

ORIGINAL PAPER

Outcomes of Patients with Schizophrenia Receiving Community Psychiatry Services at Hospital Bahagia Ulu Kinta, Malaysia

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Abstract

Introduction and Objective: The implementation of Community Psychiatry Services (CPS) in Malaysia varies across health care facilities depending on available resources. This study investigates CPS implementation by Hospital Bahagia Ulu Kinta, looking into factors associated with illness severity and outcomes, and to identify areas for improvement. **Methods:** This is a cross sectional study from June to November 2018 and patients fulfilling the required criteria recruited using computer generated simple random sampling. Baseline data was obtained from case notes and interviews. Other assessment tools included Clinical Global Impression – Severity (CGI-S) scale for illness severity, Personal and Social Performance Scale s(PSP) for functioning, Medication Adherence Rating Scale Malay version (MARS-Malay version) and the Multidimensional Scale of Perceived Social Support Malay version (MSPSS-M). Descriptive and inferential analyses were performed using IBM SPSS v.20.0. **Results:** Of the 205 participants, 60% were males, 82.4% unemployed, mean duration of illness 18.3 years, and mean duration of 7.64 years under CPS. There was improvement in severity of illness, number of admissions, substance use, adherence to medication, social support and functioning improved ($p<0.05$). Younger patients with better functioning and with no family history of mental illness, who had good support have a better improvement of illness ($p<0.05$). Patients on a longer duration of CPS were more likely to be hospitalised. **Conclusion:** The study shows the importance of CPS for psychiatric rehabilitation and recovery of patients. This could be further enhanced by improvements in scope of service, social and job placement initiatives, and better access for youth.

Keywords: Schizophrenia, Community Psychiatry Services, Factor, Outcomes

Introduction

Schizophrenia, A Prevalent Mental

Disorder, Falls Within The Top Fifteen Causes Of Disability Worldwide, Affecting An Estimated 21 Million People [1]. The

Estimated Incidence Rates Worldwide Range From 7.7 To 43.0 /100,000 [2], While The Malaysian Estimate By The National Mental Health Registry Is About 5/100,000 [3].

Individuals With Schizophrenia Experience Hallucinations, Delusions, Disorganised Speech, Erratic Behaviour, As Well As Negative Symptoms [4]. The Disease Is Chronic And Debilitating And Affects Psychosocial Functioning In Most Spheres Of Life. This Results In Substantial Economic Burden Due To Low Rates Of Employability And Productivity, As Well As The Increasing Cost Of Managing The Illness. A Recent Study Done At Hospital Kuala Lumpur Estimated The Cost Per Patient To Be USD 6,594 Per Patient Per Annum, Taking Into Account All Direct And Indirect Costs [5].

Management Modalities For Psychiatric Care Have Evolved From Fully Institutional Care To Provision Of Care In The Community Setting. In Malaysia, Decentralisation Started In The 1970s And Downsizing Of Mental Institutions In 1990s. This Paved The Way For The Development Of Community Psychiatry Services (CPS) Which Is Provided By Multidisciplinary Teams Based At Hospitals [6]. The Extent Of Services Provided By The Various Hospitals Differs According To Available Resources [7]. In 2001, The National Mental Health Framework [8], Built On The National Mental Health Policy 1998 [9] Was Developed In Collaboration Between The Various Stakeholders As A Blueprint For Mental Health Services In Malaysia. In 2000, Psychosocial Treatment Programmes Were Launched In Community Clinics And Legislatively Were Well Implemented In Accordance With The Mental Health Act 2001 And Mental Health Regulation 2010 (Part III Section 16) [10,11].

CPS In Malaysia Is Classified Into Acute Home Care, Assertive Community Treatment, Regular Follow Up, And Defaulter Tracing According To Needs [12]. The Targets Are To Prevent Hospital Admissions And Provision Of Support To The Family. Different Models Of CPS Have Been Used By Mental Health Facilities In Malaysia. Prior To The Development Of ACT, The Case Management Method Was Used, Where One Case Manager Would Act As An Intermediary Between The Individual And The Required Services [12]. In Contrast, ACT Employs A Multidisciplinary Team Approach In The Management And Was Found To Be Superior To The Case Management Model [13,14]. Among The Outcomes That Can Be Measured From CPS Are Mental State, Social Function, Employment, Medication Adherence, And Quality Of Life [14]. Some Studies Have Used Hospitalization As A Measure Of Outcome As Reduced Admissions To Hospital Is A Measure Of The Effectiveness Of CPS [15-17].

Looking At The Different Methods Of Service Delivery Across The Country, The Authors Intended To Investigate Any Modifiable Factors In Order To Optimise CPS Provision For The Hospital Bahagia Ulu Kinta (HBUK) Catchment Area In Kinta District, Which Is A Large District Consisting Of A Population Of 767,794 With An Area Of 1,305 Km² [18]. This Study Aims To Determine The Factors Associated With Illness Severity Among Patients With Schizophrenia In CPS. We Also Aim To Assess The Adherence To Treatment, Level Of Functioning, And Admissions After Being In CPS. This Study Was Conducted By The Authors To Get A Better Understanding Of CPS So As To Plan And Implement A More Comprehensive Service And To Enhance The Outcomes Among Patients In The Community Setting.

Method

Study Design And Setting

This Is A Cross-Sectional Study Done From June 2018 To November 2018 On Consenting Individuals With Schizophrenia Receiving CPS From Hospital Bahagia Ulu Kinta (HBUK). This Study Had Obtained The Ethical Approval From The Universiti Kebangsaan Malaysia Medical Centre (UKMMC) (Ref. No UKM PPI/111/8/JEP-2017-645) And Medical Research And Ethics Committee (MREC) (NMRR-17-1577-36358). Approval To Conduct This Study Was Also Obtained From The Vice Dean Of Research And Innovation Faculty Of UKMMC (Project Code FF-2017-504) And The Director Of HBUK As Well As The Research And Ethics Committee Of HBUK (Ref No: HBUK. 100-6.1/1 No. 40).

Baseline Data Was Obtained From The Case Notes Of Patients With Schizophrenia Under CPS HBUK For Age, Gender, Ethnicity, Educational Level, Marital Status, Social Support, Occupation, Source And Level Of Income, Severity Of Illness, Hospitalisation, As Well As Place Of Regular Follow Up. The Number Of Hospitalizations Prior To And After CPS Entry Were Traced From The Patient Case Notes, Interviews With Caregivers And Case Managers Regarding Admissions Into Psychiatric Facilities.

The Diagnosis Of Schizophrenia Was Assigned According To The American Psychiatric Association: Diagnostics And Statistical Manual Of Mental Disorders, Fifth Edition [4] By The Community Psychiatrist Of HBUK. Patients Were Also Interviewed To Assess The Severity Of Their Illness Via Clinical Global Impression - Severity Scale (CGI-S) [19]. The Functioning Level Of The Study Population Was Assessed By Using The Personal And

Social Performance Scale (PSP) [20], Whilst The Adherence To Treatment Used The Malay Version Of The Medication Adherence Rating Scale (Skala Pengkadaran Pematuhan Pengambilan Ubat) [21], And Social Support With The Malay Version Of The Multidimensional Scale Of Perceived Social Support (MSPSS-M) [22].

Study Measures

Clinical Global Impression – Severity Scale CGI-S [19]. The Clinical Global Impressions – Severity (CGI-S) Scale Is A Clinician Rated Tool With A Scoring Of Illness Severity Ranging From 1 To 7, With The Higher Number Corresponding With A Higher Degree Of Illness Severity. This Scale Is A Practical And Easy To Administer Tool For The Measurement Of Illness Severity [23]. For The Purpose Of This Study, CGI-S Scores Were Obtained From The Patient's Case Notes And Interview With The Case Manager To Get A Better Understanding Of The Individual's Illness Severity At CPS Entry. The Current CGI-S Was Rated By The Author.

The Personal And Social Performance (PSP) Scale [20]. The PSP Is A Clinician Rated Instrument And Is Used For The Measurement Of Personal And Social Functioning In Schizophrenia. It Is A 100 Point Rating Scale Divided In Ten Similar Intervals, Where Better Functioning Correlates With A Higher Score. The Score Is Based On The Assessment Of The Individual's Functioning In Four Areas, Namely, Personal And Social Relationships, Self-Care, Socially Useful Activities, And Disturbing Or Aggressive Behaviors. This Scale Has Good Validity And Psychometric Properties In The Assessment Of An Individual's Personal And Social Functioning [20]. The PSP Scores During The Patient's Entry Into CPS Were Obtained

From The Case Notes Together With Interview With The Case Manager And The Current Scores Were Rated By The Author.

Medication Adherence Rating Scale (MARS) - Malay Version [21]. MARS Is A Self-Administered Ten-Item Yes / No Scale Which Evaluates Both Attitudes About Medication And Actual Medication Taking Behaviour. Total Score Ranges From 0 (Low Likelihood Of Medication Adherence) To 10 (High Likelihood). This Scale Has Been Validated To Be Used In Patients With Schizophrenia And It Was Concluded That It Is A Reliable And Valid Tool For The Measure Of Medication Adherence To Antipsychotics [24]. It Was Translated Into The Malay Language By Sabrina A. Jacob From Universiti Sains Malaysia, Penang (Skala Pengkadaran Pematuhan Pengambilan Ubat) And The Version Was Used In This Study. The Patients Were Rated During Entry Into CPS And Current Scores At Time Of Study.

The Multidimensional Scale Of Perceived Social Support, Malay Version (MSPSS-M) [22]. The MSPSS Is A Self-Administered Tool Used For The Measure Of Social Support. It Assesses The Subjective Perception Of Social Support From 3 Different Aspects Such As Significant Others, Friends, And Family. This Scale Consists Of 12 Items, With 4 Items For Each Subscale, With A Scoring On A Seven Point Likert Scale Of 1 (Very Strongly Disagree) To 7 (Very Strongly Agree), With A Higher Number Corresponding To A Higher Perceived Social Support. The Malay Language Version Of This Scale Has Been Validated And Demonstrated Good Psychometric Properties In The Measurement Of Social Support [22]. This Version Was Used Where Patients Rated The MSPSS-M During Entry Into CPS And The Current Support At The Time Of Study.

Recruitment And Sampling

The Study Included Patients Diagnosed With Schizophrenia Who Are Under CPS In HBUK, Aged 18 Years And Above, And Have Given Written Informed Consent. Exclusion Criteria Are Underlying Neurocognitive Disorders And Brain Injury (Trauma Or Stroke), Other Mental Disorders Besides Schizophrenia, Intellectual Disability, Inability To Read And Write, As Well As Those Who Are Unable To Understand The Malay Language. Sampling Frame For Simple Random Sampling Was Generated Based On Case Managers Feedback On Eligible Candidates Who Fulfilled The Selection Criterias. Patients Were Selected Randomly Based On Computer Generated Random Number [25]. A Total Of 197 Samples Were Needed Based On Finite Population Correction Sample Size Calculation [26]. To Minimize Errors In The Study, Data Collection Was Done By A Single Identified Interviewer And All Participants Were Assessed Using The Same Scales For Each Area Of Assessment.

Data Collection And Statistical Analysis

Statistical Packages For Social Science (SPSS) Version 22.0 Software Was Used To Analyze The Data Collected For This Study. Descriptive Analyses Were Used To Analyze Clinical And Socio-Demographic Data, And The Results Were Presented Using Descriptive Summaries Of Frequency, Percentages, Mean, And Standard Deviation.

The Dependent Variable Is The Difference Of The Severity Of Illness, Measured Using CGI-S. The Independent Variables Were The Changes In PSP, MARS Malay Version, MSPSS-M Scores. Other Independent Variables Were The Number

Of Admissions To Hospital, Substance Use, And Place Of Follow Up. Paired T-Test Was Used To Investigate The Difference Between The Pre And Post Results Of Continuous Variables. This Test Was Performed After Meeting The Assumption Of Normality. Mc Nemar Test Was Used To Investigate The Association Between Categorical Variables With Pre And Post Assessments. *P*-Value Of Less Than 0.05 Was Considered Statistically Significant. Univariable Linear Regression Was Done To Investigate The Associating Factors On CGI-S Changes. General Linear Model Was Use To Investigate The Associating Factors On Difference In Illness Severity (CGI-S). *P*-Value Less Than 0.25 Was Used For Variable Selection For Multivariable Analysis And *P*-Value Of Less Than 0.05 Was Considered Statistically Significant. Enter Method Was Used For Multivariate Analysis.

Results

The Total Number Of Patients Enrolled In The CPS HBUK Were 509. Of These 411 Had Fulfilled Selection Criterias And 205 Were Randomly Selected.

Socio-Demographic Characteristics

Table 1 Shows The Socio-Demographic Characteristics Of All The 205 Study Participants. Sixty Percent Were Males, Majority Of Them Were Chinese (45.9%). The Mean Age Of The Participants Was 47.3 Years And The Mean Duration Of Illness Was 18.3 Years. Most Of The Participants Attained Secondary Level Of Education (62.4%). Seventy Seven Percent Of Them Were Single And A Vast Majority Of The Participants Were Unemployed (82.4%). About 63% Of Them Earned Less Than RM 2000 A Month. Ninety Eight Percent Of The Respondents Were Either Living With Family Or Friends And 36.1% Had A Family History Of Mental Illness. The Mean Duration Of Years Of The Participants Being Under CPS Was 7.64 Years, With 62.9% Of Them Being Followed Up At Local Health Clinics, While The Rest Were Followed Up At Psychiatry Clinics. A Large Number (61.5%) Were On A Depot Injection. Only 14 Individuals (6.8%) On A Depot Injection Alone While The Rest Were Receiving Concomitant Depot And Oral Antipsychotics.

Table 1. Socio-demographic characteristics of individuals with schizophrenia receiving CPS from HBUK, Jun –Nov 2018. (n=205)

Socio-demographic	Frequency (%)
Gender	
Male	123 (60.0)
Female	82 (40.0)
Ethnicity	
Malay	87 (42.4)
Chinese	94 (45.9)
Indian	19 (9.3)
Orang asli	5 (2.4)
Age (years) [mean (SD)]	47.3 (10.87)
Education	
No formal education	4 (2.0)
Primary	55 (26.8)

Secondary	128 (62.4)
Tertiary	18 (8.8)
Marital Status	
Single	159 (77.6)
Married	25 (12.2)
Divorced	10 (4.9)
Widowed	11 (5.4)
Employment	
Unemployed	169 (82.4)
Employed	36 (17.6)
Monthly Income	
None	75 (36.6)
< RM 2000	129 (62.9)
RM 2000 to RM 4000	1 (0.5)
Source of Income	
Self	12 (5.7)
Family	3 (1.5)
Social Welfare	45 (22.0)
Combination	70 (34.2)
No income	75 (36.6)
Social support	
Living with friends/family	201 (98.0)
Living alone	4 (2.0)
Duration of illness (years) [mean(SD)]	18.3 (10.56)
Family history of mental illness	
Yes	74 (36.1)
No	131 (63.9)
Place of follow up	
Psychiatry clinics	76 (37.1)
Local health clinics	129 (62.9)
Duration under CPS (years) [mean(SD)]	7.6 (4.56)
Medication	
Depot Injection	
Yes	126 (61.5)
No	79 (38.5)
Oral Typical	
Yes	20 (9.8)
No	185 (90.2)
Oral Atypical	

Yes	173 (84.4)
No	32 (15.6)

Combination

Depot Injection and Oral Typical	14 (6.8)
Depot Injection and Oral Atypical	98 (47.8)
Oral Atypical and Typical	5 (2.4)

Frequency of hospitalisations after recruitment into CPS

Patients on longer duration under CPS are more likely to get admitted as compared to those on a shorter duration under CPS (i.e.

less than 1 year). Majority of the participants were not hospitalised within the first 7 years (72.5%) and a large portion of individuals were hospitalised after being under CPS for 8 or more years (76.5%) as shown in Table 2.

Table 2. Frequency of hospitalisations according to duration of being under CPS for patients with schizophrenia receiving CPS from HBUK, Jun- Nov 2018. (n=205)

Duration under CPS	No Hospitalisations		Hospitalisations	
	Frequency	%	Frequency	%
less than 1 year	17	13.5	2	2.9
2 to 4	34	27.0	4	5.9
5 to 7	41	32.5	10	14.7
8 to 10	20	15.9	16	23.5
11 to 13	8	6.3	15	22.1
14 and above	6	4.8	21	30.9

Pre and post assessment of modifiable socio-demographic characteristics and study instruments

Table 3 shows the comparison between study instruments and factors at CPS entry and at time of data collection (current). All the variables except MSPSS-M, friends had statistically significant difference between pre and post. The CGI-S scores were 2 units lower, indicating a lesser illness severity after the participants had been receiving CPS ($p<0.001$). There is also a statistically significant improvement in the PSP and MARS- Malay version scores ($p<0.001$) where the mean scores improved into a

better category. As for the MSPSS-M, even though there is a statistically significant improvement in the total scores, both scores still remain in the same category, which is moderate support (MSPSS-M scores of 3 to 5). The individual domains of the MSPSS-M revealed that there is a significant drop of perceived support from significant others ($p<0.001$) and the difference between the scores of the friend domain was not statistically significant. There is an improvement in the family domain ($p<0.001$) and also a statistically significant reduction in total number of hospital admissions after recruitment into CPS. The

use of substance among the participants also reduced after receiving CPS ($p=0.002$).

Table 3. Comparison between study instruments and modifiable socio-demographic characteristics at CPS entry and at time of data collection (current) of individuals with schizophrenia receiving CPS from HBUK, Jun-Nov 2018. (n=205)

Variables	At CPS Entry	Current	p- value
	Mean (SD)	Mean (SD)	
CGI-S	4.3 (0.76)	2.2 (0.54)	<0.001 ^a
PSP	61.5 (9.01)	75.9 (5.56)	<0.001 ^a
MARS-Malay version	5.1 (2.80)	9.1 (1.24)	<0.001 ^a
MSPSS-M (Total)	4.4 (0.63)	4.6 (0.61)	<0.001 ^a
MSPSS-M (Significant others)	4.2 (0.72)	2.1 (0.31)	<0.001 ^a
MSPSS-M (Friends)	3.9 (1.71)	4.0 (1.01)	0.597 ^a
MSPSS-M (Family)	5.1 (0.98)	5.6 (0.89)	<0.001 ^a
Number of admissions to hospital	3.9 (5.19)	1.1 (2.21)	<0.001 ^a
Substance use			
Yes [n (%)]	46 (22.40)	33 (16.10)	0.002 ^b
No [n (%)]	159 (77.60)	172 (83.90)	

a- Paired t test

b- McNemar Test

Inferential analysis on the differences in severity of illness (CGI-S)

In univariable analysis, employment, and the difference in PSP and MSPSS-M scores were found to be statistically significant ($p<0.05$) whereby these variables associate with the difference in CGI-S. For multivariable analysis, selection of variables was based on $p<0.25$ i.e. 7 variables were selected and analysed using Enter method using General Linear Model (GLM). A total of 205 cases were included and age, family history of mental illness, and the difference in PSP and MSPSS-M scores were found to have statistically significant association with the difference in pre and post inclusion into

CPS when comparing severity of illness. Younger participants had a greater difference in the improvement of their illness severity [$\beta=-0.01$ (-0.17, 0.00), $p=0.039$]. Those without a family history of mental illness also had a greater improvement in their illness severity [$\beta=-0.19$ (-0.371, -0.018), $p=0.031$]. The improvement in the difference in functioning (PSP) and social support (MSPSS-M) scores were associated with an increment in the difference of improvement in the severity of illness [$\beta=0.05$ (0.041, 0.063), $p<0.001$ and $\beta=0.18$ (0.006, 0.348), $p=0.042$]. The univariable and multivariable analysis of severity of illness is presented in Table 4.

Table 4. Associating factors on the difference in severity of illness (CGI-S) on patients with schizophrenia receiving CPS from HBUK, Jun- Nov 2018. (n=205)

Variables	Difference in Severity of Illness (CGI-S)			
	Univariable		Multivariable	
	β (95% CI)	<i>p</i> -value *	β (95% CI)	<i>p</i> -value *
Sociodemographic				
Gender				
Male	0.06 (-0.148, 0.270)	0.565		
Female	-	-		
Age	-0.01 (-0.016, 0.003)	0.175	-0.01 (-0.170, 0.010)	0.039
Ethnicity				
Malay	0.08 (-0.596, 0.756)	0.815		
Chinese	0.05 (-0.621, 0.728)	0.877		
Indian	0.16 (-0.581, 0.897)	0.674		
Orang asli	-	-		
Education level				
No formal education	-0.17 (-0.978, 0.645)	0.686		
Primary	-0.17 (-0.565, 0.232)	0.411		
Secondary	-0.07 (-0.442, 0.297)	0.698		
Tertiary	-	-		
Marital Status				
Single	0.19 (-0.271, 0.642)	0.424		
Married	0.21 (-0.319, 0.740)	0.433		
Divorced	-0.11 (-0.749, 0.530)	0.737		
Widowed	-	-		
Employment				
Unemployed	-0.32 (-0.581, -0.050)	0.020	-0.20 (-0.423, 0.019)	0.073
Employed	-	-		
Monthly income				
No income	1.80 (-1.473, 1.473)	0.990		
<RM2000	0.12 (-1.353, 1.585)	0.876		
RM2000 to RM4000	-	-		
Domicile				
Living with family or friends	0.33 (-0.408, 1.067)	0.379		
Living alone	-	-		
Duration of illness	-0.01 (-0.011, 0.009)	0.860		
Family history of mental illness				
Yes	-0.16 (-0.369, 0.055)	0.146	-0.19 (-0.371, -0.018)	0.031
No	-	-		
Place of Follow up				

Psychiatry clinics	0.09 (-0.118, 0.304)	0.387		
Local health clinics	-	-		
Duration under CPS				
Less than 1 year	-0.02 (-0.446, 0.408)	0.929	0.05 (-0.299, 0.393)	0.789
2 to 4 years	0.03 (-0.322, 0.389)	0.854	-0.04 (-0.327, 0.254)	0.804
5 to 7 years	0.03 (-0.301, 0.367)	0.844	0.05 (-0.324, 0.218)	0.702
8 to 10 years	0.28 (-0.077, 0.643)	0.122	0.14 (-0.159, 0.431)	0.363
11 to 13 years	0.30 (-0.076, 0.676)	0.117	0.16 (-0.145, 0.465)	0.302
14 and more years	-	-		
Medication				
Depot only	-0.10 (-0.483, 0.281)	0.603		
Oral only	-0.05 (-0.267, 0.166)	0.648		
Combination	-	-		
Substance Use				
No Change	-	-		
Improvement	0.33 (0.090, 0.740)	0.123	-0.26 (-0.603, 0.084)	0.137
Deterioration	-1.06 (-2.520, 0.410)	0.156	-0.45 (-1.695, 0.790)	0.473
Number of hospitalisations	0.01 (-0.011, 0.030)	0.367		
Study Instruments (difference in scores)				
PSP	0.06 (0.050, 0.070)	<0.001	0.05 (0.041, 0.063)	<0.001
MARS-Malay version	-0.08 (-0.050, 0.030)	0.669		
MSPSS-M	0.27 (0.060, 0.480)	0.011	0.18 (0.006, 0.348)	0.042

*- General linear model

All the assumptions for General Linear Model were met.

Discussion

This study found that there were almost equal number of respondents from the Chinese and Malay ethnic groups (45.9% and 42.4%). The population statistics of Perak shows there are 57.2% Malays and 30.3% Chinese, however there are more Chinese in the urban areas and towns, which was where the majority of the study participants lived [18]. Majority of the participants had only obtained secondary level education (62.4%) as the prodrome of the illness had begun during their adolescence or early adulthood which is in

keeping with the findings of a study looking at the age on onset of schizophrenia [27]. Most of the participants (98%) were living with their family which is common in Asian communities where multi-generational households live together.

Even though the results have shown a reduction in illness severity (CGI-S) and an increase in PSP scores, the percentage of participants who are unemployed remained high at 82.4%. Income was from different sources with majority receiving financial aid from social welfare. The different sources of income for the participants in this study ranged from family, self, social welfare, or a combination of sources. However, the majority of them had a total income of less

than RM 4000 a month which puts them in the Bottom 40% (B40) of the country's income group, categorising them into the lower income group [28]. Multiple studies have recognized employment as being a pertinent part of treatment of individuals with severe mental illnesses in promoting recovery [29]. Individuals with schizophrenia are found to be the most disadvantaged when compared to other mental disorders when it comes to employment and this pattern is similar across various countries [30]. A recent Norwegian study also found the employment rate among patients with schizophrenia to be 10.24%, with unemployment due to loss of productivity being a substantial contributor (29%) of the total societal cost of schizophrenia [31]. This should be an indication as to how pervasive this problem is and steps should be taken to remedy it via intensive interventions to supported employment, such as Individual Placement and Support (IPS) method which has strong evidence for positive outcomes [29]. IPS in Malaysia generally uses the "train and place" method which in contrast with western models, are using the "place and train" method which has proven to be more successful. This is due to the low available resources devoted to work rehabilitation programs in this country. A 2014 study done among majority of patients with schizophrenia at another mental institution in Malaysia where the "place and train" method was used found that a 3 month successful employment was at 68.3%, indicating a high employment rate [29].

Substance use included the use of illicit and non-illicit substances. Among those captured during data collection were opioids, cannabis, amphetamine and methamphetamine, solvents, cigarettes, and alcohol. Although there was a reduction in

substance use, there was one participant who had started smoking cigarettes after being under CPS follow up. Studies involving cigarette smoking and schizophrenia have shown that there is a greater number of individuals with schizophrenia smoking when compared to the general population and there are suggestions that smoking cigarettes could be an attempt by these individuals to reduce extrapyramidal side effects associated with the use of antipsychotics and also to negate the cognitive deficits associated with the illness [32,33].

The current management for schizophrenia involves a balance of psychological and pharmacological treatments tailored to each individual. In this study, we found that a large number of participants receiving pharmacotherapy were on a depot injection (61.5%). This shows an increase in the prescribing trend, and the possible acceptance of depot injections by the patients in the treatment of schizophrenia as the choice for medication is done via a shared decision making process involving the patient and family members. This is in contrast to 2004 Malaysian Statistics on Medicine report which stated a depot injection use of only 28.7% [34]. Another study done in 2018 comparing the use of oral and depot preparations of antipsychotics found that those treated with depot injections had lower relapse rates with a longer time to relapse and lesser hospital admission days [35]. This is vital as consistent treatment ensures a better outcome in terms of psychopathology, quality of life, and the chance to achieve remission [36,37].

Despite an improvement in the illness severity, adherence to medication, and functioning, the perceived social support did not improve, where it remained in the same

category (moderate) after recruitment into CPS even though 98% of respondents were living with family and friends.

A one year follow up study on CPS at another centre, Hospital Kuala Lumpur found that social support had improved among their study respondents [38]. In that study, social support was measured using a questionnaire designed by the research team, while this study looked at perceived social support as described by the respondents evaluating three domains which are family, significant others (spouse and partners), and friends. The largest difference in terms of support was in the 'significant others' category, from a mean of 4.2 to 2.1 which indicates a drop of support from moderate to poor. This was because out of the 46 respondents who were married, 21 ended up either being divorced or widowed. The role of sufficient support for patients with mental illness is undeniably important as found in an environmental catchment area study done in Baltimore, United States which found that greater social support in those with mental illness was associated with lesser psychiatry services usage, indicating a better outcome [39]. However, in developing countries such as Malaysia, stigma is still an issue where it also involves pervasive stigma coming not only from the society, but also from their own family members, which in turn results in marriage separation and divorce [40]. There is a role for non-governmental organisations and the media in the promoting awareness about mental illness and providing support. One such group in Malaysia is the Mental Illness Awareness and Support Association (MIASA) which was founded in 2017 and provides support for patients and their carers via support groups as well as various other programs.

This study found that those who had been recruited into CPS for a duration lesser than

5 years had fewer admissions (8.8%). We also found that the longer the individual is receiving CPS, the more likely they are to get admitted. We posit that this is because schizophrenia is a relapsing and remitting illness and there are various factors that lead to a relapse which in turn may result in an admission. The National Psychiatry and Mental Health Services Operational Policy, 2017 states that for ACT, which the respondents in this study were receiving, a period of 2 years of stable follow up is needed before being transferred to follow up as usual, however this policy also acknowledges that majority of patients will be receiving ACT indefinitely [12], as is the case at HBUK CPS.

Younger individuals with no family history of mental illness are associated to have more improvement in their severity of illness. Factors leading to a lesser improvement in older individuals include longer duration of untreated psychosis at onset of illness and the predominance of negative symptoms [41]. Besides pharmacological treatment, several studies have shown the efficacy of non-pharmacological methods that can be used to target individuals with negative symptoms, which include social skills therapy, cognitive remediation therapy and cognitive behavioural therapy [42,43]. As the CPS team is multidisciplinary, with more training and resources, it is possible for these interventions to be included at HBUK. A recent study looking at the difference between individuals with and without family history of schizophrenia found that those with a family history had an unfavorable long term outcome when compared to those without [44]. This finding is also reflected in this study, and since individuals with a family history usually have a younger age of onset, programmes targeting young individuals with this risk should be started. One such initiative is

being done at Mentari Simee Community Mental Health Centre, Ipoh is called “Youth Connect” where the aim is to provide prevention, early intervention, and continuation of care at a setting that is more assessable and less stigmatising to young individuals.

Having good functioning and social support are associated with better improvement in their severity of illness. Another study done in a general hospital setting in Kuala Lumpur looking at a one year follow up after being recruited into CPS found that social support was the most important factor in preventing admissions [38]. There are also rehabilitation programs available at most psychiatric centres in Malaysia which are catered to the improvement of functioning in individuals with schizophrenia where some centres have trained representatives from international bodies such as the Japan International Cooperation Agency (JICA) working in collaboration with CPS teams and other agencies. With appropriate pharmacological and non-pharmacological interventions, modifiable factors contributing to negative outcomes of schizophrenia can be effectively tackled.

Limitations

Although the authors have taken into account all the confounding factors, the study may be affected by some limitations such as location, study instruments, and recall bias. Scoring of the CGI-S at CPS entry were obtained from the patient’s case notes and this may affect inter-rater reliability of the scores. This study was conducted at a single hospital setting and resources as well as types of CPS offered at different centres across the country may vary, hence this limits the ability of the findings to be generalised to other centres.

Two of the scales used, MSPSS-M and MARS-Malay version, especially when examining the support and adherence prior to recruitment into CPS can be prone to recall bias, as these were patient rated scales and some participants had been receiving CPS for many years.

For future research, we recommend that a multicentre prospective study be done on patients recruited into CPS and a comparison be made between patients receiving CPS and those on follow up as usual as this would greatly improve the power and generalisability to the local population.

Conclusion

The current concept of service provided by CPS HBUK is able to reduce the illness severity and improve outcomes in patients with schizophrenia. There is a statistically significant improvement in the medication adherence, and functioning levels as well as reduced substance use among the study sample. Younger patients, with no family history of mental illness, having good support, and functioning are associated with a greater improvement in illness severity. However, social support and employment can be enhanced with the use of different psychoeducation strategies and use of IPS method. CPS is an effective strategy in improving care for patients in the community as it improves outcomes. It can be further strengthened by improving on areas identified in this study.

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Conflict Of Interest

None

References

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