PUBLIC HEALTH 129 (2015) 252–257

Available online at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe

Original Research

Neighborhood socio-economic context and emergency department visits for dental care in a U.S. Midwestern metropolis

L. Hong [a], Y. Liu [b,*], T.L. Hottel [c], G.L. Hoff [d], J. Cai [e]

[a] Department of Pediatric Dentistry and Community Oral Health, College of Dentistry, University of Tennessee Health Science Center, USA
[b] Division of Pharmacy Practice and Administration, University of Missouri-Kansas City School of Pharmacy, USA
[c] Department of Prosthodontics, College of Dentistry, University of Tennessee Health Science Center, USA
[d] Department of Epidemiology, College for Public Health and Social Justice, St. Louis University, USA
[e] Office of Epidemiology and Community Health, Kansas City Health Department, MO, USA

ARTICLE INFO

Article history:
Received 25 April 2013
Received in revised form
19 October 2014
Accepted 28 November 2014
Available online 19 February 2015

Keywords:
Emergency department
Dental care
Neighborhood characteristics
Health inequalities

ABSTRACT

Objective: This study was to examine the association between emergency department (ED) visits for dental complaints and neighborhood socio-economic contexts of patients in a U.S. Midwestern metropolis.
Study design: A retrospective study.
Methods: Deidentified data of ED visits for the period 2001–2010 from all facilities serving Kansas City, Missouri and 2007–2011 American Community Survey 5-Year Estimates data were used to determine odds of visit by neighborhood socio-economic characteristics at the ZIP code level. ED visits with diagnoses of International Classification of Disease 9th Revision codes related to toothache or tooth injury were included. ZIP code characteristics included percent of non-white population, median family income, percent of population 25 years and older with at least a high school degree, and percent of population with a language other than English spoken at home. Each ZIP code characteristic was divided into quartiles. Chi-square tests and two-level hierarchical linear modeling (HLM) were conducted. In the HLM, the outcome variable was whether to have an ED visit for dental complaints (yes/no), the first-level variables were characteristics of individual ED visits, and the second-level variables were ZIP code characteristics.
Results: The study population made 1,786,939 ED visits, of which 35,136 (1.9%) were for dental complaints. Among the patients making ED visits for dental complaints, 54.8% were female, 51.9% were younger adults aged 19–35 years, 48.7% were non-Hispanic black, and 35.5% used self-pay as the source of payment. After controlling the first-level variables, the HLM showed that the risk of ED visits for dental complaints significantly increased for individuals residing in ZIP Code Tabulation Areas with lower median family income, or a higher proportion of the population with a language rather than English spoken at home.

* *Corresponding author*. 4248 Health Sciences Building, University of Missouri-Kansas City School of Pharmacy, 2464 Charlotte Street, Kansas City, MO, 64108, USA. Tel.: +1 8162356820; fax: +1 8162356008.
E-mail address: liuyif@umkc.edu (Y. Liu).
http://dx.doi.org/10.1016/j.puhe.2014.11.014

Conclusions: Among socio-economic characteristics examined, median family income and percent of population with a language other than English spoken at home are important indicators of ED visits for dental complaints.

Introduction

Increasing use of the hospital emergency department (ED), often accompanied by overcrowding, has become a nationwide challenge to timely and efficient delivery of emergency care in the U.S.[1–4] A major contributor to the growth is the increased use by the individuals classified as non-urgent or semiurgent.[1,4,5] While it is debatable about what constitutes a non-urgent visit to the ED and whether such visit is inappropriate,[4–6] EDs are neither the most appropriate setting for dental care nor are they generally equipped to provide definitive treatment for dental conditions.[7–9] ED visits for dental complaints have continued to increase in recent decades with a greater proportion of these visits being for non-traumatic dental problems and largely avoidable by preventive dental visits and early intervention.[10–13] In California, the ED visits for preventable dental conditions grew by 12% between 2005 and 2007 – a rate faster than the population growth in the state.[14] It has been reported that, during years 2001–2006, Kansas City, Missouri, residents made 19,316 visits to EDs for dental complaints, accounting for 1.7% of all ED visits; there was also a significant increase in dental complaint visits over the six-year period as a proportion of total ED visits.[15] Reasons for increased presentation of dental complaints to the ED include lack of insurance, inability to afford the cost or out-of-pocket expense for dental care, not having a usual source of dental care, difficulty in obtaining a dental appointment, unavailability of dental providers during weekend and afterhours, and lack of dental providers willing to accept Medicaid patients.[9,11,14,15] Compared to ED visits for other reasons, far fewer visits with dental complaints result in a procedure performed.[13,15,16]

Most studies that have examined ED visits for dental complaints are based on the experiences at specific institutions or specific sub-groups of the population such as Medicaid beneficiaries, children, and low-income adults.[7–13,17,18] Only one study has examined U.S. national data using the 1997 to 2000 National Hospital Ambulatory Medical Care Survey.[15] While these studies focused mainly on the demographic and socio-economic characteristics, little is known about the places these patients come from. There has been a growing recognition of the association between the characteristics of the places where people live and their health and health behaviors.[19,20] These contextual characteristics have also been shown to affect ED utilization in general.[21–23] While the published literature provides important information about the characteristics of individuals who are likely to visit the ED for dental complaints, knowledge of the association with neighborhood characteristics may allow for more effective policy formulation and interventions. In this study, the association between the socio-economic characteristics of areas defined by ZIP codes within the U.S. and the ED use for dental complaints at all hospitals in the city over a ten-year period were investigated.

Methods

This study was based on the ED visits made by the residents of Kansas City, Missouri (KCMO). KCMO, with a population of 480,129 and covering 318 square miles, is the largest city in Missouri and the anchor of the Kansas City bi-state metropolitan area. The final population numerator used, however, was 559,045 as two of the ZIP Code Tabulation Areas (ZCTAs) in this study extended beyond the corporate limits of KCMO.

Study design

Annually, the Missouri Department of Health and Senior Services provides the KCMO Health Department a deidentified electronic file of all ED visits within the city limits; these records are from the Missouri Patient Abstract System. Data included in this retrospective analysis were extracted by the KCMO Health Department for the period 2001–2010. Data variables were at the ED visit level, which included the patients' demographic characteristics, ZIP codes and counties of residence (KCMO is located in portions of four Missouri counties), principal and other diagnoses, principal and other procedures, total billed charges, and expected source of payment.

Setting and data selection

KCMO residents were selected by the ZIP codes of residence reported in the patient abstract system. All 51 5-digit ZCTAs with the 3-digit prefix 641 were included. A visit was considered to be for dental complaints if the primary diagnosis reported was one or more of the following International Classification of Disease, 9th Revision, Clinical Modification (ICD-9-CM) codes: 520–529, 830, 830.1, 848.1, 873.51, 873.53, 973.54, 873.63–873.69, and 873.73.

Socio-economic characteristics of the ZCTAs obtained from 2007 to 2011 American Community Survey 5-Year Estimates were: percent of non-white population, median family income, percent of population 25 years and over with high school education or higher, and percent of population