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Predictors of residency status in chronically institutionalized and community dwelling schizophrenia patients

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ABSTRACT

Background: This cross-sectional study contrasted chronically hospitalized schizophrenia (SZ) spectrum disorder inpatients to SZ community dwelling patients on measures of psychopathology, social competence, neuropsychological performance and real-world functioning in order to discern factors predictive of patients' residency status and to characterize the contrasting ends of the SZ outcome continuum.
Method: Subjects included 26 chronic SZ patients hospitalized continuously on average for 12.8 years, and 26 SZ patients with a history of at least 18 months tenure in community placement.
Results: A series of multivariate analyses revealed both chronically hospitalized and community dwelling patients were similar in terms of their real world functioning abilities such as work skills, interpersonal skills, self-care skills and community engagement. Chronic SZ inpatients' manifested more severe functional competency and neurocognitive deficits relative to outpatients. Additionally, chronic inpatients were discriminated from community dwelling outpatients by their symptom severity and commitment of more socially undesirable/antisocial type behaviors.
Conclusions: Factors associated with chronic institutionalization are, in part, related to commission of antisocial type behaviors, as well as poor social and neurocognitive competences, and total symptom severity rather than deficits in everyday functional abilities.

1. Introduction

Few studies to date have examined discriminators of SZ patients' residential status [1,2] to determine what set of factors keep a certain subgroup of SZ patients' hospitalized for extended periods of time. Past studies have found, for example that geriatric inpatients display more cognitive deficits and negative symptoms than younger patients or SZ outpatients [2–4]. Additionally, in a large scale study examining geriatric SZ patients, aggression and hostility were inversely correlated with discharge rates independent of other symptom domains [5]. Similarly, in a two year large *n* longitudinal study examining geriatric inpatients [6], it was found that SZ inpatients who remained in state hospitals were more hostile, uncooperative, and had more delusions, grandiosity and suspiciousness compared to SZ geriatric patients who were discharged to community settings.

But limited information is available about discriminators of dwelling status of non-geriatric chronically institutionalized SZ patients. The current investigation was a cross-sectional multivariate analyses comparing a SZ outpatient sample to chronically hospitalized SZ inpatient sample assessing a wide variety of symptom, neurocognitive, and social functioning domains to discriminate patients' residency status. It was hypothesized that chronically hospitalized SZ patients would be distinguished from SZ community dwelling patients by manifesting greater psychopathology as well as significantly more social and cognitive impairments.

2. Methods and materials

2.1. Subjects

Participants consisted of 26 chronically hospitalized SZ patients and 26 SZ outpatients meeting DSM-5 diagnostic criteria for schizophrenia or schizoaffective disorder as determined by the Diagnostic Interview for Genetics Studies (DIGS: 7). Subjects ranged in age between 18 and 65 years and were recruited from a state hospital long term psychiatric inpatient unit and from the Community Services Division outpatient programs from the state psychiatric services division. In order to meet study inclusion criteria all chronic hospital SZ inpatients met a minimum of at least 18 months of continuous hospitalization at the time of the study, with an average length of current hospitalization of

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12.8 years. SZ outpatients met a minimum of 18 months placement in community setting without any hospitalizations. The majority (65%) of the outpatient participants resided in community-based residences or group homes, and 25 (96%) attended at least one day per week of an intensive outpatient day program. The average number of days in a program was 3.81 (SD = 1.39) days per week. Outpatients living in the community independently (35%; n = 8) did not differ from outpatients living in community based residences (65% n = 15) on any demographic variable, adaptive competency (UPSA), cognitive functioning (index score) total symptom severity (PANSS) or any real-world functioning domain (SLOF) (p's > .05).[1]

Group demographic data are presented in Table 1. One-way analyses of variance (ANOVAs) and *chi square* tests found that the chronic inpatients (mean age = 57.27) were significantly older than their outpatient counterparts (mean age = 49.08), $F(1,52) = 10.83$, $p = .002$. There were no significant group differences in regards to gender, χ^2 (1, 52) = 1.56, $p = .21$, diagnosis, χ^2 (1, 52) = 0.72, education, $F(1,50) = 0.23$, $p = .63$, or ethnic origin, χ^2 (2, 52) = 4.07, $p = .13$.

Participants with a medical chart diagnosis of a history of head trauma, HIV, dementia, or any disorder of the central nervous system, and/or a developmental/intellectual disorder, were excluded from the study. Eleven hospitalized patients as well as eleven outpatients were initially recruited for participation but were dropped from the protocol because either they either withdrew their participation or were found to meet one of the exclusion criteria.

Table 1
Means and standard deviations for demographic characteristics of participants.

Characteristics	Inpatients	Outpatients
Age*	57.27 (9.42)	49.08 (8.51)
Sex - male (%)	65.38%	80.76%
Diagnosis - schizophrenia (%)	65.38%	53.84%
Education (years)	11.58 (1.58)	11.77 (1.28)
Length of current hospitalization	12.80 (10.89)	–
Ethnicity		
Caucasian	76.92%	50.00%
African American	15.39%	34.62%
Hispanic	7.69%	15.38%

Values enclosed in parentheses represent standard deviations.
* $p < .02$.

2.2. Measures

All subjects were administered a battery of clinical, psychosocial and neurocognitive assessments including:

2.2.1. Clinical assessment

2.2.1.1. The Positive and Negative Syndrome Scale (PANSS). The Positive and Negative Syndrome Scale (PANSS; 8) is an empirically validated measure that rates patients on symptom severity in the domains of positive, negative, and general psychopathology. The Structured Clinical Interview for the PANSS (SCI-PANSS; 9) was used to assist in data collection for ratings on the PANSS. We used the White et al. [10] factor analytic model, examining the positive symptom factor, the negative symptom factor and the, dysphoric symptom factor. The positive symptom factor includes items measures conceptual disorganization, delusional beliefs and hallucinations. The negative symptom factor includes items measuring emotional withdrawal and blunted affect. The dysphoria factor includes anxiety, depression, guilt, tension, and somatic concern items.

2.2.2. Neurocognitive assessment

All patients were administered a series of cognitive assessments in areas of attention, executive function, verbal learning and memory.

2.2.2.1. Wechsler Adult Intelligence Scale – III (WAIS-III; 11) Digit Span and letter-number sequencing subtests. The WAIS-III Digit Span asks subjects to repeat strings of numbers after they are presented. In the Digits Forward subtest, the subject is asked to recite sequences of numbers of increasing length after they are presented. In the Digits Backward subtest, the examinee is asked to repeat a series of numbers in reverse order, assessing verbal working memory. The WAIS-III letter-number sequencing task requires individuals to reorganize strings of letters and numbers into alphabetical and numerical order. The dependent variable is the sum of correct responses on the Forward and Backward subtests.

2.2.2.2. Wechsler Memory Scale – III visual reproduction. The Wechsler Memory Scale – Third Edition (WMS-III; 12) visual reproduction assesses memory for nonverbal stimuli. The subtest requires subjects to look at five figures for 10 s each. After each presentation, the stimulus is removed and subjects are asked to draw the design from memory. After 25 min, the subject is asked to draw as many of the designs as they can remember. During the recognition portion, subjects are presented with a series of designs and then they are asked to determine if they have seen the design during the initial presentation. Finally, the copy portion asks subjects to copy each of the five original designs to the best of their ability. Dependent variables included Visual Reproduction I, Visual Reproduction II, Visual Reproduction Recognition and Visual Reproduction Copy subtests.

2.2.2.3. Delis-Kaplan Executive Function System (D-KEFS; Trail Making and Verbal Fluency tests). The Delis-Kaplan Executive Function System (D-KEFS; 13) is a frequently used measure of executive functioning. The trail making portion of the test uses a visual-motor task to accurately measure attention and cognitive flexibility. This portion includes five different tests: visual scanning, number sequencing, letter sequencing, number-letter switching, and motor speed. Subjects were administered the verbal fluency subtest. This measure assesses the individual's ability to produce verbal responses as outlined by a specific set of rules for a set time period. Category fluency measures task initiation, simultaneous processing, systematic retrieval of responses, and processing speed. Category switching measures the subjects' ability to retrieve information while also measuring cognitive flexibility. The D-KEFS has been used in a number of studies and has been shown to be a reliable and valid measure of executive function [13–14]. Dependent measures for the D-KEFS included: TMT Visual Scanning, TMT Number Sequencing, TMT Letter Sequencing, TMT Number-Letter Switching, TMT Motor Speed and Verbal Fluency Letter Fluency, Verbal Fluency Category Fluency, and Verbal Fluency Category Switching.

2.2.2.4. The California Verbal Learning Test – Second Edition. The California Verbal Learning Test - II (CVLT-II; 15) is an empirical test of verbal learning and memory [15–16]. Subjects are presented with a list of 16 words, comprised of four categories (i.e. vegetables, furniture, transportation, and animals). The list is presented five times, and after each presentation, subjects are asked to recall as many words on the list they can remember. After presentation of a distracter list, patients are asked to recall items from the first list again. The word list is presented after a delay, and subjects are asked to perform both a free and cued recall. Finally, for the recognition portion, subjects are read a list of words and are asked to correctly identify which words were presented on the first list. Dependent variables used in the present study included Total Word Recall, Short Delay Free Recall, Long Delay Free Recall and Long Delay Cued Recall.

[1] These analyses were based on 23 of the 26 outpatients that residency placement status information was available.