Researchers identify characteristics of highest utilizers for mental health hospital services

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Dropping out of high school, having schizophrenia, or being diagnosed with a co-occurring personality disorder increases the likelihood of someone becoming a "high utilizer" of inpatient psychiatric hospital services, according to a new study by researchers at The University of Texas Health Science Center at Houston (UTHealth). A high utilizer is someone who has been admitted three or more times within one year.

The research was published today in *The Journal of Health Care for the Poor and Underserved*.

For their findings, researchers used machine learning to analyze deidentified electronic health record data from 9,840 patients admitted to UTHealth Harris County Psychiatric Center from January 2014 to December 2016. It is the first study of its kind to examine high utilizer trends in an academic safety net psychiatric hospital in a large, diverse region, where many patients are from underserved and disadvantaged populations.

"Many people don't realize that half of all health care expenses in the U.S. are incurred by 5% of the population," said Jane Hamilton, Ph.D., MPH, assistant professor in the Louis A. Faillace, MD, Department of Psychiatry and Behavioral Sciences at McGovern Medical School at UTHealth and first author of the study. "These high utilizers are a very small number of individuals who are consuming a high number of resources. We need to figure out why they keep coming back so we can put supports around them to stop the trend."

Instead of a traditional statistical approach, where researchers would first examine each factor's independent relationship with utilization, the team leveraged machine learning, a form of artificial intelligence, to examine all factors at once.

"A machine learning algorithm called the 'elastic net' was able to predict utilization by including all of the predictors in the model at the same time," said Robert Suchting, Ph.D., assistant professor in the Faillace Department of Psychiatry and Behavioral Sciences and study co-author. "Traditionally, including all of the predictors at the same time can lead to unstable estimates of the strength of each predictor's relationship. The elastic net quantifies each predictor's relationship to the outcome, making it much easier to determine which predictors are strongest."

By identifying years of education, a schizophrenia diagnosis, and a co-occurring personality disorder diagnosis (being diagnosed with a personality disorder and another psychiatric condition concurrently), as the main predictors of high utilization, researchers were able to highlight suggestions for each predictor:

Less than 12 years of education: When working with psychiatric patients with limited education, mental health providers should routinely assess for mental health literacy and connect patients with educational support programs to improve health outcomes.

Schizophrenia and co-occurring personality disorders: Patients experiencing a first episode of psychosis, or the first signs of schizophrenia, comprise a subpopulation requiring enhanced efforts and prioritization for better identification and treatment at this critical phase of illness. Additionally, the routine assessment and treatment for co-occurring personality disorders should be integrated into community-based psychiatric treatment.Hamilton, who studies social determinants of health, writes in the paper that many high utilizers have complex health needs, are more likely to be from socially disadvantaged

groups, and have limited access to community-based health care and social services.

"Both schizophrenia and personality disorders can be difficult to treat, and many patients with these diagnoses are disadvantaged and vulnerable to health disparities. We really need evidence-based treatments in place to help these patients avoid repeat hospitalizations, and this study is a great first step in helping to identify the appropriate outpatient resources to help these patients remain stable in the community and avoid repeat hospitalizations," Hamilton said.

Hamilton is working with Lokesh Shahani, MD, MPH, chief medical officer of UTHealth Harris County Psychiatric Center, to strategize how to leverage the study to improve care transitions for these patients as they move from inpatient to outpatient care.

"Rehospitalization in a psychiatric hospital affects patient care and adds financial burden to our current health care system," said Shahani, an assistant professor in the Faillace Department of Psychiatry and Behavioral Sciences. "Using results from this current study, we will be able to better identify patients at high risk for rehospitalization. This would help us design and provide new treatment modalities to reduce their likelihood of future hospitalization."

Provided by University of Texas Health Science Center at Houston

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