Published in final edited form as:

Am J Geriatr Psychiatry. 2012 March ; 20(3): 248–256. doi:10.1097/JGP.0b013e3182096ae5.

Older Patients With Schizophrenia: Does Military Veteran Status Matter?

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Abstract

Objective—The objective of this study was to examine the influence of military veteran status within a data set of older patients with schizophrenia or schizoaffective disorder.

Methods—The data set was examined to determine whether veteran status influenced psychopathology, quality of life, cognitive performance, and everyday functioning among 746 male participants.

Results—There were no significant differences between the groups on measures of premorbid functioning or psychopathology. Veterans in the sample were older, had a higher likelihood of being married (or previously married), had a lower likelihood of living in a board-and-care facility, and had a later age of onset of schizophrenia compared with nonveterans. Though veterans reported worse physical health, they also had better everyday functioning and better performance on some cognitive tasks than nonveterans. Fewer veterans endorsed current use of substances than nonveterans.

Conclusions—There were several differences based on veteran status, including everyday functioning, health-related quality of life, cognitive performance, and current substance use.

Keywords

aging; cognitive functioning; quality of life; schizophrenia; substance use; veterans

Schizophrenia is a debilitating and costly disease, with a negative impact across the lifespan.

¹ The growing number of older adults with schizophrenia could have serious implications for the healthcare system.^{2,3} Many older adults have served in the military. There are approximately 9 million US veterans aged 65 or older,⁴ representing nearly 40% of all veterans. However, little is known about individuals with schizophrenia who are also military veterans. One example of how schizophrenia and veteran status could converge is suicidal behavior. People with schizophrenia have a higher prevalence of suicidality (including past suicide attempts) in later life compared with age peers.⁵ Male veterans are twice as likely to complete suicide compared with nonveterans.⁶ More generally, the experience of military service could modify the trajectory of psychopathology, health-related quality of life, cognitive functioning, and performance on everyday tasks for those with schizophrenia.

The stress vulnerability model of psychotic disorders postulates that high levels of psychological stress may precede acute episodes of schizophrenia.⁷ It is therefore possible that the stressors associated with military service (e.g., separation from friends and family, boot camp, combat) could increase symptoms of schizophrenia and worsen psychological functioning over a lifetime. However, it is equally plausible that people who are selected for the military would not exhibit signs of schizophrenia earlier in life (thus suggesting a better prognosis) and that the routine of the military would provide a long-term benefit to those who do have schizophrenia while in the military.

Two studies of veterans compared those who received care in the Veterans Affairs (VA) Healthcare System with those who did not. One large-scale study found that veterans, compared with the general population, were more likely to be men and to be older.⁸ VA Veterans, compared with the general population, had lower levels of education, income, and employment and reported poorer health compared with the general population. Non-VA veterans, compared with the general population, were more likely to have a college education and to have higher income, and were less likely to be unemployed. The authors note that the differences between VA veterans and the general population were likely related to the eligibility criteria in place at the VA when the data were collected. At the time, entry into the VA required both evidence of financial need and a service-related medical condition or disability. In a separate study that examined male patients with diagnosed schizophrenia,⁹ VA patients did not differ from non-VA patients (one-fifth of whom were veterans) on most demographic and clinical variables (e.g., symptoms of psychosis and depression, duration of illness, medication side effects, rate of involuntary commitments, risk of alcohol or drug abuse, physical health, activities, social support, life satisfaction, and criminal justice system involvement). However, VA patients were older, were more often currently married, and had higher incomes than their non-VA counterparts. While these studies are informative, they are potentially misrepresentative of the veteran population, given that a relatively small proportion of veterans may utilize VA mental health services.¹⁰

There are studies that have compared veterans with nonveterans generally, and these may serve as a guide for whether veteran status may matter for individuals with schizophrenia. A study of elderly Japanese--American males revealed no significant differences on levels of depression, alcohol or tobacco consumption, or measures of physical strength and ability among high-combat veterans, low-moderate combat veterans, and nonveteran controls.¹¹ However, both veteran groups in this study performed better on a measure of cognitive functioning compared with the nonveteran group. In a study of older adults with dementia in Australia, veterans had lower scores on dementia scales than nonveterans.¹²

The objective of the current study was to examine the influence of military veteran status within a data set of middle-aged and older patients with schizophrenia or schizoaffective disorder. We did not expect differences in premorbid functioning, but on the basis of the limited empirical literature comparing veterans to nonveterans, it appeared that veterans would have some advantages in terms of education, income, employment, and cognitive functioning. We therefore hypothesized that among older patients diagnosed with schizophrenia or schizoaffective disorder, military veterans would have less psychopathology, better health-related quality of life, and better functioning in everyday tasks and cognitive performance compared with nonveterans.

METHODS

During the past 20 years, our research group at the University of California, San Diego (UCSD), has compiled a data set focused on middle-aged and older people with schizophrenia. The data were generated from various research projects funded by the

National Institute of Mental Health (NIMH) between February 1994 and March 2010. Patients were recruited by flyers, advertisements in local newspapers, and word of mouth from the UCSD Healthcare System, the VA Healthcare System, San Diego County Adult Mental Health Services, board-and-care facilities, and clinicians in private practice. All studies were approved by the UCSD institutional review board, and a trained research assistant obtained written informed consent from all participants. The data set is composed of demographic, clinical, and neurocognitive variables, including daily functioning and health-related quality of life. Data were not always collected simultaneously for each subject (as some measures were repeated over the course of longer studies). Thus, some measurements may have been separated by a matter of months. For the current study, we examined whether military veteran status appears to impact these variables.

Assessments were conducted by experienced research assistants (RAs) who were trained through the clinical trials unit of the Center. RAs had bachelor degrees or more advanced degrees, and they were trained through didactic presentations, role plays, and practice administration and scoring procedures. The Center has developed its own “gold standard” for assessments. Each RA’s score was compared with the Center criterion standard rating. Intraclass correlation coefficients must be at least 0.80 for continuous measures, and kappa must be at least 0.80 for categorical measures. Reliability is reestablished semiannually for each RA. Diagnoses were confirmed through a number of methods including the administration of the Structured Clinical Interview for DSM-III-R (*Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised*)¹³ or DSM-IV¹⁴, chart review, and verification from the treating psychiatrist.

Participants

Eligibility criteria varied slightly across the studies in the data set, but every study required patients to have English fluency, to meet criteria for schizophrenia or schizoaffective disorder according to the DSM-III-R or DSM-IV, and to complete the Positive and Negative Syndrome Scale (PANSS).¹⁵ Potential subjects were excluded if they met criteria for dependence on alcohol or other substances during the three months preceding enrollment. Individuals were also excluded if they had a history of medical or neurologic problems known to affect cognitive functioning (e.g., dementia, head injury with loss of consciousness, mental retardation).

Military veteran status was determined by a yes or no response to a single self-report item on the demographic questionnaire, “Are you a veteran?”. Although other details about veteran status were not available, we expect that the majority of veterans in the sample had used VA Healthcare services because several studies recruited from the local VA hospital. There were few female veterans in the database, and an analysis by gender would have lacked necessary statistical power. We therefore limited the analysis to males. Although some of the studies that contributed to the database included subjects as young as 31, we have limited the scope of our analyses to individuals 40 and older. We only included subjects that had been assessed on our variables of interest for our hypotheses (i.e., those measuring demographic and clinical characteristics, psychopathology, quality of life, everyday functioning, and cognitive functioning). All subjects had completed the PANSS, though there were missing data from some of the other variables. From a total of 1477 records, 373 males reported that they were veterans. The male veterans were older, as a group, than the male nonveterans, so we selected the oldest 373 nonveterans for comparison to reduce the influence of the age difference on our variables of interest. Thus, up to 746 subjects were included in analyses.

Measures

Demographic and clinical characteristics—These data included age, education, ethnicity, living situation, marital status, and alcohol and substance use. Alcohol use was marked as positive if the subjects said “yes” to drinking alcohol in the morning in the previous three months, and substance use was marked as positive if the subjects said “yes” to using the substance at all in the previous three months.

Premorbid functioning and age of onset—We used two estimates of premorbid functioning: The Premorbid Adjustment Scale¹⁶ (PAS) and the American version of the National Adult Reading Test (ANART).¹⁷ The PAS is a widely used rating scale to assess premorbid functioning retrospectively. This 28-item rating scale measures social isolation, peer relationships, functioning outside the family, school performance, and social and sexual aspects of life. A subset of the total sample had completed this scale, and the average overall score was used in the current study. Respondents completing the ANART read aloud 50 irregularly spelled words, and performance on this task provides an estimate of premorbid IQ. Age of onset was determined by prodromal symptoms as defined by the DSM-III-R or DSM-IV and as assessed by chart review, provider evaluation, and reports from subjects and caregivers.

Psychopathology—Two measures of psychopathology were examined. The PANSS is a 30-item measure of severity of psychopathology related to positive, negative, and general symptoms of schizophrenia and psychosis, and the Hamilton Rating Scale for Depression¹⁸ is a 17-item measure of depression. The total score for both measures was selected for analyses.

Health-related quality of life—The SF-36¹⁹ is a 36-item scale used to assess health-related quality of life. The SF-36 has two primary scales: the Physical Health Component (comprising physical functioning, physical health, bodily pain, and physical work limitations) and the Mental Health Component (comprising general mental health, social functioning, energy/vitality, and role limitations caused by emotional problems). Scores range from zero to 100, with higher scores representing better quality of life.

Everyday functioning—The UCSD Performance-Based Skills Assessment (UPSA)²⁰ was administered to assess functional capacity in five domains (i.e., communication, finance, household chores, transportation, and planning recreational activities). The total T score was used in analyses. Scores range from zero to 100, with higher scores representing better everyday functioning.

Cognitive performance—Cognitive performance was assessed by the Dementia Rating Scale (DRS; total score),²¹ the Trail Making Test (TMT; Parts A and B completion time T scores), and a modified 64-item Wisconsin Card Sort Test (WCST; categories complete percentile).^{22,23} We selected these tests because each is widely used and they represent a range of cognitive domains that appeared relevant given the available literature. The DRS was designed to measure cognitive functioning in older individuals with cognitive impairment, with sensitivity at lower ends of functioning. The DRS covers five areas: attention, initiation and perseveration, construction, conceptual, and memory. The DRS has good to excellent reliability and reasonable validity.²⁴ The TMT was initially developed as part of the Army Individual Test Battery, and the simple tasks (drawing lines to sequentially connect numbers and letters) have been retained because they reflect visual scanning and divided attention with good reliability and validity.²⁴ The WCST results reflect ability to categorize stimuli correctly (by shape, number, and color) and is more broadly a measure of cognitive flexibility and abstraction.

Statistical Analyses

To test the hypothesis that veterans demonstrated less severe levels of psychopathology and better functioning than nonveterans, between-groups ANOVAs were conducted for continuous variables and Pearson's chi-square for categorical variables. Multivariate analyses were not performed due to the retrospective nature of the study (some variables were collected at different time points) and to maximize sample size per comparison (since some measures were completed by relatively few subjects). The alpha level was adjusted to 0.01 to reduce Type 1 errors. Cohen's *d* was calculated for continuous variables (where 0.2 is interpreted as a small effect size and 0.5 and above as moderate or larger).

RESULTS

Veterans were older, were more likely to be married (currently or previously), and were less likely to live in a board-and-care facility (Table 1). Ages in the sample ranged from 40 to 89 years.

The measures of premorbid functioning (the PAS and ANART) revealed no difference between veterans and nonveterans. There was a significant difference between the groups regarding age of onset of schizophrenia (or schizoaffective disorder), with veterans having onset later (at 27.61 years) than nonveterans (at 24.96 years).

Fewer veterans than nonveterans endorsed drinking alcohol in the morning or using most substances (sedatives, cannabis, stimulants, opioids, and hallucinogens) during the three months preceding enrollment. There were no group differences in psychopathology (severity of symptoms characteristic of schizophrenia or depression) or quality of life related to mental health. However, veterans reported worse quality of life related to physical functioning relative to nonveterans. Veterans performed better than nonveterans on the performance measure of everyday functioning and on the both parts of the TMT.

Bivariate correlations between primary variables are shown in Table 2. Significant correlations are in the expected direction. For example, the PANSS is positively correlated with the Hamilton Rating Scale for Depression, but negatively correlated with the Mental Composite of the SF-36, the UPSA (everyday functioning), the DRS, and the TMT. The UPSA had low correlations with education (positive) and the PANSS (negative) and moderate and positive correlations with the ANART, DRS, and the TMT. The four cognitive functioning scales (DRS, TMT Part A, TMT Part B, and WCST) shared moderate correlations, indicating that they were not redundant; though the two parts of the TMT were correlated at 0.73 due in part to shared method variance.

DISCUSSION

In this study of male patients diagnosed with schizophrenia or schizoaffective disorder, our comparison of those who had served in the military and those who had not revealed differences in several variables. Veterans in this sample were older, had been more likely to marry, and were less likely to live in a board-and-care facility compared with nonveterans. As we had predicted, the measures of premorbid functioning (the PAS and ANART) revealed no difference between veterans and nonveterans, suggesting that group differences emerged after the onset of schizophrenia or schizoaffective disorder.

Nonveterans in our sample averaged an age of onset of schizophrenia nearly three years earlier than the veteran group. One potential explanation for this finding is that otherwise eligible military recruits with schizophrenia would likely have been unwilling to enter the military or would have been unable to pass the screening process due to their symptoms.

There is some evidence that earlier onset can have detrimental long-term consequences in several domains. In recent work by our group,²⁵ we discovered that individuals with early onset, compared with those with onset at age 40 or older, had more severe levels of psychopathology, were on higher doses of antipsychotic medications, had worse cognitive functioning in several domains, and had poorer everyday functioning and health-related quality of life even after adjusting for duration of illness, age, gender, and severity of negative symptoms. Thus, the later age of onset for the group of veterans in our sample was likely a factor that influenced other variables in our study.

Unexpectedly, there were no group differences in psychopathology (severity of symptoms characteristic of schizophrenia or depression) or quality of life related to mental health. However, veterans reported worse quality of life related to physical functioning relative to nonveterans. Physical problems could be associated with excessive weight. In one study, veterans were more often overweight compared with nonveterans, and obesity among veterans was more likely for those who used VA care.²⁶ However, when controlling for sociodemographic and health variables, veterans were no more likely than nonveterans to be overweight or obese.²⁷ Alternatively, the relatively diminished physical functioning of veterans may be a result of injuries incurred while serving in the military (e.g., during training or combat). Mean scores for both veterans and nonveterans in this sample of patients were within one standard deviation below the mean on the measures of health-related quality of life, and age did not appear to be factor for this variable.

As hypothesized, veterans performed better than nonveterans on the performance measure of everyday functioning. Thus, veterans were better able to complete analogue tasks involving chores, financial duties, communication with others, and coordinating transportation and recreation. Veterans also performed relatively better on the TMT, suggesting that veterans had an advantage with regard to this test of visual scanning and tracking, cognitive flexibility, and the ability to alternate focus. This was perhaps reflected in another rating that suggested a relatively lower risk of dementia among veterans (though the difference was not significant after we adjusted for Type 1 errors). However, the advantage to veterans did not extend to the card-sort task, where there is no difference between the groups. It is noteworthy that the advantages for veterans emerged in the context of veterans reporting more physical problems than nonveterans.

In addition to the effects of age of onset, it is possible that the relative advantages of veterans compared with nonveterans are a direct result of the military experience. The military demands minimum thresholds of physical and mental capabilities before individuals are accepted for service, and these thresholds are tested via mental and physical tasks. Moreover, the routine, camaraderie, and physical fitness inherent in military service may impart long-term benefits for veterans with schizophrenia or schizoaffective disorder. The fact that veterans were able to maintain their jobs within the military, at least for a time, suggests that they have the skills necessary for employment. This sets them apart from many patients with schizophrenia who do not obtain employment. However, we cannot infer causation from these data. There may be unspecified variables related to the selection and completion of military service.

It is also possible that the particular characteristics of this sample have contributed to the results. The veterans in the sample had a higher mean age, even after we had selected the older nonveterans for comparison. As we noted, it does not appear that age contributed to detriments in physical quality of life. It is also unlikely that older age would improve scores on the Trail Making Test, because older age is typically associated with worse scores on those tasks. It is possible, however, that age provided the benefits of experience with regard to everyday tasks. As a test of this, we covaried age for all analyses post hoc. There was no

change in the comparative findings between groups. Subjects were excluded from studies in this database for dementia, suggesting that the results are independent of obvious dementia.

Fewer veterans than nonveterans endorsed drinking alcohol in the morning or using most substances (sedatives, cannabis, stimulants, opioids, and hallucinogens) during the three months preceding enrollment. Although we did not make specific predictions regarding substance use, we were surprised to find lower rates of use for several substances in veterans than nonveterans, because there have been some data to suggest that veterans may be at greater risk for substance use problems than nonveterans.^{28,29} Potential subjects with dependence on alcohol or other substances during the three months preceding enrollment were excluded, which perhaps eliminated veterans (and nonveterans) who had more serious substance use disorders. It is possible that veterans had longstanding substance problems that resulted in a dishonorable discharge from the military, and this would preclude them from most VA services. This could have decreased their chances of being recruited from the local VA site for this data set. In any case, the relatively lower use of substances in the veteran group may partly account for their relative success in the areas assessed in this study.

Our findings share similarities with another study,³⁰ which compared veterans (in two VA hospitals) with patients (veteran status is not stated) in a state hospital. All of the subjects in that study were male and were chronically institutionalized with schizophrenia. The VA patients were older at their first psychiatric admission and had more education than the state hospital patients. Compared with the state hospital patients, the veterans had less severe negative symptoms and functional deficits, and they had better performance on cognitive measures even when analyses were adjusted for the discrepancy in education.

There are several limitations to this study. Due to power limitations from few female veterans in the original data set, only male patients were included in analyses. This limits results only to men aged 40 or older who have been diagnosed with schizophrenia or schizoaffective disorder. The data are cross-sectional and derived from multiple studies with different aims and sets of measures. Thus, the variables we could analyze for this report were limited to those held in common by multiple studies. Accordingly, there were unequal sample sizes between the groups on most variables. The question about veteran status did not provide any details about military service. It would have been valuable to know that how military service was selected (e.g., volunteered or conscripted), years in which veteran subjects served, their duration of service, their branch (or branches) of military service, their jobs within the military, type of discharge, and especially whether they faced traumatic events (e.g., in the context of combat or accidents). Each of these factors may have influenced our variables of interest. It is quite possible the different cohorts of military veterans face different challenges with regard to schizophrenia and general psychological functioning. It will be important for future studies in this area to assess these details about military service.

In addition to the differential rates of combat across eras of relative war and peace, there may be differences in premilitary opportunities and hardships experienced by individuals drafted into service compared with those in an All Volunteer Force.³¹ We also did not know whether VA healthcare services had been used by subjects, though as we noted we believe most of the veterans in our sample had done so. The available literature suggests that veterans in VA settings may appear disadvantaged compared with those in other healthcare systems, but as we noted this is likely due to differences in eligibility for VA services (traditionally based on evidence of disability and lower income) rather than the services provided in those settings. Finally, although we adjusted for multiple comparisons, there remains a risk of Type I errors.

Despite these limitations, we are aware of few other studies that have investigated military veteran status in a sample of middle-aged and older patients with schizophrenia or schizoaffective disorder. While many veterans are approaching older adulthood, and while hundreds of thousands of service members are now active duty, we know relatively little about the long-term consequences of military service and how that service may interact with psychopathology and healthcare utilization. This investigation produced some intriguing data but it highlights the need for additional research in this area.

Acknowledgments

This work was supported, in part, by the National Institute of Mental Health (grants MH080002, MH019934, MH43693, MH 064722) and by the Department of Veterans Affairs. Dr Thorp's work is supported by a VA Career Development Award.

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Table 1

Comparison of Non-veterans and Veterans

Variable	N	Non-veterans (%)		Veteran Status		Veterans (%)		Statistic ^a	p value	d
		n (%)	Mean (SD)	n (%)	Mean (SD)	n (%)	Mean (SD)			
Age^a (years)	746	373	54.39 (6.25)	373	57.13 (9.16)			$F_{1,745} = 22.76$	.000002*	0.35
Education (years)	718	353	11.93 (2.76)	365	12.43 (2.83)			$F_{1,717} = 5.75$	.017	0.18
Race/Ethnicity	746	373		373				$\chi^2_7 = 9.76$	.203	
Caucasian	503	250 (67)		253 (68)						
African American	118	51 (44)		67 (18)						
Hispanic	77	45 (12)		32 (9)						
Asian-American	13	8 (2)		5 (1)						
Native American	14	10 (3)		4 (1)						
Native Hawaiian/Pacific Islander	2	0 (0)		2 (0)						
Multiracial	10	5 (1)		5 (1)						
Other	9	4 (1)		5 (1)						
Marital Status	716	353		363				$\chi^2_5 = 19.48$	.002*	
Single	378	210 (60)		168 (46)						
Cohabiting	14	8 (2)		6 (2)						
Separated	55	27 (8)		28 (8)						
Divorced	183	81 (23)		102 (28)						
Widowed	36	10 (3)		26 (7)						
Married	50	17 (5)		33 (9)						
Living Situation	682	349		333				$\chi^2_9 = 40.13$	.000007*	
Alone in Apartment	107	42 (12)		65 (20)						
Alone in House	17	4 (1)		13 (4)						
With Someone in Apartment	60	26 (7)		34 (10)						
With Someone in House	88	33 (10)		55 (17)						
Board-and-care Facility	346	201 (58)		145 (44)						
Skilled Nursing Facility	4	3 (1)		1 (0)						
Locked Board and Care	16	10 (3)		6 (2)						

Variable	N	Veteran Status		Statistic _{df}	p value	d
		Non-veterans (%)	Veterans (%)			
		n (%)	Mean (SD)	n (%)	Mean (SD)	
Assisted Living	21	17 (5)		4 (1)		
Homeless	15	6 (2)		9 (3)		
Single Room Occupancy	8	7 (2)		1 (0)		
Premorbid Functioning Estimates						
PAS	87	21	2.11 (0.61)	66	1.78 (0.89)	$F_{1,86} = 2.48$.119 -0.43
ANART	267	91	103.81 (10.57)	176	106.34 (13.47)	$F_{1,266} = 2.43$.120 0.21
Age of Onset of Schizophrenia	516	244	24.96 (10.63)	272	27.61 (11.33)	$F_{1,515} = 7.47$.007* 0.24
“Yes” to alcohol in the morning	399	31 of 135 (23)		31 of 264 (12)		$\chi^2_1 = 8.57$.003* .003
“Yes” to...						
Sedatives	409	24 of 140 (17)		11 of 269 (4)		$\chi^2_1 = 20.05$.000008*
Cannabis	402	52 of 137 (38)		40 of 265 (15)		$\chi^2_1 = 26.75$.0000002*
Stimulants	402	31 of 137 (23)		31 of 265 (12)		$\chi^2_1 = 8.27$.004*
Opioids	401	15 of 137 (11)		10 of 264 (4)		$\chi^2_1 = 7.91$.005*
Cocaine	402	20 of 137 (15)		23 of 265 (9)		$\chi^2_1 = 3.31$.069
Hallucinogens	402	20 of 137 (15)		16 of 265		$\chi^2_1 = 8.12$.004*
PANSS	746	373	62.27 (16.61)	373	61.83 (17.06)	$F_{1,745} = 0.46$.496 -0.03
HAM-D	619	298	9.75 (5.66)	321	9.66 (6.21)	$F_{1,618} = 0.31$.860 -0.02
SF-36 Physical	339	151	45.80 (9.38)	188	42.57 (11.05)	$F_{1,338} = 8.15$.005* -0.32
SF-36 Mental	339	151	46.12 (11.12)	188	45.39 (11.67)	$F_{1,338} = 0.34$.558 -0.06
UPSA	325	198	69.67 (19.18)	127	76.58 (16.53)	$F_{1,324} = 11.17$.001* 0.39
DRS	482	234	127.10 (12.26)	248	129.65 (10.74)	$F_{1,481} = 5.92$.015 0.22
TMT A	421	182	37.39 (10.76)	239	34.73 (12.24)	$F_{1,420} = 8.13$.005* -0.23
TMT B	386	168	33.39 (12.93)	218	40.37 (13.18)	$F_{1,385} = 17.61$.00003* 0.53
WCST	203	124	9.46 (5.94)	79	9.68 (5.31)	$F_{1,202} = 0.08$.782 0.04

Note: Percentages may not add to 100 due to rounding errors. df = degrees of freedom, d = effect size (Cohen), SD = standard deviation, PAS = Premorbid Adjustment Scale, PANSS = Positive and Negative Symptom Scale, HAM-D = Hamilton Depression Rating Scale, SF-36 Physical = Physical Composite Scale, SF-36 Mental = Mental Composite Scale, UPSA = UCSD Performance-based Skills Assessment, ANART = American Version of the New Adult Reading Test, DRS = Dementia Rating Scale, TMT = Trail Making Test, WCST-64 = Wisconsin Card Sort Task.

Age was reported at most recent administration of the PANSS if it was administered more than once.

$p < .01$
*

Table 2

Bivariate Correlations Between Primary Variables (correlation, n)

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Age ^d	1.0											
	746											
2. Education	-.03	1.0										
	718	718										
3. ANART	.02	.388*	1.0									
	267	253	267									
4. PANSS	-.10*	-.01	-.06	1.0								
	746	718	267	746								
5. HAM-D	-.09	.02	-.03	.51*	1.0							
	619	602	226	619	619							
6. SF-36 Physical	0.05	.00	.11	-.13	-.20*	1.0						
	339	324	182	339	326	339						
7. SF-36 Mental	.07	.01	.10	-.40*	-.49*	.128	1.0					
	339	324	182	339	326	339	339					
8. UPSA	-.06	.19*	.36*	-.16*	.045	.064	-.06	1.0				
	325	314	115	325	324	177	177	325				
9. DRS	-.20*	.25*	.33*	-.25*	-.05	.00	-.02	.50*	1.0			
	482	468	183	482	461	280	280	257	482			
10. TMT A	-.07	-.02	.19*	-.16*	-.02	.12	.01	.41*	.45*	1.0		
	421	403	216	421	369	369	241	202	281	421		
11. TMT B	-.01	.06	.22*	-.15*	-.01	.01	.00	.55*	.49*	.73*	1.0	
	386	368	203	386	336	230	230	187	263	386	386	

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
12. WCST	.00	.14	.251	-.05	-.01	-.06	-.07	.22	.24*	.17	.20*	1.0
	203	192	55	203	156	102	102	87	119	183	178	203

Note: PAS = Premorbid Adjustment Scale, PANSS = Positive and Negative Symptom Scale, HAM-D = Hamilton Depression Rating Scale, SF-36 Physical = Physical Composite Scale, SF-36 Mental = Mental Composite Scale, UPSA = UCSD Performance-based Skills Assessment, ANART = American Version of the New Adult Reading Test, DRS = Dementia Rating Scale, TMT = Trail Making Test, WCST-64 = Wisconsin Card Sort Task.

^a Age was reported at most recent administration of the PANSS if it was administered more than once.

* p < .01