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California Physicians' Opinions of the Interface between Oral and Overall Health: A Preliminary Study

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Abstract

Background: Oral health is a significant health challenge in the United States. The aim of the study is to investigate California physicians' knowledge and opinion of the interface between oral and overall health as well as their recommendations for strengthening the oral and overall health interface.

Method: The questionnaire, a self-addressed, postage paid return envelope and a cover letter explaining the purpose of the project was mailed to 1,000 California physicians. The survey had a total of 45 items measuring physicians' knowledge and opinions of the interface between oral and overall health as well as their recommendations for strengthening this interface.

Results: Many of the 62 physicians who responded agreed/strongly agreed with the following items: "The dental discipline remains relatively segregated from other healthcare disciplines" (n = 49, 79.1%), "Oral health is often regarded as less important than other health needs of patients" (n = 44, 71.0%), and "Many medications are prescribed by physicians without consideration of their oral health ramifications" (n = 38, 61.3%). Most physicians believed that "Oral health should be more closely regarded as an important component of overall medical care" (n = 53, 86.9%) and that "There is a need for more inter-professional care by primary care providers in managing the oral and overall health concerns of patients" (n = 47, 77.0%).

Interpretation: Although many physicians recognize the importance and role of oral health in overall health care, they believe that there is little integration between oral and overall health care in practice.

Keywords: Oral health, California physicians, Knowledge, Attitudes, Medical practice, Integration

Introduction

Oral health is one of the major health challenges present in the United States. About 85% of adults aged 18 and older are affected by dental caries in their lifetime [1] and about 44% of 5 year olds in the United States have dental caries [2]. In fact, according to the 2000 Surgeon General report on "Oral Health in America," dental caries is the most prevalent infectious disease among children in the United States [3]. In addition, more serious oral health problems such as periodontal diseases and dental abscesses are also widespread, with 47.2% of adults aged 30 years and older having some form of periodontal disease [4].

Certain vulnerable populations such as children, minority ethnic groups, and the underprivileged are disproportionately affected by poor oral health. For example, Hispanics, non-Hispanic blacks, Alaska Natives, and American Indians generally have the poorest oral health among the different racial and ethnic groups in the United States, and Blacks, non-Hispanics, and Mexican Americans aged 35-44 years are twice as likely as Caucasians to have untreated tooth decay [5]. Among children, the percentage of 5 to 19 year olds with untreated tooth decay is twice as high for those from low-income households compared to children from higher-income households [6].

Oral health problems cause pain, interfere with daily function, and decrease quality of life. Poor oral health can also affect overall health by increasing people's risk of certain medical conditions and complications [3]. For example, dental caries, periodontitis or tooth abscess can seed systemic infection and lead to sepsis-especially in immunocompromised patients. Oral diseases have also been linked with many health conditions including cardiovascular disease [7,8], diabetes mellitus [9,10], adverse pregnancy outcomes (e.g., pre-term and low birth weight babies) [11], cancer, osteoporosis [8], HIV/AIDS [12], and Sjogren's syndrome among others [13,14].

Despite these associations, many medical professionals and the general public often fail to see the link between oral health and overall health. When prescribing medications that have oral side effects such as xerostomia (i.e. dry mouth), for example, physicians might not make the connection that such medications could then affect the patient's oral health since xerostomia is associated with increased incidences of dental caries [15] and fungal infections [10]. Alternatively, when treating immunocompromised patients, physicians might not think to inquire about dental caries, although it can be a source of systemic infection.

Primary care physicians (PCPs) can and should play an important role in maintaining and improving their patients' oral health through integrating oral health into general health care. However, several barriers including lack of knowledge and negative attitudes toward the interface between oral and overall health may constrain their role in oral health [16]. PCPs cannot play an active role in oral health without appropriate training and education on oral health topics and issues.

To our knowledge, only a few studies have been conducted to date

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to assess the physicians' knowledge and attitude of oral health [17-19]. Most of the physicians were reported to have inadequate knowledge of oral health conditions and issues [17]. Several physician studies have documented initiatives to enhance physicians and family medicine residents' oral health knowledge and skills [20-23].

The purpose of this cross-sectional survey was to gain a better understanding of California physicians' knowledge and opinion about the association between oral health and overall health so that it can help inform the direction for future research and intervention for fostering a more whole-person approach to oral health. The specific objectives of the study were 1) to understand physicians' perception of the interface between oral and overall health, 2) to assess the physicians' knowledge of issues surrounding oral and general health interface, and 3) to identify the physicians' recommendations for strengthening the oral and overall health interface.

Methods

The 4-page questionnaire comprising a total of 45 items was developed by the authors based on current literature on oral health. Twenty seven items on the survey measured physicians' opinions of the interface between oral and overall health as well as their recommendations for strengthening this interface using a 5 point Likert scale anchored by strongly disagree [1] and strongly agree [5]. A total of six items measured physicians' knowledge of oral health issues. Additional items measured the physicians' practice and demographic characteristics (e.g., gender and age). The survey was assessed for content and face validity by five [5] pharmacy and medicine researchers. The questionnaire was pre-tested with physicians to assess the clarity and completeness of the instrument. Questionnaire items were modified based on pretest results.

The study targeted actively practicing physicians in the state of California who consented to participate in the study. The questionnaire, a self-addressed, postage paid return envelope and a cover letter explaining the purpose of the study was mailed to all the randomly selected physicians (n = 1000). The questionnaires were mailed to the physicians' addresses on file. The estimated time required to fill the questionnaire was about 15 minutes.

Physicians were asked to return the questionnaires once they had completed the survey. Questionnaires were collected over a two-month period (February to March 2015). Physicians were offered a chance to enter a drawing to win an IPAD 2 or one of 10 Amazon gift cards worth $25.00 each. In addition, physicians were offered an aggregated summary of the study results as an incentive to respond.

All the data were entered into Microsoft Excel 2010 and then uploaded to Statistical Package for Social Sciences® (SPSS) for analysis. Descriptive statistics (e.g., means, standard deviations and frequency distributions) were computed for all study variables. We computed means and standard deviations for all items that were measured using the 5-point Likert scale.

Results

A total of 62 physicians responded to the survey for a 6.2% response rate. Most of the respondents were male (n = 42, 68.9%), Caucasian (n = 39, 65.0%), and primarily practicing in an urban setting/area (n = 35, 59.3%) (Table 1).

Many physicians agreed/strongly agreed with the following items: "I generally regard oral health as an important component of overall medical care" (n = 58, 93.6%), "The dental discipline remains relatively segregated from other healthcare disciplines" (n = 49, 79.1%), and "Oral health is often regarded as less important than other health needs of patients" (n = 44, 71.0%) (Table 2). Furthermore, a majority of physicians (n = 50, 80.6%) believed that little time was devoted to oral health topics in medical education (mean = 4.06, SD = 1.0) and that they did not always warn patients that their oral health can be compromised by certain medications (mean = 2.94, SD = 1.1). Physicians were not comfortable saying that they had adequate knowledge of the interaction between oral health and overall health (Table 2).

Table 1: Practice and Demographic Characteristics of Participating Physicians.

Items	Frequency (%)
Type of practice setting at primary place of employment (n = 59)	
Solo private practice	8 (13.6)
Group private Practice	16 (27.1)
Community hospital	5 (8.5)
Large tertiary care hospital (non-academic)	4 (6.8)
Academic institution	15 (25.4)
Military	1 (1.7)
Other	10 (16.9)
Current job title (n = 59)	
Practice Owner/Partner	14 (23.7)
Staff Physician	15 (25.4)
Attending/Faculty physician at academic institution	15 (25.4)
Chief Medical Officer	1 (1.7)
Other	14 (23.7)
Area of Medical Specialty (n = 60)	
General Pediatrics	10 (16.7)
Internal Medicine	8 (13.3)
Family Medicine	7 (11.7)
Other	35 (58.3)
Area/setting of primary place of employment (n = 59)	
Urban	35 (59.3)
Suburban	22 (37.3)
Rural	2 (3.4)
Gender (n = 61)	
Male	42 (68.9)
Female	19 (31.1)
Race/Ethnicity (n = 60)	
African American/non-Hispanic black	2 (3.3)
Asian American/Pacific Islander	14 (23.3)
Caucasian/non-Hispanic white	39 (65.0)
Mexican American/Hispanic	1 (1.7)
Other	4 (6.7)
	Mean (SD)
Age (n = 59)	55.3 (17.4)
Number of years practicing medicine (n = 60)	23.0 (15.5)
Hours of work per week at primary place of employment (n = 59)	45.7 (21.1)

Many physicians believed that "The drug labels of most drugs that can have xerostomic (dry mouth) effects do not contain information on their potential impacts on oral health" (n = 37, 59.7%), "Pharmacists are a great source to my patients for advice on drugs with oral health untoward effects" (n = 31, 50.0%), and that "Many medications are prescribed by physicians without consideration of their oral health ramifications" (n = 38, 61.3%) (Table 3). Furthermore, physicians did not believe that "Patients taking medicines that can have xerostomic effects are adequately informed about the importance of maintaining dental health while taking the medications" (n = 36, 58.1%). Most physicians were either neutral or agreed with the statement, "Physicians prescribing immunosuppressive and cytotoxic pharmaceuticals infrequently inquire about a patient's oral status" (n = 30, 48.4% and n = 25, 40.3%, respectively), implying that physicians probably often do not inquire about the patient's oral status when prescribing immunosuppressive and cytotoxic medications (Table 3).

Most physicians believed that "Oral health should be more closely regarded as an important component of overall medical care" (n = 53, 86.9%), "Drug labelling should be modified as necessary to improve patients' understanding of the relationship between oral disease and risk of medical complications" (n = 47, 75.8%), and that "there is a need for more inter-professional care by primary care providers in managing the oral and overall health concerns of patients" (n = 47,

Table 2: Physicians' Opinions on Oral Health.

Item (n = 62)	Mean (SD)	Disagree/ Strongly Disagree N (%)	Neutral N (%)	Agree/ Strongly Agree N (%)
a. Dentists have adequate knowledge of the interaction between oral health and treatment/ management of many non-oral diseases.	3.26 (1.0)	16 (25.8)	16 (25.8)	30 (48.4)
b. Many primary care providers are aware of the relationship between oral health and the treatment/ management of many non-oral diseases.	3.44 (0.8)	10 (16.1)	16 (25.8)	36 (58.1)
c. Oral health is often regarded as less important than other health needs of patients.	3.63 (0.9)	10 (16.1)	8 (12.9)	44 (71.0)
d. Dental cavities, periodontal diseases and oral ulcers are generally thought of as infections by physicians.	3.15 (1.0)	18 (29.0)	19 (30.6)	25 (40.4)
e. Little time is devoted to oral health topics in medical education.	4.06 (1.0)	7 (11.3)	5 (8.1)	50 (80.6)
f. The dental discipline remains relatively segregated from other healthcare disciplines.	4.05 (0.9)	3 (4.8)	10 (16.1)	49 (79.1)
g. The separation of dental and other primary health care disciplines has grown over time.	3.44 (1.0)	8 (12.9)	29 (46.8)	25 (40.3)
h. Many doctors regard oral health as an important component of overall medical care.	3.44 (0.8)	11 (17.7)	15 (24.2)	36 (58.1)
i. I generally regard oral health as an important component of overall medical care.	4.35 (0.7)	2 (3.2)	2 (3.2)	58 (93.6)
j. I always warn patients that their oral health can be compromised by certain medications.	2.94 (1.1)	25 (40.4)	16 (25.8)	21 (33.9)
k. Many immunosuppressive drugs are prescribed for people with oral conditions that can result in serious septicemias.	3.60 (0.8)	4 (6.5)	26 (41.9)	32 (51.6)
l. I have adequate knowledge of the interaction between oral health and the treatment/ management of many diseases.	2.94 (1.0)	21 (25.8)	22 (35.5)	19 (30.6)

Table 3: Physicians' Opinions on Oral Health in Relation to Medication Prescribing Practice.

Item (n = 62)	Mean (SD)	Disagree/ Strongly disagree N (%)	Neutral N (%)	Agree/ Strongly Agree N (%)
a. Dentists rarely consider the medical ramifications of the oral health care they provide.	2.77 (0.9)	25 (40.3)	24 (38.7)	13 (21.0)
b. Many medications are prescribed by physicians without consideration of their oral health ramifications.	3.61 (0.9)	8 (12.9)	16 (25.8)	38 (61.3)
c. The drug labels of most drugs that can have xerostomic (dry mouth) effects do not contain information on their potential impacts on oral health.	3.60 (0.9)	7 (11.3)	18 (29.0)	37 (59.7)
d. The inadvertent prescribing of medicines that can have xerostomic effects without considering oral health implications is a major problem.	3.34 (0.9)	10 (16.1)	23 (37.1)	29 (46.8)
e. Patients taking medicines that can have xerostomic effects are adequately informed about the importance of maintaining dental health while taking the medications.	2.34 (0.8)	36 (58.1)	23 (37.1)	3 (4.8)
f. Physicians prescribing immunosuppressive and cytotoxic pharmaceuticals infrequently inquire about a patient's oral status.	3.34 (0.8)	7 (11.3)	30 (48.4)	25 (40.4)
g. Physicians prescribing immunosuppressive and cytotoxic pharmaceuticals rarely advise patients about the importance of maintaining dental health while taking the medications. (n = 61)	3.30 (0.8)	7 (11.5)	33 (54.1)	21 (34.4)
h. Pharmacists are a great source to my patients for advice on drugs with oral health untoward effects.	3.48 (1.0)	10 (16.1)	21 (33.9)	31 (50.0)

Table 4: Physicians' Suggestions for Improving the Interface Between Oral and Overall Health.

Item (n = 62)	Mean (SD)	Disagree/ Strongly Disagree N (%)	Neutral N (%)	Agree/ Strongly Agree N (%)
a. Oral health should be more closely regarded as an important component of overall medical care. (n = 61)	4.13 (0.8)	3 (4.9)	5 (8.2)	53 (86.9)
b. Dentistry should be identified as a medical sub-specialty.	3.02 (1.2)	23 (37.1)	15 (24.2)	24 (38.7)
c. Drug labelling materials need to clarify that dental disease are infections. (n = 61)	3.46 (0.8)	5 (8.2)	28 (45.9)	28 (45.9)
d. Medicare should cover medically essential dental care/services.	4.34 (1.0)	3 (4.8)	6 (9.7)	53 (85.5)
e. Drug labelling should be modified as necessary to improve patients' understanding of the relationship between oral disease and risk of medical complications.	4.02 (0.8)	1 (1.6)	14 (22.6)	47 (75.8)
f. There is a need for more inter-professional care by primary care providers in managing the oral and overall health concerns of patients. (n = 61)	3.97 (0.7)	-	14 (23.0)	47 (77.0)
g. There is need for improved integration of dentistry with other primary health care services.	4.05 (0.76)	2 (3.2)	10 (16.1)	50 (80.6)

77.0). Furthermore, physicians agreed that "there is need for improved integration of dentistry with other primary health care services (n = 50, 80.6%) (Table 4).

Most physicians correctly identified the statement, "Most Americans receive the basic dental care that they need," to be false (n = 48, 77.4%) (Table 5). In other words, they are aware that most Americans do not receive adequate dental care. Another interesting result was that 19.7% of the respondents said that they do not know if the use of many medications among individuals with dental infections can pose an increased risk of medical complications.

Table 5: Physicians' Knowledge of Oral Health Issues.

Item (n = 62)	True N (%)	False N (%)	Don't know N (%)
a. The use of many medications among individuals with dental infections poses an increased risk of medical complications. (n = 61)	46 (75.4)	3 (4.9)	12 (19.7)
b. Most Americans receive the basic dental care that they need.	6 (9.7)	48 (77.4)	8 (12.9)
c. The risk of medical complications from bacterial dental infections increases among individuals who are immunocompromised by diseases or medications.	61 (98.4)	1 (1.6)	-
d. Dental cavities and periodontal diseases are infections. (n = 61)	51 (83.6)	5 (8.2)	5 (8.2)
e. The oral cavity and its functions can be adversely affected by many medications used in treating systemic conditions.	59 (95.2)	1 (1.6)	2 (3.2)
f. Poor dental health can compromise the ability of patients to achieve good medical outcomes.	60 (96.8)	2 (3.2)	-

Discussion

The study results show that physicians generally regard oral health as an important component of overall medical care, suggesting that physicians realize the importance of coordinating oral health with overall health and have a positive attitude towards incorporating oral health as part of overall health care. Similar findings have been reported in the literature, though literature on this topic is limited [18,24,25]. Physicians consider their role in promoting oral health to be important. In two previous US national surveys, for example, most of the pediatricians believed that oral health care should be included in well-child care [26,27]. The challenge, however, lies in whether or not these beliefs are translated into practice given the various constraints (e.g., time) faced by primary care providers.

We found that most physicians in our study believe that "The dental discipline remains relatively segregated from other healthcare disciplines" (n = 49, 79.1%) and that "Oral health is often regarded as less important than other health needs of patients" (n = 44, 71.0%). Similarly, the US Surgeon General report noted that "The public, policymakers, and providers may consider oral health and the need for care to be less important than other health needs" [3]. These findings suggest that although physicians theoretically consider their role of promoting oral health to be important, oral health issues may take peripheral positions compared to other medical issues when practicing medicine. In other words, the silo approach to systemic and oral disease management persists. Furthermore, many physicians (40.3%) believed that the separation of dental and other primary health care disciplines is growing over time (mean = 3.44, SD = 1.0).

The separation between oral and overall health manifest in many different ways as perceived by physicians:

- Many medications are prescribed by physicians without consideration of their oral health ramifications.
- The drug labels of most drugs that can have xerostomic (dry mouth) effects do not contain information on their potential impacts on oral health.
- Medicines that can have xerostomic effects are inadvertently prescribed without considering their oral health implications.
- Patients taking medicines that can have xerostomic effects are inadequately informed about the importance of maintaining dental health while taking the medications.
- Physicians prescribing immunosuppressive and cytotoxic medications infrequently inquire about a patient's oral status.
- Physicians prescribing immunosuppressive and cytotoxic medications rarely advise patients about the importance of maintaining oral health while taking the medications.

The study results show that most physicians (n = 50, 80.6%) believe that little time is devoted to oral health topics in medical education (mean = 4.06, SD = 1.0), indicating limited training on oral health topics. This limited oral education may negatively impact their oral health knowledge. This may explain why many physicians in the study did not feel comfortable saying that they had adequate knowledge of the interaction between oral health and overall health. For example, many physicians did not always warn patients that their oral health can be compromised by certain medications (mean = 2.94, SD = 1.1). There is, therefore, an urgent need to expand the oral health competencies of primary care physicians. This can be achieved through enhancing oral health topics in medical school, in post-graduate training such as residency and fellowship and with continuing medical education for practicing physicians. Many physicians have been reported to show interest in oral health continuing medical education [17,18]. Furthermore, the American Association of Medical Colleges in 2008 recommended that medical schools increase oral health education [28].

As noted by the 2000 US Surgeon General report, the above issues and problems suggest that "oral health care is not fully integrated into many care programs" [3] with serious potential repercussions for patient care. This study's results highlight the need for substantive progress for creating a truly integrated health care system that incorporates interdisciplinary and collaborative method for patient care. More should be done to bridge oral and overall health care and services through encouraging and offering more inter-professional collaboration. The link between oral health and general health necessitates the provision of interdisciplinary care by all primary care providers in managing oral and general health concerns [3]. The dental, pharmacy and medical professionals can provide the best possible health care for their patients if they work and collaborate more closely together [29]. The improved integration of dental with other primary health care services has great potential to improve the quality of patient care, leading to true whole-person care [30].

Finally, efforts to create a truly integrated healthcare system necessitate the modification of drug labelling materials to improve physicians and patients' understanding of the relationship between oral disease and risk of medical complications. As highlighted by some of the questions in this study, many physicians acknowledge the fact that very limited patient education, if any, is provided regarding oral side effects of certain medications and regarding implications of taking certain systemic medications (e.g., immunosuppressive medications) in the setting of certain oral conditions (e.g., dental cavities, abscess or gingivitis). More public education needs to take place regarding this issue.

The study has several limitations. First, the study had a small sample size and a lower response rate (6.2%). The length of the survey (45 items), physicians' busy schedules, and not sending reminders may have contributed to the lower response rate. Physicians who did not respond to the survey may have different opinions and knowledge with respect to oral health, thereby limiting the generalizability of our findings. However, concern about nonresponse bias may be less in physician surveys compared to general public surveys given that physicians are generally homogenous in terms of their knowledge, training and behaviors [31]. Second, social desirability response bias cannot be ruled out completely. It is possible that the physicians provided answers they believed were socially acceptable as opposed to what they truly believe.

Conclusion

In conclusion, although many physicians in the study recognize the importance and role of oral health in overall health care, they believe that there is little integration between oral and overall health care in practice. This underscores the need for more interdisciplinary approach by all primary care providers in managing the oral and overall healthcare concerns of their patients.

Policymakers, pharmaceutical companies, and medical school educators should consider making changes to drug labels and medical school curriculum as appropriate to ensure that physicians and the general public have increased awareness of the interface between oral and overall health that they can then translate into practice. Further studies need to be conducted to confirm the results of the study.

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