

Perception and Trends in Referral of Diabetes Patients for Dental Care among Healthcare Workers (HCWs)

Natifah Che Salleh¹, Siew Lian Yaw¹, Khairiyah Abd Muttalib¹, Tahir Aris²,
Norhafizah Sahril², Mohamad Azahadi Omar², Chien Huey Teh²,
Feisul Idzwan Mustapha³, Ahmad Sharifuddin Mohd Asari¹, Fatanah Ismail⁴,
Lee Lan Low⁵

¹Oral Health Division, Ministry of Health, Putrajaya, Malaysia,

²Institute for Public Health, Ministry of Health, Kuala Lumpur, Malaysia,

³Disease Control Division, Ministry of Health, Putrajaya, Malaysia,

⁴Family Health Development Division, Ministry of Health, Putrajaya, Malaysia,

⁵Institute for Health Systems Research, Ministry of Health, Shah Alam, Malaysia

Abstract: This study aimed to determine the perception and practice among healthcare workers (HCWs) in referring diabetes patients for dental care. A self-administered questionnaire for HCWs managing diabetes patients in four states in Malaysia was used. Random sampling of the health clinics was carried out and all health personnel managing diabetes patients were invited to participate in this study. Of the 258 HCWs who participated in the study, slightly more than half of them (55.0%) responded. The majority [73.4% (95% CI: 65.3 - 80.1)] opined that referral of diabetes patients for routine dental check-ups is necessary, but only 26.2% had actually made referral; while 18.7% were uncertain of the need. About two-thirds [65.5% (95% CI: 57.2 – 72.9)] felt that oral health messages should be integrated in health promotion and about two-thirds [64.1% (95% CI: 55.8 – 71.6)] agreed that annual dental check-ups should be in the diabetes management protocol to facilitate dental referral. The study highlights the need to educate HCWs on the association between diabetes and oral diseases and the important need to integrate oral health promotion into mainstream health promotion through common risk factor approach.

Keywords: diabetes patients, dental care, healthcare workers, Malaysia, referral.

I. INTRODUCTION

Diabetes mellitus is a metabolic disease characterised by dysregulation of carbohydrate, protein, and lipid metabolism. Sustained hyperglycemia has been shown to affect tissues in the body and is associated with significant complication of multiple organ systems including the oral tissues.

Many studies show that diabetes predisposes patients to oral infections, and infections exacerbate diabetes-related hyperglycemia [1], [2], [3], [4]. The association between diabetes and oral health, in particular periodontal disease, is yet to be fully defined, be it causative [5], bi-directional or none [6]. Nonetheless, chronic periodontitis has been recognised as the sixth complication of diabetes mellitus [7]. Studies have shown that when periodontitis is treated, diabetes parameters improved [8], [9], [10], [11]. Individuals with diabetes were 1.46 times more likely to have at least one tooth removed than those without diabetes, with stronger relationship seen in younger age groups [12]. Diabetics who receive basic preventive dental care as part of comprehensive health management develop fewer co-morbidities [8], [9], [10], [11]. Similarly, oral health can also benefit from improved diabetes management [8], [9], [10], [11], [13].

In the United States (US), dentate adults (those with some natural teeth) with diabetes were significantly less likely (66%) than those without diabetes (73%) to have visited a dentist within the preceding 12 months [14]. Of the fifty states in the US, only nine recorded more than 71% of diabetics having an annual dental examination [15]. These figures were below the national goal of 75% for the US [16]. In Malaysia, there is a lack of data on diabetics attending dental clinics.

Despite the beneficial relationship between good oral health and fewer diabetes-related co-morbidities, the referral of diabetes patients for dental care is not in the Clinical Practice Guidelines (CPG) for the Management of Diabetic Patients in the public health sector in Malaysia [17]. The objective of this study was to examine the perception and practice in referral of diabetic patients to dental clinics among the healthcare workers (HCWs) in the public sector. The findings of this study are expected to support the recommendation for a system of referral of diabetes patients for dental care.

II. METHODOLOGY

The study protocol was approved by the Medical Research Ethics Committee (MREC) of the Ministry of Health Malaysia in 2011. This was a cross-sectional study conducted in four states in Malaysia; two with lower prevalence and two with higher prevalence of diabetes mellitus than the national prevalence. For each state, four health clinics with dental clinics were randomly selected based on the following clusters, with one clinic per cluster as follows; Health clinic in rural area with Family Medicine Specialist (FMS), Health clinic in rural area without FMS, Health clinic in urban area with FMS and lastly Health clinic in urban area without FMS.

The classification of urban or rural locality was made according to the Department of Statistics Malaysia, where areas with population greater than 10,000 are 'urban' and those below 10,000 are 'rural' [18]. All health personnel (FMS, medical officers, assistant medical officers and nurses) managing diabetes patients in the selected clinics were invited to participate in the survey.

A bi-lingual (English and Malay language) of 12-item self-administered questionnaires was used. The questionnaire was developed through a focus group discussion among assistant medical officers and nurses managing diabetes patients in the Federal Territory of Putrajaya. The questionnaire covered the following; perception on necessity of dental referral for patients with diabetes, practice of dental referral for patients with diabetes, reasons for referring or not referring patients with diabetes for dental care and factors that will facilitate dental referral of patients with diabetes

HCWs were allowed to choose more than one reason for referring diabetes patients for dental care, and only one main reason for non-referral. The self-administered questionnaire was distributed on site to all available HCWs involved in managing diabetes patient during the study period from November 2011 to February 2012.

The prevalence estimates and 95% confidence intervals (CI) were generated for descriptive statistics of HCWs' socio-demographic profile, reasons for referral and non-referral, and HCWs' suggestions to facilitate referral of diabetes patients for dental care. Cross tabular analysis examined the relationships between HCWs' job categories, gender, clinic location and their perception and referral of diabetes patients for dental care. For statistical analysis, the Stata Statistical Software version 11 was used [19].

III. RESULTS

Out of 258 HCWs in the selected clinics, only 142 (55.0%) responded. Further to this, post hoc power analysis was undertaken to estimate the power of this study and its ability to detect a difference, if indeed the difference exists within the respondents. The analysis yielded a high post-hoc power of study value at 99.2%.

There were more females (64.1%) than males; and slightly more in urban (54.2%) than in rural health clinics (**Table I**). One third were nurses (34.3%), another third were medical officers (32.9%), 26.4% were assistant medical officers and 6.3% were FMS. The mean age was 35.5±9.3 years; the mean years in the public sector was 10.79±8.8 and the mean years managing diabetes patients was 4.53±4.5.

TABLE I: Socio-demographic Profile of the Healthcare Workers (HCWs)

Variable	n	%
Total number of HCWs	142	100.0
Gender		
Male	51	35.9

Female	91	64.1
Location		
Urban	77	54.2
Rural	65	45.8
Job Category (n=140) *		
Family Medicine Specialist	9	6.3
Medical Officer	46	32.9
Assistant Medical Officer	37	26.4
Nurse	48	34.3

*No response from two (2) respondents

Majority of the HCWs who responded [73.4% (95% CI: 65.3 - 80.1)] agreed that it is necessary to refer diabetes patients for dental care (**Table II**); 18.7% (95% CI: 13.0 - 26.2) were uncertain of the necessity, while a small proportion [7.9% (95% CI: 4.4 - 13.8)] perceived that referral were unnecessary.

TABLE II: Perception among the HCWs on Necessity of Referral for Routine Dental Check-Up for Diabetes Patients

Variables	Referral is necessary				Referral is not necessary				Uncertain about need to refer			
	n	%	95% CI		n	%	95% CI		n	%	95% CI	
			Lower	Upper			Lower	Upper			Lower	Upper
All HCWs (n=142)	102	73.4	65.3	80.1	11	7.9	4.4	13.8	26	18.7	13.0	26.2
Gender												
Male	35	68.6	54.5	80.0	4	7.8	2.9	19.3	12	23.50	13.8	37.2
Female	67	76.1	66.0	84.0	7	8.0	3.8	15.9	14	15.90	9.6	25.2
Location												
Urban	52	70.3	58.8	79.7	7	9.5	4.5	18.7	15	20.3	12.5	31.1
Rural	50	76.9	65.0	85.7	4	6.2	2.3	15.5	11	16.9	9.5	28.3
Job Category												
FMS *	7	77.8	41.5	94.5	1	11.1	1.5	50.6	1	11.1	1.5	50.6
MO **	29	65.9	50.7	78.4	4	9.1	3.4	22.1	11	25.0	14.3	40.0
AMO ***	25	67.6	50.9	80.7	2	5.4	1.3	19.4	10	27.0	15.1	43.6
Nurse	39	83.0	69.3	91.3	4	8.5	3.2	20.8	4	8.5	3.2	20.8

Slightly more than a quarter [26.2% (95% CI: 19.6 - 34.2)] had usually referred diabetic patients for dental care (**Table III**). Referral practices did not differ significantly by gender [males; 21.6% (95% CI: 12.3 - 35.1); females; 28.9% (95% CI: 20.4 - 39.2)], and also did not differ significantly across location and job categories.

TABLE III: Current Practice in Referral of Patients with Diabetes to Dental Clinic among the HCWs

Variables	Had referred diabetes patients for dental care				Had not referred diabetes patients for dental care			
	n	%	95% CI		n	%	95% CI	
			Lower	Upper			Lower	Upper
All (n=141)	37	26.2	19.6	34.2	104	73.8	65.8	80.4
Gender								
Male	11	21.6	12.3	35.1	40	78.4	64.9	87.7
Female	26	28.9	20.4	39.2	64	71.1	60.8	79.6
Location								
Urban	20	26.3	17.5	37.5	56	73.7	62.5	82.5
Rural	17	26.2	16.8	38.3	48	73.8	61.7	83.2
Job Category								
FMS *	2	22.2	5.5	58.2	7	77.8	41.8	94.5
MO **	15	32.6	20.6	47.5	31	67.4	52.5	79.4
AMO ***	6	16.2	7.4	32.0	31	83.8	68.0	92.6
Nurse	12	25.5	15.0	39.9	35	74.5	60.1	85.0

*FMS : Family Medicine Specialist , **MO : Medical Officer , ***AMO : Assistant Medical Officer

The most common reason for referring diabetic patients for dental care was the presence of ‘symptomatic problem’ [77.8% (95% CI: 61.2 – 88.6)], followed by ‘routine dental check-up’ [41.7% (95% CI: 26.7 – 58.3)] and ‘requested by patient’ [38.9% (95% CI: 24.4 – 55.7)] (Table IV). The three most common reasons for non-referral were ‘patients will seek treatment on their own’ [68.3% (95% CI: 58.5 – 76.7)], ‘oral healthcare is not part of diabetes management protocol’ [17.8% (95% CI: 11.5 – 26.7)] and ‘I do not think it is necessary to refer diabetes patients to the dental clinic’ [8.9% (95% CI: 4.7 – 16.4)].

TABLE IV: Reasons for Referral and Non-Referral of Patient with Diabetes for Dental Care by HCWs

Reasons	n	%	95% CI	
			Lower	Upper
1. Reasons for referral (n=37) †				
a. Symptomatic problem	28	77.8	61.2	88.6
b. Requested by patient	14	38.9	24.4	55.7
c. Routine dental check up	15	41.7	26.7	58.3
2. Reasons for non-referral (n=101) ‡				
a. I do not think it is necessary to refer diabetes patients to the dental clinic	9	8.9	4.7	16.4
b. The patient will seek oral healthcare on their own	69	68.3	58.5	76.7
c. It is time-consuming to write a referral to the dentist	1	1.0	0.1	6.8
d. Oral healthcare is not part of diabetes management protocol	18	17.8	11.5	26.7
e. Dental clinic is not in the same premises as the health clinic	1	1.0	0.1	6.8
f. Other reasons	3	3.0	0.9	8.9
† Multiple response (A respondent may select more than one reason)				
‡ A respondent select only one reason				

Of the respondents, about two-thirds [65.5% (95% CI: 57.2 – 72.9)] agreed that oral health messages should be included in health promotion for diabetics to facilitate the referral of diabetes patients for dental care. About two-thirds [64.1% (95% CI: 55.8 – 71.6)] also concurred that annual dental check-ups should be included in the diabetes management protocol. Other responses included encouraging diabetic patients to go for dental check-up during counselling sessions [59.9% (95% CI: 51.5 – 67.7)], creating awareness among HCWs [50.0% (95% CI: 41.8 – 58.2)], having a simpler referral system [44.4% (95% CI: 36.3 – 52.7)] and strengthening communication between medical and dental personnel [35.2% (95% CI: 27.7 – 43.5)] (Table V).

TABLE V: Suggestions by HCWs to facilitate the referral of patient with diabetes to dental clinic (n=136) †

Suggestions	n	%	95% CI	
			Lower	Upper
a. Health promotion talks to include oral health	93	65.5	57.2	72.9
b. Include an annual dental check-up in the diabetes management protocol	91	64.1	55.8	71.6
c. Encourage diabetes patient to go for dental check up	85	59.9	51.5	67.7
d. Create awareness amongst healthcare staff	71	50.0	41.8	58.2
e. A simple referral system	63	44.4	36.3	52.7
f. Strengthen communication between medical and dental clinics	50	35.2	27.7	43.5
g. Others	6	4.2	1.9	9.2
† Multiple response (A respondent may select more than one reason)				

IV. DISCUSSION

There is a paucity of literature regarding HCWs' referral of diabetes patients for dental care. In this study, although the majority of HCWs (73.4%) opined that it is necessary to refer diabetes patients for dental care, only 26.2% actually made the referral. Hence, opinions or perceptions do not necessarily reflect practice. It is also likely that the respondents who agreed on the necessity for such referral may also be exhibiting a Hawthorne effect, responding with what they felt was expected of them. However, the 26.2% of HCWs who did refer diabetes patients for dental care in this study is higher than the study by Sreenivas et al. (2013) [20] which showed only 10% of medical doctors referred their patients for regular dental check-ups if the patients do not request for such referral. Additionally, 18.7% of HCWs were uncertain of the necessity for dental referral, reflecting a lack of awareness among HCWs on the association between diabetes and oral diseases, especially periodontal disease. This was supported by the main reason for non-referral chosen by the majority of HCWs who perceived that their diabetes patients 'would seek dental care on their own' (68.3%).

This study also showed that HCWs mainly referred their diabetes patients for dental care when the patients complained of dental problems, hence making 'symptomatic' referral rather than preventive. The situation emphasises the great need to integrate oral health prevention messages into mainstream health promotion messages, especially for patients with non-communicable diseases (NCDs) before they present with symptoms. In addition, this study showed almost 40% of HCWs made referral for dental care when the diabetes patients requested for the referral. Thus, promotion strategies must equally target both patients and healthcare providers. This will contribute to better management of the diabetic condition(s) towards improved quality of life for diabetics.

The HCWs chose four main factors to facilitate referral of diabetics for dental care; 1) to include oral health in health promotion for diabetes patients, 2) to include annual dental check-up in the Clinical Practice Guideline (CPG) for the management of diabetes patients, 3) counselling of diabetes patients to include the importance for annual dental check-ups, and 4) creating awareness among HCWs on the diabetes-oral disease association.

The limitation of this study was the low response rate of the HCWs, which in its own way may also reflect a lack of importance attached to dental care, and not just for diabetics. Attempts to increase participation by extending the data collection period until February 2012 with personal persuasion to HCWs added, were all to no avail. This bears out the perception of lack of importance placed on dental care. This finding provided insight into the lack of awareness and apathy of HCWs towards dental care, more so for patients with co-morbidities. Nevertheless, as this study utilized a convenient sample of public sector HCWs, the findings cannot be inferred to all public sector HCWs.

V. CONCLUSION

This small study, in spite of its limitation, indicates a number of important issues. The fact that the study failed to harness more respondents in spite of attempts to encourage participation, indicates the urgent need for action to create awareness and to educate HCWs on the association between oral diseases and NCDs, especially the importance of dental referral for diabetes patients. More important, the findings of this study underline the need for an integrated common risk approach for oral health promotion into mainstream health promotion messages and materials. The acknowledgement by the HCWs that they be further educated on diabetes and oral health, that diabetics be counselled for dental care, and that annual dental check-up be incorporated into the Clinical Practice Guidelines (CPG) for the Management of Diabetes Patients would pave the way for the whole health profession to act concertedly on these suggestions.

The 7th Edition Australia Diabetes Management Guideline states that a dentist is a team member in managing patients with diabetes [21]. The authors hope that the findings of this study will lend further support to the acceptance of dentists as a member of the team managing diabetic conditions, as acknowledged in Australia. To lend further justification to these recommendations is the need for the Malaysian dental profession to seriously consider the following – to conduct further research to specifically document oral health status of groups of 'pre-diabetes' and diabetes patients, and the impact of oral diseases on their quality of life. In view of the increasing percentages of patients with 'pre-diabetes' (4.9%) and full-blown diabetes (15.2%) from the results of the National Health and Morbidity Survey 2011 [22], it is of utmost importance that the medical and dental profession collaborate for the welfare of our diabetes patients.

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