

Awareness on Oral Health Considerations in Diabetic Patients

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Running title : Awareness on oral hygiene in patients with diabetes

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ABSTRACT

Background and aim :

The current study is to show the bi-directional associations between oral health and diabetes. The universal biologic mechanisms, demographic and behavioral risk drivers underlying these associations in both directions must be considered.

The aim of the study was carried out to investigate the awareness on oral hygiene in diabetic patients.

Methodology :

A carefully structured questionnaire containing a set of 11 questions was made in google forms. This was distributed among dental students of a private institution. The data was collected and tabulated in excel and exported to SPSS where statistical analysis was done. Results were represented as bar graphs.

Results : Within the limits of the study, it is observed that the students were aware about the oral hygiene and its importance in patients with diabetes. However further research can be done over a longer period of time with a large participation size to get better results.

Conclusion : Prevention is a cornerstone of public health. Within the limits of the study, it is observed that the students were aware about the oral hygiene and its importance in patients with diabetes. However further research can be done over a longer period of time with a large participation size to get better results.

KEYWORDS :

Gingivitis, periodontal disease, oral hygiene, bleeding gums, diabetes

INTRODUCTION :

Dysglycemia, even slightly elevated blood sugar levels, adversely affects oral health, manifesting itself in several oral diseases and conditions. In the opposite direction, any oral infection with its subsequent local and systemic inflammatory responses adversely affects blood glucose levels (1). Moreover, painful, mobile, or missing teeth may lead to intake of soft food items representing a sub-optimal diet and hence poor nutrition, and thereby contribute to incident type 2 diabetes or to poorer glucose control in existing diabetes (2). Treatment of inflammation related oral conditions, such as non-surgical periodontal treatment and extraction of infected teeth, can lead to a clinically significant decrease in blood glucose levels (3). Attention to infectious oral diseases and referral to dental care professionals for treatment can therefore be an important novel tool for medical care professionals in preventing and managing diabetes mellitus (4).

Dental professionals can detect unrecognized potential dysglycemia and refer for medical examination. Such interprofessional, patient centered care may contribute to improved health, wellbeing, and quality of life in people with diabetes. Oral health and diseases of the hard and soft tissues of the oral cavity have not been included in most curricula for medical professionals in modern times, and certainly not the mutually adverse effects of oral and systemic diseases (5). During the most recent couple of decades, scientific evidence for such interrelationship has been mounting, made possible by contemporary scientific methods aided by novel technology and superfast and powerful computers and specialists who are able to interpret this unfathomable abundance of data (6).

This report is intended to summarize and describe the current scientific evidence for the two-way associations between oral health and diabetes. The overarching goal is to introduce attention to the importance of good oral health as a novel tool in the arsenal for medical care professionals in preventing and managing diabetes mellitus and thereby contribute to the wellbeing and quality of life in people with diabetes (4). Because the links between oral health and diabetes mellitus are universal in their underlying biologic mechanisms and demographic and behavioral risk drivers, this review will not be organized by different parts of the world. Rather, the cited scientific reports are selected to represent recent findings from different countries, where appropriate and applicable, and examples of studies from a variety of countries will be mentioned. Both children/adolescents and adults with pre-diabetes or type 2 diabetes, respectively, visit the dentist less frequently than their normoglycemic peers (7). For example, nearly one-quarter of Dutch patients attending family physicians' offices did not have regular dental visits (8).

Persons with diabetes generally have limited knowledge of oral health and no appreciation of its role in general health and diabetes management, coupled with poorer home oral hygiene, especially in hemodialysis patients (9).

Our team has extensive knowledge and research experience that has translate into high quality publications(10–18),(19),(20),(21,22),(23),(24),(25–29)

MATERIALS AND METHOD :

Study design :- A cross sectional questionnaire survey

Study setting :- OPD department in private dental institution in chennai

Study size :- 150

Sampling and scheduling :- owing to the nature of the study and setting, a convenience sampling method was used, and data was collected over a period of one month.

Inclusion and exclusion criteria :- patients with gingivitis and language barrier

Ethical clearance :- prior to the start of the study, ethical clearance was obtained from the institution ethical committee of saveetha university.

Statistical analysis :- the data was collected from student management software where 200 patients were analysed for the prevalence of gingivitis before and after covid by inspecting the gingival index scores. The data was then transferred to SPSS software version 25. Descriptive statistics were done using frequency and percentage. Chi square test was done and p value was less than 0.5 so it was significant. Comparisons were done between independent variables like age, gender of the patients.

RESULTS :

A total of 150 students were included in the analysis. In figure 1 bar chart showing association between gender and responses to the question “are you aware of the risk factors of diabetes and periodontitis”. It is observed that majority of the participants have responded with all of the above, alcohol, smoking and heredity. 68% males and 67% females responded with all of the above. 3% of the males and 2% of the females have responded with smoking. 11% of the females have responded with hereditary which suggests that females are less aware compared to males on the awareness of the risk factors. P value = 0.003, hence the data is statistically significant.

In Figure 2: bar chart showing association between year and responses to the question “are you aware of the risk factors of diabetes and periodontitis”. It is observed that majority of the participants have responded with all of the above, alcohol, smoking and heredity. 19.33% of first years, 18% of second years, 18% of third years, 26.67% final years, 8% of interns responded with the option all of the above. 0.67% of first years and 2% of second years have responded smoking, 2% of second years and 4.67% of final years responded with heredity. This suggests that first year, second years and final years were less aware of all the risk factors. P value = 0.022, hence the data is statistically significant.

In Figure 3 bar chart showing association between gender and the question “what are the oral signs and symptoms of diabetes”. It is seen that majority of the students have responded with all of the above, caries, tooth loss and periodontal disease. 45.33% of males and 34.67% of females have responded with all of the above. 2% of males and 0.67% of females have responded with caries as a risk factor. 6.67% of females have responded with periodontal disease and 10.67% of females responded with tooth loss. P value = 0.000 which is statistically significant.

In Figure 4 bar chart showing association between gender and the question “what are the oral signs and symptoms of diabetes”. It is seen that majority of the students have responded with all of the above, caries, tooth loss and periodontal disease. 0.67% of first years, 16% of second years, 10% of third years, 26.67% final years and 8% interns responded with all of the above. 0.67% of first years, 2.67% second years responded with caries. 2.67% of second years, 3.33% third years and 4.67% final years responded with tooth loss. 2.67% of second years and 3.33% of final years responded with periodontal disease. It is suggestive that final years were most aware. P value =0.000 which is statistically significant.

In Figure 5 bar chart showing association between year of study and the question “what are the common clinical/radiographical findings in diabetic patients”. It is seen that 19.33% of first years, 16% of second years, 10% of third years, 26.67% final years and 8% of interns responded with all of the above. 0.67% of first years, 2% of second years, 3.33% of third years and 4.67% of final years responded with periodontitis. 2.67% of second years responded with delayed wound healing and 2.67% of second years responded with candidiasis.

In Figure 6 bar chart showing association between year of study and the question “what are the common clinical/radiographical findings in diabetic patients”. It is seen that 45.33% of males and 34.67% females responded as all of the above. 2% of males and 3.33% females responded with periapical lesion. 11.33% of females responded with periodontitis. 2.67% of females responded with candidiasis. This is suggestive that males were more aware compared to females. P value = 0.001 which is statistically significant.

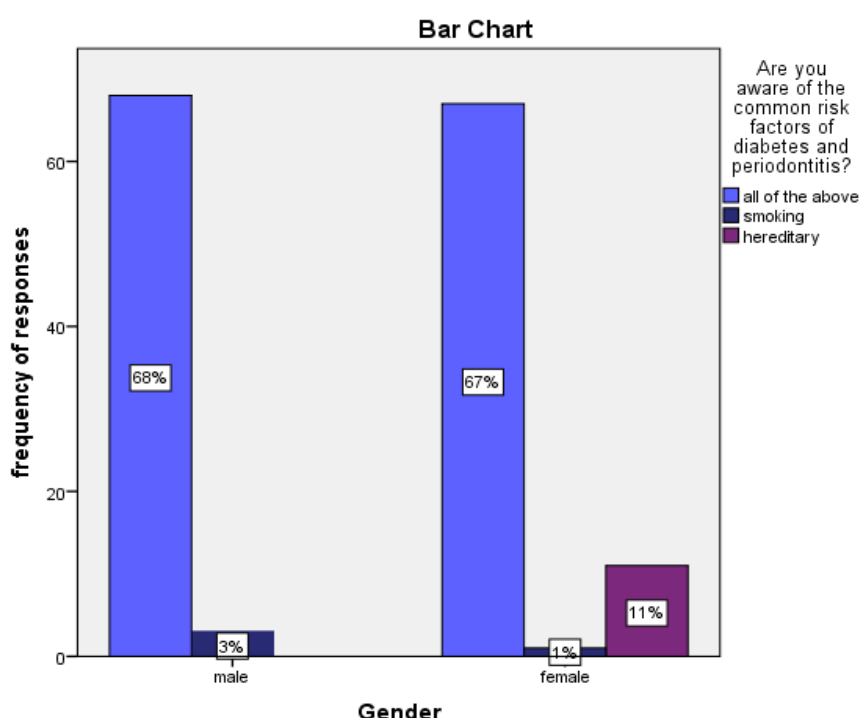


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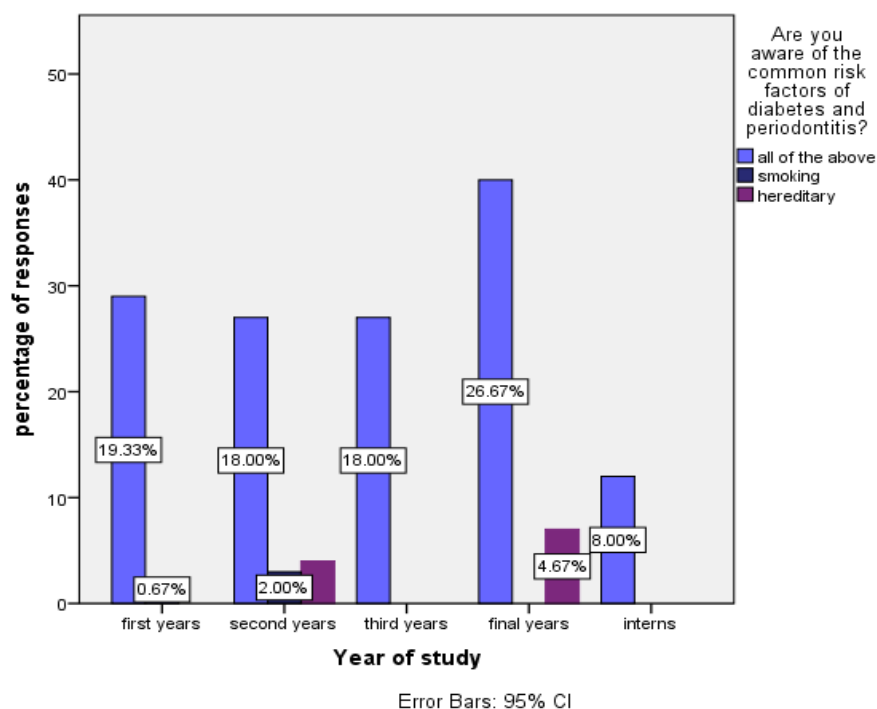


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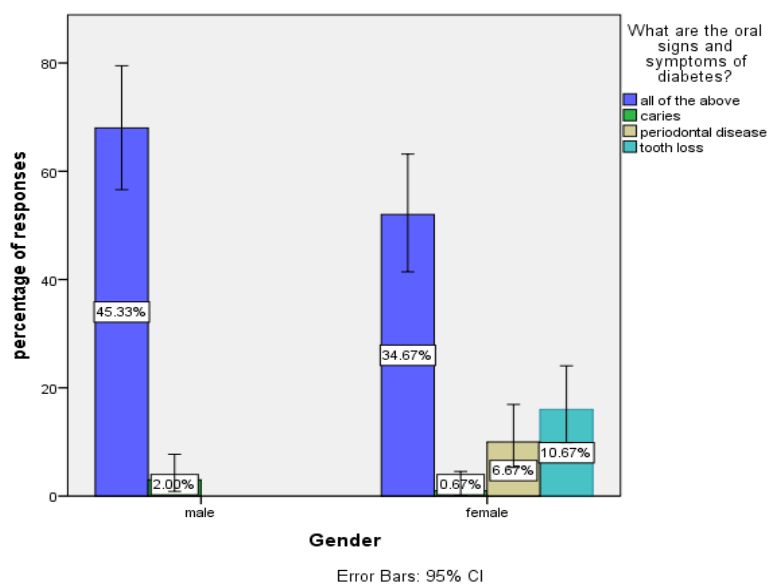


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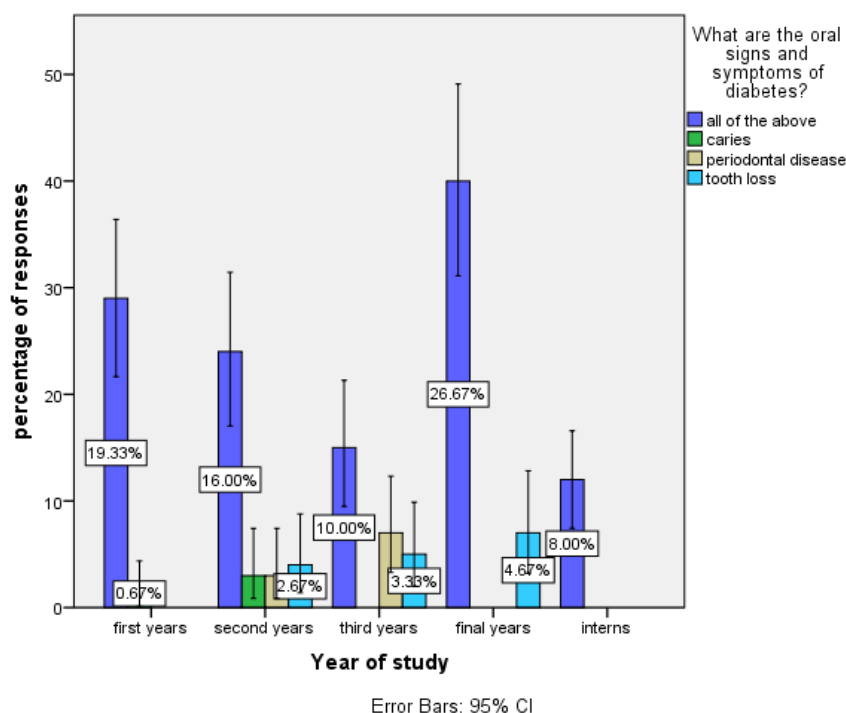


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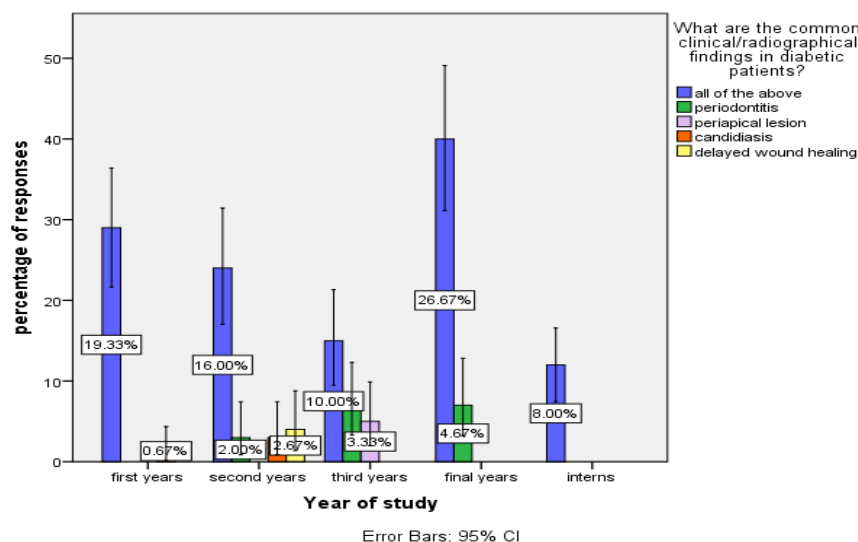


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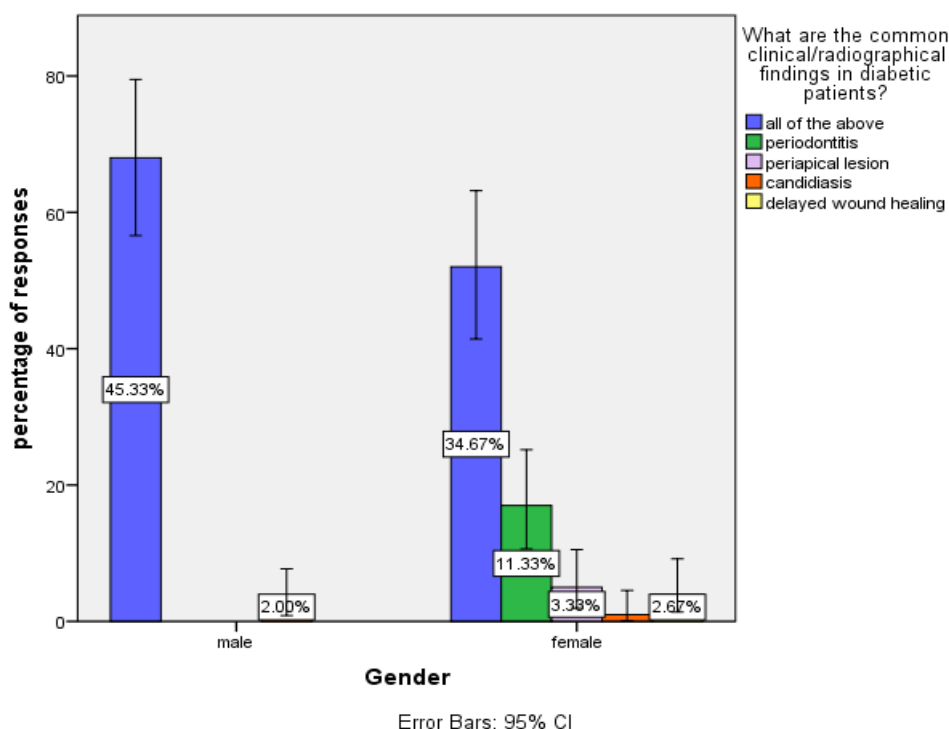


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DISCUSSION :

The first systematic review of effects of periodontitis on diabetes mellitus/hyperglycemia included only studies in which effect directionality could be determined and concluded in 2013 that the scientific evidence suggests that periodontitis adversely affects glycemic control and diabetes complications or promotes development of type 2 diabetes. People with manifest type 2 diabetes, pre-diabetes, or no known diabetes, who have poorer periodontal health, have poorer glycemic control than those with better periodontal health (30). Moreover, people with diabetes, who have poorer periodontal health, have more diabetes-related complications than those with better periodontal health. Longitudinal studies show that people without baseline diabetes, who have poorer periodontal health, have greater risk for developing (incident) type 2 diabetes than those with better periodontal health. These conclusions were confirmed in two 2018 review updates (31).

The ultimate result of untreated periodontitis and caries is tooth loss. Missing teeth – or having teeth that hurt either spontaneously or during biting off or mastication due to being mobile (loose) – leads to trouble eating (biting, chewing, and swallowing) and hence decreases the intake of a healthy diet with fruit and vegetables that often are crisp and hard to bite off and chew. This subsequently can lead to intake of soft foods, often laden with fat, sugar, and salt – exactly what people with diabetes should try to avoid (32).

Any acute or chronic disease or condition in the oral cavity that involves infection and its subsequent local as well as systemic inflammatory responses possesses the ability to increase the blood glucose level. Hence, frequent oral inspections for any such oral diseases would be prudent as part of any diabetes management, followed by any pertinent referral. Hyperglycemia/diabetes and periodontitis are both chronic, inflammation-based diseases that adversely affect each other and also share the same risk drivers, especially cigarette smoking (33). Additionally, inflammatory responses are thought to be the main mechanism underlying the mutually adverse association between diabetes and periodontitis.

Therefore, it is not surprising that these two conditions often occur in the same individuals. Extensive reviews describe these non-modifiable and modifiable common risk factors (34). In periodontitis, commensal oral microbes turn into opportunistic pathogens and easily travel from the periodontal pocket between the tooth surface and the periodontal tissues into those tissues and into the bloodstream by which they travel to all sites in the body (35). Not only can they travel, they do travel. For example, the especially virulent bacterium, *Porphyromonas gingivalis* has developed sophisticated survival mechanisms enabling it to not only survive in the bloodstream, actually circulating while inside the immune cells intended to kill them, but also to multiply and thrive in the new environment in which they lodge in locations located remotely from the oral cavity, such as atherosclerotic plaques (36).

A large body of evidence exists on the impact of oral health on quality of life, often measured by tested and validated instruments translated to multiple languages in many countries (3). Furthermore, even though periodontitis is regarded a “silent” disease due to its potential lack of noticeable signs and symptoms during the majority of its development, up until movement or loosening of the tooth, a systematic review limited to clinically assessed (not self-reported) periodontitis demonstrated the important role of periodontitis in the oral health impact on quality of life (37).

Interestingly, and as synthesized in a 2018 systematic review, a significant proportion of dental patients denying having diabetes, namely almost one-third of dental patients both in Denmark, Saudi Arabia, and the US actually had pre-diabetes or manifest diabetes; or were considered having high risk therefore.

Screening for dysglycemia in dental practice and awareness of oral health applied in medical practice, both followed up by proper reciprocal referrals and potential co-management of mutual patients by medical and dental professionals, should have good potential for benefitting the health – and thereby also improve the quality of life – of mutual patients (38).

Physicians and other medical care professionals could also play a more active role in addressing the oral health of adults. The first step is being aware of the potential role the health of the oral cavity in management of diabetes. Educating and empowering nurses and nurse practitioners has begun (39)

CONCLUSION :

Prevention is a cornerstone of public health. Within the limits of the study, it is observed that the students were aware about the oral hygiene and its importance in patients with diabetes. However further research can be done over a longer period of time with a large participation size to get better results.

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CONFLICT OF INTEREST :

Authors of this study declare no conflict of interest

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