Original Article	Predictors of Psychosocial Functioning Among Long-stay Schizophrenia Patients in a Malaysian Mental Institution			
	Тео Pey Fang ¹ , Кон Eugene Boon Yau ² , Сномд Seng Choi ²			
Submitted: 29 Jul 2024 Accepted: 10 Oct 2024	¹ Department of Psychiatry, Hospital Pakar Sultanah Fatimah, Johor, Malaysia			
Online: 31 Dec 2024	² Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia			

To cite this article: Teo PF, Koh EBY, Chong SC. Predictors of psychosocial functioning among long-stay schizophrenia patients in a Malaysian mental institution. Malays J Med Sci. 2024;31(6):178-193. https://doi.org/10.21315/ mjms2024.31.6.14

To link to this article: https://doi.org/10.21315/mjms2024.31.6.14

Abstract -

Background: A considerable number of schizophrenia patients still require long-term hospital care despite psychiatric deinstitutionalisation, especially in developing nations. Prolonged hospitalisation is associated with greater impairment in psychosocial functioning. This study aimed to determine the level of psychosocial functioning and its predictors among long-stay schizophrenia patients in a Malaysian mental institution.

Methods: This cross-sectional study included 138 patients selected through universal sampling. Data on socio-demographics, illness characteristics such as psychopathology and illness severity [measured using the Brief Psychiatric Rating Scale (BPRS)], and cognitive function [assessed using the Montreal Cognitive Assessment (MoCA)] were collected. The Personal and Social Performance (PSP) scale was used to evaluate psychosocial functioning. Pearson correlation coefficients and multiple linear regression analyses were applied to identify the correlates and predictors of psychosocial functioning.

Results: This study found that 47.8% and 16.7% of the patients had moderate and severe cognitive impairments, respectively. The mean PSP score was 69.68 (standard deviation (SD) = 15.48). Female gender, previous unemployment and more severe cognitive impairments were significantly associated with poorer psychosocial functioning. Meanwhile, negative symptoms and age of onset were negatively correlated with psychosocial functioning. By contrast, the duration of illness was positively correlated with psychosocial functioning. The regression model indicated that being female ($\beta = -7.32$, p < 0.001), previously unemployed ($\beta = -3.67$, p < 0.047), having negative symptoms ($\beta = -4.18$, p < 0.001), experiencing a longer illness duration ($\beta = -0.60$, p = 0.004, and the presence of severe cognitive impairment ($\beta = -9.80$, p < 0.001) significantly predicted poorer psychosocial functioning.

Conclusion: Long-stay schizophrenia patients experience substantial difficulties in psychosocial functioning. Factors such as gender, last employment status, negative symptoms, illness duration, and cognitive function affect psychosocial functioning.

Keywords: long-stay, schizophrenia, mental institution, psychosocial functioning, cognition, negative symptom

Introduction

Schizophrenia is a chronic and debilitating mental disorder that not only affects individuals' mental health but also significantly impacts their psychosocial functioning, resulting in a substantial annual economic burden estimated between USD94 million and USD102 billion globally (1). In Malaysia, psychiatric hospitals incur a total direct medical cost of about USD26 million, with 83% of this expenditure allocated to long-stay hospital services (USD12 million) (2). Despite psychiatric deinstitutionalisation, a considerable number of schizophrenia patients continue to require long-term hospitalisation, particularly in developing nations. Long-stay

Malays J Med Sci. 2024;**31(6)**:178–193 www.mjms.usm.my © Penerbit Universiti Sains Malaysia, 2024 This work is licensed under the terms of the Creative Commons Attribution (CC BY) 178 (http://creativecommons.org/licenses/by/4.0/).

schizophrenia patients represent a distinct population within mental healthcare settings, often characterised by severe functional impairment and social isolation. They also face numerous challenges that hinder their psychosocial functioning and successful reintegration into the community (3).

The definition of "long-stay" varies across different studies (4, 5). However, it generally refers to patients who require extended hospitalisation, often exceeding six months (6). Various studies worldwide, including those in the UK, Australia, Korea, and Malaysia, have established the prevalence of long-stay psychiatric patients, with schizophrenia being the most common diagnosis among this group (6–9). According to the annual report from Hospital Bahagia Ulu Kinta (HBUK)—the first and largest mental institution in Malaysia—the proportion of schizophrenia patients among all psychiatric inpatients was 55.4% in 2021 (10).

Prolonged hospitalisation is associated with greater impairment in psychosocial functioning, encompassing an individual's ability to engage in daily activities, maintain relationships and meet societal demands (11-13). Global functional impairment is a well-documented kev issue among schizophrenia patients, leading to challenges in social, occupational, and personal domains (3, 13-16). Successful treatment of schizophrenia is defined not only by symptom remission but also by improvements in psychosocial functioning, which has become the ultimate goal of treatment. Given that a significant extent of preventive or therapeutic interventions relies on targeting the associated factors, numerous studies have been conducted to examine this aspect. However, many existing studies primarily focus on schizophrenia patients in general or during the acute stage, with limited attention given to long-stay patients (16–19).

Current evidence indicates that being vounger, unemployed, experiencing a long duration of illness or an extended length of the current episode, and suffering from severe negative symptoms are predictors of poor psychosocial functioning in schizophrenia (13). Cognition also plays a crucial role in daily functioning and has been identified as a significant predictor of functional outcomes in schizophrenia (20-30). Notably, older patients with a long duration of illness and protracted institutionalisation have shown а more pronounced progressive cognitive decline (31).

Although substantial information is available on the determinants of functional

outcomes in schizophrenia, there exists a notable gap in the literature regarding the predictors psychosocial functioning among Asian of patients receiving long-term care in mental hospitals. Therefore, the current study aims to determine the level of psychosocial functioning and delineate further the contribution of known and potential predictors among long-stay schizophrenia patients in a Malaysian mental institution. This research could provide evidence for future recommendations to integrate routine screening, early detection and intervention of psychosocial functioning for at-risk individuals, thereby contributing to a better prognosis for schizophrenia.

Materials and Methods

Study Design, Site and Population

A hospital-based, cross-sectional study was conducted among long-stay schizophrenia patients in the general psychiatry ward of the largest mental institution in Malaysia. This facility serves as a national tertiary psychiatric referral hospital for extended stays, further stabilisation and rehabilitation. Data were collected from February 2023 to May 2023.

Sample Size and Inclusion and Exclusion Criteria

A meta-analytic approach was used to estimate the sample size for the current study. Across the dependent variables (employment status, severity of illness, depression, anxiety, and executive function), a review of the existing literature suggested that the weighted mean effect size was 0.3. With a power of 0.80 and considering a 10% dropout rate, this resulted in a required sample size of 95 participants.

The inclusion criteria were as follows:

- i) Patients who had schizophrenia formally diagnosed by a psychiatrist or medical officer based on the Diagnostic and Statistical Manual of Mental Disorders (32).
- ii) Patients who had been occupying a psychiatric bed with a current duration of admission of six months or longer during the data collection period, which is considered a long-stay (6, 8).
- iii) Patients aged 18 to 60 years. This age range was chosen because, in Malaysia, individuals below 18 years are classified as minors, while those aged 60 and above are considered an at-risk group who may have cognitive impairment due to other factors.

Meanwhile, the exclusion criteria were as follows:

- i) Patients suffering from a co-morbid psychiatric illness.
- ii) Patients experiencing psychiatric diagnoses other than schizophrenia.
- iii) Patients staying in the forensic psychiatric ward.
- iv) Patients unable to provide informed consent.

Study Procedure

Universal sampling was used for subject recruitment after screening all 38 general psychiatry wards in the study location for eligible participants. This sampling technique was adopted due to concerns that some participants might be psychotic and unable to provide informed consent, thus, limiting sample size fulfilment.

Medical records were examined, and faceto-face interviews with the respondents were conducted to obtain data regarding their sociodemographic factors and illness characteristics. Information such as the duration of stay and the types of antipsychotics prescribed were also retrieved from the medical records. By conducting the interviews and making observations, the researcher could also gauge the illness severity and psychopathology by filling out the Brief Psychiatric Rating Scale (BPRS). The participants also completed the Montreal Cognitive Assessment (MoCA) to evaluate their cognitive function. Lastly, the researcher filled out the Personal and Social Performance (PSP) scale with the assistance of staff members observations.

Variables/Measurement Scales

The independent variables included sociodemographics (age, gender, ethnicity, education level, marital status, last employment status, and economic status), illness characteristics (psychopathology, number of previous psychiatric hospitalisations, age of onset, duration of illness, illness severity, type of antipsychotic prescribed, and duration of stay) and cognitive function. Meanwhile, the dependent variable was psychosocial functioning.

Psychopathology and Illness Severity (*BPRS-18 Version*)

The BPRS was developed to characterise psychopathology and assess its severity among individuals diagnosed with psychosis (33). It is clinician-rated and comprises 18 items assessing various psychiatric symptoms, rated on a severity scale from 1 (not present) to 7 (extremely severe). The overall score and the ratings on individual items are meaningful in capturing changes during treatment. While the original scale has inter-rater reliabilities ranging from 0.56 to 0.87, the locally validated Malay version also demonstrated fair internal consistency, with a Cronbach's alpha coefficient of 0.75 (34). Fair concurrent validity was found when comparing it with the Positive and Negative Syndrome Scale (PANSS) and the Clinical Global Impression Scale (CGI) (35). Given these attributes and its ease of administration, the researcher chose BPRS to assess psychopathology and illness severity in the participants.

Cognitive Function (MoCA)

The MoCA is a brief 12-item cognitive screening tool that evaluates visuospatial and executive functioning, short-term memory, attention/concentration/working memory, language, and orientation. It operates on a 30-point system, with a cutoff score of 26 recommended to identify a normal cognitive state. Additionally, the severity of cognitive impairment can be categorised as mild (18 to 25), moderate (10 to 17), and severe (<10). The additional psychometric properties of MoCA include its sensitivity in testing executive function and its effectiveness in identifying mild cognitive impairment (36, 37). Its specificity for normal controls is 87%, with 90% sensitivity for detecting mild cognitive impairment, surpassing that of the Mini-Mental State Examination (36, 38). It is also reliable, with a Cronbach's alpha value of 0.79 (39).

Psychosocial Functioning (PSP)

The PSP scale was developed to evaluate a patient's psychosocial functioning across four subdomains: i) socially useful activities (including work and study); ii) personal and social relationships; iii) self-care and care for the personal environment; and iv) disturbing and aggressive behaviour (40). Each subdomain's impairment is assigned a six-point rating, ranging from absent (0) to mild (1), manifest (2), marked (3), severe (4) and very severe (5). After scoring each of these four subdomains, raters are instructed to select a 10-point range within a 100-point scale, guided by the subdomain scores assigned during the assessment. All 10-point ranges on the scale are described in terms of two components: i) the scores assigned to the first three subdomains, and ii) the score assigned to the fourth subdomain. The first three areas contribute equally, while the fourth is given additional weight in determining the appropriate 10-point range. For the purpose of this study, the PSP total scores (ranging from 1 to 100) were derived from the sum of severity scores across the four subdomains, representing overall functioning. Higher PSP total scores indicate a higher level of functioning. The Cronbach's alpha value for the PSP is 0.76 (40).

Statistical Analysis

Data were analysed using the Statistical Package for the Social Sciences (SPSS) version 25 (IBM Corp., Armonk, NY, US). The distribution of all continuous variables was examined for normality via skewness, kurtosis, and histogram tests, all of which indicated normal distribution. Descriptive statistics were employed to describe the participants' socio-demographic factors, illness characteristics, cognitive functioning, and psychosocial functioning.

relationships The between sociodemographics, illness characteristics. and cognitive functioning with psychosocial functioning (PSP score) were explored. The differences in PSP scores between categorical were tested using independent variables sample t-tests and one-way analysis of variance (ANOVA), while the correlation between the PSP scores and continuous variables was assessed using the Pearson correlation coefficient. Predictors of psychosocial functioning were determined using multiple linear regression analyses. Simple linear regression was first performed as a univariable exploration, and factors with a p-value of less than 0.05 were included in the variable selection process for the multivariable model using the stepwise method. Multicollinearity was assessed, and heteroskedasticity was checked using the Breusch-Pegan/Cook-Weisberg test. All tests were two-sided, and statistical significance was denoted by p < 0.05.

Results

A total of 380 long-stay patients in 38 general psychiatry wards were identified and screened. Out of these, 111 patients were excluded due to co-morbid psychiatric conditions or a psychiatric diagnosis other than schizophrenia. This left a total of 269 longstay schizophrenia patients (70.8%). Following further eligibility screening, 94 patients over the age of 60 and 22 patients who were unable to give informed consent due to irrelevant speech were excluded from the study. Another 15 patients had declined to participate. As a result, 138 long-stay schizophrenia patients were recruited for the study.

Descriptive Analyses

Table 1 depicts the socio-demographic characteristics, illness characteristics, cognitive function and psychosocial functioning of the study participants. The mean age was 51.04 years [standard deviation (SD) = 7.17]. The majority were men (70.3%), Chinese (45.7%), had secondary education (73.2%), were single (72.5%), and had been employed either full-time, part-time or self-employed prior to admission (72.5%). Furthermore, 71.0% were under the B40 group (i.e., had a monthly household income of below RM4,850).

The mean age of illness onset was 27.51 years old (SD = 8.28), with a mean illness duration of 23.29 years (SD = 9.61). The mean duration of stay in the mental institution was 3,871 days (SD = 2536), or around 10 years. On average, patients had about seven previous psychiatric hospitalisations. Typical antipsychotics were the most commonly prescribed treatment (50.7%) in this population. Regarding illness severity, the mean BPRS total score was 27.12 (SD = 4.61). The respective BPRS mean scores for each psychopathology domain were as follows: positive symptoms [6.22 (SD = 2.62)]; mood disturbance [6.46 (SD = 1.74)]; negative symptoms [6.51 (SD = 1.91)]; activation [2.01 (SD = 0.09)]; resistance [2.40 (SD = 0.57)]; somatisation [2.60](SD = 0.83); and orientation [1.00 (SD = 0.00)].

A total of 47.8% of the patients exhibited moderate cognitive impairments, while 16.7% had severe cognitive impairments. Lastly, the mean PSP score was 69.68 (SD = 15.48), translating to manifest, but not marked, difficulties in one or more domains (i.e., socially useful activities, personal and social relationships, self-care and care for the personal environment) or mild difficulties in the domain of disturbing and aggressive behaviour.

Malays J Med Sci. 2024;**31(6)**:178–193

Table 1. Socio-demographics, illness characteristics and cognitive and psychosocial functions of long-stay schizophrenia patients (n = 138)

Independent variable	Mean (SD)	n (%)
Age (years)	51.04 (7.17)	
Gender		
Male		97 (70.3)
Female		41 (29.7)
Ethnicity		
Malay		58 (42.1)
Chinese		63 (45.7)
Indian		15 (10.9)
Others		2 (1.4)
Education level		
None		0
Primary education		34 (24.6)
Secondary education		101 (73.2)
Tertiary education		3 (2.2)
Marital status		
Single		100 (72.5)
Married or living in union		26 (18.8)
Separated or widowed or divorced		12 (8.7)
Last employment status		
Employed (full-time or part-time or self-employed)		100 (72.5)
Unemployed		38 (27.5)
Monthly household income		
T20: exceeds RM10,960 per month		6 (4.3)
M40: between RM4,851 to RM10,960 per month		34 (24.6)
B40: below RM4,850 per month		98 (71.0)
Psychopathology severity based on BPRS		
Positive symptoms	6.22 (2.62)	
Mood disturbance	6.46 (1.74)	
Negative symptoms	6.51 (1.91)	
Activation	2.01 (0.09)	
Resistance	2.40 (0.57)	
Somatisation	2.60 (0.83)	
Orientation	1.00 (0.00)	
Number of previous psychiatric hospitalisations	6.57 (6.60)	
Age of schizophrenia onset (years)	27.51 (8.28)	
Duration of illness (years)	23.29 (9.61)	

(continued on next page)

Table 1. ((continued)
------------	-------------

Independent variable	Mean (SD)	n (%)
Illness severity (BPRS total score)	27.12 (4.61)	
Type of antipsychotic prescribed		
Atypical		6 (4.3)
Typical		70 (50.7)
Combination (atypical + typical)		62 (44.9)
Duration of stay (days)	3871.00 (2536.00)	
Cognitive function (MoCA total scores)	14.93 (5.43)	
Level of cognitive function		
Normal		0
Mild cognitive impairment		49 (35.5)
Moderate cognitive impairment		66 (47.8)
Severe cognitive impairment		23 (16.7)
Psychosocial functioning (PSP total scores)	69.68 (15.48)	

Inferential Analyses

Table 2 depicts the relationship between socio-demographics, illness characteristics, cognitive function, and psychosocial functioning among long-stay schizophrenia patients. It was observed that females, those previously unemployed, and those with more severe cognitive impairments were significantly associated with poorer psychosocial functioning.

A weak negative correlation was found between psychosocial functioning and positive symptoms (coefficient: -0.266; p = 0.002), mood disturbance (coefficient: -0.242: p = 0.004), and resistance (coefficient: -0.240; p = 0.005). Conversely, a moderate negative correlation was observed between psychosocial functioning and age of onset (coefficient: -0.407; p < 0.001). Meanwhile, a strong negative correlation existed between psychosocial functioning and negative symptoms (coefficient: -0.726; p < 0.001). Moreover, a weak positive correlation was noted between psychosocial functioning and the duration of illness (coefficient: 0.379; *p* < 0.001).

Table 3 presents the predictors of psychosocial functioning among long-stay schizophrenia patients. The factors that were significant in the univariable exploration included gender (p = 0.004), educational levels (p = 0.028), last employment status

(p = 0.008), positive symptoms (p = 0.002), mood disturbance (p = 0.004), negative symptoms (p < 0.001), resistance (p = 0.005), illness severity (p < 0.001) and levels of cognitive function (p < 0.001). In the final multivariate analyses, the significant predictors for psychosocial functioning among long-stay schizophrenia patients, after controlling for the potential confounders, included only gender (p < 0.001), last employment status (p = 0.047), negative symptoms (p < 0.001), duration of illness (p = 0.004), and cognitive function (p < 0.001).

Females were found to have lower PSP total scores by 7.32 points compared to males (p < 0.001). Those previously unemployed had PSP total scores that were 3.67 points lower than those who were previously employed (p = 0.047). For illness characteristics, a unit increase in negative symptoms was associated with a decrease of 4.18 points in PSP total scores (p < 0.001). Furthermore, a unit longer in the duration of illness would reduce the PSP total scores by 0.60 points (p = 0.004). Participants with severe cognitive impairment had PSP total scores that were 9.80 points lower than those with mild cognitive function (p < 0.001). The R^2 of the final multivariable model was 0.6576, indicating that the model explained 65.76% of the variance in psychosocial functioning.

Table 2.	Relationships	between	socio-demographics,	illness	characteristics	and	cognitive	function	with
	psychosocial fu	inctioning							

		Psychosocial functioning			
Variable		PSP total scores, mean (SD)	<i>p</i> -value		
Gender	Male Female	72. 18 (14.87) 63.78 (16.68)	0.004 ^b		
Ethnicity	Malay Chinese Indian Others	68.81 (16.16) 69.37 (15.86) 72.47 (15.39) 84.00 (2.83)	$0.517^{ m c}$		
Educational level	Primary Secondary Tertiary	65.82 (15.74) 70.48 (15.73) 86.67 (3.22)	0.056 ^c		
Marital status	Single Married Separated/widowed	70.27 (15.37) 65.96 (17.53) 72.83 (15.97)	0.362°		
Last employment status	Employed Unemployed	71.86 (14.08) 63.95 (18.76)	0.008^{b}		
Economic status	T20 M40 B40	81.17 (6.97) 71.26 (13.29) 68.43 (16.77)	0.128 ^c		
Type of antipsychotic prescribed	Typical Atypical Combination	63.00 (14.30) 69.34 (16.60) 70.71 (15.16)	0.510 ^c		
Cognitive impairment category	Mild Moderate Severe	79.59 (11.46) 69.39 (13.25) 49.39 (10.39)	<0.001 ^c		
Variable		Psychosocial functioning			
Variable		Pearson coefficient	<i>p</i> -value		
Age Type of psychopathologies:		0.013	0.8 78 ^a		
Positive symptoms Mood disturbance Negative symptoms Activation Resistance Somatisation		-0.266 -0.242 -0.726 -0.036 -0.240 -0.085	0.002^{a} 0.004^{a} $< 0.001^{a}$ 0.674^{a} 0.005^{a} 0.319^{a}		
Age of onset		-0.407	<0.001 ^a		
Duration of illness		0.379	<0.001 ^a		
Illness severity		0. 111	0.193 ^a		
Duration of stay		-0.179	0.0 47 ^a		

Notes: "Pearson correlation; "Independent sample t-test; "One-way ANOVA

Original Article | Psychosocial functioning and predictors

Variable		Simple linear regression		Multiple linear regression		
	Standardised beta coefficient	Coef (95% CI)	<i>p</i> -value	Adj coef (95% CI)	<i>p</i> -value	
Age	-0.007	0.03 (-0.35, 0.40)	0.878			
Gender	-0.210					
Male		Ref		Ref		
Female		-8.39 (-14.08, -2.71)	0.004	-7.32 (-10.82, -3.81)	<0.001	
Ethnicity	-0.023					
Malay		Ref				
Chinese		0.55 (-5.16, 6.27)	0.848			
Indian		3.66 (-5.44, 12.76)	0.428			
Others		15.19 (-7.40, 37.78)	0.186			
Educational level	0.031					
Primary		Ref	0.136			
Secondary		4.65 (-1.47, 10.78)				
Tertiary		20.84 (2.23, 39.45)	0.028			
Marital status	0.007					
Single		Ref				
Married		-4.31 (-11.20, 2.59)	0.219			
Separated/Wido Divorced	owed/	2.56 (-7.01, 12.13)	0.597			
Last employment s	status –0.113					
Employed		Ref	0.008	Ref	0.047	
Unemployed		-7.91 (-13.75, -2.07)		-3.67 (-7.29, -0.05)		
Economic status	0.035					
T20		Ref				
M40		-9.90 (-23.67, 3.86)	0.157			
B40		-12.74 (-25.81, 0.33)	0.056			
Types of psychopat	thology					
Positive sympto	ms 0.021	-1.61 (-2.60, -0.62)	0.002	-4.18 (-5.23, -3.13)	<0.001	
Mood disturbar	nce –0.081	-2.20 (-3.69, -0.70)	0.004			
Negative sympto	oms –0.511	-6.02 (-6.98, -5.05)	<0.001			
Activation	0.021	-6.73 (-38.27, 24.81)	0.674			
Resistance	-0.056	-6.62 (-11.17, -2.07)	0.005			
Somatisation	-0.080	-1.63 (-4.84, 1.59)	0.319			
Number of hospitalisations	0.041	0.22 (-0.19, 0.63)	0.286			
Age of onset	0.113	0.21 (-0.11, 0.54)	0.194			
Duration of illness	0.163	-0.16 (-0.44, 0.12)	0.264	-0.60 (-1.00, -0.19)	0.004	
Illness severity	-0.064	-1.91 (-2.39, -1.42)	<0.001			

Table 3. Predictors of psychosocial functioning among long-stay schizophrenia patients

(continued on next page)

Table 3. (continued)

Variable		Simple linear regre	Multiple linear regression		
	Standardised beta coefficient	Coef (95% CI)	<i>p</i> -value	Adj coef (95% CI)	<i>p</i> -value
Types of antipsycho prescribed	otic -0.022				
Typical		Ref			
Atypical		6.34 (-7.02, 19.70)	0.349		
Combination		7.71 (-5.72, 21.14)	0.258		
Duration of stay	-0.007	-0.01 (-0.01, 0.00)	0.144		
Cognitive function category	-0.112				
Mild		Ref		Ref	
Moderate		-10.20 (-14.75, -5.65)	<0.001	-9.80 (-14.69, -4.92)	<0.001
Severe		-30.20 (-36.30, -24.10)	<0.001		

Notes: Coef = beta coefficient; Adj Coef = adjusted beta coefficient; CI = confidence interval; Ref = reference. Multicollinearity was not found, and assumptions of heteroskedasticity were fulfilled. Adjusted R^2 = 0.6576

Discussion

This study determined the level of psychosocial functioning and examined the contribution of known and potential predictors in a sample of long-stay schizophrenia patients from a Malaysian mental institution. First, the results corroborate prior research findings that long-term hospitalisation leads to pronounced cognitive and psychosocial impairments. Patients with schizophrenia may require hospitalisation during acute episodes or crises. Despite a remarkable reduction in the duration of hospital stays due to improved care from community psychiatric services, many patients continue to experience prolonged stays. While a study concluded there was minimal evidence linking long or short hospitalisation to cognitive and functional changes-attributing declines to the reasons for hospitalisations (30)-prolonged hospitalisation is arguably regarded as counterproductive and is one of the associated factors contributing to disability in schizophrenia (19).

In this study's sample, the measured psychosocial functioning was poorer (mean PSP total score of 69.68) compared to subjects community-dwelling study from schizophrenia patients (mean PSP total score of 84.37) (41). These difficulties reflect challenges in performing daily activities, social interactions and employment, highlighting the impacts of prolonged institutionalisation on psychosocial outcomes. The influence of care settings on cognitive function progress remains controversial; community-dwelling patients certainly have better opportunities for cognitive remediation, while long-stay patients typically exhibit poorer functioning (42). More than half of the participants experienced moderate to severe cognitive deficits. None of them had normal cognitive function despite being under 60 years of age, suggesting that prolonged stay in the hospital has not only failed to improve this aspect of their illness but may have worsened it, as suggested by previous studies (43, 44).

Therefore, it is crucial to determine predictors of psychosocial functioning for targeted prevention and early intervention. Despite many studies exploring this area, only a few have focused on long-stay schizophrenia patients, and none have investigated this specifically among Asians. The current study builds on earlier findings regarding the clinical importance of several psychosocial functioning predictors in what is believed a distinct subset of schizophrenia patients. These include identifying gender, employment status, negative symptoms, duration of illness, and cognitive function.

Many researchers agree that gender differences play a role in the clinical and functional outcomes of schizophrenia (45). In contrast to well-documented findings indicating that schizophrenia outcomes are poorer in male patients, who tend to have an earlier age of onset, worse premorbid adjustment, and a more severe

disease course, this study's female patients had lower psychosocial function scores (46, 47). This may be attributed to the higher number of elderly females and those previously unemployed in our sample population. Decreased oestrogen levels after menopause can impair cognition, especially in memory and executive function domains, which subsequently influence psychosocial functioning (48). While social and intellectual premorbid adjustments predict cognitive and functional outcomes in schizophrenia, postmorbid negative symptoms appear to play a mediating role (49, 50).

people Generally. with schizophrenia experience long-lasting negative symptoms throughout their illness. Moreover, a longer duration of illness is associated with more prominent negative symptoms and has been found to predict lower psychosocial functioning in this study's population (51). This aligns with observations that long-term institutionalised schizophrenia patients, especially those who are geriatric and chronically ill, exhibit more significant negative symptoms than younger and community-dwelling patients (52). Researchers have characterised a difference in the negative symptom profiles of people with schizophrenia who are in long-term hospital-based care compared to those living in the community, with severe asociality being the most characteristic symptom of prolonged hospitalisation (53). A previous study investigating the additional influence of negative symptoms on real-world functioning in people with schizophrenia concluded that diminished expression and avolition-apathy contribute substantial additional variance in predicting both realworld functioning and employment outcomes after accounting for neurocognition and functional capacity (54). Given these insights, the management of negative symptoms in longstay schizophrenia patients, especially those with a protracted history of illness, necessitates comprehensive strategies, including medication adjustments, psychosocial interventions, family support, and cognitive remediation, to improve patients' functional outcomes (24, 55-57).

To date, neurocognitive and social cognitive impairments have been identified as determinants of disability in schizophrenia, including vocational drift, emphasising the importance of cognitive assessment and remediation (23, 58). Meanwhile, premorbid employment status may indicate levels of social adjustment and intellectual function before disease onset, both of which influence psychosocial functioning among schizophrenia patients (49). In the present study, being unemployed prior to the current extended hospital stay correlated with lower psychosocial functioning, further confirming the need to pay attention to this group of patients with poor premorbid functions. There is a pressing need to strengthen vocational rehabilitation in the local setting to equip patients with job skills and opportunities, fostering a sense of purpose and social integration (15, 17, 41, 59). By empowering patients through employment and vocational support, mental health professionals can also enhance their psychosocial functioning and overall well-being (15, 17, 41, 59).

Community-based care offers better opportunities for social integration and professional competence, potentially leading to improved outcomes. The findings emphasise the necessity for comprehensive interventions targeting long-stay schizophrenia patients. Treatment strategies should incorporate cognitive remediation, psychosocial rehabilitation and symptom management to enhance functional outcomes. Communitybased care and support programmes are crucial in preventing prolonged hospitalisation and promoting better long-term outcomes for individuals with schizophrenia. In adopting a holistic approach to the treatment and management of psychosocial functioning of long-stay schizophrenia patients, the following strategies should be considered: individualised treatment plans tailored to the unique needs and challenges of each patient, accounting for factors such as gender, cognitive abilities and negative symptoms. Vocational rehabilitation programmes (60-62), social skills training (63) and cognitive remediation (64, 65) should be integrated into treatment plans to improve functional outcomes, particularly for those who are unemployed and facing cognitive impairment. Cognitive remediation has also been shown to effectively treat negative symptoms (66, 67). Regular psychosocial interventions, family support and community integration efforts are essential to address social withdrawals and deficits. Early intervention and continuous monitoring can help prevent symptom worsening and cognitive decline over time.

This current study is the first research conducted in a local setting exploring predictors of psychosocial functioning among long-stay schizophrenia patients in the country's largest

Malays J Med Sci. 2024;31(6):178-193

mental institution, with a relatively significant number of study subjects. Nevertheless, this study has some limitations that need to be addressed. First, it is a cross-sectional design that does not allow for inferring causal links. Second, the final multivariable model explained 65.76% of the variance in psychosocial functioning. While this indicates that the included predictors account for a substantial portion of the variance, other factors influencing psychosocial functioning were not explored in this study. Future research could investigate additional variables, such as social support, family dynamics, insight, coping mechanisms, as well as perceived and self-stigma, to provide a more comprehensive understanding of the predictors of psychosocial functioning in longstay schizophrenia patients (68-70). The current study used a universal sampling method to achieve an adequate sample size, meaning that the participants were not randomly selected. Furthermore, the study included only one mental institution in Malaysia, which might limit the generalisability of the findings. Hence, future research should employ longitudinal designs, consider a broader range of variables and adopt larger samples in multicentre settings. Lastly, including community-dwelling schizophrenia patients as a comparison would yield a more comprehensive understanding of the unique challenges faced by long-stay patients.

Conclusion

This study highlights that long-stay schizophrenia patients in mental institutions experience substantial difficulties in psychosocial functioning. By identifying gender, previous employment status, negative symptoms, illness duration and cognitive function as predictors of psychosocial functioning, targeted interventions can be developed to improve functional outcomes among at-risk populations. Future research should continue to explore effective strategies to support this distinct patient population and promote their overall well-being within mental institutions and beyond.

Acknowledgements

The authors are grateful to all the patients who had consented to participate in the study. The authors also thank the Director General of Health Malaysia for his permission to publish this article. The Director of Hospital Bahagia Ulu Kinta, Malaysia, is thanked for granting permission for the present study to be carried out in the facility.

Ethics of Study

The study procedures were approved by the National Medical Research and Ethics Committee of the Ministry of Health, Malaysia, NMRR ID-22-02909-481 (IIR).

Conflict of Interest

None.

Funding

None.

Authors' Contributions

Conception and design: CSC, EKBY Analysis and interpretation of the data: TPF, CSC Drafting of the article: TPF Critical revision of the article for important intellectual content: CSC, EKBY Final approval of the article: TPF, EKBY, CSC Collection and assembly of data: TPF

Correspondence

Dr. Chong Seng Choi Master of Medicine (Psychiatry) (UPM), MRCPsych (UK) Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia. Tel: +603-9769 2541 E-mail: sengchoi@upm.edu.my

References

- Global Burden of Disease Study 1. 2013 Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2015;**386(9995)**:743-800. 2013. Lancet. https://doi.org/10.1016/S0140-6736(15)60692-4
- Teoh SL, Chong HY, Abdul Aziz S, Chemi N, Othman AR, Md Zaki N, et al. The economic burden of schizophrenia in Malaysia. *Neuropsychiatr Dis Treat.* 2017;13:1979–1987. https://doi.org/10.2147/NDT.S137140
- Goreishizadeh M, Mohagheghi A, Farhang S, Alizadeh L. Psychosocial disabilities in patients with schizophrenia. *Iran J Public Health*. 2012;41(5):116–121.
- Glick ID, Hargreaves WA, Raskin M, Kutner SJ. Short versus long hospitalization: a prospective controlled study. II. results for schizophrenic inpatients. *Am J Psychiatry*. 1975;132(4): 385–390. https://doi.org/10.1176/ajp.132.4.385
- Jakubaschk J, Waldvogel D, Würmle O. Differences between long-stay and short-stay inpatients and estimation of length of stay. a prospective study. Soc Psychiatry Psychiatr Epidemiol. 1993;28(2):84–90. https://doi. org/10.1007/BF00802097
- Lelliott P, Wing J, Clifford P. A national audit of new long-stay psychiatric patients. I: method and description of the cohort. *Br J Psychiatry*. 1994;**165(2)**:160–169. https://doi.org/10.1192/ bjp.165.2.160
- Richards J, Smith DJ, Harvey CA, Pantelis C. Characteristics of the new long-stay population in an inner Melbourne acute psychiatric hospital. *Aust N Z J Psychiatry*. 1997;**31(4)**:488–495. https://doi. org/10.3109/00048679709065070
- Chung W, Chang H-S, Oh S-M, Yoon C-W. Factors associated with long-stay status in patients with schizophrenia: an analysis of national databases covering the entire Korean population. *Int J Soc Psychiatry.* 2013;**59(3)**:207–216. https://doi. org/10.1177/0020764011431794

- Cheah YC, Nur Aiza Z, Paramasivam S, Kadir AB, Jeyarajah S. Audit of new long-stay patients in Permai Mental Hospital, Johor. *Med J Malaysia*. 1997;52(2):139–145.
- Hospital Bahagia Ulu Kinta. 2021: Laporan Tahunan (2021: Annual Report) [Internet]. Ipoh, Perak: Hospital Bahagia Ulu Kinta; 2021 [Retrieved 2024 Apr 16]. Available at: https:// anyflip.com/atmdi/vufs
- World Health Organization (WHO). International classification of functioning, disability and health (ICF) [Internet]. Geneva: World Health Organization; 2001 [Retrieved 2024 Apr 16]. Available at: https://iris.who.int/ handle/10665/42407
- 12. Mehta S, Mittal PK, Swami MK. Psychosocial functioning in depressive patients: a comparative study between major depressive disorder and bipolar affective disorder. *Depress Res Treat.* 2014;2014(1):302741. https://doi. org/10.1155/2014/302741
- Suttajit S, Arunpongpaisal S, Srisurapanont M, Thavichachart N, Kongsakon R, Chantakarn S, et al. Psychosocial functioning in schizophrenia: are some symptoms or demographic characteristics predictors across the functioning domains? *Neuropsychiatr Dis Treat*. 2015;**11**:2471–2477. https://doi.org/10.2147/ NDT.S88085
- Stouten LH, Veling W, Laan W, van der Helm M, van der Gaag M. Psychotic symptoms, cognition and affect as predictors of psychosocial problems and functional change in first-episode psychosis. *Schizophr Res.* 2014;158(1-3):113– 119. https://doi.org/10.1016/j.schres.2014.06.023
- Valencia M, Fresán A, Barak Y, Juárez F, Escamilla R, Saracco R. Predicting functional remission in patients with schizophrenia: a cross-sectional study of symptomatic remission, psychosocial remission, functioning, and clinical outcome. *Neuropsychiatr Dis Treat*. 2015;11:2339–2348. https://doi.org/10.2147/ NDT.S87335
- Harvey PD, Strassnig MT, Silberstein J. Prediction of disability in schizophrenia: symptoms, cognition, and self-assessment. J Exp Psychopathol. 2019;10(3). https://doi. org/10.1177/2043808719865693

- Dahlan R, Midin M, Sidi H. Remission of symptoms among schizophrenia patients receiving assertive community treatment (ACT) in Malaysia: one year follow up. Sains Malays. 2013;42(3):389–397.
- Kossmann C, Heller J, Brüne M, Schulz C, Heinze M, Cordes J, et al. Assessment of psychosocial functioning in a large cohort of patients with schizophrenia. *Psychiatr Q*. 2021;92(1):177–191. https://doi.org/10.1007/s11126-020-09773-y
- Narayan KK, Kumar DS. Disability in a group of long-stay patients with schizophrenia: experience from a mental hospital. *Indian J Psychol Med.* 2012;**34(1)**:70–75. https://doi. org/10.4103/0253-7176.96164
- 20. Green MF, Kern RS, Braff DL, Mintz J. Neurocognitive deficits and functional outcome in schizophrenia: are we measuring the "right stuff"? *Schizophr Bull.* 2000;**26(1)**:119–136. https://doi.org/10.1093/oxfordjournals.schbul. a033430
- Bowie CR, Harvey PD. Cognition in schizophrenia: impairments, determinants, and functional importance. *Psychiatr Clin N Am*. 2005;28(3):613–633. https://doi.org/10.1016/j. psc.2005.05.004
- 22. Hofer A, Baumgartner S, Bodner T, Edlinger M, Hummer M, Kemmler G, et al. Patient outcomes in schizophrenia II: The impact of cognition. *Eur Psychiatry*. 2005;**20(5–6)**:395–402. https://doi. org/10.1016/j.eurpsy.2005.02.006
- 23. Matza LS, Buchanan R, Purdon S, Brewster-Jordan J, Zhao Y, Revicki DA. Measuring changes in functional status among patients with schizophrenia: the link with cognitive impairment. *Schizophr Bull*. 2006;**32(4)**:666– 678. https://doi.org/10.1093/schbul/sbl004
- Kurtz MM, Wexler BE, Fujimoto M, Shagan DS, Seltzer JC. Symptoms versus neurocognition as predictors of change in life skills in schizophrenia after outpatient rehabilitation. *Schizophr Res.* 2008;102(1-3):303-311. https://doi. org/10.1016/j.schres.2008.03.023
- 25. Tabarés-Seisdedos R, Balanzá-Martínez V, Sánchez-Moreno J, Martinez-Aran A, Salazar-Fraile J, Selva-Vera G, et al. Neurocognitive and clinical predictors of functional outcome in patients with schizophrenia and bipolar I disorder at one-year follow-up. J Affect Disord. 2008;109(3):286–299. https://doi. org/10.1016/j.jad.2007.12.234

- 26. Palmer BW, Dawes SE, Heaton RK. What do we know about neuropsychological aspects of schizophrenia? *Neuropsychol Rev.* 2009;19(3):365–384. https://doi.org/10.1007/ s11065-009-9109-y
- 27. Reichenberg A, Harvey PD, Bowie CR, Mojtabai R, Rabinowitz J, Heaton RK, et al. Neuropsychological function and dysfunction in schizophrenia and psychotic affective disorders. *Schizophr Bull.* 2009;**35(5)**:1022– 1029. https://doi.org/10.1093/schbul/sbn044
- Fett A-KJ, Viechtbauer W, Dominguez MDG, Penn DL, van Os J, Krabbendam L. The relationship between neurocognition and social cognition with functional outcomes in schizophrenia: a meta-analysis. *Neurosci Biobehav Rev.* 2011;35(3):573–588. https://doi. org/10.1016/j.neubiorev.2010.07.001
- 29. Lewandowski KE, Cohen BM, Ongur D. Evolution of neuropsychological dysfunction during the course of schizophrenia and bipolar disorder. *Psychol Med.* 2011;41(2):225–241. https://doi.org/10.1017/S0033291710001042
- 30. Harvey PD, Loewenstein DA, Czaja SJ. Hospitalization and psychosis: influences on the course of cognition and everyday functioning in people with schizophrenia. *Neurobiol Dis.* 2013;**53**:18–25. https://doi.org/10.1016/j. nbd.2012.10.022
- 31. Harvey PD. What is the evidence for changes in cognition and functioning over the lifespan in patients with schizophrenia? *J Clin Psychiatry*. 2014;75(suppl. 2):34–38. https://doi. org/10.4088/JCP.13065su1.08
- 32. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. Arlington, VA: American Psychiatric Association Publishing; 2013. https://doi.org/10.1176/appi. books.9780890425596
- 33. Overall JE, Gorham DR. The brief psychiatric rating scale. *Psychol Rep.* 1962;10(3):799–812. https://doi.org/10.2466/pr0.1962.10.3.799
- 34. Yee A, Ng BS, Hashim HMH, Danaee M, Loh HH. Cultural adaptation and validity of the Malay version of the brief psychiatric rating scale (BPRS-M) among patients with schizophrenia in a psychiatric clinic. *BMC Psychiatry*. 2017;17(1):384. https://doi.org/10.1186/s12888-017-1553-2

Original Article | Psychosocial functioning and predictors

- Mortimer AM. Symptom rating scales and outcome in schizophrenia. Br J Psychiatry. 2007;191(S50):7–14. https://doi.org/10.1192/ bjp.191.50.s7
- 36. Dautzenberg G, Lijmer J, Beekman A. Diagnostic accuracy of the Montreal Cognitive Assessment (MoCA) for cognitive screening in old age psychiatry: determining cutoff scores in clinical practice. avoiding spectrum bias caused by healthy controls. *Int J Geriatr Psychiatry*. 2020;**35(3)**:261–269. https://doi.org/10.1002/ gps.5227
- 37. Pendlebury ST, Cuthbertson FC, Welch SJV, Mehta Z, Rothwell PM. Underestimation of cognitive impairment by Mini-Mental State Examination versus the Montreal Cognitive Assessment in patients with transient ischemic attack and stroke: a population-based study. *Stroke*. 2010;41(6):1290–1293. https:// doi.org/10.1161/STROKEAHA.110.579888
- 38. Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc. 2005;53(4):695–699. https:// doi.org/10.1111/j.1532-5415.2005.53221.x
- 39. Daniel B, Agenagnew L, Workicho A, Abera M. Psychometric properties of the Montreal Cognitive Assessment (MoCA) to detect major neurocognitive disorder among older people in Ethiopia: a validation study. *Neuropsychiatr Dis Treat.* 2022;18:1789–1798. https://doi.org/10.2147/NDT.S377430
- 40. Morosini PL, Magliano L, Brambilla L, Ugolini S, Pioli R. Development, reliability and acceptability of a new version of the DSM-IV Social and Occupational Functioning Assessment Scale (SOFAS) to assess routine social functioning. *Acta Psychiatr Scand*. 2000;**101(4)**:323–329. https:// doi.org/10.1034/j.1600-0447.2000.101004323.x
- Norlelawati AT, Kartini A, Norsidah K, Ramli M, Wan Azizi WS, Tariq AR. Relationship of psychological symptoms, antipsychotics and social data with psychosocial function in schizophrenia patients in Malaysia. *Asia Pac Psychiatry*. 2015;7(1):45–53. https://doi. org/10.1111/appy.12089

- 42. Fett AJ, Velthorst E, Reichenberg A, Ruggero CJ, Callahan JL, Fochtmann LJ, et al. Long-term changes in cognitive functioning in individuals with psychotic disorders: findings from the Suffolk County Mental Health Project. JAMA Psychiatry. 2020;77(4):387–396. https://doi.org/10.1001/jamapsychiatry.2019.3993
- 43. Okasha TA, Hussein H, Shorub E, Nagi H, Moustafa AA, El-Serafi D. Cognitive dysfunction among inpatients and outpatients with schizophrenia: relationship to positive and negative symptoms. *Middle East Curr Psychiatry*. 2020;**27**:58. https://doi.org/10.1186/s43045-020-00062-9
- Murante T, Cohen CI. Cognitive functioning in older adults with schizophrenia. *Focus*. 2017;15(1):26–34. https://doi.org/10.1176/appi. focus.20160032
- Giordano GM, Bucci P, Mucci A, Pezzella P, Galderisi S. Gender differences in clinical and psychosocial features among persons with schizophrenia: a mini review. *Front Psychiatry*. 2021;**12**:789179. https://doi.org/10.3389/ fpsyt.2021.789179
- 46. Ayesa-Arriola R, de la Foz VO-G, Setién-Suero E, Ramirez-Bonilla ML, Suarez-Pinilla P, Mayoralvan Son J, et al. Understanding sex differences in long-term outcomes after a first episode of psychosis. *npj Schizophr*. 2020;6:33. https://doi. org/10.1038/s41537-020-00120-5
- Rusakovskaya O, Kharitonova N, Movina L, Papsuev O. Real-life functioning in women with schizophrenia living in residential facilities: gender-based comparison. *Front Psychiatry*. 2023;14:1120141. https://doi.org/10.3389/ fpsyt.2023.1120141
- 48. Tiwari S, Prasad R, Wanjari MB, Sharma R. Understanding the impact of menopause on women with schizophrenia-spectrum disorders: a comprehensive review. *Cureus*. 2023;**15(4)**:e37979. https://doi.org/10.7759/ cureus.37979
- 49. Lundsgaard J, Kristensen TD, Wenneberg C, Gregersen M, Nordentoft M, Birkedal Glenthoj L. Premorbid adjustment associates with cognitive and functional deficits in individuals at ultra-high risk of psychosis. *Schizophr*. 2022;**8**:79. https:// doi.org/10.1038/s41537-022-00285-1

- 50. Brill N, Levine SZ, Reichenberg A, Lubin G, Weiser M, Rabinowitz J. Pathways to functional outcomes in schizophrenia: the role of premorbid functioning, negative symptoms and intelligence. *Schizophr Res.* 2009;110(1–3):40–46. https:// doi.org/10.1016/j.schres.2009.02.016
- Becarevic N, Softic R, Osmanovic E. Does the duration of the illness affect the severity of negative symptoms of schizophrenia? *Mater Sociomed.* 2022;**34(1)**:25–27. https://doi. org/10.5455/msm.2022.33.25-27
- Davidson M, Harvey PD, Powchik P, Parrella M, White L, Knobler HY, et al. Severity of symptoms in chronically institutionalized geriatric schizophrenic patients. *Am J Psychiatry*. 1995;**152(2)**:197–207. https://doi.org/10.1176/ ajp.152.2.197
- negative 53. Okada H. Association of symptom domains and other clinical characteristics of schizophrenia longon term hospitalization. Indian J Psychiatry. 2022;64(3):277-283. https://doi.org/10.4103/ indianjpsychiatry.indianjpsychiatry_134_21
- 54. Yang Z, Lee SH, Abdul Rashid NA, See YM, Dauwels J, Tan BL, et al. Predicting real-world functioning in schizophrenia: the relative contributions of neurocognition, functional capacity, and negative symptoms. *Front Psychiatry*. 2021;**12**:639536. https://doi. org/10.3389/fpsyt.2021.639536
- 55. Milev P, Ho B-C, Arndt S, Andreasen NC. Predictive values of neurocognition and negative symptoms on functional outcome in schizophrenia: a longitudinal first-episode study with 7-year follow-up. *Am J Psychiatry*. 2005;**162(3)**:495–506. https://doi.org/10.1176/ appi.ajp.162.3.495
- 56. Ventura J, Subotnik KL, Gitlin MJ, Gretchen-Doorly D, Ered A, Villa KF, et al. Negative symptoms and functioning during the first year after a recent onset of schizophrenia and 8 years later. *Schizophr Res.* 2015;161(2-3):407–413. https://doi.org/10.1016/j.schres.2014.10.043
- 57. Shamsi S, Lau A, Lencz T, Burdick KE, DeRosse P, Brenner R, et al. Cognitive and symptomatic predictors of functional disability in schizophrenia. *Schizophr Res.* 2011;**126** (1-3):257–264. https://doi.org/10.1016/j. schres.2010.08.007

- 58. Bowie CR, Leung WW, Reichenberg A, McClure MM, Patterson TL, Heaton RK, et al. Predicting schizophrenia patients' real-world behavior with specific neuropsychological and functional capacity measures. *Biol Psychiatry*. 2008;63(5):505–511. https://doi.org/10.1016/j. biopsych.2007.05.022
- Honkonen T, Stengård E, Virtanen M, Salokangas RKR. Employment predictors for discharged schizophrenia patients. *Soc Psychiatry Psychiatr Epidemiol.* 2007;**42(5)**:372–380. https://doi. org/10.1007/s00127-007-0180-5
- 60. Kinoshita Y, Furukawa TA, Kinoshita K, Honyashiki M, Omori IM, Marshall M, et al. Supported employment for adults with severe mental illness. *Cochrane Database Syst Rev.* 2013;9:CD008297. https://doi. org/10.1002/14651858.CD008297.pub2
- Frederick DE, VanderWeele TJ. Supported employment: meta-analysis and review of randomized controlled trials of individual placement and support. *PLoS ONE*. 2019;**14(2)**:e0212208. https://doi.org/10.1371/ journal.pone.0212208
- 62. Abidin MZRZ, Yunus FW, Rasdi HFM, Kadar M. Employment programmes for schizophrenia and other severe mental illness in psychosocial rehabilitation: a systematic review. *Br J Occup Ther.* 2021;**84(10)**:605–619. https://doi. org/10.1177/0308022620980683
- 63. Barnes S, Carson J, Gournay K. Enhanced supported living for people with severe and persistent mental health problems: a qualitative investigation. *Health Soc Care Community*. 2022;**30(6)**:e4293–e4302. https://doi. org/10.1111/hsc.13822
- 64. Bowie CR, Bell MD, Fiszdon JM, Johannesen JK, Lindenmayer JP, McGurk SR, et al. Cognitive remediation for schizophrenia: an expert working group white paper on core techniques. *Schizophr Res.* 2020;**215**:49–53. https://doi.org/10.1016/j. schres.2019.10.047
- 65. Vita A, Barlati S, Ceraso A, Nibbio G, Ariu C, Deste G, et al. Effectiveness, core elements, and moderators of response of cognitive remediation for schizophrenia: a systematic review and metaanalysis of randomized clinical trials. *JAMA Psychiatry*. 2021;**78(8)**:848–858. https://doi. org/10.1001/jamapsychiatry.2021.0620

Original Article | Psychosocial functioning and predictors

- 66. Cella M, Preti A, Edwards C, Dow T, Wykes T. Cognitive remediation for negative symptoms of schizophrenia: a network meta-analysis. *Clin Psychol Rev.* 2017;**52**:43–51. https://doi. org/10.1016/j.cpr.2016.11.009
- 67. Penadés R, Wykes T. Use of cognitive remediation to treat negative symptoms in schizophrenia: is it time yet? *Br J Psychiatry*. 2023;**223(1)**:319–320. https://doi.org/10.1192/bjp.2023.50
- Jalbrzikowski M, Sugar CA, Zinberg J, Bachman P, Cannon TD, Bearden CE. Coping styles of individuals at clinical high risk for developing psychosis. *Early Interv Psychiatry*. 2014;8(1):68–76. https://doi.org/10.1111/ eip.12005
- 69. Lien Y-J, Chang H-A, Kao Y-C, Tzeng N-S, Lu C-W, Loh C-H. Insight, selfstigma and psychosocial outcomes in schizophrenia: a structural equation modelling approach. *Epidemiol Psychiatr Sci.* 2018;27(2):176–185. https://doi.org/10.1017/ S2045796016000950
- 70. Fan CH, Hsu SC, Hsiao FH, Chang CM, Liu CY, Lai YM, et al. The association of social support and symptomatic remission among communitydwelling schizophrenia patients: a crosssectional study. *Int J Environ Res Public Health*. 2021;**18(8)**:3977. https://doi.org/10.3390/ ijerph1808397