Subgroup Identification with Bayesian Nonparametric Models for individuals with schizophrenia who are at risk for relapse

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SUBMISSION DETAILS

What is the Methodological Question Being Addressed? Can Bayesian nonparametric models be used to identify subgroups with high or low rates of relapse through decision trees of complex interactions in a way that is likely to be readily understandable by clinicians and policy makers?

Introduction Many individuals with schizophrenia relapse within 1 year following discharge from inpatient hospitalization. Although prior research has identified several risk factors for relapse among individuals with schizophrenia, little is known about how these factors may interact to modify relapse risks. We conducted an exploratory analysis aimed to obtain an empirically based set of interactions of factors related to relapse rates of individuals with schizophrenia. Unlike logistic regression analyses that include only main effects or interaction terms specified a priori, these analyses allow for the investigation of more complex interactions.

Methods We assessed 140 inpatients discharged from a psychiatric facility in New York and followed for two years, utilizing data mining (Bayesian Dirichlet Equivalent (BDE)) to reanalyze data from a retrospective study by randomly splitting the data into two samples (primary (n = 70) and replication (n = 70)), and developing a decision tree for the primary sample using recursive partitioning. We tested whether the subgroups developed within the primary sample were associated with increased relapse risk in the replication sample. Analyses focused on predicting relapse as the primary outcome with candidate risk factors: race, treatment with LAIs, treatment with clozapine, sex, education, MCCB domain, age, substance use disorder, comorbid psychiatric disorder, prior hospitalizations (< > 5), length of recent hospitalization, Marder PANSS factors, PANSS G12 Lack of judgment and Insight, and baseline medical comorbidity.

Results The analysis produced a decision tree with subgroups at differing levels of risk for relapse. These were identified by a combination of factors: >3 on PANSS G12 Lack of Judgment and Insight, co-occurring substance use, African American race, male, PANSS Disorganization factor score, and > 5 previous inpatient hospitalizations. The groups developed by the decision tree accurately discriminated between those with and without relapse in the replication sample. Item G12 PANSS, PANSS Disorganized factor, older age, and being African American were the single strongest indicators of relapse (OR = 2.1 (95%CI 1.5, 3.3). Depending on the pattern of risk, the risk of relapse ranged from low among younger women without a substance use disorder, to high among African Americans with a substance use disorder and > 5 inpatient psychiatric hospitalizations.

Conclusion Although the sample size is small, this study uses an empirically derived decision tree to identify subgroups by relapse rates. Results indicate that the association between a known risk factor and relapse is not independent of another risk factor. Findings suggest that the identification

of individuals at increased risk for relapse is improved through the examination of higher order interactions among potential risk factors. This significant variability in level of risk depending on the interaction of factors could facilitate the study of how these risk factors combine to influence relapse. Clinicians treating these subgroups should be aware of these risks and consider targeting treatment strategies to address these combined factors.

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Keywords

Keywords
bayesian nonparametric
relapse
decision tree

Guidelines I have read and understand the Poster Guidelines

Disclosures if applicable The study is a secondary analysis of existing data from a parent study assessing cognitive remediation. There are no funding sources.

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