Dental Health Practices in US College Students: The American College Health Association-National College Health Assessment Findings

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Dental Health Practices in US College Students: The American College Health Association-National College Health Assessment Findings

Abstract

Objective: The purpose of this study is to investigate the dental health seeking practices of US college students. Participants: The total number of college students who participated in the ACHA-NCHA survey from 2000-2013 was 1,201,531. Methods: The data requested were the demographic questions and the dental health question from both the ACHA-NCHA I and II. The data were analyzed using SPSS version 20. Results: The percentage of students who reported having a dental exam and cleaning in the last year averaged 76.6% in this study period of time. However, dental health care declined annually following their freshman year. More females have had an annual dental visit than have male students. Caucasian students overwhelmingly have had a visit to a dentist in the previous year as compared to their fellow students who are from minority populations. International students are in need of being connected to dentists in the city where the university is located. More students attending public universities have had dental care in the previous year compared to those attending a private university. Students attending 4 year universities are more likely to have had dental care in the previous year than students attending a 2 year college. Conclusions: While we now know that many college students have dental exams and cleanings, there is still need for dental health education in all college student populations, especially minority and international students. What is not known are the dental and oral health habits of college students and this needs to be determined by future research.

Keywords

College students; Dental health

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Dental Health Practices in US College Students: The American College Health Association-National College Health Assessment Findings

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ABSTRACT
Objective: The purpose of this study is to investigate the dental health seeking practices of US college students.
Participants: The total number of college students who participated in the ACHA-NCHA survey from 2000-2013 was 1,201,531.
Methods: The data requested were the demographic questions and the dental health question from both the ACHA-NCHA I and II. The data were analyzed using SPSS version 20.
Results: The percentage of students who reported having a dental exam and cleaning in the last year averaged 76.6% in this study period of time. However, dental health care declined annually following their freshman year. More females have had an annual dental visit than have male students. Caucasian students overwhelmingly have had a visit to a dentist in the previous year as compared to their fellow students who are from minority populations. International students are in need of being connected to dentists in the city where the university is located. More students attending public universities have had dental care in the previous year compared to those attending a private university. Students attending 4 year universities are more likely to have had dental care in the previous year than students attending a 2 year college.
Conclusions: While we now know that many college students have dental exams and cleanings, there is still need for dental health education in all college student populations, especially minority and international students. What is not known are the dental and oral health habits of college students and this needs to be determined by future research.

Keywords: College students, dental health, oral health

INTRODUCTION

In 2000, the US Surgeon General released a report entitled, Oral Health in America: A Report of the Surgeon General. This was the first time oral health was identified as an emphasis by the US Surgeon General. The report stated that oral and dental health was a "silent epidemic", the mouth was a "mirror for general health and well-being and the association between oral health problems and other health problems", and oral health is vital to a person's overall health.

Healthy People 2020 (HP2020), includes the oral health goal to "Prevent and control oral and craniofacial diseases, conditions, and injuries, and improve access to preventive services and dental care." The HP2020 oral health objectives are (1) Oral Health of Children and Adolescents, (2) Oral Health for Adults, (3) Access to Preventive Services, (4) Oral Health Interventions, (5) monitoring Surveillance Systems, and (6) Public Health Infrastructure. There are also oral health interventions outlined in HP2020 which is found at HealthyPeople2020.gov. Calderon and Mallory (2014) said, "U.S. adolescents aged 12-19 are in serious distress because of poor oral health".

Cavities in teeth (also known as tooth decay) is a common problem in U.S. children and is often left untreated. Teeth that are decaying cause pain during chewing of food and are a common site for infections to develop. Decaying teeth and the resulting pain inhibit eating, and affect a child's talking, learning, and interactions with friends and classmates. Dye, Xianfen, and Beltrán-Aguilar (2012) found that 20% of children between the ages of 5 and 11 have at least one tooth that is decaying and untreated; and 13% of adolescents between the ages of 12 and 19 have at least one tooth that is decaying and untreated. Twenty-five percent of children and adolescents from families with low-incomes have untreated cavities in their teeth, while only 11% of children and adolescents from higher income homes have untreated cavities. In CDC (2014b) research, the 17.5% of 5-19 year old children have untreated dental caries/tooth decay and 27.4% of adults between ages 20-44 years old have tooth decay. The good news is that tooth decay is preventable. Fluoridated drinking water, fluoridated toothpaste, fluoridated tooth dental coating/sealant, and regular dental care are prevention efforts. There is also a shortage of dental professionals and 50 million people in the US live in a shortage area and 30 million have no access to a dentist. (Kurthy, McKernan, Hand, & Johnsen, 2009; Department of Health and Human Services, 2015). The challenge with regular dental care is access to dentists, and this is escalated with the lack of pediatric dentists.

Another contributing factor to poor dental and oral health is not behavior but economics. Economic factors impede acquiring and maintaining dental insurance and also access to dental health services from a dental hygienist and dentist. The percentage of Americans with dental insurance dropped from 2000 through 2012 (Nasseh & Vujicic, 2014a). A corresponding steady decline of adults visiting a dentist through 2012 was also found with only 35.4% of adults visiting a dentist (Nasseh & Vujicic, 2014b). Vujicic and Nasseh (2014) found a decrease in the utilization of dental care by working-age adults, but children going to a dentist was the highest it has ever been at 47.6%. Yet both the children and adult visits to dentists are below the recommendations of the American Dental Association and the American Association of Pediatric Dentists. Yarbrough, Nasseh, and Vujicic (2014) found the top three reasons for 18-34 year olds not going to a dentist were: having a healthy mouth and not needing dental care (37.9%), cost (35.7%), and (3) not having time to get to a dentist (28.4%). An economic concern in college students are those who are experiencing food insecurity and if they are struggling to purchase food, it is possible that they are also struggling to buy toothpaste, toothbrushes, and dental floss.

Finally, there are dramatic disparities in oral health within the United States. These oral health disparities cross all genders, ages, ethnic and racial groups, socioeconomics, and geographical regions. Periodontal disease is prominent in 47% of US adults and increases to 70% in adults over the age of 65. Periodontal disease is also higher in men than in women. The racial and ethnic groups with the poorest oral health are non-Hispanic blacks, Hispanics, American Indian and Alaska Natives. Mexican American and black non-Hispanic Children ages 2-4 and 6-

8 years demonstrate the greatest racial and ethnic disparities. Throat cancer's (oral pharyngeal) 5 year survival is only 36% in black men, but 61% in white men (Health, United States, 2014).

College campuses have been concerned for the health of their college students and have been providing campus-based medical care to their students for nearly a century. Rarely, however, in this campus health care, has dental health been included in the health prevention and treatment services.

College students are no different than others in their age group. They are risk takers. They no longer have parents in their immediate presence to remind them to brush their teeth. College students may forget to floss daily, brush their teeth multiple times per day, or they may even go days without brushing their teeth. The combination of busy college students, risk taking, and lack of campus dental health care services is a dangerous triad both for the present and also for the future. Current health issues can be caused by poor oral health practices. But also future health issues are caused by current day poor oral health practices. In 2015 it is now known that many health illnesses and diseases have their origins in the mouth and are due to poor dental hygiene by the patient. Health behaviors such as poor nutrition, alcohol consumption, and use of tobacco products affect oral health and contribute to poor oral health. Research has linked oral health to systemic conditions including heart disease, pneumonia, osteoporosis and osteopenia, stroke, diabetes, both preterm births and low birth weight babies, oral cancer, and human papilloma virus (HPV) (Glick, 2005). Thirty thousand new cases of oral cavity and pharynx cancer are found annually, with 8000 deaths due to oral cancer. Oral cancer has a 5-year survival rate of only 50%. As with all cancers, early detection increases the survival rates. Oral cancer mortality is twice the rate in black males compared to white males. Cigarette smoking, cigar and pipe smoking, smokeless tobacco usage, and excessive consumption of alcohol are the high risk behaviors for developing oral cancer. While tobacco use and alcohol consumption have been decreasing, the newest concern for oropharyngeal cancer is related to the human papillomavirus (HPV). Sixty-two percent of oropharyngeal cancers are caused by HPV (Dunne, Markowitz, Saraiya, Stokley, Middleman, Unger, & Iskander, 2014). The HPV is the most common sexually transmitted infection in the US (CDC, 2014a). There are currently 79 million people infected with HPV in the US, and there are 14 million new infections each year in the US. There are more than 150 different types of HPV. Forty of these are transmitted through oral and genital sexual contact (CDC, 2014a). College students use of tobacco and alcohol along with the increase in oral sex and acquisition of HPV could contribute to future cases of oral cancer. Educating college students about oral health today can prevent dental health issues and oral cancer in their futures.

College students often abandon healthy lifestyle habits when going off to college and this could include dental health habit. However, what are the health habits of high school students prior to going off to college? Maybe incoming college students did not have dental health habits to begin with? Both of these unanswered questions could provide student health centers with the opportunity to provide dental and oral health educational programming at freshman orientation and through peer health educators. These dental and oral health education efforts could establish positive dental and oral health habits in college students and thus positively impacting their long term health and wellness.

The purpose of this study was to investigate the dental health seeking practices of US college students. This research study is an effort to bring awareness to the dental health seeking practices of college students and to encourage college student health centers to expand educational programming to include dental and oral health education.

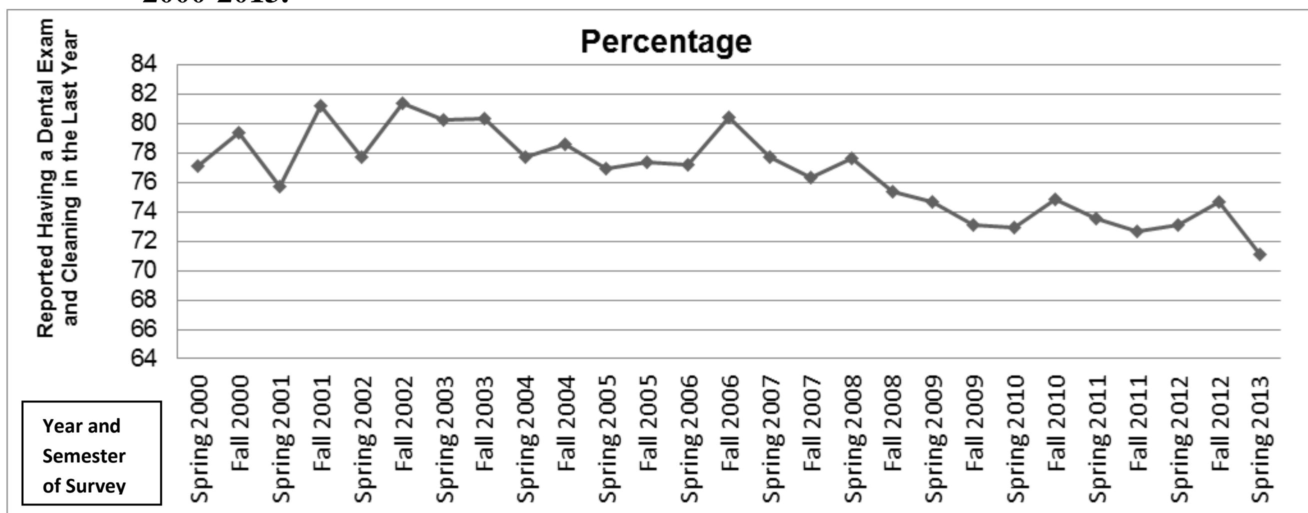
METHODS

The American College Health Association's National College Health Assessment (ACHA-NCHA) has been conducted since 2000. The ACHA-NCHA gathers data on college student's behaviors, including dental health behaviors. There are two versions of the survey. The ACHA-NCHA I (2000-2008) and the ACHA-NCHA II (2009-Present). The survey has been asking a dental health question since the initial survey in 2000 (ACHA-NCHA I) and continues to ask this same dental health question in the current survey (ACHA-NCHA II). The ACHA-NCHA dental health question is question 39A and asks "Have you had a dental exam and cleaning in the last 12 months?" This question has never been analyzed in the history of the ACHA-NCHA. The author requested the ACHA-NCHA data from the American College Health Association who controls the data and the data were later received. The full data spans 2000-2013 and this comprehensive data were used for this study. The data requested were the demographic questions (gender, year in college, ethnicity, international student, type of university, and 2/4 year college) and dental health question (39A) from both the ACHA-NCHA I and II surveys. The data were analyzed and descriptive statistics were generated using SPSS version 20.

RESULTS

The total number of college students who participated in the ACHA-NCHA was 1,201,531. The lowest number of students (N=4717) who completed the ACHA-NCHA was in the Fall of 2001 while the largest number of students (N=123,078) was in the Spring of 2013. The percentage of students who reported having a dental exam and cleaning in the last year averaged 76.6% from 2000-2013. However, since 2006 there has been a steady decline in the number of students who report having an annual dental exam and cleaning. The lowest percentage was in the Spring 2013 with 71.1% reporting a dental exam and cleaning. See Figure 1 for the entire results.

Figure 1: Percentage of Students Who Report Having a Dental Exam and Cleaning from 2000-2013.



More females (N=445,381) have an annual dental exam and cleaning than males (N=232,757). Exactly why there is a difference of more females (50%) to males (26%) cannot be determined by the data. See Table 1 for the entire gender results.

Table 1: Dental Exam and Cleaning by Gender.

Dental Exam and Cleaning in Last Year	Female	Male	Total
No	120,007 (13.49%)	77,132 (8.67%)	197,139 (22.16%)
Yes	445,381 (50.07%)	232,757 (26.17%)	678,138 (76.25%)
Do not know	7,627 (0.85%)	6,451 (0.72%)	14,078 (1.58%)
Total	573,015 (64.43%)	316,340 (35.56%)	889,355

The freshmen, sophomores, seniors, and 5th year undergraduate students all have dental exams and cleanings more so than do not. Twenty-one percent of freshman, 16% of sophomores, 11.7% of seniors, and 8.1% of graduate students reported having an annual dental exam and cleaning. In the junior year, more students (22.8%) do not have an annual dental exam and cleaning than do have this procedure (15.0%). See Table 2 for the entire results.

Table 2: Dental Exam and Cleaning by Year in School.

Dental Exam and Cleaning in Last Year	Undergraduate 1st year	2nd year	3rd year	4th year	5th year	Graduate	Adult Special	Other	Total
No	34,301 (3.86%)	34,888 (3.92%)	202,659 (22.81%)	34,453 (3.87%)	15,985 (1.79%)	33,411 (3.76%)	998 (0.11%)	2,231 (0.25%)	196,926 (22.16%)
Yes	186,758 (21.02%)	142,374 (16.02%)	133,430 (15.01%)	104,826 (11.79%)	29,923 (3.36%)	72,458 (8.15%)	2,615 (0.29%)	5,032 (0.56%)	677,416 (76.24%)
Do not know	4,748 (0.53%)	3,098 (0.34%)	2,730 (0.20%)	1,818 (0.20%)	603 (0.06%)	907 (0.10%)	35 (0.003%)	157 (0.01%)	14,116 (1.58%)
Total	225,807 (25.41%)	180,360 (20.29%)	176,819 (19.90%)	141,097 (15.58%)	46,511 (5.23%)	106,676 (12.00%)	3,668 (0.41%)	7,420 (0.83%)	888,458

All ethnicities report they have an annual dental exam and cleaning, however there is a large discrepancy between Whites and other ethnicities. Fifty-six percent of White college students reported having an annual dental exam and cleaning, while no other ethnicity even achieved 10% having an annual exam and cleaning. Three percent of Blacks, 4.5% of Hispanics,

7% of Asian, 0.93% of Indian, 1.0% of Biracial/Multiracial, and 2.1% of Other ethnicity reported having a dental exam and cleaning. See Table 3 for the entire results.

Table 3: Dental and Cleaning in the Last Year by Ethnicity.

Dental Exam in Last Year	White	Black	Hispanic	Asian	Indian	Other	Biracial/ Multiracial*	Totals
No	127,666 (13.44%)	19,285 (2.03%)	19,407 (2.04%)	29,814 (3.14%)	3,915 (0.41%)	8,338 (0.87%)	3,729 (0.39%)	212,154 (22.33%)
Yes	539,934 (56.85%)	31,663 (3.33%)	43,189 (4.54%)	68,112 (7.17%)	8,854 (0.93%)	20,602 (2.16%)	9,607 (1.01%)	721,961 (76.02%)
Do not know	8,911 (0.93%)	1,050 (0.11%)	1,449 (0.15%)	2,757 (0.29%)	278 (0.02%)	775 (0.08%)	345 (0.03%)	15,565 (1.63%)
Total	676,511 (71.23%)	51,998 (5.47%)	64,045 (6.74%)	100,683 (10.60%)	13,047 (1.37%)	29,715 (3.12%)	13,681 (1.44%)	949,680

*not collected in 2000-2008

Sixty-three percent of international students have the annual exam and cleaning compared to 34.32% who do not. See Table 4 for the entire results.

Table 4: Dental Exam and Cleaning in Last Year in International Students.

No	20,752 (34.32%)
Yes	38,294 (63.34%)
Do not know	1,407 (2.32%)
Total	60,453

When the data were compared between public verses private colleges or universities, the students from both institutional types reported having a dental exam and cleaning in greater numbers (74.55%) than students who did not have a dental exam and cleaning (23.65%). What was found in the data is the discrepancy between the public and private colleges/universities. Forty-seven percent of students at public colleges/universities have had a dental exam and cleaning compared to only 27.1% of students who attended a private college/university. See Table 5 for the entire results.

Table 5: Dental Exam and Cleaning in Last Year by University Type.

Dental Exam and Cleaning	University Type: Public	University Type: Private	Total
No	79,797 (16.88%)	32,044 (6.77%)	111,841 (23.65%)
Yes	224,098 (47.40%)	128,335 (27.14%)	352,433 (74.55%)
Do not know	5,430 (1.14%)	3,005 (0.63%)	8,435 (1.78%)
Totals	309,325 (65.43%)	163,384 (34.56%)	472,709

And finally, students attending a 4 year college/university have an annual dental exam more (72.43%) than those who attend a 2 year college/university (3.44%). See Table 6 for the entire results.

Table 6: Dental Exam and Cleaning at 2 or 4 Year Schools.

Type of College	2 year	4 year	Professional	Total
No	14,458 (1.58%)	187,632 (20.52%)	952 (0.10%)	203,042 (22.20%)
Yes	31,523 (3.44%)	662,250 (72.43%)	2,688 (0.29%)	696,461 (76.17%)
Do not know	1,150 (0.12%)	13,561 (1.48%)	32 (0.0035%)	14,743 (1.61%)
Total	47,131 (5.15%)	863,443 (94.44%)	3,672 (0.40%)	914,246

DISCUSSION

These research findings are consistent with the findings of Raychowdhury and Lohrmann (2008) who found that 75.9% of college students had a dental visit at least one time per year. They also found that only 39.5% of college students went to their medical doctor. These similar findings in two different dental studies with different subjects, is a positive sign that college students are having an annual dental visit and teeth cleaning.

Further studies need to explore why females are more likely to have an annual exam and cleaning than their male counterparts. There is also a need for a study to determine why dental visits and cleanings decline in the junior year of college.

What is concerning from this research study is the large percentage of Black, Hispanic, Asian, Indian, Biracial/Multiracial, and Other ethnicity students who are not going to a dentist nor receiving an annual dental cleaning. What needs to be further determined is if international students are receiving their annual dental exam in their home country or after arriving in the US to attend college. If their dental exam and cleaning was in their home country, then connecting international students with dentists in the immediate locale of the university is important. More

education for dental health is needed in all minority groups and more emphasis on prevention through regular visits to dentists is desperately needed in ethnic minority college students.

Additional research needs to determine why so few (27.1%) of students attending a private university are having an annual dental exam and cleaning. Another study needs to determine the reasons for such a low percentage (3.4%) of students at 2 year colleges going to a dentist for an annual dental exam and cleaning. While a possible reason could be due to the adult learners at community colleges, but this needs to be clarified. There has been a steady decline since 2009 in students having a dental exam and cleaning, but why this has been occurring is not determinable with the ACHA-NCHA data and thus further studies need to investigate this.

What is not known are the dental health habits of college students of the past or present. We do not know how frequently college students brush their teeth. We do not know how frequently college students floss their teeth. We do not know any of their other dental health behaviors. We only know from the ACHA-NCHA data that college students have been having an annual dental exam and cleaning. This data has not varied much for the fourteen years of the ACHA-NCHA survey.

The Illinois Department of Public Health (2014) found “as a result of oral health problems, 50 million school hours resulting in 10 million school days are missed by children”. Seierawan, Faust, and Mulligan (2012) and Jackson, Vann, Kotch, Pahel, and Lee (2011) found oral health status affects the academic performance of students. These negative performances include low grade point average, and missed days of school. While these research studies were in children, it could be possible that college students are experiencing dental and oral health issues and it is affecting their academic performance and class attendance. Unfortunately, dental and oral health issues can arise between annual appointments. We do not know if college students have had dental or oral health issues during the academic year. Nor do we know what these dental or oral health issues might have been or if there was an impact on class attendance or overall academic performance. This warrants more dental and oral health research in the college student population.

The level of oral health training for pediatricians was found to be inadequate to provide them with the competencies required for the provision of quality oral health care to children (Krol, 2004). Since this study was published in 2004, no more recent studies on pediatrician’s oral health training have been published. Even though, this could have resulted in today’s college students having had pediatricians who were not providing adequate oral health care and oral health education during the years when today’s college students were children. Additionally, many times general or family physicians do not exam the mouth unless the patient is in the office for a medical problem within the mouth or throat. Sometimes this lack of routine examining of the oral cavity is due to insufficient training in the structures and functions of the mouth and oral cavity, and the connection between oral and physical health. This lack of examining of the mouth could result in missed oral diseases or even referrals to dentists for a patient who has never been to a dentist. Better collaboration between medical and dental professionals could result in greatly improved oral health and a reduction in oral-related diseases for all ages.

Danielsen, Dillensberg, and Bay (2006) established general oral health competencies for physician assistants (PAs) and certified registered nurse practitioners (CRNP). Likewise, a list of the oral health competencies medical doctors should know was published by Kim, Mouradian, and Slayton (2006). We need to establish oral health competencies for college student health professionals, and remind the PAs and CRNPs of their prior learning. Student health center healthcare professionals might consider an in-service educational program on oral health and

hygiene. This in-service could be delivered by dentists and dental hygienists. Reed, Duffy, Walters, and Day (2005) suggests dental and oral health educational programming should include: (a) a review of teeth and their structure; (b) an in-depth training in the risk factors for oral cancer; (c) oral cancer detection; (d) dental health and oral cancer prevention strategies; (e) how to perform intra-oral and extra-oral exams for oral cancer.

Many times a chasm occurs and exists between healthcare professionals and their patients. This can also occur between college student health center professionals and the students that seek medical care via student health centers. Health literacy is vital at all stages of life, but promoting health literacy within the college student population sets them up for a lifetime of improved literacy for health. Promoting health literacy also needs to include the promotion of oral health literacy. Oral health literacy was defined in Healthy People 2010 (2000) as, "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate oral health decisions". Ickes and Cottrell (2010) conducted the first research study of health literacy of college students, but did not include dental or oral health literacy. Healthy literacy is considered the 6th vital sign. Dental health literacy needs to be considered the 7th vital sign.

A research study examining dental and oral health literacy of college students is also needed. College students tend to search online for answers to health issues they may be experiencing, but is oral health on their radar screen and are they concerned about oral health and its linkages with physical health? Do they search online for oral health answers? We do not know these answers. However, we should not abandon peer health education on college campuses. Peer health educators were found to be effective and successful in promoting healthy behaviors within their fellow students in the areas of alcohol, tobacco, drugs, and nutrition (White, Park, Israel, & Cordero, 2009). Peer health educators roles should be expanded and they should be used to deliver oral and dental health education programming, and promote healthy dental health behaviors in their classmates. Delivery of this oral and dental health education programming needs to be culturally sensitive, age appropriate, and meaningful to the college-age student.

Campus-wide dental and oral health awareness and literacy programs can be included in the student orientation programming, and centered around the month of April which is oral cancer awareness month. The American Dental Association (ADA) has free educational materials for the general public that student health centers can use and distribute across campus. The two most recent ADA educational materials are: (1) Common Oral Sores and Irritation (2012), and (2) Detecting Oral Cancer (2010). Two other ADA educational materials, while now dated, but worthy of consideration for updating or revisions are: (1) How Medications Can Affect Your Oral Health (2005), and (2) Diabetes and Oral Health (2002). The ADA also has a current campaign called "MouthHealthy" (http://www.mouthhealthy.org). This could be incorporated into the dental and oral health education of the college student population. Dental and oral health educational materials are needed specifically for the college population.

With the increasing presence of college students experiencing food insecurity, university health centers need to consider toothpaste and toothbrushes as financially difficult for students to afford. Partnering with local dentists to donate toothbrushes and toothpastes for college students could help address dental health during the collegiate years.

Student health center professionals make significant impacts on the undergraduate and graduate students and their physical and mental health. Adding oral health and its connection to overall health completes the circle. College student health center professionals need to regularly ask their patients if they are getting regular dental checkups, encourage dental visits, and make

referrals to area dentists. Campus student health centers need to develop relationships with area dental hygienists and dentists for referral of students with dental and oral health issues. Having these partnerships already established will speed up the transfer of a student from the college health center to the dentist's office for dental care.

The American College Health Association should consider surveying their member institutions to discover if dental health services are provided within student health centers, and by whom (dental hygienists, dentists, dental students, medical physicians) these dental health services are provided. The ACHA-NCHA Advisory Committee should consider expanding the ACHA-NCHA survey to include more dental health questions specific to detailed dental health behaviors such as tooth brushing regularity, dental flossing, and incidence of dental problems during their collegiate years.

As public health educators, we must not forget dental health as an integral part of overall health in college students, and we must educate for dental health and the prevention of related dental health issues.

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