CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

Emergency Department Cluster High Utilizers: Trends, Demographics, and Impact on Health Care Systems

A graduate project submitted in partial fulfillment of the requirements

For the degree of Master of Social Work

By

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The graduate project of Luke Barrett is approved:

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Dedication

This project is dedicated to the hospital social workers who supported the research. I learned the value of social work in a hospital setting and expanded my expectations for the role of social work in health care.

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Abstract

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The purpose of this research was to identify demographics of people who repeatedly have
multiple emergency department visits over a short period of time, defined by this project
as cluster high utilizers, and to draw attention to the impact of cluster high utilizers on
health care systems. This research included retrospective hospital data organized by
quantity of emergency department visits per week over a four-year period. The methods
for data analysis included descriptive statistics focused on demographics and emergency
department utilization for a sample of cluster high utilizers ($n = 53$). Cluster high
utilizers in this research were most likely to be middle aged, homeless, white, male, have
MediCal health insurance, not have a primary care provider, and visit the emergency
department in the summer months. The results of this research indicate that cluster high
utilizers represent an extremely small portion of the overall emergency department
patient population (0.83%); however, they use the emergency department at significantly
higher rates, in this study 2,644% more than the general patient population ($N = 92,313$).
Further research is necessary to determine the causes of cluster high utilization and to
design effective social work and emergency department interventions. Addressing this
problem could prevent many unnecessary emergency department visits.

Introduction

High utilizers of the emergency department have been a focus of previous research largely due to the negative financial effects that they have on health care systems (Chambers, et al., 2013). As of 2010, the highest health care cost accruing patients in the United States averaged $90,000 per person in annual expenses, and represented 1% of the patient population, and 20% of the annual national health care cost. A large portion of those expenses were eventually paid for by hospitals and/or public money through government programs (Powers, Chaguturu, & Ferris, 2015). The amount of emergency department visits, and prevalence of high utilizers of emergency departments, has also increased nationwide in recent years (Tang, Stein, Hsia, Maselli, & Gonzales, 2010). Another growing cost of health care system misuse is staff burn out and turnover. In recent years, emergency department staff members have been found to report concerning rates of burn out (Adriaenssens, Gucht, & Maes, 2015).

Published research has suggested that as a group, high utilizers of the emergency department is too heterogeneous for health care systems to develop effective interventions, and that identification of well-defined homogenous subgroups within high utilizers of the emergency department is a necessary step to develop systematic evidence-based interventions to address this growing issue (Lacalle & Rabin, 2010). One potential subgroup of high utilizers of the emergency department suggested by this research project is cluster high utilizers, which is a category to describe people who visit an emergency department frequently over a short period of time. There may be a different set of causative

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factors related to a patient who visits an emergency department every day for seven days but never again, compared to a patient who visits an emergency department once per month for a year, even though both are high utilizers. Due to potential differences between cluster high utilizers and other types of high utilizers of emergency departments, specialized social work interventions may be indicated for cluster high utilizers to prevent unnecessary repeat emergency department visits.

Literature Review

Research indicates that high utilization of emergency departments is multi-factorial in nature and may often be considered an effect of other institutional gaps in service. Barriers to primary care for example have been found to be directly related to high emergency department utilization (Lasser, 2012) (Cheung, 2011). As an attempt to reduce barriers to primary care, some states recently expanded Medicaid. Some research has found that new Medicaid health insurance coverage for low income people does not seem to proportionally increase primary care utilization or lower emergency department visit rates (Lin, Bharel, Zhang, O'Connell, & Clark, 2015). Other researchers have indicated that Medicaid expansion can reduce emergency department visits (Sommers, Blendon, Orav, & Epstein, 2016). The disparity in the literature base may be attributed to regional differences and/or the inherent heterogeneity of people who have high lifetime emergency department utilization rates (Lacalle & Rabin, 2010).

Another challenge for health care systems is creating standardized quality

metrics for hospitals and emergency departments, especially when subgroups such as high utilizers are considered. A common practice for health care industry regulators, such as the Centers for Medicare and Medicaid Services, is to compare the quality of safety net hospitals, which provide care for medically underserved populations, to non-safety net hospitals using the same metrics, which may not take into account differences in patient population (Fee, Burstin, Maselli, & Hsia, 2012). As more hospitals are reimbursed based on standardized quality metrics, the metrics become more important to the financial stability of the health care system overall. For example, researchers suggest that the standard return to the emergency department within 72 hours rate metric is significantly confounded by high utilizers, which affect hospitals nationwide inconsistently (Rising, Wiebe, Victor, Hollander, & Carr, 2013). Further research about high utilizers of the emergency department, and especially cluster high utilizers, may prompt new standardized health care quality metrics that account for the effects of those groups (Sabbatini, Kocher, Basu, & Hsia, 2016).

Medical social work often serves a role at the intersection of patient care, hospital administration, and policy (Moore, Ekman, & Shumway, 2012). Medical social work is also especially relevant when addressing high utilizers of the emergency department because people with low socioeconomic status are very prevalent in that group (Capp et al., 2013). The increasing trend in high utilizers of the emergency department is over-represented in middle age males of low socioeconomic status with multiple physical and mental health conditions (Krieg, Hudon, Chouinard, & Dufour, 2016). Fear about disease progression,

and uncertainty regarding outpatient services such as primary care, are also related to consistent emergency department utilization for non-emergency conditions (Rising et al., 2015). The problem of inappropriate utilization of emergency departments is complex and health care systems have attempted to reduce the burden of high utilizers in many ways.

In prior research, co-payments for Medicaid patients who visited the emergency department did not have a significant effect on reducing emergency department utilization rates (Jarou, 2015). Many of the more successful interventions in published literature involved medical social work and interagency collaboration (Mercer et al., 2015) (Reiss-Brennan et al., 2016) (Adams, 2013). For example, the medical home model has been found to reduce emergency department visits for low income people (Friedberg, Rosenthal, Werner, Volpp, & Schneider, 2015). Multidisciplinary teams including social work or case management have also been found to be effective when emergency department visits were used as an intervention point (Soril, Leggett, Lorenzetti, Noseworthy, & Clement, 2015). Emergency department initiated behavioral health interventions have been effective to decrease hospital utilization and increase outpatient behavioral health treatment adherence (Stanley et al., 2015) (Kirk, Leo, Rehmer, Moy, & Davidson, 2013). A key component of many successful models of emergency department intervention for complex patients and high utilizers is a predictive trigger paired with a specific evidence-based intervention.

People who visit an emergency department frequently over a short period of time, cluster high utilizers, comprise a subgroup that has not yet been adequately researched to create a specific predictive model that may trigger a medical social work intervention. There are several successful examples of predictive models that could be used as a foundation to identify potential cluster high utilizers. A group of researchers focused on specific diagnoses and combinations of health risk factors to create an accurate predictive model for future emergency department visits (Billings & Raven, 2013). Another successful predictive model was focused on prevention of medical errors in the emergency department (Calder et al., 2014). Overall, interagency data sharing combined with predictive modeling-based triggers for specific interventions designed to help complex patients has been found to reduce health care system costs and improve patient health (Horrocks, Kinzer, Afzal, Alpern, & Sharfstein, 2016) (Parikh, Kakad, & Bates, 2016).

Medical social workers may be involved in the research process for predictive models to identify potential cluster high utilizers, and could be effective as part of the associated hospital interventions. While using predictive models and associated evidence-based interventions in hospitals has been found to be effective for other groups, there is also some associated risk to patients. Being labeled in an electronic health record as a potential cluster high utilizer could attach a negative stigma to a patient and could negatively affect how they are treated by hospital staff members. Additionally, patients have a legal right to access their medical records and a chart label such as cluster high utilizer may

cause some psychological or emotional harm. These concerns should be carefully considered and mitigated before any type of predictive analysis or intervention is implemented in a hospital setting to reduce the risk of causing harm to vulnerable patients (Joy, Clement, & Sisti, 2016).

Data Source

The data for this research was originally collected through the reporting section of two hospital electronic medical record systems (IBEX and All Scripts) as part of a medical social work internship and hospital quality improvement study. The intent of the research was to identify all patients who repeatedly visited the emergency department at a high rate during a short period of time (cluster high utilizers), and to use that information to help address the health and/or social issues causing the emergency department visits. The researcher reviewed the quantity of emergency department visits for every patient that received treatment between August, 2012 and August, 2016. A spreadsheet was created to record information about all patients who visited the emergency department three or more times in one week. The spreadsheet initially contained the patient name, visit quantity, and the week the emergency department utilization occurred. Later, the age, gender, race, ethnicity, housing status, primary care clinic, and health insurance type was recorded in the spreadsheet for the people who met the cluster utilization criteria for three or more weeks. The inclusion criterion of cluster utilization during three or more weeks was determined primarily based on the data collection time limitations of the researcher. Patients were never interacted with by the researcher as part of the

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data collection process. The spreadsheet was stored securely on a hospital computer workstation and was later completely and irreversibly de-identified for future use.

Aims and Objectives

The published literature regarding high utilizers of the emergency department indicates that more research is needed to define homogeneous subgroups, and that the negative impact of inappropriate emergency department utilization to health care systems is significant and growing. There is also a precedent of predictive data models as a trigger for specific team-based interventions that include social work being used in hospitals successfully. The primary objective of this research project was to define a subgroup of emergency department high utilizers, specifically people who repeatedly use the emergency department frequently in a short period of time. This research project used the term cluster high utilizers to describe that group.

Another goal of this research was to use the data collected from a medium sized safety net hospital to measure the prevalence of cluster high utilizers, describe the group demographically, and illustrate the group's utilization trends. Due to the data source hospital's location in Southern California where there is a common belief that more homeless people live in the area during the summer compared to the winter, special attention was given to seasonal effects on cluster utilization rates. The primary value of this research project to the health care industry and the field of medical social work was the cluster high utilizer group definition and description, which could serve as a foundation for a predictive model of cluster utilization research in the future.

Method

Participants

The participants in this study consisted of 767 hospital patients who visited the emergency department three or more times in one week (a cluster visit instance), between August, 2012 and August, 2016. A sample of cluster high utilizers was selected for detailed analysis ($n = 53$). The sample of cluster high utilizers was selected based on the following inclusion criteria: three or more cluster visit instances during the review period. The average age of the cluster high utilizer sample group was 53 years old, ranging from 20 to 83 years old. The cluster high utilizer sample group was 81% male, 19% female, 79% White, 17% Latino, and 4% African American, and 63% were experiencing homelessness. The participants were not interacted with by the researcher because all data was collected from pre-existing hospital records retrospectively.

Measures

The data collected about all emergency department patients during the review period were the quantity of visits per week between August, 2012 and August, 2016. The additional data collected for the cluster high utilizer sample included: age, gender, race, ethnicity, housing status, primary care clinic, and health insurance type.

Data Collection Procedures

The data were originally collected by reviewing the total number of emergency department visits for each week by patient name, for the period between August, 2012 and August, 2016. All patients who had a total of 3 visits or more were logged as meeting the cluster visit instance criteria for that week. Next, the data was sorted by the total quantity of weeks that each patient met the cluster visit instance criteria, from

highest to lowest. There were 53 patients who had met the cluster visit instance criteria three times or more. The researcher then reviewed the patient profile for all 53 people included in the cluster high utilizer sample group, and logged their age, race, ethnicity, gender, housing status, primary care clinic, and heath insurance type based on hospital records. Finally, the researcher permanently and completely de-identified the data set for future use and analysis outside of the hospital setting.

Research Design

This research project was descriptive in nature and used retrospective de-identified hospital data (see Data Collection Procedures above). Institutional Review Board approval was requested from California State University Northridge on (10/09/2017) and was this project was granted exempt status on (10/10/2017).

Data Analysis

Data analysis was conducted using IBM SPSS Statistics version 22 and Tableau version 10.2.4. Prevalence of cluster high utilizers was measured by comparing the total quantity of patients that visited the emergency department during the review period to the cluster high utilizer sample group. Descriptive statistics were calculated for demographic data variables (age, race, ethnicity, gender, housing status, health insurance type, primary care clinic) for the cluster high utilizer sample group. Cluster high utilizer emergency department visits by month were analyzed to illustrate seasonal differences. Finally, the emergency department visit rate of the cluster high utilizer sample group was compared to the general patient population to highlight the impact on the health care system.

Results

The information collected about the cluster high utilizer sample group ($n = 53$) was analyzed using descriptive statistics to create a demographic data. The cluster high utilizer sample group was 81% male, 79% white, 63% were experiencing homelessness, 37% had MediCal health insurance, and 40% did not have an established primary care provider (Appendix A). The emergency department visit dates were analyzed to measure seasonal differences in utilization by the cluster high utilizer sample group. The years 2013, 2014, and 2015 were used for the seasonal utilization analysis because they were the only full years available in the data set. In all three years, the summer months of July and August had the highest cluster utilization rates of the emergency department by the sample group (Appendix B). During the four-year review period, the cluster high utilizer sample group ($n=53$) accounted for 2,873 emergency department visits. During the same period, the mean per patient emergency department visit rate for all patients ($N = 92,313$) was 2.05 compared to 54.21 for the cluster high utilizer sample group, which represents a utilization rate of 2,644% higher than the general emergency department patient population.

Discussion

Cluster high utilizers represent a very small portion of emergency department patients; however, they disproportionately impact health care systems. This research found that cluster high utilizers were likely to have low income as evidenced by the high prevalence of homelessness and MediCal health insurance in the sample group. Due to the lack of comparison data about the general patient population, it is unknown how different cluster high utilizers were socioeconomically. The higher rate of cluster

utilization in the summer was interesting. The seasonal differences in cluster utilization rates found in this research may be related to the common belief that the region had an annual influx of people experiencing homelessness during the summer months.

There were several limitations of this research. First, the lack of similar demographic data for the general patient population made comparison to the sample group impossible. Second, because the hospital source for the data was a medium sized acute care facility located in an urban area of Southern California the findings of this research may not be generalizable to other parts of the country or rural areas. Future research may consider collecting diagnostic data for emergency department cluster high utilizer visits as a method to separate valid medical emergencies from inappropriate emergency department utilization. It may also be important for the literature base on this topic if future studies are conducted in rural areas and/or outside of California. Additionally, future research may benefit from collecting demographic data for the general patient population to compare with the cluster high utilizers.

The results of this research may be useful to medical social work practice in particular. Medical social workers could incorporate the criteria for cluster high utilizers from this project in future research or program design. Additionally, the cluster high utilizer demographics and seasonal trend data collected in this research may be useful for emergency department social workers as part of a predictive model design. Because this research was entirely retrospective, cultural considerations were not included in the methodology. Future social work researchers may consider cultural factors if interviews of cluster high utilizers are conducted.

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Appendix A

Cluster High Utilizers Sample Descriptive Statistics Table

Demographics (*n* = 53)	Frequency
Gender	
Female……………………………………………………....	19% (10)
Male………………………………………………….…....	81% (43)
Age	
20 – 39 years old……………………………………….……	11% (6)
40 – 55 years old……………………………………….….	45% (24)
56 – 71 years old……………………………………….….	42% (22)
72 – 83 years old……………………………………….….	2% (1)
Race/Ethnicity	
White…………………………………………………….	79% (42)
Hispanic / Latino…………………………………………....	17% (9)
African American……………………………………….…..	4% (2)
Housing Status	
Homeless…………………………………………………....	63% (33)
Not Homeless…………………………………………….…	37% (20)
Health Insurance Coverage	
MediCal……………………………………………………..	37% (20)
MediCal and Medicare……………………………………....	30% (16)
Medicare………………………………………………….…	11% (6)
Blue Cross…………………………………………………..	4% (2)
United Healthcare…………………………………………..	4% (2)
VA…………………………………………………………..	2% (1)
VA and MediCal……………………....……..….…………....……….	2% (1)
Aetna………………………………………………………..	2% (1)
Kaiser Permanente…………………………………………..	2% (1)
No Health Insurance………………………………………….	6% (3)
Primary Care Clinic	
None………………………………………………………....	40% (21)
Santa Barbara Public Health Department……………………..	28% (15)
Santa Barbara Neighborhood Clinics…………………………	11% (6)
Sansum Clinics………………………………………………..	9% (5)
American Indian Health…………………………………….…	6% (3)
VA Community Based Outpatient Clinic……………………..	2% (1)
Other…………………………………………………….…..	4% (2)

Appendix B

Cluster High Utilizers Seasonal Trends Graph

Cluster High Utilizer Visits (2013, 2014, 2015)