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Undergraduate

# The Importance of Advocating for Oral Health Education Programs on College Campuses:

## Original Research on the Systematic Examination of Oral Health Beliefs among College Student Minorities

By Pang Vang, Arianna Khaira, Claudia Marmolejo-Aguado, Kuljeet Bains, & Manmeet Sandhu

### **Abstract**

Consistent oral hygiene habits are paramount for the efforts to preserve our overall health. Minimal research has been conducted focusing on college students and more specifically, those classifying as minorities. By narrowing down the field of oral health research to college educated minorities, such as Asian and Hispanic individuals, it is evident that there is a lack of oral education programs available to these individuals. Research focused on college students enables common misconceptions to be identified. Thus, systemic examinations need to be conducted regarding various oral health beliefs in an academic environment. This study investigates oral health beliefs of university students classifying as minorities in efforts to provide new insights as to why common misconceptions are held, even at an educated level. An oral health survey of 829 students was conducted at the University of California, Merced in the Fall of 2015. Most of these students self-identified as Latino (51%) or Asian (22%). A significant number of UC Merced minority students exhibited inaccurate oral health knowledge, which consequently may predispose individuals for a higher risk of developing poor oral hygiene. Oral health misconceptions may have been overlooked and therefore, universities need to provide educational advocacy programs to promote effective hygienic oral practice.

## **Introduction**

Effective oral hygiene contributes to our overall well-being. Furthermore, it aids in the prevention of chronic mouth and facial pain, oral and throat cancer, and other diseases and disorders (Oral Health, 2016). Previous studies have examined oral health beliefs from various groups of individuals, but an ongoing gap in healthcare studies prevails. An insufficient amount of oral-related research has focused on college students and more specifically, those classifying as Asian or Hispanic minorities. By focusing on college minority students, researchers may narrow this previously unexplored area in the healthcare field and provide new insights to unanswered questions regarding common oral health beliefs. Many studies center on oral hygiene attitudes and beliefs from a racial, age, and even health perspective, yet none focus on promoting healthy oral practices among young adults by studying their beliefs. Our study examines a previously unexplored category of common oral health beliefs among college students.

Previous research has been conducted on nonspecific-aged minorities. For example, studies have focused on Hispanics as being a large role in the representation of minorities in the United States. One study suggest that Hispanics may lack basic oral health knowledge due to various circumstances (Lugo, et al. 2013). However, the study could have been strengthened by examining college-educated Hispanics and Asians to determine if they have a greater capability of answering various oral health related questions comprehensively.

Other research has focused on children's oral hygiene routine and elderly at-risk patients. A study found that establishing healthy oral habits at an early age increases the probability of doing so as an adult (Walker, Jackson, 2015). Additionally, research relating to elderly individuals found that as one ages, oral health becomes an increasingly sensitive issue; gums

naturally recede over time and expose areas of the tooth that are not protected by enamel. A common condition in seniors, known as dry mouth, may be caused by medications or certain medical disorders. If left untreated, dry mouth can lead to damaged teeth by disabling the antibacterial properties of saliva. One study showed that existing health conditions such as diabetes, heart disease, and cancer can also negatively impact one's oral health (Oral Health for Seniors, 2010). Healthy oral habits introduced at an early age must continue throughout adulthood in order to maintain optimal practices as one ages. Studies focusing on elderly patients could benefit younger generations by creating a longitudinal group. Studying preventive measures during earlier years of these elderly patients may provide new insights effective oral hygiene maintenance as participants' age. This type of research could present new ideas regarding oral habits in a previously unexplored area and also provide younger generations the motivation to practice effective oral health practices. There is little evidence regarding why specifically college educated minorities have inadequate knowledge on common oral practices. Ultimately, it is salient that studies should also focus on college students to advocate preventative measures.

There is a large amount of research on the correlation between oral health and overall well-being. Studies have focused specifically on inadequate oral hygiene practices that may lead to complications such as diabetes and stroke on various individuals (Broadbent, et. al. 2016). Other studies center on the positive effects of regular oral care leading to a sense of self-confidence and how this leads to a strengthening of one's aesthetics. For example, actively engaged patients typically feel proud of their teeth, and thus, are able to evaluate their overall health standards as being proficient. In contrast, people who experience untreated dental pain typically feel distressed, fearful, upset, bad tempered and ashamed along with other negative

attitudes. Many of these misconceptions regarding oral hygiene remain prevalent amongst general populations (Walker, et al. 2015). These studies seem to focus on the general populations and not minority groups. Minorities contribute to a large portion of the population and therefore it is crucial that studies examine various minority groups.

Due to the lack of oral health research on young educated minorities, it is critical for dental education to be advocated to university campuses nationwide. This may inspire others to target research on college students. Narrowing the field down to specifically college educated minorities, such as Asian and Hispanic individuals, provides new insights to the lack of oral education in these groups. Focusing on college students should be a crucial field of study to determine why common misbeliefs are held, even at a higher education level. An insufficient amount of research has been conducted on college-educated individuals which would provide an appropriate group to advocate preventative care and measures (Broadbent, et. al. 2016). A survey was conducted on the University of California, Merced's campus to provide a newly focused field of research. Our field of research focuses on studying oral health beliefs of college students classifying as minorities.

## **Methods**

A data sample from students was collected using an online oral health survey distributed through the University of California, Merced's SONA research participation system. The survey was conducted from the months of October through December 2015. A total of 999 students classifying as mostly minorities responded, however, only 829 students were retained in the sample to eliminate experimental errors. Students who took less than ten minutes or more than thirty minutes were eliminated to account for reliability. The study primarily focused on minority students; most of which were Hispanic or Asian.

## *Measures*

In the SONA survey, oral health beliefs among college students were measured through six statements/questions, as seen in Table 1. Students were asked to analyze and respond to a total of six scenarios. The six statements/questions were taken from a previous study conducted in efforts to understand oral health status and perception in the Hispanic population (Lugo, et al. 2013). Oral health beliefs were measured using a five-point Likert-scale from 1) Strongly Agreed and 5) Strongly Disagreed. Demographic variables such as gender, race/ethnicity, and years in school were measured as shown in Figure 1.

Table 1:

Statements/Questions Examined by Minority Students Ranked Using a Likert-Scale	
Question Number	Question or Statement Asked to Students
1.	With time cavities will go away on their own if you brush regularly.
2.	With time gingivitis or gum disease will go away on its own if you brush regularly.
3.	When it comes to oral health, brushing is more important than flossing.
4.	Mouthwash freshens breath but does little else in terms of oral health.
5.	A little bleeding when brushing is normal.
6.	Poor oral health may be linked to other health complications.

## **Results**

### *Analysis*

The research conducted examined the frequencies of six oral health belief statements/questions along with demographic characteristics of the sample. Analysis of the data in discussion focuses on the incorrect answers or statements provided by students. We chose to

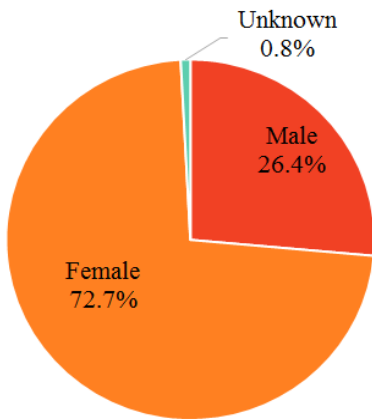
analyze incorrect answers to better understand why college educated minorities have misunderstood crucial facts regarding oral hygiene.

*Demographics*

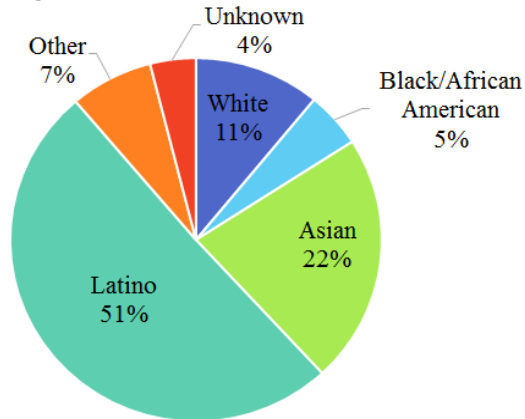
Figure 1 shows a breakdown of demographic variables. Our sample was predominantly individuals that identified as female resulting in 603 of the participants (72.7%) and 219 were males (26.4%). Most students self-identified as Latino (51%) or Asian (22%), with a smaller amount of students identifying as Black/African American (5%), White (11%), and others (7%). The median age was 19.67 years; 285 students were freshman (34.4%), 140 students were sophomore (16.9%), 199 students were juniors (24.0%) and 203 were seniors (24.5%).

**Figure 1: Student Demographic Variable**

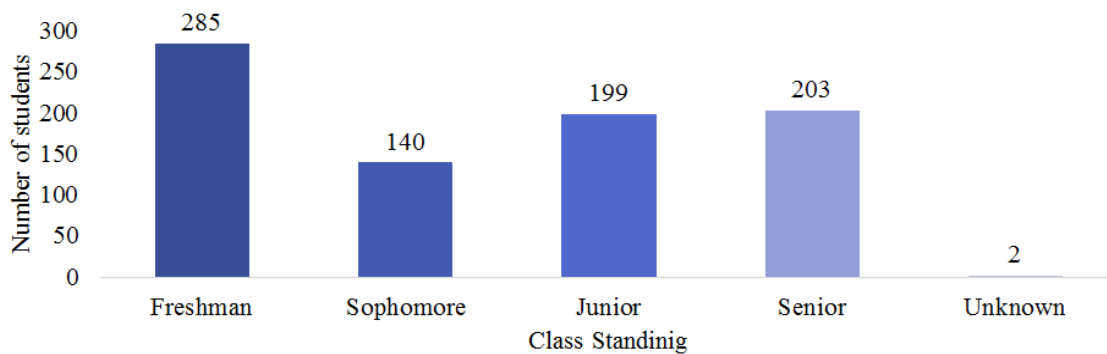
**Gender Distribution**



**Race/ethnicity Breakdown**

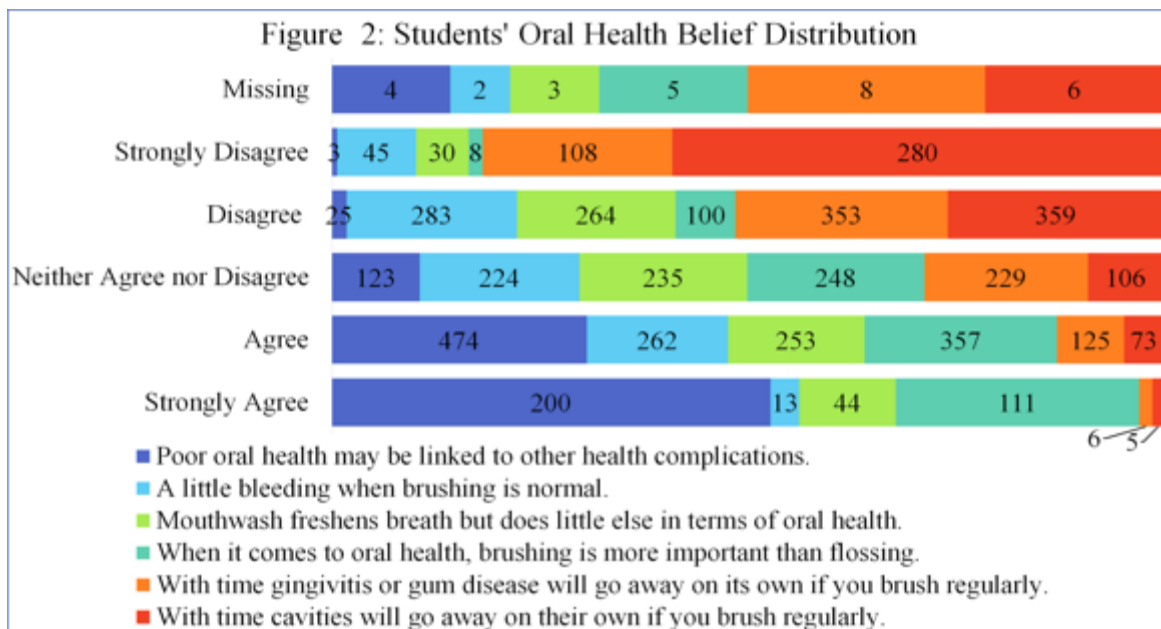


**Class Standing Distribution**



## Data

Figure 2 shows the frequency of responses for each oral health belief statement or question. A few students (9.4%) believed that *with time cavities will go away on its own with regular brushing* while the majority (77.1%) of students disagreed. When asked a similar question but in regards to gingivitis, a form of gum disease, the majority (55.6%) of students also disagreed, however, (15.8%) of students strongly agreed/agreed. Also, when asked about their beliefs on oral hygiene, (81.3 %) of students believed that *brushing is more important than flossing*. Students were asked whether they believed that *mouthwash freshens breath but does little in terms of oral health*, their responses were equally distributed between those who strongly agreed/agreed (35.8%) and those who strongly disagreed/disagreed (35.5%). One third (33.2%) of those who responded agreed that *a little bleeding while brushing is normal*. To understand students' beliefs about the importance of oral health on the overall body, students were asked if they agree that *poor oral health may be linked to other health complications*. The majority of students agreed (81.3%). However, a few disagreed (3.38%) and the rest neither agreed nor disagreed (14.8%).





## Discussion

### I. Oral Health Beliefs

After careful analysis of the data, it is evident that individuals of higher education held controversial oral health beliefs. As indicated, 9.4% of students “agreed” with “cavities will go away on their own with time if brushed regularly”. Although a relatively small amount of individuals agreed with this statement, their beliefs represent one of the many common misconceptions that may lead to detrimental consequences over time. Dental cavities affect the two outer layers of enamel and is diagnosed in 90% of the general population (Who Gets Cavities and Why, 2016). Most often, dentists use fluoride/sealants on molars that have early signs of decay to protect enamel from further deterioration. However, once the decay breaks through the enamel, the tooth is incapable of rebuilding what has been lost (The Tooth Decay Process, 2016). Students who agreed are more susceptible to enamel erosion if their cavities are left unattended and solely rely on brushing their teeth. Acid, produced from dental caries, continues to destroy the enamel which will then require professional help. This disconnect between awareness, proper management, and unattended cavities may lead to further development and worsening of symptoms.

When asked “gingivitis will go away with time and regular brushing”, 15.8% of participants agreed with this idea, which shows common misconception regarding student beliefs. Gingivitis, or gum disease, causes the inflammation of gums making them prone to bleed. This disease slowly progresses to the supporting bone, where pockets form and trap bacteria, requiring a professional deep cleaning below the gum line (ADA, 2016). If untreated, it can worsen and lead to periodontitis and eventual tooth loss (Gum Disease, 2016). Students who believed that gingivitis should be left unattended may be more at risk for developing serious

complications. To prevent further damage, professional gingivitis care is required since this disease will not go away on its own.

In regards to the question “little bleeding when brushing is normal”,  $\frac{1}{3}$  of participants agreed, which showed an increase lack of awareness. This is an important indicator because almost the same percentage of students agreed and disagreed, showing conflicting knowledge. This suggest that the individuals who “agreed” may not have been informed about the effects of bleeding which can occur from brushing. Bleeding gums is a way of one’s mouth signaling a need for attention. Sometimes bleeding gums occur because of brushing too hard, by using a firm back-and-forth brushing motion with hard bristles (Krucik, 2016). This shows that individuals do not know how to properly brush, that is by brushing in circular motions to prevent gum irritation. In an even worse scenario, bleeding gums can be identified as a common symptom of gum disease or periodontal disease (ADA, 2016). Signs of bleeding require professional attention or preventative measures, without which, symptoms can progressively worsen.

A greater lack of awareness was identified when asked on the importance of flossing. The majority, 81%, agreed with “brushing is more important than flossing”. However, this statement is surprising because flossing is just as equally important as brushing. Consequently, this showcases that the majority of individuals who agreed have a misconstrued understanding. According to the American Dental Association, flossing removes debris and plaque formation that may collect between teeth and areas that cannot be reached with a toothbrush. Floss, on can adequately clean between the teeth and under the gums– the combination of both, not only removes debris and plaques but also protects from more serious conditions (ADA, 2016). By continuing to perpetuate this misconception about flossing, students are unknowingly allowing plaque to accumulate between their teeth. Since they are unable to remove the plaque that is hard

to reach by simply using a toothbrush alone, they are more prone to deteriorating teeth.

Another common misconception was recognized when asked “mouthwash freshens breath but does little else in terms of oral health.” An equal dividend was identified amongst both groups, with 35.8% agreeing and 35.5% disagreement with the statement that mouthwash only freshens breath. Similarly to brushing and flossing, mouthwash, is beneficial. Like toothpaste, mouthwash kills the bacteria that form debris and plaques, and like floss, can remove plaques, and other debris in between teeth and under the gums. Mouthwash has several benefits, which contributes to improved hygiene, such as reducing plaque, gingivitis, cavities and elimination of bad breath (ADA, 2016). Additionally, without knowing that mouthwash contributes to more than freshening breath, many people may not utilize it as frequently as they should. Since mouthwash has numerous positive benefits, it can lead to better oral health if frequently used.

## II. Possible Cause to Misconception

### *Access to Care*

All students are enrolled in UC SHIP, an insurance plan, through UC Merced. However, students may waive this plan if they have their own insurance, regardless if their personal insurance includes dental care. Unfortunately, those that waived their insurance may not be educated on the benefits of this policy. Many students may choose to forego dental treatment because of high costs. However, through UC SHIP, from a provider who is in network, these costs are exponentially reduced from 80% for basic services, while a regular cleaning is covered at 100% (UC SHIP, 2016). This disconnect stems from not only the cost of treatment but also the lack of awareness regarding benefits of this coverage. Introducing programs that educate individuals on their insurance benefits may encourage students to seek dental treatment more.

Another key factor of students not having knowledge on oral health practices is their inability to access oral health facilities. Although UC SHIP is an option for students, there is still a drawback in regards to not having a dental clinic on UC Merced's campus, which other UC campuses have (SHIP, 2014). As a result, students must seek alternatives off campus. However, the lack of transportation and mapped out dental locations may affect their ability to attain care. Furthermore CatTracks line C1 only takes students to one general area that contains the dental office El Portal (CatTracks, 2016). There is a lack of educational programs on campus and resources that could be used to motivate students to seek providers. Unfortunately, students may forego dental treatment altogether.

Many educated minorities are first generation students and come from families whose native tongue is not English (Who Our Students Are, 2016) which may present a language barrier. Language barriers between individuals may lead to misunderstandings. Most individuals choose to not only find healthcare professionals who identify with their race but also speak the same language. However, there is a shortage of diversity and a lack of cultural understanding among dental professionals to care for diverse communities, mainly because 14% of licensed dentists are non-white; 7% of which identify as Asian/Pacific Islander, while 3.3% identify as Hispanic/Latino (Kelesidis, 2014). This shortage of culturally diverse dentists affects patients in that providers may have little understanding of the issues they face. As a result, the patients may feel unable to connect with their dentists.

Children raised in families that did not form a strong relationship with their dentists may not be appropriately informed on important health care techniques. These children therefore may end up entering college and adulthood with a skewed perception of their oral hygiene. Cultural beliefs and upbringings, are highly influential and may limit the willingness of certain

individuals from trusting and seeking these practices (Kelesidis, 2014). If there is not a sufficient patient-provider relationship, these individuals may choose to not share their ‘new’ knowledge with their family members and/or children. This creates a continuous cycle of oral misbeliefs. It is crucial for providers to be able to respond to patients whose cultures may be different from their own. If parents are not communicating the oral health information to their children, then this may result in their children having inaccurate preconceived notions carrying into adulthood.

### III. Media Influence

Media influences the way dentistry is portrayed to the general public. Although the media advertises oral hygiene, it is restricted only to aesthetics (Hilgenberg et al. 2011). For example, toothpaste commercials often list many benefits of whitening with their product. Unfortunately, the disadvantages and harmful side effects of doing so are not included. The media focuses more on aesthetic appeal by whitening your teeth and enabling consumer satisfaction. Media presentations include preconceived notions that are built on the foundation of customer satisfaction – how to get the prettiest smile, whitest teeth, but no actual information on the ingredients. There are ingredients that can bring harm to teeth, such as silica that is a sand that scratches away at the enamel of teeth, resulting erosion (More Harm Than Good, 2016). This is detrimental because enamel acts as the first protective barrier of your tooth. Instead, sales are urged on ‘whitening strips’ and ‘whiter teeth’ when in reality, the long term exposure to these ingredients are harmful to consumers. Therefore, whitening techniques may present new oral problems such as the wearing down of enamel (Price, 2000). This desire to have white teeth may present destructive results to teeth because of the ingredients being used in order to achieve the look.

Having bad breath is a topic that the media uses against the average consumer. Bad odor in breath is often portrayed as undesirable and something that consumers must fix in order to be considered attractive. An example of this in the media, is the fixation on mouthwash.

Commercials advertise the removal of bacteria that cause bad breath, but do not educate consumers on other benefits of mouthwash. Mouthwash provides more to oral hygiene than is being advertised. Clinical studies have shown that the use of fluoride mouthwashes can actually aid in the additional protection against cavities, and even more so than that a fluoride toothpaste (ADA, 2016). Media seems to be more concerned with the business aspect of dentistry rather than the well-being of their consumers. Furthermore, they seem to only provide a short term fix that consumers can buy into. Their main goal appears to treat the problem rather than educating consumers on the idea that mouthwash is most effective in conjunction with brushing and flossing.

#### *UC Merced Advocacy/Education*

Without continuous visits to healthcare professionals or direct access to educational programs, students may find dental care a lower priority compared to other health routines. At UC Merced, there are programs that advocate safe sex by distributing condoms that are readily available throughout campus. However, there aren't toothbrushes or floss packs being passed around campus. A few on-campus programs, such as HEROES (Health Education Representatives for Opportunities to Empower Students) and VPP (Violence Prevention Program) advocate for health education. VPP provides education for the UCM community in order to achieve an environment that is free from threat of sexual violence, dating/domestic violence and stalking (UCM Health Services, 2016). HEROES focus primarily on topics of: sleep, drugs/alcohol, sex, nutrition and stress management. However, there is no similar focus on

oral health. Educational health programs focusing on oral health would not only provide information to clarify previously misconstrued beliefs, but would also provide useful resources regarding oral hygiene. Conclusively this would lead to individuals with a better understanding of effective care.

### **Limitation**

The research poses a few limitations. The research is unrepresentative of males because the retained sample consists a majority of females (72.7%). Therefore, the level of certainty we concluded in our findings may not apply to males due to the fact that there were more females than males surveyed. Additionally, there was a great amount of freshman participants (34.4%), and a near equal amount of juniors (24.0%) and seniors (24.5%), but not a sufficient amount of sophomores (16.9%). Therefore, the research may not account for all educated young minority adults. Another limitation that was recognized regarded the questions and statements asked to the participants. Oftentimes, vague statements may be misconstrued and therefore answered with a level of uncertainty. For example, when asked “little bleeding when brushing is normal” students may have assumed that they were being asked if short term bleeding was normal - as in, they had brushed a little “too hard.” However, in reality the point of the question was to determine if students knew that bleeding is actually a sign of gingivitis.

### **Conclusion/Implication**

A significant number of students hold misconstrued oral health beliefs. Therefore, more oral health advocacy efforts are needed on university campuses, such as the University of California, Merced, to promote the importance of oral health to students. Improving dental hygiene education may involve supporting dental organizations and integrating oral health into programs supported by the Office of Student Life, such as HEROES. Educating students on

dental health insurance benefits may also increase oral health knowledge because it encourages students to seek advice from oral health professionals. In addition, further research may suggest exactly why many college students have oral health misconceptions by applying our findings to generate new and more thorough questions.

### **Acknowledgement**

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## References

- American Dental Association (2016). Retrieved November 6, 2016, from <http://www.ada.org/en/>
- Broadbent, J. M., Zeng, J., Page, L. F., Baker, S. R., Ramrakha, S., & Thomson, W. M. (2016). Oral Health–related Beliefs, Behaviors, and Outcomes through the Life Course. *Journal of dental research*, 0022034516634663.
- CatTracks Bus Schedule (2016.). Retrieved November 01, 2016, from <http://cattracks.ucmerced.edu/>
- Gum Disease Symptoms, Treatments, Causes. (2016). Retrieved November 06, 2016, from <http://www.webmd.com/oral-health/guide/gingivitis-periodontal-disease>
- Halvari, A. E., Halvari, H., Bjørnebekk, G., & Deci, E. L. (2013). Oral health and dental well-being: testing a self-determination theory model. *Journal of Applied Social Psychology*, 43(2), 275-292.
- Hilgenberg, Sérgio Paulo, Pinto, Shelon Cristina Souza, Farago, Paulo Vitor, Santos, Fábio André, & Wambier, Denise Stadler. (2011). Physical-chemical characteristics of whitening toothpaste and evaluation of its effects on enamel roughness. *Brazilian Oral Research*, 25(4), 288-294. Epub July 08, 2011
- Kelesidis, N. (2014). A Racial Comparison of Sociocultural Factors and Oral Health Perceptions. *American Dental Hygienists Association*, 88(3), 173-182.
- Krucik, G. (Ed.). (2016). What causes bleeding gums? 17 possible conditions. Retrieved November 06, 2016, from <http://www.healthline.com/symptom/bleeding-gums>
- Lugo, I., Arteaga, S., Sanchez, V. (2013). Oral health status, perceptions, and access to dental

care in the Hispanic population. *General Dentistry*, 62(4), 24-30.

More Harm Than Good. (2016). Retrieved October 20, 2016, from

[http://anthropology.si.edu/writteninbone/teeth\\_cleaning.html](http://anthropology.si.edu/writteninbone/teeth_cleaning.html)

Oral Health. (2016, April). Retrieved from [http://www.who.int/oral\\_health/en/](http://www.who.int/oral_health/en/)

Oral Health for Seniors. (2010, November 15) Seniors Oral Health Article. Colgate-Palmolive

Company. Retrieved May 12 2016 from

<http://www.colgate.com/en/us/oc/oral-health/life-stages/oral-care-age-55-up/article/oral-health-for-seniors>

Price, R. (2000.). The pH of Tooth-Whitening Products. Retrieved April 08, 2016, from

<http://www.cda-adc.ca/jcda/vol-66/issue-8/421.html>

Student Health Insurance Plan. (2016). Retrieved November 04, 2016, from

<http://www.ucop.edu/ucship/care-on-campus/index.html>

The Tooth Decay Process: How to Reverse It and Avoid a Cavity. (2013, May). Retrieved

November 06, 2016,

from <http://www.nidcr.nih.gov/OralHealth/OralHealthInformation/ChildrensOralHealth/ToothDecayProcess.htm>

UCM Health Services. (2016). Retrieved April 08, 2016, from <http://health.ucmerced.edu/>

Walker, K., & Jackson, R. (2015). The health belief model and determinants of oral hygiene

practices and beliefs in preteen children: a pilot study. *Pediatric dentistry*, 37(1), 40-45.

Who Gets Cavities and Why, How to Know If You Have One. (2016). Retrieved April 07,

2016, from <http://www.medicinenet.com/script/main/art.asp?articlekey=43098>

Who Our Students Are. (2016). Retrieved November 04, 2016, from

[http://crte.ucmerced.edu/who\\_our\\_students\\_are](http://crte.ucmerced.edu/who_our_students_are)

Your UC SHIP Dental Benefits (2016). Retrieved April 07, 2016 from

<http://www.ucop.edu/ucship/campuses/merced/my-dental-coverage/your-uc-ship-dental-benefits.html>