

Published in final edited form as:

Spec Care Dentist. 2010 July 1; 30(4): 151–156. doi:10.1111/j.1754-4505.2010.00146.x.

Factors that limit access to dental care for adults with spinal cord injury

Hon K. Yuen, PhD, OTR/L [Associate Professor],

Occupational Therapy Division, Department of Health Professions, College of Health Professions, Medical University of South Carolina, Charleston, SC 29425; yuen@musc.edu

Bethany J. Wolf, PhD,

Division of Biostatistics and Epidemiology, Department of Medicine, MUSC, Charleston, SC 29425; wolfb@musc.edu

Dipankar Bandyopadhyay, PhD [Assistant Professor],

Division of Biostatistics and Epidemiology, Department of Medicine, MUSC, SC 29425; bandyopd@musc.edu

Kathryn M. Magruder, MPH, PhD [Professor],

Department of Psychiatry & Behavioral Sciences, MUSC, Charleston, SC 29425; magrudkm@musc.edu

Anbesaw W. Selassie, DrPH [Associate Professor], and

Division of Biostatistics and Epidemiology, Department of Medicine, MUSC, Charleston, SC 29425; selassie@musc.edu

Carlos F. Salinas, DMD [Professor, Director]

Division Craniofacial Genetics, College of Dental Medicine, MUSC, Charleston, SC 250507; salinasc@musc.edu

Abstract

Purpose—This study investigated dental care service utilization among adults with spinal cord injury (SCI) and identified barriers and other factors affecting utilization among this population.

Methods—Respondents (n = 192) with SCI participated in an oral health survey assessing dental care service utilization and were compared with respondents from the 2004 Behavioral Risk Factors Surveillance System (BRFSS).

Results—There was no significant difference in the proportion of SCI respondents who visited the dentist for any reason in the past year compared to the general population (65.5% vs. 68.8%, $P = 0.350$). However, SCI respondents were less likely to go to the dentist for a dental cleaning in the past year compared to the general population (54.6% vs. 69.4%, $P < 0.001$). The three most commonly reported barriers to accessing dental care were cost (40.1 %), physical barriers (22.9%), and dental fear (15.1%). Multivariable modeling showed physical barriers and fear of dental visits were the two significant factors deterring respondents from dental visits in the past year.

Conclusions—Physical barriers preventing access to dental facilities and dental fear are prevalent and significantly impede the delivery of dental health care to adults with SCI. Dentists should undertake necessary physical remodeling in their facilities to accommodate wheelchair users and implement appropriate strategies for the management of dental fear among patients with SCI.

Keywords

Dental care access; Physical barriers; Dental fear; Paraplegia; Tetraplegia

Spinal cord injuries (SCI) have a profound effect on oral health. For persons with SCI, xerostomic side effects of medications (i.e., those used to reduce muscle spasms and regulate neurogenic bladder),¹ impaired manual dexterity,^{2, 3} dependence on others for oral hygiene,³ and access barriers to dental care may adversely affect their oral health.^{3, 4} The problems of access to dental care encountered by persons with SCI are similar to those for non-disabled individuals (especially those of low socio-economic status without private dental insurance), but are compounded by physical barriers (e.g., wheelchair-inaccessible dental offices),^{5, 6} limited transportation,^{5, 6} lack of dentists specializing in oral health needs of this population,⁷ and limited knowledge of oral health issues faced by persons with SCI.^{4, 8}

Stiefel³ suggested that high cost, dental fear or anxiety, and physical barriers are the three major obstacles to community-dwelling adults with SCI in obtaining regular dental care services. Compared to the general population, persons with disability exhibit a higher level of dental fear.^{7, 9} Dental fear among persons with SCI may relate to inaccessible dental office environments,^{3, 5} and/or experiencing episodes of asphyxiation due to impaired respiratory musculature while undergoing dental procedures.^{10, 11}

Physical access barriers can range from limited/non-accessible (public) transportation, wheelchair-inaccessible terrain between residence and dental office, and wheelchair inaccessibility into and within the dental office building.^{3, 5, 6, 12-14} Despite passage of the Americans with Disabilities Act in 1990, widespread access barriers, including physical layout or environment for patients with disabilities, still exist within US health care settings.¹⁵ For example, in a 2002–2003 survey of residents with disabilities in Los Angeles County, California, 22% of respondents reported having difficulty accessing health care providers' offices.¹⁶

Regarding past-year visits to the dentist, Johnston *et al.*¹⁷ reported no significant difference between adults with SCI living in New Jersey and the general adult population (based on the Behavioral Risk Factors Surveillance System [BRFSS] 2000 data) (76% vs. 69%). Furthermore, there was no difference in dental visits between adults with paraplegia and adults with tetraplegia.¹⁷ This is in contrast to the findings of Lavela *et al.* who compared female veterans with SCI to female veterans in general (based on BRFSS 2003 data) and found that significantly fewer female veterans with SCI reported an annual dental visit (56% vs. 69%).¹⁸ It should be noted that the particular question regarding dental visits in these two studies does not differentiate the purpose of the visit—whether the visit is for dental extraction, restoration, or prevention (i.e., professional dental cleaning). Professional dental cleaning every 6 months has been recommended to prevent oral disease development, especially among vulnerable populations like those with SCI,¹⁹ because lack of regular professional dental cleaning may result in increased severity of oral disease, extensive dental treatment, and even tooth loss.¹⁹

To address unanswered questions concerning dental care service utilization among adults with SCI, we conducted a survey to: 1) describe the frequency of dental visits and professional dental cleaning in the past year, and 2) identify barriers and other factors affecting dental visits among this population. Exploration of barriers to dental care for those with SCI may identify areas where education is needed and resources can be directed to improve access to dental care services as well as to plan effective public health interventions.

Methods

SCI oral health survey

An oral health survey of various oral health issues encountered by adults with SCI was conducted between mid-August of 2006 and mid-February 2007. The survey was posted on

the South Carolina Spinal Cord Injury Association (SCSCIA) website (<http://www.scschia.org/>). Adults with SCI interested in completing the survey could access it through the Internet. Informing individuals with SCI about the survey was mainly through word-of-mouth with assistance from the SCSCIA and the South Carolina Traumatic Spinal Cord Injury Registry. Potential respondents could also request a paper copy of the survey (by phone or mail) if they did not have access to the Internet. The study was approved by the Institutional Review Board at the Medical University of South Carolina.

The survey collected data on dental visits and professional dental cleaning patterns in the past year, as well as self-reported level of injury. Tetraplegia was defined as injuries sustained at the cervical segment (C1–C8), and paraplegia referred to injuries to all other spinal cord segments (T1–S5). Respondents were also asked about demographic and socio-economic characteristics, mobility status, self-reported barriers in accessing dental care, perceived need for dental care, tooth brushing habits, and self-rated condition of teeth.

Demographic and socio-economic characteristics were race (Caucasian vs. other), gender, age, education (some education beyond high school vs. high school or less), employment status (paid employment vs. no paid employment), annual household income (<\$25,000, \$25–50,000, or >\$50,000), dental insurance (private or other public funding such as Medicaid vs. none). Mobility status was indoor wheelchair user (yes vs. no). Barriers to dental care access included perception of cost (answer “yes” to cost too much, or dental office does not accept Medicaid), physical barriers (answer “yes” to unable to get wheelchair into dental office, exam room, or unable to transfer to dental chair), transportation problem (yes vs. no), and dental fear (answer “yes” to fear of going to dentist, or don't trust the dentist). Perceived need for dental care (treatment and cleaning) (yes vs. no) was also included. Brushing habit was defined as individuals brushing twice a day or more vs. less often. Self-rated condition of teeth was categorized as very good or good compared to fair, poor, or very poor.

National survey

The Behavioral Risk Factor Surveillance System (BRFSS) is a standardized population-based survey developed by the Centers for Disease Control (CDC) to collect information on health practices and risk behaviors among non-institutionalized adults in the United States.²⁰ Data are collected by state health departments from a random sample of adults via telephone survey using a standardized questionnaire. The survey questionnaire consists of core components (asked in all participating states), optional modules (asked at the discretion of the state), and state added questions (developed by a particular state). These data are processed and edited by the CDC.

Data from the national 2004 BRFSS were accessed for comparative analysis.²⁰ The data used for this study were a subset of the BRFSS which includes respondents who were at least 18 years of age upon completing the survey and who completed the optional Oral Health module. A total of 301,812 respondents were included in the subset. Oral Health module questions 11.1 (How long has it been since you last visited the dentist or a dental clinic for any reason?) and 11.3 (How long has it been since you had your teeth cleaned by a dentist or dental hygienist?) from the BRFSS were used to compare the responses from the general population and respondents with SCI in our survey.

SCI Respondents

A total of 207 adult respondents who identified themselves as having SCI and residing in the United States completed the oral health survey. The majority (82.1%) completed the survey on-line. Slightly more than half (51%) were from South Carolina; the rest were from 26 other states. We excluded three respondents who indicated that they had completely recovered from

their injuries (i.e., American Spinal Injury Association [ASIA] Impairment Scale of grade E) and an additional 12 respondents who sustained an SCI within a year prior to completing the survey. A total of 192 eligible respondents were included in the final data analysis for dental care utilization within the year prior to completing the survey.

Data analysis

The SCI study sample was stratified by gender and by level of injury (paraplegic and tetraplegic) for preliminary analysis. Chi-square tests were used to determine differences in demographics, dental visits, and professional dental cleanings within the SCI study sample between individuals with paraplegia and tetraplegia.

A two-sample *t* test was used to assess differences in age between the SCI respondents and the general population as reported for the BRFSS estimates. Chi-square tests were used to assess differences in other demographic characteristics (gender, race, marital status, employment status, and education), dental visits, and professional dental cleanings between the SCI respondents and the general population as reported in the BRFSS estimates.

Having visited the dentist at least once for any reason in the past year was coded as 1. Prior to developing logistic regression models for predicting dental visits in the past year, bivariate analyses using Chi-square tests and Fisher's exact tests (when appropriate) for categorical variables with two levels, Cochran-Armitage trends tests for ordinal categorical variables with more than two levels, and *t* tests for continuous variables were performed to determine the relationship between the explanatory variables and dental visits for any reason within the year prior to completing the survey. Explanatory variables with a *P*-value less than 0.25 in bivariate models were considered to be candidates for multivariable modeling.²¹ A multivariable logistic regression analysis modeled the probability of SCI respondents not visiting the dentist for any reason within the year prior to completing the survey. All *P*-values reported in the multivariable models were two-sided, and the type I error rate was set at 0.05. All statistical analyses were performed using SAS version 9.1.

Results

There were 142 SCI respondents who reported sustaining an injury at the cervical segment (classified as tetraplegia). There was no significant difference between injury status (paraplegia vs. tetraplegia) in the proportion of respondents who had visited the dentist for any reason, or who had had a professional dental cleaning in the year prior to completing the survey (visiting: 65.2% vs. 66.2%, *P* = 0.97; cleaning: 54.5% vs. 56.3%, *P* = 0.90). There were also no significant differences between paraplegics and tetraplegics in the following demographic variables: age, race, marital status, and employment status (all *P* values > 0.05). There were no significant gender differences by injury status in the proportion of respondents who had visited a dentist for any reason or who had had a professional dental cleaning in the year prior to completing the survey. Therefore, data from these two groups (paraplegia vs. tetraplegia) were not separated for analyses.

The mean age (and standard deviation) of the SCI respondents was 43.9 (\pm 13.1) years (range 19 to 83) with the majority (77.6%) being Caucasians. Respondents were significantly younger in age than the BRFSS population (*P* < 0.001). Also, the BRFSS population contained a larger proportion of Caucasians (84.0%) than the SCI respondents (77.6%). The BRFSS population also included significantly fewer males (38.8%) than the SCI sample (59.9%). The SCI sample was significantly less likely than the BRFSS population to be married or employed, but more likely to be educated beyond high school. General characteristics of respondents of both groups are shown in Table 1.

Regarding dental insurance, 40.1% of all SCI respondents ($n = 77$) reported having none; 38.0% ($n = 73$) reported having private dental insurance; and 25.5% ($n = 49$) had Medicaid or other public dental insurance. Also, 47.9% ($n = 92$) indicated a need for dental treatment now; 45.8% ($n = 88$) indicated that they need dental cleaning now; 42.2% ($n = 81$) reported they brushed their teeth at least 2 times a day; and 62.0% ($n = 119$) rated the condition of their teeth as good or better. For household annual income, 41.3% of SCI respondents reported less than \$25,000, while 33.9% reported income above \$50,000.

Dental care utilization patterns

There was no significant difference in the proportion of SCI respondents who visited the dentist for any reason in the past year compared to that in the general population (BRFSS data) (65.5% vs. 68.8%, $P = 0.350$). Results of the comparison remained non-significant after controlling for all significant demographic variables ($P = 0.314$). SCI respondents were less likely to go to the dentist for cleaning in the past year compared to the general population (54.6% vs. 69.4%, $P < 0.001$). Results of this comparison were not significant after controlling for all significant demographic variables ($p = 0.095$). Results were similar when stratified by gender.

Barriers to access dental care

The most common barrier to accessing dental care was high cost, reported by 40.1 % ($n = 77$) of respondents, followed by physical barriers (22.9%; $n = 44$), and dental fear (15.1%; $n = 29$). Excluding the 43 respondents who claimed not using a wheelchair indoors, the proportion of respondents who reported wheelchair inaccessibility to dental office, exam room, or dental chair increased to 29.5% (44/149). Only 18 (9.4%) reported that lack of transportation prevented them from receiving dental care.

Factors affecting dental visits in the past year among adults with SCI

Results of the bivariate analyses indicated that visiting the dentist for any reason in the past year was shown to be significantly related to the following: physical barriers, dental fear, race, brushing habits, cost, reported need for dental care, and perceived condition of teeth (all P values < 0.05). Adults with SCI who are concerned about physical barriers in accessing the dental office, indicate fear or distrust of the dentist, are not Caucasian, brush teeth fewer than 2 times a day, have concern about the cost for dental care services, express a need for dental care, and perceive their teeth to be in poor condition were less likely to visit the dentist in the past year (see Table 2). Respondents with dental insurance had a slightly better odds ($OR = 1.37$) of going for an annual dental visit (including professional cleaning) than those with no insurance, but the results were not statistically significant ($P = 0.31$). Since dental insurance was shown to be a significant predictor for dental visit in several national population surveys,²²⁻²⁴ we controlled for the confounding effect of this variable in our multivariable analysis regardless of its P -value in the univariate analysis.

Only physical barriers, dental fear, race, brushing habits, and dental insurance were included in the final multivariable model for dental visits for any reason in the past year (see Table 2). Adults with SCI who reported physical barriers at the dental office, such as wheelchair inaccessibility or inability to transfer from the wheelchair to the dental chair, were 4.5 times more likely not to visit the dentist in the past year compared to those who did not report this as a barrier (adjusted $OR = 4.52$, 95% $CI = 2.06-9.93$, $P < 0.001$). Adults with SCI who expressed fear or distrust of the dentist were 5 times more likely not to visit the dentist in the past year compared to those who did not express such fear (adjusted $OR = 5.09$, 95% $CI = 2.04-12.70$, $P < 0.001$). Those who reported brushing teeth less often than twice a day were twice as likely not to visit the dentist in the past year compared to those who reported brushing at least twice a day (adjusted $OR = 2.16$, 95% $CI = 1.07-4.35$, $P = 0.032$). Racial differences were an important explanatory variable for visiting the dentist in the past year. Minorities (mainly

African Americans and Latinos) had 2.7 times the odds of not visiting the dentist in the past year compared to Caucasians (adjusted OR = 2.70, 95% CI = 1.26–5.81, $P = 0.011$). There was enhancement of the odds ratios for physical barriers to accessing care and expressing fear as a barrier to going to the dentist in the multivariable model. However, this enhancement was not accounted by collinearity ($p = 0.433$).

Discussion

In the present study, adults with SCI were as likely to have had an annual dental visit in the past year as the general population. This is consistent with the findings of Johnston *et al.*¹⁷ however, adults with SCI were significantly less likely to have had an annual professional dental cleaning than the general population, a distinction which was not made in previous studies.^{17, 18} Thus, it seems that dental care utilization among our SCI respondents is mostly limited to taking care of existing dental problems rather than preventive dental care.

Consistent with the pilot study of Stiefel,³ high cost, physical barriers to access dental care facilities (examination room and dental chair), and dental fear (fear or distrust of the dentist) are the three major barriers that limit dental access among persons with SCI. Further, our multivariable model suggests that physical barriers and dental fear independently deter SCI respondents from visiting the dentist for any reason in the past year.

Of the three major barriers that limit dental access among persons with SCI, physical barriers may be most under the control of dental health professionals and the easiest to remedy—especially with the passage of the Americans with Disabilities Act in 1990. Even so, more than one and a half decade after the Disabilities Act and the publication of the Stiefel study,³ the situation persists.

The extent to which dental offices -- especially examination rooms and dental chairs -- in this country are inaccessible to wheelchair users is unknown. According to the US Department of Justice, there are several cases of legal actions against health care professionals and organizations involving inaccessible health care environments or medical equipment.²⁵ Receiving dental treatment (restoration or extraction) for toothache, caries, and periodontitis is a medical necessity. Based on the comments from some of our SCI respondents, many indicated that they either have to call the dental office ahead of time to learn whether it is wheelchair accessible before making an appointment, or they may go to another dental office when they discover that the office layout (e.g., examination room and/or bathroom) is not wheelchair accessible.

Results of this survey may be useful to dental care professionals, patients, and health policy decision makers, providing evidence that physical barriers to access dental facilities is a prevalent and significant deficiency/impediment in the delivery of dental health care to persons with SCI and possibly other wheelchair users. If physical barriers in the dental office are eliminated, the utilization rate for preventive dental care may be increased, resulting in improved oral health for persons with SCI as well as other wheelchair users.

Limitations

We acknowledge that the sample in this study is a convenient sample which may or may not represent the SCI population; however, it should be noted that the demographic characteristics of the SCI participants in the present study are similar to those reported in the Johnston *et al.* study,¹⁷ and our findings validate the Johnston *et al.* findings.¹⁷ Confirmation of the results should come with a population-based study using the National Spinal Cord Injury Database.

Physical barriers to dental care may be reduced by increasing dentists' awareness of the Americans with Disabilities Accessibility Guidelines for Buildings and Facilities (published in 1991). Dentists should make appropriate modifications in their offices so that their space is free from physical barriers and the dental chair is accessible to wheelchairs. Additionally, they need to let the public know that the office is wheelchair accessible.

Dougall and Fiske²⁶ in their special issue on access to special care dentistry provide detailed information on access to the dental chair which include “break-leg” dental chair to allow easy access and transfer from wheelchair, portable turntable, and hoist. Dentists, other dental health professionals, and staff should be trained on the use of transfer aids, if available, and basic skills of how to transfer persons with SCI and other wheelchair users safely. To eliminate the risk of transferring patients with SCI between wheelchair and dental chair, a wheelchair reclining platform with integrated head rests (e.g., manufactured by Design Specific) may help accommodate a conventional wheelchair into an optimal tilted position that is comfortable for both dental professionals and patients. Most of the modern models of electric wheelchairs are equipped with a backrest reclining feature that will facilitate dental treatment while the patient remains in his/her own chair.

There is no reason not to assume that people with SCI will encounter the same dental fears as the rest of the population; however there may be additional factors unique to SCI. These may include: access to dental care, difficulty clearing oral cavity secretions, and poor coughing ability due to the de-innervations or impairments of breathing musculature.^{10, 11, 26} The present survey did not fully explore the participants' underlying reasons for their dental fear. Further study should use a qualitative approach to understand this important issue. Without knowing the underlying reasons for the participants' dental fear, we can only recommend that dentists should conduct a thorough patient dental fear assessment to understand their concerns, and then implement appropriate behavioral techniques, as well as suctioning and pharmacological support. General clinical guidelines established for managing patients exhibiting mild forms of dental fear should be implemented.^{27, 28}

Acknowledgments

This study was completed with support from the South Carolina Centers of Biomedical Research Excellence (COBRE) for Oral Health with funding provided by the National Institutes of Health (NIH) and the National Center for Research Resources (NCRR) with a P20 RR-017696, and its contents are solely the responsibility of the authors and do not necessarily represent the official views of NIH. The authors appreciate the support from South Carolina Spinal Cord Injury Association.

References

1. Gage, TW.; Pickett, FA. Mosby's Dental Drug Reference. Mosby-Year Book; St. Louis: 1997.
2. Lancashire P, Janzen J, Zach GA, Addy M. The oral hygiene and gingival health of paraplegic inpatients--a cross-sectional survey. *Journal of Clinical Periodontology* 1997;24:198–200. [PubMed: 9083905]
3. Stiefel DJ, Truelove EL, Persson RS, Chin MM, Mandel LS. A comparison of oral health in spinal cord injury and other disability groups. *Special Care in Dentistry* 1993;13:229–35. [PubMed: 8042130]
4. Bronte S. Oral health care for individuals with tetraplegia due to spinal cord injury: A pilot study. *Journal of Disability and Oral Health* 2001;2:30–6.
5. Persson RE, Stiefel DJ, Griffith MV, Truelove EL, Martin MD. Characteristics of dental emergency clinic patients with and without disabilities. *Special Care in Dentistry* 2000;20:114–20. [PubMed: 11203884]
6. Storhaug K. Barriers to utilization of dental health services in a group of disabled Norwegian adults. *Acta Odontologica Scandinavica* 1988;46:241–6. [PubMed: 2973203]

7. Stiefel DJ, Truelove EL, Mandel LS. Perceived barriers vs. dental care availability for persons with disabilities. *J Dent Res* 1991;70:337.
8. Stiefel DJ. Dental care considerations for disabled adults. *Special Care in Dentistry* 2002;22:26S–39S. [PubMed: 12375745]
9. Gordon SM, Dionne RA, Snyder J. Dental fear and anxiety as a barrier to accessing oral health care among patients with special health care needs. *Special Care in Dentistry* 1998;18:88–92. [PubMed: 9680917]
10. Durnan JR, Thaler R. Dental care for the patient with a spinal cord injury. *Journal of the American Dental Association* 1973;86:1318–21. [PubMed: 4512739]
11. Thornton JB, Sneed RC, Tomaselli CE, Boraz RA. Dental management of patients with spinal cord injury. *Compendium* 1992;13:122. 4, 6 passim. [PubMed: 1387834]
12. Edwards DM, Merry AJ. Disability part 2: access to dental services for disabled people. A questionnaire survey of dental practices in Merseyside. *British Dental Journal* 2002;193:253–5. [PubMed: 12353044]
13. Freeman R, Adams EK, Gelbier S. The provision of primary dental care for patients with special needs. *Primary Dental Care* 1997;4:31–4. [PubMed: 10332344]
14. Wehman P, Wilson K, Targett P, West M, Bricout I J, McKinley W. Removing transportation barriers for persons with spinal cord injuries: An ongoing challenge to community reintegration. *Journal of Vocational Rehabilitation* 1999;13:21–30.
15. Kirschner KL, Breslin ML, Iezzoni LI. Structural impairments that limit access to health care for patients with disabilities. *JAMA* 2007;297:1121–5. [PubMed: 17356035]
16. Centers for Disease Control and Prevention. Environmental barriers to health care among persons with disabilities--Los Angeles County, California, 2002-2003. *MMWR - Morbidity & Mortality Weekly Report* 2006;55:1300–3. [PubMed: 17159832]
17. Johnston MV, Diab ME, Chu BC, Kirshblum S. Preventive services and health behaviors among people with spinal cord injury. *Journal of Spinal Cord Medicine* 2005;28:43–54. [PubMed: 15832903]
18. Lavela SL, Weaver FM, Smith B, Chen K. Disease prevalence and use of preventive services: comparison of female veterans in general and those with spinal cord injuries and disorders. *Journal of Women's Health* 2006;15:301–11.
19. Bader J. Risk-based recall intervals recommended. *Evidence-Based Dentistry* 2005;6:2–4. [PubMed: 15789038]
20. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System survey data. U.S. Department of Health and Human Services. 2005
21. Mickey J, Greenland S. A study of the impact of confounder-selection criteria on effect estimation. *Am J Epidemiol* 1989;129:125–37. [PubMed: 2910056]
22. Goodman HS, Manski MC, Williams JN, Manski RJ. An analysis of preventive dental visits by provider type, 1996. *J Am Dent Assoc* 2005;136:221–8. [PubMed: 15782529]
23. Macek MD, Cohen LA, Reid BC, Manski RJ. Dental visits among older U.S. adults, 1999: the roles of dentition status and cost. *J Am Dent Assoc* 2004;135:1154–62. quiz 65. [PubMed: 15387055]
24. Stancil TR, Li CH, Hyman JJ, Reid BC, Reichman ME. Dental insurance and clinical dental outcomes in NHANES III. *J Public Health Dent* 2005;65:189–95. [PubMed: 16468459]
25. US Department of Justice. Enforcing the ADA: status reports from the Department of Justice. Washington, DC: July-September. 2007
26. Dougall A, Fiske J. Access to special care dentistry, part 1. *Access. Br Dent J* 2008;204:605–16. [PubMed: 18552796]
27. Corah NL, O'Shea RM, Ayer WA. Dentists' management of patients' fear and anxiety. *Journal of the American Dental Association* 1985;110:734–6. [PubMed: 3859545]
28. De Jongh A, Adair P, Meijerink-Anderson M. Clinical management of dental anxiety: what works for whom? *International Dental Journal* 2005;55:73–80. [PubMed: 15880961]

Table 1

Demographic characteristics for BRFSS 2004 population in the dental module and SCI respondents

Characteristics	Respondents with SCI (N = 192)	General population (N = 303,812)	P-value
Mean years since injury	12.8 ± 11.1	N/A	
Mean age (years)	43.9 ± 13.1	50.2 ± 17.2	<0.001
Gender (% male)	59.9	38.8	<0.001
Caucasians (%)	77.6	84.0	<0.001
Married (%)	45.8	54.5	0.016
Education beyond high school (%)	67.7	58.3	0.008
Employed for wages (%)	32.8	58.1	<0.001

Table 2

Univariate and multivariable analyses examining factors that limit SCI respondents to visit the dentist for any reason in the past year

Predictor	Reference Group	Bivariate Analysis				Multivariable Analysis			
		Odds Ratio	95% CI	P-value	Adjusted Odds Ratio	95% CI	P-value	Adjusted Odds Ratio	P-value
Physical Barriers	Do not report physical barriers as a problem	3.45	1.69–6.67	<0.001	4.52	2.06–9.93	<0.001		
Dental Fear	Express no dental fear	3.33	1.47–7.14	<0.001	5.09	2.04–12.70	<0.001		
Race	Caucasian	2.99	1.41–5.69	0.002	2.70	1.26–5.81	0.011		
Brushing Habits	Brush at least 2 times per day	1.76	1.02–3.27	0.046	2.16	1.07–4.35	0.032		
Dental Insurance	Have dental insurance	0.73	0.40	1.35	0.53	0.26–1.06	0.072		
Cost	Express no concern about cost	2.85	1.64–5.56	0.008	N/A				
Need for Dental Care	Express no need for dental care	2.56	1.25–5.26	<0.001	N/A				
Perceived Teeth Condition	Perceive teeth condition as good	2.30	1.32–4.50	0.008	N/A				