Primary Care Utilization and Mental Health Diagnoses Among Adult Patients Requiring Interpreters: a Retrospective Cohort Study

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BACKGROUND: Patients requiring interpreters may utilize the health care system differently or more frequently than patients not requiring interpreters; those with mental health issues may be particularly difficult to diagnose.

OBJECTIVE: To determine whether adult patients requiring interpreters exhibit different health care utilization patterns and rates of mental health diagnoses than their counterparts.

DESIGN: Retrospective cohort study examining patient visits to primary care (PC), express care (EC), or the emergency department (ED) of a large group practice within 1 year.

PATIENTS: Adult outpatients (n=63,525) with at least one visit within the study interval and information regarding interpreter need.

MAIN MEASURES: Mean visit counts, counts of mental disorders, and somatic symptom diagnoses between patients requiring interpreters (IS patients) and not requiring interpreters (non-IS patients).

KEY RESULTS: IS patients (n=1,566) had a higher mean number of visits overall (3.10 vs. 2.52), in PC (2.54 vs. 1.95), and in ED (0.53 vs. 0.44) than non-IS patients (all p<0.01). IS patients had a lower mean number of visits in EC than non-IS patients (0.03 vs. 0.13; p<0.01). Interpreter need remained a significant predictor of visit count in multivariate analyses including age, sex, insurance, and clinical complexity. A greater proportion of IS patients were high utilizers (10+ visits) than non-IS patients (3.6 % vs. 1.7 %; p<0.01). IS patients had a lower frequency of mental health diagnoses (13.9 % vs. 16.7 %), but a higher frequency of diagnoses recognized as potential somatic symptoms including diseases of the nervous (29.3 % vs. 24.2 %), digestive (22.6 % vs. 14.5 %), and musculoskeletal systems (43.2 % vs. 34.5 %), and ill-defined conditions (61 % vs. 49.9 %), all p<0.01.

CONCLUSIONS: IS patients visited PC more often than their counterparts and were more often high utilizers of care. Two sources of high utilization, mental health diagnoses and somatic symptoms, differed appreciably

between our populations and may be contributing factors.

KEY WORDS: adults; health care utilization; language barriers; mental health; outpatients.

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INTRODUCTION

Language can be a meaningful barrier to health care access for individuals with limited English proficiency, including immigrants and refugees.¹⁻³ Patients with language barriers may access fewer services, including preventive care, and have poorer outcomes. Removing language barriers through the use of language interpreters may increase access to care.

Alternatively, higher numbers of health care visits may signal that patients with language barriers have unaddressed needs, even when interpreters are provided. Diagnosing these needs may result in both improved patient outcomes and reduced costs. High health care utilization is especially important in the primary care (PC) setting, because high utilizers can account for a substantial proportion of clinical resources realized in both time and financial costs.⁴ Predictors of high utilization include patient diagnosis and number of comorbidities, illness severity, past behavior (e.g., prior use of health care), and the presence of mental health issues.⁴⁻⁶ Psychiatric illness has been found to be twice as prevalent among frequent attenders in primary care.⁷ Furthermore, it is not uncommon for individuals to present to PC providers with nonspecific physical complaints that ultimately reflect underlying mental health problems such as anxiety, post-traumatic stress disorder, or depression. Patients may be unaware of or dismiss mental health symptoms, or present with somatic symptoms such as headaches, muscle aches, fatigue, or heart palpitations. Often these somatic symptoms can be considered to be expressions of psychological distress if not actual mental health disorders.⁸ Research suggests that unrecognized (and

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therefore untreated) mental health disorders are associated with high utilization in PC settings.^{9,10}

While patients with diagnosed and undiagnosed mental illnesses from the US general population are associated with high utilization of health care services, little evidence exists regarding mental health diagnoses and PC utilization patterns among patients with language barriers. Language interpreters can bridge communication barriers, reduce medical errors, and increase adherence to recommended treatments.¹¹ However, as a third party, they also inherently bring complexity to clinical encounters and concerns about confidentiality may arise, especially when sensitive issues are discussed.¹² Mental health-related issues present particular challenges as patients requiring interpreters are often from cultures attributing negative connotations to mental health issues with far-reaching personal, familial, and community stigma.^{13–17}

The purpose of this study was to examine health care utilization patterns of adult outpatients requiring interpreters, with a focus on the PC setting. We hypothesized that patients requiring interpreters would have a greater number of visits/encounters over the study period, as compared to patients not requiring interpreters. A second aim was to compare frequencies of mental health diagnoses and somatic symptoms between patients requiring interpreters and those not requiring interpreter services over the same 1-year interval.

METHODS

We conducted a retrospective cohort study of patients who were 18 years of age or older and who had at least one outpatient visit to PC, express care (EC), or the emergency department (ED) at Mayo Clinic (Rochester, Minnesota) during the 1-year study period (October 1, 2009–September 30, 2010). PC settings included family practice, internal medicine, preventative and occupational health clinics. EC consisted of two walk-in clinics providing treatment for conditions such as strep throat, pinkeye, sinus infections, skin conditions, and other medical issues that require prompt treatment. All adult patients were electronically identified from the electronic medical record (EMR) and administrative database within Mayo Clinic's health records system. Patients were excluded for the following reasons: lack of consent for the use of their medical record in accordance with Minnesota state law, pregnancy, personal address outside of the United States, and missing information regarding interpreter services (IS). The rationale for these exclusion criteria reflect the inability to conduct research on patients who do not authorize it, avoidance of pregnancy-related health care visits, exclusion of medical tourism, and an inability to categorize patients on the primary independent variable. With regard to IS, Mayo

Clinic provides trained medical interpreters to facilitate communication between two parties in terms of language and culture, and to convey the message accurately without adding, modifying, or deleting information.

Data Collection and Processing

Demographic variables collected included date of birth, sex, insurance status, primary language, and interpreter need. Interpreter need was listed as a single yes/no indicator in the EMR and included patients with language barriers or hearing impairment requiring a sign language interpreter. Insurance status was grouped into four categories; Medicare, no insurance, other government (Medicaid and state programs), and private.

Utilization was analyzed using visit information from administrative billing data. The number of visits to PC, EC, and ED were aggregated for each patient. Subsequent visits to other departments referred by PC, EC, or ED were not included in totals, as the focus of this work is on PC. In the absence of a recognized, generally accepted measure of frequent attendance in general practice,¹⁸ high utilization was defined as ten or more visits during the 1-year study period.^{4,19}

The data set included up to 15 International Classification of Diseases, Ninth Revision (ICD-9) codes per patient visit. These codes were used to identify mental health diagnoses (ICD-9 codes 290-319) and somatic symptoms (ICD-9 codes 320-389, 520-579, 710-739, and 780-799).²⁰ ICD-9 codes, along with patient age and sex, were submitted to the John Hopkins Adjusted Clinical Groups (ACG) Case-Mix System to classify patients into morbidity groups called Aggregated Diagnosis Groups (ADGs). Clinical complexity was classified using major ADGs, which are the diagnostic groups with high severity, high diagnostic certainty, and high likelihood of requiring specialty care.^{21–23} Clinical complexity was addressed, as it is likely that complex patients would have more visits. The study was approved by the Mayo Clinic Institutional Review Board.

Statistical Methods

The population was stratified by interpreter need (yes/no) into IS patients (patients requiring interpreter services) and non-IS patients. Numerical data were described by means and standard deviations, categorical data by counts and percentages. Group differences were tested using the *t* test or χ^2 test. Multivariable linear regression was used to describe the relationship between interpreter need and number of visits after adjusting for age, sex, insurance coverage, and clinical complexity. Statistical analyses were performed using SAS version 9.1 (SAS Institute

Inc., Cary, NC). Statistical significance was declared at $p < 0.05$ for all analyses.

RESULTS

A total of 82,490 patients were identified who were 18 years of age or older and who had at least one outpatient visit to PC, EC, or the ED at Mayo Clinic, Rochester, Minnesota, during the 1-year study period (October 1, 2009 - September 30, 2010). Of the 82,490 patients initially identified, 18,965 (23 %) were excluded for the following reasons: lack of research authorization, pregnancy, personal address outside of the US, and missing information regarding interpreter services.

The final dataset of 63,525 patients was primarily female (58 %, $n=36,858$) with a mean age of 49.9 ± 18.9 years. Patients identified as having a preferred language other than English comprised 3.4 % of the total sample ($n=2,158$), while patients requiring interpreter services comprised 2.5 % ($n=1,566$). Among patients requiring interpreter services, Somali (30 %, $n=472$) and Spanish (17 %, $n=264$) language interpreters were the two most prevalent, followed by Vietnamese (12 %, $n=182$), Khmer (10 %, $n=154$), and Arabic (7 %, $n=110$). The remaining 24 % of patients ($n=384$) represented 29 other languages, including 2.4 % ($n=38$) requiring American Sign Language interpreters.

The IS and non-IS patient groups did not differ significantly by age, but the IS patients were more likely to be female (62.5 % vs. 57.9 % non-IS, $p < 0.01$; Table 1).

Using ADGs as a measure of clinical complexity and expected utilization, the IS patients had a higher mean number of ADGs relative to non-IS patients (4.39 vs. 3.93, respectively; $p < 0.01$), but there was no significant difference in the number of major ADGs. The largest difference between the groups was insurance type; more than half of IS group patients had public insurance, including Medicare, Medicaid, and other public payers, compared to one-third of the non-IS patient group. The IS patient group was also more likely to be uninsured than the non-IS patient group (7.6 % vs. 2.6 %, respectively; $p < 0.01$).

As hypothesized, mean number of visits overall in PC and in the ED were greater for IS patients than for the non-IS patients (3.10, 95 % CI [2.98, 3.21] and 2.52, 95 % CI [2.50, 2.54]; $p < 0.01$) corresponding to a difference of 0.58 with 95 % CI (0.46, 0.69). The difference in mean number of visits between IS and non-IS patients remained very similar after adjusting for age and sex, (0.56, 95 % CI [0.44, 0.67]; $p < 0.01$). Though somewhat attenuated, this difference remained significant after additionally adjusting for major ADGs and insurance type (0.36 [0.24, 0.47 95 % CI]; $p < 0.01$).

Numbers of visits for various subgroups are described in Table 2. Mean number of visits were greatest in the PC setting for both IS and non-IS patient groups, compared to the ED and EC, and they accounted for 82 % and 77 % of study visits, respectively. In both IS and non-IS patient groups, only a small number of visits were made to EC clinics, but still a smaller number of visits to EC clinics were made by IS patients. Mean number of visits remained higher for IS patients as compared to non-IS patients when

Table 1. Patient Characteristics by Interpreter Services Designation

Characteristics	Patients requiring Interpreter Services (n=1,566)	Patients not requiring Interpreter Services (n=61,959)	p value
Sex (% female)	978 (62.5 %)	35,880 (57.9 %)	$< 0.01^*$
Age (mean $\pm$ SD)	50.08 ± 17.46	49.86 ± 18.97	0.65 [†]
ADGs [‡] (mean $\pm$ SD)	4.39 ± 3.00	3.93 ± 2.76	$< 0.01^†$
Major ADGs [‡] (mean $\pm$ SD)	0.47 ± 0.79	0.47 ± 0.80	0.96 [†]
One or More Major ADGs [‡] (%)	521 (33.3 %)	20,468 (33.0 %)	0.84 [*]
Insurance type [§] (%)			$< 0.01^*$
Private insurance (%)	421 (26.9 %)	39,888 (64.4 %)	
Medicare (%)	353 (22.5 %)	16,125 (26.0 %)	
Other government insurance (%)	673 (43.0 %)	4,356 (7.0 %)	
No insurance (%)	119 (7.6 %)	1,587 (2.6 %)	

* χ^2

[†] t test

[‡] Aggregated Diagnosis Groups (ADGs) identify patient complexity. Major ADGs are those with high severity, high diagnostic certainty, and high likelihood of requiring specialty care

[§] There are 61,956 non-interpreter patients with insurance information

Table 2. Mean Visits for Subgroups by Interpreter Services Designation

Subgroups	Patients requiring Interpreter Services	Patients not requiring Interpreter Services	p value [*]
All clinic locations	3.10 ± 2.72	2.52 ± 2.30	< 0.01
Emergency Department	0.53 ± 0.87	0.44 ± 1.00	< 0.01
Express Care	0.03 ± 0.19	0.13 ± 0.42	< 0.01
Primary Care	2.54 ± 2.54	1.95 ± 2.02	< 0.01
Patients with major ADG [†]	4.40 ± 3.42	3.50 ± 3.05	< 0.01
Female patients	3.18 ± 2.80	2.67 ± 2.47	< 0.01
Private insurance	2.43 ± 2.33	2.32 ± 1.96	0.26
Medicare	3.99 ± 3.11	2.90 ± 2.65	< 0.01
Other government insurance	3.30 ± 2.69	3.18 ± 3.35	0.37
No insurance	1.71 ± 1.51	1.96 ± 1.89	0.18

* t test

[†] Aggregated Diagnosis Groups (ADGs) identify patient complexity. Major ADGs are those with high severity, high diagnostic certainty, and high likelihood of requiring specialty care

considering only patients with a major ADG (4.40 vs. 3.50; $p<0.01$), female patients (3.18 vs. 2.67; $p<0.01$), and patients with Medicare insurance (3.99 vs. 2.90; $p<0.01$). There was no statistically significant difference in overall visits between IS and non-IS patients who had private insurance, other government insurance, or no insurance.

Figure 1 displays the distribution of patients by number of visits during the study period. Two percent ($n=1,120$) of the study population met the definition of high utilization in this study, i.e., ten or more visits during the 1-year study period. A disproportionate number of these patients were represented in the IS patient group (3.6 % IS patients vs. 1.7 % non-IS patients; $p<0.01$). These high-utilizer IS patients accounted for 14.2 % of IS patient visits, compared to 9.0 % of visits in the high-utilizer non-IS group. Among high utilizers, both non-IS and IS patients presented most frequently in PC and least frequently in EC.

Patients requiring IS had lower rates of mental disorder diagnoses than non-IS patients (Table 3). In contrast, IS patients had higher rates of diagnoses recognized as potential somatic symptoms including diseases of the nervous system (29.3 % vs. 24.2 %; $p<0.01$), digestive system (22.6 % vs. 14.5 %; $p<0.01$), and musculoskeletal system (43.2 % vs. 34.5 %; $p<0.00$), as well as symptoms, signs, and ill-defined conditions such as sleep disturbances, fatigue, headaches, or nausea (61 % vs. 49.9 %; $p<0.01$).

Among the total study population, more than 60 % of high utilizers had a mental disorder diagnosis, compared to 16 % of patients with fewer than ten visits, $p<0.01$. High utilizers (vs. those with <10 visits in the 1-year period)

Table 3. Diagnostic Codes by Interpreter Services Designation

Codes	Patients requiring Interpreter Services (n=1,566)	Patients not requiring Interpreter Services (n=61,959)	p value*
Mental Health Diagnoses			
Mental disorders (ICD-9 290-319)	217 (13.9 %)	10,355 (16.7 %)	< 0.01
Somatic Diagnoses†			
Diseases of the nervous system and sense organs (ICD-9 320-389)	459 (29.3 %)	14,998 (24.2 %)	< 0.01
Diseases of the digestive system (ICD-9 520-579)	354 (22.6 %)	8,982 (14.5 %)	< 0.01
Musculoskeletal system (ICD-9 710-739)	677 (43.2 %)	21,362 (34.5 %)	< 0.01
Symptoms, signs, ill-defined conditions (ICD-9 780-799)	955 (61 %)	30,902 (49.9 %)	< 0.01

* χ^2

†Somatization symptoms classification as reported by Smith et al.²⁰
Abbreviation: ICD-9, International Classification of Diseases, Ninth Revision

also had a greater frequency of the somatic symptom categories, including diseases of the nervous (74.4 % vs. 23.4 %), digestive (51.7 % vs. 14.0 %), and musculoskeletal systems (85.0 % vs. 33.8 %), as well as symptoms of ill-defined conditions (96.1 % vs. 49.3 %), all $p<0.01$. These differences between high and low utilizers persisted in subgroup analyses including only IS patients. In a comparison of high-utilizer IS patients and high-utilizer non-IS patients, there was little difference in somatic

Figure 1. Distribution of patients by number of visits during study period.

symptom categories, but a large difference in mental health diagnoses (37.5 % vs. 63.8 %).

DISCUSSION

Efficient and effective use of health care resources is predicated by proficient communication between health care providers and patients. Interpreters can facilitate communication, but clinical efficiency and diagnostic precision may be compromised by cultural, interpersonal, and health system constraints. This study found that IS patients, compared to non-IS patients, evidenced a higher number of visits, even in multivariate analyses including age, sex, insurance, and clinical complexity. The difference in mean visits between the IS and non-IS groups was meaningful, translating into greater than 900 extra visits for the IS group consisting of 1,566 patients. Of particular concern are the 3.6 % of IS patients ($n=56$) with ten or more annual visits (i.e., high utilizers) accounting for 14 % of all IS patient visits. These patients may be “over-served but underserved.”⁴

In addition to higher health care utilization in the settings examined in this study, the IS patient group had fewer mental health diagnoses and greater somatic symptom diagnoses, and high-utilizer IS patients had much lower rates of mental health diagnoses. While further research is needed to understand higher utilization in the IS group, one possibility is that somatization and utilization in this population are connected. The IS patients in this study may be presenting more often than non-IS patients because both patients and providers may have greater difficulty communicating about mental health concerns, even with the assistance of an interpreter.¹¹

High utilization may also reflect the time needed for the clinician, patient and interpreter to build a trusting relationship. For instance, it is possible that the provider appropriately brings the patient back more frequently for visits to address their issues fully and enable patients to feel more comfortable sharing sensitive information.^{12,24,25} Our study is not able to determine whether the higher number of visits to PC are patient or provider initiated, nor can a judgment be made regarding appropriateness, although these represent important questions for further study. However, offering integrated mental health and IS in the PC setting where IS patients present frequently for care may facilitate recognition, discussion, and diagnosis of mental health concerns.

The results of this study are congruent with other studies identifying high utilization among patients with undiagnosed depression or somatization of symptoms.^{9,10} A greater prevalence of potential somatic symptom diagnoses among the IS group may indicate issues of stigma as well as reflect cultural communication problems where select

languages include few acceptable words for mental health problems. Finding reliable methods to evaluate mental health conditions among patients with language barriers may provide a more direct measure of related primary care utilization among this population. Culturally-adapted mental health screening instruments have been lacking, and increased research to develop and validate these instruments may better assist providers in making mental health diagnoses.¹³ Additionally, replacing stigmatizing terms,^{26–28} and augmenting the use of interpreters with community advisors, mediators or “culture brokers” may facilitate discussion, diagnosis, and treatment of mental health issues.

The findings of this study are limited by the inclusion of patient visits over a 1-year period at a single institution, which limits generalizability. Similarly, the findings reflect only patients who accessed the health care system (PC, ED, or EC) at least once during the study period; thus, they do not address access barriers such as difficulty entering or navigating the health care system. Moreover, the analysis did not include individuals in the catchment area who did not present for health care during this time. Further, we compared ADGs for medical claims billed by PC providers, as this was the focus of the work. Including ADGs for all medical claims, e.g., from consulting physicians, may have led to different conclusions and improved sensitivity.

Finally, this investigation was focused on language barriers. Interpreter need was defined by a single indicator in the EMR. This indicator was missing for over 13 % of the initial sample identified for analysis; when present this administrative data field may not accurately or adequately identify language barriers for all patients. It also does not indicate whether an interpreter was used at each individual visit, and it does not differentiate the type of interpreter used (e.g., medical interpreter in person, via telephone, or ad-hoc interpreter such as a family member). Consistent and complete documentation of interpreter use in medical records, including updating the record after each clinical encounter to reflect actual interpreter use at the respective visit, will enhance the validity of similar studies and potentially broaden the scope of future research questions addressing the use of interpreters in medical encounters. Additional factors that may explain differences in medical care utilization among populations with limited English proficiency were not evaluated in this study, such as health literacy, acculturation, religion, use of traditional healing, and perceived discrimination.^{13,16,17,29–31}

CONCLUSION

This research provides clinically relevant information about health care utilization patterns and mental health diagnoses among patients with language barriers, including immigrants and refugees. Our study showed that patients

requiring interpreters utilized PC more frequently and were more often high utilizers of care compared to patients not requiring an interpreter. We found that two documented sources of high utilization, mental health diagnoses and somatic symptoms, differed significantly between our populations, suggesting that they may be contributing factors.

More frequent health visits may be appropriate and beneficial to some patients, recognizing, however, that repetitive visits may signal under-diagnosis of some conditions, including mental health issues. In lieu of more frequent or longer PC visits, alternative modes of care delivery for IS patients could be explored including the use of community health workers and home visits. Clearly, further research is needed to elucidate clinical and sociocultural variables associated with utilization patterns among patients requiring interpreters. Factors warranting inquiry in the context of PC utilization include, but are not limited to, trust, mental health stigma, acculturation, cultural communication, culturally adapting mental health screening instruments, and cost.

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