A Needs Assessment Pilot Study of Patients with High Utilization in an Academic Inpatient Setting

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Background: *A disproportionate amount of health care spending in the United States is attributed to a small subset of patients who employ inpatient and emergency department (ED) services. While patients with high ED utilization have previously been well-described, patients seen in an inpatient academic medical setting may differ with regard to demographics, medical conditions, and social factors.*

Objectives: *We aimed to characterize patients with high utilization in an academic inpatient setting for the purpose of identifying unmet needs.*

Setting and Patients: *Adults aged 18–80 were eligible for inclusion if they had more than three admissions to a general medicine service of an academic medical center within a large health care system. Patients who were admitted for pregnancy, oncology, trauma, or surgical procedures for acute conditions or were diagnosed with dementia or encephalopathy were excluded. Twenty-six patients met inclusion/exclusion criteria and were approached to be interviewed, of which 13 agreed to be interviewed.*

Measurements: *Face-to-face administration of a self-reported survey assessing unmet needs regarding services for medical or mental health needs, access to health care, housing, transportation, or legal services, and any other barriers to health the respondent identified.*

Results: *All of those surveyed had health insurance and regular visits with primary care providers (mean 14 visits per 12 months). The most prevalent medical conditions identified were depression (85%) and chronic pain (77%). In addition, patients self-identified having an average of 2.2 chronic conditions. Financial struggles were common as 62% of the respondents reported annual incomes of <$12,000, and 77% were unemployed over the previous 12 months.*

Conclusion: *These results indicate unique clinical and social characteristics associated with high readmission rates at one academic medical center, suggesting the need for additional patient-centered research of this population to aid in the development of novel strategies to reduce overutilization and improve health.*

Keywords: *needs assessment; high utilization; super utilizers; high utilizers; academic medical center*

INTRODUCTION

Much of the literature on patients with high utilization focuses on emergency department (ED) utilization. The top 4.5–8% of patients with high ED utilization account for 21–28% of all ED visits.[1] However, patients with high inpatient utilization are not necessarily patients with high ED utilization who get admitted. If a hospital were to design interventions for patients with high utilizations in an inpatient setting using the needs of patients with high ED utilization, this could be ineffective or even harmful. Therefore, through this pilot study, we aimed to characterize patients with high utilization in an academic inpatient setting to identify unmet needs regarding services for medical or mental health needs, access for health care, housing, transportation, or legal services, and any other barriers to health the respondent identified.

The literature, while not directly comparing the two populations, hints at distinct differences. Patients with high inpatient utilization have been reported to be older than patients with high ED utilization.[1,2] While patients with high ED utilization have been found to present with acute complaints,[2] admitted patients with high inpatient utilization have been found to present with

chronic disease exacerbations. Pain has been found to be a common presenting complaint in both groups of patients.[2–4]

We aimed to find a better understanding of these admitted patients' needs to allow future design of successful interventions. Therefore, we aimed to define the characteristics of admitted patients with high utilization in an academic medical center using a face-to-face needs assessment survey.

METHODS
Study Design and Setting

The University of Minnesota Institutional Review Board approved this study, which was performed by medical students in person by means of a needs assessment survey (Appendix 1). We interviewed patients on the general medicine floor of an academic medical center within a large health care system in the Minneapolis/St. Paul metro area from January to June 2016. Adult patients 18–80 years old who were admitted to the general medicine floor and had been admitted three or more times in the previous 12 months (inclusive of the current admission) were eligible to participate. We excluded patients who were pregnant at any point, admitted for treatment for oncology, trauma, or surgery for acute conditions, or who had previously been diagnosed with dementia or encephalopathy.

Eligible patients were identified through the electronic medical record and approached to participate. Patients who agreed to participate received a $10 gift card. After informed consent was obtained, the needs assessment survey was administered in person, which comprised questions regarding patient demographics, medical and mental health history, health care access, drug and alcohol abuse, education, employment, average monthly income over the past 12 months, housing, transportation, legal consult, and any other barriers to health the patient acknowledged. Self-identified race was included in patient demographics to determine if our survey population was representative of the census data of Hennepin County where the study was performed.

We constructed the needs assessment by combining questions from several validated surveys (Appendix 1). We piloted and refined the needs assessment with five respondents who met inclusion criteria; these responses were not included in the final analysis.

We created several composite variables for analysis. We defined chronic diseases as heart disease, diabetes mellitus, chronic pain, chronic obstructive pulmonary disease, and hypertension. We defined a mental health need as having been diagnosed with depression, having serious personal or emotional problems in the last 12 months (as defined by the respondent), or needing but not receiving mental health counseling. We defined substance use as non-prescription drug use or daily alcohol use.

Study data were collected and managed using REDCap electronic data capture tools hosted at the University of Minnesota.[5] Descriptive statistical analyses and data processing were performed with R version 3.2.1[6] and RStudio version 0.99.467.[7]

RESULTS

In total, 26 respondents met inclusion criteria, and 13 respondents consented and completed this pilot study for a 50% response rate.

Baseline characteristics of the respondents are shown in Table 1. The average number of inpatient admissions in the preceding 12 months was 10.77 (SD 3.94). All respondents had a primary care provider and health insurance. Respondents self-reported that they had seen their primary care provider an average of 14 times (range 3–48) in the preceding year. In terms of medical needs, a majority of respondents (77%) had more than one chronic disease (Figure 1), with the most prevalent chronic diseases being depression (85%) and chronic pain (77%; Table 2). In addition, almost all respondents identified a mental health need (92%) and we found a relatively low prevalence of reported substance use (15%; Table 3).

In terms of social needs, a majority of respondents (62%) earned less than $12,000 per year and were unemployed over the preceding year (77%). In addition, a majority of the respondents (62%) needed government assistance in terms of food and housing assistance and almost half of the respondents (46%) needed transportation assistance in the prior 3 months However, only a minority of the respondents (23%) had housing instability. A majority of the respondents (92%) had more than one person with whom they discuss important matters (Table 4).

A majority of the respondents (75%) named communication between the patient and the care team as a barrier.

DISCUSSION

This study characterized 13 patients with high health care utilization in an academic medical center inpatient

Table 1. Demographics.

	Current study	Hennepin county
Male sex (n [%])	6 (46.2)	
Age (mean [sd])	43.77 (8.52)	
Number of inpatient admissions in 12 months (mean [sd])	10.77 (3.94)	
What is your race or ethnicity? (n [%])		
White = Yes	11 (84.6)	74.4
African American or Black = Yes	1 (7.7)	11.8
American Indian or Alaskan Native = Yes	1 (7.7)	0.9
Asian = Yes	0 (0)	6.2
Latino, Hispanic, or Spanish Origin = Yes	0 (0)	6.7
Native Hawaiian or Other Pacific Islander = Yes	0 (0)	0.0
What is your educational background? (%)		
Graduated college	5 (38.5)	
Graduated high school or got GED	7 (53.8)	
Some college, did not graduate	1 (7.7)	
What is your average monthly income over the past year? (n [%])		
$1,001–$1,800	2 (15.4)	
$1,801–$2,600	2 (15.4)	
$201–$1000	5 (38.5)	
Less than $200	3 (23.1)	
More than $2,600	1 (7.7)	
How many months have you been employed in the last year? (n [%])		
6 months or more	1 (7.7)	
Less than 6 months	2 (15.4)	
None	10 (76.9)	

Total respondents = 13. n = number of respondents. % = percentage of total study population. Data for Hennepin County from U.S. Census Bureau, 2010 Census.
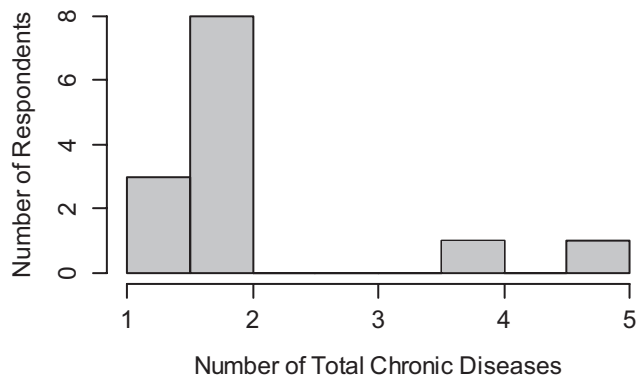
Figure 1. Distribution of total number of chronic diseases. Chronic diseases were defined as heart disease, diabetes mellitus, chronic pain, chronic obstructive pulmonary disease, and hypertension. Mean total number of chronic diseases per patient = 2.15 (Standard Deviation = 1.14). Overall n = 13.

Table 2. Medical conditions.

Do you have a primary care provider (PCP)? = Yes (%)	13 (100.0)
If yes, in the past year, how many times have you seen your primary care provider (PCP)? (mean [sd])	14.35 (13.24)
Do you have health insurance? = Yes (%)	13 (100.0)
Total number of chronic diseases per patient (mean [sd])	2.15 (1.14)
Patients with >1 chronic disease (n [%])	10 (76.9)
Patients with >2 chronic diseases (n (%))	2 (15.4)
Have you been diagnosed by health care provider with any the following health conditions?	
Heart disease (n [%])	2 (15.4)
Cancer (n [%])	2 (15.4)
Stroke (n [%])	2 (15.4)
Diabetes (n [%])	4 (30.8)
Depression (n [%])	11 (84.6)
Chronic pain (n [%])	10 (76.9)
COPD/asthma (n [%])	7 (53.8)
High blood pressure (n [%])	5 (38.5)

Total respondents = 13. n = number of respondents. % = percentage of total study population.

setting. All of the respondents had health insurance and a primary care provider. In addition, financial struggles were common as more than a majority of the respondents reported annual incomes of less than $12,000,

Table 3. Mental health.

	n (%)
Respondents with mental health needs	12 (92.3)
Respondents with substance use	2 (15.4)
During the past 12 months, have you had any serious personal or emotional problems? = Yes	3 (23.1)
During the past 12 months, did you seek help for any personal or emotional problems from:	
Family or friends?	8 (61.5)
A therapist, counselor, or self-help group?	4 (30.8)
A priest, minister, rabbi, or other religious counselor?	4 (30.8)
During the past 12 months, was there any time when you needed mental health care or counseling, but didn't get it because you couldn't afford it? = Yes	2 (15.4)

Total respondents = 13. *n* = number of respondents. % = percentage of total study population.

Table 4. Social needs.

Income and employment	
How many months have you been employed in the last year? *n* (%)	
None	10 (76.9)
Less than 6 months	2 (15.4)
6 months or more	1 (7.7)
What is your average monthly income over the past year? *n* (%)	
Less than $1,000	8 (61.5)
More than $1,000	5 (38.5)
Housing and transportation	
Where do you live now? (*n* [%])	
Currently own a house/apartment	4 (30.8)
Currently rent a house/apartment	7 (53.8)
Other	2 (15.4)
Are you at risk of losing your housing? (*n* [%])	
No	9 (69.2)
Pass	1 (7.7)
Yes	3 (23.1)
Do you currently receive government assistance for housing? = Yes (%)	3 (23.1)
How many times in the last year have you been unable to seek medical care due to transportation issues? (%)	
3 or more	5 (38.5)
Less than 3	1 (7.7)
Never	7 (53.8)
In the last 30 days, did you ever cut the size of your meals or skip meals because there wasn't enough money for food? = Yes (*n* [%])	3 (23.1)
If Yes, in the last 30 days, how many days did this happen? (mean [sd])	2.67 (0.58)
Do you currently receive government assistance for food? = Yes (*n* [%])	6 (46.2)
On government assistance = Yes (*n* [%])	8 (61.5)
Legal	
In the past year, have you received legal assistance? (from a lawyer or legal aide) = Yes (*n* [%])	1 (7.7)
Social support	
How many people do you discuss important matters with? (mean [sd])	3.69 (2.06)
Respondents with more than one important person = Yes (*n* [%])	12 (92.3)

Total respondents = 13. *n* = number of respondents. % = percentage of total study population.

being on food or housing assistance and being unemployed for the previous 12 months.

Our rationale for conducting this study was to compare our findings from our face-to-face needs assessment to previously reported characteristics of patients with high ED utilization. The age of the respondents in the current study were more comparable to patients with high ED utilization but as opposed to patients with high ED utilization, the respondents presented with unique medical issues such as chronic pain management and depression.[1] This demonstrates the unique medical complexity of patients served by our tertiary academic medical center. However, similar to the patients in our study, pain was a common symptom with high utilization visits in the ED.[8] This is unsurprising as chronic pain has been associated with higher health care expenditures[9] and health care use.[10,11]

As opposed to medical needs, social needs of the respondents in our study mirrored the social needs of patients with high ED utilization. Patients with high ED utilization have high rates of unemployment with incomes below the poverty level but have low rates of housing instability.[1,8,12] In addition, similar to the respondents in our study, 94% of patients with high ED utilization had relatives or friends for support.[8]

All patients in our study had health insurance, consistent with previous studies.[2,13] However, while previous studies of admitted patients with high utilization of public insurance in Tennessee demonstrated only 54% of respondents having a primary care physician,[2] all

respondents in our study reported that they had a primary care physician. While this could be related to the small sample size in our study, it is also possible that the primary care surplus in Minnesota may have provided

greater primary care access as opposed to the deficit in Tennessee.[14]

As compared with previous studies, this study found a low prevalence of substance use disorders and lower rates of hypertension and congestive heart failure. Previous studies of admitted patients with high utilization have found substance use disorder prevalence rates of 57%.[15] The low prevalence found in the current study could be attributed to the survey method as patients are less likely to report illicit drug use during an in-person interview or may not identify opiate use disorder as substance abuse or dependence given the high prevalence of chronic pain observed in the current study.[16]

Even though our study differs from previous studies by relying on self-reports of patients of their medical conditions, previous studies have demonstrated high accuracy of self-reports for heart disease, diabetes mellitus, and hypertension, although some of the studies may have been confounded by the education level of the participants.[17,18] Rates of diabetes mellitus, hypertension, and heart disease were lower in our sample, suggesting the relative youth and unique medical complexity of the patient population.

Limitations of the study include the low number of respondents and the lack of a comparison group of patients without high utilization for statistical comparison. In addition, barriers to health for non-English speaking patients could not be analyzed because only native English speakers were included in the study. Finally, differences in sources of insurance could not be analyzed as our study did not differentiate between private and public insurance.

Future work should elucidate the attitudes of patients with high utilization on the communication between the patient and the health care team, as this was the most common additional barrier mentioned by respondents and further elucidating whether their primary care access is adequate.

In addition, patients with high utilization in multiple hospital settings should be surveyed using the needs assessment with a comparison group for statistical analysis.

This pilot study surveyed patients with high utilization in an inpatient setting at an academic medical center using a needs assessment tool. Even though patients with high utilization have been characterized in multiple settings, it is important for each hospital to examine its own population of patients with high utilization to determine the best means of supporting them.

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