Victorian oral health professionals' knowledge of *Type*-2 Diabetes.

#1862

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Introduction

Diabetes is increasing at a faster rate than other chronic diseases such as heart disease and cancer in Australia. Despite this, little is known about the management of patient with diabetes, undiagnosed diabetes/pre-diabetes or at risk of diabetes in the oral health care setting. In addition to the number of undiagnosed diabetes/pre-diabetes, it is important that oral health professionals are aware of and understand diabetes mellitus (DM), in terms of clinical practice and patient education. The starting point for living well with diabetes is early diagnosis. To effectively promote chairside medical screening by dentists, one of the necessary elements is an understanding of their knowledge about diabetes. According to the theories of planned behaviour and reasoned action, knowledge, together with attitudes and beliefs, is a strong predictor of intentions and intention predicting behaviour forms the fundamental of these theories.[1,2,3]

Objective

As part of a larger study on the management of diabetes, pre-diabetes, and patient or at risk of diabetes by Oral Health Professionals (OHPs - dentists, dental hygienists, dental therapists, and oral health therapists), this study aims to describe the knowledge of Type-2 diabetes (T2D) in a sample of OHPs practising in Victoria, Australia; and to identify factors associated with the knowledge scores. This information could be used inform the development of continuing education programs specifically focused on T2D prevention, and identification and management of T2D.

Methods

The study was a cross-sectional survey of Oral Health Practitioners in Victoria, Australia. With the approval of the Human Research Ethics Committee at the University of Melbourne, a request was submitted to the professional associations representing Victorian OHPs (Australian Dental Association Victoria Branch; Dental Hygienists Association of Australia; Australian Dental and Oral Health Therapists Association), to distribute the survey (i.e. invitation-letter with URL of online survey) to their members. This analysis includes responses received from September 2017-January 2018 (n=181).

Variables included in this analysis: five socio-demographic and work-related characteristics:

a) **Socio-demographic** [gender]
b) **Occupational characteristics** considered in this assessment included:
- Professional groups: 'Dental Hygienists (DH)'; 'Oral Health Therapists (OHT)'; and 'Dental Therapists (DT)'. Dentists were sub-divided into 'General Dental Practitioners (GDP)' and 'Dental Specialists'.
- **Professional experience in years.**
- **Work location:** 'Urban', or 'Rural'.
- **Work Sector:** 'Private only'; 'Public only'; and 'Mixed'.

c) **Knowledge about T2D** included self-assessed T2D general knowledge (items=7); knowledge of T2D risk-factors (items=9) utilizing a 5-point numerical scale (1 = 'Strongly agree' to 5 = 'Strongly disagree'); and knowledge of T2D complications (items=7) utilizing a 4-point numerical scale (1 = 'Negligible' to 4 = 'Significant').
Knowledge scores were computed by adding correct responses within each component. The overall knowledge score was calculated by adding all twenty-three items.

Data analysis

The analysis provides descriptive information on the participants' work and various socio-demographics. Bivariate associations were evaluated with Chi-squared analysis and one-way analysis of variance (ANOVA). In order to better understand the association between the combination of socio-demographic and work variables and overall T2D knowledge, a stepwise multiple linear regression analysis (MRA) was performed. All p-values <0.05 were considered significant. Data manipulation and analyses were conducted using IBM SPSS Statistics (Version 23.0, IBM Corporation, Endicott, NY, USA).

Results

181 OHPs respondents were part of this analysis. The majority of this group were dentists (76.7%; n=138), either General Dental Practitioners (GDP) (60.0%) or Dental Specialists (11.7%). Another 14.4% (n=26) were OHTs; 5.0% (n=9) were DHs; and the remaining 3.9% (n= 7) were DTs (See Table 1).

Table 1. Demographic and work characteristics of oral health professionals in Victoria, Australia.

	Dentists (n=138)	DHs (n=9)	OHT (n=26)	DTs (n=7)
Gender **	%	%	%	%
Male	52.9	--	19.2	14.3
Female	47.1	100	80.8	85.7
Duration of practicing ***				
5 years or less	14.6	12.5	53.9	14.3
6-10 years	13.8	--	42.3	14.3
11-15 years	30	37.5	3.8	28.6
>25 years	41.6	50	--	42.9
Place of residence				
Urban	76.5	100	68	57.1
Rural/Regional	23.5	--	32	42.9
Work sector *				
Private	72.8	100	65.4	28.6
Public	22.2	--	26.9	71.4
Mix	5.1	--	7.7	--

Chi- squared test; p-value: *0.05; **0.001; ***0.0001

By gender, 60.6% were female. By work sector, the majority (72.8%) nominated the private sector; about one quarter, worked in the public sector (22.2%), and 5.0% of the participants indicated a combination of private and public-sector work, with no statistically significant difference by professional background. Differences in professional experience by gender were statistically significant by oral health profession (p<0.001). Those working exclusively as an OHT/DH/OHT were predominantly female.

When participants were asked about the location of their workplace, the majority (75.7%) indicated an 'Urban/Suburban' location; 24.3% indicated a regional location and 6.0% a rural location. Regarding the length of time practicing as an OHP, 35.5% indicated more than 25 years of practice; 26.2% between 11 and 25 years; 20.9% reported 5 years or less of practice; and the remainder 17.4% reported between 6 and 10 years of practice. Differences by duration of practice between groups were statistically significant (p<0.0001).

Knowledge of T2D

Almost all OHPs (96.4%) indicated that DM may go unrecognized by the patient for many years from the actual onset. However, about 40% OHPs were unsure about the glycated haemoglobin level (HBA1c) indicative of good glycaemic control (i.e., < 5.7%) (Table 2).

Table 2. Type-2 diabetes knowledge of oral health professionals in Victoria, Australia.

General Knowledge	SD/D*¥	Neutral	A/SA*
DM may go unrecognized by the patient for many years from the actual onset	0.0/1.7	2.2	49.7/46.4
Early identification of "at-risk individuals" can delay or prevent the onset of the disease, with minimal complications	0.0/1.1	3.3	53.6/42.0
Periodontal treatment by scaling and root surface debridement may improve glycaemic control in people with DM	1.1/8.4	17.4	48.9/24.2
Some ethnic groups such as Aboriginals and Torres Straits Islanders are at increased risk of DM	0.0/0.6	8.3	38.7/52.5
Recognizing uncontrolled DM is difficult because DM patients respond to periodontal therapy similarly to non-diabetics	20.6/52.2	17.8	8.9/0.6
There is good evidence to support the bi-directional link between periodontal disease and poor glycaemic control(F)	0.0/2.2	13.3	57.9/26.7
Patients reporting a glycated hemoglobin level (HBA1c) of less than 5.7% is indicative of good glycaemic control	0.0/3.3	36.7	37.2/22.8
Risk factors knowledge	SD/D	Neutral	A/SA
Genetics	0.0/4.5	9.6	52.2/33.8
Periodontitis	1.1/8.4	27	52.8/10.7
Increasing age	1.7/6.3	12.5	60.8/18.8
Physical inactivity	0.0/1.7	2.8	53.9/41.6
High blood pressure	0.6/12.4	29.2	41.6/16.3
Increased stress	0.0/8.5	28.8	48.6/14.1
Smoking	1.1/14.0	25.3	42.1/17.4
Alcohol use	0.6/8.5	26.6	48.0/16.4
Systemic inflammation	0.0/1.7	18	58.4/21.9
Complications Knowledge	Negligible	Low	Moderate	Significant
Cardiovascular disease	1.2	2.9	31.2	64.7
Foot ulcers	1.7	6.3	29.7	62.3
Blindness	1.7	4.6	31.4	62.3
Kidney failure	0.6	4.6	36.4	58.4
Tooth mobility	1.7	7.4	49.7	41.1
Stroke	2.3	13.1	45.1	39.4
Osteoporosis	10.4	41	36.4	12.1

¥: n=181; * SD: Strongly disagree; D: Disagree; A: Agree; SA: Strongly Agree.

Regarding knowledge of T2D risk factors, while the majority (95.5%) indicated lack of physical activity as a risk factor, one third or more of respondents (35% - 42%) did not consider periodontitis, high blood pressure, smoking, increased stress and alcohol use as a risk factor for T2D. Concerning knowledge of T2D complications, OHPs indicated that osteoporosis (12.1%) and stroke (39.4%) were a significant complication of DM compared to other complications questions.

Participants had an overall mean knowledge of 17.1 (sd 3.5; range: 7.5-23). Knowledge component means were; general knowledge: 5.7 (sd 1.2; range: 2.0-7.0); knowledge of risk-factors: 6.8 (sd 2.0; range: 1.0-9.0); and knowledge of complications: 4.7 (sd 1.6; range: 1.0-7.0), with no significant difference by OHPs. Thus, while the majority OHPs had an overall sufficient T2D knowledge, by component there were knowledge deficits regarding T2D complications, and, to some extent T2D risk-factors. None of the work-related variables yielded a significant main effect on the overall knowledge score. However, in the multivariate analysis, after controlling for other work related and socio-demographic variables, dental therapists scored lower on knowledge than other OHPs [p=0.05]. The variance for T2D knowledge, using the full model, was 2.0%.

Discussion

T2D is an important public health issue, OHPs have an important role in T2D prevention and identification. Participants were found to have an overall fair knowledge about T2D. Nevertheless, to provide effective screening of T2D in dental settings, their knowledge on specific issues (e.g. risk-factors, and complications) should be addressed by including evidence-based information.

Significant difference in T2D knowledge by OHP were found. Dental therapists scored lower than other OHPs. However, DTs see mostly children and young people, so may not perceive diabetes to be prevalent in their patient group. Nonetheless, the explanatory power of the final model was low. This suggests that variables not considered in this study might add explanatory power to the model.

It would be important to explore mechanisms to increase OHP knowledge about T2D through undergraduate and continuing professional development. The goal is for the whole health team to work collaboratively and to build a more integrated approach to T2D prevention, identification and management.

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