

# Original Article

## Awareness of Periodontal Disease and Systemic Health Inter-Relationship Amongst the General Population of Kelambakkam, Chennai: A cross Sectional Survey

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Chettinad Health City Medical Journal 2019; 8(4): 114 - 121

DOI: [https://doi.org/10.36503/chcmj\\_8\(4\)-03](https://doi.org/10.36503/chcmj_8(4)-03)

### Abstract

**Aim:** The aim was to determine the awareness of patients about the association of periodontal disease and systemic disease.

**Materials and Methods:** A total of 219 subjects were included in this study. Data was collected based on a questionnaire survey which was distributed among the subjects.

**Results:** The results of the study showed that 43% of post graduates had a good knowledge, 64% of graduates, 25 % of undergraduates had a good knowledge while 24 % of unlettered group had poor knowledge of the relationship between periodontal disease and systemic disease.

**Conclusion :** This study concludes that, an interdisciplinary approach is required in prevention of systemic disease by integration of periodontal care and the awareness of the interrelationship between periodontal disease and systemic health needs to be increased.

**Key words :** Periodontal disease, Systemic disease, Pyorrhoea, Premature low birth weight babies

### Introduction

Periodontal disease is a chronic inflammatory disease of periodontium. Its advanced form is characterized by the loss of periodontal ligament and destruction of the surrounding alveolar bone. It is the main cause for tooth loss and is considered as one of the two biggest threats to the oral health.<sup>1</sup> The interaction of bacterial infection and host response can be modified by behavioural factors such as smoking which can result in periodontal disease.<sup>2</sup> A variety of systemic diseases and conditions can affect the course of periodontitis or it may have a negative impact on the periodontal attachment apparatus. With various studies conducted over the years, evidence suggests that there is a link between oral diseases with many non-oral and systemic diseases which includes cancer, cardiovascular disease, type 2 diabetes, respiratory tract infection, adverse pregnancy outcomes, and neurodegenerative disease.<sup>3</sup> However, it still remains to be established whether there are any specific periodontal pathogens that stimulate development

of the systemic disease, or if the systemic disease causes the abundance of periodontal pathogens to change. If these pathogens cause non-oral disease, then they would represent obvious targets for therapeutic intervention. The presence of periodontopathic pathogens could be used as a diagnostic marker to predict the susceptibility to non-oral disease.

### Materials and Methods

#### Subject Sampling:

This cross sectional study was conducted in the outpatient section of the department of Periodontics, Chettinad dental college and Research Institute, Kelambakkam and the study sample comprised of the South Indian population. A total number of 219 subjects were selected for the study. This study was then approved by the Institutional Ethics committee. A questionnaire format was prepared and distributed (Fig 1) and a verbal consent of the population was obtained. A trained investigator assisted in filling of the questionnaire.

**Questionnaire design:**

The questionnaire was adapted from the questionnaire used by Siddiqui et al,<sup>4</sup> after obtaining formal permission. It included 18 questions which were filled by the participants in order to evaluate their

knowledge, attitude, awareness and behaviour regarding their periodontal health and systemic disease. The participants were rated with different scores such as poor with a score of 0-6, fair 7-12, Good 13-18

<b>CHETTINAD DENTAL COLLEGE &amp; RESEARCH INSTITUTE DEPARTMENT OF PERIODONTICS</b>	
<b>Questionnaire</b>	
<b>Awareness of periodontal disease and systemic health inter-relationship amongst the general population of Kelambakkam, Chennai: A cross sectional survey.</b>	
<b>Name:</b>	<b>Age/Gender:</b>
<b>Occupation:</b>	<b>Educational Qualifications:</b>
<ol style="list-style-type: none"> <li>1. Do you know about Pyorrhoea? a) Yes                      b) No</li> <li>2. Are you aware that gum disease can affect your general health/systemic disease? a) Yes                      b) No</li> <li>3. Are you aware that your Dentist should know about your past medical history /previous hospitalization/medication? a) Yes                      b) No</li> <li>4. Do you know that gum disease is a risk factor for Diabetes mellitus/Increase blood sugar? a) Yes                      b) No</li> <li>5. Do you know that gum disease is a risk factor for heart attack/Cardiovascular disease? a) Yes                      b) No</li> <li>6. Are you aware that gum/periodontal disease can exacerbate respiratory disease? a) Yes                      b) No</li> <li>7. Are you aware that stress is related to gum disease /ulcerations in the mouth? a) Yes                      b) No</li> <li>8. Do you know that there exists an association between gum disease and obesity? a) Yes                      b) No</li> <li>9. Are you aware that bleeding gums can be seen during the puberty phase? a) Yes                      b) No</li> <li>10. Do you know that certain drugs used in the treatment of Epilepsy can cause gingival enlargement? a) Yes                      b) No</li> <li>11. Do you know that certain drugs used in the treatment of hypertension can cause gingival enlargement? a) Yes b) No</li> <li>12. Are you aware that smoking is a risk factor for gum/periodontal disease? a) Yes                      b) No</li> <li>13. Are you aware that HIV can worsen gum disease? a) Yes                      b) No</li> <li>14. Do you know that gum disease in pregnancy is common? a) Yes b) No</li> <li>15. Do you know that gum disease is a risk factor for pre term birth weight? a) Yes                      b) No</li> <li>16. Do you know that gum disease could lead to Alzheimer's? a) Yes                      b) No</li> <li>17. Are you aware that gum/periodontal disease and osteoporosis are linked? a) Yes                      b) No</li> <li>18. Do you know that gum/periodontal disease is a risk factor for chronic kidney disease? a) Yes                      b) No</li> </ol>	

Figure 1: Questionnaire

### Statistical Analysis

The data was analysed and Chi square test was employed. The p value < 0.05 indicated a statistically significant association.

### Results

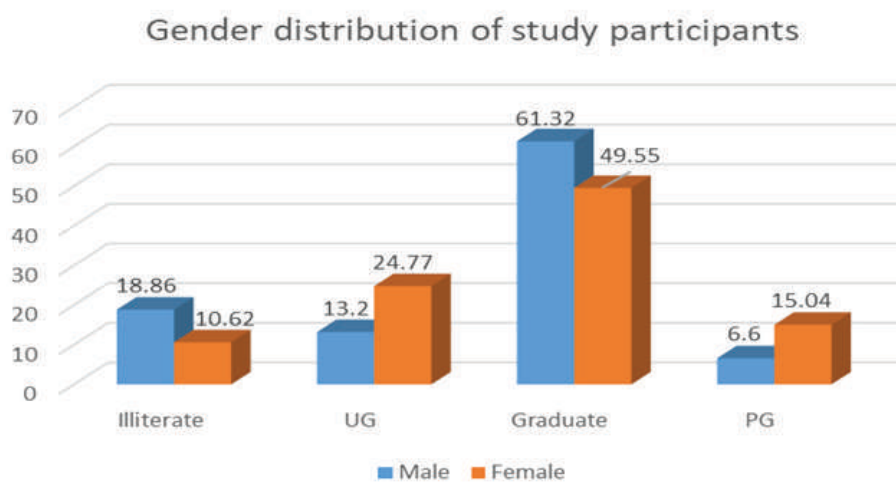
A total of 219 individuals participated in the study of which 113 were females and 106 were males and the result showed that the awareness of the oral-systemic link in the qualified group is different when compared to general less qualified group. The study population comprised of four different groups based on educational background which is as follows:

1. An unlettered (Illiterate/Education Deprived) group which comprised of 32 individuals
2. An undergraduate (UG) group with 42 individuals
3. A graduate group which comprised of 121 individuals
4. Post Graduate (PG) group that comprised of 24 individuals

Table 1 shows Gender Distribution of the study participants in each group (graph 1). Table 2 shows association between educational status of the study population and their level of knowledge (Graph 2).

Table 1. Gender distribution of study participants						
Educational status	Gender				Chi sq test	p value
	Male		Female			
	No	%	No	%		
Illiterate/Education deprived (n =32)	20	18.86792	12	10.61947	11.29	0.0102
UG (n = 42)	14	13.20755	28	24.77876		
Graduate (n = 121)	65	61.32075	56	49.55752		
PG (n=24)	7	6.603774	17	15.04425		

Table 1: Gender Distribution of study participants

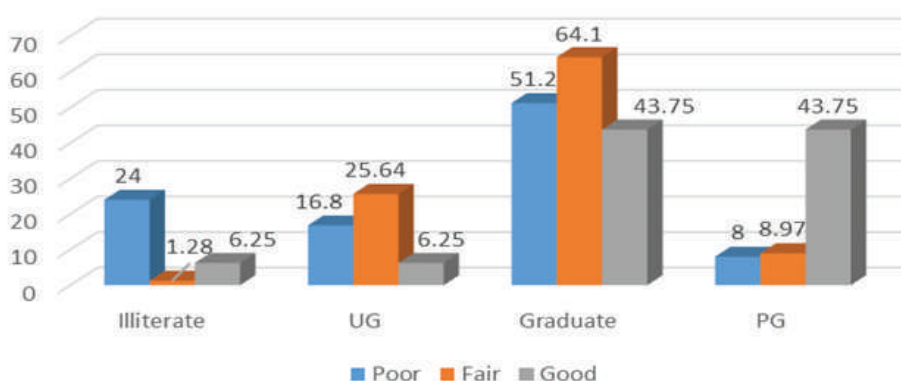


Graph 1: Gender distribution of study participants

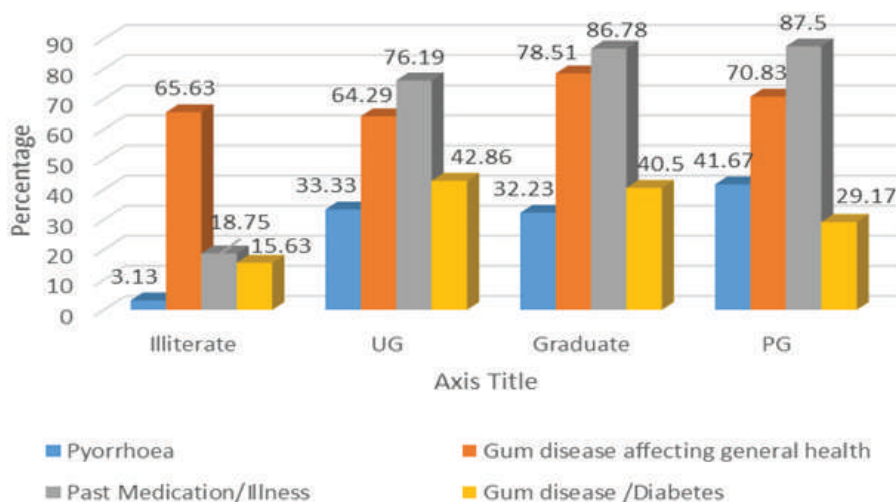
Table 2. Association between educational status and level of knowledge							Scale	
Educational status		Level of Knowledge					0-6 poor 7-12 fair 13-18 good	
	Poor		Fair		Good		Chi sq test	p value
	No	%	No	%	No	%		
Illiterate (n =32)	30	24	1	1.282051	1	6.25	40.1	<0.001
UG (n = 42)	21	16.8	20	25.64103	1	6.25		
Graduate (n = 121)	64	51.2	50	64.10256	7	43.75		
PG (n=24)	10	8	7	8.974359	7	43.75		

Table 2: Association between educational status of the study population and their level of knowledge

### Association between educational status and level of knowledge



Graph 2: Association between educational status and level of knowledge



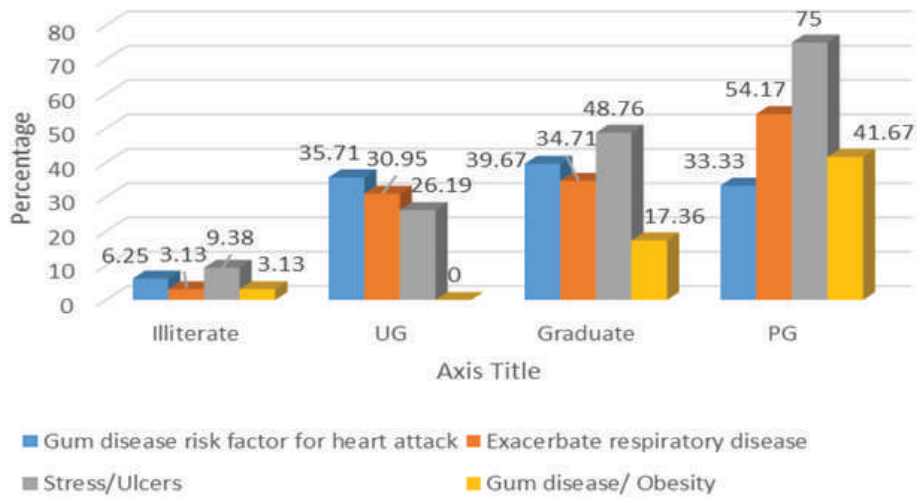
Graph 3: Association of gum disease and pyorrhoea, general health, past medication, diabetes

Table 3. Questionwise level of awareness for different educational strata										
Question	Illiterate (n=32)		UG (n=42)		Graduate (n=121)		PG (n=24)		Significance of difference	
	No	%	No	%	No	%	No	%	X <sup>2</sup>	P
Pyorrhoea	1	3.125	14	33.33333	39	32.2314	10	41.66667	13.21	0.004
Gum disease affecting general health	21	65.625	27	64.28571	95	78.5128	17	70.83333	4.43	0.21
Past medication/illness	6	18.75	32	76.19048	105	86.77686	21	87.5	64.78	<0.001
Gum disease/Diabetes	5	15.625	18	42.85714	49	40.49587	7	29.16667	8.163	0.043
Gum disease risk factor for heart attack	2	6.25	15	35.71429	48	39.66942	8	33.33333	12.96	0.004
Exacerbate respiratory disease	1	3.125	13	30.95238	42	34.71074	13	54.16667	18.24	<0.001
Stress /Ulcers	3	9.375	11	26.19048	59	48.76033	18	75	31.37	<0.001
Gum disease/Obesity	1	3.125	0	0	21	17.35537	10	41.66667	18.91	<0.001
Bleeding gums/Puberty	1	3.125	11	26.19048	32	26.44628	10	41.66667	11.99	0.007
Epilepsy drug/Gingival enlargement	2	6.25	10	23.80952	29	23.96694	13	54.16667	17.13	<0.001
Hypertensive Drug/Gingival Enlargement	2	6.25	8	19.04762	25	20.66116	12	50	16.18	0.001
Smoking risk factor/Gum disease	7	21.875	22	52.38095	109	90.08264	20	83.33333	69.27	<0.001
HIV	4	12.5	17	40.47619	66	54.54545	18	75	26.2	<0.001
Pregnancy/Gum Disease	1	3.125	15	35.71429	28	23.1405	9	37.5	13.17	0.004
PLBW	1	3.125	9	21.42857	21	17.35537	11	45.83333	16.72	0.008
Gum disease/Alzheimer's	1	3.125	12	28.57143	31	25.61983	6	25	8.43	0.03
Gum disease/Osteoporosis	2	6.25	9	21.42857	25	20.66116	8	33.33333	6.51	0.08
Gum disease/Chronic Kidney disease	3	9.375	9	21.42857	26	21.4876	7	29.16667	3.62	0.3

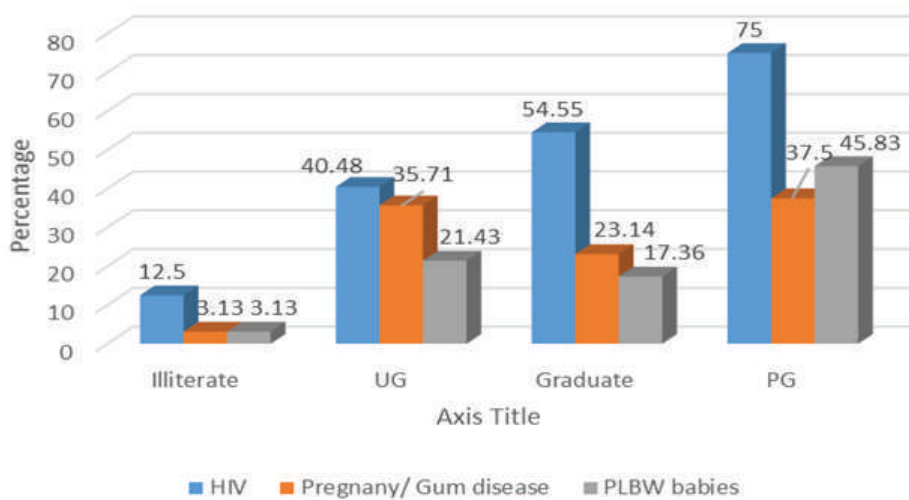
Table 3: Question wise level of awareness for different educational strata

About 65% of the individuals in unlettered group were aware that periodontal disease can affect general health (Table 3, Graph 3). In undergraduate group 76% of the individuals were aware that the dentist should be informed about past medical history/medication (Table 3, Graph 3). In the graduate group 90% of the individuals were aware that smoking is a risk factor for periodontal disease (Table 3, Graph 6) while 75% of the individuals in post graduate group were aware that stress is a risk

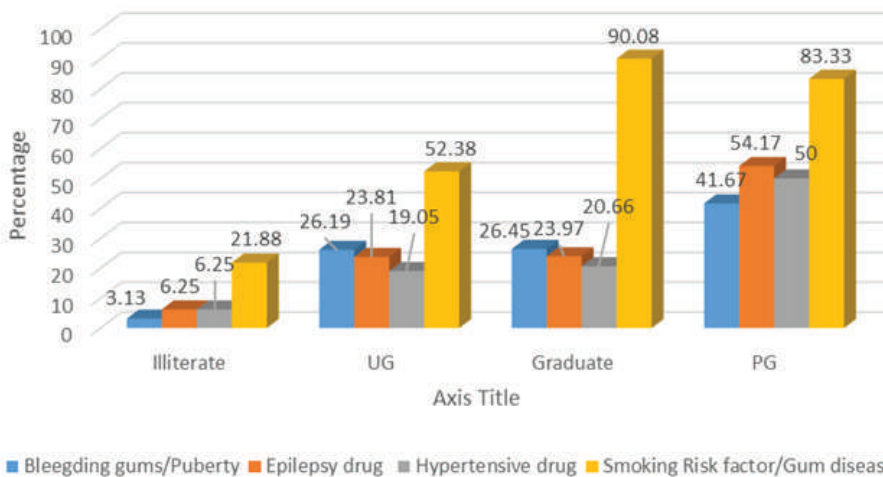
factor for periodontal disease as well as that there was an association between gum disease and HIV infection. (Table 3, Graph 4, 5). 33% of individuals in the postgraduate group were aware that gum disease and Osteoporosis shared risk factors (Table 3, Graph 7). In the qualified group which was not related to medical stream the knowledge about the oral disease, the relationship of oral health with systemic disease and life threatening oral disease was limited.



Graph 4: Association of gum disease and cardiac disease, respiratory disease, stress/ulcers, obesity

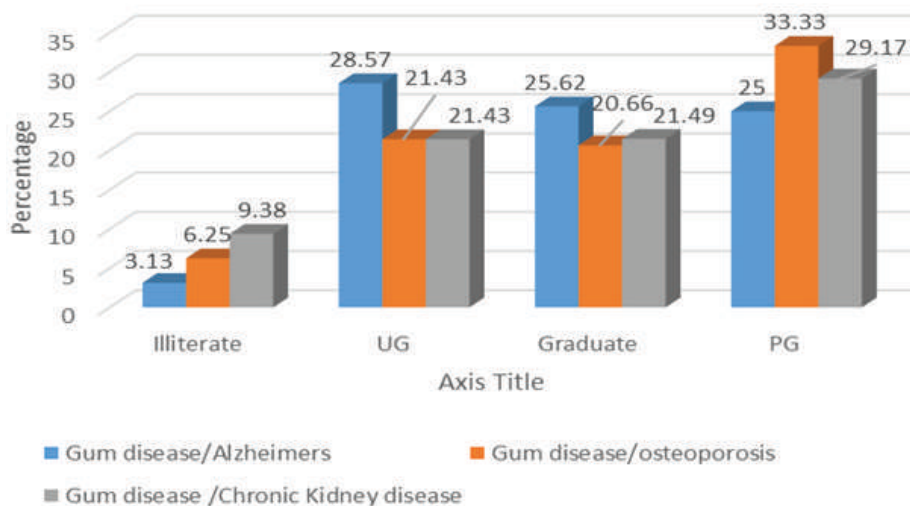


Graph 5: Association of gum disease and HIV, pregnancy, premature low birth weight babies



Graph 6: Association of gum disease and bleeding gums, epilepsy, antihypertensive drugs, and smoking as a risk factor





Graph 7: Association of gum disease and Alzheimers, osteoporosis, chronic kidney

### Discussion

Periodontal disease is an immuno-inflammatory response to microbial complexes resulting from the interplay between periodontal pathogens and host. More than 500 different bacterial species are capable of colonizing the mouth of an adult.<sup>5</sup> This host-immune response may offer explanatory mechanism for the interaction between periodontal infection and a variety of systemic disorders such as coronary heart disease and related events like angina, infarction, atherosclerosis, stroke, diabetes mellitus, premature rupture of membrane, low- birth-weight infants, chronic obstructive pulmonary disease and hospital-acquired pneumonia.<sup>6</sup>

Oral hygiene awareness and practice differs from country to country and community to community. Although India is a developing country and the literacy ratio is comparable to the developed countries, we still have some areas where people are less educated. In this study we have tried to reach people with different educational level and the present work was done with the aim of collecting data on the awareness of oral-systemic inter-relationship in general population of Kelambakkam, Chennai. A questionnaire was formulated and distributed to the varied sections of people.

In a study by Zeba Rehman Siddiqui, postgraduates had a good knowledge (72.6%) about this interrelationship, undergraduates and graduates had fair knowledge (50-60%), and 80% of unlettered people had poor knowledge.<sup>4</sup> Comparing this study, 43% of post graduates and 43 % graduates had a good knowledge, 6% of undergraduates had a good knowledge while 24 % of unlettered group had poor knowledge (Table 2, Graph 2).

In a study by Nasir<sup>7</sup>, the awareness regarding the association of periodontal health and coronary heart

disease among medical interns was found to be 55% while in the results of this study the awareness was found to be 33 % among postgraduates (Table 3, Graph 4 ).

In a study by Tarannum<sup>8</sup> among General Dentists, General Medical Practitioners (GMPs) and Gynecologists said that more general dentists (67.4%) than GMPs (56.4%) and Gynecologists (63%) knew that there is an association between periodontal disease and pre-term low birth weight, while in this study 45 % of postgraduates had an awareness of association between periodontal disease and pre term birth (Table 3, Graph 5).

In the study by Nutalapati et al<sup>9</sup> 73.3 % of gynaecologists reported that their patients complain of bleeding gums,swelling and mobility, whereas in this study, 23% of graduates were aware of bleeding gums in association with pregnancy Table 3, Graph 5).

About 52% of undergraduate group in this study were aware of association of smoking and periodontal disease (Table 3 Graph 6) whereas in study by Nwhator et al<sup>10</sup>, awareness was extremely low.

In this study 40 % of graduates has awareness regarding diabetes and periodontal disease (Table 3, Graph 3), while in study conducted by Habashaneh et al<sup>11</sup> 48% of Jordanians were aware that diabetic patients were prone to periodontal disease.

In a study by Kanabuka et al<sup>12</sup> 13.4 % of participants were completely unaware of the total manifestations of HIV/AIDS There was no significant association between awareness of oral manifestations and general awareness of HIV/AIDS, or level of education, while in this study 12.5% of the illiterate/ educationally backward group were aware of oral manifestations of HIV/AIDS(Table 3,Graph 5).

Therefore, this study questionnaire has attempted to include various aspects of the relationship between periodontal diseases and systemic health.

## Conclusion

From the inference of this study it is important to create awareness among the uneducated strata of people about the importance of systemic and oral health. It is important to raise awareness within medical and dental community thereby promoting interdisciplinary teamwork which will help patients suffering from targeted systemic conditions to be referred to dental professionals for periodontal diagnosis and if required, treatment. The dental professional needs to be alert regarding the possible systemic implications that might be present in their periodontal patients, thus should conduct a comprehensive medical history; a timely referral might allow for an early detection and adequate treatment or proper management of a systemic condition.

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