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Oral Health Needs Assessment of an Inner-City Homeless Population and Follow-up of Dental Referrals

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Oral Health Needs Assessment of an Inner-City Homeless Population and Follow-Up of Dental Referrals

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ABSTRACT

Background: The University of Connecticut (UConn) School of Dental Medicine (SODM) routinely recruits dental students and faculty volunteers to conduct no-cost dental health screenings for transient residents at South Park Inn Homeless Shelter in Hartford, CT. Once screened, patients are referred to UConn or another hospital-based dental clinic in the area for treatment. The purpose of this study was to determine the demographics and oral health needs of the homeless population at South Park Inn and referrals to UConn SODM were followed to verify patient presentation at UCONN SODM. Dental students' attitudes towards working with the underserved were also assessed. Methods: A retrospective analysis was conducted of 527 dental screening surveys administered at South Park Inn homeless shelter in Hartford, CT. Current UConn dental students that participated in South Park dental screens were administered a survey evaluating their experiences at the homeless shelter. Results: Half of the study participants had acute dental needs, 35% declared a chief complaint requiring prompt attention, 72% displayed clinically visible decay, and 36% had retained all of their adult teeth. Of the homeless residents that were referred to UConn for dental care, 18% had at least one dental visit at UConn SODM. In addition, the survey of dental students found that the majority of student volunteers believed their experience working with this homeless population increased their comfort with working with underserved populations and enhanced their dental education. Conclusion: This study informs public health practitioners about the needs of the homeless population located in Hartford, Connecticut. A better understanding of oral health issues common to the homeless can allow for an oral health outreach program to be designed that is appropriately prepared to meet the needs of this community and is readily accessible by the homeless population.

INTRODUCTION

Oral health is a complex issue that encompasses more than having healthy gums and being free of decay. Its scope includes conditions such as oral cancers, birth defects, orofacial pain, and other pathological conditions affecting the craniofacial complex. In addition, oral tissues can act as signifiers of systemic health by displaying co-existing signs and symptoms of systemic disease and nutritional deficiencies. Conversely, the health of oral tissues has been shown in many circumstances to influence systemic health, and loss of oral function can reduce nutritional intake. The status of a person's oral health has many implications, not just on physical health, but on mental health, social interactions, and overall well-being. Lack of dental care can affect physical ailments, negatively impact mental well-being and social interactions, and limit employment opportunities. The homeless population has little access to medical care, and it is an unfortunate reality that dental care is even more infrequently available to them.

The University of Connecticut (UConn) School of Dental Medicine (SODM) routinely recruits dental students and faculty volunteers to conduct no-cost dental health screenings for homeless residents at South Park Inn Homeless Shelter in Hartford, CT. Once screened, patients are referred to UConn or another hospital-based dental clinic in the area for treatment. However, up to this point there has never been any follow-up of these patients to ensure that they are receiving dental care, and so the effectiveness of the program has never been measured. The aim of this research project was to address this issue, and it consisted of three components. First, the oral needs of the homeless population were assessed in order to enable health providers to better understand the most common ailments in this population. Such knowledge can aid in providing care, particularly if care is provided in a nontraditional setting. Next, South Park residents that were referred to UConn for dental care were followed to determine if they indeed went on to receive treatment at UConn. Finally, the attitudes of dental students performing the dental screenings were investigated to determine how this experience has influenced their desire to work with underprivileged populations in the future.

BACKGROUND

Homelessness

In January 2011, a total of 636,017 people were homeless in the United States, 399,836 as lone individuals and 236,181 with other family members. Approximately two-thirds of the homeless stayed in shelters, while the remaining one-third slept in unsheltered locations. Those chronically homeless, or individuals with disabilities who have been continuously homeless for one year or who have had four or more periods of homelessness in three years, make up 17% of the current homeless population (U.S. Department of Housing and Urban Development [HUD], 2011). It is estimated that between 3.5 and 13.5 million persons become homeless for some period of time each year, affecting 7.5% of the general population at some point during their lives (Okunseri, Girgis, Self, Jackson, McGinley, & Tarima, 2010).

Connecticut is among 25 states reporting the lowest rates of homelessness; in 2011, 4,465 people were counted as being homeless in Connecticut (Connecticut Coalition to End Homelessness [CCEH], 2011). California accounts for nearly a quarter of the nation's total homeless population, followed by New York (10%), Florida (8.9%), Texas (5.8%), and Georgia (3.3%) (HUD, 2011). The number of homeless residents in Connecticut has decreased by 10% from counts taken by the Department of Housing and Urban Development in 2010. Of Connecticut's homeless, 9% are veterans, 30% suffer from severe mental illness, 47% are chronic substance abusers, 10% have HIV/AIDS, and 10% have been victims of domestic violence (HUD, 2011).

Oral health problems have been identified as the most common unmet health need of homeless populations (Bagget, O'Connell, Singer, & Rigotti, 2010). The oral health issues seen in the homeless population are infrequently addressed by medical professionals. One study found that of the homeless persons reporting dental care to be their most needed medical service, just 17% had a dental visit in the previous year. A study of homeless veterans demonstrated the need for immediate dental care as nearly half of veterans polled described pain during their oral exam,

compared with just 2.5 % of the general population (Okunseri, Girgis, Self, Jackson, McGinley, & Tarima, 2010).

Rates of acute, chronic, and mental illness, and history of drug abuse are exceedingly higher in homeless populations compared to the general population. In October and November 1996, the Census Bureau conducted the National Survey of Homeless Assistance Providers and Clients in 76 varying locales in order to characterize a representative sample of those utilizing homeless services across the nation. The sample consisted of 2,974 people homeless at the time of the survey. The majority were aged 25-49 (73.3%), male (67.8%), Non-Latino white (40.3%) or Non-Latino African American (43.5%), and living in an urban area (77.2%). In the previous year, nearly three-quarters of those surveyed admitted they experienced a mental health condition, or abused alcohol or drugs. In addition, 56.6% had no insurance or healthcare assistance, and nearly half of the homeless that were surveyed displayed at least one comorbid illness. Although most of the veterans (22.3% of the sample) qualified for Veteran Affairs (VA) health benefits, only 26.8% were currently enrolled for VA benefits. Outpatient clinics were utilized by 62.8% of the respondents, who most often sought care at hospital clinics, community health clinics, and from medical staff at homeless shelters. One fourth of respondents reported being unable to receive medical care, and these respondents were more likely to be uninsured and suffering from co-morbidities. (Kushel, Vittinghoff, & Haas, 2001).

South Park Inn

There are eight homeless shelters in the city of Hartford, providing shelter for one-quarter of the homeless population in the state of Connecticut (Homeless Services Directory, 2012; CCEH, 2012). In 2011, 864 people sought refuge in these shelters, one of which is South Park Inn (CCEH, 2012). Founded in 1984 in a renovated Methodist church, the non-profit shelter provides both temporary and long-term housing and services for men, women, and children for up to two years. Residents are provided with food, hygiene supplies, access to services, transportation, support groups, and when possible, aid in relocation to permanent housing.

South Park Inn, an emergency shelter staffed with support counselors, provides shelter for 85 people per day. A transitional living program allows 33 men committed to making major changes in their life to transition from the emergency shelter to more permanent housing for up to two years as they work towards specific, self-designed goals, ranging from getting treatment for substance abuse or illnesses to increasing income and level of education. In addition, the staff engage in weekly sweeps of areas frequented by the homeless, including bridges, overpasses, forests, and river banks. If these people are unwilling to seek shelter at South Park Inn, they are delivered bagged lunches, blankets, and other essentials they may need to survive the elements. (South Park Inn, 2012).

Oral Health of the Homeless

Few studies have been conducted in the United States pertaining to the oral health status of the homeless, but existing data indicate that this population experiences much higher rates of dental disease than the general public. In one such study, a subset of Boston's homeless population from five area shelters volunteered for an examination of teeth for caries in 1995. Of the 102 adults that volunteered for the study, 29 did not return for the exam after a consultation and three people, ages 26, 56, and 62, were fully edentulous (all three had dentures at the time of study). The average age of the sample was 35.7, ranging from 19 to 64. Decay was detected in 91.4% of participants and 77.1% had at least one restored tooth. Eight people retained all 28 teeth (wisdom teeth were excluded from the counts), while 88.6% were missing at least one adult tooth. Females averaged 5.6 teeth with decay while the mean for males was 5.9. This was significantly higher than rates found in the general population of New England (Kaste & Bolden, 1995).

A larger study, conducted in Los Angeles in 1988, examined 529 homeless, English-speaking individuals. Nineteen different locations were included in the sample in an effort to ensure that the majority of the area's homeless population was represented. While over a quarter of the sample reported a toothache, only 10% had sought treatment for the pain. Nearly 40% had

not had a dental prophylaxis in over five years (four times the national average), according to the National Center for Health Statistics (2010). As observed in the Boston study, homeless individuals had higher rates of decayed teeth. Rates of edentulism were also higher than for the general population in the 45 and over age group. Of the fully edentulous individuals surveyed, 38% were lacking any prostheses, compared to 5% of the general population, and 37% of people with less than 21 remaining teeth had removable dentures at the time the study was conducted (Gelberg, Linn, & Rosenberg, 1988).

A Dental School in New Jersey conducted a one-day study assessing the dental needs of 46 people that participated in an annual Homeless Services Day. The participants averaged 3.8 diseased teeth per person; over half were experiencing current pain in the oral facial region, and two-thirds of the sample reported a history of dental-related pain during the previous year. The study also found that the population described their abilities to eat, smile, concentrate, and talk were also negatively affected by their oral health status (Conte, Broder, Jenkins, Reed, & Janal, 2006).

Several studies have been conducted internationally that assess the oral health needs of the local homeless populations. A sample of homeless people utilizing fixed and mobile dental services in the United Kingdom found that 17% of sampled individuals required treatment for primary or secondary decay, 60% needed treatment for periodontal disease (including gingivitis), and 38% had gaps and edentulous spaces. Other conditions that necessitated treatment were root surface decay, surgical conditions, and oral pathological conditions. Although continuity of care is often difficult with homeless populations, 51% did return for further treatment after an initial appointment. However, only 18% completed their treatment, with the endpoint of completion determined by a dentist (Daly, Newton, & Batchelor, 2010).

Mothers and their children are becoming homeless at a faster rate than any other group, representing over 30% of the nation's homeless population. Previous studies of homeless children indicate that these children have rates of tooth decay that are several times higher than

low income children that reside in more permanent housing (DiMarco, Huff, Kinion, & Kendra, 2009). A prospective study conducted in Ohio of 120 families staying in a shelter found that 42% of the children (with an average age of 6.38 years) had never seen a dentist, and 30% had not been to a dentist in over a year. The number of decayed primary or adult teeth in these children ranged from zero to 28, with an average of three untreated cavities per child (DiMarco, Ludington, & Menke, 2010).

Barriers to Care

Providing dental care to a homeless population poses many unique challenges. The Health Care for the Homeless User Survey concluded that 60% of the 966 homeless individuals sampled lacked any form of insurance, while 34.3% received state assistance (Bagget, O'Connell, Singer, & Rigotti, 2010). Even with state assistance, provision of healthcare benefits is not guaranteed. Nationwide, only 30-40% of children enrolled in Medicaid receive dental care. This disconnect is partially due to factors such as the lack of a permanent address, and dental providers refusing to accept state insurance ((DiMarco, Ludington, & Menke, 2010). The Stewart B. McKinney Homeless Assistance Act, initially passed in 1987, allowed for funding of programs designed to aid the homeless by creating (in Title VI) the Health Care for the Homeless Program through the Health Resources and Services Administration. However, provision of programs that improve access to care is not the same as supplying funding for the actual services. Although this program has improved access to many health services, oral health services themselves have yet to be funded (HUD, 2011).

Homeless individuals have other issues that must be addressed in their lives, contributing to the barriers towards health care. In the previously mentioned Ohio study of 120 homeless mothers and their children, nearly 30% of women reported to be engaged in alcohol and/or illegal drug abuse, 58.3% reported a history of emotional abuse, 55% had been physically abused, and 35.8% had been abused sexually. Half of these mothers had personal mental health concerns, and 35% were concerned about the mental health of their children ((DiMarco, Ludington, & Menke,

2010). Other risk factors for homelessness that make accessing healthcare difficult include unemployment, legal problems, debt, lack of social support, youth institutionalism, and history of traumatic family events (Wright & Tompkins, 2009). Transportation issues and other difficulties commonly prevent patients from attending scheduled appointments. Patients are often unable to be reached using traditional methods of communication. In addition, assumed health provider biases can keep the homeless from seeking care. Disadvantaged populations can feel they will be judged or discriminated against for their lifestyle, background, or medical history.

Developing dental outreach programs for the homeless is difficult due to the transient nature of the population, the expense of setting up clinics that meet the standard of care, accessibility of the clinic locale, and poor follow-up rates. One example of a dental outreach program is the Connecticut Mission of Mercy (CTMOM), which has been held in varying locations in Connecticut for the last five years. In 2012, the weekend-long event, staffed by 1,605 volunteers, treated 2,008 patients. Dental procedures including extractions, endodontic therapy, restorative therapy, dental prophylaxis, and prosthodontics were delivered by dentists, hygienists, students, and dental staff from around the state. Together, they provided 1.3 million dollars worth of services (CT Mission of Mercy, 2012). However, this is a once-a-year approach, and comprehensive care and follow-up services cannot be delivered.

Tracking a Homeless Population

Despite the difficulties inherent in tracking homeless populations for long-term periods, there do exist documented research projects that successfully followed participants for 18 months at a time. Methods of follow-up in homeless populations are an important part of study design. In one such study, building a caring relationship was determined to be the most important factor in order to guarantee that subjects would remain in the study; staying updated on the lives of the subjects allowed them to be located for follow-up visits. Many homeless are institutionalized for periods of time in hospitals, correctional facilities, group homes, or substance abuse facilities, so there were occasions when researchers had to travel to these sites to obtain periodic data.

"Neighborhood store fronts" operated daily and were constructed in the local neighborhood, where subjects would spend time socially with the entire research staff, some even using the facility as an emergency contact. Economic incentives were also utilized (Conover et al., 1997).

A review by McKenzie, Tulsky, Long, Chesney, & Moss (1999) of successfully-maintained longitudinal studies of marginalized populations found ten coinciding factors essential for ensuring high follow-up rates. The first component was collection of contact information, including full name, mailing address, phone, hangout locations, eating and sleeping addresses, nicknames, aliases, birth date, social security number, mother's maiden name, case manager, and contact information of two people with whom the subject regularly communicates. Other essentials are detailed organization of tracking endeavors, staff training, use of various types of communication for follow-up, incentives, confidentiality, agency and field tracking, and awareness of safety concerns. Many of these factors may prove useful when attempting to deliver comprehensive dental care and follow-up with Hartford's homeless residents.

Oral Health in Connecticut

Although Connecticut is considered to be one of the wealthiest states, income levels vary widely depending upon location. For example, in 2007, the number of children living below the federal poverty line in the state overall (10.8%) was lower than the national average (17.3%), but topped 41.3% in Hartford alone. This disparity is significant from an oral health perspective because dental caries disproportionately affects the underprivileged. An oral health survey conducted in 31 states sampling Head Start, kindergarten, and third grade children in 2006-2007 revealed that Connecticut children exhibited the lowest levels of decay, ahead of Vermont, Maryland, and Maine (National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], 2010). Connecticut Head Start programs, under federal mandate, provide oral health data from healthcare assessments on children aged two through five. In 2005, 1,310 (16%) of children in Head Start programs were in need of dental care. Of the children needing oral health care, 69% went on to receive dental treatment. Nearly all of these children had a medical

home, but 21% did not have an established dental home. That year, 21% of Connecticut's elementary school students were referred by school nurses to dental providers due to dental issues requiring immediate care (State of CT Department of Public Heath [CT DPH], 2007).

Adult residents of Connecticut rank first in the country in keeping natural, adult teeth. As income and education increase, people are less likely to experience the loss of one or more teeth. African Americans, on the other hand, are more likely to report the loss of six or more teeth. Data from 2000 to 2004 reveal cleft lips or palates were seen in 1 out of 2,200 births in Connecticut or 15 to 24 per year. These rates are 25-50% lower than those seen nationally. Oral cancer rates are similar to those seen around the country, with men and African Americans displaying the highest rates. Out of the 16.5% of Connecticut residents that smoked in 2007, 12.4% smoked daily, and young adults with low levels of income and education were more likely to smoke. In 2003, 1.6% of males used smokeless tobacco, as did 0.8% of females (CT DPH, 2007).

Connecticut provides comprehensive adult dental benefits for Medicaid recipients. Children receive HUSKY benefits. However, less than half of children receiving HUSKY benefits take advantage of comprehensive dental care services for children (CT DPH, 2007). Of the 2,734 dentists in Connecticut (2009), 233 received payment for Medicaid or State Children's Health Insurance Program (SCHIP) claims, with a total of 442 dentists billing at least one claim. There is one dental school, four hygiene schools, and 45 community-based, low-income dental clinics providing dental care to the state's disadvantaged populations (NCCDPHP, 2010). These institutions participate in state insurance and provide dental care at a reduced cost to self-paying patients. Cost is reported as a barrier to dental care by 10% of state residents, with the highest percentages self-reported by Hispanics (24%) and African Americans (16%) (CT DPH, 2007).

Validity of Self-Reports in Health-Related Surveys

This study relies on data collected from self-reports of each participant's medical history, substance use, and oral hygiene routine. Epidemiological research on substance use and patient histories often depends on self-reports. Current evidence pertaining to the validity of these studies is mixed. For example, the efficacy of cessation programs for cigarette smokers has been researched in many epidemiological studies and is often assessed using these reports. Many believe that people will underestimate or deny their personal smoking patterns due to the fact that both smokers and nonsmokers alike increasingly disapprove of cigarette smoking (Surgeon General, 1989). This pattern also pertains to self-reporting of illegal drug use. In order to validate this type of data collection, researchers have used biochemical analyses, witness recounts, and anonymous, self-administered surveys to corroborate self-reporting of substance use.

When comparing self-reports of cigarette smoking and validation of reports by biochemical analysis, researchers have found that sensitivity and specificity are high, at 87% and 89% respectively, although there is considerable variance seen among studies. This variance is attributed to differences in elements of study design, such as study population, setting, purpose, and methods of measurement (Patrick et al., 1994). Subject recognition of the purpose of the survey has been shown to alter responses in smoking studies, as seen in female smokers in California. Inquiries specifically for smoking studies produced lower rates of admittance of smoking than when the women were told that the study investigated overall health beliefs (Cowling, Johnson, Holbrook, Warnecke, & Tang, 2003). To complicate the issue, biochemical tests are not without variations in accuracy either (Patrick et al., 1994). However, self-reporting of intravenous drug use tends to be more accurate compared to smoking. A review of studies comparing the self-reporting of intravenous drug use and biochemical drug testing found that, although inconsistencies do occur (most often with the participant over-reporting their drug use), high levels of reliability and validity are consistently demonstrated (Darke, 1998).

Attitudes of Dental Students Towards the Underserved

With the tremendous need for dentists treating underserved populations, increasing interest and exposure during dental school may aid in recruiting dentists to work or volunteer with the underprivileged after graduation. In addition to their scheduled academic coursework, nearly all students in the University of Connecticut School of Dental Medicine volunteer to work with one or more underserved populations during various community service activities. Oral health related service projects are conducted with the homeless, migrant farm workers, children, individuals with special needs, and international citizens in need. These experiences increase the exposure of students to various populations, and may improve understanding of their unique health issues. A study of dental alumni from the University of Michigan School of Dentistry found that 38.4% of dentists sampled stated that dental school prepared them well to treat socioeconomically disadvantaged patients, 50.4% felt well prepared to treat patients in different types of communities, and 37.1% currently use their abilities to address community needs. When asked the same questions pertaining to their future career, dental students consistently expressed a greater desire to work with underprivileged populations (Smith, Ester, & Inglehart, 2006).

Researchers at the University of Southern California School of Dentistry (USCSD) have attempted to analyze dental students' attitudes towards delivering care to underserved populations. Several years ago, the Herman Ostrow School of Dentistry began operating a dental clinic in Los Angeles. The area, known as "Skid Row," is the primary location for homeless services in the Los Angeles area. The educational goals of the program were to aid students in understanding oral health issues common to the homeless and developing empathy and the competencies to treat these issues (Habibian, Elizondo, & Mulligan, 2010).

A study was conducted of 242 USCSD dental students, the majority of them in their final year of study, who participated in a seven-week rotation at the dental clinic on Skid Row. Very few of the students had any prior experience working with homeless. Nearly all students, 98%, agreed they had an overall positive experience, 85% agreed they felt more comfortable treating

homeless people, and 79% felt they learned more about the unique needs of the homeless. Students more strongly felt they "entered dentistry to help those in need," and were more likely to disagree with the statements "homeless people are rude," "homeless people are aggressive," and "the state should not waste its resources on the homeless". There were no differences in scoring based on sex or age of the respondent (Habibian, Elizondo, & Mulligan, 2010).

USCSD further assessed dental students' attitudes towards the underprivileged by surveying freshman dental students before, during, and following their mandatory participation in programs promoting oral health and disease prevention to underserved elementary school students. During these programs, students conduct a needs assessment in an elementary school, and, working with school teachers, develop a series of lessons designed to be age- and culturally-appropriate. The dental students also evaluate the children during oral exams, place sealants, and provide fluoride treatments for eligible children in dental-equipped trailers (Holtzman & Seirawan, 2009).

In the USCSD freshman study, females consistently believed more than males that they had the ability to play a significant role in helping the needy, as did students that had previous experience working with underserved populations. Younger dental students were more likely to score higher, which meant they displayed more "idealistic" attitudes than older students. Students receiving no parental financial support were more likely to express higher scores on personal efficacy. However, on average, following pretest administration, students expressed less empathy towards the underserved, with empathy at the lowest point at the posttest. Students felt less strongly about access to dental care regardless of ability to pay, the responsibilities healthcare providers have to provide care for patients unable to pay, and that dental providers can make a difference in the lives of the underserved. It should be noted that despite these findings, the majority of students still expressed high levels of social responsibility towards serving the underserved (Holtzman & Seirawan, 2009).

RESEARCH DESIGN

This study attempted to determine the follow-up rate of dental referrals dispensed by UConn dental students during oral screens of residents of South Park Inn homeless shelter. In addition, the study aimed to answer the following research questions about the homeless population in Hartford that utilizes South Park Inn:

What are the demographics, including gender, age, race, and length of time homeless, of the transient population choosing to undergo dental screenings at South Park Inn?

What are the common medical issues and substance use histories of Hartford's homeless population?

What are the primary oral health concerns of the transient residents of South Park Inn presenting at the dental screening?

What is the current oral health status of the participants?

Are there specific barriers to care that can be used to determine the ideal location referral for each patient?

Did patients screened in the past at South Park actually receive treatment at the hospital to which they were referred?

In an additional aspect of the study, dental students answered a short survey pertaining to their opinion of what was accomplished during their time at South Park, with the opportunity to write in any suggestions they may have for improving the dental screening outreach program.

The results of this study will aid in the development of a dental treatment program that can successfully meet the unique needs of the homeless population in Hartford, CT (Figure 1).

METHODS

The subjects of the retrospective analysis are the temporary residents of South Park Inn, a homeless shelter located in Hartford, CT. Surveys were collected from September 2001 through May 2011. Several survey instruments consisting of similar inquiries were used throughout the program (Figure 2). There were 527 surveys collected over the course of those ten years, and by

default this will be the sample size of the study. All collected surveys from the homeless participants were considered for the study. A new survey instrument was constructed for the 2011-2012 academic year that contained additional information to be assessed.

Subject's names and date of birth were removed from the surveys by the investigator and replaced with a random number generated by random.org. A master list was created using the random numerical identifiers linking the name and date of birth. The master list was used to search the UConn dental Quick Recovery database by authorized personnel to determine the rate of follow-up of participants who had been referred to UConn SODM. A second survey was administered to current dental students that had participated in the South Park screening program at some point between 2008 and 2012 (Figure 3). Participation was voluntary and anonymous. All surveys were completed in full and entered in the study.

Data were analyzed using univariate and bivariate descriptive analysis by SPSS version 20. Univariate descriptive statistics included mean, frequency, and range. A multivariate correlational analysis determined relationships among independent study variables. The UConn SODM Quick Recovery patient database was searched using name and birthdate of study participants to determine rate of follow-up of referrals to UConn SODM. A multiple regression analysis determined relationships between study variables and presentation of referrals. Frequency and rate of responses to the dental student survey was calculated.

Human Subjects

Permission to review medical records was obtained from the University of Connecticut Health Center Institutional Review Board (IRB), as the surveys contained identifying information and the health center database was searched for confirmation of patient follow-up. As the participants in the study are homeless, they were classified as a vulnerable population by the IRB, requiring additional information to determine that the study protocol was ethical towards this disadvantaged group.

The protocol had legal risks, social risks, and psychological risks that had to be reported to the IRB and minimized in order to protect the study participants. The legal risks derived from the survey questions related to the participants' illegal drug use. To minimize this risk, the survey did not ask when the person used drugs, participants were never forced to answer all questions, and information was kept confidential. Social risks included possible discrimination against participants if remarkable health histories were released, such as HIV status or drug history. This risk of discrimination was lessened by storing data without patient names on an encrypted computer, by locking up all surveys in a secure location at the UConn Health Center, and by ensuring that all students administering the survey followed Health Insurance Portability and Accountability Act (HIPAA) guidelines, keeping all gathered information confidential. South Park Inn residents signed up to participate in the surveys and dental examinations without any coercion from UConn or South Park affiliates. A waiver of the requirement to consent subjects was granted by the IRB

PROCEDURES

Surveys administered to South Park Inn residents were designed by Dr. Sarita Arteaga, Associate Clinical Professor at UConn SODM. The outreach program conducted the surveys in an attempt to provide appropriate, case-by-case dental referrals to homeless residents of South Park Inn. The survey instrument described above is a hard copy, two page survey that consisted of multiple choice questions, additional open-ended questions, and multiple choice questions followed by an open-ended follow-up question. The information asked in the survey pertained to medical history, social history, demographics, oral hygiene routine, and the oral examination. The survey design was based on the medical history form administered to all patients at the UConn SODM clinics.

Prior to the dental students' arrival at South Park Inn, current residents of the shelter were asked by the South Park Inn staff if they would like to participate in a dental screening or if they had any oral health concerns that they would like addressed at the UConn screening event. The

demographics and medical history portion of the survey were administered by a dental student volunteer, unless the patient preferred to self-administer the form. If they chose the second option, responses would then be confirmed by the student. All surveys and exams were conducted in discreet areas found in the isolated clinical area of South Park Inn. The patients were asked demographic information such as name, date of birth, and gender, before being asked their chief complaint, or reason for seeking treatment. This was followed by a series of questions pertaining to medical history, which began with two-part questions; closed-ended questions were used to document a respondent's medical history, and when necessary these were followed by a contingent, open-ended, fill-in question.

Significant medical history was assessed extensively in the survey for multiple reasons. It must be known if the patient has a dangerous medical condition requiring immediate medical care, or a condition that would affect their dental care. Additionally, scientific evidence continues to discover links between oral health and overall health. Aside from the more obvious implications for the health of the individual patient, this information is important on a population level as it allows for an understanding of which diseases are commonly found in the homeless. Knowledge of this information can allow an outreach program to prepare properly for the comorbidities likely to present. Another crucial aspect of the medical history to be assessed is substance abuse history. Substance abuse, especially of alcohol and tobacco products, is a predictor of oral carcinomas, as well as other health issues.

Chief complaint was the basis for separating the participants into groups requiring acute versus routine care. Asking patients their primary complaint reveals the issues that most worry them and thus answers the research question focusing on the oral health concerns of the individual. Although the chief complaint is often not the primary concern of a dental provider, it is still important to address during the treatment planning process. Querying patients about chief complaint also aided in determining whether a patient was pursuing routine and preventative care, or if they had more immediate, acute needs.

The dental student assessed the participant's oral health through a brief oral exam and direct, face-to-face questioning of aspects of oral care. Patients were classified into predetermined categories, some with additional contingency questions. Missing teeth (excluding wisdom teeth) were tallied, and prostheses, when present, were inspected. Clinically carious teeth were counted, as were the total number of teeth present. The presence or absence of purulence, signifying infection, was noted. The participant's oral hygiene routine was discussed and responses were categorized. Overall oral hygiene and the presence or absence of gingivitis was noted by the dental student. Based on the information gathered, a referral was made to a local hospital for dental treatment if needed.

The second component of this study, the administration of a survey to dental students, gathered information about their experience as a volunteer conducting oral health screens at South Park Inn. Students were asked to answer eight questions with answer choices in Likert scale format. Students' attitudes towards working with an underprivileged population were assessed, and suggestions for improvement of the program were gathered by allowing an open-ended response. This survey was optional and anonymously administered to all current students with a history of volunteering at South Park Inn.

RESULTS

Demographics and Health History

The surveyed sample consisted of a total of 527 homeless persons residing for varied periods of time at South Park Inn. Ages ranged from less than one year to 78 years of age, with an average age of 34.57 (Figure 4). Sixty percent of the participants were males, and 42% were African American, 32% were Hispanic, 25% were white, and 2% were other races (Figures 5, 6).

Medical History

For those divulging medical histories (148), mental health issues, primarily anxiety and depression, were the most common, reported by 33% (49) of the South Park Inn residents (Figure 7). Asthma diagnoses were disclosed by 19% (43) of the participants and diabetes by 6% (13).

Six percent (14) reported cardiac problems and 10% (19) had a history of hypertension. Infectious diseases were self-reported by 22%, with 11% (25) disclosing a history of hepatitis, 2% (4) HIV/AIDS, and 9% (21) revealed a confirmation of a sexually transmitted disease. Another 15% reported diagnoses in the "Other" category. Most of the respondents (64%) divulged having one morbidity, while 23% reported two comorbidities, 9% had three, 3% had four, and just one person had five comorbidities (Figure 8). Nearly two-thirds (212) of the South Park residents questioned about smoking (323) reported they currently smoked cigarettes, and 30% (149) admitted to an illegal drug-use history (Figures 9, 10).

Dental Health

Half of all participants (n= 508) were triaged as having acute complaints, while half were seeking routine care, the latter including exams, dental prophylaxes, and prosthetic services (Figure 11). Thirty-five percent (178) of screened individuals presented with a chief complaint that required prompt attention (Figure 12); their symptoms included pain and signs of infection or abscess, while sensitivity was described by 6% (28). Restorative needs such as fractured teeth or lost restorations were reported in 11% (56) of the sample, and 9% (46) self-reported experiencing caries. Exams were requested by 26% (133) of the participants, and 4% (20) complained of needing dentures.

Oral hygiene was rated by the dental students and the SODM faculty preceptor by assessing plaque build-up and the general status of the oral cavity. Those screened were most commonly given a score of fair (203), or 45% (Figure 13). An evaluation of poor was designated to 31% (140) of those sampled, while 24% (110) were declared good. The gingival tissue was also assessed for inflammation by the dental students and preceptor conducting the oral health screens. Eight percent were categorized as having little to no gingival inflammation, 13% had severe inflammation, and 45% and 33% had mild and moderately inflamed gingival tissues, respectively (Figure 14).

South Park residents were asked to report their tooth brushing frequency (Figure 15). Eighty-six percent (411) reported brushing daily, while 5% (22) stated they never brushed their teeth. Six percent brushed one to three times per week and three percent four to six times per week. Upon oral examination, 72% had signs of clinically visible decay (Figure 16). Missing adult teeth were also counted in the screening. Excluding third molars in the counts, 36% had at least 28 teeth, 35% had lost between one and five teeth, 11% were missing six to ten, and 12% had lost greater than ten teeth (Figure 17).

Correlations

Gingivitis was strongly associated ($r > .6$) with a history of smoking and those deemed to have poor oral hygiene at time of evaluation. Additionally, smoking was strongly associated with the presence of a temporomandibular joint disorder. Age of the participant was moderately associated with missing teeth, as was oral hygiene ($r > .3$). Oral hygiene was mildly associated with brushing frequency. Gingivitis was moderately associated with both drug use and inversely associated with frequency of teeth brushing. Although most of the associations found were statistically significant ($P < .05$) , all other association between variables relating to patient demographics, medical histories, and dental health were weak ($r < .3$).

UConn Referrals

UConn dental records were examined to determine if individuals screened at South Park presented at UConn SODM for dental care. Of the 224 patients referred to UConn SODM from 2001-2011, 18.3% (41) presented at UConn dental clinics seeking dental care (Figure 18). Of these patients, seven ceased care after the initial screening appointment which is mandatory at UConn for all patients seeking comprehensive care. At this appointment an initial oral evaluation is conducted and relevant radiographic films are captured to determine the university dental clinic best suited to meet the patient's oral health needs. The remaining 34 went on to seek care in the dental clinics.

Regression Analysis

A multiple regression analysis was conducted to determine relationships between the independent variables and presenting for a dental appointment at UConn SODM. No statistically significant predictor variables were found.

Student Surveys

A total of 31 of the dental students that volunteered for South Park Inn Dental Clinic completed the voluntary, anonymous survey (Table 1). Females made up 58.1% (18) of the respondents. Most of the respondents (96.8%) felt that conducting the dental screens was valuable to their dental education. Three-quarters of the participants felt they were more comfortable working with the underprivileged after screening the South Park Inn residents and 93.4% had a positive experience while volunteering at the Inn. When asked about working with the underserved as a full-time career, 38.7% said they would not, 41.9% were neutral, and 35.9% either agreed or strongly agreed to the possibility of a full-time career working with the underserved. All students stated they would consider volunteering with underprivileged populations during their career. A majority of students (86.7%) believed that dentists had a duty to care for the underprivileged, and nearly 90% believed that homelessness is a health issue. Four students provided additional responses. Of these comments, one student stated the experience helped them learn how to form patient rapport while another suggested providing South Park Inn residents with extractions at no cost and public transportation vouchers to UConn SODM for dental treatment.

DISCUSSION

We found that the majority of this sample of homeless individuals suffered from oral pathologies. Prevalence of decay and missing teeth were much greater in the sample than in the general United States population (National Institutes of Health, 2011). Although edentulism is prevalent in homeless populations the use of prostheses remains low. This population may benefit from prosthetic services after disease has been treated in the oral cavity. Two-thirds of

this homeless population has a smoking history, so smoking cessation programs could prove beneficial.

With 18% of patients referred to UConn seeking care (this does not take into account the patients that presented after referral to two other local hospitals), this dental screening and referral program is moderately successful, although there is much room for improvement. Lack of childcare, transportation, and telephone numbers are possible challenges homeless individuals may face before receiving dental care at UConn, as are extended waiting periods for new patients and difficulties reaching a dental receptionist due to a high call volume. Most participants admitted to brushing daily, implying that dental health is a priority in their life and that they may be open to further oral health education and treatment. The independent variable correlations in the study further highlight the importance of brushing, smoking cessation, and oral hygiene measures on eliminating disease and delaying edentulism.

Medical issues were prevalent in this homeless population, and it is unknown how well these conditions are managed by appropriate physicians. If urgent needs, such as pain or infection, encourage underserved individuals to seek dental care, then dentists have the opportunity to ensure these patients are referred to appropriate and accessible physicians that can address unmet health needs. Additionally, the student survey suggested that providing dental students the opportunity to work with homeless populations may contribute positively to their dental education and improve comfort with working with this underserved population.

Future Research at South Park Inn

The next steps are to determine the barriers to dental care expressed by the homeless at South Park Inn. A new survey, designed in 2011, is currently in use at South Park Inn. It inquires as to barriers of care that may prevent individuals from obtaining the dental treatment they require. Questions including method of communication, insurance status, when they were last seen by a dentist or physician, military history, and issues that may keep them from seeking treatment were added. After the collection of the initial 39 surveys, preliminary data revealed

that the primary method of communication varied widely. Many responded to having their own phone, but others stated reliance on the phone at South Park Inn, or on a friend or family member's phone or email. Several answered that they are unable to be reached. Many had state insurance that covered dental care, and no one was a military veteran, eliminating the possibility of receiving care through their veterans' benefits. Most relied on public transit, stating they are able to access UConn using this mode of transportation.

Implications for Public Health Practice

This study will inform public health practitioners about the needs of the homeless population located in Hartford, Connecticut. These needs include medical, dental, and substance abuse treatment. A better understanding of these issues can allow for an oral health outreach program to be designed that is appropriately prepared to meet the needs of this community and is readily accessible by the homeless population. By investing in the oral health of Hartford's homeless residents, more serious pathological conditions, including infections and systemic disease, can be prevented. Improving oral health and esthetics contributes to overall wellbeing, which can potentially help this disadvantaged population integrate back into society. In addition, the survey of dental students acknowledged that participating in activities related to the homeless aids in their comfort and understanding of health issues specific to homeless populations. This may encourage a greater number of students to choose to practice in the dental safety net.

Limitations

There are limitations to this study. Only one shelter was sampled, so the needs identified here may not be representative of all of Hartford's homeless population, including homeless individuals that do not frequent emergency shelters. Another limitation is that various dental students conducted the exams, so inconsistencies in subjective measurements are to be expected. Since the South Park screening program began, several surveys have been used, each of which contained slight modifications. This has caused discrepancies in the sample size for each question. Participants have often left questions blank, and this could lead to potential nonresponse

errors. The study relies on self-reporting of the participants without any independent or objective confirmation. Not all dental students that participated in South Park chose to respond to the anonymous survey, so the survey may not accurately represent the average beliefs of student volunteers. A pretest and posttest administered to students before and following their South Park services would have been a more desirable indicator of the effect that working with the homeless had on the students' views on working with the underserved.

CONCLUSION AND RECOMMENDATIONS

This study aids in informing public health practitioners about the needs of a sample homeless population located in Hartford, Connecticut. A better understanding of oral health issues common to the homeless can allow for an oral health outreach program to be designed that is appropriately prepared to meet the needs of this community and is readily accessible by the homeless population. For a more comprehensive understanding of oral health needs of the homeless in Hartford, Connecticut, individuals at shelters other than South Park as well as various locations frequented by the homeless should be evaluated. In addition, access of care should be further studied. A larger study of homeless individuals that are treated at community clinics, area hospitals providing dental treatment, and private practices can help provide a better understanding of issues involving access to dental care and dental needs of the homeless population in Hartford, CT.

REFERENCES

Baggett, T., O'Connell J. J., Singer, D., & Rigotti, N. (2010). The Unmet Health Care Needs of Homeless Adults: A National Study. American Journal of Public Health, 100, 1326-1333.

Connecticut Coalition to End Homelessness. (2011). Homelessness in Hartford. Retrieved from http://www.cceh.org/files/publications/

Connecticut Coalition to End Homelessness. (2011). Point in time count summaries for sheltered and unsheltered 2011. Retrieved from http://www.cceh.org/

Connecticut Department of Public Health. (2007). Oral Health in Connecticut. Retrieved from http://www.ct.gov/dph/lib/dph/oral_health/pdf/oral_health_in_ct.pdf

Connecticut Mission of Mercy. (2012). Retrieved from http://cfdo.org/cfdo1_ctmom.html

Conover, S., Berkman, A., Gheith, A., Jahiel, R., Stanley, D., Geller, P., Valencia, E., & Susser, E. (1997). Methods for Successful Follow-up of Elusive Urban Populations: An Ethnographic Approach with Homeless Men. Bulletin of the New York Academy of Medicine, 74(1), 90-107.

Conte, M., Broder, H.L., Jenkins, G., Reed, R., & Janal, M.N. (2006). Oral health, related behaviors and oral health impacts among homeless adults. Journal of Public Health Dentistry, 66(4), 276-8.

Cowling, D.W., Johnson, T.P., Holbrook, B.C., Warnecke, R.B., & Tang, H. (2003). Improving the self reporting of tobacco use: results of a factorial experiment. Tobacco Control, 12, 178-183.

Blanaid D., Newton, T., & Batchelor, P. (2010). Patterns of dental service use among homeless people using a targeted service. Journal of Public Health Dentistry, 10(1), 45-5.

Darke, S. (1998). Self-report among injecting drug users: a review. Drug and Alcohol Dependence, 5, 253-263.

DiMarco, M., Huff, M., Kinion, E., & Kendra, M.A. (2009). The Pediatric Nurse Practitioner's Role in Reducing Oral Health Disparities in Homeless Children. Journal of Pediatric Health Care, 23(2), 109-116.

DiMarco, M., Ludington, S., & Menke, E. (2010). Access to and Utilization of Oral Health Care by Homeless Children/Families. Journal of Health Care for the Poor and Underserved, 21, 67-81.

Gelberg, L., Linn, L.S., & Rosenberg, D.J. (1988). Dental health of homeless adults. Special Care Dentistry, 8(4), 167-72.

Habibian, M., Elizondo, L., & Mulligan, R. (2010). Dental Students' Attitudes Towards Homeless People While Providing Oral Health Care. Journal of Dental Education, 74(11), 1190-1196.

Holtzman, J., & Seirawan, H. (2009). Impact of Community-Based Oral Health Experiences on Dental Students' Attitudes Towards Caring for the Underserved. Journal of Dental Education, 73(3), 303-310.

Homeless Services Directory. (2012). Hartford Connecticut Homeless Shelters and Services for the Needy. Retrieved from http://www.homelessshelterdirectory.org/

Kaste, L.M., & Bolden, A.J. (1995). Dental caries in homeless adults in Boston. Journal of Public Health Dentistry, 55(1), 34-6.

King, T., & Gibson, G. (2003). Oral health needs and access to dental care of homeless adults in the United States. Special Care in Dentistry, 23(4), 143-7.

Kushel, M.B., Vittinghoff, E., & Haas, J.S. (2001). Factors Associated with the Health Care Utilization of Homeless Persons. Journal of the American Medical Association, 285(2), 200-206.

Okunseri, C., Girgis, D., Self, K., Jackson, S., McGinley, E., & Tarima, S. (2010). Factors associated with reported need for dental care among people who are homeless using assistance programs. Special Care Dentistry, 30(4), 146-150.

McKenzie, M., Tulsky, J., Long, H., Chesney, M., and Moss, A. (1999). Tracking and Follow-Up of Marginalized Populations: A Review. Journal of Health Care for the Poor and Underserved, 10, 409-427.

U.S. Department of Housing and Urban Development. (2011). McKinney-Vento Act. Retrieved from http://portal.hud.gov/hudportal/HUD

National Institute of Dental and Craniofacial Research. (2011). Dental Caries (Tooth Decay) in Adults (Age 20 to 64). Retrieved from http://www.nidcr.nih.gov/oralhealth/

National Center for Chronic Disease Prevention and Health Promotion. (2010). Oral Health Resources. Retrieved from http://apps.nccd.cdc.gov/nohss/ByState.asp?stateId=9

Patrick, D.L., Cheadle, A., Thompson, D.C., Diehr, P., Koepsell, T., & Kinne, S. (1994). The Validity of Self-Reported Smoking: A Review and Meta-Analysis. American Journal of Public Health, 84(7), 1086-1093.

Smith, C., Ester, T., & Inglehart, M. (2006). Dental Education and Care for Underserved Patients: An Analysis of Students' Intentions and Alumni Behavior. Journal of Dental Education, 70(4), 398-408.

South Park Inn, Inc. (2011). South Park Inn. Retrieved from http://www.southparkinn.org/

State of Connecticut Department of Public Health. (2007). Connecticut Tops in the Country for Oral Health Status of Children. Retrieved from http://www.ct.gov/dph/cwp/view.asp?Q=396338&A=3116

United States Department of Health and Human Services. (1989). Reducing the Health Consequences of Smoking: 25 years of Progress. A Report of the Surgeon General. Washington, DC: U.S. Government Printing Office.

US Dept. of Housing and Urban Development. (2011). The 2011 Point-in-Time Estimates of Homelessness. Retrieved from http://www.hudhre.info/documents/PIT-HIC_SupplementalAHARReport.pdf

Wright, N., & Tompkins, C. (2009). How can health services effectively meet the health needs of homeless people. British Journal of General Practice, 56(525), 286-293.

APPENDICES

Table 1: Dental student survey questions and results in a Likert scale. n=31.

Survey Questions (n=31)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Disagree
1.Sex: M=41.9%;F=58.1% (18)					
2. Your experience at South Park Inn was valuable to your dental education.	0	0	3.2	77.4	19.4
3. You feel more comfortable working with the underprivileged after screening patients at South Park Inn.	0	3.2	22.6	58.1	16.1
4. You had a positive experience working at South Park Inn.	0	0	6.7	56.7	36.7
5. You will consider working full-time with underprivileged populations during your career.	9.7	29	41.9	19.4	16.5
6. You will consider volunteering with underprivileged populations during your career.	0	0	0	35.5	64.5
7. Dentists have a duty to care for the underprivileged.	0	3.3	10	36.7	50
8. Homelessness is not a health issue.	0	0	9.7	32.3	58.1
9. Please feel free to comment on your experience, including suggestions for improvement:					

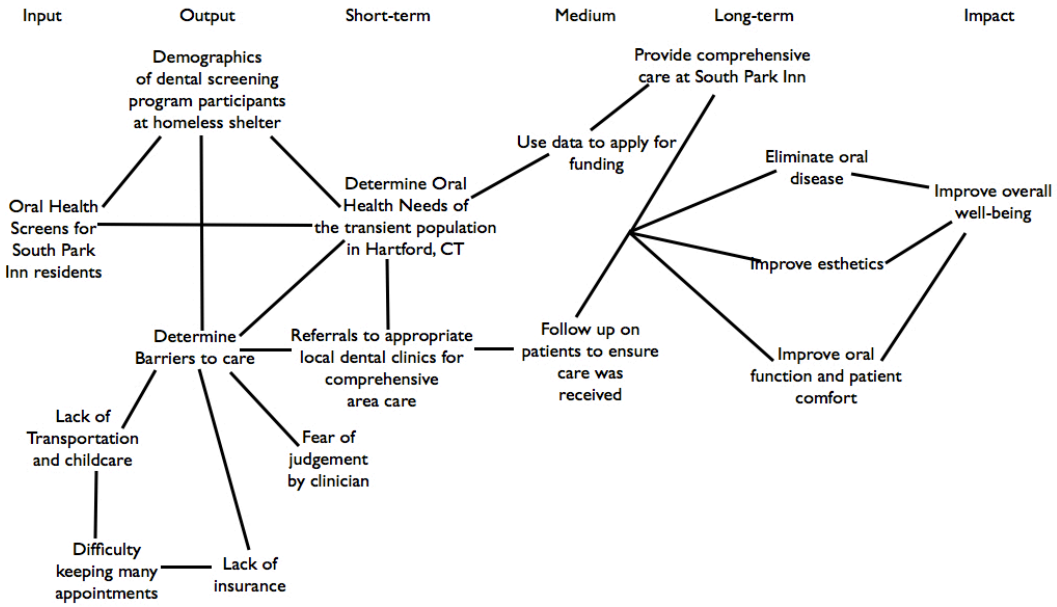

Figure 1: Logic Model of the South Park Inn dental screening program conducted by UConn dental students. Students perform oral health exams on homeless residents at the homeless shelter and refer the individual to appropriate hospitals.

South Park Dental Clinic
Hartford, CT
Dental/Medical Health History Questionnaire

Name _____ M____F____ Age:_____

Date of Birth:_____ Race:_____

Length of Stay at South Park Inn:_____
Current Dental Problem/Complaint:
_____

Please answer all questions below by circling Yes or No, and/or fill in the blank. If you are not sure, leave the answer blank. Answers are completely confidential and for our records only.

1. Are you currently under the care of a doctor? ….....……....Yes No
   If yes, what are you being treated for?_____
2. Please list significant medical issues you have had at anytime in your life
   (Including, but not limited to diabetes, hepatitis, bleeding problems, or TB):
   _____
3. Are you taking any drugs, medicines, pills?.....Yes No
   If yes, what?_____
4. Are you allergic to anything?.....Yes No
   If yes, what?_____
5. Do you have any heart problems (including high blood pressure, murmurs,
   bacterial endocarditis, prosthetic valves, rheumatic fever)?.....Yes No
1. Is it possible that you have AIDS?.....Yes No
10. Do you drink alcohol?.....Yes No
    If yes, how much?_____
11. Have you or do you smoked cigarettes or marijuana or chewed tobacco?....Yes No
    If yes, how much?_____
12. (WOMEN) Are you pregnant?.....Yes No

This is to certify that I consent to a dental examination and possible emergency dental treatment. Any treatment that might be provided will be discussed with me in advance.
If this patient is a minor and/or is physically/mentally incompetent, this statement must be signed by the patient's legal guardian.
To the best of my knowledge, the above information is complete and accurate.
Signature of Patient/Guardian_____Date_____

Pt presents for: Acute:_____ Routine:_____

Is the patient in pain?: Yes:___ No:___ If yes, how long?_____

Oral hygiene: Good:_____ Fair:_____ Poor:_____

Brushing: <1/week:____ 1-6/week:____ 1x/day:____ 2x/day:____

Flossing: Never:___monthly:___weekly:___daily:___

Missing teeth: None:____ 1-5:___ 6-10:___ 10+:___ (excluding wisdoms)

Prosthesis: Yes:___ No:___ If yes, serviceable?: Yes___ No___

Non restorable teeth: ___

Restorable teeth: ____ of ____teeth present (number of teeth)

Purulence: Yes:___ No:___

Referred to: UConn:___ Hartford Hospital:___ St.Francis:___ Burgdorf:___ Other:___

Comments:

Student/Reviewer:_____Date_____

Preceptor_____Date_____

Figure 2: Survey instrument administered to South Park Inn residents during dental screens conducted by UConn dental students from 2001-2011. n=427.

South Park Inn Student Volunteer Survey

Directions: Please check the appropriate response. Thank you for you time and honesty.

1. Sex: __male __female

2. Your experience at South Park Inn was valuable to your dental education.
__strongly disagree __disagree __neutral __agree __strongly agree

3. You feel more comfortable working with underprivileged after screening patients at South Park Inn.
__strongly disagree __disagree __neutral __agree __strongly agree

4. You had a positive experience working at South Park Inn.
__strongly disagree __disagree __neutral __agree __strongly agree

5. You will consider working full-time with underprivileged populations during your career.
__strongly disagree __disagree __neutral __agree __strongly agree

6. You will consider volunteering with underprivileged populations during your career.
__strongly disagree __disagree __neutral __agree __strongly agree

7. Dentists have a duty to care for the underprivileged.
__strongly disagree __disagree __neutral __agree __strongly agree

8. Homelessness is a health issue.
__strongly disagree __disagree __neutral __agree __strongly agree

9. Please feel free to comment on your experience, including suggestions for improvement:
_____
_____
_____
_____
_____
_____

Figure 3: Survey instrument administered to South Park Inn dental student volunteers participating in the South Park Inn dental screening program between 2008-2012. n=31.

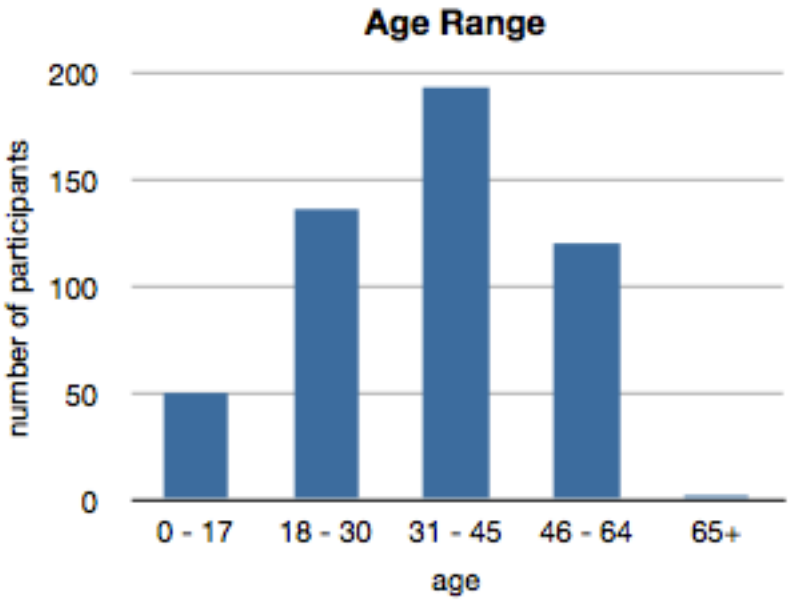

Figure 4: Age range of South Park Inn residents screened by UConn Dental students from 2001-2011. n=501.

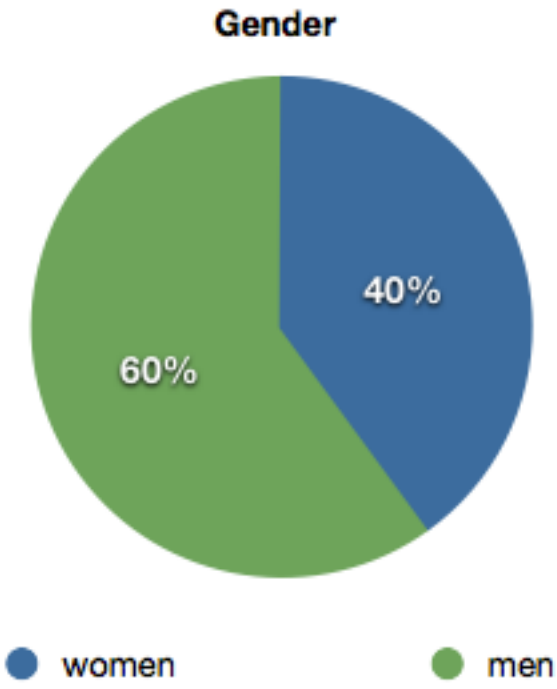

Figure 5: Gender of South Park Inn residents screened by UConn Dental students from 2001-2011. n=524.

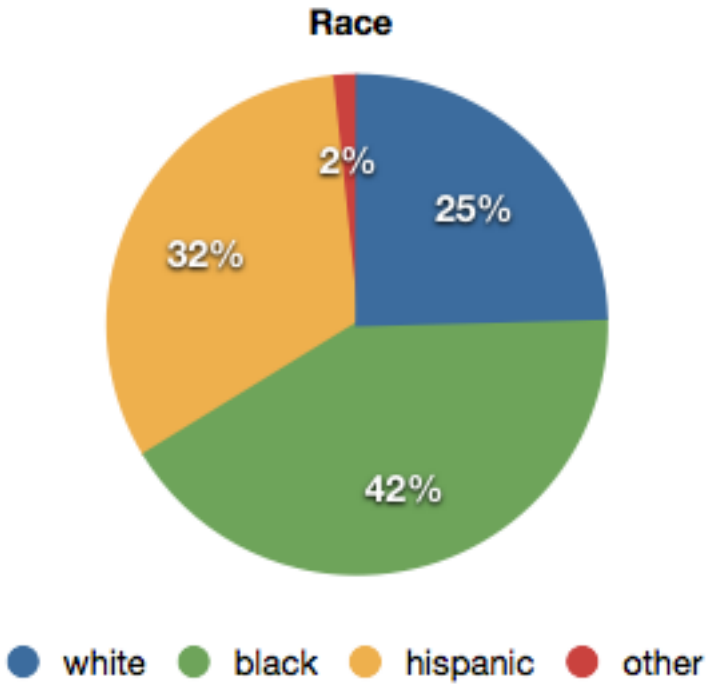

Figure 6: Race of South Park Inn residents screened by UConn Dental students from 2001-2011. n=187.

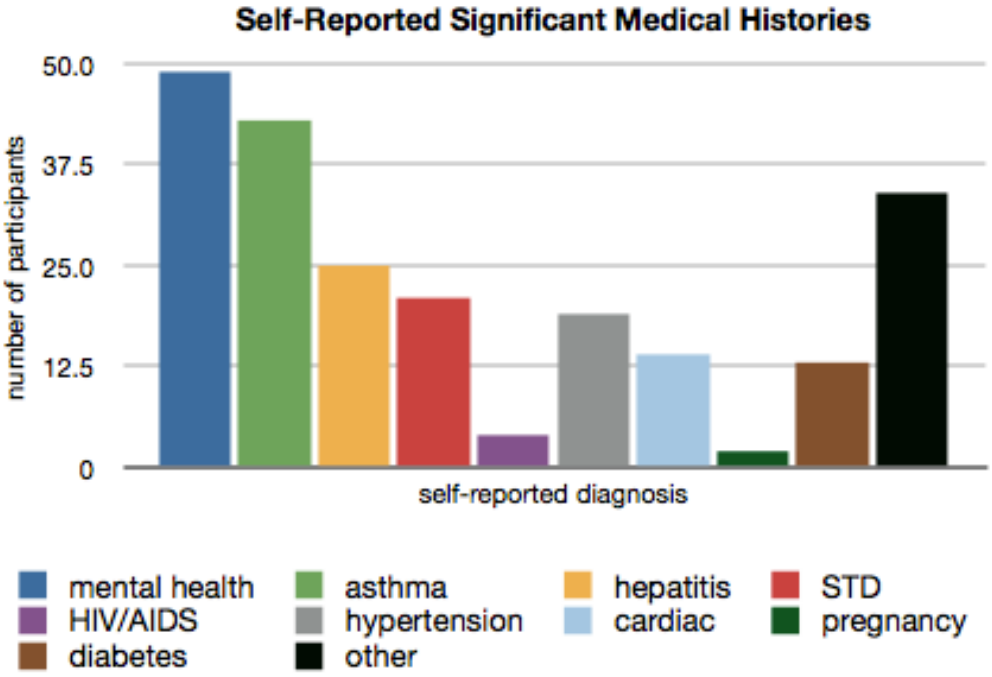

Figure 7: Self-reported significant medical histories of South Park Inn residents screened by UConn Dental students from 2001-2011. n=224.

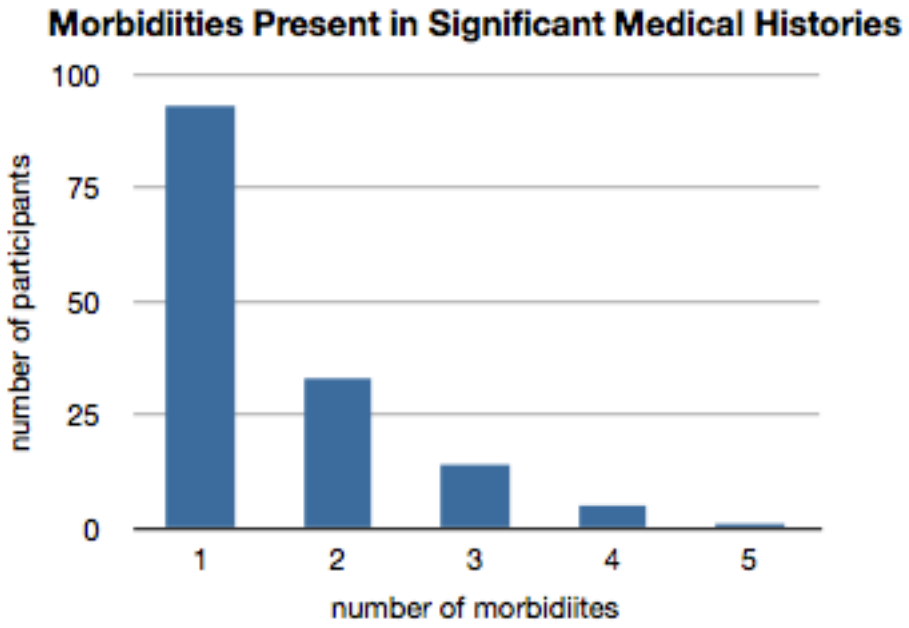

Figure 8: Number of self-reported medical morbidities afflicting South Park Inn residents screened by UConn Dental students from 2001-2011. n=146.

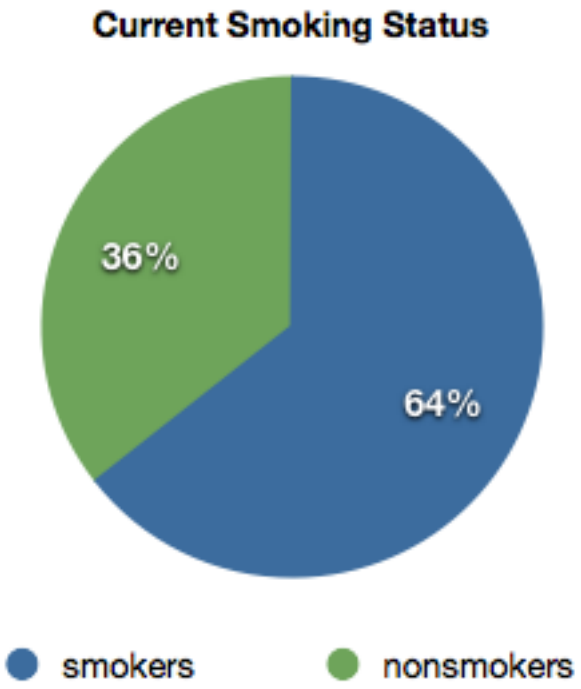

Figure 9: Current smoking status of South Park Inn residents screened by UConn Dental students from 2001-2011. n=329.

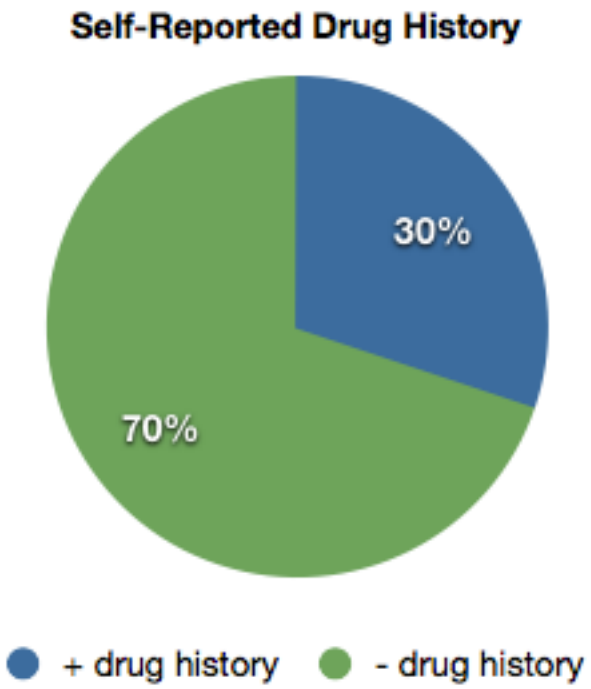

Figure 10: History of illegal drug use self-reported by South Park Inn residents screened by UConn Dental students from 2001-2011. n=494.

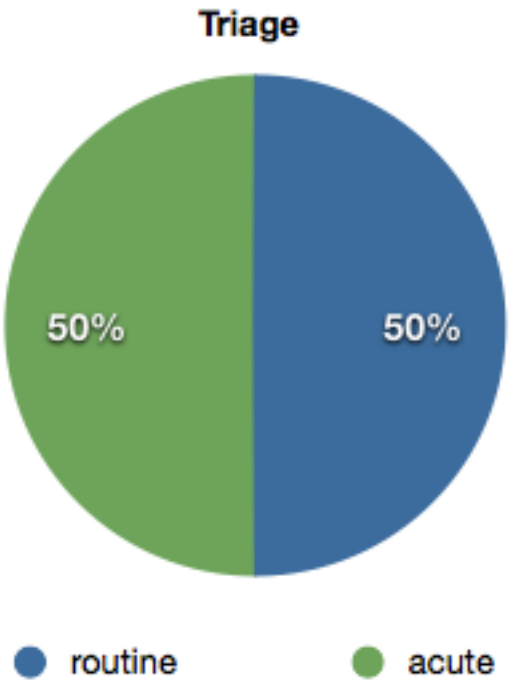

Figure 11: Triage of South Park Inn residents screened by UConn Dental students from 2001-2011. Acute needs included pain, infection, and abcess. Routine needs included general exam, asymptomatic decay, edentulous spaces, and dental prophylaxis. n=508.

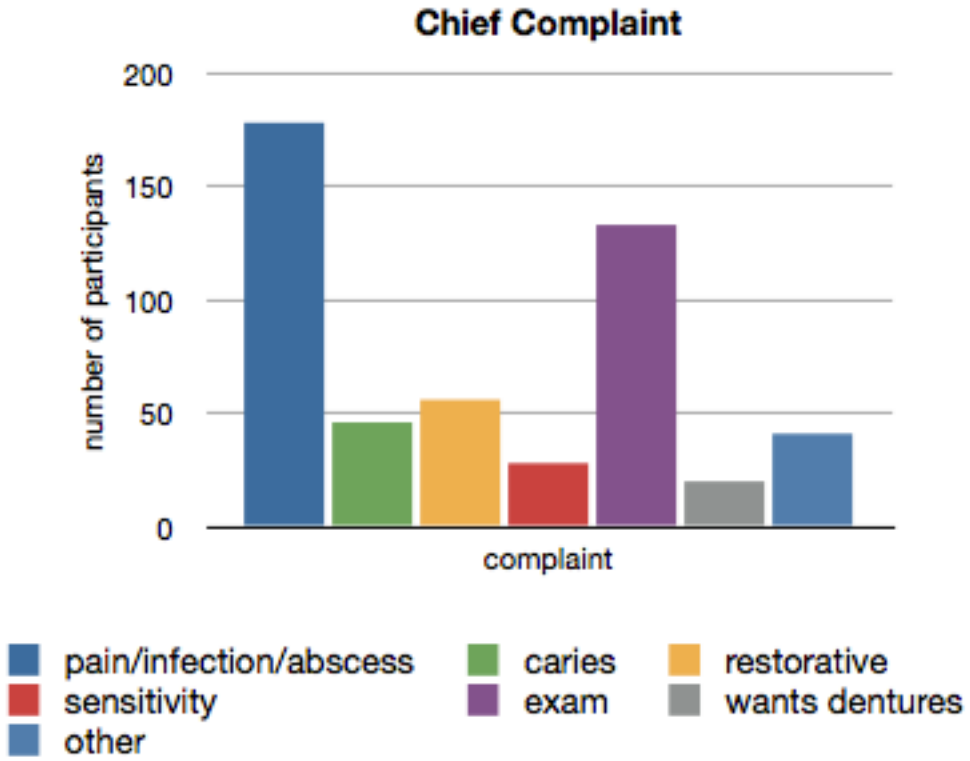

Figure 12: Dental chief complaint expressed by South Park Inn residents screened by UConn Dental students from 2001-2011. n=502.

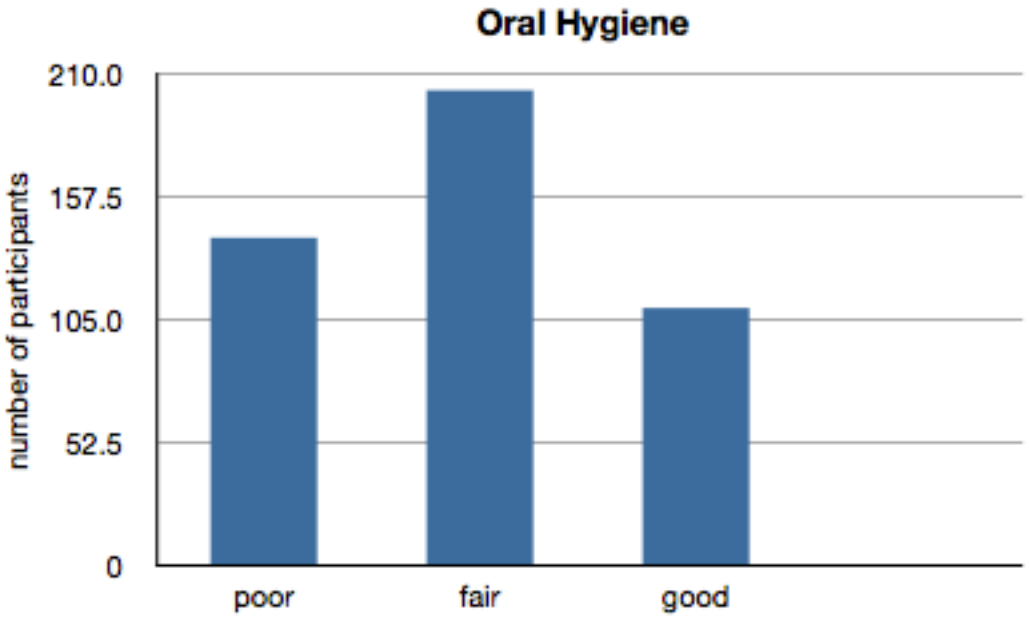

Figure 13: Oral hygiene status of South Park Inn residents screened by UConn Dental students from 2001-2011. Status was determined by dental students and confirmed by a faculty preceptor. n=453.

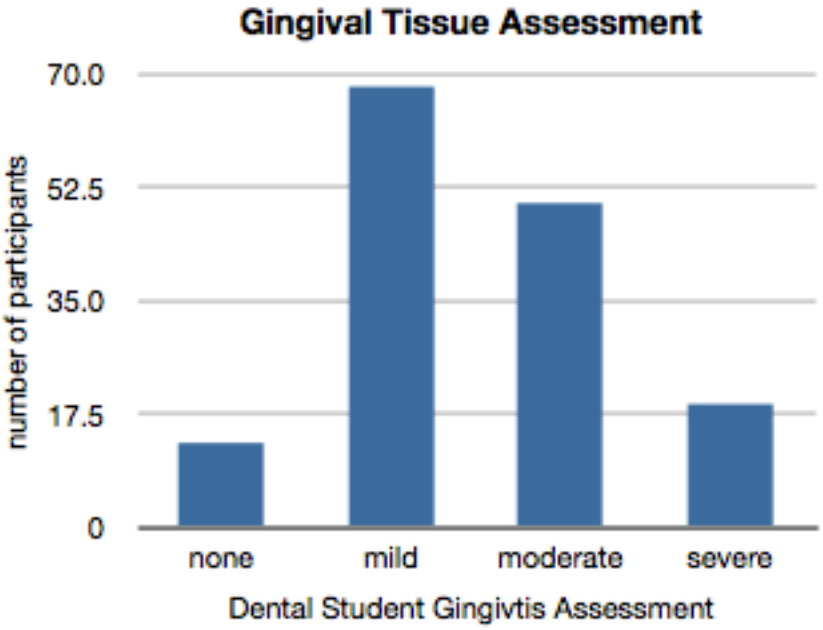

Figure 14: Gingival tissue assessment of South Park Inn residents screened by UConn Dental students from 2001-2011. Tissue was assessed for signs of inflammation, including redness and swelling, and confirmed by a faculty preceptor. n=221.

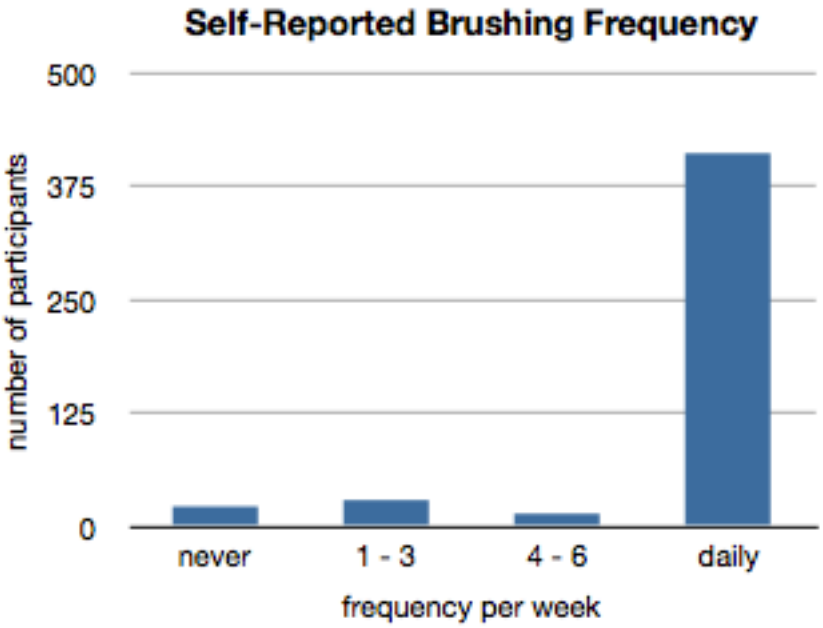

Figure 15: Self-reported weekly brushing frequency of South Park Inn residents screened by UConn Dental students from 2001-2011. n=476.

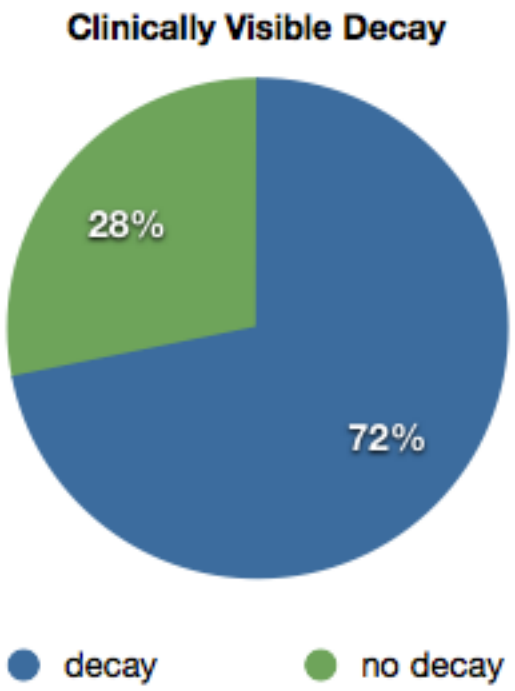

Figure 16: Clinically visible decay of South Park Inn residents determined by dental students and faculty preceptors during dental screens from 2001-2011. n=167.

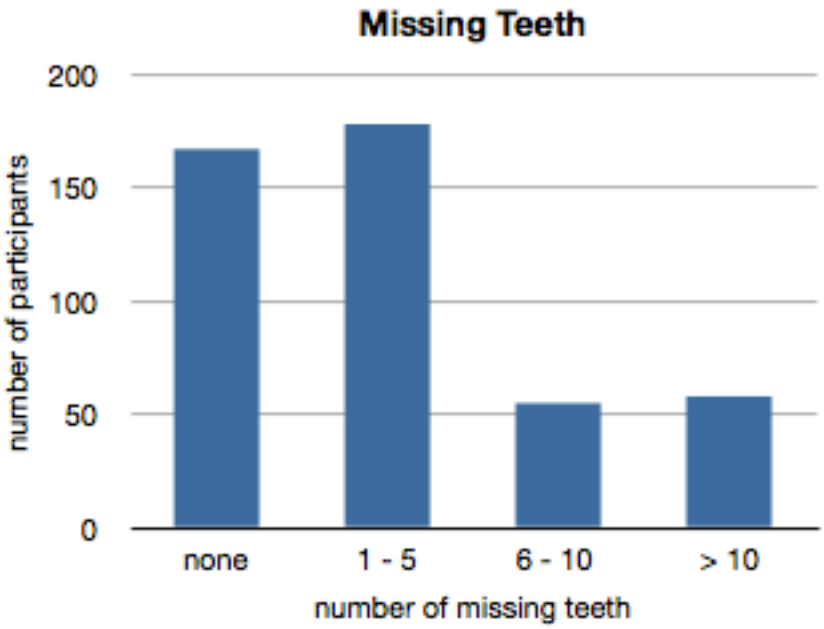

Figure 17: Number of missing teeth (excluding third molars) of South Park Inn residents determined by dental students and faculty preceptors during dental screens from 2001-2011. n=458.

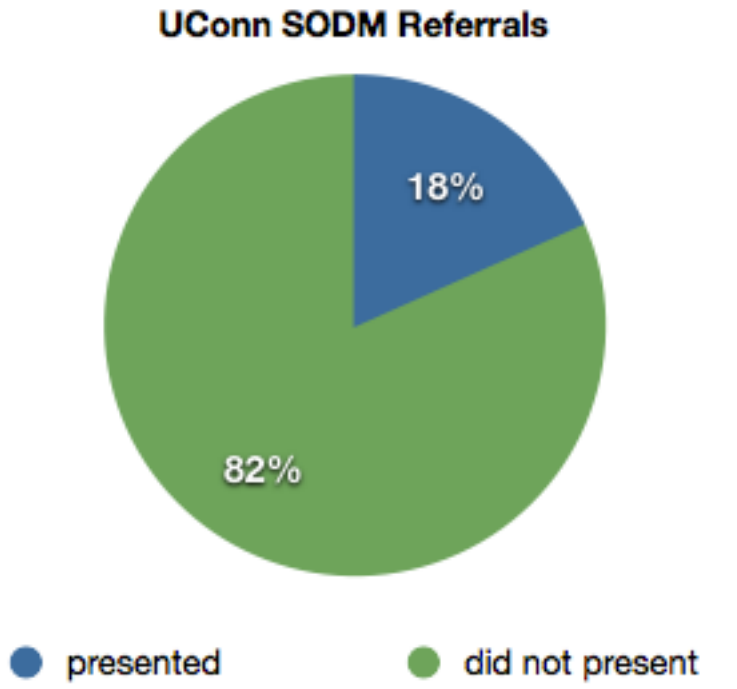

Figure 18: South Park residents referred to UConn for comprehensive dental care. n=224. Of those referred, 41 presented at UConn SODM for treatment.