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Illness Severity among Non-English, Non-Spanish Speaking Patients in a Public Emergency Department

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Findings from disparity research suggest that significant contributors to a patient's access to medical care include income, race, geography, education, insurance status, and language (Begley, Vojvodic, Seo, & Burau, 2006; Billings et al., 1993; Djojonegoro, Aday, Williams, & Ford, 2000; Haider et al., 2008; J. Laditka, S. Laditka, & Mastanduno, 2003; Priebe et al., 2011; Shavers, 2007). In the U.S., patients who have limited English proficiency (LEP) tend to have less access to medical care, receive fewer preventative services, and have an increased likelihood of nonadherence to prescribed treatment plans (Flores, 2006). All stages of navigating a complex healthcare system may be more challenging for LEP patients (Pourat, Kagawa-Singer, Breen, & Sripipatana, 2010; Priebe et al., 2011). Though studies have supported an association between LEP and health disparities, there are still gaps in the literature in understanding the nature of this relationship (Jacobs, Chen, Karliner, Agger-Gupta, & Mutha, 2006). In particular, few studies have been aimed at elucidating the differences in health outcomes among LEP subpopulations.

According to the 2007 American Community Survey, which is conducted by the U.S. Census Bureau, Spanish is the most common language, other than English, spoken in American homes (Shin & Kominski, 2010). Additionally, Mexican immigrants to the United States are the fastest growing immigrant population in the country (Casteñeda, Ruelas, Felt, & Schenker, 2011). Perhaps for this reason, Latino-born individuals draw much of the attention in studies examining immigrant health, leaving groups such as Asian and Pacific Islanders underrepresented in language-access research (Dang et al., 2010). In the few studies comparing Spanish- and non-Spanish-speaking LEP populations, findings have indicated discrepancies between these two groups. A survey of LEP individuals in southern California found that having limited English proficiency was associated with having fewer visits to a doctor (Kim, Worley, et al., 2011). Asian-born LEP patients tended to have diseases that had gone unscreened and untreated longer, culminating in increased need for treatment compared to other LEP groups. Another study found that Asian LEP patients were slightly more likely than Latino LEP patients to have received poor care for diabetes mellitus (Choi, Lee, & Rush, 2011). However, few of the studies were designed with the explicit intent of comparing Spanish-speaking with non-Spanish-speaking LEP groups. Even though non-Spanish-speaking LEP patients may be a minority of the total LEP population, they may actually be at greater risk for developing health problems. There is a need for more research on this subpopulation in order to determine if they are at a greater risk for developing conditions resulting from poor access to primary care.

A rich setting for observing discrepancies in primary care is the emergency department (ED). In the United States, the emergency department is the only healthcare facility that is required to keep its doors open to all patients at all hours, regardless of a patient's ability to pay (Begley et al., 2006). As a result, the emergency department is the primary source of medical care for many uninsured and medically underserved patients (Begley et al., 2006; Billings, Parikh, & Mijanovich, 2000). Our purpose was to determine if outcome differences exist when comparing the ED use of Spanish-speaking and non-Spanish-speaking LEP patients to English-speaking patients. We hypothesize that non-English-speaking, non-Spanish-speaking LEP patients will present with more acute disease, have higher rates of comorbid conditions, and have longer and more complicated hospital stays than English-speaking patients and Spanish-speaking patients.

Method

This was a retrospective case-control study comparing the severity of illness in populations who differ primarily by language proficiency.

Patients were divided into three groups: English-, Spanish-, and non-English-, non-Spanish (NENS)-speaking patients based on the demographic information available in the electronic medical record. NENS patients were used as the case group and were compared to English-speaking patients, as were Spanish-speaking patients. Included in the NENS group were all patients ages >17 seen in a Houston, Texas, level 1 trauma county emergency center from November 2010 to February 2012 whose primary language was anything other than English or Spanish. Equal numbers of English- and Spanish-speaking patients were randomly selected from the same time frame. Patients were excluded if they were being seen for end-stage renal disease as part of a dialysis program, if they had already been included in the study for a prior visit, or if they left the ED prior to evaluation. Patients were excluded from the English-speaking group if a physician or nursing note indicated the use of an interpreter or a primary language besides English (see Figure 1). All physician and nursing notes in English-speaking patient charts were reviewed for at least one year prior to time of presentation to verify that no interpreter had ever been used and that no other language had been identified as a primary language.

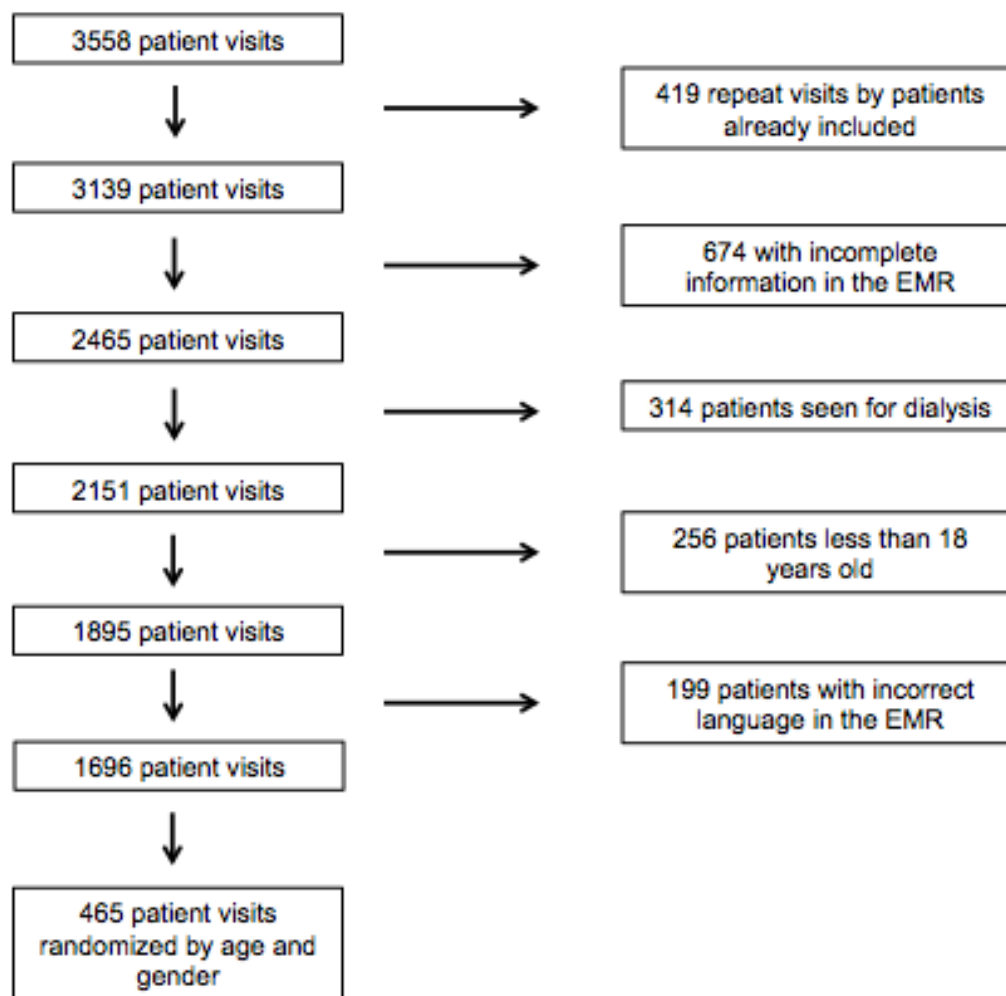


Figure 1. Inclusion/exclusion process.

Patients were selected using an EMR query of all patients with ED visits from November 1, 2010, to February 28, 2012, based on age and language, by the hospital's information technology department. Demographics and study endpoints were obtained by two unblinded reviewers using an abstraction form created by the research team. Two medical students served as the reviewers, with one of the reviewers having prior experience with similar data collections. To maintain consistency throughout the process, the reviewers held regular meetings as recommended by Gilbert, Lowenstein, Koziol-McLain, Barta, and Steiner (1996). The reviewers overlapped on 50% of the charts for quality control.

Demographic information included gender, nationality, race, and ethnicity. Primary endpoints for illness severity included the emergency severity index (ESI) assigned by the triage team in the ED, the area of the ED to which the patient was triaged, the amount of time the patient spent in the hospital, the admission rate, the in-hospital surgery rate, the ICU admission rate, and the in-hospital mortality rate. EMRs with missing primary endpoints or missing language, gender, or age were excluded from analyses. The ESI is a five-point scale used in triage to predict admission and resource utilization based on subjective and objective parameters (Tanabe, Gimbel, Yarnold, Kyriacou, & Adams, 2004). Secondary endpoints included rates of certain conditions associated with high chronic morbidity that were able to be extracted from EMR, including prior and new diagnoses of cancer, coronary artery disease, hypertension, diabetes mellitus, HIV, and stroke.

The data analysis for this paper was generated using SAS/STAT software, Version 9.3 of the SAS® System for Windows (Cary, NC, USA). Analysis of variance was performed to compare average ESI, average days in hospital, average days in ICU, and area of the ED to which triaged. The area of ED to which the patient was triaged was first converted to a numerical value of 1 to 5, with 1 being the acute care rooms (highest acuity) and 5 being the fast-track area (lowest acuity). All other endpoints were compared as frequencies using chi-square analysis. For frequencies with a value of or near “0,” a Fisher Exact Fit test was also performed to verify the validity of the chi-square procedure.

Results

Overall there were 1186 visits to the emergency center by NENS patients. From this study period, data from randomly selected ED patient encounters were reviewed from 1186 patients whose primary language was Spanish and 1186 whose primary language was English. Included in the study were 636 NENS patients, 674 Spanish patients, and 382 English patients.

After exclusions, a random age- and gender-matched subsample was created using 80 NENS patients serving as the cases and with the Spanish-speaking and English-speaking groups each matched to this sample. This provided 80 NENS, 227 Spanish-speaking, and 158 English-speaking patients with an average age of 55.1 (+/- 12.4). The final subsample included 56 Vietnamese, 6 Hindi, 4 Urdu, 4 Arabic, and 10 Chinese speakers (either Mandarin or Cantonese). Demographics are reported in Table 1.

Table 1

Demographics

	NENS	Spanish	English	p-value
n	80	227	158	-
Age (SD)	56.2(12.1)	55.1(11.9)	54.4(13.2)	0.58
% Female	65.0	68.7	70.3	0.71
% HTN	60.0	49.6	50.6	0.26
% Cancer	11.3	10.1	8.2	0.72
% DM	17.5	33.0	27.9	0.029
% Prior CAD	6.3	4.9	9.5	0.20
% Prior CVA	5.0	5.7	5.0	0.95
% Smoker	5.1	5.5	18.6	0.001
% CHF	3.8	5.7	8.2	0.37
% HIV	0	0.9	0	0.35

Overall, there were significant language-based outcome differences (see Table 2 and Figure 2). Rates of surgery were markedly higher in NENS patients compared to English-speaking patients (11.3% vs 1.9% [$p=0.002$], respectively) but similar between Spanish-speaking and English-speaking groups (3.9% vs 1.9% [$p=0.35$], respectively). Further, NENS patients had much higher admission rates compared to English speakers (38.8% vs 24.7% [$p=0.025$]), although Spanish-speaking and English-speaking groups had similar admission rates (26.7% vs 24.7% [$p=0.63$], respectively). Average days spent in the hospital (including time spent in the emergency center) of NENS was longer than English speakers (2.49 +/- 5.43 vs 1.93 +/- 8.56 [$p<0.001$]), but there was no difference between Spanish-speaking and English-speaking groups (1.49 +/- 2.78 vs 1.93 +/- 8.56 [$p>0.76$], respectively).

Table 2

Study Endpoint Among the Language-Based Groups

	NENS	Spanish	English	p-value
Days in hospital (SD)	2.49 (5.43)	1.49 (2.78)	1.93 (8.56)	0.40

ESI on presentation (SD)	2.9 (0.84)	2.89 (0.77)	2.98 (0.78)	0.54
New diagnosis of cancer (%)	2.5	1.3	2.5	0.64
New diagnosis of CHF (%)	1.3	0	0	0.09
% presenting to critical care	20.0	18.4	15.9	0.79
% admitted (overall)	38.8	26.7	24.7	0.16
% admitted (ICU)	5.0	3.5	1.9	0.41
% receiving surgery	11.3	3.5	1.9	0.003
% in hospital death	2.5	0.4	0	0.065

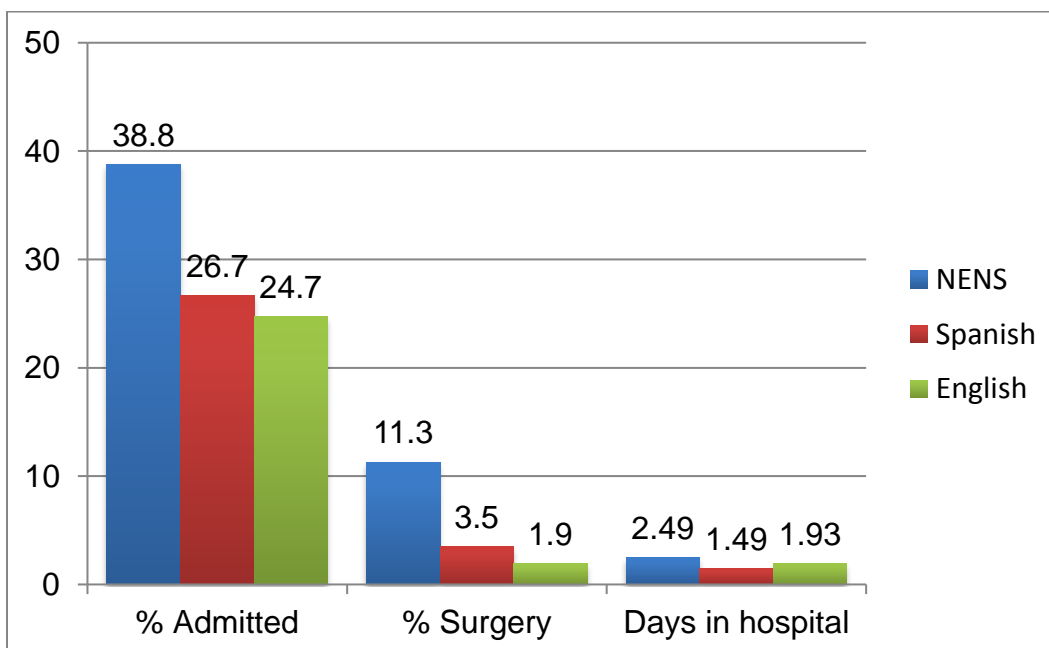


Figure 2. Significant language-based outcomes.

Chi-square comparison of the in-hospital mortality rate found it to be higher for NENS versus English-speaking patients (2.5% vs 0% [$p=0.046$]). However, because there was a 0% mortality rate for the English-speaking group, analysis using Fisher's Exact Fit test was not significant ($p=0.112$), suggesting the sample size may be too small to properly describe a difference. Finally, comparisons of the ICU admission rate, the ESI score, the area of the ED to which patients were triaged, and ED recidivisms within a year revealed no language-based outcome differences.

Analyses of secondary outcomes revealed a higher rate of new stroke among NENS (3.8%) compared to English-speaking patients (0% Chisquare $p=0.01$, Fisher $p=0.037$). Rates of cancer, coronary artery disease, and HIV revealed no statistically significant differences between groups for both prior and new diagnoses. Of note, there were lower rates of diabetes in the NENS group (17.5%) than in the Spanish-speaking group (33.0%) or English-speaking group (27.9%) ($p=0.029$), respectively.

Discussion

We find that NENS patients present with higher rates of surgical emergencies, are admitted to the hospital more frequently, and spend more time in the hospital per visit than Spanish-speaking or English-speaking patients in a county hospital serving a primarily uninsured population. Furthermore, we describe a trend that suggests this may also be associated with an increase in mortality. The implication of our findings suggests that language-based resources are necessary to improve these outcome findings in the NENS population. Further research delineating interventions that may successfully change these outcomes is needed.

Research on disparities has consistently suggested that limited English proficiency (LEP) is a risk factor for poor health outcomes (Kim, Aguado Loi, et al., 2011; Kim, Worley, et al., 2011). This risk is greatest when patients lack access to language or culture-appropriate resources, leading to use of the emergency department as the entry point to receive healthcare (Billings et al., 1993). Patients with language barriers have less access to regular medical care, receive reduced preventative screening, and have decreased treatment adherence rates (Flores, 2006). This study adds evidence when presenting to the emergency department, the non-Spanish-speaking LEP population may be at greater risk than Spanish-speaking LEP patients in terms of the need of surgical treatment, need for admission, and length of hospital stay. The lack of difference between Spanish- and English-speaking populations may be the result of increased

language and culture-appropriate resources already available for the Spanish-speaking population in Houston, Texas.

The lack of difference between all language groups in ESI score and triage area is important. The purpose of using the ESI in triage is to quickly estimate a patient's disease acuity and resource needs (Gilboy, Tanabe, Travers, & Rosenau, 2011). The findings of our study suggest NENS patients may receive inappropriately higher ESI scores (higher score = lower acuity) and thus be under-triaged compared to age- and gender-matched Spanish-speaking and English-speaking cohorts. Others have suggested similar challenges. In a retrospective review of 19,726 patient charts, Schrader and Lewis (2013) reported a tendency for African American patients to receive higher ESI scores (i.e., being rated as having lower acuity than similar non-African-American patients) and to wait longer for care for similar needs even after controlling for comorbidities that may influence the score (Schrader & Lewis, 2013).

An alternative explanation for our findings is that the ESI may not reliably predict resource needs and disease acuity of the NENS LEP patients presenting to a safety-net hospital. Primarily, the aim of this study was to evaluate whether NENS LEP patients were presenting with more acute disease than cohorts speaking Spanish or English. Additionally, the differences found in this study may be culturally based. The languages included in the final analysis included those from the Eastern hemisphere, whereas Spanish-speaking patients come from South and North America and Europe. The findings of this study may be accounted for by patient attitudes regarding Western medicine and patients' willingness to receive primary care treatment. Further, the differences in this study may be biases held by treating physicians. It is plausible that the decision to admit or perform surgery by a physician may be influenced by greater difficulty obtaining an accurate history from patients. In our county hospital, there are translators for all languages in this study available 24 hours a day via phone; however, the inconvenience of using translation services may limit their use.

Limitations

A limitation of this study is the small number of cases included in the final analysis. This occurred because the groups that were randomly reviewed differed significantly by age and gender. In order to control for these differences, a subpopulation of NENS cases was randomly selected based on the presence of age and gender matches among the control populations. It should be noted that the initially included group of NENS patients were significantly older than the Spanish-speaking and English-speaking groups.

This may be the result of higher English proficiency among immigrants coming to the United States at a younger age (Bleakley & Chin, 2010).

Another limitation is the possible inaccuracy of demographic information in the electronic medical record. For example, 199 patient charts were those of English speakers per the demographic section but who had evidence of low English proficiency based on the use of translator or alternate language preference in physician or nursing notes. Extra effort was made to check this variable by reviewing chart notes from the entire year prior to patient presentation. Additionally, a large number of patients were excluded (n = 314) due to the presence of ESRD.

Finally, it is well known that low socioeconomic status is associated with poor health outcomes (Billings et al., 1993; Jacobs et al., 2006; Shavers, 2007). Unfortunately, the insurance and socioeconomic status of these patients was unavailable to the reviewers; however, some homogeneity in this parameter occurs within the data set as all patients presented to a county hospital that primarily cares for uninsured patients.

Conclusion

By comparing the illness severity of Spanish-speaking, English-speaking, and NENS patients in a large county emergency department, we demonstrate greater healthcare needs among NENS patients compared to the other two groups. NENS patients were more likely to be admitted, have surgery, and stay longer than those speaking English or Spanish. These findings are important as they suggest that further research regarding the awareness of these disparities by healthcare providers, and public health interventions focusing on this population, is warranted.

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