

EVALUATION OF KNOWLEDGE AND AWARENESS RELATED TO PERIODONTAL INFECTION WITH DIABETES, CARDIAC, RESPIRATORY AND RENAL CONDITIONS IN DENTAL AND MEDICAL PRACTITIONERS IN NORTH INDIA

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ABSTRACT

Background: Oral health is the one of the primary factor in maintaining sound psychological and physical health. Medical practitioners and dentists may play an important role in maintaining oral & general health of the patients. They will be in a better position to offer sound advice on the link between periodontal disorders and systemic problems after receiving oral health education, which will enhance their general health.

Aims and Objective: To assess the knowledge and awareness related to periodontal infection with systemic condition in dental and medical practitioners in India.

Materials & Methods: The survey was conducted among 2200 medical and dental practitioners of India in an offline mode. The study consisted of 23 questions that included part A: demographic analysis, part B: knowledge and awareness regarding “periodontitis” condition and part C: awareness pertaining to the association of periodontal disease, systemic illness and medications among health care workers. Data was recorded and statistically analyzed using IBM SPSS version 20.

Results: Of 2200 questionnaires, only 2000 were returned. Maximum participants were of age group 30-50 years. Males were predominant in the study. Participants were master degree holder and senior residents. Junior residents visited a general and specialist dental practitioner less than the senior residents ($p < 0.05$). The junior residents visited maximally to endodontic surgeon whereas, the senior residents visited maximally to oral pathologist ($p < 0.05$). According to maximum junior and senior residents the term periodontitis was inflammation of PDL, cementum, and bone ($p < 0.05$). Screening of patients with periodontal disease was done very often by 421 junior and 1413 senior residents ($p < 0.05$). According to 471 junior and 1429 senior residents ($p < 0.05$), the most common oral complications associated with diabetes mellitus was xerostomia. Association of stress with periodontitis was agreed by 481 junior and 1470 senior residents ($p < 0.05$). 64.7% participants considered tooth brushing, fluoride toothpaste and dental flossing daily as the best method for preventing periodontal disease.

Conclusion: From the results of the survey, it was concluded that the knowledge, awareness and orientation related to the systemic outcomes of Periodontal infection (Periodontitis) in

medical and dental faculty & practitioners in India was limited. Therefore oral health care programmes should be reinforced among medical and dental practitioners by continuing dental education courses.

Keywords: Awareness, cardiac, diabetes, Periodontal Disease, Practitioners, renal, respiratory conditions

INTRODUCTION:

Periodontal diseases incorporate a variety of conditions affecting the periodontium which may cause periodontitis. The characteristic features of periodontitis are loss of periodontal attachment apparatus and alveolar bone which will eventually result in loss of tooth structure.^{1,2} Periodontal disease is a considered as a major global health issue with a prevalence rate of 20-50%. Theory of focal infection provides sufficient scientific evidence indicating a strong relationship among periodontal condition and systemic conditions like diabetes mellitus, respiratory, CVS, and adverse pregnancy outcomes.³⁻⁶

The main cause of periodontal disease is presence of dental biofilm and calculus which may further initiate gingivitis & periodontitis. Because of presence of extensive amount of microbial assault, the chronic nature of periodontal disease, the exuberant local as well as systemic host response to microbial assault, it can be hypothesized that these chronic infections may influence the overall health of patient. Through the bloodstream, bacteria that causes periodontitis spread to many important organs such the heart, lungs, joints, and amniotic fluid..⁷

Numerous systematic reviews and meta analysis have concluded that diabetes mellitus (both type I and type II) is the main risk factor for periodontal disease. A systematic review evaluating the effect of

periodontal disease on diabetes was recently published which concluded with an evidence that a two way relationship exists between periodontal disease and diabetes mellitus.^{2,8} Periodontal infections may lead to a chronic state of disease in diabetes such as insulin resistance, hypoglycemia & formation of AGE'S (Advanced glycation end products) which further induces destruction of connective tissue.⁹ Advanced glycation end products are the modification of proteins or lipids that may lead to thickening of blood vessels and narrowing of the lumen. These products also immobilize & covalently cross-linking the circulating low density lipoproteins (LDL's). Few studies showed that diabetic individuals are more prone to severe attachment loss as compared to non diabetic individuals.^{10,11} Recent studies have shown that effective control of periodontal infection in patient with diabetes may reduce the level of AGE in serum.^{3,4}

There is a strong link between periodontal disease & cardiovascular disease that occurs secondary to atherosclerosis of blood vessels and hypertension leading to myocardial infarction.¹² Periodontal disease has an association with carotid atherosclerosis and severe periodontal disease leading to atheroma, thickness and calcification resulting in recurrent vascular events such as stroke and transient ischemic attack.¹³ Leukocytes and C-reactive protein levels are sensitive marker of systemic

inflammation,¹⁴ and their levels were found to be raised in patients with periodontitis in various studies.¹⁵

Several studies provide data that oral cavity may influence the progression or initiation of respiratory diseases such as COPD which further includes two important disorders i.e. chronic bronchitis and emphysema. These inflammatory condition results in trache-obronchial mucous production along with destruction of alveolar septa. Oral bacteria may continuously stimulate periodontal tissue to release inflammatory cytokines from GCF which may further enter the whole saliva and contaminate the distal respiratory epithelium.¹⁶ Inflammatory cells secretes hydrolytic enzymes which increases the epithelium's susceptibility to bacterial colonization and infection. The patho physiological link between these two chronic diseases was proposed in 1990.¹⁷

Several studies have documented the association between periodontal diseases and adverse pregnancy outcomes such as preterm low birth weight (PTLBW) babies and premature labor out of which PTLBW is known to be major cause of neonatal death¹⁸⁻²¹.

Microbiologically, gram negative microflora may play as important role in low birth weight infants. Periodontopathogenic organisms and their by products may mediate host-cytokine production in target tissue. Collins et al(1994) reported that *P. gingivalis* during gestation period may lead to significant increase in inflammatory mediators such as TNF & PGE₂. It was also evaluated that there was decrease in fetal birth weight & increase fetal death rate after intravenous infection with LPS derived from *P. gingivalis*.

Exposure to oral LPS downregulate E-selectin expression on endothelial cells and thereby prevents normal leukocyte margination & diapedesis.

By using effective plaque control techniques like brushing and the use of interdental cleaning tools, periodontal disease can be managed well and can possibly be reversed²². Early detection and awareness of periodontal disease are required for prevention and management of the disease.²³ Despite the significant prevalence of periodontal disease, there is still a low level of public awareness, particularly in developing nations..^{24,25} Hence, this prompted us to conduct a survey to assess the knowledge, awareness and orientation related to systemic outcomes of periodontal infection (periodontitis) in among medical and dental practitioners in India.

MATERIAL & METHODS:

Ethical approval: Ethical approval was obtained from Ethical review committee of National Dental College and Hospital, Derabassi on. Written informed consent was obtained from all the participants.

Sample size: Sample was framed and generalized by doing cluster sampling to different parts and subcontinents of India such as; Jammu Kashmir, Punjab, Delhi, Uttarakand states. A sample size was estimated with 10 % of margin error and 95% confidence level. Hence sample size of 2000 was obtained.

Study was done by using pretested questionnaires to validity and reliability of the questionnaire by doing the pilot study in Punjab before start of the study under the guidenace of the senior evaluator.

This cross sectional study involves a self-administered questionnaire based survey was among 2000 medical and dental practitioners to evaluate the knowledge regarding periodontal disease. The reason of this research was informed to the respondents. Participants current on day of survey and residents willing to be part of study were incorporated in this research. Subjects those who were not present on day of survey were eliminated. The study consisted of 23 questions that included demographic analysis in the 1st domain and a structured interview questionnaire in the 2nd and 3rd domain. The questionnaire was delivered to the participants by both offline and online mode and requested to return the response form within one week after receiving with consent letter. Offline forms were collected personally on same day of evaluation. Online modes were collected with one week of delivery. Out of 2200 participants only 2000 were responded. The drop out were 200 respondents. The study was conducted from august 2021 till may 2022.

Questionnaire Design:

A study specific questionnaire consisted of 23 questions which were divided into 3 domains was made under the supervision of Head of the department and Reader. The questions were framed from the data obtained from various literature reviews of relevant articles. The basic idea of framing the questionnaire was to assess about the knowledge, awareness and orientation related to systemic outcomes of periodontal infection(periodontitis) among medical and dental faculty & practitioners in India. The questionnaire proforma which was based upon the knowledge

regarding the periodontal disease, its primary cause, their interrelationship with systemic disease(Diabetes mellitus, cardiovascular disease, leukemia, pregnancy, rheumatoid arthritis and COPD) and its prevention. The participants filled the questionnaire proforma by giving one response to each question.

- The first domain included the questions based on personal data related to demographic analysis, Name, Age(21-65 years), Educational Level, Designation.
- The second domain included 8 questions which evaluated the knowledge and awareness regarding “periodontitis” condition(its cause, earliest sign and clinical manifestation of periodontal disease)
- The third domain included 15 questions related to knowledge & awareness related to systemic outcomes of periodontal infection(periodontitis), medications along with prevention of periodontal disease.

Statistical Analysis: All the data was analyzed using IBM SPSS version 20. The Pearson chi square test was used to calculate significant connection among categorical variables such as the knowledge of periodontal disease, age group, gender and designation of the members. $p < 0.05$ was considered statistically significant.

RESULTS:

Out of 2200 questionnaire Performa only 2000 participants completed the questionnaire Performa and positively contributed in this research. The reply rate of participants was 90.90%.

Table 1: Demographic analysis of contestant (n=2000)

Variables		Frequency	%
Age	Under 30 years	331	16.6
	30 – 50 years	1624	81.2
	>50 years	45	2.3
Gender	Male	1132	56.6
	Female	868	43.4
Educational level	Bachelor Degree Holder	605	30.3
	Master Degree Holder	1395	69.8
Designation	Junior resident	489	24.5
	Senior resident	1511	75.6

Sociodemographic analysis of the participants:

Table 1 shows the sociodemographic analysis of the participants. Maximum participants were in the age group 30-50 years (81.2%) individuals. Males were predominant in the study (56.6%). Participants who were master degree holder (69.8%) and senior residents (75.6%) were found to be maximum in number.

Association of dental visit based on designation of the participants

476 junior residents and 1467 senior residents had visited a dentist for treatment. The results were statistically non-considerable ($p>0.05$). Junior residents visited a general dental practitioner and

specialist dental practitioner less than the senior residents. The results were statistically significant ($p<0.05$). The junior residents visited maximally to endodontic surgeon(76) followed by pedodontist(47) and periodontist(47) whereas, the senior residents visited maximally to oral pathologist(112) followed by oral and maxillofacial surgeon(110). The results were statistically significant based on the designation among participants who visited to general dental practitioners or specialized dental practitioners ($p<0.05$) (Table 2).

Table 2: Association of dental visit based on designation of the participants (n=2000)

		JR(Medical +Dental)	SR(Medical +Dental)	p-value
Have you ever visited a dentist for treatment?	Yes	476 (23%)	1467 (73%)	0.770
	No	13 (0.65%)	44(2.2%)	
If yes, the dentist you visited was?	General dental practitioner(BDS)	82 (4.1%)	620(31%)	0.000
	Specialist dental practitioner(MDS)	395(19.8%)	887(44.4%)	

What speciality does your dentist belong to?	Prosthodontist	17(0.85%)	77(3.85%)	0.000
	Oral Pathologist	19 (0.95 %)	112 (5.6 %)	
	Periodontist	47 (2.35 %)	86 (4.3 %)	
	Oral And Maxillofacial surgeon	32 (1.6 %)	110 (5.5 %)	
	Public Health Dentist	9 (0.45 %)	89 (4.45 %)	
	Orthodontist	23 (1.15 %)	63 (3.15 %)	
	Endodontic surgeon	76 (3.8 %)	77 (3.85 %)	
	Pedodontist	47 (2.45 %)	47 (2.45 %)	

P<0.001

Association of knowledge and awareness of periodontal disease based on the designation

Among the junior residents, the term periodontal disease was known to 476 whereas among the senior residents, it was known to 1463. Based on the designation of participants (JR or SR), senior resident (1272) had sound knowledge regarding the terminology of periodontitis which is the inflammation of PDL, cementum, and bone. The results were statistically significant (p<0.05). When asked about the clinical manifestations of periodontitis, more than 1/3rd of senior resident (1430) were aware of bleeding gums, mobile teeth and gingival recession. The results were

statistically non-important (p>0.05).The main cause of periodontal disease is dental plaque, consumption of sugary food and beverages and nutritional deficiencies. More than half of the senior resident (1391) agreed that dental plaque and consumption of sugary food and beverages were the primary cause of periodontal disease. The results were statistically non-considerable (p>0.05).

When asked about the earliest sign of periodontal disease. Majority(1400) of senior resident agreed that bleeding and swollen gums and bad breath is earliest sign of periodontal disease.. The results were found statistically non- considerable (p>0.05)(Table 3).

Table 3: Association of knowledge and awareness related to systemic outcome of periodontal disease based on the designation

		JR	SR	p-value
Do you understand the term Periodontal disease?	Yes	476(23%)	1463 (73%)	0.562
	No	13 (0.65 %)	48 (2.4 %)	
What do you understand by the term “ Periodontitis” ?	Inflammation of enamel	9 (9.45 %)	86 (4.3 %)	0.000
	Inflammation of dentin	15 (0.75 %)	122 (6.1 %)	
	Inflammation of Gingiva	6 (0.3 %)	29 (1.45%)	
	Inflammation of PDL, Cementum and Bone	459 (22.95 %)	1272 (63.6 %)	
What are the clinical	Bleeding gums	7 (0.35 %)	37(1.85 %)	0.410
	Mobile teeth	14 (0.7 %)	44 (2.2 %)	
	Gingival recession	0 (0%)	0 (0 %)	

manifestations of Periodontitis?	All the above	468 (23.4 %)	1430 (71.5 %)	
What according to you may the primary cause of periodontal disease?	Dental Plaque	9 (0.45%)	50 (2.5 %)	0.057
	Consumption of a lot of sugary foods and beverages	12 (0.6%)	61 (3.05 %)	
	Nutrition deficiency	0 (0%)	0 (0 %)	
	All the above	468 (23.4 %)	1391 (69.55 %)	
Earliest sign of periodontal disease?	Swollen gums	15 (0.75 %)	84 (4.2%)	0.147
	Bleeding gums	4 (0.2%)	17 (0.85 %)	
	Bad breath	4 (0.2 %)	10 (0.5 %)	
	All the above	466(23.3 %)	1400 (70 %)	

P<0.05

Association of knowledge and awareness related to systemic outcomes of periodontal disease and medication based on the designation

There is a strong and two way relationship that exist between systemic and periodontal disease and majority of senior resident agreed with this. Examination of participants with periodontal disease was done very often by senior resident(1413). Majority of senior resident were conscious of probable association of periodontal

disease and diabetes, HIV/AIDS, stress, pre- term low birth weight, rheumatoid arthritis, cardiac disorders, respiratory disorders, chronic kidney disease(Table 4). The majority of senior residents correctly identified medication/drugs associated gingival enlargement and the results were found to be statistically considerable. Knowledge of periodontal disease as a risk factor for systemic diseases was significantly connected with senior resident designation as compared to the junior resident designation (Table 4).

Table 4: Association of knowledge and awareness concerning the impact of periodontal illness, systemic illness and medication based on the designation

		JR	SR	p-value
Do you have any idea between the inter relationship between systemic and periodontal disease?	Yes	466(23.%)	1449 (72.5%)	0.020
	No	13 (0.65 %)	52 (2.6 %)	
	Don't know	10(0.5 %)	10 (0.5 %)	
If yes what according you is correct?	Periodontal disease leads to systemic disease	2 (0.1 %)	17(0.85 %)	0.052
	Systemic disease leads to periodontal disease	0 (0 %)	12 (0.6 %)	
	2 way relationship	464 (23.2 %)	1420 (71 %)	
Do you screen your patients with periodontal disease?	Very often	421 (21.05 %)	1413 (70.65 %)	0.000
	Often	12 (0.6 %)	58 (2.9 %)	

	Rarely	42 (2.1 %)	22 (1.1 %)	
	Never	14 (0.7 %)	9(0.45 %)	
Periodontitis is the----- ----- hurdle of Diabetes Mellitus.	1 ST	3 (0.15 %)	12 (0.6 %)	0.492
	2 ND	4 (0.2 %)	16 (0.8 %)	
	3 RD	7 (0.35 %)	11 (0.55 %)	
	6 TH	475 (23.75 %)	1472 (73.6 %)	
Which is the most common oral complications seen in diabetes mellitus?	Xerostomia	471 (23.55 %)	1429 (71.45 %)	0.017
	Gingivitis	2 (0.1 %)	6 (0.3 %)	
	Leukoplakia	2 (0.1 %)	0 (0%)	
	Gingival Enlargement	14 (0.7 %)	76 (3.8 %)	
Are you aware of that gingival enlargements can be caused by certain medications/ drugs?	Yes	478 (23.9 %)	1476(73.8 %)	0.268
	No	2(0.1 %)	16 (0.8 %)	
	To some extent	9 (0.45 %)	19 (0.95 %)	
HIV/AIDS is directly or indirectly associated with Periodontitis?	Yes	480 (24 %)	1478 (73.9 %)	0.317
	No	0 (0 %)	7 (0.35 %)	
	To some extent	9 (0.45 %)	26(1.3 %)	
Does stress has any association with Periodontitis?	Yes	481(24.05 %)	1470 (73.5 %)	0.000
	No	2 (0.1 %)	41 (2.05 %)	
	To some extent	6 (0.3 %)	0 (0 %)	
Is Pregnancy/ preterm low birth weight associated with Periodontitis?	Yes	469 (23.45 %)	1432 (71.6 %)	0.297
	No	0 (0 %)	6 (0.3 %)	
	To some extent	20 (1 %)	73 (3.65 %)	
Does rheumatoid arthritis/osteoporosis affect periodontal condition?	Yes	479 (23.95 %)	1481 (74.05 %)	0.823
	No	2 (0.1 %)	9 (0.45 %)	
	To some extent	8 (0.4 %)	21 (1.05 %)	
Can leukemia cause Periodontal disease?	Yes	475 (23.75 %)	1457 (72.85 %)	0.718
	No	2 (0.1 %)	6 (0.3 %)	
	To some extent	12 (0.6 %)	48 (2.4 %)	
Is there any association between Periodontitis and cardiac disorders(cardiac stroke, congestive heart disease)?	Yes	483 (24.15 %)	1484 (74.2 %)	0.410
	No	2 (0.1 %)	16 (0.8 %)	
	To some extent	4 (0.2 %)	11 (0.55%)	
Are respiratory disorders (COPD, Pneumonia, Asthma, Tb) associated with Periodontal disease?	Yes	479 (23.95 %)	1485(74.25%)	0.512
	No	4 (0.2 %)	6 (0.3 %)	
	To some extent	6 (0.3 %)	20 (1 %)	
Is there any association between chronic kidney	Yes	480(24 %)	1475 (73.75 %)	0.522

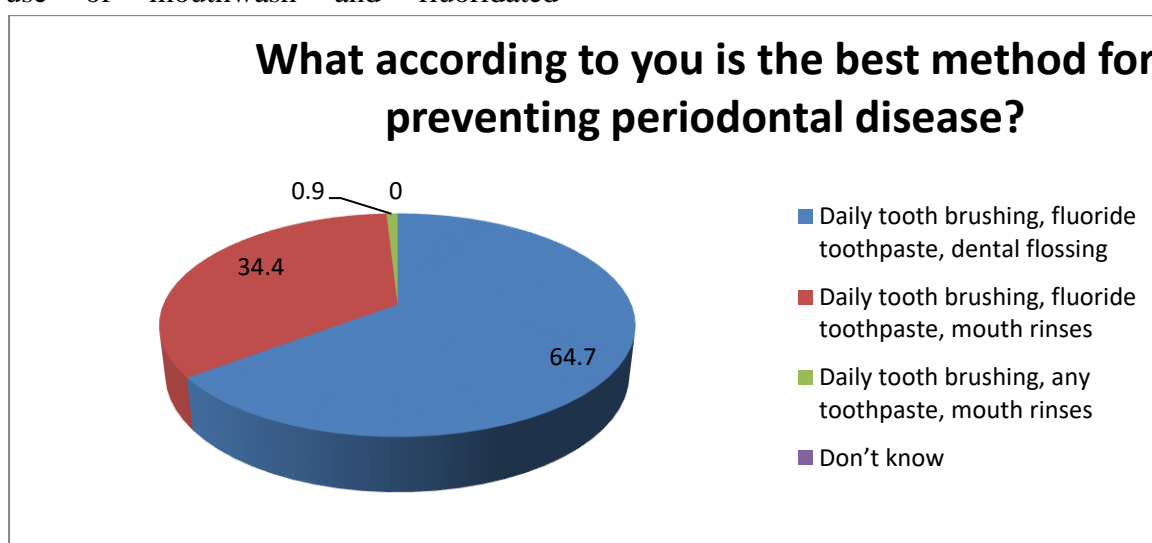
disease and Periodontal disease?	No	5 (0.25%)	26 (1.3 %)
	To some extent	4 (0.2 %)	10 (0.5 %)

P<0.05

Best method for preventing periodontal disease

The traditional method for inhibiting periodontal disease is mechanical and chemical plaque control. Mechanical plaque control include daily tooth brushing, daily flossing and interdental cleaning aids whereas chemical plaque control include use of mouthwash and fluoridated

toothpaste. In the present survey, 64.7% participants agreed to the fact that the best way for preventing periodontal disease was daily brushing, and dental flossing according to 64.7% participants. The results were found to be statistically significant (p<0.05) (Pie Chart 1)



Pie chart 1: Methods of preventing periodontal disease

DISCUSSION:

Physicians and medical doctors may play a fundamental role in educating the patients about oral health. If basic dental health care education programmes regarding the knowledge and examination of the oral cavity are carried out regularly, many systemic conditions can be diagnosed at an initial stage.^{26,27} Also, medical practitioners are more likely to work in rural and urban areas than dentists which is one of the meaningful opportunities for them to play an active role in management of oral health and their promotions. Dentists also have less knowledge about the

medical conditions when they treat patients in daily practice. Scientific literature and evidence reports reveals that about half of the dentists look into clinical-guidelines thereby using suitable interference to treat dental patient with systemic co-morbidities.²⁸ Periodontal diseases are frequently overshadowed of systemic conditions, which needs the remarkable and urgent counselling by medical physician and doctors to the patients.²⁹

The majority findings in this survey were that senior residents had a modest knowledge and awareness related to systemic outcomes of periodontal infection.

The result of this present survey is in compliance with the Swathi P and Thomas B study in 2011 which concluded that periodontal health programs and joint ventures between medical and dental practitioners could be of great help to achieve the goal.³⁰ 1484 (74%) Senior residents agreed that periodontitis may have an association with cardiovascular diseases. The data obtained from the study was somewhere closer to the percentage found in an American study (89%).³¹ A study done in Chennai where 83% of medical participants agreed that periodontal disease is a risk factor for infective endocarditis. The results were quite comparable to the above mentioned studies.³¹ Conversely, a study done in India reveals only 14% of physicians thought that periodontal disease may cause cardiac heart diseases.³² In harmony with current study, most physicians had knowledge about periodontal disease.³³

The present survey, 1432 (71%) senior residents agreed that periodontitis may have an association with preterm low birth weight. A study was conducted in India which evaluated that general practitioners & gynaecologists also had sufficient level of awareness of association between periodontal disease and preterm low birth weight babies.³⁴ According to a study done in Nigeria, more than 50% of doctors strongly approved that there may be a connection among oral disorders and the patient's overall health in cases of rheumatic heart disease, diabetes mellitus, valvular heart disease, and HIV/AIDS³⁵.

25% senior residents answered that plaque is the cause for periodontal disease. Srinidhi et al. concluded that around 73.3% of the participants were aware of the fact

that plaque and calculus were the primary factors in the etiology of periodontal disease. In the study conducted by Wong and Elischwartz et al., only 27% of medical students were aware. Dental biofilm is the primary etiological factor of periodontal diseases, so it is necessary to highlight its role in periodontal disease among health care workers.³⁶

This education programme would aid in diagnosing oral and dental issues and in assisting patients in adopting a favourable attitude about dental care..^{37,38}

It is significant for the physicians to remain well informed of the need and treatments available for dental care^{39,40}. This knowledge can help to decrease the morbidity and mortality rates hence improving the quality of life of patient. The dental faculty should be involved in the creation of special study modules or electives in oral health and disease, highlighting the significance of oral health.^{41,42}

We found lower knowledge of medical practitioner about periodontal diseases. In contrast to our finding Abid and Javed found acceptance response and awareness among medical practitioners about periodontal diseases.⁴³ Mian et al found that dental practitioner had better awareness compared to medical one about oral systemic diseases.⁴⁴

Limitations of the study:

1. Of 2200 questionnaire proformas only 2000 returned with a response rate of 90%
2. Despite the fact that the participant's self-reported beliefs and actions were anonymous, the

results may have been skewed toward what they saw as ideal.

3. Study doesn't include practitioners from all parts of India.

Further studies are needed to validate the results.

CONCLUSION:

The vision on oral health is that medical practitioners ought to improve and impart oral health counselling, and function a guide in developing positive dental perspectives. For this, the physician has to be enlightened on the necessity for aid and

coverings available, that concerns a joint support between the two professions. This can modify the physicians to create applicable referrals and once needed to address the serious problems of unequal access to qualified dental services. The data obtained from the survey can be utilized to change the perspective of the oral health care workers towards oral health care needs.

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Questionnaire Proforma

Part A: Demographic Analysis

Name:

Phone no./ E-mail-Id:

Age: under 30 years, 30-50 years, >50 years

Gender:Male/Female

Educational Level: Bachelor Degree Holder (MBBS/ BDS), Master Degree Holder (MD/MS/MDS)

Designation: Junior Resident, Senior Resident, Occupation:

PART-B: KNOWLEDGE AND AWARENESS CONCERNING “PERIODONTITIS” CONDITION

1. Have you ever visited a dentist for treatment?
 - a) Yes
 - b) No
2. If yes, the dentist you visited was?
 - a) General dental practitioner(BDS)
 - b) Specialist dental practitioner(MDS)

3. What speciality does your dentist belong to?
 - a) Prosthodontist
 - b) Oral Pathologist
 - c) Periodontist
 - d) Oral And Maxillofacial surgeon
 - e) Public Health Dentist
 - f) Orthodontist
 - g) Endodontic surgeon
 - h) Pedodontist
4. Do you understand the term Periodontal disease?
 - a) Yes
 - b) No
5. What do you recognize by the term “ Periodontitis” ?
 - a) Inflammation of enamel
 - b) Inflammation of dentin
 - c) Inflammation of Gingiva
 - d) Inflammation od PDL, Cementum and Bone
6. What are the clinical manifestations of Periodontitis?
 - a) Bleeding gums
 - b) Mobile teeth
 - c) Gingival recession
 - d) All the above
7. What according to you may the primary cause of periodontal disease?
 - a) Dental Plaque
 - b) Consumption of a lot of sugary foods and beverages
 - c) Nutrition deficiency
 - d) All the above
8. Earliest sign of periodontal disease?
 - a) Swollen gums
 - b) Bleeding gums
 - c) Bad breath
 - d) All the above

PART C- KNOWLEDGE & AWARENESS CONCERNING THE IMPACT OF PERIODONTAL DISEASE AND SYSTEMIC ILLNESS AND MEDICATIONS

9. Do you have any idea between the inter relationship between systemic and periodontal disease?
 - a) Yes
 - b) No
 - c) Don't know
10. If yes what according you is correct?
 - a) Periodontal disease leads to systemic disease
 - b) Systemic disease leads to periodontal disease
 - c) 2 way relationship
11. Do you screen your patients with periodontal disease?
 - a) Very often
 - b) Often
 - c) Rarely

- d) Never
12. Periodontitis is the----- complication of Diabetes Mellitus.
 - a) 1st
 - b) 2nd
 - c) 3rd
 - d) 6th
 13. Which is the most common oral micro vascular complications found in diabetes mellitus?
 - a) Xerostomia
 - b) Gingivitis
 - c) Leukoplakia
 - d) Gingival Enlargement
 14. Are you aware of that gingival enlargements can be caused by certain medications/ drugs?
 - a) Yes
 - b) No
 - c) To some extent
 15. HIV/AIDS is directly or indirectly associated with periodontitis?
 - a) Yes
 - b) No
 - c) To some extent
 16. Does stress has any association with Periodontitis?
 - a) Yes
 - b) No
 - c) To some extent
 17. Is Pregnancy/ preterm low birth weight associated with periodontitis?
 - a) Yes
 - b) No
 - c) To some extent
 18. Does rheumatoid arthritis/osteoporosis affect periodontal condition?
 - a) Yes
 - b) No
 - c) To some extent
 19. Can leukemia cause periodontal disease?
 - a) Yes
 - b) No
 - c) To some extent
 20. Is there any association between periodontitis and cardiac disorders(cardiac stroke, congestive heart disease)?
 - a) Yes
 - b) No
 - c) To some extent
 21. Are respiratory disorders (COPD, Pneumonia, Asthma, Tb) associated with periodontal disease?
 - a) Yes
 - b) No
 - c) To some extent
 22. Is there any association between chonic kidney disease and periodontal disease?
 - a) Yes
 - b) No
 - c) To some extent
 23. What according to you is the best way for preventing periodontal disease?

- a) Daily tooth brushing, dental flossing, fluoride toothpaste,
- b) Daily tooth brushing, mouth rinses, fluoride toothpaste,
- c) Daily tooth brushing, any mouth rinses, toothpaste,
- d) Don't know