"Transplanting of Teeth" by Thomas Rowlandson. Courtesy Metropolitan Museum of Art, New York.

Assessing the Oral Health of the Homeless Population in Central Massachusetts

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Objectives: Oral health conditions are common yet evitable, and disproportionately plague underserved communities. This study aimed to survey the homeless and housing insecure in central Massachusetts to better understand their oral health disease burden and resource needs. **Methods**: Data was collected in 2021 from 144 individuals at four sites frequented by this population. The 26-item anonymous questionnaire was available in written, electronic, and verbal formats in English and Spanish, including questions on sociodemographic factors, access to and use of dental and primary care, self-reported oral and overall health statuses, and resources needed to improve oral health. **Results**: The study sample was 65% male, 58% White,

and 90% Medicaid insured. Nearly three-quarters of study subjects reported homelessness (27% unsheltered; 44% sheltered); the remaining were housing insecure. The percentage of participants with a PCP (79%) was more than three times that with a dentist (25%). Unsheltered homeless respondents were significantly less likely to have a PCP than sheltered homeless or housing insecure, and poor oral health was correlated with poor overall health. The most common resources needed were dentists accepting public insurance, dental supplies, and transportation. About two-thirds of respondents (66%) were amenable to receiving dental advice from a case manager or social worker. **Conclusions**: Our results demonstrate a need in the homeless and housing insecure community for dental supplies, more insurance-eligible providers and assistance to patients for finding them, education about oral hygiene, and transportation options, possibly with case management and primary care involvement.

INTRODUCTION

Despite being highly preventable, oral health conditions are among the most prevalent diseases in the U.S. and globally (1). In fact, the most common health condition worldwide in 2017 was untreated tooth decay in permanent teeth (2). Tooth decay and gum disease, the two most common dental pathologies (3), can be prevented by personal dental hygiene, fluoride application, routine dental visits, and reducing sugar consumption (4).

However, such prevention strategies for maintaining good oral hygiene can be particularly challenging in low-resource communities. As such, oral health issues disproportionately affect socioeconomically disadvantaged populations (3). According to the 2000 Report on Oral Health by the Surgeon General, the "silent epidemic" of dental and oral disease particularly affects the poor, members of racial and ethnic minority groups, the medically compromised, and individuals with disabilities.[5] Decades later, this still holds true. The association between low socioeconomic status and poor oral health has been extensively established in the literature (6-11). Racial disparities in oral health persist (12, 13). As examples, the number of Black and Mexican American adults with untreated cavities is almost double that of non-Hispanic White adults, and the five-year survival rate for oral pharyngeal cancer is a staggering 34% lower for Black men (41%) than for White men (62%) (14).

For the more than half a million individuals in the U.S. suffering from homelessness (15), these oral health disparities are particularly stark. Homeless individuals, defined as living on the street or in shelters, are 12 times more likely to face dental issues than their stably housed counterparts. For individuals who are housing insecure who live in hotels and motels or with relatives or friends, dental problems are six times more likely than for those in reliable residences (16). In a national study of homeless adults, 60% of those with a dental issue in the preceding year reported an unmet need for dental care (17).

Of all vulnerable populations, the homeless community may have the least access to health resources due to a lack of money, no permanent residence, and the unwillingness of providers to treat them (18, 19). The stigma of homelessness and visibly unhealthy mouths has also been identified as a barrier to seeking dental care (20). A lack of access to affordable health care is even attributed as a cause of homelessness (21). In the past decade, the U.S. Interagency Council of Homelessness credited Worcester, Massachusetts, with having "effectively ended chronic homelessness" (22). But as of January 2020, Worcester, centrally located in the state and the second most populous city in New England (23), had over 1400

homeless individuals, about 40% of whom were Hispanic and 21% Black or African American (24).

The main goals of our study were to: determine some of the unique aspects of the oral health disease burden on the homeless and housing-insecure population in central Massachusetts; identify their self-reported needs for improvement and resource availability; and compare this to their primary care utilization and barriers. This information could guide initiatives for improving the oral health of the homeless and housing insecure.

METHODS

This study was approved by the UMass Chan Medical School's Institutional Review Board (Protocol #H00023291) and granted an exemption waiver. It was also approved by the Family Health Center of Worcester Program & Policies Committee.

Study sample and recruitment: Inclusion criteria for the study were adults 18 years of age or older and able to speak or read in English or Spanish. Between June 1, 2021, and July 31, 2021, the survey was administered to individuals at the Homeless Outreach and Advocacy Program (HOAP) in Worcester, MA, a primary care clinic operated by the Family Health Center of Worcester, a federally qualified health center. Survey data were also collected at two local housing shelters and a food pantry. These sites where homeless and housing insecure persons visit for health care, temporary housing, and food were selected to reach those who both formally and informally access health care. The shelters and food pantry have a weekly on-site clinic staffed by a health care team to address health issues.

Survey development: The 26-item anonymous survey collected self-reported information about respondents' access to and use of dental care, barriers to dental care, dental hygiene status, and resources that would improve oral health. The survey also included questions about the use of primary and emergency medical care, overall health, and socio-demographic questions (e.g., gender, age, race/ethnicity, education level, preferred language, country of origin, insurance status, and current housing situation).

Data collection: An initial Fact Sheet was provided to all eligible participants which described the research project, data collection and storage, and any potential risks or inconveniences. Informed verbal consent was obtained from each respondent. The survey was voluntary, and its completion time was approximately ten minutes. Respondents could elect to complete the survey verbally, by paper, or via an anonymous survey link on a tablet, all available in both English and Spanish. At the completion of the survey, each respondent received a $15 gift card to a local retail store, a toothbrush, and toothpaste.

Statistical analysis: We used univariate analyses for the demographic characteristics of the survey respondents, as well as for independent and dependent variables. Bivariate analyses (i.e., chi-square tests and tests of proportions) were used to assess relationships between housing status (street, sheltered living, or renter/homeowner) and key independent variables (e.g., use of oral health care services, resource needs, primary care integration, and barriers to service use). A test of proportions was used to assess the difference in the homeless population comparing those without a dentist to those without a primary care provider (PCP). A p-value of $\leq .05$ was used to denote statistical significance. All analyses were conducted using SPSS statistical software (Version 27; IBM Corp) (25).

RESULTS

Study sample characteristics: We recruited 150 participants, of which 6 were excluded because they did not complete at least 50% of the survey. Fewer than five eligible individuals declined to participate in the study. Our sample predominantly was male (65%), between 40 and 64 years of age (65%), and received at least a high school education (83%) (**Table 1**). Most respondents were insured by Medicaid (90%). Over half of the study sample was White (58%), followed by Hispanic or Latino (24%), then Black or African American (16%). The U.S. was the most common country of origin (85%); the majority of the remaining countries were in Central and South America or Africa. Just over one-quarter (27%) of individuals indicated that they were living on the street, or unsheltered homeless, and two out of five (44%) individuals reported being sheltered homeless, meaning they described their housing situation as a shelter, safe haven, transitional housing, institution, hotel, motel, or living with friends or family.

Access to dental and medical care: Only one-quarter (25%) of respondents indicated they had a dentist or dental hygienist whom they saw regularly. For more than one-half (59%), it had been a year or more since they had visited a dental provider. These 83 respondents were asked about barriers that prevented them from seeing a dentist in the prior year (Figure 1). The most common barrier was a lack of knowledge of where to receive dental care (23%), followed by fear, requiring too much dental care, and insufficient time (each 19%). Sixteen percent of respondents noted "other" barriers for not receiving dental care, including: the COVID

Table 1: Characteristics of the Study Sample (n=144*), 2021

Characteristic	*N (%)*	
Gender		
Male	46	(31.9)
Female	93	(64.6)
Other	5	(3.5)
Age Group		
Under 21	64	(78)
21-39	18	(22)
40-64	94	(65.3)
65+	9	(6.3)
Race/Ethnicity		
White	83	(57.6)
Black/African American	23	(16.0)
Hispanic/Latino	34	(23.6)
Other	15	(10.5)
Multiracial	8	(5.6)
Education Level		
Less than high school	23	(16.1)
High school/GED	69	(48.3)
Some college/ associate degree	37	(25.9)
College/associate degree	8	(5.6)
Graduate school	6	(4.2)
Insurance Status		
No insurance	3	(2.1)
Medicaid	128	(90.1)
Medicare	24	(16.9)
Private insurance	10	(7.0)
Current housing status		
Unsheltered homeless	39	(27.7)
Sheltered homeless	63	(44.7)
Renter or homeowner	39	(27.7)
No insurance	3	(2.1)

**Within each variable, numbers may not total to 144 because of sporadic missing data. For some variables, the total may exceed 144 because respondents were able to select multiple options.*

pandemic, incarceration, depression/anxiety, forgetting appointments, not a high priority, having dentures, and "need new dentures, but heard that MassHealth doesn't pay for another set." One in five respondents (23%) reported having gone to the emergency department (ED) in the past year for a dental issue.

By comparison, the percentage of participants having a PCP was more than three times that of having a dentist (79% vs. 25%, respectively). The 30 participants who reported not having a PCP were asked which barriers they faced in seeing a PCP in the last year (**Figure 1**). The most frequently cited barriers to receiving medical care were time (30%) and transportation (20%). For 27% of respondents who listed "other" barriers for not seeing a PCP in the last year, they noted barriers such as: the COVID-19 pandemic, incarceration, access to a phone, can't get old records, depression/anxiety, keep changing PCP, laziness, losing appointment card, moving out of area where PCP was located, and not caring. Respondents living on the street were significantly less likely to have a PCP than respondents who either were sheltered homeless or were renters/homeowners (X^2=14.72, p<0.001). For the street homeless, the proportion of those who did not have a dentist (79%) vs. those who did not have a PCP (39%) was significantly higher (z=3.60; p<.001). Less than half (43%) of participants without a PCP had visited the ED for non-dental medical needs in the prior year. These respondents were significantly more likely to have sought care in the ED in the prior year (X^2=4.28, p=0.039).

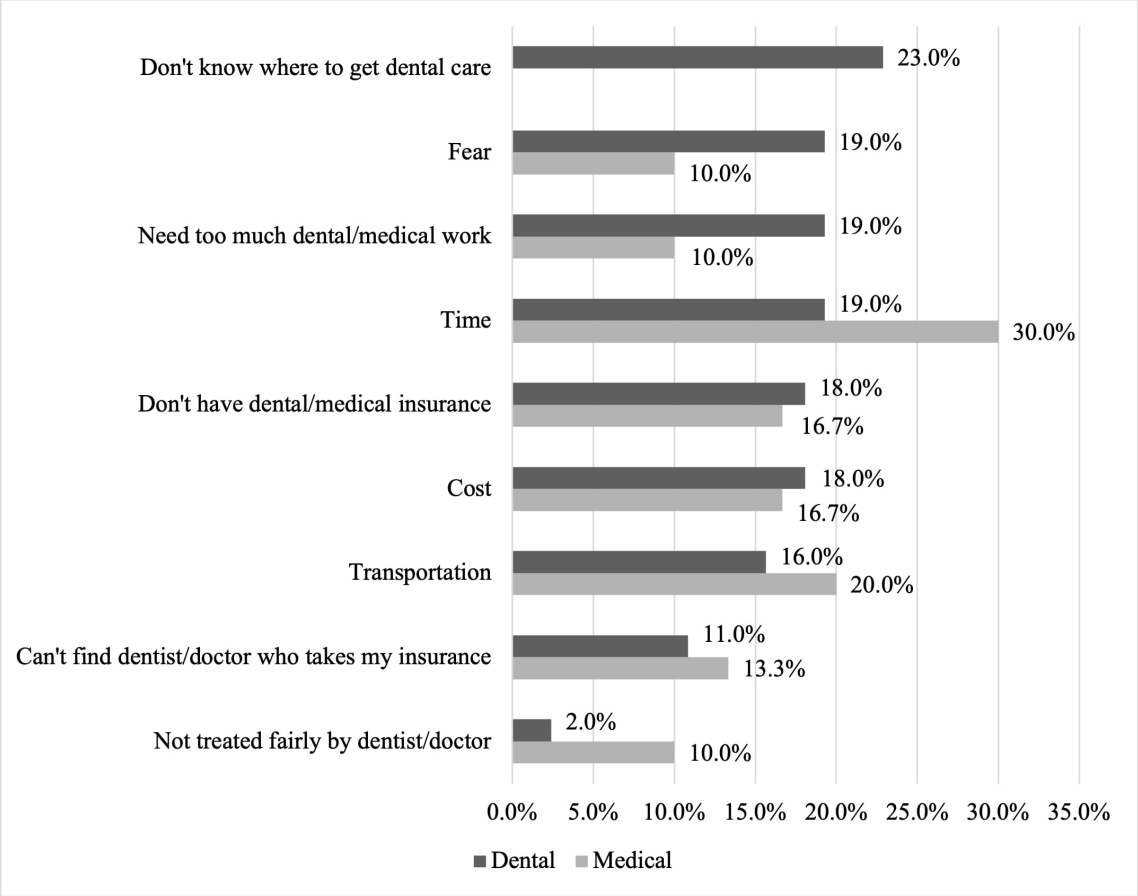

Figure 1: ***Reported Barriers to Receiving Dental (n=83) and Medical (n=30) Care, 2021***

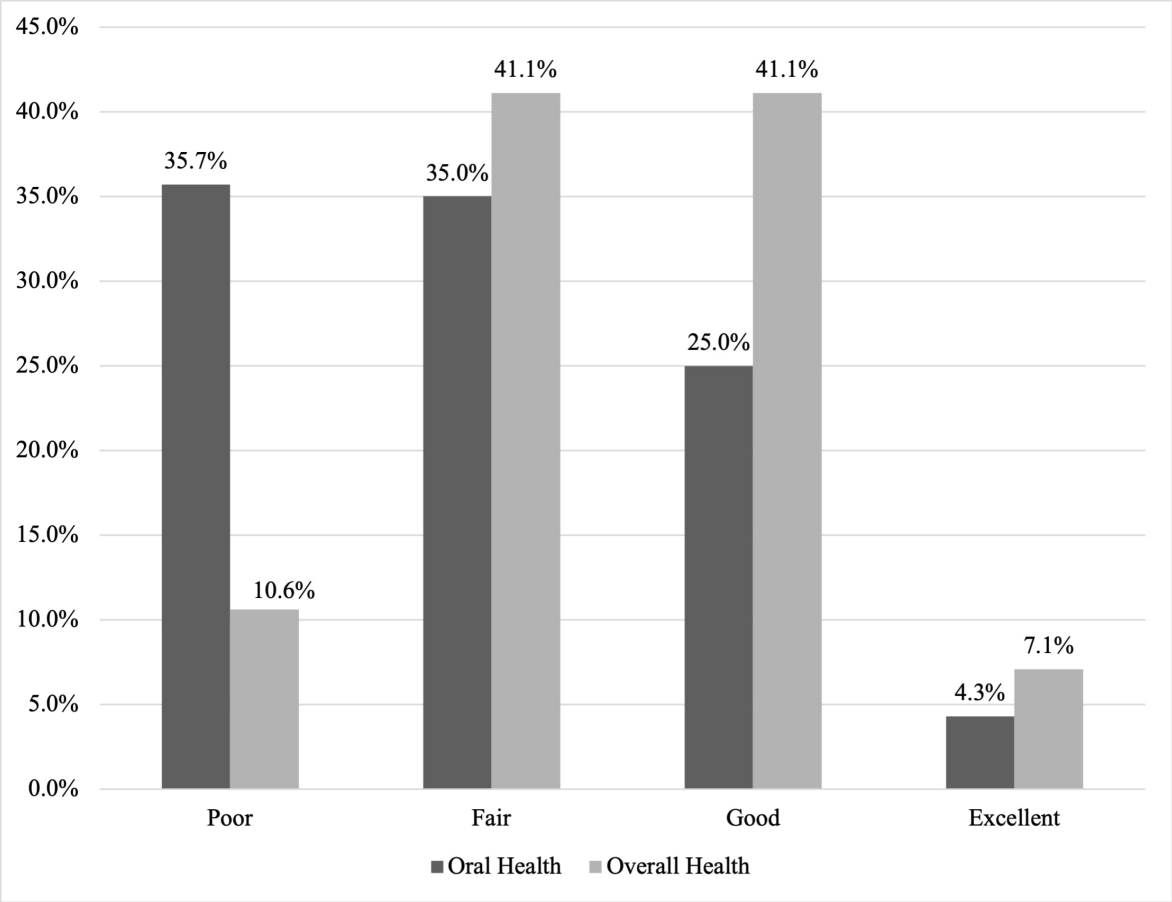

Figure 2: ***Reported Oral (n=140) and Overall (n=141) Health Status, 2021***

Self-reported oral and overall health status: Nearly three-quarters (71%) of respondents reported that the health of their teeth, gums, and mouth was 'poor' or 'fair', while only 29% endorsed 'good' or 'excellent' (**Figure 2**). More than half (57%) of respondents reported having lost teeth because they were unable to receive prompt dental care. For current overall health, 52% selected 'poor' or 'fair', and 48% said they were in 'good' or 'excellent' health. For individuals who noted that their dental health was poor, they were also more likely to rate their overall health as poor ($X2=60.04$; $p<0.001$).

Oral health needs: To improve their oral health, respondents most commonly expressed needs for: a dentist who would accept their insurance (33%), a toothbrush (30%), toothpaste (29%), transportation to the dentist (28%), and a protective case for dental supplies (28%) (**Figure 3**). One in five respondents (22%) also endorsed "other" resources that would help them better take care of their teeth, including: dentures, oral surgery, dental cleaning, denture adhesive, mouthwash, and a water pick.

Willingness to receive oral health support from other health care workers: When asked whether they would be willing to receive dental care advice from a nurse, 44% responded affirmatively, and 66% responded positively for willingness to receive dental advice from a case manager or social worker. Of interest, over half (54%) of respondents were amenable to getting dental hygiene advice from peer support teaching. Our study population also reported being more likely to

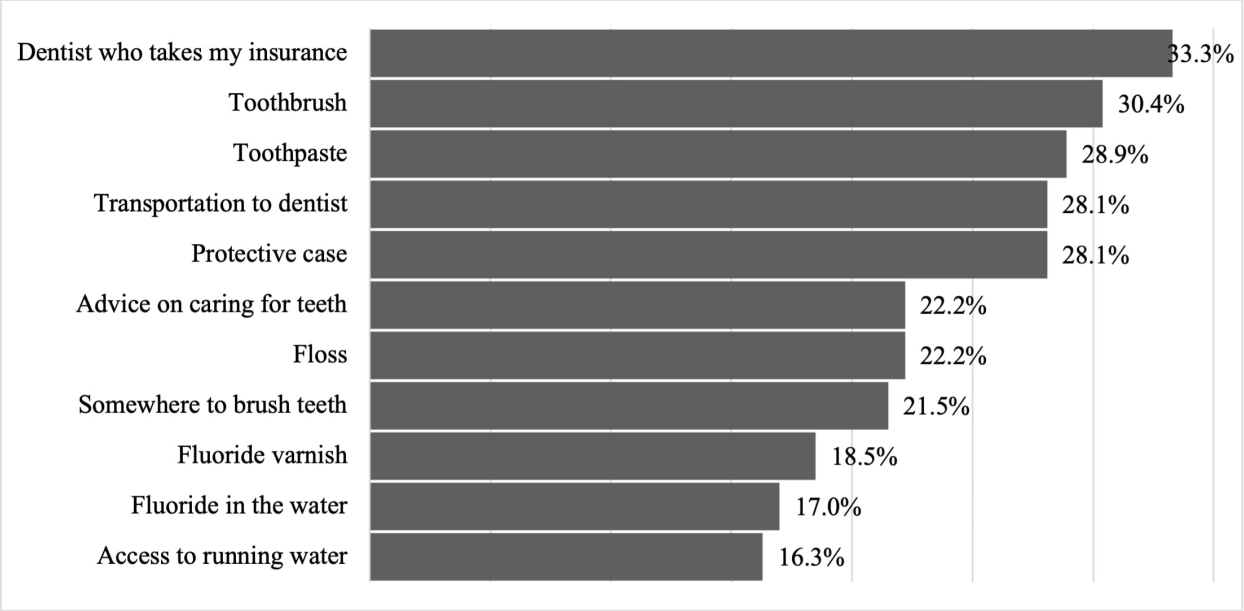

Figure 3: ***Reported Resources Needed to Improve Dental Health (n=135), 2021***

accept a referral to a dentist (62%) and receive an oral exam (59%) from a nurse in their doctor's office than the receipt of a toothbrush and toothpaste (39%) or fluoride varnish (32%) from a nurse.

DISCUSSION

There are a number of important findings from this study that have the potential to impact local and possibly national efforts to address the oral health issues of the homeless and housing insecure. There was no predominant barrier to receiving dental care; in fact, the barriers mirrored those that affect medical care, yet more people have a primary care provider and access to primary care. The focus, with a specific eye toward prevention, may be better placed on the resources that respondents identified as important to improving their dental health.

Currently, only a quarter of dentists in Massachusetts bill the state Medicaid program greater than $10,000, so it is not surprising that it is challenging for homeless populations to find a dentist that accepts their insurance, since 90% have Medicaid (26). A local survey of dental practices in central Massachusetts found that, of those reporting to accept MassHealth (Massachusetts Medicaid), 45% were not accepting new patients, and half of those accepting new patients spoke only English (27). This is not a barrier that can be easily addressed. However, several of the most prevalent barriers reported among our study sample can be attributed to a lack of dental supplies, which could more easily be addressed with small grants or working with local dentists to donate supplies.

A key component of the identified needs to improve dental care and prevent negative outcomes pertains to assistance and education. There are 18 dental offices in Worcester that accept Medicaid and are accepting new patients. The missing link here is assisting the homeless to find these practices. Anecdotally, the majority of the homeless in Worcester do have case management. Our survey indicates that respondents are very willing to receive dental information from case workers and social workers. Efforts to train these health extenders about dental access may be an important factor for accessing professional dental services. The same health care providers could be trained to teach about oral

hygiene and hand out self dental care supplies. Interestingly, one of the key barriers noted by respondents was the need for transportation, despite our state's Medicaid benefits paying for transportation to dental visits. So, again, case managers could serve as change agents helping to educate this population about transportation services.

The other solution that our data suggests is that primary care can be a key aspect of dental care improvement. More respondents identified a primary care provider whom they had seen within the last year. Two out of five respondents were willing to receive some interventions from nursing staff. It should be noted that this may not affect the street homeless as strongly, as they were less likely to have a regular primary care provider. With ED visits being relatively prevalent among the homeless for dental issues, efforts designed to improve dental follow-up directly from the ED could be useful. Currently, our state Medicaid program is working on a portal that EDs could use to notify Medicaid of the acute need and have their team help coordinate a dental appointment within 24 hours.

Our study has several limitations. First, the survey depended on self-reported responses, which poses a potential for information bias (including recall and social desirability). Second, our study was conducted in one locale (i.e., central Massachusetts) and may not be generalizable to all homeless and housing insecure communities; however, the study collected data from four different sites, and the demographics of our study population are similar to the demographics of our city's homeless population. Third, we were not able to assess for any potential non-response bias as we were unable to approach all individuals coming to each of the four sites where data was collected; however, of those approached, fewer than five individuals declined to participate. Lastly, while the study was carried out for two months across four different sites, the potential existed for some overlap of the populations coming to more than one site. Since our anonymous survey did not collect any identifiable information among respondents, there was a very small possibility of the same person completing the survey more than once, especially given that most respondents were wearing masks due to the pandemic. However, the survey was conducted by only two members of the research team.

In conclusion, this study highlights several factors that can contribute to improving the oral health of individuals facing homelessness and housing insecurity: improving access to dental supplies, training case managers and social workers to assist and educate about accessing dental providers and improving oral hygiene, increasing the number of local dental providers who accept Medicaid, and integrating oral health care into primary care.

DISCLOSURES

Funding: Not applicable.
Conflicts of interest: None.
Availability of data and material: Upon request.
Code availability: Not applicable.
Authors' contributions: Authors listed in the manuscript have contributed per submission guidelines and standards for authorship.
Ethics approval: This study was approved by the UMass Chan Medical School's Institutional Review Board (Protocol #H00023291) and granted an exemption waiver. It was also approved by the Family Health Center of Worcester Program & Policies Committee.
Consent to participate: Informed verbal consent was obtained from each respondent.

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