



## ASSESSMENT OF AWARENESS AND KNOWLEDGE OF ORAL-SYSTEMIC DISEASE CONNECTION AMONG MEDICAL DOCTORS IN PORT HARCOURT

\*<sup>1</sup>Modupeoluwa Omotunde Soroye, <sup>2</sup>Richard Ishmael Oko-Jaja

<sup>1</sup>Department of Preventive Dentistry, Faculty of Dentistry, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria.

<sup>2</sup>Department of Medicine, University of Port Harcourt, Port Harcourt, Rivers State, Nigeria.

\***Corresponding Author:** Modupeoluwa Omotunde Soroye; **Email:** docdupe@yahoo.com

### ABSTRACT

**Background:** There are many literatures that reported association between periodontal disease (PD) and non-communicable diseases (NCDs) through the inflammatory pathway that is common to them. Despite this, there is still a low referral for oral health care by medical practitioners.

**Methodology:** Sample size was all consenting medical practitioners that attended the 2019 Annual General Meeting of the Nigeria Medical Association in Port Harcourt. Data was collected with self-administered questionnaire and analyzed with SPSS version 20.0. Statistical significance was set at  $p \leq 0.05$ .

**Results:** One hundred and fifty-six medical doctors were recruited with M: F of 1.5:1. 28.9% were specialists, 14.1% have practised for over 30 years and 90.4% claimed they are aware of what oral health is. 69.9% of participants knew gum disease is a form of periodontal disease, only 50.6% and 19.2% knew that the aetiological factor is dental plaque and gingival bleeding is the first sign respectively. One quarter of participants did not know that cigarette smoking is a risk factor for periodontitis. 84.6% will seek the dentist's opinion and 92.9% will refer patients to them. There was statistical significance between participants' knowledge of systemic diseases and cadre as regards chronic renal failure, hypertension and diabetes mellitus.

**Conclusion:** Participants' awareness of correlation of NCDs with PD is poor and only a quarter had good and excellent knowledge of the NCDs that are implicated. There is therefore, the need to educate them about this and emphasize the importance of referring their patients for oral care.

**Keywords:** Chronic Periodontitis, Knowledge, Medical Doctors, Non-communicable Diseases, Oral-Systemic interactions





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## **INTRODUCTION**

The general trend worldwide is to approach patients' care holistically. Of late, much has been said about the effect of periodontal disease on the other parts of the body. Associations have been established; due to their common risk pathway between periodontal disease (PD) and non-communicable diseases (NCDs) such as coronary heart disease<sup>1</sup>, chronic obstructive pulmonary disease (COPD)<sup>2</sup>, rheumatoid arthritis<sup>3</sup>, infertility<sup>4</sup>, Alzheimer<sup>5</sup>, diabetes mellitus<sup>6</sup>, adverse pregnancy outcomes [low birth weight babies, preterm deliveries, preterm low birth weight (PLBW)]<sup>7-10</sup> and chronic renal failure<sup>11</sup> among others.

Periodontal disease is an infectious and inflammatory disease that is caused primarily by dental plaque that contains multiple bacteria, byproducts and metabolites that are injurious to the oral tissues. It also induces the inflammatory pathway that results in the production of interleukins, tumour necrotic factor and metalloproteinases.<sup>12</sup>

Significant correlations and underlying mechanisms have been demonstrated through systemic reviews of experimental and epidemiological evidences between PD and various systemic diseases.<sup>13-21</sup> PD and NCDs are chronic disorders that share many risk factors such as older age, active smoking, stress, uncontrolled glucose level and blood pressure. This association is possible as a result of the common risk pathway in their disease progression.<sup>22</sup>

Thus, since these associations have been established, it is important for medical practitioners to collaborate with dentists while treating patients with NCDs. Furthermore, medical practitioners are at an advantage compared to dentists in that they can provide early counselling to their patients on oral health since they see them more often than them. Hence, it is important that they are aware of and have adequate knowledge of oral-systemic interactions of diseases.

This study therefore, evaluated the knowledge and awareness of medical practitioners in private and government hospitals in Port Harcourt about oral-systemic disease interactions.

## **METHODOLOGY**

This cross-sectional descriptive study was done among medical practitioners that attended the 2019 Annual General Meeting of the Nigeria Medical Association of Nigeria, Port Harcourt; Rivers State that held in August, 2019.



Participants were randomized by balloting and all medical practitioners who picked 'Yes' were recruited after understanding the purpose of the study.

The questionnaires administered sought information on participants' demographics, and awareness and knowledge of oral-systemic relationships between PD and NCDs and systemic diseases that have possible positive correlation with PD. Furthermore, 22 questions were used to assess the level of knowledge of participants as regards the correlation between PD and NCDs using a 5-point Likert scale (strongly agreed, agreed, neutral, disagree and strongly agreed).

Data for awareness and attitude were analysed using the Statistical Package for Social Sciences version 20.0 (IBM SPSS Statistics Armonk New York) and frequencies and percentages were generated with statistical significance set at  $p \leq 0.05$ . The data for assessing the participants' level of knowledge about the correlation between PD and NCDs were analyzed by performing univariate and secondary log-linear statistics of several categorical variables after recoding into numeric variables where 5 replaced "strongly agree," 4 replaced "agreed" 3 replaced "Partially disagree," 2 replaced 'Strongly disagree' and 1 replaced "don't know". This gave a score of 110 as maximum obtainable score and 22 as minimum obtainable score. The scores were categorized into 4 levels of knowledge: 22-44 (poor knowledge), 44-66 (fair knowledge), 67-88 (good knowledge) and 89-110 (excellent knowledge). The Likert scale range is 0.8

## RESULTS

**Table1. Participants' demographics**

Variables	Frequency	Percentage
<b>Gender</b>		
Male	94	60.3
Female	62	39.7
<b>Age(years)</b>		
≤45	112	71.8
>45	44	28.2
<b>Tribe</b>		
Yoruba	4	2.6
Igbo	31	19.9
South-South	121	77.6

<b>Designation</b>		
Medical Officers	61	39.1
Registrars	29	18.6
Senior Registrars	21	13.5
Consultants	45	28.8
<b>Year of practice(years)</b>		
<10	73	46.8
11-20	45	28.8
21-30	16	10.3
31-40	19	12.2
>40	3	1.9
<b>Place of Practice</b>		
Private Hospitals	28	17.9
State Hospital	50	32.1
University Hospital	78	50.0
<b>Total</b>	<b>156</b>	<b>100.0</b>

One hundred and fifty-six Medical Doctors participated in the study with a male predominance. M: F of 1.5:1. 45(28.9%) were specialists. 22(14.1%) have practised for over 30 years. Half of the participants work in a Federal Teaching Hospital {University of Port Harcourt Teaching Hospital (UPTH)}.

**Table 2. Participants' awareness of oral health**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Knowledge of oral health</b>		
Yes	141	90.4
No	15	9.6
<b>How?</b>		
Dentist	35	24.8
Medical School	77	54.6
Media	10	7.1



Others	19	13.5
<b>What is Periodontal Disease (PD)?</b>		
Gum disease	109	69.9
Tooth decay	23	14.7
Don't know	24	15.4
<b>Primary cause of PD?</b>		
Dental plaque	79	50.6
Sweets	33	21.2
Vit C	5	3.2
Don't know	39	25.0
<b>First sign of PD?</b>		
Gingival swelling	94	60.3
Gingival bleeding	30	19.2
Caries	6	3.8
Don't know	26	16.7
<b>Is smoking a risk factor for PD?</b>		
Yes	123	78.8
No	8	5.1
Don't know	25	16.0
<b>PD Prevention</b>		
Toothbrush (TB)+ Any Toothpaste (TP)+ Mouthwash	6	3.8
TB + Fluoridated TP (FTP)+ Flossing	98	62.8
TB+ FTP + Mouthwash	30	19.2
Don't know	22	14.1
<b>Total</b>	<b>156</b>	<b>100.0</b>

144(90.4%) participants claimed a knowledge of oral health. About half [77(54.6%)] said they learnt about it in medical school. Though, 7 out of 10 participants who claimed a knowledge of oral health [109(69.9%)] knew gum disease is a form of periodontal disease, only 1 out of 2 [79(50.6%)] knew that the aetiologic factor is dental plaque and 1 out of 5[30(19.2%)] knew that gingival bleeding is the first sign presented mostly by patients.



25(16.0%)} of participants did not know that cigarette smoking is a risk factor for periodontal disease. More than three-fifth {98(62.8%)} of participants knew that periodontal disease can be prevented by cleaning the mouth with toothbrush, fluoridated toothpaste and flossing.

**Table 3. Participants' attitude to oral health**

Variables	Frequency	Percentage
<b>Will you seek Dentist's opinion about oral health?</b>		
Yes	132	84.6
No	24	15.4
<b>Will you refer your patients to Dentists for if needed</b>		
Yes	145	92.9
No	11	7.1
<b>Do you routinely collaborate with Dentists for management of NCDs</b>		
Yes	8	5.1
No	148	94.9
<b>Total</b>	<b>156</b>	<b>100.0</b>

Eight out of ten [132 (84.6%)] participants will seek the dentist opinion for their patients where necessary. Nine out of ten [145 (92.9%)] will refer patients for oral care. Only 5.1% of participants routinely collaborate with dentists for management of their patients who have NCDs.



**Table 4. Participants' awareness of NCDs that have correlation with Periodontal Disease**

Variables	Medical Officers		Registrars		Senior Registrars		Consultants		Total		p
Coronary Heart Disease	9	15.0	8	28.6	2	9.5	5	10.6	24	15.4	0.164
Rheumatic Heart Disease	3	5.0	5	17.9	2	9.5	5	10.6	15	9.6	0.294
Valvular Heart Disease	2	3.3	4	14.3	2	9.5	3	6.4	11	7.1	0.292
Myocardial Infarction	10	16.7	7	25.0	2	9.5	4	8.5	23	14.7	0.219
Stroke	12	20.0	9	32.1	3	14.3	6	12.8	30	19.2	0.200
Arteriosclerosis	12	20.0	10	35.7	4	19.0	7	14.9	33	21.2	0.190
Stress	9	15.0	7	25.0	4	19.0	7	14.9	27	17.3	0.656
COPD	13	21.7	13	46.6	5	23.8	9	19.1	40	25.6	0.048*
Chronic Renal Failure	15	25.0	10	35.7	2	9.5	5	10.6	32	20.5	0.028*
PLBW	18	30.0	13	46.4	5	23.8	6	12.8	42	26.9	0.014*
Preeclampsia	19	31.7	12	42.9	8	38.1	8	17.0	47	30.1	0.082
Erectile Dysfunction	23	38.3	12	42.9	7	33.3	13	27.7	55	35.3	0.536
Rheumatoid Arthritis	18	30.0	8	28.6	7	33.3	6	12.8	39	25.0	0.137
Osteoporosis	20	33.3	12	42.9	6	28.6	9	19.1	47	30.1	0.160
Leukaemia	22	36.7	13	46.4	7	33.3	11	23.4	53	34.0	0.215
Hypertension	23	38.3	13	46.4	10	47.6	8	17.0	54	34.6	0.018*
HIV/AIDS	16	26.7	9	32.1	6	28.6	5	10.6	36	23.1	0.103
Hospital acquired Pneumonia	22	36.7	12	42.9	7	33.3	6	12.8	47	30.1	0.017*
Diabetes Mellitus	25	41.7	10	35.7	3	14.3	7	14.9	45	28.8	0.007*

It was significant that the participants were aware that COPD, PLBW, hypertension, hospital acquired pneumonia and diabetes mellitus have correlation with PD



**Table 5. Participants' level of knowledge about oral health**

<b>Level of knowledge</b>	<b>Frequency</b>	<b>Percentage</b>
Poor	46	29.5
Fair	69	44.2
Good	32	20.5
Excellent	9	5.8
Total	156	100.0

About two-fifth of the participants had fair knowledge of the correlation between NCDs and PD. Less than 6% had excellent knowledge.





**Table 6. Association between participants' knowledge of correlation between NCDs and Periodontal disease and some demographics**

Variables	Freq	%	Freq	%	Freq		%	Freq	%	Freq	%	$\chi^2$	p	
	Level of knowledge of correlation between NCDs and periodontal disease													
	Poor		Fair		Good			Excellent		Total				
<b>Gender</b>												<b>3.36</b>	<b>0.34</b>	
Male	23	24.5	46	48.9	20	62.5	21.3	5	5.3	<b>94</b>	<b>60.1</b>			
Female	23	37.1	23	37.1	12	37.5	19.4	4	6.4	<b>62</b>	<b>39.7</b>			
<b>Age group</b>												<b>1.31</b>	<b>0.73</b>	
≤45	32	28.6	52	46.4	21	65.6	18.8	7	6.2	<b>112</b>	<b>71.8</b>			
>45	14	31.8	17	38.6	11	34.4	25.0	2	4.6	<b>44</b>	<b>28.2</b>			
<b>Year of Practice</b>												<b>9.32</b>	<b>0.68</b>	
<10	22	30.1	34	46.6	12	37.5	16.4	5	6.9	<b>73</b>	<b>46.8</b>			
11-20	11	24.4	22	49.0	10	31.3	22.2	2	4.4	<b>45</b>	<b>28.8</b>			
21-30	3	18.8	6	37.5	6	18.7	37.5	1	6.2	<b>16</b>	<b>10.3</b>			
31-40	8	42.1	7	36.8	3	9.4	15.8	1	5.3	<b>19</b>	<b>12.2</b>			
>40	2	66.7	0	0.0	1	3.1	33.3	0.0	0.0	<b>3</b>	<b>1.9</b>			

Equal number of female participants had poor and fair level of knowledge of correlation between NCDs and periodontal disease, while more male participants had fair level of knowledge. More female participants, participants less than 45 years of age and those with less than 10 years of practice had excellent knowledge.



## **DISCUSSION**

The age range in this study was between 23 and 72 years with a mean age of  $41.5 \pm 11.2$  years. This mean age contrasted with a study done among medical doctors in Turkey that reported a mean age of  $25.82 \pm 4.21$ .<sup>23</sup> Also, twenty three percent of participants were older than 45 years of age. This is greater than that reported by the study done among medical doctors in Turkey where ten percent of their participants were aged more than 45 years.<sup>23</sup> This could be because most doctors in Nigeria practise till they are old, many practising till 70 years and above.

Studies have shown that medicine is seen predominantly as a male profession especially in Africa.<sup>24,25</sup> One out of every three medical doctors who participated in this study was a female in contrast to the studies among medical doctors in Turkey and medical practitioners in Pakistan that reported that 4 out of 5 and 3 out of 5 doctors were females respectively.<sup>23,26</sup>

In both our study and that done among medical doctors in Turkey<sup>23</sup>, half of the participants worked in university hospital; 50.0% and 57.4% respectively.

Over half of the participants (53.2%) in this study have practised medicine for more than 10 years. The study done among medical doctors in Turkey recorded that a quarter of their participants had practised medicine for more than 10 years.<sup>23</sup>

Chronic periodontitis, a periodontal disease that is both an infectious and inflammatory is caused by dental plaque. Gingival bleeding is the most presenting symptom reported by patients who have periodontal disease. Though half of the participants in this study knew that the aetiological factor is dental plaque, only 1 out of 5 of them knew that gingival bleeding is the first sign presented mostly by patients. The Turkey study reported that 2 out of 5 medical doctors knew gingival bleeding is the primary clinical symptoms of periodontal disease.<sup>23</sup>

Holistic care has been advocated for all patients and collaboration is needed among different specialists to achieve that. Thus, if associations have been proven between chronic periodontitis and some non-communicable diseases, then there is the need to collaborate with periodontists in the management of patients with these diseases in order to improve their quality of life.<sup>27</sup> Though our study showed that 9 in 10 participants {145 (92.9%)} are willing to refer patients for oral care, however, only 5.1% do so routinely. Likewise, 8 out of 10 participants claimed they will seek



dentist's opinion as regards their patients, but they are not clear about in what disease scenario to do so besides diabetes mellitus.

It is surprising that only half of the participants of this study knew about oral-systemic disease relationships involving common chronic communicable diseases like hypertension, Chronic Obstructive Pulmonary Disease (COPD), chronic renal failure, hypertension, hospital acquired pneumonia and uncontrolled diabetes mellitus. The remaining half knew of no such relationship. Despite that our study reported a 90.4% awareness of oral health among participants and is similar to the Turkey study that reported a 90.8% awareness<sup>23</sup>, only 5.1% of our participants collaborate with the dentists in managing their patients with NCDs.

In our study, 28.8% of participants were aware of the association between chronic periodontitis {a type of periodontal disease} and diabetes, 7.1% to 15.4% were aware of its impact on the cardiovascular system, 25.6% respiratory infections. 25% rheumatoid arthritis, 35.3% infertility and 20.5% renal failure. This is low compared to a study done among general practitioners in France that reported a better awareness among their participants. They reported that 75% of their participants were aware of the association between periodontitis (PD) and diabetes, and 53% to 59% were aware of the impact of PD on cardiovascular diseases, inflammatory bowel diseases, and respiratory infections. 35.18% and <15%, respectively identified PD as a possible risk factor of rheumatoid arthritis and Alzheimer disease.<sup>28</sup> A study done among medical practitioners in Pakistan reported a better awareness too as 80.0% of their participants agreed that periodontal disease can be a risk factor for diabetes; 73.0% believed that it can lead to adverse pregnancy outcomes and 62.0% thought that it can result in cardiovascular diseases.<sup>26</sup>

In this study, 69.9% of participants knew that periodontal disease is a gum disease. This is lower compared to a study done among medical practitioners in Pakistan that reported that 83.0% participants knew the definition of periodontal disease.<sup>26</sup>

In this study, erectile dysfunction was the most frequent systemic disease known to be associated with periodontal disease. The study among general doctors in Turkey mentioned diabetes mellitus as the most frequent systemic disease (66.8%) related to periodontal disease.<sup>23</sup>



In our study, over 80% of practitioners do not ask their patients about their periodontal health. This is similar to the study done among general practitioners in France that reported that 74.3% of general practitioners never asked their patients about their periodontal health.<sup>23</sup>

In conclusion, less than half of the medical practitioners in our study are aware of oral systemic disease interactions; and many are not so knowledgeable about the diseases that can result from such interactions. There is therefore, the need to educate medical practitioners on the possible associations between some NCDs and periodontal disease especially chronic periodontitis emphasizing the importance of collaborating with the periodontists in the management of such patients so as to enhance their quality of life.

### **RECOMMENDATIONS**

1. Oral-systemic disease interactions, identification of periodontal conditions and examinations should be included in medical students' curriculum.
2. Practicing medical practitioners should be educated about oral-systemic disease interactions.

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**Conflict of Interest:** There was no conflict of interest.

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