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# Knowledge, Attitude and Practice towards Prevention of Peri-Implant Infection and Inflammation: A Cross-Sectional Descriptive Survey

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ABSTRACT

Even till now, nothing much has been done to explore the inflammation and prevention of the same around the implants placed, hence the aim of this study was to evaluate factor associated with dentist knowledge, attitude along with practice in preventing peri-implant diseases. This was a descriptive, cross-sectional, questionnaire based study carried within Dental professionals of Patna city. Stratified random sampling technique was the sampling method utilized in this study. The survey was conducted among 132 dentists. A questionnaire was framed by using google forms. Most of dental professionals were having fair knowledge {61(46.21%)}, positive attitude {61 (46.21%)} and poor practice (47.72%)} towards prevention of Peri-implant diseases. On application of Chi-square test, it was found that knowledge of study participants was significantly (0.05*) associated with gender, average duration of doing Implant surgery while attitude was significantly (0.05*) associated with age and degree. It was concluded that knowledge was fair; attitude was positive and despite this practice was poor regarding the prevention of Peri-Implant diseases among Dental professionals. Factors associated with knowledge, attitude and practice of study participants was gender, average duration of doing Implant surgery, age and degree.

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## INTRODUCTION

The infectious state influencing the soft and hard gingival tissue encompassing a dental implant is known as Peri-implant diseases. Bacteria can expand on the plinth of the implant, beneath the gingival line, a like a natural tooth. Continuous irritation of the gingival tissue by bacteria, leads it to become inflamed, mutilating the tissue, thus if left undiagnosed for too long, it may cause the bony anatomy beneath the implant to degenerate, it may be peri-implant mucositis, because gin-

gival inflammation can only be seen in gingiva surrounding a dental implant, with no change of bone anatomy. Altogether peri-implant mucositis is antecedent of peri-implantitis. Thus, verifications propound that peri-implant mucositis can be effectively managed and is changeable if diagnose early. In peri-implantitis, gingival inflammation is seen encompassing the soft tissue and degeneration of the bony anatomy bearing the dental implant. Peri-implantitis often need surgical management. (Doornewaard et al., 2018) For a prospering implant therapy, a fine peri-implant soft tissue is requisite. A numerous circumstance the suitable substitute fot teeth are Dental implants (Tolstunov, 2007; Blanes et al., 2007). Inspite of prosperous outcome in implant therapy, impediment sometimes transpires in unfortunate situation (Zitzmann and Berglundh, 2008).

The common reasons for failure of implants are infection caused by bacteria along with inflammation in the soft tissues. It has been found that in 14.6% implants, inflammation and loss of bone has been observed (Berglundh et al., 2002) In the Sixth Workshop of the European Periodontology Association which was held in 2008, it was found that prevalence of peri-implantitis is 28–56%. The prognosis of dental implants can be affected due to peri-implant mucositis and peri-implantitis (Lindhe and Meyle, 2008). Traditional methods of oral care have intricate reconditioning of tissues after the beginning of the disease. Therefore, diagnoses were drawn up considering surgical therapeutic procedures for oral healthcare. A precautionary move towards oral healthcare requires proper detection, knowledge and inspiration targeting behavioral change in patient who wants to have good oral healthcare, with the help and guidance of the oral health care team (Tonetti et al., 2015).

Customized, executive protective measures are provided for exacting subject, established on the basis of lifestyle factors and clinical observations. It is necessary that patients are classified into: (i) normal periodontium, (ii) peri-implant gingivitis (iii) marked periodontitis considered as peri-implantitis. Then there should be risk assessment also. Adequate examination procedures for periodontium have become a rudimentary necessity which every patient must avail. This is very important for those subjects in which there are increased chances of infection of periodontium around implants (Tonetti et al., 2015).

As for the success of the implant, it is very important for the dental professional to take preventive measure in every case in the initial stages, rather than doing management of peri-implant diseases in the later stages. Till now, no research has been performed to evaluate the adequate attitude, required knowledge and clinical practice of the dental professionals focusing on prevention of abnormalities in periodontium around implants and factors associated with it. Therefore, the current study was conducted with the purpose to evaluate factor related with attitude, knowledge, along with practice towards prevention of peri-implant diseases.

## MATERIALS AND METHODS

The present study was a descriptive, cross-sectional, questionnaire based study performed within Dental professionals of Patna city. The research was held during January–February 2020. Stratified random sampling technique was used for sampling. Clearance from the ethical committee to conduct this study was obtained from ethical committee of Government Medical College, Dehradun, Uttarakhand, India on 17/12/2019. The sampling frame for the study was all the private dental clinics of the city. Out of the all clinics, only those clinics were included in which implants were done by the dental professional himself or herself? Among the clinics informed consent was sent through google form link, those dental professionals reverted back were included in the study. The survey was conducted among 132 dentists.

Before carrying out the original research, it was planned to perform a pilot study. The purpose of this was to evaluate the achievability of the study. It was also done to evaluate soundness and consistency of the study questionnaire. Test-Retest along with the values of measured Kappa (k) =0.91 weighted Kappa ($k_w$) = 0.87 were used to evaluate the reliability of the questionnaire. Cronbach's-Alpha ($\alpha$) and the value of $\alpha$=0.90 was measured to evaluate the consistency of questionnaires. The questions having reduced validity along with reliability were removed.

A questionnaire was framed by using google forms. The link was generated, and this link was forwarded to every participant on the mobile phones. To increase the response rate call backs and reminders were sent continuously. The questionnaire consists of 4 portions, $1^{st}$ portion included demographic details that consisted of details of age group, sex, degree obtained, years of experience, Specialty, number of OPD per month, number of implants done per month. $2^{nd}$, $3^{rd}$ and $4^{th}$ part consisted of questions focusing on the attitude, knowledge, and dental practice of subjects towards prevention of peri-implant diseases.

**Table 1: Demography details ofstudy subjects (n=132).**

| Demography Variables | | Number (n) | Percentage (%) |
|---|---|---|---|
| Age (years) | 25 to 30 Years | 49 | 37.12 |
| | 31 to 35 Years | 35 | 26.51 |
| | 36 to 40 Years | 28 | 21.21 |
| | 41 to 45 Years | 20 | 15.16 |
| | **Total** | **132** | **100%** |
| Gender | Male | 69 | 52.27 |
| | Female | 63 | 47.73 |
| | **Total** | **132** | **100%** |
| Degree | BDS | 76 | 57.57 |
| | MDS | 56 | 42.43 |
| | **Total** | **132** | **100%** |
| Year of Practice | 1 to 7 years | 75 | 56.81 |
| | 8 to 15 years | 44 | 33.33 |
| | ≥15 years | 13 | 9.86 |
| | **Total** | **132** | **100%** |
| Average duration of doing Implant surgery | 6 months to 1 year | 27 | 20.45 |
| | 1 to 2 years | 61 | 46.21 |
| | ≥2 years | 44 | 33.34 |
| | **Total** | **132** | **100%** |
| Average number of OPD per month. | 1-15 | 54 | 40.90 |
| | 16-30 | 55 | 41.66 |
| | More than30 | 23 | 17.44 |
| | **Total** | **132** | **100%** |
| Average number of implant surgery done per month. | 1-5 | 89 | 67.42 |
| | 6-10 | 41 | 31.06 |
| | More than 10 | 02 | 01.52 |
| | **Total** | **132** | **100%** |
| Average number of implant failure in last 6months | 0-4 | 42 | 31.81 |
| | 5-8 | 55 | 41.66 |
| | More than 8 | 35 | 26.53 |
| | **Total** | **132** | **100%** |

There were 7 questions regarding knowledge of study participants, to every right answer 1 marks was given 0 marks for wrong answer. The knowledge scores ranges from 0-7 with participants with score 0 to 2 has very less knowledge, 3 to 5 score has sufficient knowledge while 6-7 has good knowledge. There were 8 questions regarding attitude of study participants. The responses of subjects were measured using Likert scale. 5 for those who strongly agreed, 4 for those who agreed, 3 for those who were uncertain, 2 for those who disagreed and 1for those who strongly disagreed, attitude scores ranges from 8-40. Those having negative attitude were given score of 8-18, those having neutral attitude were given score of 19-29 and those having positive attitude were given score of 30-40. Responses to 8 practice question was measured as yes and no with yes given 2 marks while no given 0 marks. Practice scores ranges from 0-16, with those having poor practice were given score of 0-5; those having fair practice were given score of 6-11, while those having good practice were given score of 12-16.

**Statistical analysis**

Study participants demographic details, knowledge, attitude and practice scores regarding the Peri-implant diseases was measure using Descriptive analysis and results was presented in number and percentages. The factors associated with knowledge, attitude and practice scores were measured utilizing Chi-square test. The level of significance was set at 5%.

**Table 2: Attitude, Knowledge, and Practice scores of study participants (n=132).**

| Variables | Number of subjects | Percentage of subjects n (%) |
|---|---|---|
| Knowledge | 0 to 2 (Poor) | 50 (37.87) |
| | 3 to 5 (Fair) | 61 (46.21) |
| | 6 to7 (Good) | 21 (15.92) |
| | **Total** | **132 (100%)** |
| Attitude | 8-18 (Negative) | 12 (9.09) |
| | 19-29 (Neutral) | 59 (44.69) |
| | 30-40 (Positive) | 61 (46.21) |
| | **Total** | **132(100%)** |
| Practice | 0-5 (poor) | 63 (47.72) |
| | 6-11 (fair) | 61 (46.21) |
| | 12-16 (good) | 08 (06.07) |
| | **Total** | **132 (100%)** |

**Table 3: Association of various factors with attitude, knowledge, and practice scores of Dentist towards prevention of peri-implant diseases by utilizing Chi-square test.**

| Demographic Details | Knowledge | | Attitude | | Practice | |
|---|---|---|---|---|---|---|
| | $X^2$ value | p-value | $X^2$ value | p-value | $X^2$value | p-value |
| Age in years | 0.278 | 0.22 | 0.781 | **0.05*** | 1.226 | 0.11 |
| Gender | 1.222 | **0.05*** | 0.290 | 1.39 | 2.334 | 0.34 |
| Degree | 0.322 | 0.97 | 0.256 | **0.05*** | 1.026 | **0.05*** |
| Year of Practice | 0.964 | 0.38 | 1.005 | 0.26 | 0.931 | 1.89 |
| Average Number of OPD per month. | 2.309 | 1.56 | 1.426 | 0.59 | 0.066 | 2.33 |
| Average duration of doing Implant surgery | 1.468 | **0.05*** | 0.982 | 1.24 | 0.008 | 2.19 |
| Average number of implant surgery done per month. | 0.023 | 2.33 | 0.449 | 1.12 | 1.288 | **0.05*** |
| Average number of implant failure in last 5 years | 1.485 | 0.10 | 1.508 | 3.42 | 3.445 | **0.05*** |

**p-value $\leq$ 0.05***

## RESULTS AND DISCUSSION

The present study found that response rate was 81% with response to questionnaire was given by 132 dentists out of 161 dentists.

Table 1 It reflect that major portion of study subjects {49 (37.12%)} consisted of those subjects with 25-30 years of age. Male study participants {69 (52.27%)} were in majority. Study participants holding BDS degree {76 (57.57%)} were more than specialists. Years of practice of 75 (56.81%) study participants was 1-7 years. Average duration of doing Implant surgery for 61 (46.21%)} study participants were 1-2 years. Most of the study participants {55 (41.66%)} were having average OPD per month of 16-30 patients. Average number of implant surgery for 89 (67.42%) study participants was 1-5 patients and average number of failed implants in last 6 months for 55 (41.66%) was 5-8 implants.

Table 2 shows that most of dental professionals were having fair knowledge {61(46.21%)}, positive attitude {61 (46.21%)} and poor practice (47.72%)} towards prevention of Peri-implant diseases.

Table 3 shows that when Chi-square test applied, it was determined that knowledge of study participants was significantly (0.05*) associated with gender, Average duration of doing Implant surgery while attitude was significantly (0.05*) associated with age and degree. Degree, Average number of

implant surgery done per month, Average number of implant failure in last 5 years were the factors significantly (0.05*) associated with practice of study participants.

The current research was done to evaluate the various factors connected with attitude, knowledge, and practice of dentists towards prevention of Peri-implant diseases. The word prevention in the present reflects primary level of prevention. It means taking necessary steps before the occurrence of disease. Some of these steps include putting restrictions on those products which possess threat to normal health, vaccinations, making suitable changes in harmful activities like tobacco abuse and poor eating habits (Renvert et al., 2018).

The main probability of the beginning of priodontitis is chronic gingival inflammation in reaction to microbial bio films, or its advancement of patients who have been treated. The only way to avoid periodontitis is elimination and treatment of gingival inflammation. Peri-implant diseases are very common, and it is quite mandatory for the dentist to make proper examination of periodontium in those patients in which implant supported prosthesis are given. The most important preventive method to avoid periodontitis (and peri-implantitis) is by controlling and managing the main risk factor i.e tobacco smoking and diabetes (Tonetti et al., 2015; Donos et al., 2009).

It has been observed in recent 10-20 years that there is rapid increase in the number of dental professionals who are carrying out the implant placement procedures. But the majority of these dental professionals are those who do not have got necessary expertise in placement of the implants (Ji et al., 2012; Morris et al., 1997). There is also lack of proper skills and knowledge. It has been reported earlier that there is enough literature to support the fact implant surgery carried out by such dental professionals are more subjected to failures (Lambert et al., 1997; Jemt et al., 2016).

Till now no study was conducted which has evaluated the attitude, knowledge, and practice of dentists regarding prevention of Peri-Implant diseases?

The present study involved those dental professionals who were 25-45 years old. Male study participants were more than female. General dental practitioners were more than specialists. Year of practice for most of the dental practitioners was 1-7 years. An only study conducted by (Kadkhodazadeh et al., 2018) conducted among Iranian dentists who report attitude and knowledge of Iranian Dentists towards Peri-implant Diseases. In this study response rate was 61.5% and study was conducted among dentists on dentists attending the annual conference of the Iranian Dental Association held in 2013. Besides this response rate was very less as compared to present study which conducted online, which shows effectiveness of call backs in increasing response rate. Similar to present study, in a study conducted by (Kadkhodazadeh et al., 2018). Males study participants were more than females, general dental practitioners were more than specialists. Age range was 24-62 years. No specific conclusion was reported in this study about knowledge and attitude of dental professionals as compared to present study in which knowledge was fair; attitude was positive and despite this practice was poor. Cortical Bone Thickness plays a significant role in prevention and causation of inflammation around the implants (Meher et al., 2012; Arora et al., 2013). In cases of compromised ridges short implants can be an option to prevent inflammation and failure of the implants (Shilpa et al., 2018).

It is important to determine more factors which are associated with attitude, knowledge, and practice of dentists towards prevention for Peri-Implant diseases so by manipulation of these factors we can improve the practice of prevention and help the patient in better manner.

## CONCLUSIONS

It can be concluded from this study that knowledge among dentists was fair; attitude was encouraging and despite this practice was poor regarding the prevention of Peri-Implant diseases among Dental professionals. Factors associated with knowledge, attitude and practice of study participants was gender, average duration of doing Implant surgery, age and degree. Degree, average number of implant surgery done per month and average number of implant failure in last 5 years. More studies both cross-sectional and longitudinal in future should be conducted in this area to determine knowledge, attitude and practice of different populations of dentists and factors associated with it.

### Funding Support

### Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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