



A Preliminary Survey on Awareness of Periodontal Risk and Oral Health Practices among Diabetic Patients in Hospital Kuala Lumpur

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ABSTRACT

Aim. To determine the level of awareness on periodontal disease risk and the oral health practice among diabetic patients in Hospital Kuala Lumpur and the source of information they receive regarding the periodontal risk among diabetic patients.

Materials and Methods. This cross-sectional study was conducted among confirmed diabetic patients (n=110) through convenient sampling at the Specialist Medical Clinic and Out-patient Department of Hospital Kuala Lumpur. A self-administered questionnaire was constructed incorporating ten items related to sociodemographic data, awareness on periodontal risk and the need for good oral health care. Sources of information regarding periodontal disease risk and their oral health practice were also included.

Results. The response rate for this study was high (93%). Only 26.5% and 19.6% of respondents were aware of the risk of developing periodontal disease and the need for good oral health practice among diabetic patients respectively. Less than a third (25.9%) of the respondent claimed to obtain the information on periodontal risk from their dentists. Eighty percent of patients brushed twice or more a day and only 7% of them used floss for interdental cleaning. One third of respondents visited their dentists for the last 1-2 years. There was a significantly higher proportion of regular attendees who were aware of periodontal risk amongst diabetics as compared to irregular attendees ($p < 0.05$).

Conclusion. Level of awareness on periodontal disease risk and the need for good oral health care was low among diabetics. Even though good toothbrushing frequency was found, the importance of interdental cleaning must be emphasized to diabetic patients. Dentists should play more active roles in informing diabetic patients of their periodontal risk and the needs for good oral health practice.

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INTRODUCTION

Diabetes mellitus is a chronic metabolic disease as characterised by hyperglycaemia secondary to defects in insulin secretion, production or both. In Malaysia, the prevalence has reached up to 16% on selected groups of the population and has the potential to increase every year.¹ Major complications of diabetes mellitus include cardiovascular disease, diabetic nephropathy, peripheral vascular disease and retinopathy. Diabetic patients will also present with higher prevalence of oral disorders, including periodontal disease (inflammatory disorders affecting the supporting structures of teeth), xerostomia,

taste impairment, oral candidosis and oral lichen planus.²

There has been a growing body of evidence showing that patients with diabetes have higher severity of periodontal disease. They are 2-3 times more likely to have periodontitis as compared to non-diabetic patients which is related to long term metabolic control and disease duration.^{3,4} The bi-directional effects of periodontal disease and diabetes have been confirmed by many longitudinal and cross sectional studies where severe periodontal disease at baseline is strongly associated to poor metabolic control and the development of other major complications.⁵⁻⁸ In a meta analysis, many studies have tried to prove that

treating periodontitis through a combination of mechanical and chemical therapy could improve metabolic control among diabetic patients.⁹ Eventhough these studies showed promising results, they were however limited and unconvincing due to variability in study designs.

Given the inconclusive results of the effectiveness of periodontal therapy in improving metabolic control of diabetes, it is important to provide preventive measures and good oral health care to ensure periodontal disease is stabilised. Previous research has emphasised the importance of oral self care and regularly attending their dentists in prevention and treatment of periodontitis.¹⁰ Most diabetic patients with poor oral health care and high Plaque Index had poor glycaemic control.¹¹ Diabetic patients with better tooth brushing efficacy, higher frequency of tooth brushing and lower plaque control had better glycaemic control.¹² Jansson et al.¹³ reported that poor attitude and lack of awareness on periodontal risk among diabetics was related to higher risk of poor periodontal health among diabetic patients.

Many studies have looked at the level of knowledge on the periodontal disease and diabetes link among diabetic patients. Studies in USA, United Kingdom, and Jordan have shown that majority of diabetic patients have low level of periodontal disease risk.¹⁴⁻¹⁶ Until recently, there has been no data regarding the level of awareness on periodontal disease risk and oral health practice among diabetic patients in Malaysia so as to provide a basis to develop interventions for diabetic patients to maintain good oral health practice and glycaemic control. The latter will involve implementation of preventive measures by general dental practitioners and medical personnel to all diabetic patients.

The aims of this preliminary survey were to determine the level of awareness on periodontal disease risk among diabetic patients, and also to determine the oral health practice among diabetic patients. This study was also conducted to determine the source of information which diabetic patients received regarding periodontal disease risk.

MATERIALS AND METHODS

The study was reviewed and approved by the Universiti Kebangsaan Malaysia Dental Faculty ethical committee and Ministry of Health Research and Ethics Committee (MREC) Malaysia NMRR-09-573-4245. A cross sectional study using convenient sampling was carried out at the Medical Specialist Clinic and Out Patient Clinics situated at Hospital Kuala Lumpur. Dentate patients with confirmed diagnosis of diabetes mellitus were invited to participate while they were waiting to be called for their routine diabetes check-up. An information sheet was given to each respondent who agreed to participate. It was read out to the respondents and informed consent was obtained. They were then asked to complete a self-administered questionnaire. Assistance was rendered if they could not read due to vision impairment. Data was collected from July until November 2009.

The questionnaire consisted of 10 items which were developed based on questions drawn from a review of related literature.^{16,17} The questionnaire was reviewed for content validity by 2 dental experts and pre-tested for face validity to 20 patients before they were amended accordingly. The demographic data consists of age, gender, race and educational background. Awareness on periodontal disease risk among diabetic patients was measured by the question: "Are you aware that diabetics are prone to develop gum disease?". Awareness on diabetic patients' need to be extra careful on their oral health practices was measured by asking the respondents "Are you aware that you need to be extra careful to brush, floss and visit your dentists regularly because you are a diabetic patient?". The source of information which the respondents received regarding periodontal risk among diabetic patients, was achieved by asking "Where did you obtain such information regarding periodontal risk among diabetic patients?". Response of "Yes" or "No" was needed for the awareness questions while questions on sources of information, options were given as dentists, medical officers, nurses, reading material and others.

The last section of the questionnaire was on oral health practice which consists of frequency of tooth brushing, frequency of inter-dental cleaning, type of inter-dental cleaning aid used and frequency of dental visits. Frequency of dental visits

once in 1-2 years was set as regular dental attendee.¹⁸

DATA ANALYSIS

Data were analysed using SPSS version 15.0. Descriptive statistics and frequency distributions were used for demographic variables and chi-squared test was used when comparing categorical data. Statistical significance was determined as $p < 0.05$.

RESULTS

A total of 110 patients were approached but 8 patients declined to participate. A response rate of 93% was thereby achieved. As shown in table 1, from 102 participants who consented and completed the questionnaires, majority of them were > 50 years old. Demographic characteristics which included gender, age, education levels and ethnicities were shown in table 1. The percentage of male (45.1%) and female (54.9%) respondents was more or less equal. With respect to the educational level, majority of them were from primary level (63.7%). There were more Malay respondents (54.9%) involved in the study compared to the Chinese (18.6%) and Indians (21.6%).

Table 1. Sociodemographic profiles of the participants

	Demographic categories	n (%)
Gender	Male	46 (45.1)
	Female	56 (54.9)
Age	<20 years	3 (2.9)
	20-29 years	3 (2.9)
	30-39 years	7 (6.9)
	40-49 years	17 (16.7)
	≥50 years	72 (70.6)
Education Level	Primary	65 (63.7)
	Secondary	25 (24.5)
	Tertiary	12 (11.8)
Ethnicity	Malay	56 (54.9)
	Chinese	19 (18.6)
	Indian	22 (21.6)
	Others	5 (4.9)

Respondents' awareness on periodontal risk and the need for extra oral health care among diabetics:

The response to question if the respondents were aware that diabetic patients were prone to develop periodontal disease, revealed that less than one third (26.5%) of the respondents were aware of the risk. Meanwhile only 19.6% of respondents were aware that they need to be extra careful on oral health practice (tooth brushing and visit dentist regularly) because they have diabetes (table 2).

Table 2. Awareness of the risk for periodontal disease and the need for extra oral health care for being a diabetic

	Aware Counts (%)	Not Aware Counts (%)
Diabetic patients are prone to gum disease	27 (26.5)	75 (73.5)
Diabetic patients needs to be extra careful on oral health practices	20 (19.6)	82 (80.4)

Sources of information obtained by diabetic patients:

Figure 1 shows that majority of participants obtained knowledge regarding periodontal risk from their friends and relatives (29.6%) and obtaining this knowledge from their dentists were the second highest (25.9%) source.

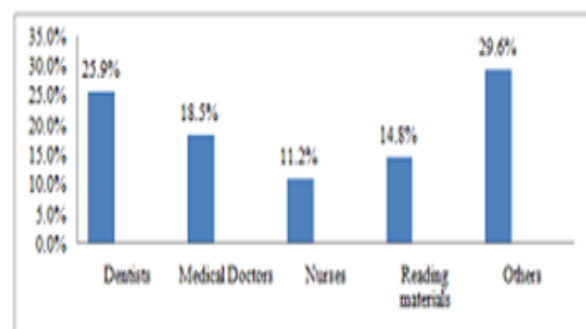


Figure 1. Source of information which respondents received regarding risk of periodontal disease

Oral health practices among respondent.

About 99% of participants brushed their teeth, where 18.6% of the participants brushed once a day and 80.4% of the participants brushed twice or more a day. Only 6.9% of the participants performed some form of interdental cleaning which was

flossing. Only one third (33.3%) of participants visited their dentists for the past 1-2 years ago.

The relationship between awareness of periodontal risk and the need for extra attention on oral health practices with oral health practice is shown in table 3. Those who were aware of the risk and the need for extra oral health practice were

more among those who brushed at least twice a day and among regular attendees. However those who were not aware of either question were also high among the regular attendees and those who had better tooth brushing habits.

Table 3. Respondents awareness on the periodontal risk among diabetics and oral health practice

	Brushing ≥ 2 times / day Counts (%)	Brushing < 2 times / day Counts (%)	Regular dental attendee Counts (%)	Irregular dental attendee Counts (%)
Aware of periodontal risk among diabetics				
Yes	25 (92.6)	2 (7.4)	25 (92.6)*	2 (7.4)*
No	57 (76.0)	18 (24.0)	59 (78.7)	16 (21.3)
Aware of the need of extra oral health practice among diabetics				
Yes	18 (90.0)	2 (10.0)	17 (85.0)	3 (15.0)
No	64 (78.1)	18 (21.9)	67 (81.7)	15 (18.3)

DISCUSSION

In the present study, it was found that less than a third (26.5%) of the respondents were aware of their risk of developing periodontal disease. A smaller percentage of the respondents (19.5%) were aware of the need to have good oral health practice such as toothbrushing, flossing and regularly visit their dentist. These results are in accordance with previous studies,¹⁴⁻¹⁶ whereby most studies found less than 50% of diabetic population knew of their risks in developing periodontitis. Allen et.al¹⁵ found that more than 80% of their respondents knew other major complications of diabetes such as heart disease, circulatory problems, eye disease, and kidney problems as compared to only 33% of the respondents who knew the risk of developing periodontal disease. A growing body of evidence reported strong association between diabetes and periodontal disease,¹⁹ where diabetic patients show greater severity of periodontal disease. Loe²⁰ has ranked periodontal disease to be the 6th complication of diabetes after other major medical complications. Periodontitis has also been found to cause more tooth loss among younger-aged diabetics as they are at least 1.46 times more likely to have at least one tooth removed due to

periodontitis and caries than a non-diabetic patient.²¹ Given the fact that tooth loss may result in oral function disability and affect their quality of life, the importance of periodontitis as one of the complications of diabetes should be emphasized among diabetic patients along with other major complications.²²

Awareness on the need to have good oral health practice was also found to be lower (19.6%) in the present study. Good oral health practice has been found to be the key factor in periodontal disease prevention.¹⁰ Treatment of periodontal disease has the potential ability to improve metabolic control among diabetics, even though conclusive results need further investigation.⁹ Emphasizing good oral care habits potentially will improve periodontal disease and metabolic control in diabetic patients. Dentists should play an active role in assessing their patients' diabetic status and disseminating knowledge on the periodontal risk to all their diabetic patients. In the present study, dentists only account for less than a third (25.9%) of the overall source of information which the respondents received for the knowledge on periodontal risk. The reasons for dentists not advising their patients regarding the association of periodontal disease and diabetes needs further

investigation within our local population. Previous studies reported that dentists were not identifying this high risk group within their practice setting and managing diabetic patients well because they believed that managing and intervening diabetic patients were not their main role as dentists. They also claimed that they need formal training to provide advice regarding periodontal risk.^{23,24} Lack of information (in the form of videos, brochures and leaflets) regarding the association between periodontal disease and diabetes was also found to be the reason for not informing their patients regarding this knowledge.²⁵ Other health personnels (medical practitioners, nurses and dietician) should also play their roles to inform their diabetic patients regarding their risks of developing periodontal disease or refer their patients for dental check up as part of managing diabetic patients.

In this study, 80.4% of all respondents reported toothbrushing frequency of twice or more in a day. This finding is similar to a study among Swedish population, where 88% reported brushing twice daily.⁶ This indicates that brushing more than once a day has been a universal practice among our population group as the sample was taken from an urban population. However the proportion of respondents that performed interdental cleaning was found to be very low (6.9%). This was very low as compared to previous studies by where by their studies reported 35% and 27% of their respondents performed interdental cleaning respectively.^{16,25} This suggests that interdental cleaning is not a common practice among the studied population. Emphasizing interdental cleaning to be as important as toothbrushing should be made to our population as toothbrushing alone will not reach the interproximal areas.

In the present study, only 33.3% of the respondents were regular dental attendees. This was also low as compared to previous study carried out in which 63% of the respondents reportedly visited the dentist for the past one-year.²⁵ The difference between the present study and previous study could be due to the different characteristics of the population studied.

This study have also looked at the respondents who reported awareness of the periodontal risk. This was higher among regular dental attendees and those who brushed more than

twice per day. This would suggest that more information regarding periodontal disease risk and diabetes have been conveyed to the patients when they visit their dentist frequently. In a study by Karouski et al. 2002,²⁵ they have also found that respondents with good knowledge on periodontal disease were among those with frequent dental visits. However, this study also showed that there was also high proportion of regular dental attendees who were not aware of the periodontal disease risk. This suggests that insufficient information on periodontal risk from dentists was gained by diabetic patients in a dental setting.

The present preliminary studies have highlighted a few issues regarding the management of diabetic patients. Firstly, dentists should actively manage their diabetic patients who attend their practices by assessing the type and severity of disease then to discuss with their patients on the association of diabetes with oral health. Dentists should encourage good oral health care to their diabetic patients as part of general health care. Secondly, a multidisciplinary approach is very important in managing diabetic patients. Medical practitioners, diabetic nurses, dietitians, in the diabetic team should be made aware of the periodontal risk which diabetic patients are exposed to. Future research to explore the awareness of these health providers on the relationship of periodontal disease and diabetes and the importance of advising their patients on having good oral health is very much needed. Strategies need to be planned for the diabetic care team to refer their diabetic patients to their local dentists or how oral health care provider can be part of the team to identify periodontal disease during these patient's regular check-up appointments. Dental auxiliaries can be appointed to be part of the diabetic care team who can identify signs and symptoms of periodontal disease and providing oral health education and preventive advice to diabetics.

There are several limitations from this study, one of which is the small sample size. Hence the result cannot be extrapolated to general populations' level of awareness. Secondly, the response on regular attendance to the dentist from this study may not reflect regular dental check-up, as the respondents may be there for a specific reason such as for dental extractions, restorations or

management of dental emergencies for the past 1 to 2 years. Understanding of the items in the questionnaire could have been a problem for the respondents as most of the respondents were elderly and with lower educational level. This preliminary survey will hopefully give a descriptive overview on how much diabetic patients know about periodontal disease risk and maintaining good oral health care.

CONCLUSION

Within the limitation of this study, low levels of awareness was found in the studied population on the periodontal disease risk and the need for good oral health care among diabetics. Dentist should play more active role in disseminating or informing their diabetic patients regarding the association of periodontal disease and diabetes. Good toothbrushing habit but low interdental cleaning was performed among the studied population. Majority of the respondents were irregular dental attendees. Most diabetic patients who were aware of the risk of developing periodontal disease were among the regular attendees and those who have better toothbrushing habits.

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