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Research Paper

Emergency Department utilization among Deaf American Sign Language users

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Abstract

Background: Deaf American Sign Language (ASL) users comprise a linguistic minority population with poor health care access due to communication barriers and low health literacy. Potentially, these health care barriers could increase Emergency Department (ED) use.

Objective: To compare ED use between deaf and non-deaf patients.

Method: A retrospective cohort from medical records. The sample was derived from 400 randomly selected charts (200 deaf ASL users and 200 hearing English speakers) from an outpatient primary care health center with a high volume of deaf patients. Abstracted data included patient demographics, insurance, health behavior, and ED use in the past 36 months.

Results: Deaf patients were more likely to be never smokers and be insured through Medicaid. In an adjusted analysis, deaf individuals were significantly more likely to use the ED (odds ratio [OR], 1.97; 95% confidence interval [CI], 1.11–3.51) over the prior 36 months.

Conclusion: Deaf American Sign Language users appear to be at greater odds for elevated ED utilization when compared to the general hearing population. Efforts to further understand the drivers for increased ED utilization among deaf ASL users are much needed.

Keywords: Deaf; Emergency Department utilization; Health access; LEP populations; Disabilities

Patterns of Emergency Department (ED) utilization provide a good opportunity to evaluate existing access to health care and potential barriers to routine care in the general population.[1] Higher rates of inappropriate ED utilization can lead to a variety of poorer health outcomes such as decreased preventive care services receipts, increased inpatient hospitalizations, lower satisfaction with health care, and higher health care costs.[2,3] National data show that one in five adult Americans (20.1%) utilized emergency room services in the last 12 months with this proportion varying on the basis of age, gender, race, educational achievement, income and status.[4] Another study estimated that 23% of Americans visited the ED at least once, with 92% of those going to the ED 3 or less times in the previous 12 months.[5]

Certain populations are at higher risk for increased ED utilization: female gender, elderly age, African-American race, poverty, low educational achievement, poorer health status, poor mental health, frequent use of outpatient services and those reported having no usual source of care.[4,5] Surprisingly, immigrant populations and linguistic minority groups appear to be at lower risk for ED use.[6,7]

Deaf American Sign Language (ASL) users represent a population group that is also considered to be a cultural and linguistic minority population[8,9] yet little is known about their use of ED care. ASL is commonly misunderstood to be a gestural language or a visual "English" language. ASL contains its own syntax and language structure, which is distinct from English and does not have a written form.[8,9] There is anecdotal evidence demonstrating higher than average ED use by deaf ASL users likely due to their existing language, communication, and cultural barriers in the health care setting. The lack of linguistic and cultural concordance among health care providers places the deaf population at high-risk for inappropriate health care use. Despite the vulnerability and the size of the population (estimated to be ~500,000 to 1 million),[10,11] health care utilization and patterns remain poorly understood in this group.

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The primary objectives of this study were: 1) to evaluate whether deaf ASL users appear to be at higher odds for ED utilization compared to the general population and; 2) identify characteristics associated with ED utilization in the deaf population.

Methods

The data source was medical records obtained from a large non-hospital affiliated primary care based outpatient health center in the Rochester, New York region. It was selected due to its diverse patient panel, including a large number of deaf ASL users, and records of language preferences by its patients. The health center was also selected due to its acceptance of both public- and private-based insurance. We used May 1, 2009–April 30, 2012 chart data from the designated health center's electronic medical records to compare ED utilization among deaf and non-deaf patients. A report on the patient panel was generated listing patients by their known language preferences. Using this list of patients, we randomly selected 200 deaf ASL users and 200 hearing English speakers. These patients were established health center patients representing the patient panels of multiple primary care providers (i.e. family medicine and internal medicine physicians). Both the University of Rochester Research Subjects Review Board and the health center where the data were collected approved the study protocol.

One of the authors trained a research assistant to abstract electronic medical record data from the targeted health center. A standardized chart abstraction tool was used. Independent chart abstraction review was done by the principal investigator on 10% of the charts for quality assurance. The percent agreement between raters for these variables was high, ranging from a low of 90% (smoking history) to a high of 100% for most variables (mean of 98.75%). This chart abstraction review was done throughout the data abstraction to provide regular feedback to the research assistant to further enhance the quality of the data abstracted.

Data abstracted included: age, gender, insurance type, educational attainment, race, ethnicity, and smoking history and status. Each chart was reviewed for ED use during the assigned time period (2009–2012). We categorized any ED records documenting ED use in the previous 36 months as "Yes" or "No." We also recorded the date and frequency of the ED visits to assess repeat ED utilization. The ED use was not restricted to any specific hospital. Any ED use regardless of location and type were included in the study. Because educational attainment was poorly documented in most clinical charts of the randomly selected participants (194 of 400 lacked educational attainment documentation), it was not used in the analysis. Race and ethnicity documentation was inconsistent but less so than educational attainment. Annual household income was not available; Medicaid was used as a surrogate measure for poverty. Medicare was not used in the model since it was strongly correlated with hearing loss (due to the association of hearing loss with aging and disability). Smoking history and status was inconsistently documented in many of the subjects' chart. For example, the patient chart had a designated area to document patient's smoking history but some providers occasionally documented the smoking use via free text in the patient's note instead. This led to the lower percent agreement between reviewers within that variable.

Statistical analysis

Demographic characteristics relevant to ED use were compared between deaf and hearing persons using *t*-test or chi-square for continuous and categorical data, respectively. A univariate analysis was also conducted to identify associations with ED use among deaf patients. This was conducted to identify potential demographic factors that increase the odds of using the ED in the deaf sample. Finally, we assessed the association between the primary independent variable (i.e. deaf versus hearing) and ED use over the past 36 month study period using logistic regression that controlled for available demographics (sex, age, race/ethnicity, smoking status, and insurance type). Each of these demographic factors was incorporated into the model due to their relevance with ED use in the general population.[4] All statistical analyses were conducted using SAS version 9.3 (SAS Institute, Inc, Cary, NC).

Results

Deaf patients were more likely to be never smokers and more often to have public insurance (Table 1). The only statistically significant demographic differences among deaf ED users versus deaf non-ED users were age and insurance type (Table 2). In an adjusted analysis, the odds of a deaf individuals was 1.97 times as likely to have an ED visit over the past 36 months (odds ratio [OR], 1.97; 95% confidence interval [CI], 1.11–3.51; Table 3) compared to hearing peers.

Other predictors of ED use included being female (OR, 1.82; 95% CI, 1.05–3.15), black (OR, 3.20; 95% CI, 1.25–8.20), and Medicaid status (OR, 2.63; 95% CI, 1.34–5.19). Deaf ASL users were also more likely to experience repeat ED utilization during a 36 month period when compared to the hearing peers ($p < 0.001$; Table 4).

Discussion

We found that deaf ASL users had a 97% greater likelihood of using the ED over the past 36 months compared with their hearing peers. These effects persisted after controlling for age, sex, race, smoking history, and Medicaid