficult procedure. An all-India survey carried out to gauge the knowledge and perception of undergraduate students towards dental implants also concluded that there is a need for revision of undergraduate curriculum [18].

General dental practitioners: As stated earlier, studies conducted by Chowdhary R et.al , Pragati K. Mayank K, and Satpathy et al in different regions of India was concluded that the dentists are the main source of information for the patients, which is in accordance to our study in Tamilnadu region too and therefore, it becomes imperative to gauge their viewpoint as they can influence patients' decision making. The present study showed that 50% dentists preferred FPD with conventional tooth supported crown/bridge where edentulous space is bounded by healthy natural tooth. In case of distal extension edentulous jaws, only 19.6% dentists had preferred RPD and 25.2% of the dentists had preferred conventional complete dentures and 54.4% this results are in contrast with previous studies by Mahantesh Achanur et.al [19] where only 32% dentists involved in the study preferred implant in distal extension edentulous cases. Increase in the percentage of preference for dental implants in distal extension edentulous jaw suggests that still some dentists included in the study were considering dental implant as an alternative treatment modality where tooth supported FPD is not possible

In this study, about 74% of the dentist providing dental implant as a treatment option for the patients and most of the patients has limited for its high cost and fear of undergoing a surgical procedure.

In addition, the greater patient mobility encountered today combined with a growing trend of 'dental implant tourism' and the application of dental implants increases worldwide, it is essential to know the technical and biological complications by the general dental practitioners.

In our study, 18.4 % of general dental practitioners lack the complete knowledge about dental implants and 55.2% of general dental practitioners has the moderate knowledge and lacks the area of prosthesis with indications and cost, 26.4% of General dental practitioners have sound knowledge, who has undergone training in dental implant. These results show that there is need for general dental practitioners to undergo training courses which could give confidence to incorpate the dental implant modality in their day to day practice.

Nowadays there has been an increase in the number of courses offered and targeted at general dental practitioners, ranging from one day courses to the fellowship certificate courses conducted by different implant manufacturing companies and private institutions in India.

The General dental practitioners involved for this survey may not be representative of all general dental practitioners in south India. However, this survey does give an insight into the awareness of dentists who are involved in the study. There is increase in number of General dental practitioners who provide dental implant treatment, but still as the patient awareness had increased a lot in modern days, it’s the role of General dental practitioners to gain adequate knowledge on dental implant modality. However, it was a welcome finding that all the dentists are ready to learn about dental implant.

Summary

SUMMARY

Implant dentistry is a multidisciplinary field of oral health care which combines knowledge and discoveries from many clinical and basic sciences. Implant dentistry has matured to be not only a widespread treatment modality, but also one of the most active fields of education and research and development in health care.

The awareness and attitude level of dental implants are very low in Low socioeconomic class participants of this study. Hence, a special effort is needed among those people to improve awareness about dental implants and should be made by implementing various public awareness campaigns and establishing counseling centers in the outpatient ward of the dental colleges. Efforts should be made by the public sector to lower the cost of the implants so that they can be made affordable to all. Currently, the trend is that one need not be a specialist in any field to provide implantation services and one just needs to acquire a certain amount of training and a certain number of implants to be placed before one makes the self-assessment that one is ready to treat patients on one's own. Thus, in the long run a general dental practitioners who takes up the role of all the specialists together in dental implant treatment. As there is increasing demand for dental implant, there is need for implementing the dental implant practice in undergraduate level. Many universities around the world are imparting knowledge for practicing implantation, but there is a lack of a definite curriculum the way it exists for the dental professions

especially in developing countries like India. There is no doubt that great knowledge was acquired from the laboratory hands-on (surgical and restorative) than serious lectures. This was seen in this analysis as both PG and general dentists indicated that they could place implants after the conclusion of the laboratory, hands-on session (ogasalu et al 2009). The undergraduate syllabus in dentistry must be revised to include sufficient knowledge and practical experience to allow the student to indicate implant-treatments based on evidence, and to inform the patient about the real risks and possible solutions relevant to his individual case.

Conclusion

CONCLUSION

There is an increase in awareness and positive attitude towards dental implants in this era and also it had become a field of interest in modern dentistry. Still the general dentist have a major role in educating the patient but the lack of curriculum framework of dental implant in undergraduate level can limit their role in dental implant dentistry.As this survey was conducted in a limited group of people, further studies are needed to be conducted amongst the people of urban and rural India to assess the level of awareness about dental implants amongst larger strata of people. Further studies are needed with larger sample sizes to evaluate the level of information of the dental patients who attended governmental and private dental clinics in different areas. The respondents of our survey have also expressed concern over the increased cost of dental implants, which may limit its usage to only a certain section of the society. The high cost factor for implants further highlights the requirement for dental insurance coverage of implant treatment. Knowledge and perception about dental implants among undergraduate dental students differed at different academic years, as expected. Even at the late-clinical year a majority of students gave unsatisfactory answer as there most of has least experience with dental implants. Thus, there is a need for curriculum review, evaluation of teaching materials and methods, consensus workshops drawing solutions to obstacles and providing recommendations and clear guidelines to include implant dentistry in undergraduate curriculum.

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Annexures

ANNEXURE- I

RAGAS DENTAL COLLEGE & HOSPITAL
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TO WHOM SO EVER IT MAY CONCERN

Date: 31/12/2019
Place: Chennai

From
The Institutional Review Board
Ragas Dental College and Hospital
Uthandi, Chennai-119

The Project topic titled " **KNOWLEDGE, ATTITUDE AND AWARENESS ABOUT DENTAL IMPLANT AMONG COMMON PEOPLE, DENTAL UNDERGRADUATE STUDENTS AND GENERAL DENTAL PRACTITIONERS – QUESTIONNAIRE**" submitted by **Dr.VEERARAGAVAN** has been approved by the Institutional Review Board of Ragas Dental College and Hospital.

Dr. N.S. Azhagarasan,MDS

Member Secretary,
The Institutional Review Board
Ragas Dental College and Hospital
Uthandi , Chennai-119

ANNEXURE- II

URKUND

Urkund Analysis Result

Analysed Document:	KNOWLEDGE, ATTITUDE, AWARENESS OF DENTAL IMPLANT AMONG COMMON PEOPLE, DENTAL UNDERGRADUATE STUDENTS AND GENERAL DENTAL PRACTITIONERS.docx (D63115156)
Submitted:	1/28/2020 7:38:00 PM
Submitted By:	styleveera001@gmail.com
Significance:	7 %