

A Questionnaire Study to Determine the Knowledge of Peri-Implantitis and Peri-Mucositis Among Dental Practitioners in Ahmedabad City, Gujrat, India

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Key Words:

Peri-implantitis, Peri-mucositis

Abstract:

Background:

There is currently little knowledge regarding the precise occurrence and recommended course of treatment for peri-implant disorders. The purpose of this study was to learn more about how dental practitioners in the city of Ahmedabad evaluate the prevalence, causation, and treatment of peri-implant mucositis and peri-implantitis.

Methods:

A total of 250 dental practitioners were approached with a questionnaire for collecting data related to demographic details, experience, and knowledge about implant placement and management of its complications. Of these, only 174 were included as part of the statistical analysis. This data was collected based on historical data using the empirical method.

A survey with 20 questions was created. A link to the survey was included in an email sent to dental practitioners currently working in Ahmedabad city.

Results:

All data were analysed by using Chi-square and Descriptive statistical analysis.

174 dental practitioners (41.38% of whom were men, 58.64% of women who had worked in the field of dentistry) responded to the poll. The majority (53.5% BDS & 46.5% MDS).

Conclusions:

According to this survey, peri-implant diseases are a common issue in dental clinics. The lack of a consistent therapeutic protocol leads to a substantial number of therapeutic modalities being used empirically, with a somewhat effective treatment outcome

1. Introduction:

Due to their incredible success and survival rates, dental implants have transformed the treatment of edentulous patients during the past 20 years. Dental professionals have a problem with the two biological consequences of peri-implant tissues, peri-implantitis, and peri-implant mucositis. Peri-implant mucositis is a reversible inflammatory disease that causes redness and swelling that is limited to the soft tissue around implants without any signs of loss of supporting bone.¹

Peri-implantitis is an inflammatory disorder that can lead to the loss of the implant. It might include soft tissue inflammation and a slow loss of supporting bone.² Dentists in Ahmedabad City are largely unaware of the frequency of peri-implant disease. A successful strategy for the prevention and treatment of peri-implant illnesses would be strengthened by identifying the critical factors connected to their etiology and risk.²

The inflammatory reaction of people in the tissues surrounding the implant and microbial colonization in the form of dental plaque biofilms have both been recognized as significant causative factors for the development of peri-implant diseases.

According to research, the peri-implant disease has been clinically treated. Peri-implant pathology may not have been sufficiently covered in continuing education seminars or residency programs, which has hampered the expansion of dental practitioners' education in Ahmedabad as a whole. Depending on their level of expertise, dental professionals may have different attitudes toward, opinions on, and management techniques for peri-implant disorders.³

2. Materials and Methods:

Study design and population

A questionnaire was distributed to 250 dental professionals to gather information regarding their demographics, experience, and understanding of implant placement and the handling of associated complications. Only 174 dentists agreed to take part in the survey after being informed about its purpose and that participation was optional via email. To access the questionnaire, click on the link provided in the uniform resource locator. The questionnaire could only be completed once by each invited dental professional, and completion of it meant their signed informed

permission. The reported survey data were private and anonymous.⁴

A 20-question survey was developed based on a questionnaire previously designed and validated in Ahmedabad city. Most of the questions were in multiple-choice format.

Questionnaire:

What is Peri-implantitis?

What is Peri-mucositis?

What are the Causes of peri-implantitis?

Which are the most commonly used Instruments for local debridement at the site of peri-implantitis?

What is the best method of surgical resection at the site of peri-implantitis?

How Implant surface decontamination can be achieved by?

Inclusion criteria:

All the registered dental practitioners, residing or practicing in Ahmedabad, were willing to participate in the survey.

Exclusion criteria:

The dental practitioners who were not willing to participate and left the survey in the middle.

Statistical analysis:

All the data was entered and tabulated into M. S Excel Spreadsheet (Version 2015). The data were analyzed using the statistical software package SPSS (Chicago, IL, USA) version 26.0 for MS Windows. Data were collected in an Excel file and analyzed. The data was analyzed using SPSS version 17 (SPSS Inc., Chicago, IL, USA). The Chi-square test was used to find the association between the variables, and to determine the significant differences between the frequencies in one or more categories.

The statistical significance was set at a level of 5% ($P < 0.05$) power sample was examined using the chi-square likelihood ratio. And the Cramer v test was applied. The responses were compiled and statistical analysis was performed

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Table 1 Distribution of demographic variables including age, gender, years of practice, and designation

Gender	Male 72 Female 102	41.38% 58.62%
Age	Below 25 years= 76 25-35 years= 74 35-45 years= 16 Above 45 years = 8	43.68% 42.53% 9.19% 4.60%
Work experience	Less than 5 years - 54 5 years - 35 More than 5 years - 11	43.10% 47.29% 6.32%
Designation	BDS MDS	53.5% 46.5%

3. Results:

Table 1 shows age, gender, years of practice, and implant therapy education. Of 174 dentists, 72 were male and 102 were female participants. The majority of the dentist (43.68%) belonged to the age group of fewer than 25 years, followed by the age group of 25–35 years (42.53%) followed by 35-45 years (9.19%). Out of all the participating dentists, 46.5% were specialty

practitioners (MDS), periodontists being in the majority (35.1%) followed by general practitioners (53.5%). The majority of the dentist participants were in their clinical practice (47.29% had been practicing for 5 years), followed by 43.10% of the dentists practicing for less than 5 years. More than half of the dentists (54.3%) learned about implant therapy while doing their postgraduation/masters (MDS)

Table 2 shows an understanding of what peri-implantitis and peri-mucositis is

Questions	Options	Female	Male	P value ≤ 0.05	BDS	MDS	P value ≤ 0.05
Peri-implantitis	Bone loss around an Osseointegrated implant	38.2%	52.8%	0.63	50.0%	37.8%	0.195
	Soft tissue inflammation around an implant	9.8%	2.8%		7.6%	6.1%	
	Both a and b,	52.0%	44.4%		42.4%	56.1%	
Peri mucositis	Bone loss around an Osseointegrated implant	5.9%	20.8%	0.01	6.5%	18.3%	0.00

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	Soft tissue inflammation around an implant	71.6%	47.2%		77.2%	43.9%	
	Both a and b,	22.5%	31.9%		16.3%	37.8%	

Table 3 shows the causes of peri-implantitis

Questions	Options	Female	Male	P value	BDS	MDS	P value
Causes of Peri-implantitis	Microbial activity	2.9%	16.7%	0.18	2.2%	15.9%	0.14
	Failure of osseointegration	4.9	4.2%		5.4%	3.7%	
	Excessive mechanical overload	2.0%	1.4%		2.2%	1.2%	
	All of the above	90.2%	77.8%		90.2%	79.3%	

Table 4 shows the most commonly used instruments at the site of peri-implantitis

Questions	Options	Female	Male	P value	BDS	MDS	P value
The most commonly used Instrument for local debridement at the site of peri-implantitis	Conventional ultrasonic scaler	19.6%	16.7%	0.197	23.9%	12.2%	0.03
	Rotating titanium brush	15.7%	29.2%		10.9%	32.9%	
	Stainless steel cures	23.5%	18.1%		21.7%	20.7%	
	Teflon ultrasonic scaler	41.2%	36.1%		43.5%	34.1%	

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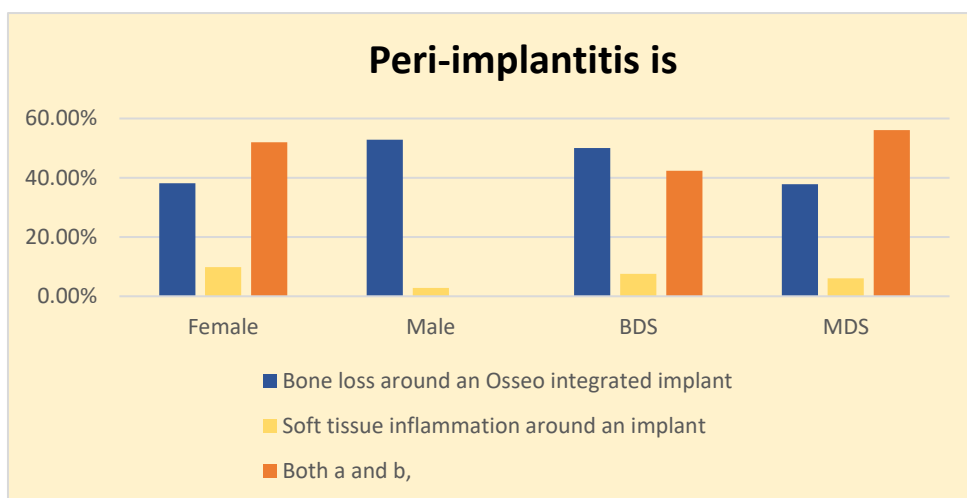
Table 5 shows the methods for surgical resection at the site of peri-implantitis

Questions	Options	Female	Male	P value	BDS	MDS	P value
Methods for surgical resection at the site of peri-implantitis	Autogenous bone graft	12.7%	6.9%	0.01	7.8%	13.4%	0.36
	Autogenous bone graft covered by membrane placement	64.7%	43.1%		59.8%	51.2%	
	Control access flap	6.9%	23.6%		18.5%	8.5%	
	GTR membrane only	15.7%	26.4%		14.1%	26.8%	

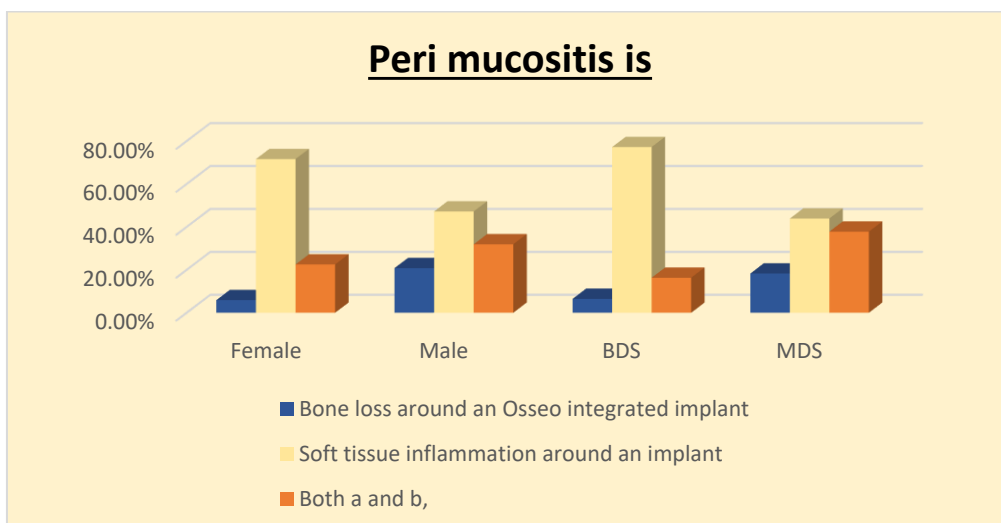
Table 6 shows the methods for implant surface decontamination can be achieved by

Questions	Options	Female	Male	P value	BDS	MDS	P value
Implant surface decontamination can be achieved by	Air powder abrasive and citric acid application	10.8%	9.7%	0.718	3.3%	18.3%	0.009
	Gauze soaked in saline	4.9%	5.6%		5.4%	4.9%	
	Gauze soaked in saline and 0.1% chlorhexidine	26.5%	19.4%		28.3%	18.3%	
	All of the above	57.8%	65.3%		63.0%	58.5%	

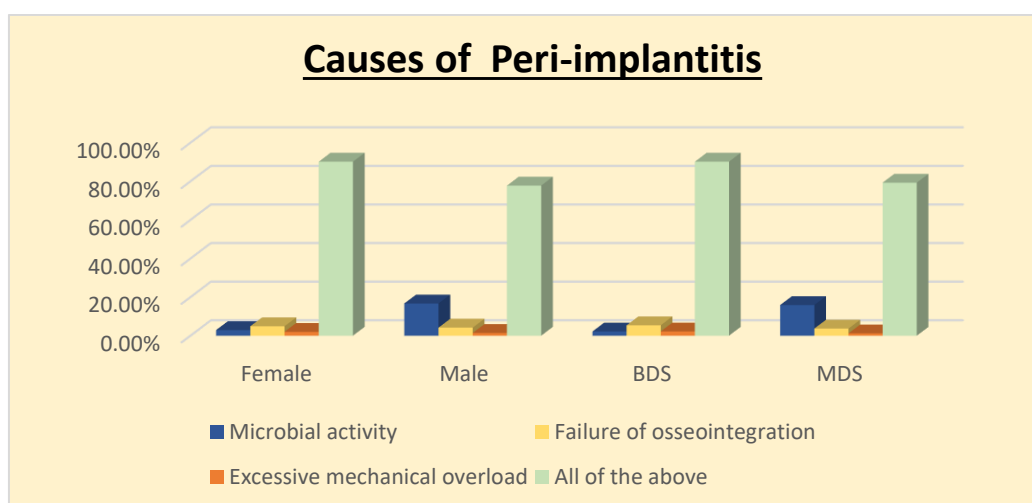
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Graph 1 shows an understanding of what peri-implantitis is

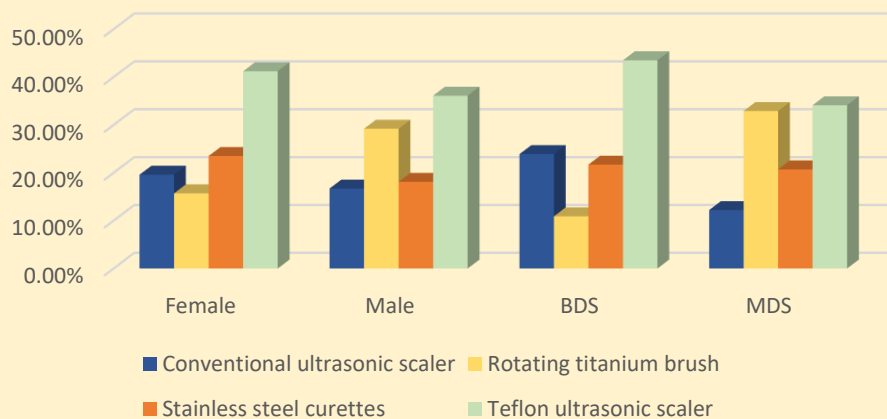


Graph 2 shows an understanding of what peri mucositis is



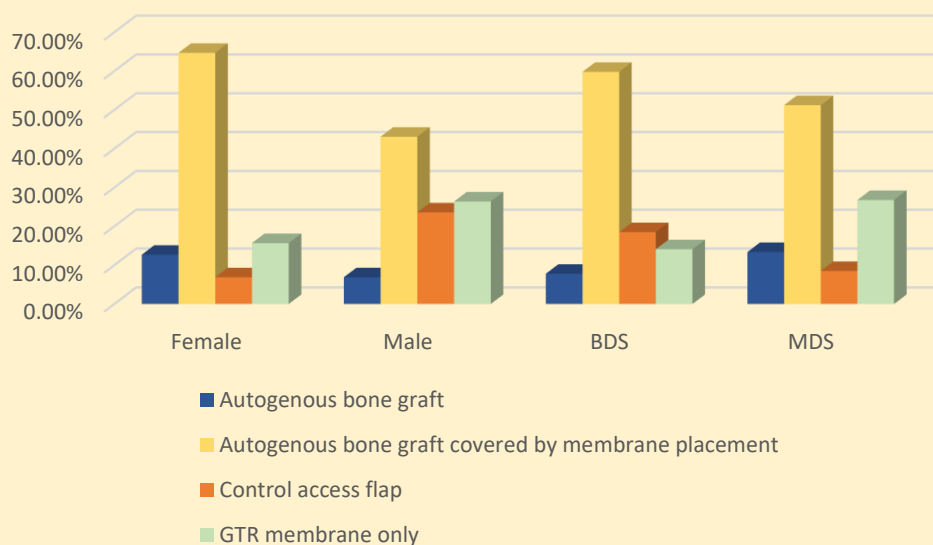
Graph 3 shows the causes of peri-implantitis

Most commonly used Instrument for local debridement at site of Peri-implantitis

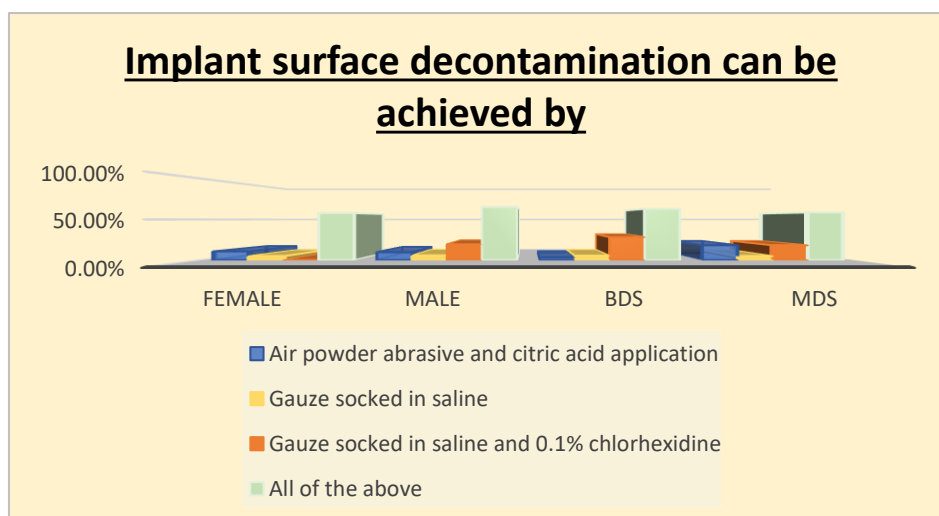


Graph 4 shows the most commonly used instruments at the site of peri-implantitis

Methods for surgical resection at the site of Peri-implantitis



Graph 5 shows the methods for surgical resection at the site of peri-implantitis



Graph 6 shows the methods for implant surface decontamination can be achieved by

The majority of male dental practitioners 52.8% believed that peri-implantitis is bone loss around an implant and female practitioners 52.0% believed that peri-implantitis is bone loss around an implant and soft tissue inflammation around an implant. There was no significant association between Gender and understanding of what peri-implantitis is. ($p = 0.063$)

90.2% of female dentist believed that etiologic factor for peri-implantitis is Microbial activity, Failure of osseointegration, and Excessive mechanical overload, while male dentist 77.8% believed the same. There was an insignificant association between causes of periimplantitis ($p = 0.018$)

Of female dentists, 64.7% believed that surgical treatment for periimplantitis is an autogenous bone graft covered by membrane placement. while 43.1% of male dentist feels the same. There was a highly significant association is seen between the methods for surgical resection at the site of peri-implantitis.

36.1% of male dentists believed that for local debridement Teflon ultrasonic scaler should be used for peri-implantitis cases. While 41.2% of female dentists also believed that Teflon ultrasonic scaler is used. There was no significant association is seen.

Specialist dentists 32.9% believed that rotating titanium brush is used for local debridement at peri-implantitis site and 43.5% of general dentists used Teflon ultrasonic scaler for peri-implantitis patients. There was a highly significant association is between designation and local debridement for periimplantitis.

65.3% of males and 57.8% of a female believed that implant surface decontamination can be achieved by Air powder abrasive and citric acid application Gauze soaked in saline and also Gauze soaked in saline and 0.1% chlorhexidine. There was an insignificant association seen between gender and also for designation.

Knowledge about Peri-mucositis :

71.6% of female dentists believed that peri-mucositis occurred because of soft tissue around an implant, and 20.8 % of male dentists believed that it occur because of bone loss around an Osseo integrated implant. There was a highly significant association between Gender and understanding of peri-mucositis. ($p = 0.001$). There was a highly significant association between designation and understanding of what is peri-mucositis.

4. Discussion:

The goal of the current study was to assess the level of dental implants and peri-implantitis knowledge among 174 dental practitioners.

Dental implants are a successful therapeutic option for individuals who are partially or completely edentulous, as evidenced by their high implant survival rates of 92.8-97.1% after a ten-year follow-up period. Dental implants have high survival rates but were susceptible to biological issues like peri-implantitis. Early peri-implantitis detection and suitable treatment are crucial in a practise that concentrates on implant rehabilitation

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of the edentulous patient.⁵ One study found that people who had one implant removed because of peri-implantitis were more likely to suffer implant failure.

Along with mechanical implant cleaning using titanium or plastic curettes, these techniques also involve ultrasonic or air polishing. All types of curettes can perform the straightforward manual procedure, including those made of Teflon, carbon, plastic, and titanium.

The tip's material may need to be softer than titanium since standard curettes have the potential to alter the implant surface by roughening it.⁶ Reduced bleeding on probing scores can be achieved by using piezoelectric scalers as well as hand instruments, and after at least two months, there are no differences between these two cleaning techniques in terms of bleeding on probing, plaque index, or probing depths.⁷

After mechanical curettage, Persson et al. and Renvert et al. saw significantly reduced bacterial counts with partial reductions in plaque and bleeding scores, whereas Schwarz et al. found 30%–40% less residual biofilm regions by employing ultrasonic techniques.⁸ Louropoulou et al. suggest various therapeutic approaches based on the surface topography of the implants.

Abrasive air polishing can be used to change an implant's surface. Cell attachment and survival remained at adequate levels following air powder treatment, however, cell responsiveness was diminished in comparison to sterile surfaces.⁹

Treatments for peri-implantitis that involved surgery and non-surgery were covered in a total of 18 reviews. Among the non-surgical techniques were manual debridement, manual debridement with chlorhexidine, ultrasonic debridement, air abrasion, local or systemic antibiotics, local antiseptic application, lasers, and host modulation therapy. Local irritants that cause peri-implantitis respond better to non-surgical treatment than osseous abnormalities do.

The surgical methods focused on flap elevation, implant surface treatment, and detoxification, with or without the use of an anti-microbial agent, membranes, or grafting materials. One of the surgical techniques was open flap debridement using plastic or carbon curettes, revolving instruments, air powder, or gentle laser treatment. Reconstructive peri-implant surgery

and implantoplasty 3) directed bone regeneration procedures with or without various membranes (synthetic membranes, resorbable bovine or porcine collagen), in combination with or without bone substitutes (demineralized freeze-dried bone alone or in combination with other materials, such as hydroxyapatite,

In a 1997 trial in dogs, Hürzeler et al. found no discernible difference in bone regeneration between the administration of membranes alone and membranes combined with bone grafts (canine demineralized freeze-dried bone or hydroxyapatite). Nevertheless, the combination led to more re-osseointegration.^{10 11}

Schwarz et al. administered nanocrystalline hydroxyapatite instead of xenogenic bone material with a collagen membrane to 22 randomly selected patients after access flap surgery.¹²

In a different study, the effectiveness of using autogenous bone versus xenogenic material produced to fill infra crestal deficiencies was examined.¹³

Claffey et al. review's of 43 experimental and clinical studies, 13 of which involved human participants, that assessed various decontamination protocols using sterile saline solution, chlorhexidine, citric acid, and hydrogen peroxide failed to demonstrate that any one technique was superior to the others.¹⁴

According to reviews written by various authors, 40% citric acid at pH 1 for 30 to 60 seconds has proven to be the most efficient agent for reducing bacterial growth on HA surfaces. However, clinical application at a more acidic pH could harm the peri-implant tissues, and if the time of application is prolonged, this can harm the union between the HA and the implant body.¹⁵

5. Conclusion:

This study gives information on dental professionals' awareness of the fundamentals of peri-implantitis and perimucositis, including clinical symptoms and radiographic findings. It was determined that their knowledge of the various therapeutic modalities needed to be improved.

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