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Oral Health Content in Diabetes Self-Management Education Programs

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Abstract

Oral health information was included in 89.5% of diabetes education programs in states with high diabetes prevalence compared to 85.9% in low prevalence states ($P=0.22$). However, management of dry mouth, demonstrations and return demonstrations of oral hygiene techniques were covered by 27.0%, 10.1% and <1% programs, respectively.

Keywords

Diabetes Self-Management Training; Oral Health Education; Certified Diabetes Educators

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Author Contributions

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Conflict of Interest

The authors declare that they have no conflict of interest.

Many adults with diabetes are unaware of their susceptibility to oral complications (e.g., periodontal disease) [1]. They are also less likely to have seen a dentist in the past year [2]; therefore, oral health education from health care providers is essential. A preliminary report indicated significant associations between specific oral health information received from health professionals and the corresponding improvement in self-reported oral health behaviors among adults with diabetes [1]. However, very limited data on oral health education provided by health care providers in adults with diabetes existed. Yuen and associates found that certified diabetes educators (CDE) in the state of South Carolina (SC) do not routinely provide comprehensive oral health education to people with diabetes [3]. In order to better understand the extent of oral health information included in the diabetes self-management education programs (DSMEP), a survey of the DSMEP was conducted to determine whether there are differences in oral health information provided by programs in states with a high prevalence versus a low prevalence of diabetes. Results obtained from this study will provide information for the CDE and/or other health care providers to direct appropriate education and resources for improving oral health among people with diabetes.

Methods

We reviewed diabetes prevalence estimates per every 100 U.S. adults in each state and selected DSMEP from six states with the highest diabetes prevalence (West Virginia [11.5], Tennessee [11.3], Mississippi [11.0], Oklahoma [10.1], Alabama [10.1], and Kentucky [9.9]) and six states with the lowest prevalence (Colorado [5.3], Minnesota [5.7], Utah [5.8], Alaska [6.0], Wisconsin [6.4], and Montana [6.5]) as reported in 2007 [4]. We identified and contacted (by telephone and supplemented with fax) all of the 552 DSMEP that are recognized by the American Diabetes Association from these 12 states. A list of programs was found on the following website: (http://professional.diabetes.org/ERP_List.aspx) (accessed 5 May 2009). The mean ($\pm$ standard deviation [SD]) number of programs per state was 46 ± 42.1 ranging from 6 (in Alaska) to 138 (in Minnesota).

A 13-question survey instrument drawn from our previous study was used [3]. Representatives from the DSMEP were asked whether their diabetes curriculum includes an oral health component or any oral health information. If the representatives responded “yes” to this question, they were then asked to identify coverage of 12 specific oral health topics (see Table 1). If the response to this first question was “no”, no further questions were asked and the response value of the 12 topics was treated as “no”. The survey data were collected between mid-May 2009 and mid-October 2009.

Data analysis

We compared the odds of responding “yes” per question between DSMEP in high versus low diabetes prevalence states. We used generalized estimating equations (GEE) type logistic regression to accommodate for potential correlation among DSMEP with identical program-ID-numbers due to similar characteristics among these satellite DSMEP [5, 6]. We used an exchangeable working correlation, meaning DSMEP with identical program-ID-numbers were all mutually correlated to the same extent. The reported P-values are based on the GEE empirically-corrected standard errors, which are robust to this working correlation structure [7]. All analyses were performed using SAS (version 9.2; SAS Institute; Cary, NC).

Results

Overall, 358 DSMEP responded to the survey (64.9% response rate). After excluding 13 DSMEP with no CDE or mainly work with small children, we had 345 programs for data analysis. Of which, 301 (87.3%) reported that their curriculum included an oral health component or some oral health information. The percentage of DSMEP per state including

oral health information in the curriculum was 89.5% among the high diabetes prevalence states and 85.9% among the low diabetes prevalence states ($P=0.22$ for the difference in odds). The percentage of respondent DSMEP that provided oral health information for each of the 12 specific oral health topics varied greatly. Topics of preventing dental problems (i.e., daily brushing and flossing, and regular dental care) and those specifically related to diabetes and oral health (such as effect of periodontal disease on diabetes, and effect of uncontrolled diabetes on periodontal disease) were covered by 70% DSMEP. Of note, managing dry mouth, showing patients proper tooth brushing and flossing techniques and having patients demonstrate recommended proper oral hygiene techniques were covered by 27.0%, 10.1% and <1% programs, respectively. Comparing the high to low diabetes prevalence states, there were significant differences in odds for responding “yes” to the topics “show patients proper tooth brushing (and flossing) techniques” and “managing dry mouth” ($P=0.02$).

Discussion

The majority of the respondent DSMEP from the 12 selected states in the current study included oral health information in their curricula, which is consistent with the results from our previous CDE study conducted in South Carolina [3]. However, this comparison is based on the aggregate responses of “adequate” and “not adequate” from the SC CDE study. It is unknown in the current study that the oral health information provided by the DSMEP was regarded as “adequate” or “not adequate”, as this was not the focus of inquiry in the present study.

Results indicated that more respondent DSMEP in the high diabetes prevalence states include demonstrations of brushing and flossing techniques by educators and by patients, as well as management of dry mouth. These findings may reflect a more comprehensive oral health education approach among DSMEP in the high diabetes prevalence states to assist in meeting the oral health needs of this growing population.

Overall, these three oral health topics (management of dry mouth=27.0%; demonstrations of proper brushing and flossing techniques=10.1%; and return demonstrations of recommended proper oral hygiene techniques by patients <1%) are considered to be major deficiencies in the diabetes curriculum. Since prior researchers have found that many adults with diabetes are unaware of their susceptibility to periodontal disease [1] and visit the dentist less frequently than people without diabetes [2], including management of dry mouth, demonstrations and return demonstrations of proper oral hygiene care offers opportunities to CDEs and other health professionals for improving patients’ oral health.

Dry mouth is a common diabetes-related phenomenon [8–10]. The decrease of salivary flow may predispose individuals with diabetes to dental caries and oral candidiasis [11]. Recommending appropriate strategies and over-the-counter products to alleviate dry mouth is therefore important. While hands-on training in appropriate oral hygiene techniques requires additional time, adults with diabetes who are unaware of their susceptibility to periodontal disease or who do not receive adequate training and opportunities for oral hygiene practice may be less likely to perform these techniques, or perform them improperly at home.

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Table 1

Percent of respondent programs reporting coverage of oral health topics in the diabetes self-management education programs (DSMEP)

Items	Proportion of DSMEP responding "yes" by state specific diabetes prevalence group			High vs. low prevalence states
	Six highest states	Six lowest states	Overall	
Part 1	n ₁ =133 DSMEP	n ₂ =212 DSMEP	N=345 DSMEP	<i>P-value</i>
Inclusion of an oral health component or any oral health	89.5%	85.9%	87.3%	0.22
Part 2				
Getting regular dental care	88.0%	85.4%	86.4%	0.43
Importance of good oral hygiene to prevent dental problem	85.0%	84.0%	84.3%	0.52
Effect of uncontrolled diabetes on periodontal disease	80.5%	75.5%	77.4%	0.06
Daily brushing and flossing	80.5%	74.1%	76.5%	0.13
Effect of periodontal disease on diabetes	69.9%	72.2%	71.3%	0.93
Signs of dental disease	66.2%	64.6%	65.2%	0.23
Care of denture	48.1%	47.2%	47.5%	0.996
Managing dry mouth	33.8%	22.6%	27.0%	0.02
Show patients proper tooth brushing techniques	15.8%	6.6%	10.1%	0.02
Show patients proper flossing techniques	15.8%	6.6%	10.1%	0.02
Have patients demonstrate recommended brushing techniques	1.5%	0%	0.6%	n/a
Have patients demonstrate recommended flossing techniques	1.5%	0%	0.6%	n/a