

Emergency Department Utilization by Native American Children

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Objectives: The aims of this study were to determine differences in emergency department (ED) use by Native American (NA) children in rural and urban settings and identify factors associated with frequent ED visits.

Methods: This cross-sectional, cohort study examined visits to 6 EDs: 2 rural, 2 midsize urban, and 2 large urban EDs from June 2011 to May 2012. Univariate and multiple regression analyses were conducted. Frequent ED visitors had more than 4 visits in the study period.

Results: We studied 8294 NA visits (5275 patients) and 44,503 white visits (33,945 patients). Rural EDs had a higher proportion of NA patients, those below 200% of the income poverty level, and those who traveled more than 10 miles from their residence to attend the ED (all $P < 0.05$) compared with midsize and urban EDs. Native American patients had a high proportion of mental health diagnoses compared with whites (4.9% vs 1.9%, $P < 0.001$). Frequent ED visitors had greater odds of NA race, age younger than 1 year, public insurance, female sex, residence within less than 5 miles from the ED, and chronic disease.

Conclusions: Native American children seem to have greater challenges compared with whites obtaining care in rural areas. Native American children were more likely to be frequent ED visitors, despite having to travel farther from their residence to the ED. Native American children visiting rural and midsize urban EDs had a much higher prevalence of mental health problems than whites. Additional efforts to provide both medical and mental health services to rural NA are urgently needed.

Key Words: Native American, race, rural, urban

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Many children receive treatment in the emergency department (ED) for nonemergent conditions that could likely be appropriately treated in a primary care clinic.^{1–17} Many factors have been associated with frequent ED visits in adults^{3,10,12,14,16,18–21} and pediatric patients,^{6,11,13,22–25} in both urban^{8,14} and rural settings.^{7,11} Children with socioeconomic disadvantage, such as those on public insurance, some racial groups, and perhaps those in urban location, seem to be frequent ED users when compared with non-Hispanic white children on private insurance.^{6,11,15,17,22–24} Lack of primary care access, residence in close proximity to the ED, visits to the ED in the afternoon or early evening, urban location, younger age, mental health issues, chronic medical conditions,

and minority race/ethnicity have all been associated with frequent ED visits.^{4,7,11,14,16,24,26}

Despite these many reports, ED utilization by Native American (NA) children has not been well characterized. As a racial group, NA patients are often underrepresented or combined with other racial groups, presumably because NA patients often constitute too small a fraction of the study sample to facilitate reliable analyses.^{10–12,15,19,23} Native American children seem to have higher ED utilization rates, poorer health status, and higher infant/pediatric mortality and live in a greater degree of poverty compared with white children and even other minorities.^{27,28} Although modest progress has been made in reducing some disparities, NA children are still less likely to receive necessary preventive care, to have a physician visit in the last 12 months, and to have routine preventive dental care in the last 12 months compared with white children.²⁹ Because many NA children live in rural areas, it also is not clear how the size of their community might influence ED utilization.

The purpose of our study was to better understand ED utilization by NA children. We hypothesized that (1) NA children would be more likely to visit the ED frequently in rural settings compared with urban and semiurban areas, presumably because of low primary care access and that (2) other demographic and clinical factors associated with frequent ED visits by NA children would vary in rural versus semiurban or urban areas.

METHODS

Study Design and Sample

This cross-sectional study examined all pediatric patients (<18 years old) who visited 6 different EDs in Minnesota and South Dakota from June 1, 2011, to May 31, 2012. Researchers electronically extracted data from each of the 6 participating hospitals' medical records and sent them to a central site where research staff cleaned, deidentified, and merged the data into a single database. Patients who died or were discharged to a correctional facility were excluded (Fig. 1). Institutional review boards of all participating hospitals approved this study.

There were 2 large urban EDs that are located in metropolitan centers (population $\geq 250,000$). One of the urban sites is located in the neighborhood with the largest concentration of NA in an urban area in the Upper Midwest. Multiple primary care clinics are available to NA patients of all ages in these areas, some of which require no insurance and provide free transportation. The 2 urban EDs are not close to reservations and primarily care for urban NA patients. The 2 midsize urban centers (population 70,000 and 170,000) serve primarily NA patients living in those cities, although both have reservations approximately 40 miles from the ED. The 2 rural sites (population <20,000) are approximately 30 miles from NA reservations.

Outcome Measures and Clinical Definitions

The primary outcome was the number and characteristics of frequent ED visitors. We defined frequent ED visitors as those

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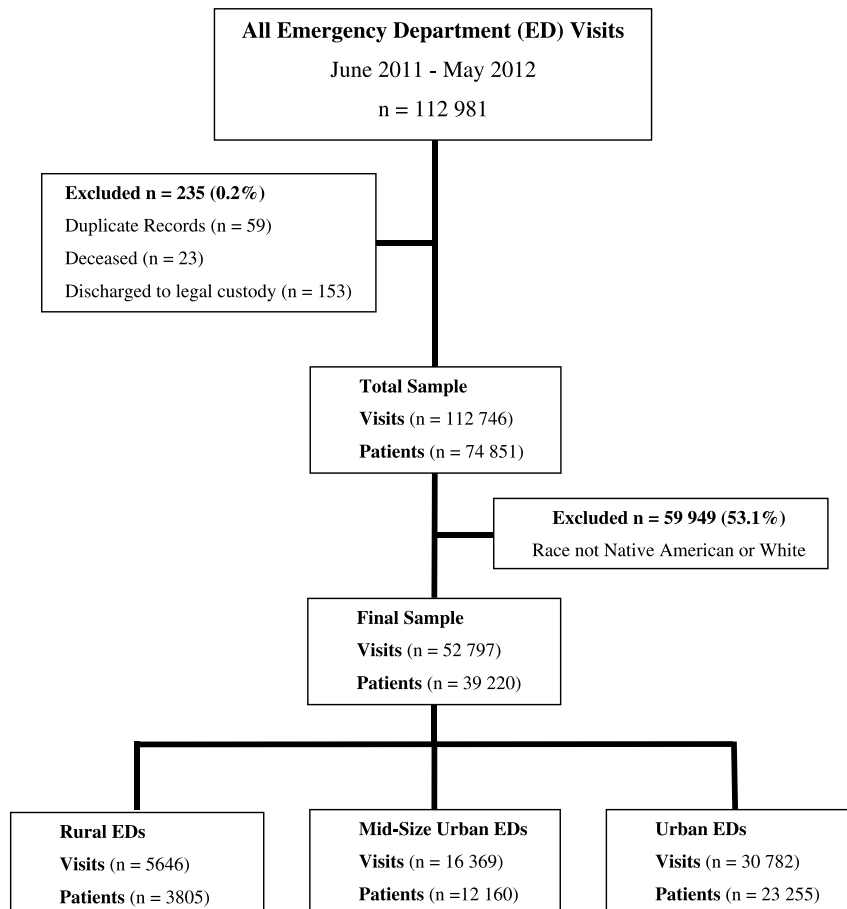


FIGURE 1. Flow diagram of study sample. Percentages are out of the original sample of 59,719 ED encounters.

with 4 or more ED visits in the study period.^{1,15,19} Secondly, we examined the characteristics of NA ED visits by rural, mid-size urban, and large urban ED location. Patients were dichotomized into those with 1 to 3 versus 4 or more total visits. Previously identified, clinical and demographic factors were assessed to evaluate their association with ED visit and frequent ED utilization.

Other clinical variables were defined using standard definitions where available. We defined chronic disease using the Agency for Healthcare Research and Quality Chronic Condition Indicator software.^{15,30,31} Patients were considered to have a chronic condition if they had a chronic condition at any ED visit. Patients were assigned the median income for the zip code in which they resided using Truven Health Analytics (Ann Arbor, Mich) data. Median income as a percentage of the national poverty level was used as an estimate of socioeconomic status³² and grouped as below 200% of the poverty level, above 200% but below 300% of the poverty level, and above 300% of the poverty level for a family of 2 adults and 2 children. The threshold poverty income level for a family of 2 adults and 2 children in 2012 was \$23,283.³³ Race was self-/parent-reported at registration, as was sex. Triage level was recorded differently at the participating EDs and could not be compared. For example, whereas most EDs used the 5-level Emergency Services Severity Index, version 4,³⁴ some used another method, including one that used a 3-level triage system. Insurance type was categorized as private, public, or other. Prepaid medical assistance plans were included in the public insurance category.

We calculated the distance between the patient's residence and the ED from the center of the patient's zip code to the treating ED using SAS (SAS Institute, Cary, NC). The amount of time between each visit was calculated in hours for patients with multiple visits.

Statistical Analysis

Independent variables were selected based on our hypothesized association with ED visits, which was based on previously published studies^{2,6,7,9,11,13,15,35} and available study data. For multiple logistic regression, we included all variables with a significant association with frequent ED attendance using a $P < 0.1$ in univariate analysis. For the final regression model, we included all variables with a $P < 0.05$. We examined all variables for an interaction with race and also for an interaction between distance from the ED and rural versus midsize urban versus urban location. Statistical analyses were performed using Stata version 14.1 (Stata Corp, College Station, Tex).

To assess the sensitivity of the original model, we redefined our primary outcome variable to include only visits occurring more than 48 hours after a previous visit¹⁵ and repeated our analysis. We also attempted to account for the influence of hospital-level characteristics, using a hierarchical model and logistic regression (Stata routine "xtmelogit"), grouping patients by hospital. Finally, racial classification was missing from 21.5% (1327/6182) of the visits at 1 ED. Multiple imputations were used for the missing race values on the basis of the following variables: age, language, insurance, distance from the ED, hospital, and the presence of a chronic condition. We used 20 imputations, repeating our logistic

regression analysis for each imputed data set and then combined the results using Stata's Multiple Imputation suite of commands. $P < 0.05$ indicated statistical significance, and we did not adjust for multiple comparisons in the univariate analyses.

RESULTS

Demographic Characteristics Visits

Our total study sample included 112,746 visits of which NA and white patients constituted 52,797 ED visits and 39,220 patients (Fig. 1). The 5275 NA patients contributed 8294 visits,

and the 33,945 white patients contributed 44,503 visits. There were notable differences among the 6 EDs. The rural EDs and the midsize urban EDs had a much higher proportion of NA pediatric visits compared with the urban EDs (Table 1). Compared with midsize and large urban EDs, rural location was positively associated with public insurance, income of below 200% of the poverty level (based on median zip code income), and travel of more than 10 miles from the patients' residence to the ED (Table 1). Rural EDs had lower rates of hospital admission/transfer and lower rates of most chronic diseases compared with the urban EDs (Table 1). Other demographic features of ED visits are shown in Table 1.

TABLE 1. Demographics of ED Visits by Site

	Rural*†	Mid-Size Urban*†	Large Urban*†	Total†
Visit characteristics	6.3% (7147)	16.6% (18,677)	77.1% (86,922)	100% (112,746)
Racial/ethnic group‡				
Whites	41.2% (2943)	65.4% (12,211)	33.8% (29,349)	39.5% (44,503)
NA	37.8% (2703)	22.3% (4158)	1.7% (1433)	7.4% (8294)
African American	0.9% (64)	4.8% (888)	30.2% (26,281)	24.2% (27,233)
Asian	0.3% (22)	1.2% (222)	4.4% (3799)	3.6% (4043)
Hispanic	0.4% (31)	1.9% (354)	15.8% (13,740)	12.5% (14,125)
Other	0.8% (54)	2.9% (550)	10.4% (8994)	8.5% (9598)
Missing	18.6% (1330)	1.6% (294)	3.8% (3326)	4.4% (4950)
Language‡				
English	13.5% (964)	99.1% (18,500)	75.1% (65,257)	75.1% (84,721)
Spanish	0% (0)	0.4% (83)	12.0% (10,410)	9.3% (10,493)
Other	0.01% (1)	0.4% (77)	12.6% (10,965)	9.8% (11,043)
Missing	86.5% (6182)	0.1% (17)	0.3% (290)	5.8% (6489)
Age‡				
<1 y	16.2% (1157)	10.4% (1940)	18.0% (15,672)	16.7% (18,769)
1–4 y	32.6% (2333)	36.4% (6799)	40.7% (35,332)	39.4% (44,464)
5–10 y	23.5% (1682)	24.1% (4505)	25.1% (21,785)	24.8% (27,972)
11–17 y	27.6% (1975)	29.1% (5433)	16.3% (14,133)	19.1% (21,541)
Sex				
Female	47.9% (3425)	48.0% (8965)	46.5% (40,456)	46.9% (52,846)
Male	52.1% (3722)	52.0% (9712)	53.5% (46,466)	53.1% (59,900)
Insurance type‡				
Public	71.7% (5124)	62.0% (11,581)	62.3% (54,125)	62.9% (70,830)
Private	26.5% (1895)	26.7% (4978)	37.7% (32,748)	35.2% (39,621)
Other	1.8% (128)	11.3% (2116)	0% (0)	2.0% (2244)
Income level‡§				
<2× Poverty level	84.2% (6018)	51.4% (9604)	49.9% (43,382)	52.3% (59,004)
2–3× Poverty level	10.1% (718)	38.1% (7106)	30.0% (26,109)	30.1% (33,933)
>3× Poverty level	1.0% (77)	4.3% (795)	19.3% (16,754)	15.6% (17,619)
Missing	4.8% (341)	6.3% (1172)	0.8% (677)	1.9% (2190)
Distance from ED‡				
<5 Miles	47.4% (3388)	58.0% (10,823)	47.1% (40,954)	48.9% (55,165)
5–10 Miles	1.3% (90)	16.5% (3083)	27.7% (24,085)	24.2% (27,258)
>10 Miles	51.3% (3669)	25.5% (4771)	25.2% (21,883)	26.9% (30,323)
Chronic condition‡				
None	90.7% (6480)	89.8% (16,769)	82.2% (71,484)	84.0% (94,733)
Chronic	9.3% (667)	10.2% (1908)	17.8% (15,438)	16.0% (18,013)

*Rural location was defined as population of less than 50,000, midsize urban as 50,000 to 250,000 population, urban as population > 250,000.

†Numbers represent % (n) of ED visits with the row characteristic within the column group.

‡Significant difference ($P < 0.001$) between sites using χ^2 tests.

§Patients were assigned the median income for the zip code in which they resided. The poverty threshold for a family of 2 adults and 2 children was \$23,283 in 2012.

TABLE 2. Characteristics of ED Patients by Race and City Size

Characteristics	Rural (n = 3805)		Midsize Urban (n = 12,160)		Large Urban (n = 23,255)		Total (n = 39,220)	
	NA* (n = 1680 [44.2%]) [†]	Whites [†] (n = 2125 [55.9%])	NA (n = 2779 [22.9%])	Whites (n = 9381 [77.2%])	NA (n = 816 [3.5%])	Whites (n = 22,439 [96.5%])	NA (n = 5275 [13.5%])	Whites (n = 33,945 [86.6%])
Median income <200% of poverty level	1510 (91.7%)	1630 (82.6%)	2129 (82.1%)	3593 (41.4%)	589 (72.7%)	4214 (19.0%)	4228 (83.8%)	9437 (28.8%) [‡]
Distance from the ED >10 miles	1166 (69.4%)	918 (43.2%)	958 (34.5%)	2705 (28.8%)	125 (15.3%)	11,440 (51.0%)	2249 (42.6%)	15,063 (44.4%) [§]
Any chronic condition	118 (7.0%)	137 (6.5%)	345 (12.4%)	591 (6.3%)	87 (10.7%)	2706 (12.1%)	550 (10.4%)	3434 (10.1%)
Asthma	46 (2.7%)	28 (1.3%)	62 (2.2%)	150 (1.6%)	54 (6.6%)	779 (3.5%)	162 (3.1%)	957 (2.8%)
Mental health diagnosis	38 (2.3%)	54 (2.5%)	214 (7.7%)	243 (2.6%)	4 (0.5%)	349 (1.6%)	256 (4.9%)	646 (1.9%) [‡]
≥4 ED visits in year	99 (5.9%)	49 (2.3%)	113 (4.1%)	201 (2.1%)	72 (8.8%)	472 (2.1%)	284 (5.4%)	722 (2.1%) [‡]
Left without being seen	71 (4.2%)	52 (2.5%)	35 (1.3%)	90 (1.0%)	43 (5.3%)	373 (1.7%)	149 (2.8%)	515 (1.5%) [‡]
Admit or transfer to hospital	76 (4.5%)	52 (2.5%)	78 (2.8%)	642 (6.8%)	97 (11.9%)	4607 (20.5%)	251 (4.8%)	5301 (15.6%) [‡]
ED return at <49 h	42 (2.5%)	45 (2.1%)	45 (1.6%)	147 (1.6%)	16 (2.0%)	493 (2.2%)	103 (2.0%)	685 (2.0%)

*Whites = Non-Hispanic white.

[†]Numbers represent % (n) of patients with the row characteristic within the column group.

[‡] $P < 0.001$ by χ^2 analysis.

[§] $P = 0.018$.

Demographic and Clinical Characteristics of Patients

Some patients had multiple visits overweighting their impact on the findings; thus, subsequent analysis was restricted to patients, instead of visits (Table 2). Native American patients, especially rural NA patients, differed in several respects from white patients. Rural NA and white patients had lower estimated income than did patients seen at midsize or large urban EDs, but in each location, NA patients had a lower estimated income than did white patients (Table 2). Rural NA patients had a higher percentage of patients traveling more than 10 miles to the ED than did white patients (69.4% vs 43.2%, $P < 0.001$; Table 2). Compared with urban patients, rural and midsize urban NA ED patients were more likely than white patients to have asthma and other chronic diseases (Table 2). Native American patients had a particularly high prevalence of mental health diagnoses (4.9% vs 1.9%, $P < 0.001$).

Frequent ED Visits

Multiple visits accounted for 25.7% of all NAs' and whites' visits (n = 13,577/52,797). There were 6030 visits (11.4% [6030/52,797]) by patients who were frequent users (>4 ED visits in the study period). Characteristics associated with frequent ED visitors varied by geographic site and racial group. By univariate analysis, all 3 settings (rural, midsize urban, and large urban) were associated with a higher prevalence of frequent ED visitors among NA compared with white patients ($P = 0.029$ to 0.001; Table 2). Urban NA patients were more likely than either rural or midsize urban patients to be frequent visitors. We did not have sufficient patients to determine if rural and midsize urban NA patients differed in the prevalence of frequent ED visits. A chronic health

condition, public insurance, median zip code income of below 200% of the poverty level, rural location, female sex, living within less than 5 miles from the ED, and age younger than 1 year were all associated with frequent ED visits by univariate regression (Table 3).

Multiple regression analysis largely confirmed the univariate analysis; however, there were site differences (Table 3) and 2 significant interactions (Figs. 2A, B). By multiple regression analysis, frequent visitor status was associated with NA race, age younger than 1 year, public insurance, female sex, and residence less than 5 miles from the ED (Table 3). Estimated income was not a significant predictor of frequent visits when insurance status was included. After adjusting for covariates and interactions, NA race was associated with a higher predicted probability of being a frequent ED visitor at urban and rural locations, but not at the 2 midsize urban EDs (Fig. 2A). Chronic conditions increased the odds of being a frequent visitor, among both white and NA patients, but had a smaller effect in the case of NA patients (Fig. 2B).

Sensitivity Analyses

We performed 3 sensitivity analyses to assess our findings with regard to frequent ED visitors. First, patients were recategorized as frequent visitors after excluding repeat visits to the ED that occurred at less than 48 hours from the initial visit. This reduced the number of frequent visitors from 1179 to 1006. There were no differences in significant associations, including the interactions. Second, we repeated our model analysis using each site as a hierarchical variable. There were no changes in significant associations or interactions. Finally, there was 1 site that had 21.5% of racial classifications missing. We performed

TABLE 3. Unadjusted and Adjusted Odds Ratios for Frequent ED Attendees

Patient Characteristics	OR* (95% CI)	aOR* (95% CI)
Age		
11–17 y	1.0	1.0
<1 y	2.855 (2.408–3.384) [†]	3.356 (2.803–4.019) [†]
1–4 y	1.370 (1.163–1.615) [†]	1.643 (1.384–1.950) [†]
5–10 y	0.772 (0.634–0.940) [§]	0.854 (0.697–1.046) [‡]
Insurance type		
Private	1.0	1.0
Public	3.687 (3.246–4.187) [†]	3.175 (2.745–3.672) [†]
Other	1.017 (0.671–1.544) [‡]	1.467 (0.942–2.284) [‡]
Sex		
Male	1.0	1.0
Female	1.171 (1.043–1.315) [§]	1.202 (1.067, 1.355) [§]
Distance to ED		
>10 Miles	1.0	1.0
5–10 Miles	1.354 (1.140–1.607) [§]	1.648 (1.375–1.976) [†]
<5 Miles	2.086 (1.827–2.381) [†]	2.317 (2.006–2.676) [†]
Chronic condition [¶]		
No chronic condition	1.0	1.0
Any chronic condition	4.375 (3.851–4.971) [†]	6.494 (5.573–7.568) [†]
Urban location [#]		
Large urban (>100,000)	1.0	1.0
Midsized urban (50,000–100,000)	1.063 (0.933–1.211) [‡]	0.782 (0.659–0.933) [§]
Rural (<50,000)	1.629 (1.371–1.936) [†]	0.828 (0.618–1.109) [‡]
Race		
Whites	1.0	1.0
NA [¶]	2.432 (2.130–2.778) [†]	2.122 (1.598–2.817) [†]
Interaction of NA and chronic disease		
Whites × chronic condition		1.0
NA × chronic condition		0.461 (0.328–0.649) [†]
Interaction of race and urban location		
Whites × urban location		1.0
NA × rural		1.163 (0.753–1.795) [‡]
NA × midsized urban		0.631 (0.445–0.895) [§]

*Odds ratio (OR) and adjusted odds ratio (aOR) of 4 or more ED visits in the 12-month study period. Adjustors chosen on the basis of their presumed association with frequent ED visits.

[†] $P \leq 0.001$.

[‡] $P \geq 0.05$ (not significant).

[§] $P = 0.001–0.01$.

^{||}Distance from center of patient's zip code to the ED attended (see Methods).

[¶]Determined using definitions found in reference.

[#]Numbers in parentheses refer to population of the city in which the ED was located (based on 2010 census estimates, see Methods).

CI indicates confidence interval.

multiple (20) imputations of the missing race values and then repeated the original analysis. Again, there were no changes in significant findings or interactions.

DISCUSSION

Our findings on ED utilization by NA patients emphasize the challenges facing NA children seeking care at an ED, especially those who live in rural areas. More than 90% of rural NA patients lived in households with incomes below 200% of the poverty level, and almost 70% traveled more than 10 miles to reach the ED (Table 2). Despite their longer travel distance to rural EDs,

rural NA patients were more likely to be frequent ED visitors compared with rural white patients (Table 3). This suggested limited primary care access for NA children and/or the parent's/guardian's belief that the patient needed urgent care. Between 1 in 14 and 1 in 40 NA patients presented to a rural ED with a mental health diagnosis (Table 2). Interestingly, rural NA patients had a lower prevalence of asthma and any chronic disease compared with NA patients presenting to an urban ED (Table 2). This could represent underdiagnosis or relocation to seek care for a child with chronic illness. Rural NA ED patients were hospitalized less often than urban NA ED patients. This may be partially explained by a higher prevalence of chronic disease in

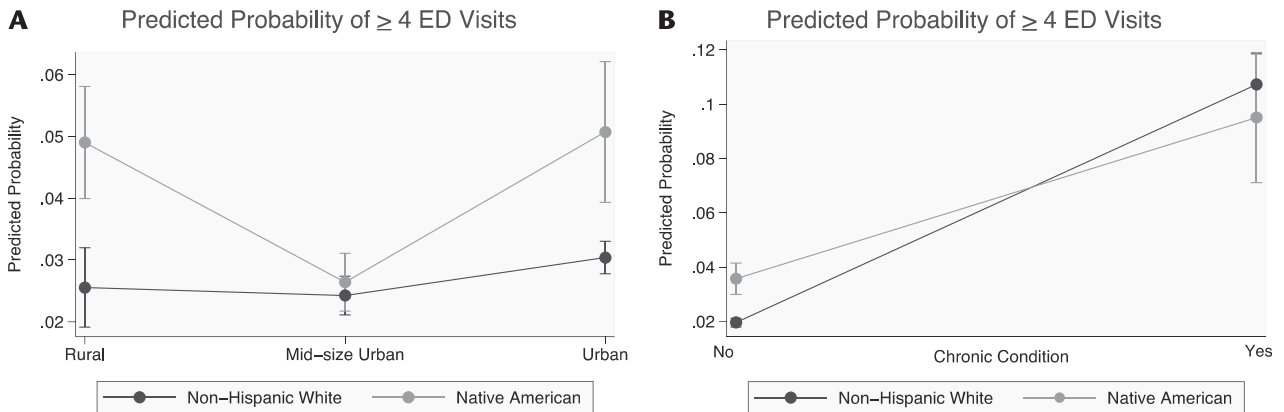


FIGURE 2. Predicted probability graphs illustrating the interaction between race and chronic disease (A) and race and ED location (B). Along the y axis is the predicted probability of being a frequent ED visitor (>4 ED visits in the study period). Along the x axis are the categorical values of ED location (rural/midsize/urban, A) and chronic disease (yes/no, B).

urban than in rural NA patients or a greater tendency to treat rural patients on an outpatient basis. All of these findings highlight the very significant health and care challenges that NA patients face in rural, midsize urban, and urban areas.

Previous work has shown that rural NA patients carry a high burden of injuries and illness compared with those living in urban areas.^{28,36,37} Our findings confirm and help to characterize that burden. Native American children living in rural areas may also be served by the Indian Health Service (IHS) facilities.^{38,39} It has been reported that some IHS emergency medical services may lack the resources to treat pediatric patients.^{38,39} This might force NA children to visit emergency rooms of non-IHS facilities and travel long distances to obtain needed emergency care. Although regionalization might improve the availability of services,⁴⁰ travel distances might not improve. Our finding of a high proportion of ED visits associated with mental health conditions in all NA patients compared with whites was similar to the observations of others.³⁵

Higher proportions of NA patients were frequent ED visitors compared with white patients at rural, midsize urban, and urban EDs (Table 2). Urban location had the highest prevalence of NA frequent ED visitors (Table 3). However, in multiple regression analysis, there was a significant interaction of race and location such that at midsize urban EDs NA race was not statistically associated with a higher predicted probability of being a frequent ED visitor (Fig. 2A). We also found an interaction between race and chronic disease indicating that chronic disease was less likely to predict frequent ED visits in NA than in white patients (Fig. 2B). Taken together, these data suggest that availability of primary care access, chronic disease, distance of residence from the ED, and other factors influence the frequency of ED visits by NA patients.

Common characteristics among frequent ED users at all locations suggest opportunities for intervention, primarily through better access to consistent primary care. The highest odds for being a frequent ED visitor were associated with public insurance, age younger than 1 year, proximity to the ED, NA race, and chronic disease. Perhaps, interventions directed at first-time mothers, whose neonates and infants have increased ED utilization,¹³ would provide reassurance and guidance for their children's first-year illnesses without attending the ED. The weaker association of chronic disease and frequent ED visits in NA compared with white patients (Fig. 2B) is concerning and might mean that NA patients are not receiving sufficient care. Previous reports have shown that primary care access has not improved over recent years for most

NAs.⁴¹ Taken together, our findings suggest that NA patients might not be receiving needed care, despite frequenting the ED.

However, simply providing more primary care access may not reduce frequent ED visits.^{8,14} Many NA patients harbor a deep distrust of health care institutions, more so than white patients.⁴² Therefore, there may be emotional barriers to establishing a consistent source of care. Furthermore, some parents may not distinguish between their child's serious and less urgent conditions, perceiving an illness as severe that ED personnel would assess as minor.^{1,2,6,9,19,43,44} This further suggests that assessing health literacy, providing care navigation, and improving health care education might lead to more appropriate ED use.^{21,45} To address many of the inconsistencies of care will require a thoughtful, culturally sensitive approach to care.

Strengths

This multicenter study had several unique features. First, our study reports one of the largest numbers of NA pediatric ED patients (5275 children and 8294 ED visits) that we have found. We accrued sufficient NA patients to assess their ED utilization apart from other racial groups. Second, we included patients treated at rural and midsize large urban hospital EDs, which we believe provides a more complete picture of NA ED utilization and makes our results potentially generalizable to a large number of EDs. We also examined both clinical and demographic factors associated with ED attendance, such as income, distance of residence from the ED, and the presence of chronic disease.

Limitations

Our data come only from EDs in the Upper Midwest, and results from other regions might differ. We were limited to the potential covariates that were present in our electronically extracted data. Our data include only ED returns to the same institution. Other authors have documented that frequent ED utilizers may visit more than 1 ED.⁴ Without data from all EDs in our region, it is likely that we have underestimated the number of frequent ED visitors. Race classification was missing from 21.5% of ED visits from 1 hospital, but we were able to use multiple imputations to partially compensate for the missing data.

CONCLUSIONS

Our study suggests that NA children have greater challenges than whites obtaining care in rural areas. Native American children were more likely to be frequent ED visitors, despite having

to travel farther from their residence to the ED and greater poverty. Native American children visiting rural and midsize urban EDs had a much higher prevalence of mental health problems than whites. Additional efforts to provide both medical and mental health services to rural NA are urgently needed.

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