

# Assessing Oral Health Status, Practices, and Access to Care among War-Affected Refugees Living in San Antonio, Texas

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Eur J Dent:2020;14:371–379

## Abstract

**Objectives** Refugees encounter several health disparities including oral health problems. This study evaluated the self-reported oral health status, practices, and access to care of adult refugees living in San Antonio, Texas, United States.

**Materials and Methods** Adult refugees ( $n = 207$ ) who accessed services from two centers in San Antonio, completed this survey. Multivariate logistic regression was used to examine the relationship of the refugees' demographics with oral health status, practices, and access to care.

**Results** Oral pain in the previous 12 months was common among refugees having been reported by almost 58.9% of the survey participants; 43% reported pain as the reason for their last dental visit. Approximately half of the participants reported both the condition to their teeth and gums as being good: 42.5 and 54.6%, respectively. Most participants (84%) reported brushing their teeth one or two times a day, and around 78% reported they never smoked. Fifty-two percent reported needing dental care in the past 12 months, but not being able to receive it; while 45.9% reported not having dental insurance, 41.5% reported not having money to pay a dentist. Fifteen percent reported never visiting a dentist. Arabic speakers, moving to the United States more recently, and lower level of education were associated with a poor oral health status and practices ( $p < 0.05$ ).

**Conclusion** Refugees in this study encountered limited access to dental care. Their inability to seek dental care could affect their oral and general health, weaken efforts of preventing oral health diseases, and restrict their full inclusion into the community.

## Keywords

- refugees
- San Antonio
- oral health status
- oral health practices
- oral health access

## Introduction

The United States is a country of immigrants both legal and illegal. Legal immigrants fall into several categories: refugee, parolee, asylee, special immigrant visas holder, and victims

of human trafficking.<sup>1</sup> Of the approximately one million migrants lawfully entering the United States every year, less than 10% are refugees.<sup>2</sup> In the early 21st century, most refugees were from the Soviet Union and Southeast Asia, but more recently they are coming from Eastern Europe,



Central Asia, Africa, and the Middle East. In the past decade, conflicts and wars increased the number of refugees from the Middle East.<sup>3</sup>

Of the refugees coming into the United States, ~10% settle in Texas; the majority go to Houston, Dallas, and Fort Worth.<sup>4</sup> Although the number of immigrants in Texas has been increasing since 2011, the percentage of those being refugees has been decreasing: 72% of 9,759 in 2012 to 46% of 15,866 in 2015.<sup>1</sup> The largest proportion of refugees in Texas is from Iraq, Congo, and Myanmar: 7 to 8% of them reside in Bexar County.<sup>1</sup> As of December 2015, 615 refugees were identified as living in San Antonio: most of them from Myanmar ( $n = 285$ ) and Iraq ( $n = 145$ ).<sup>4</sup>

Refugees are a vulnerable population with experiences of traumatic events including casualties of war, hunger, family loss, social and emotional stress, human rights violations, and physical intimidation or violence. Such circumstances impacted access to basic health services in their country of origin, including access to preventive care, oral health care, chronic disease management, and nutrition. Refugees lack an intact health care system and experience a higher prevalence of certain diseases.<sup>5-8</sup> Therefore, refugees require access to a health care system focused on wellness that is culturally appropriate, addresses communication barriers, and is sensitive to experiences associated with traumas of war.<sup>9</sup> Among the health care needs and treatment of diseases, oral health care is needed to address the high prevalence of dental caries, oral trauma (missing and fractured teeth), and periodontal disease.<sup>9</sup>

Studies from different countries demonstrated a difference between refugees and locals in their oral health status. For example, studies from Sweden, Holland, and Italy reported that refugees from Chile, Poland, and Yugoslavia had poorer oral health and needed more treatment than did their native citizens.<sup>10-13</sup> In the United States, however, Cote et al assessed the oral health status of newly arrived refugee children (6 months–18 years) participating in the Refugee Health Assessment Program. This study found significant differences in the oral health status among different ethnic groups of refugees when compared with findings from National Health and Nutrition Examination Survey (NHANES III).<sup>3</sup> A study in Massachusetts of Somali refugees found that English health literacy and spoken proficiency were not the main factors in the utilization of preventive care services and oral health status of refugees. However, acculturation was more predictive of care use and oral health condition.<sup>14,15</sup>

There is a limited data that examines the oral health needs of the adult refugee population in the United States. Studies are lacking that describe the oral health status, oral health care access, and health care needs of refugees, specifically refugees who are affected by war in the Middle East and in Myanmar. Therefore, this study aimed to identify self-reported oral health status, oral health practices, and oral health care access of adult refugees living in San Antonio, Texas.

## Materials and Methods

This was a cross-sectional study that utilized a self-report survey collecting data from refugees affected by war who have relocated to San Antonio. A convenience sample of participants was collected at two sites that provide services to refugees: Center for Refugee Services of San Antonio and the Islamic Center of San Antonio. The Institutional Review Board (IRB) approval was obtained from the University of Texas Health Science Center at San Antonio. Letters of agreement between the two sites and the Dental Public Health Advanced Education Program at the University of Texas Health School of Dentistry were made to establish collaboration for data collection.

### Data Collection

Data was collected at both sites, during routine business hours, under the supervision of the facility director or a person in charge of immigration services at each site. The survey consisted of 17 questions, including general demographic information, self-assessment of oral health status, oral health practices, and access to dental services. The first page of the survey outlined the purpose of the study, the study investigator's contact information, and a statement that completion of the survey was considered the participants' consent.

The survey was provided to refugees attending the two sites to receive services or participate in an event. The investigator did not intervene during data collection nor answer individual questions to avoid any possible bias. The completed forms were collected daily by the study investigator. Participants were informed about the purpose of the survey; upon completion of the survey, study participants received dental educational materials: a toothbrush, toothpaste, and dental floss. Oral hygiene instructions were offered to all participants, and they were given a list of dental clinics in San Antonio that provide dental care services at a reduced cost.

### Instrument

The survey was developed in English and translated into the main languages of refugees: Arabic, Burmese, Persian, Pashto, Urdu, and Malaysian. Translations to other languages were provided as needed, for example, translation into Malay was done since many refugees originating in Myanmar (Burma) migrated to Malaysia before coming to the United States. All translated surveys were back-translated. Survey questions were adopted and modified from the 2013 World Health Organization's "Oral Health Surveys: Basic Methods - 5th edition."<sup>16</sup> The use of these standardized questions helps establish comparability of data collected from different sources. The survey was pretested on 15 individuals of different languages to ensure the validity of questions and their reflection of study objectives. Pilot testing didn't show any conflict of understanding or a comment indicating a concern.

Inclusion and exclusion criteria: refugees, 18 years of age or older. Refugees who originated from a war-torn country were eligible to participate in this study. Individuals who

were illiterate, could not read any language, or had any type of mental or cognitive disability, were excluded from this study. Participants were identified by their date of birth, language of origin, and gender to avoid duplication in data.

Demographic information: age, gender, language of origin, level of education, US education, duration in the United States were considered independent variables. Oral health status, oral health practices, and oral health care access were considered dependent variables.

### Analysis

Descriptive statistics were used to examine the demographics of the refugee populations, their oral health status, oral health practices, and oral health care access. Binary logistic regression and multinomial logistic regression analyses were used to examine the relationship of demographic information with oral health status, oral health practices, and oral health care access. All variables were categorical variables except age. For the convenience of the analysis, age was categorized into three categories; 18 to 29 years old, 30 to 49 years old, and 50 years old or older. For multivariate analysis, some variables were rescaled as shown in ►Table 1.

Rescaling was done because some levels of independent variables were unequally distributed across levels of dependent variables, and some were restricted in range, resulting in weak correlation and unreliable variable representation. Therefore, some levels were merged to enhance reliability of results, improve variables' representation, and minimize biases.

SPSS Statistical Software version 23 was used in the analysis, and *p*-value of 0.05 was considered statistically significant.

### Results

A total of 207 refugees participated in the study: 115 males (55.6%) and 81 females (39.1%), as shown in ►Table 2. The mean

age was 37.38 years old ( $\pm$  12.34 years). The most common language of origin among participants was Arabic (41.5%), followed by Persian/Dari (23.7%). Approximately 60% of the participants had a high school education or less and 25% completed a college degree or higher. When participants were asked how long they were in the United States, 30% had moved to the United States less than a year ago.

Tooth or mouth pain or discomfort in the past 12 months was the main oral health complaint reported by 58.9% of the participants as well as being the major reason (43%) of the participants' visit to a dentist. As shown in ►Table 3, most respondents reported the condition of their teeth or gums as "Good" (42.5 and 54.6%, respectively); less than 10% considered the condition of their teeth or gums as very poor.

Responses of participants show generally good oral health practices (►Table 3). Eighty-four percent of participants reported brushing their teeth once (41.1%) or twice (43%) on the day before the survey. Most participants reported cleaning their teeth using a toothbrush (84.5%), toothpaste (68.6%), and chewstick or miswak (20%). Over one-third of the participants eat sweets (e.g., cakes or cookies) and almost one-fifth (22.2%) reported drinking soda. However, many participants reported having two or more servings of fruits (42%). Around three out of four participants reported to have never smoked.

While 29% of the participants reported never visiting a dentist or having seen one more than 5 years ago, just over 60% of participants reported visiting a dentist within the past 2 years. As noticed in ►Table 3, almost one-fifth of the participants (18.4%) had seen a dentist in the past 6 months. Fifty-two percent of the refugees reported needing dental care in the past 12 months, but not being able to receive it. The most common reason was financial: 45.9% reported not having dental insurance, while 41.5% reported not having money to pay a dentist. Communication issues and language barriers were issues reported by only 7.2%.

**Table 1** Original and modified scaling of variables used in the multivariate logistic regression

Original scaling	Modified scaling	Original scaling	Modified scaling
<b>Language of origin</b>	<b>Language of origin</b>	<b>Condition of teeth or gums</b>	<b>Condition of teeth or gums</b>
Arabic Rohingya Pashto Persian/Dari Other languages	Arabic Rohingya Persian/Dari Other languages (including Pashto)	Very good Good Poor Very poor	Good Poor
<b>Education</b>	<b>Education</b>	<b>Brushing times</b>	<b>Brushing times</b>
Less than high school High school diploma Some college College degree Postgraduate degree	Less than high school High school diploma Some college College degree or higher	Did not brush One time Two times More than two times	Did not brush One time Two times or more
<b>Tobacco use</b>	<b>Tobacco use</b>	<b>Last visit to a dentist</b>	<b>Last visit to a dentist</b>
Every day Several times a week Several times a month Rarely Never	Often Occasionally Rarely or never	Less than 6 m ago 6–12 m ago 1–2 y ago 2–5 y ago More than 5 y ago Never	0–12 m ago 1–2 y ago 2–5 y ago More than 5 y ago

**Table 2** Demographic information of study participants

Gender	n (%)	Age	n (%)
Males	115 (55.6)	Younger than 30 y old	51 (24.6)
Females	81 (39.1)	30–49 y old	97 (46.9)
Unknown	11 (5.3)	50 y or older	39 (18.8)
		Unknown	20 (9.7)
Education	n (%)	US education	n (%)
Less than high school	62 (30)	No	169 (81.6)
High school diploma or GED	61(29.5)	Yes	37 (17.9)
Some college	23(11.1)	Unknown	1 (0.5)
College degree	47 (22.7)		
Postgraduate degree	5 (2.4)		
Unknown	9 (4.3)		
Time since moved to the US	n (%)	Language	n (%)
Less than a year ago	63 (30.4)	Arabic	86 (41.5)
1–2 years ago	47 (22.7)	Rohingya	23 (11.1)
2–5 years ago	61 (29.5)	Pashto	30 (14.5)
5 years or more ago	32 (15.5)	Persian/Dari	49 (23.7)
Unknown	4 (1.9)	Other languages	19 (9.2)

### Multivariate Analysis

Male respondents were less likely than females to report having tooth or mouth discomfort or pain in the previous 12 months (odds ratio [OR]: 0.45, 95% confidence interval [CI]: 0.21–0.95,  $p = 0.037$ ). Arabic speaking respondents were more likely than respondents of “other” languages to report having teeth or mouth discomfort or pain in the previous 12 months (OR: 3.92; 95% CI: 1.37–11.23,  $p = 0.011$ ). Those who relocated to the United States 1 to 2 years ago were more likely to report having teeth or mouth discomfort or pain in the previous 12 months (OR: 4.60; 95% CI: 1.39–15.22,  $p = 0.01$ ).

Regarding participants' self-reported condition of the teeth or the gums, language of origin was a strong predictor as shown in ►Table 4. Education and age were also significantly associated with condition of the teeth. Those who completed less than high school of education were more likely to report poor teeth condition (OR: 3.08; 95% CI: 1.07–8.89,  $p = 0.037$ ), while those in the age group of 30 to 49 were less likely to report poor teeth condition (OR: 0.28; 95% CI: 0.089–0.78,  $p = 0.015$ ).

►Table 5 demonstrated the relationship of demographic data with time since the last visit to the dentist and reasons for that visit. Education and duration in the United States were the most statistically significant predictors. Other variables such as age and language of origin were also statistically significant. Those who moved more recently to the United States or had less education were less likely to have had seen a dentist in less than 5 years and were less likely to see a dentist for a regular checkup or consultation ( $p < 0.05$ ). Furthermore, participants younger than 30 years old were less likely to have had seen a dentist in the previous 5 years. However, visiting a dentist for treatment or follow-up was not statistically significant ( $p > 0.05$ ).

Although participants who arrived more recently in the United States were less likely to have had sodas in the last 24 hours than participants living in the United States for more than 5 years, and they were also less likely to have had two or more servings of fruits (►Table 6). The youngest age group (younger than 30 years old) was more likely to consume sweets and sodas than adults 50 years or older. Tobacco use was more common among males, individuals with less than high school of education, and Arabic speakers, as shown in ►Table 6.

Demographic data significantly associated with brushing times and brushing items, varied. Participants who moved to the United States in less than a year ago were more likely to have brushed one time than to have brushed two times or more (OR: 3.46; 95% CI: 1.00–11.91,  $p = 0.049$ ). They were also less likely to use a toothpick than those who moved more than 5 years ago (OR: 0.16; 95% CI: 0.032–0.78,  $p = 0.024$ ). Participants who were 30 to 49 years old were more likely to use a toothbrush (OR: 4.02; 95% CI: 1.16–13.9,  $p = 0.03$ ), and they were less likely to use a chewstick/miswak (OR: 0.19; 95% CI: 0.04–0.92,  $p = 0.039$ ) compared with participants 50 years or older. Age, gender, education levels, language, and length of time in the United States were not significantly associated with access to oral health care (i.e., needed dental care in the last 12 months in the United States but couldn't get it).

### Discussion

Education level was a significant variable in this study. The majority (60%) of refugees seeking services at the two refugee centers in San Antonio had only a high school education or less. Educational services sought in the United States were primarily English courses offered by refugees' services centers.

**Table 3** Summary of oral health status, practices, and dental care access of participants

Oral health problems		Oral health practices		Oral health care access	
Discomfort or pain in teeth or mouth in the last 12 months	n (%)	Brushing times, the day before	n (%)	Time since you have seen a dentist	n (%)
Yes	122 (58.9)	Did not brush	10 (4.8)	Less than 6 m	38 (18.4)
No	81 (39.1)	One time	85 (41.1)	6–12 m	37 (17.9)
Unknown	4 (1.9)	Two times	89 (43)	1–2 y	50 (24.2)
		More than two times	21 (10.1)	2–5 y	22 (10.6)
		Unknown	2 (1)	More than 5 y	29 (14)
				Never	31 (15)
Condition of your teeth	n (%)	Items used to clean teeth <sup>a</sup>	n (%)	Dental care was needed in the past 12 months but couldn't get it <sup>b</sup>	n (%)
Very good	19 (9.2)	Toothbrush	175 (84.5)	Yes	107 (51.7)
Good	88 (42.5)	Toothpick	29 (14)	No	94 (45.4)
Poor	80 (38.6)	Thread or dental floss	36 (17.4)	Unknown	6 (2.9)
Very poor	18 (8.7)	Chewstick or miswak	42 (20.3)		
Unknown	2 (1)	Toothpaste	142 (68.6)		
Condition of your gums	n (%)	Eating/drinking (past 24 hours) <sup>a</sup>	n (%)	Reasons for not getting dental care <sup>ab</sup>	n (%)
Very good	20 (9.7)	Sweets/sugary foods	74 (35.7)	No transportation	14 (6.8)
Good	113 (54.6)	Candies	35 (16.9)	No dental insurance	95 (45.9)
Poor	61 (29.5)	Sodas	46 (22.2)	No money to pay the dentist	86 (41.5)
Very poor	13 (6.3)	Other sugar-sweetened beverages	72 (34.8)	Didn't know how to find a dentist	12 (5.8)
		Two or more servings of fruit	87 (42)	Previous bad experiences	15 (7.2)
				Communication problems	15 (7.2)
				Other reasons	5 (4.2)
		Tobacco use	n (%)		
		Every day			
		Several times a week	16 (7.7)		
		Several times a month	10 (4.8)		
		Rarely	2 (1)		
		Never	15 (7.2)		
		Unknown	161 (77.8)		
			3 (1.5)		
		Reason for last visit to the dentist <sup>a</sup>	n (%)		
		Pain with teeth, gums, or mouth	90 (43.5)		
		Treatment or follow-up treatment	31 (15)		
		Regular checkup or consultation	15 (7.2)		
		Prevention or dental cleaning	46 (22.2)		

<sup>a</sup>More than one reason may apply.

<sup>b</sup>Those who answered “no” to this question were asked to skip “reasons for not getting dental care.”

Most of the refugees who came to the centers do so seeking “help to find a job” or “applying for government aid.” There is a high possibility that many were seeking assistance because they could not find a well-paying job with their current level of education. Having a higher level of education may have assisted refugees to secure better jobs, therefore, not needing to visit the refugee center for help.

Given these factors, the findings in this study of self-reported poor oral health (condition of teeth and gums)

being associated with a lower education level and language of origin (represents culture and/or ethnicity) are consistent with numerous other studies.<sup>10-13,17-24</sup> Poor oral health status has also been associated with chronic stress, depression, and financial hardship.<sup>19</sup> These are conditions that would be expected in a refugee population.

Another point that contributes to the condition of refugees' oral health is the time elapsed since they moved to the United States. Over 50% of participants in this

**Table 4** Relationship of demographic data with condition of the teeth and the gums of participants

	OR	p-Value <sup>a</sup>	CI (95%)
Condition of the teeth: poor			
Less than high school	3.08	0.037	(1.07–8.89)
High school diploma or GED	NS		
Some college	NS		
College degree or higher	1		
Arabic	6.23	0.003	(1.88–20.64)
Rohingya	4.8	0.045	(1.03–22.23)
Persian\Dari	4.69	0.014	(1.37–16.09)
Other languages	1		
30–49 y old	0.28	0.015	(0.089–0.78)
50 y or older	1		
Condition of the gums: poor			
Arabic	5.7	0.01	(1.53–21.27)
Persian\Dari	8.5	0.002	(2.15–33.67)
Other languages	1		

Abbreviations: CI, confidence interval; GED, general education diploma; NS, not specified; OR, odds ratio.

Binary logistic regression was used in the analysis.

<sup>a</sup>Only significant variables are included.

“good” is the reference group for teeth and gums conditions.

sample moved to the United States in the previous 2 years. In fact, acculturation and adaptation to a new culture are less likely to occur within a short period of time, especially for those who moved at an older age.<sup>14,24</sup> The average age of this study's participants is 37.38 years old, almost all of them have no formal US education, and lived for a short duration in the United States. Therefore, oral health practices are less likely to have changed since they moved.<sup>8,14</sup> A study by Cruz et al revealed that adults who immigrated to the United States at an older age had higher prevalence of caries and periodontal diseases and higher treatment needs.<sup>25</sup> The aspect that men in this study were 12 times more likely to often use tobacco than women demonstrated that acculturation was yet to occur. This is closer to the global ratio of smoking, which is five times much more common in men than in women.<sup>26</sup> The ratio in the United States is much different. The prevalence of smoking in women is 13.5%, compared with 17.5% in men, as of in 2016.<sup>27</sup>

Although most participants had a low level of education, came to the country at an older age, and consumed a lot of sweets and sweetened beverages, they showed good oral health practices toward brushing times and items used to clean their teeth. A possible explanation for brushing more than one time is that most participants felt pain or discomfort in the previous 12 months and needed dental care but could not get it. Armfield et al found that more frequent dental visiting and toothbrushing were associated with poorer self-rated oral health, more untreated decay, and higher DMFT (i.e. Decayed, Missed, and Filled Teeth).<sup>20</sup> These factors could have contributed to the difference noticed between those who brushed one or two times and those who brushed

more than two times (10%). In addition, most participants were not smokers, which also supported the high percentage of having a good condition of the gums or teeth.

Acculturation has a huge impact on oral health status, behaviors, and access to care,<sup>14,15,25</sup> which explains the significant association of poor oral health practices and lower access with care in participants who moved to the United States 1 to 2 or 2 to 5 years ago. A systematic review by Gao and McGrath showed that the higher the acculturation, better are the oral health outcomes, including oral health condition, practices, and utilization of care. The two important domains used in most studies to measure acculturation were time since the refugees moved to the United States and whether they had English-speaking abilities.<sup>24</sup>

Refugees receive medical coverage in the first 8 months after arriving in the United States,<sup>28</sup> which may enable them to receive dental care. Once coverage is no longer available, they may start facing difficulties accessing medical and dental care. This might explain why 90% of participants in this study reported the main reason for not receiving dental care was lack of insurance or ability to pay.<sup>29</sup> Although demographic information of participants is expected to be significantly associated with “access to dental care when needed,” the lack of a significant association may be due to the small sample size with almost all of individuals having relatively similar socioeconomic status.

## Strengths and Limitations of the Study

This study provides an insight into the oral health practices and self-reported oral health status of refugees living in San Antonio, identifying barriers to care and dietary behaviors toward which educational efforts can be targeted.

**Table 5** Relationship of demographic data with time since the last visit to a dentist and the main reason for that visit

Time since the last visit to the dentist			
	OR	p-Value <sup>a</sup>	CI (95%)
Less than a year ago			
Arabic	4.37	0.03	(1.15–16.56)
Other languages	1		
1–2 y ago			
Persian/Dari	0.13	0.005	(0.032–0.532)
Other languages	1		
Younger than 30 y old	0.22	0.05	(0.048–0.99)
50 y or older	1		
2–5 y ago			
Younger than 30 years old	0.067	0.035	(0.006–0.824)
50 y or older	1		
Moved to the US less than a year ago	0.39	0.02	(0.002–0.539)
Moved to the US 1–2 y ago	NS	NS	NS
Moved to the US 2–5 y ago	0.106	0.043	(0.012–0.929)
Moved to the US more than 5 y ago	1		
Less than high school	0.05	0.05	(0.002–0.99)
High school diploma or GED	NS		
Some college	NS		
College degree or higher	1		
Reasons for the last visit			
	OR	p-Value <sup>a</sup>	CI (95%)
Pain or trouble in the mouth, teeth, or gums			
Moved to the US 1–2 y ago	3.47	0.034	(1.1–10.95)
Moved to the US more than 5 y ago	1		
Regular checkup or consultation			
Moved to the US 1–2 y ago	0.018	0.009	(0.001–0.374)
Moved to the US 2–5 y ago	0.062	0.015	(0.007–0.584)
Moved to the US more than 5 y ago	1		
Less than high school	0.01	0.016	(0.00–0.427)
High school Diploma or GED	0.114	0.038	(0.015–0.886)
College education or higher	1		

Abbreviations: CI, confidence interval; GED, general education diploma; NS, not specified; OR, odds ratio; US, United States.

<sup>a</sup>Only significant variables are included.

“More than 5 years ago” is the reference category for “time since the last visit to the dentist.”

There are limitations in this study. Clinical examination of refugees is critical in determining their oral health status and oral health needs. However, due to limited resources, this project was not able to obtain clinical data through direct examination of refugees.

The self-reported questionnaire is affected by social and cultural desirability, especially for those participants who came from completely different backgrounds. In addition, this was a convenience sample that is not representative of the target population who were war-affected refugees living in San Antonio, which impacts the generalizability

to a larger population. A possible bias in sampling is that participants were mostly from the refugee center, where refugees go to receive aid. This restricts the sample to be from refugees who had a low socioeconomic status (SES) and not those of a high SES. In addition, illiterates were excluded, who could have different oral health status and practices compared with others who were able to read any of the languages provided. Another limitation is subjects' recruitment. Encouraging refugees to participate was challenging especially when no monetary incentives were provided.

**Table 6** Relationship of demographic data with dietary and smoking habits

Eating or drinking in the last 24 hours+			
	OR	p-Value <sup>a</sup>	CI (95%)
Sweets and sugary food			
18–29 y old	6.4	0.003	(1.86–21.97)
50 y or older	1		
Sodas (coke, sprite, etc.)			
Moved to US 1–2 y ago	0.24	0.047	(0.059–0.981)
Moved to US more than 5 y ago	1		
18–29 y old	3.32	0.04	(1.06–10.42)
50 y or older	1		
Other sugar-sweetened beverages			
Male	0.46	0.048	(0.22–0.92)
Female	1		
Arabic	7.49	0.005	(1.84–30.51)
Rohingya	10.11	0.012	(1.65–62.02)
Other languages	1		
Two or more servings of fruit			
Moved to US less than a year ago	0.236	0.017	(0.072–0.769)
Moved to US 1–2 y ago	NS	NS	NS
Moved to US 2–5 y ago	0.145	0.001	(0.046–0.461)
Moved to US 5 y or more ago	1		
Tobacco use			
Often			
Male	12.45	0.003	(2.38–65.1)
Female	1		
Less than high school	6.97	0.02	(1.36–35.8)
College degree or higher	1		
Arabic	6.88	0.021	(1.33–35.54)
Other languages	1		

Abbreviations: CI, confidence interval; NS, not specified; OR, odds ratio; US, United States.

<sup>a</sup>Only significant variables are included.

“Never or rarely used tobacco” is the reference group for tobacco use.

## Conclusions

Although most refugees participated in this study reported good teeth and gum condition, they encountered pain the previous 12 months that needed dental care but couldn't get because they lacked dental coverage, or they were not able to pay. Improving oral health access for refugees will help to improve their oral and general health and prevent oral diseases and other diseases related to oral health. However, good access to care that includes cultural and language feasibility is essential to provide the quality of care refugees need.<sup>30</sup>

In addition, refugees manifested acceptable brushing habits, but their eating and drinking habits were inadequate. Therefore, refugees do not only need dental care provision but dental education as well, which will prevent them from oral diseases and improve their overall quality of life.<sup>31</sup>

## Ethical Approval

This study obtained approval from the institutional review board of the University of Texas Health Science Center at San Antonio. Participants were informed about the purpose of the study and their completion of the questionnaire was considered a consent to participate.

## Funding

None.

## Conflict of Interest

None declared.

## Acknowledgments

We would like to thank the San Antonio Center for Refugee Services for their outstanding cooperation and for allowing to collect data at their site.



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