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Analysis of Adult Users of Emergency Departments Visits for Primary Dental Related Complaints in the United States in 2015AW

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ABSTRACT

Objectives: Using nationally representative data, the researchers examined the differences in dental care utilization in Hospital-Based Ambulatory Care Services working age adults associated by lack of insurance, and other co-variates.

Methods: The researcher used data from the 2015 National Hospital Ambulatory Medical Care Survey (19-65 years age; N= 12,956 unweighted observations). Multiple logistic regression analysis was performed to determine the association with dental insurance coverage and other covariates.

Results: In 2015, There were an estimated 83 million ED visits among working adults ages 19-64 in the United States. Dental related complaints accounted for between 0.1 and 0.5 percent of all visits, depending on patient characteristics. Dental visits were significantly more likely among patients with self-paying or with government insurance relative to the privately insured.

Conclusion: Medicaid and Self pay adults had significant higher odds of making dental emergency visits. The limited scope of dental treatment in the ED, coupled with poor availability of safety-net dental resources, may result in dental exacerbations. The engagement of safety-net dental service accessibility is crucial to reducing dental ED visits and improving dental health, particularly among low-income, self-pay populations.

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Introduction

One of the contributors to overall healthcare system costs in the United States is dental-related visits to emergency departments (ED) [1]. Across the United States, the number of emergency department (ED) visits continue to show a steady increase in dental related complaints which has become a growing public health concern for public health professionals, policymakers and community advocates [2-5]. The economic recession that took place in the United States between 2007 and 2013 shows a correlation to the increase in the number of individuals eligible for Medicaid and subsequent Medicaid spending. Faced with declining revenues, many states made significant cuts to Medicaid [1]. It has been widely recognized in recent studies that the provision of dental services in medical settings, including hospital emergency departments, tend to be more costly and less effective compared to services provided by primary dental practices or clinics [6-8]. Additionally, in recent literature, young adults ranging from 21 to 34 years, attribute to the larger share of ED visits. Furthermore, some young adults are either insured by government insurance or uninsured, hence are most likely to present to the ED, seeking dental care [2,3,8-11].

Literature indicates that adults 21 years or older had higher dental-related visits compared to children. The percentage of dental-related ED visits by adults has increased from 82.0 percent in 2006 to 88.7 percent in 2012 [1]. However, ED use among this young adults and factors that influence disproportionate ED uptake are underexplored.

Therefore, the purpose of this current study was to examine the utilization of emergency departments for dental related care among the uninsured working age adult population. The uninsured face challenges regarding obtaining appropriate access to health care services due to lack of insurance. Additionally, the researchers hypothesized that these individuals are more likely to present at the ED on the weekend seeking dental care.

Data and Methods

Study Design and Data Source, and Population

The researchers conducted a cross-sectional study using data from the 2015 National Hospital Ambulatory Medical Care Survey (NHAMCS) [12]. NHAMCS is part of the ambulatory component of the National Health Care Surveys, a family of surveys that measures health care utilization across various types of providers. The NHAMCS is designed to provide information regarding ambulatory patients health concerns and the treatment provided in emergency departments. Furthermore, NHAMCS data is collected in accordance with the privacy guidelines of the Health Insurance Portability and Accountably Act (HIPPA) [12]. For the purpose of this study, the researchers restricted their analysis to working

age adults, as those individuals are more likely than children or those over 65 to lack insurance [13]. The sample size was 12,956 non-weighted observations, representing an estimated 83,205,909 visit by adults between the age 19 to 64 years of age.

Study Variables

Outcomes Measure

The dependent variable was a primary diagnosis of common dental related complaints based on the International Classification of Diseases, Ninth Edition, Clinical Modification (ICD-9-CM) codes in the primary diagnosis (Table 1). A maximum of 24 diagnosis were available in each record, coded utilizing the ICD-9-CM [14]. The diagnostic list used for this research is more restrictive than previous studies [4,15]. Which included all codes in the 520.0 and 526.99 range.

The specific ICD-9 codes were selected in consultation with a dental professional to include the dental diagnoses most probably related to dental caries alone and not associated with accidents or trauma, diabetes, human-immuno deficiency virus, or any ambulatory sensitive care medical conditions.

Primary Independent Variable

The primary independent variable was the patient's insurance status defined using the NHAMCS variable PAYTYPER; Payer status information was coded as: 1=) Private Insurance; 2=) Medicare; 3=) Medicaid or CHIP; 4=) Worker's Compensation; 5=) Self Pay ;6=) No charge/ Charity; 7=) Other; -8=) Unknown and -9=) Blank. For this analysis, "Medicaid or CHIP" variable was re-coded for purposes of excluding those children under 19 years of age, then included with Medicare variable and re-labeled at Government Insurance. Additionally, "No Charge/Charity" variable and "Unknown" was merged with Other variable and Blank was re-coded at "Missing" in our analysis.

Covariates

The ADay and Andersen Behavioral Model for Health Services Conceptual Framework was adopted to develop the research question and conceptualize the variables of interest for the analysis [16]. According to this model, the use of healthcare services suggest that an individual's use of health services does not include service utilization or structural changes, but it is the function of predisposing, enabling factors, and need factors to determine how a patient accesses and utilizes health care services. In the researchers' analysis, the study highlighted the following constructs: the predisposing (i.e., race, age, gender) for enabling factors we included (i.e., admission timing).

Analytical Approach

All analyses were conducted sing Statistical Analysis Software SAS version 9.4 [17]. Statistical analysis included descriptive analyses with frequencies, percentages, distributions, and logistic regression to determine differences in ED use by selected variables of interest. The study was approved by Grand Canyon University Institutional Review Board.

Results

Table 1. describes the demographic characteristics of adult patients in the study (n=12,956 visits). Approximately 58% of all ED visits were Adults under 43 years of age. More than half (58%) of visits were made by females and 13% of all visits were self-pay. Examining the enabling variables, over 74% of ED visits occurred on a weekday.

Table 1: ICD-9 CM Dental Codes included in Analysis of patients

ICD-9 codes	Descriptor
521.0, 521.00 ,521.01 521.03, 521.04, 521.05 521.06, 521.07 521.08, 521.09	Dental Caries
521.81	Cracked tooth
522.0 ,522.1	Disease of pulp and periapical tissue
525.11*	Loss teeth / Trauma
525.12	Loss teeth Periodontal Disease
525.13 ,525.19, 525.63 525.64	Other disease and conditions of the teeth and supporting structures
527.3	Salivary glands abscess
525.9 *	Unspecified disorder teeth supporting structures
V52.3	Dental Prothesis
V53.4	Fit Orthodontic Device
V58.5	Orthodontic Aftercare

Dental emergencies were not a common reason for visit, accounting between 0.1 and 0.5 of all visits. (Table 2). The proportion of visits attributable to dental related complaints was higher among those adults who identified as self-paying and in receipt of government insurance. Visits were likely on a weekday than on a weekend.

Table 2: Characteristics of Hospital-Based Ambulatory Care Service, 2015 National Hospital Ambulatory Medical Care Survey by Primary Diagnosis versus Other Primary Diagnosis; Adult 19-64 Years of Age (All Percentages are Weighted to Reflect Sampling Design)

Un-weighted Observations n= 12,956	Total Population		Dental Primary Diagnosis		Other Primary Diagnosis		P-Value
Total Estimated Visits	83,205,909 (%)		1,431,146 (%)		81,774,763 (%)		
Personal Characteristics		SE		SE		SE	
Predisposing factors							
Age							
19-26	19.6	0.51	0.4	0.07	99.6	0.52	
27-36	26.1	0.73	0.7	0.10	99.3	0.72	
37-42	12.4	0.39	0.3	0.06	99.7	0.38	
43+	42.0	0.76	0.3	0.06	99.3	0.77	
Gender							0.22
Male	42.4	0.66	0.8	0.11	99.2	0.67	
Female	57.6	0.66	0.9	0.10	99.1	0.66	
Race/Ethnicity							0.29
White	57.9	2.14	1.1	0.11	98.9	2.11	
Black	24.4	2.17	0.4	0.07	99.6	2.15	
Hispanic	15.3	1.51	0.2	0.07	99.8	1.48	
Other	2.38	0.32	0.1	0.01	99.9	0.32	
Primary Payor							
Private Insurance	33.7	1.42	0.3	0.06	99.7	1.41	
Government Ins.	37.7	1.56	0.5	0.06	99.5	1.55	
Self-Pay	12.7	1.21	0.4	0.09	99.6	1.16	
Other	4.0	0.88	0.1	0.03	99.9	0.87	
Missing	11.9	2.15	0.3	0.11	99.7	2.08	
Ecological Characteristics							
Enabling Characteristics							
Admission Timing							0.05
Weekday	73.7	0.39	1.1	0.13	98.9	0.41	
Weekend	26.2	0.39	0.5	0.08	99.5	0.41	

In the adjusted logistic regression analysis (Table 3), certain factors emerged as key likelihood of a visit to the ED for dental related compliant. Working age adults less than 43 years continued to be associated with visits for dental caries, while those visits were more likely to occur on the weekend. With the exception of "other", all payers categories were associated with higher odds for dental visit compared to those covered by private insurance.

Table 3: Adjusted Odds of Hospital Based-Ambulatory Care Visits with Primary Dental Complaints versus Other Primary Diagnosis: Adult 19-64 Years of Age; 2015 National Hospital Ambulatory Medical Care Survey (NHAMCS)

	Adjusted Analysis			
	Odds Ratio	**95% CI**		**P-Value**
Un-weighted Observations n= 12,956	OR	LCL	UCL	
Total Estimated Visits: 83,205,909				
Personal Characteristics				
Predisposing factors				
Age				0.01
19-26	2.86	1.61	5.07	
27-36	3.35	2.00	5.61	
37-42	2.79	1.49	5.21	
43+	Reference	Ref.	Ref.	
Gender				0.20
Female	Reference	Ref.	Ref.	
Male	1.27	0.88	1.82	
Race/Ethnicity				0.04
White	Reference	Ref.	Ref.	
Black	0.80	0.55	1.16	
Hispanic	0.71	0.38	1.31	
Other	0.08	0.01	0.58	
Primary Payor				0.01
Private Insurance	Reference	Ref.	Ref.	
Government Ins.	1.55	1.05	2.29	
Self-Pay	3.17	1.87	5.39	
Other	1.35	0.39	4.66	
Missing	2.32	1.18	4.34	
Ecological Characteristics				
Enabling Characteristics				
Admission Timing				
Weekday	Reference	Ref.	Ref.	0.04
Weekend	1.48	1.01	2.18	

Discussion

Patients without insurance or with government insurance were more like to present to the ED for primary dental related diagnoses than were those with private insurance, exclusive of other dental diagnoses, in both raw and adjusted analysis. This finding supports that of Okunseri and colleagues 3; it extends their descriptive work by determining that the greater likelihood of ED visits among self-pay patients and those in receipt of government insurance remains, after population characteristics are held statistically equal. Public dental insurance in not state mandated for adults, which some states have downsized or eliminated in several states the policy change had led to increase utilization of the ED for dental related complaints, which eventually led to negative oral health outcomes and cost shifting [18-21]. Also, the reluctance of private dental providers of accepting Medicaid due to the low reimbursement rate for restorative care, leaving the patient with increase dependence of opting for extraction to elevate chronic tooth pain furthermore, this reluctance of the dental care providers may have role in ED utilization [21-23]. However, Medicare cover for ED visits for a primary diagnosis for dental related problem, Medicare offers no dental coverage and treatment for dental services and would require out-of-pocket cost. The researchers found that hospital ED visit for primary dental related diagnoses occurred more often on Saturday and Sundays among adult users. The findings are consisted with other studies regarding adult users additionally, this finding is consistent with previous studies and reports that ED is regular source of care for patients who are uninsured, or self - paying [24-29]. As a secondary data analysis, the study has multiple limitations. Study limitations include the absence of information median income by ZIP code and the lack of patient-specific identifiers and the lack of information about any follow up care or whether an individual has more than one visit for any of the ED visit type. Finally, the researchers recognize that all data were collected and coded by providers and could be subject to coding errors due to lack to familiarity with oral health complaints and hospital may code dental condition differently. Despite these limitations, the study provides useful evidence to inform policy debates regarding how best to increase access among low-income populations.

Limitations

As a secondary data analysis, our study has multiple limitations. Study limitations include the absence of information about any

follow-up care obtained after the ED visit. Because the data source does not provide a single patient identifier across episodes, we could not observe whether the patients return to the ED for dental complaints multiple times during the course of the year. Finally, the providers coding the data reported in the NHAMCS may not be familiar with oral health complaints, and hospitals may code dental complaints differently.

Implications

Emergency department have become a regular source of care for those who are lack insured or who are on state government insured. A major driver of dental related visits to the ED is a failure to ensure that underprivileged adults have access to adequate preventive and restorative care from dental care providers. Many poor and disfranchised adults experience barriers to health care. Among these barriers are high cost, access to care, health literacy, lack of insurance and lack of a dental home. Options include a) increasing or expanding access to dental care services; b) modification of state and federal insurance policies consideration of adult low income working adults. Several institutions are implementing ED diversion programs to engage patients who have dental related complaints to appropriate safety net providers as way to improving access. These safety net providers include: Federally Qualified Health Centers (FQHC), community health centers, and dental programming in hospitals [30]. For instance, In 2010 , over 3 million patients who present for dental complaints were treated 70 percent treated at FQHCs [31].

In addition hospitals have linked with FQHC to compile of list of dental providers who are willing to assist low income patients on sliding fee scale, providing the ED with an alternative to which to refer patients able to pay [32]. Additionally, ED diversion programs offered through some specialty clinics in hospital have been able to offer relief of burden of some initial and recurrent dental visits [33].

Moreover, a modification in policies on state and federal level in regards with coverage expansion should be considered in respects to working adults. For example, defining dental care as an essential health care benefit for adults within the affordable care act (ACA), and mandating dental care as a covered service in states' Medicaid and including dental coverage to Medicare. Yarbrough et al. study estimated that by implementing a comprehensive dental benefit for Medicaid adults in over twenty states that lacked one would require up to 1 billion per year, with the state portion amounting to about 1 percent of total State Medicaid spending [34]. Hence, expanding adult dental benefits to Medicaid has shown to increase access to dental care in states, and suggests that dental care system has the capacity to facilitate such an expansion [35-38].

Modifying scope of practice laws could address the dearth of dental care providers in underserved areas. Future work is needed to better understand the patterns and risk factors of dental visit amongst diverse underserved populations within ED's.

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