Health Services Research

Visits to Non-Dentist Health Care Providers for Dental Problems

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Background and Objectives: *Although poor and minority adults experience greater levels of dental disease, they frequently face cost and other system-level barriers to obtaining dental care. These individuals may be forced to use physicians or hospital emergency rooms for the treatment of dental problems. This study was conducted to gain a better understanding of the role that non-dentist health care providers play in providing access to oral health care services.* Methods: *Dental conditions and dental condition-related visits to non-dentist health care providers during 2001 for the US civilian noninstitutionalized population were analyzed using data from the Household Component of the Medical Expenditure Panel Survey.* Results: *During 2001, approximately 3.1% of the US population experienced at least one dental problem reported outside of the traditional office-based dental delivery system. Of these, approximately 2.7% received care in a hospital emergency room setting while 7.0% received care in other medical settings. A majority (68.1%) had contact with the formal health care system via a prescription associated with their identified dental problem. Approximately 22.5% did not seek any formal treatment for their problem. Overall, low-income individuals were more likely not to seek formal care than were middle/high-income individuals (32.5% versus 19.7%).* Conclusions: *Individuals not using traditional sources of dental care appear to have greater access to physician offices and other medical settings than to hospital emergency rooms for the treatment of dental problems.*

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Although poor and minority adults experience greater levels of dental disease,[1-5] they frequently face cost and other system-level barriers to obtaining care in the private practice dental delivery system.[1,6] Individuals lacking a usual source of medical care have been found to be less likely to gain access to needed health services.[7-9] Similarly, many individuals who lack access to the private practice dental delivery system may be forced to use physician offices, hospital emergency departments (EDs), or other ambulatory care settings for their dental care.

National data document the greater use of EDs for physician contacts by blacks and the poor.[10] Overall visits to EDs increased approximately 14% during the period 1992–1999.[11] Nationally, during a similar period (1997–2000), there was an average of 738,000 visits annually to EDs for complaints of tooth pain or tooth injury. Overall, diseases of the teeth and supporting structures accounted for 0.7% of all visits to EDs. Individuals visiting EDs for dental as compared to medical problems were significantly more likely to indicate Medicaid or self-pay as the payer rather than private insurance.[12] More recently, diseases of the teeth and supporting structures were reported to account for 0.9% of all visits to EDs.[13] At the institutional level, studies have documented the use of EDs for the treatment of children's dental disease,[14,15] as well as for the treatment of adult dental emergencies.[16-18] Several recent statewide reports also have examined the use of EDs by adult Medicaid recipients seeking relief from dental problems.[19-21]

Several authors have addressed the role physicians play in addressing oral health problems;[22-24] however, few studies have documented visits to physicians for the treatment and prevention of dental problems, especially visits by adults. Nationally in 2002 there were approximately 890 million visits to office-based physicians.[25] Visits for dental-related problems account for approximately 0.3% of all visits to physician offices.[13] The physician's role in the early detection of oral cancer,[26] visits for the treatment of children's dental problems,[27,28] as well as the provision of children's preventive oral health services have been examined.[29]

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Only a few studies have documented adults' visits to physicians for the treatment of dental problems.[30,31]

Over the last several decades, minorities and the poor have benefited significantly from the temporal reduction in caries. Nevertheless, these groups continue to suffer disproportionately from dental problems.[32] The pressing need to address these health disparities has received national recognition.[6,33] Minorities often face additional barriers to care associated with their level of cultural competence.[34] Dental diseases are generally not self-limiting, and untreated dental conditions and their associated pain may adversely impact a person's well-being and overall quality of life.[35,36] This study was conducted to gain a better understanding of the role that non-dentist providers play in providing access to oral health care services.

Methods

The focus of these analyses was dental conditions and dental condition-related visits to non-dentist health providers during 2001 for the US civilian noninstitutionalized population. Data were obtained from the Household Component (HC) of the Medical Expenditure Panel Survey (MEPS).[37-45] As described on the Web site of the Agency for Healthcare Research and Quality:

> MEPS is an ongoing nationally representative health survey of the US community-based population. It is a set of large-scale surveys of families and individuals, their medical providers, and employers across the United States. MEPS collects data on the specific health services that Americans use, how frequently they use them, the cost of these services, and how they are paid for, as well as data on the cost, scope, and breadth of private health insurance held by and available to the US population. The HC collects data on a sample of families and individuals across the nation, drawn from a nationally representative subsample of households that participated in the prior year's NCHS National Health Interview Survey. The objective is to produce annual estimates for a variety of measures of health status, health insurance coverage, health care use and expenditures, and sources of payment for health services. The survey features several rounds of interviewing covering 2 full calendar years.[46]

Our analytical file was developed using the MEPS 2001 Medical Condition File and several 2001 MEPS event files, including the Prescribed Medicines File, the Office-based Medical Provider Visit Event File, the Outpatient Department Visit Event File, the Emergency Room Visit Event File, the Hospital Inpatient Stay Event File, and the Home Health Visit Event File.[38-45] The Medical Condition File contains variables describing medical (dental) conditions that were reported by respondents in several sections of the MEPS questionnaire, including the Condition Enumeration Section, Health Status Section, and all questionnaire sections collecting information about health provider visits, prescription medications, and disability days.[45] Medical (dental) conditions reported by the Household Component respondent were recorded by the interviewer as verbatim text and were then coded by professional coders to fully specified *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) codes. To preserve respondent confidentiality, all of the condition codes provided were collapsed from fully specified codes to three-digit code categories.[45] The ICD-9-CM codes[47] used in these analyses were restricted to dental-relevant codes selected by a panel of content experts as most relevant to the treatment of mouth pain and infections associated with the teeth and periodontal tissues and represented conditions judged best treated by a dentist. Thus, codes representing injuries such as facial trauma and mandibular fractures were excluded.

For persons with a dental ICD-9-CM-specified code, national estimates are provided for population percentage by data source category, including provider types, limitation (missed work days, missed school days, or bed days), or receipt of a prescription drug. Persons with a reported dental-specified ICD-9-CM code and no associated provider, prescription drug, or disability day indicator were classified as "no association." Source indicator variables were not mutually exclusive. For the purpose of data presentation, a medical encounter was defined as including medical visits and hospital emergency room visits. A medical visit was defined as including office-based medical provider visits, outpatient department visits, hospital inpatient stays, and home health visits.

National estimates also are provided for the population percentage with a dental ICD-9-CM code and dental ICD-9-CM code source indicator for each of several socioeconomic and demographic categories, including age, gender, race/ethnicity, poverty status, education, employment status, geographic indicator, and having at least one dental visit during the year (dental visits are not associated with dental-specified ICD-9-CM codes). Findings were judged statistically significant when 95% confidence intervals did not overlap for displayed estimates. All estimates and statistics reported were computed taking into account the complex sampling design of MEPS with the use of the software package SUDAAN (Shah BV, Barnwell BG, Bieler GS. SUDAAN. Users manual. Software for analysis of correlated data. Release 6.40. Research Triangle Park, NC: Research Triangle Institute, 1995).

Results

During 2001, approximately 3.1% of the US population experienced at least one dental problem outside of the traditional office-based dental delivery system,

Table 1

Total Population, Percent of Population, and Total Population With Dental Condition (Dental ICD) by Association Type and by Selected Population Characteristics, United States, 2001

					Percent Dental ICD (CI) With Medical Encounter, Limitation, or Prescription		
Population Characteristic	*Total Population*	*% (CI) Population With Dental ICD*	*Total Population With Dental ICD*	*% ICD (CI) Only*	*Medical Encounter*	*Missed Work, School, or Bed Days*	*Prescription*
Total[a]	284,247	3.1 (2.8, 3.3)	8,674	22.5 (19.6, 25.4)	9.1 (7.1, 11.1)	20.0 (16.6, 23.4)	68.1 (64.8, 71.5)
Age in years							
Under 19	76,917	1.5 (1.2, 1.8)	1,145	17.6 (10.9, 24.3)	15.2 (8.0, 22.4)	33.1 (23.9, 42.4)	55.4 (45.4, 65.5)
19 to 64	171,495	3.7 (3.4, 4.1)	6,393	24.0 (20.4, 27.7)	8.2 (6.0, 10.3)	20.8 (16.8, 24.8)	69.1 (65.1, 73.2)
65 and over	35,835	3.2 (2.6, 3.8)	1,137	18.9 (10.8, 26.9)	8.2 (2.1, 14.2)	1.9 (0, 4.5)	75.4 (66.4, 84.4)
Sex							
Male	138,631	3.0 (2.7, 3.4)	4,224	24.7 (20.4, 28.9)	8.5 (5.6, 11.4)	21.2 (16.8, 25.6)	67.5 (63.1, 72.0)
Female	145,616	3.1 (2.7, 3.4)	4,450	20.4 (16.4, 24.5)	9.7 (6.8, 12.6)	18.8 (14.3, 23.3)	68.7 (63.7, 73.8)
Race/ethnicity [a]							
Black Non-Hispanic	34,987	2.9 (2.3, 3.4)	1,001	23.7 (15.9, 31.6)	12.8 (5.6, 19.9)	27.9 (17.1, 38.7)	57.7 (48.9, 66.5)
Hispanic	37,685	2.7 (2.2, 3.2)	1,028	23.6 (17.2, 30.1)	4.9 (2.0, 7.9)	30.2 (21.8, 38.5)	62.8 (55.3, 70.4)
White Non-Hispanic	211,575	3.1 (2.8, 3.5)	6,645	22.1 (18.7, 25.6)	9.2 (6.7, 11.6)	17.2 (13.6, 20.8)	70.5 (66.8, 74.3)
Family income [b]							
Poor	43,576	3.3 (2.7, 3.8)	1,420	26.1 (18.1, 34.0)	12.7 (7.6, 17.8)	19.8 (13.8, 25.9)	62.4 (54.1, 70.6)
Low income	39,646	3.1 (2.5, 3.7)	1,242	32.5 (23.4, 41.5)	8.5 (3.7, 13.3)	18.2 (12.4, 24.1)	57.3 (48.5, 66.0)
Middle/high income	198,813	3.0 (2.7, 3.3)	5,989	19.7 (16.3, 23.1)	8.4 (6.0, 10.8)	20.2 (15.6, 24.7)	71.9 (67.9, 76.0)
Education [c]							
Some or no school	57,262	3.1 (2.7, 3.6)	1,793	26.3 (19.3, 33.2)	8.5 (4.7, 12.2)	22.0 (16.3, 27.8)	62.6 (55.9, 69.2)
High school graduate	129,372	3.3 (2.9, 3.7)	4,296	19.3 (15.8, 22.8)	10.1 (7.1, 13.2)	21.1 (16.2, 26.0)	71.3 (66.7, 75.9)
College graduate	94,312	2.7 (2.3, 3.2)	2,551	25.6 (19.8, 31.4)	7.9 (4.2, 11.6)	15.8 (10.6, 21.1)	67.0 (60.8, 73.2)
Employment							
Employed	206,830	3.2 (2.9, 3.5)	6,591	22.6 (19.3, 25.8)	9.0 (6.7, 11.3)	24.3 (20.1, 28.5)	67.5 (63.7, 71.4)
Not employed	75,153	2.7 (2.3, 3.2)	2,061	22.6 (16.5, 28.6)	9.5 (5.0, 14.0)	5.5 (2.5, 8.5)	70.5 (64.0, 77.1)
Rural/urban							
MSA	231,722	3.0 (2.7, 3.3)	6,962	21.9 (18.6, 25.1)	8.1 (5.9, 10.3)	21.4 (17.3, 25.4)	69.0 (65.2, 72.7)
Non-MSA	52,525	3.3 (2.7, 3.9)	1,712	25.2 (18.9, 31.4)	13.2 (8.6, 17.7)	14.3 (9.0, 19.5)	64.7 (57.6, 71.8)

a White Non-Hispanic includes all other ethnic/racial groups.
b Includes persons in families with negative income. Where poor refers to incomes below 125% of the poverty line, low income refers to income equal to or over 125% to below 200% of the poverty line, and middle/high income equal to or over 200% of the poverty line.
c Where "some or no school" refers to all individuals who did not graduate from high school. For children age 18 and under, education refers to parent's education. For children with two parents, education refers to the parent with the higher level of education.

CI—confidence interval
MSA—metropolitan statistical area
non-MSA—non-metropolitan statistical area

Source: Center for Financing, Access and Cost Trends (CFACT), Agency for Healthcare Research and Quality (AHRQ). 2001 Medical Expenditure Panel Survey (MEPS).

as identified by the report of a dental-relevant ICD-9-CM code (Table 1). While some of these individuals also may have seen a dentist for this or other reasons and at other times during the same calendar year, the reports of dental problems being discussed here were not generated by any dental office-based visits. With the exception of age, the percentage of the population with a dental problem did not differ significantly by any of the examined demographic characteristics (Table 1). Individuals experiencing dental problems were most likely to be in the 19–64 and 65 and over age categories. Individuals experiencing a dental problem were examined further to determine whether their dental problem was associated with a medical encounter, limitation (missed work or school days or bed days), a prescription, or had no other association. These events were not mutually exclusive.

Individuals With Associated Medical Encounter

Approximately 9.1% of the individuals who experienced a dental problem outside of the traditional dental office-based system during 2001 received medical care for that problem from a health care provider/treatment site other than a dental office (Table 1). No statistically significant differences in the demographic characteristics of these individuals were noted. These individuals were examined further to determine whether their care involved an ED visit or a medical visit.

Individuals with dental problems were more than twice as likely to have made a medical visit (7.0%) as compared to an ED visit (2.7%) though some individuals received care for a dental problem in both settings (Table 2). With the exception of education, the percentage of individuals with dental problems who visited an ED for treatment did not differ significantly by any of the demographic characteristics examined (Table 2). Individuals with some or no school were more likely than those with greater levels of education to have an ED visit (5.3% versus 1.0% for college graduates). The percentage of individuals with dental problems who made medical visits did not differ significantly by any of the demographic characteristics examined (Table 2).

Those individuals with medical visits and ED visits were examined controlling for whether or not the individual reporting the dental problem had experienced at least one visit to a dental office sometime during the year (Figure 1). It is important to note that visits to dentists were totally unrelated to the generation of ICD codes and the identification of dental problems outside of the traditional office-based dental care delivery system. Visits to dentists were interpreted as indicating at least a minimal level of access to the traditional dental office-based delivery system. Among individuals with at least one visit to a dentist sometime during the year, 8.8% of individuals who experienced a dental problem during 2001 received care from a health care provider/treatment site other than a dental office as compared to 10.8% for those individuals who experienced no visits to the dentist during the year. For individuals with a dentist visit during the year, this included 2.4% (confidence interval [CI]=1.2%–3.5%) with ED visits and a significantly greater 7.0% (CI=4.9%–9.1%) with medical visits. For individuals without a dental visit during the year, the comparable figures were 4.6% and 7.3%, respectively.

The demographic composition of individuals with ED visits and medical visits and with at least one visit to a dental office sometime during the year was examined. There were no significant differences in the demographic makeup of those individuals with ED visits. Examining individuals with medical visits revealed that individuals less than 19 years of age were significantly more likely to receive care in these settings than were 19–64 year olds (15.2%: CI=7.3%–23.1% versus 5.0%: CI=3.0%–7.0%). The demographic composition of individuals who did not experience any visits to a dentist during the year could not be statistically evaluated due to the small size of the unweighted sample.

Individuals Receiving No Formal Care for Their Dental Problem

Approximately 22.5% of individuals who experienced a dental problem during 2001 outside of the traditional office-based dental delivery system did not seek any formal treatment for their problem. With the exception of income, none of the demographic variables were significantly associated with a lack of formal treatment (Table 1). Low-income individuals were more likely not to seek formal treatment (32.5%) than were middle/high income individuals (19.7%).

Individuals not receiving formal care also were examined controlling for whether or not the individual reporting the dental problem had at least one visit to a dental office sometime during the year. Those individuals who did not experience any dental visits during the year were more likely to have received no formal care (56.4%: CI=47.9%–65.0%) than were individuals who did have at least one dental visit sometime during the year (16.2%: CI=13.3%–19.2%). However, a great deal of this difference can be attributed to having received a prescription in association with their dental problem. Receiving a prescription was included in the category of formal care (see Prescription Experience below). Among those individuals with at least one dental visit during the year, no significant differences in the demographic composition of people not receiving formal care were noted.

Limitations to Work and School

Twenty percent of all individuals who experienced a dental problem outside of the normal dental office-based delivery system during 2001 missed at least one

day of school, stayed home from work, or stayed in bed as a result of their dental problem. The demographic distribution of individuals experiencing a limitation related to their dental problem is presented in Table 1. By far, individuals under the age of 19 experienced the greatest rate of limitation (33.1%) while those over the age of 64 experienced the lowest (1.9%). Racial differences also were noted, with Hispanics experiencing the highest rate of limitation (30.2%) and whites the lowest (17.2%). Finally, employed individuals experienced a greater rate of limitation than did the unemployed (24.3% versus 5.5%).

No differences in limitations were noted based on whether or not the individual reporting the dental problem had at least one visit to a dental office sometime during the year (20.7% versus 19.7% limitation rate, respectively). The demographic distribution of individuals experiencing a limitation related to their dental problem was examined for those individuals with a dentist visit sometime during the year and was found to generally mirror that found for the overall group experiencing limitations. Individuals under the age of 19 experienced the greatest rate of limitation (32.9%: CI=23.8%–42.1%)), followed by those 19–64

Table 2

Total Population, Percent of Population, and Total Population With Dental Condition (Dental ICD) and Medical Encounter by Encounter Type and Selected Population Characteristics, United States, 2001

Population Characteristic	*Total Population*	*Population With Dental ICD Visit*	*% Population With Dental ICD and Medical Encounter*	*Medical Visit*	*Emergency Room Visit*
Total[a]	284,247	8,674	9.1 (7.1, 11.1)	7.0 (5.1, 8.9)	2.7 (1.6, 3.9)
Age in years					
Under 19	76,917	1,145	15.2 (8.0, 22.4)	13.6 (6.6, 20.7)	2.4 (0.1, 4.7)
19 to 64	171,495	6,393	8.2 (6.0, 10.3)	5.6 (3.8, 7.5)	2.8 (1.6, 3.9)
65 and over	35,835	1,137	8.2 (2.1, 14.2)	8.2 (2.1, 14.2)	2.9 (0, 7.1)
Gender					
Male	138,631	4,224	8.5 (5.6, 11.4)	6.6 (3.8, 9.3)	3.0 (1.3, 4.7)
Female	145,616	4,450	9.7 (6.8, 12.6)	7.5 (4.9, 10.0)	2.5 (1.1, 3.9)
Race/ethnicity [a]					
Black Non-Hispanic	34,987	1,001	12.8 (5.6, 19.9)	12.2 (5.1, 19.4)	1.8 (0, 3.9)
Hispanic	37,685	1,028	4.9 (2.0, 7.9)	3.0 (0.8, 5.3)	2.8 (0.4, 5.2)
White Non-Hispanic	211,575	6,645	9.2 (6.7, 11.6)	6.9 (4.6, 9.1)	2.9 (1.4, 4.3)
Family income [b]					
Poor	43,576	1,420	12.7 (7.6, 17.8)	8.3 (4.2, 12.3)	5.7 (1.7, 9.7)
Low income	39,646	1,242	8.5 (3.7, 13.3)	7.3 (2.5, 12.1)	1.7 (0.9, 2.5)
Middle/high income	198,813	5,989	8.4 (6.0, 10.8)	6.7 (4.5, 8.9)	2.2 (0.9, 3.6)
Education [c]					
Some or no school	57,262	1,793	8.5 (4.7, 12.2)	4.7 (1.9, 7.6)	5.3 (2.3, 8.4)
High school graduate	129,372	4,296	10.1 (7.1, 13.2)	8.0 (5.1, 11.0)	2.7 (1.0, 4.4)
College graduate	94,312	2,551	7.9 (4.2, 11.6)	7.0 (3.5, 10.5)	1.0 (0, 2.2)
Employment					
Employed	206,830	6,591	9.0 (6.7, 11.3)	6.6 (4.6, 8.7)	2.6 (1.4, 3.8)
Not employed	75,153	2,061	9.5 (5.0, 14.0)	8.3 (4.1, 12.6)	3.2 (0.2, 6.1)
Rural/urban					
MSA	231,722	6,962	8.1 (5.9, 10.3)	6.0 (4.1, 8.0)	2.9 (1.5, 4.3)
Non-MSA	52,525	1,712	13.2 (8.6, 17.7)	11.1 (6.5, 15.7)	2.1 (0.4, 3.8)

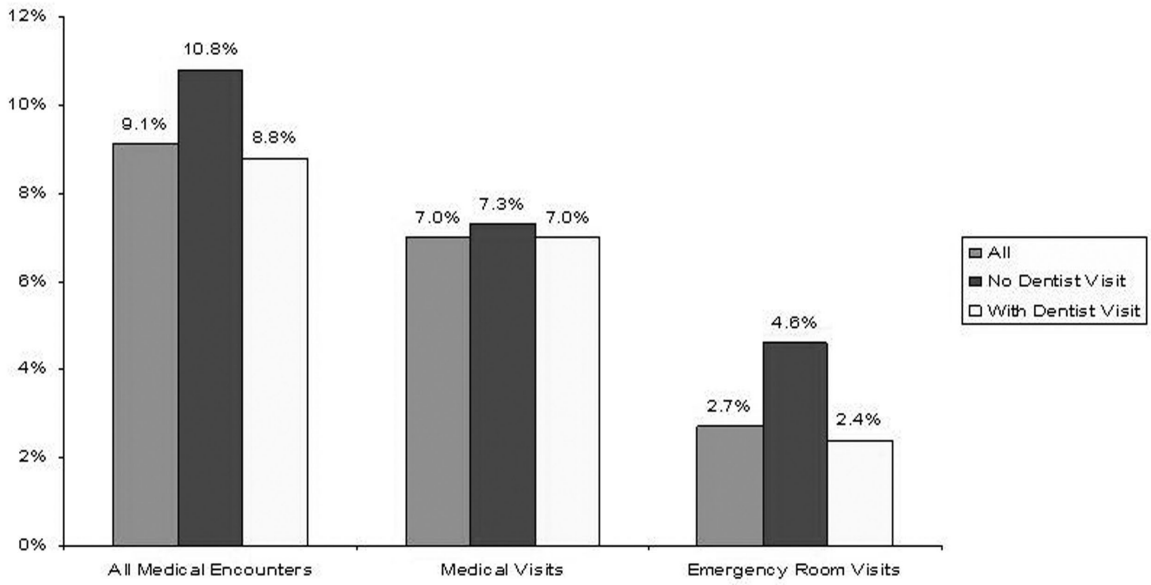
a White Non-Hispanic includes all other ethnic/racial groups.
b Includes persons in families with negative income. Where poor refers to incomes below 125% of the poverty line, low income refers to income equal to or over 125% to below 200% of the poverty line, and middle/high income equal to or over 200% of the poverty line.
c Where "some or no school" refers to all individuals who did not graduate from high school. For children age 18 and under, education refers to parent's education. For children with two parents, education refers to the parent with the higher level of education.

MSA—metropolitan statistical area
Non-MSA—non-metropolitan statistical area.

Source: Center for Financing, Access and Cost Trends (CFACT), Agency for Healthcare Research and Quality (AHRQ). 2001 Medical Expenditure Panel Survey (MEPS).

Figure 1

Percent of Medical Encounters for Persons With a Dental Condition (Dental ICD) and Percent of Medical Encounters, by Visit Type and by Dental Visit Status



(21.3%: CI 16.8%–25.8%), while those over the age of 64 experienced the lowest (0.9%: CI=0.0%–2.2%). As above, employed individuals experienced a greater rate of limitation (24.4%: CI=19.7%–29.2%) than did the unemployed (4.9%: CI=1.7%–8.0%).

Prescription Experience

A majority of the individuals (68.1%) who experienced a dental problem outside of the dental office-based system had contact with the formal health care system via a prescription associated with their identified dental problem (Table 1). Although the prescription was associated with a dental problem identified outside of the dental office-based system, the MEPS database did not permit a determination of whether the prescription itself was written by a physician or a dentist or received as part of an office visit or resulted from a telephone contact. Several demographic variables were found to be associated with the likelihood of receiving a prescription. Approximately 75.4% of individuals over the age of 64 received a prescription, compared to 55.4% of those individuals under the age of 19. Similarly, whites were more likely to receive a prescription than were blacks (70.5% versus 57.7%). In addition, middle/high-income individuals were more likely to receive a prescription than were low-income individuals (71.9% versus 57.3%).

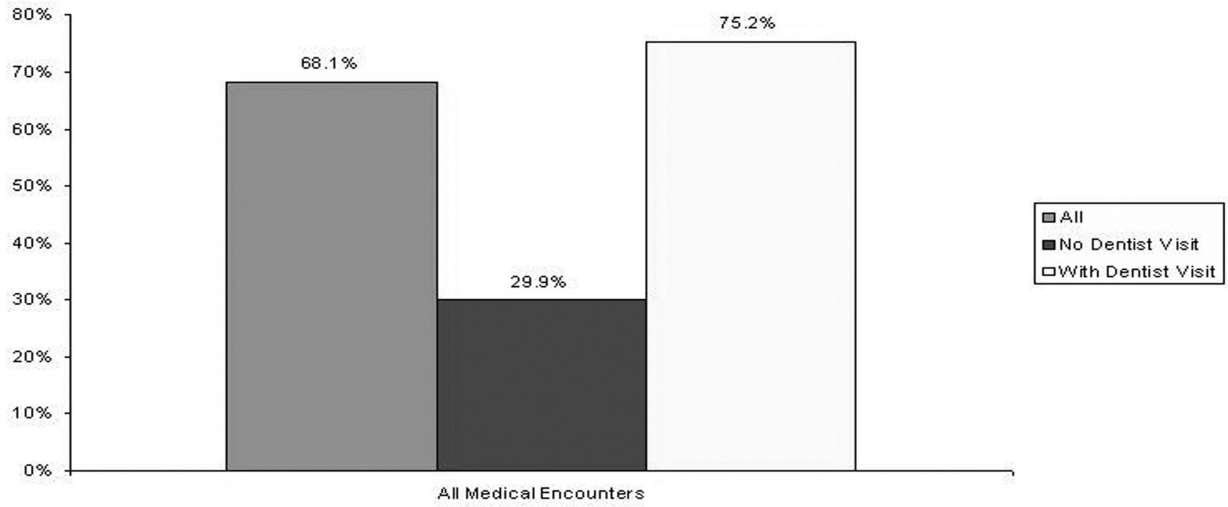
The likelihood of receiving a prescription was examined controlling for whether the individual reporting the dental problem also had at least one visit to a dental office sometime during the year (Figure 2). Individuals who did not have any dental visits during the year were significantly less likely to report having received a prescription associated with their dental problem (29.9%: CI=21.3%–38.5%) than were those individuals who did have a dental visit sometime during the year (75.2%: CI=71.4%–79.0%). The demographic background of individuals with a visit to the dentist sometime during the year was examined. No significant differences were noted, with the exception that individuals under the age of 19 were less likely to receive a prescription (54.8%: CI=44.2%–65.4%) than were those 19–64 years of age (77.6%: CI=73.3%–82.0%) or those over the age of 64 (82.6%: CI=74.8%–90.4%).

Discussion

In 2001, approximately 3% of the US population experienced a dental problem that was dealt with outside of the traditional office-based private practice system. Patients with dental problems were more likely to have made medical visits (7.0%) compared to ED visits (2.7%). Interestingly, this association was strongest among those individuals who experienced at least one unrelated visit to a dentist during the year and may

Figure 2

Percent of Prescribed Medicines for Persons With a Dental Condition (Dental ICD) and Percent Prescribed Medicines by Dentist Visit Status



reflect a pattern or preference for office-based rather than ED-based care. The general preference for office-based care is consistent with previous reports that examined the use of EDs[19] and physician offices[31] for the treatment of adult Medicaid patients' dental problems. This finding appears to confirm that individuals not using traditional sources of dental care have greater access to physician offices than to EDs for the treatment of dental problems.

It is interesting that there were no statistically significant associations between an individual's demographic background and his/her overall use of health care providers/treatment sites other than a dental office. This was true regardless of his/her relative access to dental services as measured by whether the individual did or did not have a visit to a dentist sometime during the year. The greater use of EDs by individuals with less schooling was consistent with prior national reports.[10]

More than one in five individuals (22.5%) who experienced a dental problem during 2001 did not seek formal treatment for their condition. Individuals demonstrating less access to traditional dental services, as exemplified by not having any visits to the dentist during the year, were significantly less likely to seek formal care for their dental problem. This may be explained by the fact that individuals lacking access to traditional dental services also may be more likely to lack access to medical care as well. As mentioned previously, individuals without a usual source of medical care are less likely to access needed health services.[7-9] Overall, low-income individuals were significantly less likely to seek formal care than were middle/high-income individuals. This pattern, of course, mirrors that seen with the use of traditional dental services.[6]

The influence of dental problems on lost days from work and school and bed days is well documented. Data from the 1996 National Health Interview Survey revealed that adults missed approximately 2,442,000 days of work due to acute dental conditions, while children experienced 1,611,000 days lost from school. Individuals of all ages suffered 4,602,000 bed days.[48] In the present study, 20% of individuals experiencing a dental problem outside of the traditional office-based dental care delivery system suffered a limitation as a result of their condition. Relative access to traditional dental services did not affect the frequency of experiencing limitations and thus was not associated with the severity of the dental problem as measured by the presence of these limitations. Although lacking a usual source of dental care may lead to a delay in seeking treatment and potentially exacerbate the condition, this did not appear to be the case. Overall, limitations were more likely to be experienced by Hispanics, school-aged children, and the employed. Limitations associated with age and employment status undoubtedly reflect the inherent exposure to the risks of missed school and work experienced by these groups. The greater prevalence of dental problems among Hispanics as compared to whites is well documented.[6,49]

By far, individuals experiencing a dental problem identified outside of the traditional dental office-based delivery system had formal contact with the health

care system most frequently through a prescription associated with their dental problem (68.1%). The greater likelihood of whites and middle/high-income individuals receiving prescriptions for their dental problems as compared to blacks and individuals with low incomes is noteworthy. The higher levels of dental needs among blacks and those with lower incomes are well documented.[1-5] It might have been assumed that these groups would be most likely to have prescriptions associated with their dental problems. Whether these demographic-linked differences are founded on a sound clinical basis or are influenced by practitioner knowledge, attitudes, or cultural-based biases is unknown. There has been increasing awareness of racial and ethnic disparities in health care. An Institute of Medicine report, "Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care," addressed the possible role of provider bias, discrimination, and patient stereotyping in health disparities.[50] The role of cultural issues in the delivery of oral health care services deserves greater attention.[51,52]

Limitations

A key limitation of this study is the precision of condition data self-reported by respondents and the interpretation/ability of professional coders to correctly specify a specific code. Although codes were verified, and error rates did not exceed 2.5% for any coder, the ability of household respondents to report condition data that can be coded accurately should not be assumed. Also, as mentioned earlier, the size of the unweighted sample precluded an assessment of the demographic composition of individuals who did not have any visits to a dentist during the year. However, these data are important because they broaden our limited understanding of the role that physician-based services play in the delivery of needed oral health services.[6]

Conclusions

In the current economic environment, public dental clinic resources are under stress. Utilization rates for adult Medicaid recipients have decreased in recent years as many states facing financial difficulties have continued to tighten eligibility criteria and restricted and/or entirely eliminated adult dental benefits. It is estimated that by the middle of FY 2003, 27 states had cut or restricted eligibility. Further, the number of states with full adult Medicaid dental benefits decreased from 14 in 2000 to 4 in 2003, while the number with no benefits increased from 7 to 16 during the same period.[53]

Thus, it can be assumed that many individuals, especially those lacking access to traditional dental services, will continue to seek care from EDs and physicians. The use of alternative services for management of dental problems may have adverse consequences. Many EDs do not provide dental services and, therefore, do not provide definitive treatment for dental problems. The same is generally true of physicians, most of whom lack substantive training in dentistry.[15,16,54]

Additional education and guidelines have proven beneficial in assisting physicians in dealing with dental problems.[55] Nevertheless, further studies are needed to evaluate the adequacy of the treatment of dental problems by non-dentist providers. In addition, future studies should explore the prescription practices of both dentists and physicians as they relate to differences associated with patient income and racial/ethnic backgrounds.

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References

1. National Institute of Dental Research. Oral health of United States adults: The National Survey of Oral Health in US employed adults and seniors 1985-1986. National Findings. NIH Publication No. 87-2868. Washington, DC: US Government Printing Office, August 1987.
2. National Center for Health Statistics (NCHS). Third National Health and Nutrition Examination Survey (NHANES III) reference manuals and reports [CD-ROM]. Hyattsville, Md: NCHS, US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, 1996.
3. Green BL, Person S, Crowther M, et al. Demographic and geographic variations of oral health among African Americans. Community Dent Health 2003;20:117-22.
4. Riley JL, Gilbert GH, Heft MW. Socioeconomic and demographic disparities in symptoms of orofacial pain. J Public Health Dent 2003;63:166-73.
5. Manski RJ, Moeller JF, Maas WR. Dental services: an analysis of utilization over 20 years. J Am Dent Assoc 2001;132:655-64.
6. US Department of Health and Human Services. Oral health in America: A Report of the Surgeon General. Rockville, Md: US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.
7. Gross CP, Mead LA, Ford DE, Klag MJ. Physician heal thyself ? Regular source of care and use of preventive health services among physicians. Arch Intern Med 2000;160:3209-14.
8. Ettner SL. The relationship between continuity of care and health behaviors of patients: does having a usual physician make a difference? Med Care 1999;37:547-55.
9. DeVoe JE, Fryer GE, Phillips R, Green L. Receipt of preventive care among adults: insurance status and usual source of care. Am J Pub Health 2003;93:786-91.
10. US Department of Health and Human Services. Health status of minorities and low-income groups: third edition. Washington, DC: US Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, 1991.
11. Burt CW, McCaig LF. Trends in hospital emergency department utilization: United States, 1992–1999. National Center for Health Statistics. Vital Health Stat 2001;13(150).
12. Lewis C, Lynch H, Johnston B. Dental complaints in emergency departments: a national perspective. Ann Emerg Med 2003;42:93-9.

13. Burt CW, Schappert SM. Ambulatory care visits to physician offices, hospital outpatient departments, and emergency departments: United States, 1999–2000. Vital Health Stat 13.2004 Sept(157):1-70.
14. Zeng Y, Sheller B, Milgrom P. Epidemiology of dental emergency visits to an urban children's hospital. Pediatr Dent 1994;16:419-23.
15. Graham DB, Webb MD, Seale NS. Pediatric emergency room visits for nontraumatic dental disease. Pediatr Dent 2000;22:134-40.
16. Pennycook A, Makower R, Brewer A, Moulton C, Crawford R. The management of dental problems presenting to an accident and emergency department. J R Soc Med 1993;86:702-3.
17. Gibson GB, Blasberg B, Hill SJ. A prospective survey of hospital ambulatory dental emergencies, Part 1: patient and emergency characteristics. Spec Care Dentist 1993;13:61-5.
18. Waldrop RD, Ho B, Reed S. Increasing frequency of dental patients in the urban ED. Am J Emerg Med 2000;18:687-9.
19. 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 2002;133:715-24.
20. Cohen LA, Magder LS, Manski RJ, Mullins CD. Hospital admissions associated with nontraumatic dental emergencies in a Medicaid population. Am J Emerg Med 2003;21:540-4.
21. Mullins CD, Cohen LA, Magder LS, Manski RJ. Medicaid coverage and utilization of adult dental services. J Health Care Poor Underserved 2004;15:672-87.
22. Clark MM, Album MM, Lloyd RW. Medical care of the dental patient. Am Fam Physician 1995;52:1126-32.
23. Pyle MA, Terezhalmy GT. Oral disease in the geriatric patient: the physician's role. Cleve Clin J Med 1995;62:218-26.
24. Venugopal T, Kulkarni VS, Neruker RA, Patnekar PN. Role of pediatricians in dental caries. Indian J Pediatr 1998;65:85-8.
25. Woodwell DA, Cherry DK. National Ambulatory Medical Care Survey: 2002 summary. Advanced data from vital and health statistics; no. 346. Hyattsville, Md: National Center for Health Statisitcs, 2004.
26. Goodman HS, Yellowitz JA, Horowitz AM. Oral cancer prevention; the role of family practitioners. Arch Fam Med 1995;4:585-6.
27. Mason C, Porter SR, Madland G, Parry J. Early management of dental pain in children and adolescents. J Dent 1997;25:31-4.
28. Lewis CW, Grossman DC, Domoto PK, Deyo RA. The role of the pediatrician in the oral health of children: a national survey. Pediatrics 2000; 106:E84.
29. Meskin L. Look who's practicing dentistry. J Am Dent Assoc 2001; 132:1352, 1354, 1356, 1358.
30. Riley JL, Gilbert GH, Heft MW. Health care utilization by older adults in response to painful orofacial symptoms. Pain 1999;81:67-75.
31. Cohen LA, Manski RJ, Magder LS, Mullins CD. A Medicaid population's use of physicians' offices for dental problems. J Am Pub Health Assoc 2003;93:1297-1301.
32. Brown LJ, Wall TP, Lazar V. Trends in caries among adults 18 to 45 years old. J Am Dent Assoc 2002;133:827-34.
33. US Department of Health and Human Services. A national call to action to promote oral health. Rockville, Md: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention and the National Institutes of Health, National Institute of Dental and Craniofacial Research. NIH publication no. 03-5303. Washington, DC: US Department of Health and Human Services, May 2003.
34. Stewart DCL, Ortega AN, Dausey D, Rosenheck R. Oral health and use of dental services among Hispanics. J Public Health Dent 2002;62:84-91.
35. Rosenberg D, Kaplan S, Senie R, Badner V. Relationship among dental functional status, clinical dental measures, and generic health measures. J Dent Educ 1988;52:653-7.
36. Kressin N, Spiro A, Bosse R, Gracia R, Kazis L. Assessing oral health quality of life: findings from the normative aging study. Med Care 1996;34:416-27.
37. MEPS HC-060: 2001 full year consolidated data file, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, April 2004.
38. HC-059A: 2001 prescribed medicines, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, February 2004.
39. MEPS HC-059C: 2001 other medical expenses, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, December 2003.
40. MEPS HC-059D: 2001 hospital inpatient stays, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, January 2004.
41. MEPS HC-059E: 2001 emergency room visits, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, January 2004.
42. MEPS HC-059F: 2001 outpatient department visits, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, January 2004.
43. MEPS HC-059G: 2001 office-based medical provider visits, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, January 2004.
44. MEPS HC-059H: 2001 home health visits, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, December 2003.
45. MEPS HC-061: 2001 medical conditions, Center for Financing, Access, and Cost Trends, Agency for Healthcare Research and Quality. Rockville, Md: Agency for Healthcare Research and Quality, April 2004.
46. www.meps.ahrq.gov/WhatIsMEPS/Overview.htm.
47. International classification of diseases, ninth revision, clinical modifications. Publication (PHS) 91-1260. Washington, DC: US Department of Health and Human Services, 1989.
48. National Center for Health Statistics (NCHS). Current estimates from the National Health Interview Survey, 1996. Series 10, no. 200. Hyattsville, Md: Public Health Service, 1996.
49. Vargas CM, Macek MD, Marcus SE. Sociodemographic correlates of tooth pain among adults: United States, 1989. Pain 2000;85:87-92.
50. Institute of Medicine Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. Unequal treatment: confronting racial and ethnic disparities in health care. Washington, DC: National Academy Press, 2002.
51. Like R, Steiner P, Rubel A. Recommended core curriculum guidelines in culturally sensitive and competent health care. Fam Med 1996;28(4):291-7.
52. Formicola AJ, Stavisky J, Lewy R. Cultural competency: dentistry and medicine learning from one another. J Dent Educ 2003:67:869-75.
53. Schneider D, Schneider K. Medicaid dental care for adults: a vanishing act. Paper presented at the National Oral Health Conference, April 28, 2003, Milwaukee, Wisconsin.
54. Burgess J, Byers MR., Dworkin SF. Pain of dental and intraoral origin. In: Bonica JJ, ed. The management of pain, 1. Philadelphia: Lea and Febiger, 1990.
55. Ma M, Lindsell CJ, Jauch EC, Pancioli AM. Effect of education and guidelines for treatment of uncomplicated dental pain on patient and provider behavior. Ann Emerg Med 2004;44:323-9.