

# Awareness of Medical Practitioners on the Link between Periodontitis and Systemic Diseases in a Tertiary Hospital

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## ABSTRACT

**Background:** It has been established that periodontitis is linked to some systemic conditions. It is therefore important for medical doctors to be aware of the association between this oral disease and systemic conditions so that they can refer their patients with dental needs, for supportive dental therapy. It is not yet clear how this link is understood or perceived among medical practitioners and there are limited studies in the literature on this, particularly in the South-South region of Nigeria

**Objective:** To assess awareness of the association between periodontitis and systemic conditions among medical practitioners and elicit the history of dental referral for supportive therapy.

**Methods:** This was a descriptive, cross-sectional study, conducted among medical practitioners working at the University of Port Harcourt Teaching Hospital (UPTH), Rivers State, Nigeria. Data collection (socio-demographic variables, level of awareness of the link between periodontitis and systemic diseases and history of dental referrals) was carried out using a semi-structured, self-administered questionnaire. The level of awareness was categorized as follows: limited ( $\leq 1$  systemic disease associated with periodontitis), Fair (2-3 systemic diseases associated with periodontitis) and Good ( $\geq 4$  systemic diseases associated with periodontitis). SPSS version 25.0 was used for statistical analysis, the p-value was considered significant at  $\leq 0.05$ .

**Results:** A total of 162 out of 250 distributed questionnaires (64.8%) were analyzed. Majority (78.4%) of the participants had a limited level of awareness of the link between periodontitis and systemic diseases while 18.5% and 3.1% of the participants had fair and good levels of awareness respectively. Only 26.5% of the participants had referred patients to the dental clinic for supportive therapy

**Conclusion:** The level of awareness of the association between periodontal disease and systemic conditions among medical doctors in this study was limited

**Keywords:** Association, Medical practitioners, Periodontitis, Dental Referral, Systemic conditions

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## INTRODUCTION

Periodontal disease is one of the commonest dental diseases globally. It is not only prevalent in Africa,<sup>1</sup> but also has a worldwide geographic spread.<sup>2,3</sup> It is common among people with poor oral hygiene. This is so because the inflammatory disease is initiated by the accumulation of dental plaque.<sup>4</sup> The mechanical removal of the accumulated plaque by dental professionals, therefore, terminates the disease progression and may result in complete resolution, depending on the degree of periodontal tissue destruction. Periodontal disease commences initially as gingivitis, which is a mild and reversible form.<sup>5</sup> However, it can progress, if untreated, to periodontitis, which is a severe, more destructive and irreversible form which impacts significantly on overall general health.<sup>6</sup> Periodontitis has been identified as a major cause of tooth loss, and masticatory dysfunction. It affects the patient's nutrition, speech, quality of life and self-esteem.<sup>7,8</sup> It was reported in 2017 by Jepsen et al.,<sup>9</sup> that increased life span leads to increased tooth retention and hence a higher burden of periodontitis.

Periodontal health is an important component of oral health which in turn is an essential part of general health.<sup>10</sup> Periodontitis is a risk factor for some systemic conditions such as low birth weight,<sup>11</sup> cerebrovascular disease,<sup>12, 13</sup> diabetes,<sup>14,15</sup> cardiovascular disease,<sup>16</sup> respiratory diseases,<sup>17</sup> obesity<sup>18</sup> and complications of pregnancy.<sup>19</sup> A meta-analysis reported the presence of oral bacterial species in atherosclerotic plaque samples.<sup>20</sup> Periodontal bacteria may move through the ulcerated epithelium of the periodontal pockets into the circulation and disperse through various routes such as hematogenous, oro-pharyngeal and oro-digestive to reach extra-oral sites, causing bacteraemia and systemic inflammation, which then can induce acute-phase responses as well as metabolic and inflammatory alterations in the liver and bone marrow activities which can influence comorbid conditions,<sup>21, 22</sup> also periodontitis shares inflammatory effector mechanisms, genetic and acquired risk factors with many comorbid conditions.<sup>21</sup> Periodontitis can impact on the aetio-pathology and outcome of treatment of the systemic conditions concerned if its role is not taken into consideration during treatment planning of patients with systemic conditions. It is therefore imperative for medical doctors to be aware of the association between periodontitis and systemic diseases, to enhance prompt referral and adequate management of their

patients. In a study conducted by Umeizudike et al.,<sup>23</sup> in the South-west region of Nigeria, resident doctors, reported a low level of awareness of periodontal disease and its association with systemic disease.

It is not yet clear how the link between periodontitis and systemic conditions is understood or perceived among medical practitioners and there are limited studies in the literature on this, particularly in the South-South region of Nigeria.

This study intended, therefore, to assess the level of awareness of the association between periodontitis and systemic conditions among medical doctors in the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt, Rivers State, Nigeria and to elicit a history of referral for supportive dental therapy among this group of participants.

## MATERIALS AND METHODS

This descriptive, cross-sectional study was conducted among medical practitioners working in the University of Port Harcourt Teaching Hospital (UPTH), Port Harcourt, Rivers state. Ethical approval was obtained from the Health Research and Ethics Committee of the Institution. Participants' consent was obtained before the study commenced. The study population comprised medical practitioners from various fields in UPTH; Medicine, Obstetrics and Gynaecology, Paediatrics, Pathology, Public Health and Surgery, based on the participants' responses. Data collection was done using an anonymous semi-structured, self-administered questionnaire, during the June Ordinary General Meeting (OGM) of the Medical and Dental Consultants Association of Nigerian (MDCAN), and the August OGM of the Association of Resident Doctors (ARD) respectively. The OGMs of the MDCAN and ARD are usually one-day programmes, which holds thrice every year and an Annual General Meeting (AGM), which holds once (November/December) every year. After a face-validity of the questionnaires by two dentists, the questionnaires were pre-tested among medical students, to ensure simplicity and ease of understanding by participants and the Cronbach Alpha of 0.84 was estimated as a measure of internal consistency. A purposive non-probability sampling technique was used, and the questionnaires were distributed to every participant present at the event, at the time of the data collection. Those who did not fill the questionnaire properly or failed to return the questionnaire were excluded from the study. The questionnaire had two sections. Section A included information on socio-demographic characteristics

(age, gender, marital status, ethnicity) and work-related characteristics (Clinical posting/units, year of practice, cadre i.e., registrar, senior registrar and consultants). Section B included information on awareness of the association between periodontitis and systemic conditions, source of knowledge and history of dental referral of patients with dental needs for supportive therapy.

The level of awareness was categorized, based on the number of systemic diseases associated with periodontitis, into limited ( $\leq 1$  systemic disease associated with periodontitis), Fair (2-3 systemic diseases associated with periodontitis) and Good ( $\geq 4$  systemic diseases associated with periodontitis).<sup>24</sup>

**Data analysis:**

Statistical analysis was done using the Statistical Product and Service Solution, SPSS version 25.0 (IBM SPSS Inc. Chicago, Illinois). Categorical variables were expressed as frequencies with accompanying percentages. The strength of association was tested using Pearson Chi-square, and statistical significance was considered at  $p \leq 0.05$ .

**RESULTS**

**Socio-demographic characteristics of the participants**

One hundred and sixty-two properly filled questionnaires were returned out of the 250 that were distributed giving a response rate of 64.8%. One hundred questionnaires were distributed among MDCAN members (response rate of 63%), while one hundred and fifty were distributed among ARD (response rate of 66%). Ninety-six of the participants

(59.3%) were males and the remaining 66 (40.7%) were females. The mean age was 38.4 years  $\pm$  10.0 while the age range was 25 - 68 years. Most of the participants were registrars (43.8%), as shown in table 1.

**Level of awareness of the link between periodontitis and systemic conditions**

Most (47.5%) of the participants reported that their source of information was from books/articles, and 95.1% agreed that there is an association between periodontitis and systemic conditions (Table 2). When their level of awareness was categorized, (78.4%) of the participants had limited level of awareness, 18.5% of the participants had fair level of awareness while only 3.1% had good level of awareness (Table 2).

About 2.1% of the males and 4.5% of the females had a good level of awareness, while 3.2% of the consultants had a good level of awareness of the link between periodontitis and systemic diseases, these findings, however, were not statistically significant. (Table 3). Majority of the participants associated periodontitis with cardiovascular disease (95%), followed by diabetes mellitus (79%) and only 10% of the participants associated periodontitis with low birth weight (Figure 1).

**History of dental referral for supportive therapy**

Only 26.5% of the participants had referred patients with dental needs for supportive dental therapy before the study; and out of this, 90.7% and 9.3% did the referral for the purpose of dental check-ups and scaling and polishing respectively. (Table 4).

Table 1: Sociodemographic characteristics of Participants

Sociodemographic Variables		n (%)
Age group (years)	20-29	22(13.6)
	30-39	80(49.4)
	40-49	37(22.8)
	50-59	13(8.0)
	60-69	10(6.2)
Gender	Male	96(59.3)
	Female	66(40.7)
Cadre	Registrar	71(43.8)
	Senior Registrar	28(17.3)
	Consultant	63(38.9)
Specialty	Medicine	46(28.4)
	Obstetrics & Gynaecology	20(12.3)

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Paediatrics	12(7.4)
Pathology	17(10.5)
Public Health	19(11.7)
Surgery	48(29.6)
<b>Total</b>	<b>162(100.0)</b>

Table 2: Awareness of the association between periodontitis and systemic conditions among participants

Variable	n(%)	
<b>Source of Information</b>	Media (TV, radio, etc)	7(4.3)
	Books/articles	77(47.5)
	Seminar/Conference	26(16.0)
	Media & books	19(11.7)
	Books & seminar/ conference	6(3.7)
	All	6(3.7)
	No response	21(13.0)
<b>Do you agree that there is an association between periodontitis and systemic diseases?</b>	Yes	154(95.1)
	No	2(1.2)
	No response	6(3.7)
<b>Level of awareness</b>	Limited	127(78.4)
	Fair	30(18.5)
	Good	5(3.1)
<b>Total</b>	<b>162(100.0)</b>	

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Table 3: Level of awareness of participants across gender and cadre

Variables		Level of Awareness			p value
		Limited n(%)	Fair n(%)	Good n(%)	
<b>Gender</b>	Male	79(82.3)	15(15.6)	2(2.1)	0.318
	Female	48(72.7)	15(22.7)	3(4.5)	
<b>Cadre</b>	Registrar	60(84.5)	8(11.3)	3(4.2)	0.214
	Senior Registrar	20(71.4)	8(28.6)	0(0.0)	
	Consultant	47(74.6)	14(22.2)	2(3.2)	

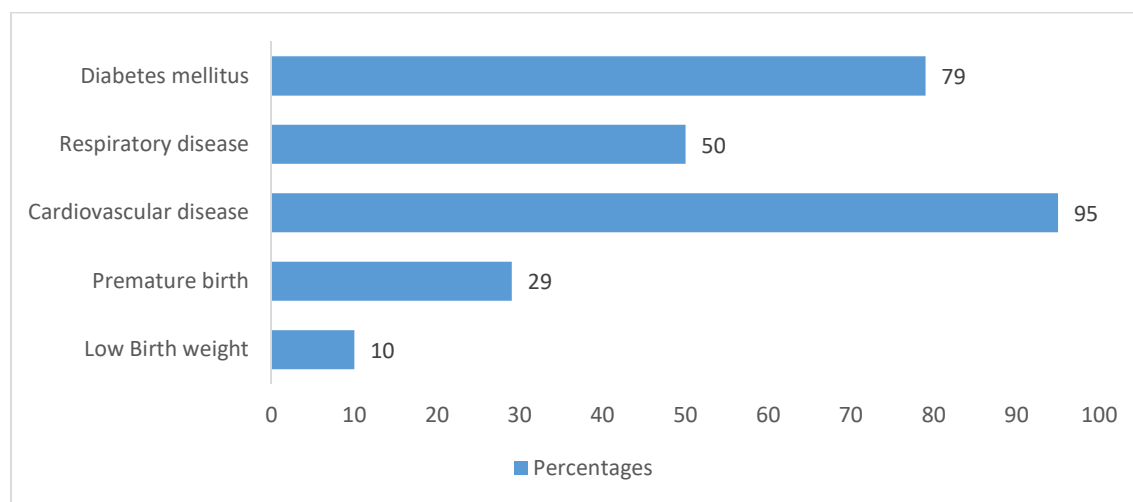


Figure 1: Percentage of awareness about systemic diseases associated with periodontitis among participants

Table 4: History of dental referral for supportive therapy

Patients referral		n(%)
<b>Have you ever referred a patient to the dental clinic?</b>	Yes	43(26.5)
	No	119(73.5)
	<b>Total</b>	<b>162(100.0)</b>
<b>Reason for referral</b>	Check-up	39(90.7)
	Scaling and Polishing	4(9.3)
	<b>Total</b>	<b>43(100.0)</b>

## DISCUSSION

Evidence from the literature, reports that periodontitis affects both the immediate oral environment and systemic organs.<sup>25</sup> Periodontitis, caused mainly by anaerobic microorganisms found predominantly in the subgingival sulcus, leads to oral inflammatory processes, which may increase the systemic inflammatory burden and contribute to diseases in extraoral sites.<sup>26</sup> It is therefore vital for medical doctors to be aware of the association between periodontitis and systemic diseases for informed and prompt dental referral.

In this study, most of the participants reported awareness of the link between periodontitis and systemic condition in line with previous studies.<sup>23,27</sup> The source of information for most of the respondents was books/articles in contrast to a previous study by Umeizudike et al.,<sup>23</sup> where dentists were their source of information and also in contrast to the study by Nagaranki et al.,<sup>28</sup> where media and dentists were the sources of information. The finding in this study suggests that the Dental School of the University of Port Harcourt needs to interact more with their medical colleagues and escalate dental public health services, also it highlights the need for the inclusion of dental topics in the postgraduate medical curriculum. Majority of the participants associated cardiovascular disease and diabetes mellitus with periodontitis in tandem with previous studies by Umeizudike et al.,<sup>23</sup> at the National Postgraduate Medical College of Nigeria, Ijanikin Lagos and that by Opeodu et al.<sup>29</sup> at three tertiary health institutions located at Ibadan, Ile-Ife and Ogbomoso, where majority of the participants agreed that there is an association between periodontitis and diabetes mellitus. The finding in this study also corroborates the report from another study<sup>28</sup> conducted among medical doctors practicing in Nellore District, where only a few participants agreed that there is a link between oral health and premature low birth weight (PLBW). The reason for

this finding is not far-fetched; studies linking periodontitis with cardiovascular disease and diabetes mellitus have long been reported in the literature and well known, while studies linking periodontitis and premature birth/low birth weight, though well reported in the literature, are among the few areas under study in recent times and might not be well known to most medical doctors.

Although majority of the participants claimed to be aware of the association between periodontitis and systemic conditions, the result of the objective assessment showed that majority of them had limited level of awareness as previously reported by Gur et al.<sup>30</sup> However, this is in contrast to the report by Mian et al.,<sup>24</sup> where majority of the participants had good level of awareness. This may not be unconnected to the fact that dental practitioners were among the participants in the study by Mian et al.<sup>24</sup> As regards gender; most of the males and females in this study had a limited level of awareness in contrast with a previous study carried out among Internal Medicine resident doctors by Umeizudike et al.,<sup>31</sup> where both males and females had good level of awareness, this is in contrast to the study by Opeodu et al.,<sup>29</sup> where the males had better level of awareness. The reason for the difference could be due to the non-inclusion of dental topics in the post-graduate medical curriculum in the location where this study was conducted.

A large percentage of the participants had not referred patients to the dental clinic for supportive therapy. Those that referred patients with systemic conditions mainly referred them for dental check-up, this is in contrast with the finding in a previous study, conducted in Nellore district<sup>28</sup> where only 10% of the medical doctors referred patients for regular dental check-up. This finding in this present study is quite encouraging, as any oral disease present can be identified during dental check-ups. The medical practitioners should encourage their patients to attend the dental clinic, not only for check-ups but

also for scaling and polishing. Scaling and polishing is a non-surgical periodontal therapy which reduces the bacterial plaque load (the main aetiological factor for periodontal disease), hence improving periodontal health<sup>32</sup> and eventually systemic health and general wellbeing. Several studies have reported a bidirectional relationship between type 2 diabetes mellitus and periodontitis, such that diabetes mellitus increases the risk and severity of periodontitis, while periodontitis can aggravate insulin resistance and affect glycaemic control.<sup>33,34</sup> Thus, a reduction in glucose level has been reported after non-surgical periodontal therapy in type 2 diabetes patients with periodontitis.<sup>35,36</sup> Hence, the timely and effective management of periodontitis is crucial, not only for oral health but also for overall health.

### CONCLUSION

The majority of the participants had a limited level of awareness of the link between periodontitis and systemic diseases. Only a few of the participants had referred patients for supportive therapy. We recommend, therefore, that there should be better collaboration between medical practitioners and dentists for patients with systemic conditions, and the inclusion of dental topics on this subject, in the curriculum of postgraduate medical students. Oral health education on the topic should be vigorously driven by dental practitioners.

### Source of Support

Nil

### Conflict of interest

None declared

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