



HHS Public Access

Author manuscript

J Health Care Poor Underserved. Author manuscript; available in PMC 2016 July 01.

Published in final edited form as:

J Health Care Poor Underserved. 2016 ; 27(2): 860–868. doi:10.1353/hpu.2016.0081.

Emergency Department Use for Dental Problems among Homeless Individuals: A Population-Based Cohort Study

Rafael Figueiredo, BDS, MSc, FRCD(C),

Faculty of Dentistry, University of Toronto, Toronto, ON, Canada

Laura Dempster, DH, MSc, PhD,

Faculty of Dentistry, University of Toronto, Toronto, ON, Canada

Carlos Quiñonez, DMS, MSc, PhD, FRCD(C), and

Faculty of Dentistry, University of Toronto, Toronto, ON, Canada

Stephen W. Hwang, MD, PhD

Centre for Research on Inner City Health, St. Michael's Hospital, Toronto, ON, Canada

Abstract

Objectives—To evaluate emergency department (ED) visits for dental problems among Toronto's homeless population (Ontario, Canada).

Methods—A random sample of 1,189 homeless was recruited from shelters and meal programs. Emergency department visits for non-traumatic dental problems (ICD-10-CA codes K00-K14) were identified using participants' health insurance number, during 2005–2009. Age- and sex-matched controls were selected from low-income neighborhoods.

Results—Homeless and matched controls had 182 and 10 ED visits for dental problems, respectively. Homeless people were more significantly more likely (OR=2.27, p=.007) to make ED visit for dental problems compared with controls. Over 80% of the ED visits by homeless people were for odontogenic infections, and 46% of homeless people had more than one such visit.

Conclusion—The high rate of ED visits for dental problems by people who are homeless suggests that access to dental care is inadequate. The large number of repeat visits indicates that ED settings are ineffective for treatment of dental problems.

Keywords

Dental problems; emergency department; homeless; ICD-10-CA

Introduction

In North America, access to health care has been recognized as one of the fundamental challenges faced by homeless populations¹. Homeless individuals often lack a regular source of health care and have inadequately treated physical and mental health conditions, which in

Address correspondence to: Rafael Figueiredo, Faculty of Dentistry, University of Toronto, 124 Edward St., Toronto, ON M5G 1G6, Canada; or ; Email: rafael.figueiredo@albertahealthservices.ca

turn can lead to potentially avoidable use of hospital emergency departments (EDs)². Some have claimed that ED visits for health problems that could have been treated in an ambulatory setting contribute substantially to high health care costs and represent an inefficient use of health care resources²⁻⁵. However, for marginalized and socioeconomically disadvantaged individuals, EDs often represent the most accessible source of healthcare^{1,6,7}.

ED visits for non-traumatic dental problems are of particular interest, because almost all non-traumatic dental problems are more appropriately addressed in a dental office rather than the ED⁸. In 2009, Quiñonez et al. observed that dental problems not associated with trauma were a common reason for ED visits in Ontario and were more frequent than ED visits for diabetes and hypertensive diseases⁹. These potentially avoidable ED visits for dental problems occurred more frequently among adults and low-income groups, specifically those without private or public dental insurance^{8,9}. While EDs can provide temporary measures such as pain relief or treatment of infection, they do not provide definitive dental care, so fail to resolve underlying dental problems.

Canada has a universal system of publicly funded insurance for physician and hospital care but not dental care, the oral health needs of socio-economically disadvantaged populations often go unmet^{9,11}. While Canadian provinces have limited programs for dental care, they mainly address the needs of children in low-income families with acute dental problems. Thus, homeless people face barriers to accessing dental care that reflect the general scarcity of dental care resources for low-income individuals across the country^{9,12}.

In Toronto, Canada's most populous municipality, the adult homeless population has a higher prevalence rate of acute and chronic oral health problems compared to the general population^{10,11}. In 2013, Figueiredo et al. reported that the oral health status of homeless adults in Toronto was precarious: 40% required urgent dental treatment, 88% restorative treatment, and 71% periodontal treatment¹⁰. Due to limited access to dental care and the high prevalence of dental diseases in this population^{8,9,13}, homeless individuals would be expected to have a high rate of ED use for dental problems. Again, these visits may represent potentially avoidable ED visits.

In light of the above, the main objective of this study is to determine the frequency of ED visits for dental problems not associated with trauma among a population-based sample of homeless adults, compared to a control group of low-income non-homeless adults. A secondary objective is to identify characteristics of homeless adults that are associated with an increased likelihood of ED visits for dental problems. These findings will provide insights into the impact of dental diseases on a marginalized population and on the acute care system.

Materials and Methods

The cohort of homeless individuals examined in this study has been described previously^{14,15}. In brief, a representative sample of 1,189 homeless individuals was recruited at shelters and meal programs in Toronto, Ontario, Canada, from December 2004 to December 2005^{14,15}. The study defined a homeless person as an individual 18 years old who

self-reported being homeless for a minimum of seven days preceding the survey. Study participants were required to have a provincial health insurance number, a unique 10-digit number that is assigned to every insured individual in the province of Ontario and does not change over an individual's lifetime. Health insurance numbers were used to link to administrative health care databases at the Institute for Clinical and Evaluative Sciences (ICES). A total of 1,165 homeless participants (98%) were successfully linked. All homeless participants gave written informed consent to perform this linkage. Low-income controls were selected from the Registered Persons Database (RPDB), a registry of all insured individuals in Ontario that includes the vast majority of residents of the province. Each homeless participant was assigned one age- and sex-matched control who lived in Toronto during the study recruitment period and was residing in a neighborhood in the lowest income quintile based on the 2006 Canadian Census. This study was approved by the Research Ethics Board of St. Michael's Hospital in Toronto.

Data on ED visits by homeless participants and matched controls were obtained from the National Ambulatory Care Reporting System (NACRS) database, which captures information on almost all ED visits in the province of Ontario. Each ED visit is assigned a main diagnosis using the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10-CA). Dental problems not related to trauma were identified using ICD-10-CA codes K00 through K14 (diseases of the oral cavity, salivary glands and jaws).

Data Analysis

Descriptive statistics for all potential predictor variables among homeless participants, which described their demographic characteristics, were performed. All variables were dichotomized and chi-square statistics were run to calculate odds ratios (ORs \pm 95% confidence intervals (CI)). As the outcome variable was categorical in nature, logistic regression was performed. To adjust for other confounder variables, multivariable modeling was performed to determine which specific characteristics of homeless individuals were associated with increased likelihood of using EDs for dental problems. Stepwise regression using backward elimination (using retention of p-value $<$ 0.01) was used to include predictor variables in the final model. Analyses were performed using SAS Version 9.2 (SAS Inc., Cary, NC).

Results

During the follow-up period (December 2004 to December 2008), 1,165 homeless participants had 182 ED visits for dental problems not associated with trauma, representing 2.1% of all their ED visits. The 182 ED visits for dental problems were made by 94 homeless individuals, with 46% visiting the ED at least two times for their dental problems during the study period. The data available did not provide enough information to determine if any of the repeated ED visits were for the same dental problem. Table 1 shows the distribution of the ED visits. In contrast, during the same time period, the controls had 10 ED visits for dental problems, which represented 0.9% of their total ED visits.

Homeless individuals had 8.0 times as many total ED visits as controls, and 18.2 times as many ED visits for dental problems as controls. Homeless individuals were significantly more likely to have at least one ED visit for dental problems than controls (OR = 2.27; 95% CI, 1.16 – 4.57).

Table 2 shows the frequency of ED visits for dental problems by the homeless sample based on ICD-10-CA codes. Three dental problems – Toothache NOS (K0887), Periapical abscess without sinus (K047) and Dental caries (K029) – accounted for 72% of the total number of ED visits for dental problems. The remaining 28% of the dental problems were related to conditions that occurred much less frequently, including those of non-odontogenic etiology such as disorders of the temporomandibular joint and lesions of the oral mucosa.

Socio-economic and demographic characteristics of homeless individuals who visited the ED for dental problems are presented in Table 3. Among the characteristics of homeless individuals analyzed, older males born in Canada who were homeless for more than two years, had some chronic health condition and were smokers visited EDs for dental problems more frequently than their counterparts.

Table 4 describes some of the demographic characteristics of homeless individuals who had at least one ED visit for dental problems. The unadjusted model shows six characteristics significantly associated with ED visits for dental problems. However, in the adjusted model, after controlling for the influence of all the variables simultaneously, smoking was the only characteristic significantly associated with an increased likelihood of visiting an ED for dental problems.

Discussion

This study examined the utilization of EDs for dental problems not associated with trauma by homeless individuals. Our findings demonstrate that utilization of EDs for dental problems is significantly higher among homeless individuals compared to a low-income control group. The number of ED visits for dental problems showed little variation during the four-year time period. The dental problems observed suggest significant impact on individual well-being and quality of life. Over 80% of the ED visits were caused by odontogenic infections associated with pain. Furthermore, 46% of homeless individuals who visited the ED for dental problems had more than one such visit during the observation period. These repeat ED visits suggest that dental problems had a significant impact on these homeless individuals, and that they had difficulty accessing appropriate dental care in the community. In Toronto, the adult population which is the most frequent users of EDs for dental problems has very limited access to free dental care services, even for urgent care¹⁰. Nevertheless, the extent to which economic and other personal barriers contribute to individuals choosing the ED as a source of dental care in Toronto is still a subject of investigation and cannot be determined by this analysis.

The health care system as it relates to dentistry and medicine is distinctive as the fields are completely independent of each other. For dentistry, the professional training and work settings are exclusive to oral health care. However, these differences are not always

recognized by the general population. Even though most hospitals are not structured for dental treatment, dental problems are still a part of the health services sought in hospitals^{9,16}. Definitive treatment for most non-traumatic dental emergencies involves procedures that are only performed by dentists in a properly equipped dental care setting. ED settings are meant to provide health care for acute illness and injuries which may be life threatening and need immediate attention. Dental problems at this degree of severity are not very common^{9,17}. Nonetheless, although the level of morbidity caused by odontogenic infections is generally non-life threatening, untreated dental conditions do not resolve spontaneously and grow progressively worse without appropriate care. The inappropriateness of ED settings to treat dental problems limits physician procedures to only pharmacotherapy in the majority of cases, which in turn leads of treatment postponement, which then ends up being more extensive and costly. This incoherent behavior pattern of palliative dental care in EDs also impacts the important concept of preventive care and dental rehabilitation, factors that greatly influence the oral health status of individuals in both the short- and long-term¹⁸.

Limitations

Our analysis included only ED visits that had a dental problem as a main diagnosis, so the number of dental problems seen in EDs may be underestimated. The sampling strategy excluded homeless individuals who do not use either shelters or meal programs. However, prior research suggests that the unsheltered homeless population in Toronto is very small¹⁹. Another limitation is that although all study participants were homeless at the time of enrollment, their housing status is expected to have fluctuated over the course of the 4-year observation period. Furthermore, health care utilization was assessed using administrative data that are provincial in scope; as such, ED encounters that occurred outside the province of Ontario would have been missed. Homeless participants were required to have a valid provincial health number in order to be eligible for this study, which may have also biased our sample towards individuals who have better health care access.

Conclusion

The findings of this study provide evidence that the utilization of EDs for dental problems is a common occurrence for homeless individuals^{8,9,13,17}. ED visits for dental problems represent an inefficient and potentially avoidable use of healthcare system resources¹⁶⁻¹⁸. The ED should not be used as a routine source of dental care, just as it should not serve as a substitute for primary medical care^{17,18,20}. Planning and implementing a dental program for the homeless population will, however, require significant political will⁶. The development of new public health policy initiatives that provide more comprehensive dental care services to the population is necessary. The proposition does not require universal dental care benefits; however, the provision of public dental care services to attend to in-need populations for urgent dental problems should be part of an immediate public health action. Urgent intervention is required for the improvement of well-being and quality of life of disadvantage minorities concerning their oral health, as well as to more wisely use public health resources. The findings of this study reinforce previous evidence representing strong arguments that advocate for homeless populations concerning the lack of dental public

health services in Canada. This information has the potential to guide health authorities and policy makers to structure a more effective dental care delivery system for vulnerable populations.

References

1. Hwang SW. Is homelessness hazardous to your health? Obstacles to the demonstration of a causal relationship. *Can J Public Health*. Nov-Dec;2002 93(6):407–410. [PubMed: 12448860]
2. Milbrett P, Halm M. Characteristics and predictors of frequent utilization of emergency services. *J Emerg Nurs*. Jun; 2009 35(3):191–198. quiz 273. [PubMed: 19446122]
3. Oates G, Tadros A, SM D. A comparison of national emergency departments use by homeless versus non-homeless people in the United States. *Journal of Health Care for the Poor and Underserved*. 2009; 20(3):840–845. [PubMed: 19648710]
4. Cohen LA, Manski RJ, Magder LS, Mullins CD. Dental visits to hospital emergency departments by adults receiving Medicaid: assessing their use. *J Am Dent Assoc*. Jun; 2002 133(6):715–724. quiz 768. [PubMed: 12083647]
5. Fuda KK, Immekus R. Frequent users of Massachusetts emergency departments: a statewide analysis. *Annals of Emergency Medicine*. Jul; 2006 48(1):9–16. [PubMed: 16781915]
6. Falvo, N. Homelessness, program responses, and an assessment of Toronto's streets to homes program. Carleton University; 2009.
7. Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. *The Milbank Quarterly*. 2005; 83(4)
8. Quinonez C. Self-reported emergency room visits for dental problems. *International J of Dental Hygiene*. Feb; 2011 9(1):17–20.
9. Quinonez C, Gibson D, Jokovic A, Locker D. Emergency department visits for dental care of nontraumatic origin. *Community Dentistry and Oral Epidemiology*. Aug; 2009 37(4):366–371. [PubMed: 19486348]
10. Figueiredo RL, Hwang SW, Quinonez C. Dental health of homeless adults in Toronto, Canada. *Journal of public health dentistry*. Winter;2013 73(1):74–78. [PubMed: 22881462]
11. Ministry of Health, Health Canada. The findings of the Oral Health Component of the Canadian Health Measures Survey 2007–2009. 2010
12. Ruger JP, Richter CJ, Spitznagel EL, Lewis LM. Analysis of costs, length of stay, and utilization of emergency department services by frequent users: implications for health policy. *Academic Emergency Medicine*. 2004; 11(12):1311–1317. [PubMed: 15576522]
13. Quinonez C, Ieraci L, Guttman A. Potentially preventable hospital use for dental conditions: implications for expanding dental coverage for low income populations. *J Health Care Poor Underserved*. Aug; 2011 22(3):1048–1058. [PubMed: 21841295]
14. Hwang SW, Ueng JJM, Chiu S, et al. Universal Health Insurance and Health Care Access for Homeless Persons. *Am J Public Health*. 2010; 100(8):1454–1461. [PubMed: 20558789]
15. Hwang SW, Chambers C, Chiu S, et al. A Comprehensive Assessment of Health Care Utilization Among Homeless Adults Under a System of Universal Health Insurance. *Am J Public Health*. 2013; 103(S2):S294–S301. [PubMed: 24148051]
16. Lewis C, Lynch H, Johnston B. Dental complaints in emergency departments: a national perspective. *Annals of Emergency Medicine*. Jul; 2003 42(1):93–99. [PubMed: 12827128]
17. Davis EE, Deinard AS, Maiga EWH. Doctor, my tooth hurts: the costs of incomplete dental care in the emergency room. *J Public Health Dent*. 2010; 70:205–210. [PubMed: 20337900]
18. Shortridge EF, Moore JR. Use of Emergency Department for conditions related to poor oral healthcare: implications for rural and low-resource urban areas for three states. *Journal of Public Health Management Practice*. 2009; 15(3):238–254. [PubMed: 19363404]
19. City of Toronto. Street Needs Assessment Results. Toronto: Shelter, Support, and Housing Administration; 2009. City of Toronto
20. Krug SE. Access and use of emergency services: inappropriate use versus unmet need. *Clinical Pediatric Emergency Medicine*. 1999; 1:35–44.

Table 1

Frequency of ED visits by homeless individuals and controls per year

| | 2004* | 2005 | 2006 | 2007 | 2008 | Total (%) |
|--|-------|------|------|------|------|--------------|
| Homeless Individuals | | | | | | |
| Number of ED visits for dental problems | 3 | 34 | 47 | 55 | 43 | 182 (2.1) |
| Number of ED visits for all other conditions | 199 | 2095 | 2227 | 2075 | 1898 | 8494 (97.9) |
| Total number of ED visits | 202 | 2129 | 2274 | 2130 | 1941 | 8676 (100.0) |
| Controls | | | | | | |
| Number of ED visits for dental problems | 0 | 2 | 2 | 3 | 3 | 10 (0.9) |
| Number of ED visits for all other conditions | 18 | 197 | 282 | 294 | 269 | 1060 (99.1) |
| Total number of ED visits | 18 | 199 | 284 | 297 | 272 | 1070 (100.0) |

* Year 2004 accounted for only one month

Table 2

Frequency of ED visits by discharge diagnosis

| ICD-10-CA code | Description of the code | Frequency (%) |
|----------------|--|---------------|
| K0887 | Toothache NOS | 70 (38.46) |
| K047 | Periapical abscess without sinus | 40 (21.98) |
| K029 | Dental caries, unspecified | 21 (11.54) |
| K040 | Pulpitis | 5 (2.75) |
| K108 | Other specified diseases of jaws | 4 (2.20) |
| K122 | Cellulitis and abscess of mouth | 4 (2.20) |
| K130 | Disease of lips | 4 (2.20) |
| K137 | Other and unspecified lesions of oral mucosa | 4 (2.20) |
| K049 | Other and unspecified diseases of pulp and periapical tissues | 3 (1.65) |
| K051 | Chronic gingivitis | 3 (1.65) |
| K052 | Acute periodontitis | 3 (1.65) |
| K089 | Disorder of teeth and supporting structures, unspecified | 3 (1.65) |
| K069 | Disorder of gingiva and edentulous alveolar ridge, unspecified | 2 (1.10) |
| K120 | Recurrent oral aphthae | 2 (1.10) |
| K121 | Other forms of stomatitis | 2 (1.10) |
| various | Other dental problems with only one visit | 12 (6.6) |

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 3

Demographic Characteristics of homeless individuals who had at least one ED visit for dental problems not associated with trauma

| n = 1165 | | Visited ED Freq. (%) | Not Visited ED Freq. (%) | p-value |
|---|-----------------------------|----------------------|--------------------------|---------|
| Demographic group: | Single Males | 58 (61.7) | 529 (49.4) | Ref. |
| | Single females | 24 (25.5) | 272 (25.4) | |
| | Adults with Families | 12 (12.8) | 270 (25.2) | 0.017 |
| Age: | 24 years or less | 27 (28.7) | 254 (28.7) | 0.336 |
| | 25 years or more | 67 (71.3) | 871 (76.3) | |
| Immigration status: | Canadian born | 79 (84.0) | 717 (66.9) | 0.001 |
| | Immigrant | 15 (15.9) | 354 (33.0) | |
| Level of education: | High school or less | 49 (52.1) | 538 (50.4) | 0.827 |
| | High school diploma or more | 45 (47.9) | 530 (49.6) | |
| Lifetime duration of homelessness: | 2 years or less | 32 (34.0) | 552 (51.6) | 0.002 |
| | More than 2 years | 62 (65.9) | 519 (48.5) | |
| Problematic alcohol use: | No | 59 (62.8) | 767 (71.6) | 0.090 |
| | Yes | 35 (37.2) | 304 (28.3) | |
| Problematic drug use: | No | 42 (44.7) | 665 (62.0) | 0.001 |
| | Yes | 52 (55.3) | 406 (37.9) | |
| Smoke: | No | 10 (10.6) | 328 (30.6) | <0.001 |
| | Yes | 84 (89.4) | 742 (69.3) | |
| Chronic health condition: | No | 28 (29.8) | 442 (41.3) | 0.038 |
| | Yes | 66 (70.2) | 628 (58.7) | |

Table 4

The odds of visiting ED for dental problems not associated with trauma among homeless individuals

| N = 1165 | Unadjusted | | Adjusted | |
|---|------------------|---------|------------------|---------|
| | OR (95% CI) | P-value | OR (95% CI) | P-value |
| Demographic group: | | | | |
| Single Males | Ref. | | Ref. | |
| Single females | 0.81 (0.49–1.32) | 0.382 | 0.91 (0.55–1.51) | |
| Adults with Families | 0.41 (0.21–0.77) | 0.013 | 0.63 (0.32–1.25) | 0.412 |
| Age | | | | |
| 24 years or less | Ref. | | Ref. | |
| 25 years or more | 0.99 (0.98–1.02) | 0.779 | 0.99 (0.98–1.01) | 0.414 |
| Immigration status: | | | | |
| Canadian born | Ref. | | Ref. | |
| Immigrant | 0.39 (0.22–0.68) | 0.001 | 0.57 (0.32–1.03) | 0.063 |
| Lifetime duration of homelessness: | | | | |
| 2 years or less | Ref. | | Ref. | |
| More than 2 years | 2.06 (1.32–3.21) | 0.001 | 1.51 (0.94–2.42) | 0.087 |
| Smoke: | | | | |
| No | Ref. | | Ref. | |
| Yes | 3.71 (1.90–7.25) | < 0.001 | 2.61 (1.30–5.24) | 0.007 |
| Problematic drug use: | | | | |
| No | Ref. | | | |
| Yes | 2.03 (1.33–3.10) | 0.001 | – | – |
| Chronic health condition: | | | | |
| No | Ref. | | | |
| Yes | 1.66 (1.05–2.62) | 0.031 | – | – |