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A randomized controlled trial on the effectiveness of the abridged illness management and recovery program for people with schizophrenia spectrum disorders

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Abstract

Objective: This study aimed to investigate the effectiveness of an abridged version of the Illness Management and Recovery Programme (AIMR) that was modified and developed in Hong Kong through a mult-centre randomized controlled trial for patients with schizophrenia spectrum disorders. **Methods:** This study was implemented in 10 occupational therapy departments, psychiatric day hospitals of 7 Hospital Authority clusters in Hong Kong. A total of 211 patients with schizophrenia or schizoaffective disorder was recruited and randomized into either the experimental or the control condition. In the control group, the subjects went through conventional occupational therapy programmes. In the experimental group, the subjects went through an additional 10-session programme of AIMR. **Participants:** were measured at baseline, completion of the AIMR, and 3-month after the AIMR programme. Measures include the expanded version of the Brief Psychiatric Rating Scale (BPRS-E), the client version of the Illness Management and Recovery Scale (IMRS), the Snyder Hope Scale, the Social and Occupational and Occupational Functioning Assessment Scale (SOFAS), the WHO Quality of Life Scale (WHOQOL-BREF), and the Chinese Version of the Short Warwick-Edinburgh Mental Well-Being Scale (C-SWEMWBS). **Results:** Both the experimental and control cohorts had comparable clinical and socio-demographic characteristics except years of education and duration of illness. These two variables were entered as covariates in the linear mixed model which showed that the experimental group had significantly higher improvement than the control group in terms of illness management ($F = 4.82$; $p = .03$; Cohen's $d = .45$), functional ($F = 10.65$; $p = .001$; Cohen's $d = .58$), and hope ($F = 5.52$; $p = .02$; Cohen's $d = .08$) measures after the completion of treatment. **Conclusion:** The results supported the effectiveness of the AIMR programm which would be important in the recovery oriented practices in psychiatry.

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Introduction

Schizophrenia is a chronic psychiatric illness that may lead to lifelong disability. Despite advances in antipsychotic medication for schizophrenia, relapse of psychotic symptoms are common and have a disruptive effect on the quality of life of people with schizophrenia and their capacity for independence (Müller, 2004). Therefore, it is important that people with schizophrenia learn to manage their illness more effectively and have active collaboration with their treatment provider. In mental health service, there is increasing awareness that treatment should not just focus on managing symptoms but on recovery, which was defined as helping people with mental illness "live, work, learn, and participate fully in their community" (Hogan, 2003, p. 2). However, a lot of people with schizophrenia need help in managing their illness, collaboration with treatment provider, and pursuing their recovery goals. Psychosocial treatment programme that promotes recovery, illness management, and adaptive adjustment is thus a necessary component of mental health service. Illness self–management provides people with schizophrenia a good foundation for maintaining a stable mental condition which is essential for their recovery journey.

In Hong Kong, the Hospital Authority issued a Mental Health Service Plan for Adults 2010 – 2015 embracing the vision that "The vision of the future is of a person-centered service based on effective treatment and the recovery of the individual." (Hospital Authority, 2011, p.5) Evidence-based psychosocial interventions that promoted recovery was encouraged. Occupational Therapists in Hong Kong were active to identify international evidenced-based recovery-oriented programmes to be applied in Hong Kong. The Illness Management and Recovery (IMR) Programme is one of the identified programmes that have good potential to be incorporated into the Occupational Therapy services in Hong Kong for promoting the recovery of people with schizophrenia.

The IMR Programme (Mueser et al., 2002, 2006) was developed in order to help people with schizophrenia learn how to manage their illness more effectively in the context of pursuing their personal goals. It was based on a review of controlled research in teaching illness self-management strategies to clients with severe mental illness done by Mueser et al. (2002), who identified and incorporated five empirical supported strategies including psychoeducation about mental illness and its treatment, cognitive-behavioural approaches to medication adherence, developing a relapse prevention plan, strengthening social support by social skill training, and coping skill training for the management of persistent symptoms.

IMR employed a combination of educational, motivational, and cognitive-behavioral teaching strategies, with weekly individual or group sessions requiring approximately 9 months to complete. Homework assignments are developed collaboratively with the client. Important aspects of the programme are the emphases on helping clients set personally meaningful goals for recovery and a strong therapeutic alliance aimed at achieving these goals. In addition, with clients' consent, significant others (e.g., family, friends) are encouraged to be involved in helping clients learn self-management strategies and pursue their personal goals.

McGuire et al. (2014) reviewed the literature on IMR up till 2011 and found three randomized-controlled trials (RCTs), three quasi-controlled trials and three pre-post trials on IMR have been conducted. They concluded that IMR shows promise for improving some consumer-level outcomes and further research is needed to compare outcomes of IMR consumers and active control groups. Salyers et al. (2014) reported a RCT on IMR against an active control group. They found no significant differences between IMR and problem-solving (PS) groups. Moreover, participation rates in both groups were low. Only 28% of consumers assigned to IMR and 17% of those assigned to the PS group participated in more than half the scheduled groups, and 23% and 34% respectively attended no sessions. Asking participants to attend weekly for nine months is an important issue in implementation of IMR in community mental health settings. Therefore, further research on the integration of IMR with ongoing treatment is needed.

Recent study on IMR seems to have unsatisfactory result. For example, Jensen et al. (2019) reported a one-year follow-up of a randomized controlled trial on illness management and recovery in Danish community mental health centers. No significant differences were found between the IMR and control groups in the Global Assessment of Functioning one year after the intervention, nor were there significant differences in symptoms, number of hospital admissions, emergency room visits, or outpatient treatment. However, this research has the limitation of low participation rate. 13% of the IMR group did not attend a single IMR session and the average number of sessions

attended was only 16.4. This may contributed to the lack of improvement in the IMR group.

In non-western countries, Lin et at (2013) developed a culturally adapted and abbreviated version of the IMR for Taiwanese people with schizophrenia who were ready for discharge from the hospital. She conducted a RCT on it with 1-month follow-up and found significant improvement in participants in terms of illness management knowledge, attitude toward medication, insight, and negative symptoms. More research on the effective of IMR, or modified version of it, in non-western countries is needed.

It takes about 9 months to complete the whole IMR in its original package. However, in Hong Kong, the average length of stay of psychiatric day hospitals is about 2–3 months. It is unlikely that clients in day hospital can go through the whole original IMR programme. Therefore, an Abridged Illness Management and Recovery Programme (AIMR) was developed by the research group based on their experience of running IMR in Hong Kong psychiatric day hospitals. The AIMR followed the same principles and theoretical base of IMR. However, it consists of 10 sessions covering the key concepts of IMR instead but with less repetition of materials taught in other modules. The contents are written in Chinese. Cultural adaptation has been also made in the area of community mental services to fit the local context in Hong Kong. Although the duration of AIMR is much shorter than the original IMR, we hypothesized the AIMR contains the essential therapeutic elements that render it as effective as the IMR but less time-consuming, hence save the cost. Table 1 summarize the topics covered by IMR and AIMR.

Since the contents of the AIMR was modified from the original IMR, it is uncertain that the programme could be applied in the Hong Kong culture. Therefore, this research was to explore the effectiveness of the AIMR for treatment of patients with schizophrenia in Hong Kong. We hypothesized that the patients with schizophrenia who had received the AIMR on top of their conventional treatment in occupational therapy would show better clinical and functional outcomes than those without the AIMR in occupational therapy.

Methods

Design

This was a multi-centre randomized controlled clinical trial. It included 10 Occupational Therapy Departments in all seven clusters of the Hospital Authority in Hong Kong from December 2014 to December 2016. Participants attending Occupational Therapy (OT) in psychiatric day hospitals were recruited and randomized into cohorts of experimental or control conditions. The experimental group received an additional 10-session programme of AIMR programme on top of conventional OT while those in the control group went through only conventional OT programmes. The cohorts were assessed and compared on (1) knowledge and progress gained from the Illness Management and Recovery; (2) hope level; (3) social and occupational functioning; (4) perception on his/her quality of life; and (5) subjective mental well-being. Assessments were done before and immediately after the programme, and at three months follow-up after the programme.

Participants

Participants were recruited from day-patients and outpatients receiving OT services at 10 psychiatric day hospitals namely Castle Peak Psychiatric Day Hospital, East Kowloon Psychiatric Centre, Kowloon Psychiatric Day Hospital, Rehabilitation Activity Centre (RAC) of Kwai Chung Hospital, North District Psychiatric Day Hospital, Pamela Youde Nethersole Eastern Psychiatric Day Hospital, Tai Po Psychiatric Day Hospital, United Christian Psychiatric Day Hospital, Yung Fung Shee Psychiatric Day Hospital, and Shatin Psychiatric Day Hospital in 7 Hospital Authority clusters in Hong Kong.

Inclusion criteria were: (1) psychiatric day-patients who are mentally stable based on clinical team/cases conference decision; (2) with a diagnosis of Schizophrenia, Schizotypal and Delusional disorders (F20 – F29) according to the ICD-10 (WHO, 2004) based on clinical notes review; (3) age 18 – 65; and (4) be able to communicate verbally with Cantonese, read and write Chinese. Exclusion criteria were: (1) with dual diagnosis; (2) diagnosed with mental retardation; (3) with a history of substance abuse over the past one year before the study commencement.

Outcome measures

The 24-item Brief Psychiatric Rating Scale (expanded version 4.0) enables the rater to measure psychopathology severity of schizophrenic and affective symptoms. A 7-point rating scale is used (Lukoff et al., 1986). It has good psychometric properties including Inter-rater reliability has ranging from .67 to .88, and concurrent validity when compared to other widely accepted tests measuring depressive, negative and thought disorder symptoms (Burlingame et al., 2006).

The Client version of The Illness Management and Recovery Scale (IMRS) targets to measure the target domains of IMR Program which includes personal goals, knowledge of mental illness, adherence to medication, social support, relapse prevention, coping with symptoms and functioning, as well as substance abuse and dependence (Mueser et al., 2004). It contains 15 items with 5-point Likert scale to be rated. IMRS (Client version) has good internal consistency (Cronbach's alpha = .70) and test-retest

reliabilty over 2 weeks (r = .82; Mueser & Gingerich, 2005), convergent validity with the Recovery Assessment Scale (r = .54; Corrigan et al., 2004), and with the Colorado Symptom Inventory (r = .38; Shern et al., 1996). The IMRS has been translated to Chinese by an expert panel comprising local experienced Occupational Therapists from various psychiatric settings in Hong Kong.

The Hope Scale by Snyder et al. (1991) is an independent predictor of success in various areas of life performance. It contains 12 questions for measuring "pathways thinking" (waypower) and "agency thinking" (willpower). The rater responds to each question using an 8-point Likert-type scale. Snyder et al. (1996) asserted that "high-hope individuals" typically can clearly conceptualize their goals, can envision one major pathway to a desired goal and can generate alternative pathways, perceive that they will actively employ pathways in pursuit their goals. The Hope Scale (Snyder) was found to have good concurrent validity by having significant correlations with Life Orientation Test for measurement of dispositional optimism (r = .50; Holleran & Snyder, 1990), with Generalized Expectancy for Success Scale for cross-situational expectancies for attaining goals (r = .54; Holleran & Snyder, 1990). Gibb (1990) also found that Hope Scale was correlated with Burger-Cooper Life Experiences Survey, with Problem Solving Inventory, with Rosenbery Self-Esteem Scale, with Hopelessness Scale, with Beck Depression Inventory (r = .54, −.62, .58, −.51, and −.42 respectively).

The Social and Occupational Functioning Assessment Scale (SOFAS) is an assessment scale that focuses exclusively on the individual's level of social and occupational functioning and is not directly influenced by the overall severity of the individual's psychological symptoms (Hay et al., 2003). The rating of overall functioning is measured on a scale of 0–100 from grossly impaired functioning to excellent functioning, the effects of lack of opportunity and other environmental limitations are not to be considered. The SOFAS has good inter-rater reliability with One-way random effects model ICC = .89 and Spearman-brown correlation for One-way random effects model ICC = .94, good convergent and discriminant validity with Global Severity Index of the SCL-90-R (r = −.37), Global Score of the Social Adjustment (r = −.47), and with Inventory of Interpersonal Problems (r = −.46) (Hilsenroth et al., 2000).

The abbreviated World Health Organization Quality of Life questionnaire (WHOQOL-BREF) self-administered version is a shorter version of the original instrument and was validated in Hong Kong which is especially useful in the assessment of long-term treatment outcome when patients have returned to live in the community (Leung et al., 2005). It is used to measure the individual's perceptions in the context of their culture and value systems, and their personal goals, standards and concerns. It comprises 28 items, which measure the following broad domains: physical health, psychological health, social relationships, and environment, in addition of 2 general questions on the overall quality of life and the other one on the overall health condition. The ICC values of the domain scores ranged from .73 in the environment domain to .83 in the psychological domain. The ICC for the domain scores ranged from .76 in the social interaction domain to .84 in the psychological domain (Leung et al., 2005).

The Warwick-Edinburgh Mental Well-Being Scale (Tennant et al., 2007) is a measure of mental well-being focusing entirely on positive aspects of mental health. A short 7-item version of WEMWBS with better internal construct validity is translated to the Chinese Version of the Short Warwick-Edinburgh Mental Well-Being Scale (Ng et al., 2013). C-SWEMWBS is an ordinal scale comprising 7 positively phrased Likert-style items covering a range of aspects of mental well-being. Scores ranges from 7 to 35, with a higher score reflecting a higher level of mental well-being. It has good internal consistency with Cronbach's Alpha coefficients ranging from .87 to .89, item-total correlation ranges from .57 to .75, test-retest reliability of intra-class correlation .94, and good concurrent validity by significant correlation with WHO-5 (r = .58) (Ng et al., 2013).

Control group

Participants in the control group attended conventional occupational therapy programmes which included pre-vocational assessments and trainings on entry-level job tasks in enhancing specific work skills and work habits of the participants for future job placement. The conventional occupational therapy programmes also offer psycho-educational and coping skills training in facilitating individual in gaining knowledge and independence in activities of daily living.

Experimental group

Participants in the experimental group attended a 10-session AIMR on top of the conventional occupational therapy programmes. The AIMR is primary focus on self-management, personal goal, social support, appropriate use of medication, relapse prevention, and coping with persistent symptoms. The AIMR was conducted in group format, and participants were encouraged to share their knowledge and personal experience on top of the structured curriculum.

Ethical considerations

The study protocol complied with the ICH-Good Clinical Practice and had been approved by the Research Ethical Committees of the seven clusters of the Hong Kong

Hospital Authority. (HKU/HA HKW/IRB Reference No. UW 14-548).

Procedures

Patients who had given their written informed consents were randomized into either the experimental group or control group by using block randomization procedure as described by Kang et al. (2008) in order to generate similar numbers of participants between groups. The research team leader of each day hospital conducted the randomization procedure but the process was blinded to the occupational therapists who carried out the programme intervention. Blinding to all investigators was not feasible in this study due to the small number of therapists in each day hospital. Participants' socio-demographic characteristics and clinical information were entered into a database form by their case occupational therapists of each participating centre. Assessments were conducted at baseline after the recruitment, at completion of the AIMR, and at 3-month after AIMR programme.

Statistical analysis

The Jamovi (2020) was used for data analysis. Comparisons of baseline socio-demographic between the experimental and control groups were assessed by the independent sample *t* test, Mann Whitney U, and chi-square test as appropriate. Clinical and functional outcomes were tested by repeated measures analysis of variance; the experimental/control condition was entered as between-group factor whereas repeated outcome scores were treated as within-group factors.

Results

A total of 220 patients with schizophrenia or schizoaffective disorder were recruited and assessed for eligibility, 216 patients were then randomized into either the experimental or the control groups (Figure 1). In the experimental group, 103 patients completed the occupational therapy programmes and a 10session programme of the AIMR. In the control group, 108 patients completed the conventional occupational therapy

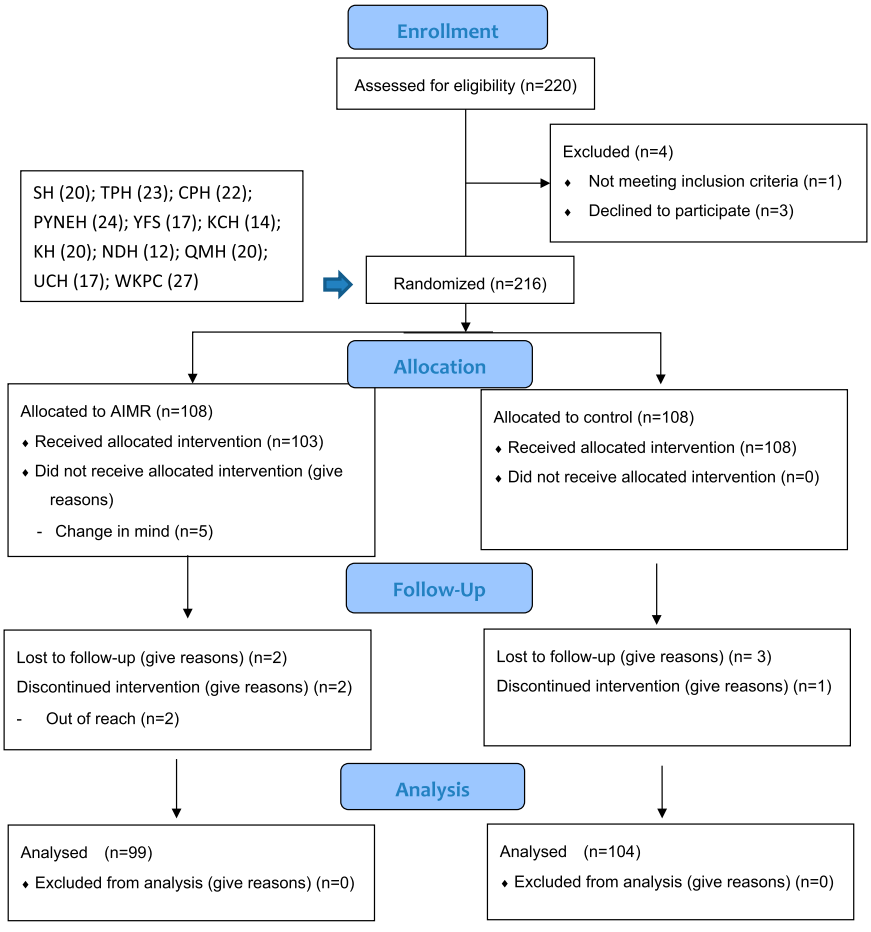

Figure 1. CONSORT Diagram on the study sample.

Table 1. Contents of IMR and AIMR.

IMR	AIMR
1. Recovery strategies	1. Recovery strategies
2. Practical facts about mental illness	2. Understanding schizophrenia
3. The stress-vulnerability model and strategies for treatment	3. Understanding treatment
4. Building social support	4. Building social support
5. Using medication effectively	5. Relapse prevention
6. Drug and alcohol use	6. Mental health services
7. Reducing relapses	7. My recovery journey
8. Coping with stress	
9. Coping with problems and symptoms	
10. Getting your needs met in the mental health system	

Table 2. Demographic data of the sample.

	Control group total N = 108 (Completed n = 104)		Experimental group total N = 103 (Completed n = 99)		
	Mean/count	SD/%	Mean/count	SD/%	p-value
Age (years)	44.35	11.33	42.90	11.98	.38[a]
Male	63	60.6%	52	52.5%	.16[b]
Education (years)	11.05	3.82	12.14	3.11	.03[c,d]
Psychiatric diagnosis					.57[b]
Schizophrenia	86	82.7%	79	79.8%	
Persistent delusional	5	4.8%	2	2.0%	
Acute and transient psychotic	2	1.9%	2	2.0%	
Induced delusional	1	1.0%	0	0%	
Schizoaffective	8	7.7%	13	13.1%	
Unspecified nonorganic psychosis	2	1.9%	3	3.0%	
With medical diagnosis	22	21.2%	22	22.2%	.49[b]
Duration of illness (years)	18.23	11.41	14.65	10.18	**.02**[a,c]
Medication					
Atypical antipsychotic	82	78.8%	82	82.8%	.29[b]
Conventional antipsychotic	33	31.7%	31	31.3%	.53[b]
Benzodiazepine	20	19.2%	22	22.2%	.36[b]
SSRI	14	13.5%	19	19.2%	.18[b]
Lithium	10	9.6%	3	3.0%	.50[b]

[a]Independent sample t test.
[b]Chisquare test.
[c]Statistically significant.
[d]Mann–Whitney U test.

programmes. Four patients were lost to the follow-up at 3-month post intervention in each group resulting in 99 subjects in the experimental group and 104 patients in control group available for data analysis.

The socio-demographic and clinical information of the sample can be found in Table 2. Both the experimental and the control groups had comparable clinical and socio-demographic characteristics except years of education and duration of illness. There was no significant difference between the experimental and the control groups in the outcome measures at baseline. Years of education and duration of illness were entered as covariates in the linear mixed models which showed that the experimental group had significantly higher improvement than the control

Table 3. Outcome data of the sample.

	Control group Total *N* = 108 (Completed *n* = 104)						Experimental group Total *N* = 103 (Completed *n* = 99)								
	Baseline		Post-treatment		3 month		Baseline		Post-treatment		Effect size	3 month follow-up		Effect size	Linear Mixed models[a]
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	d[b]	Mean	SD	D[c]	F	*p*-value
BPRS-E	35.32	14.55	33.66	13.17	32.78	12.00	34.40	11.77	31.29	8.20	−.31	30.46	6.50	−.41	3.76	.054
IMRS	50.15	8.81	50.77	8.11	50.64	8.81	48.28	6.88	51.71	8.09	.46	51.77	8.47	.45	4.82	**.03**[d]
SOFAS	63.28	12.60	64.22	11.99	65.44	13.20	60.85	11.21	64.12	10.91	.30	67.49	11.55	.58	10.65	**.001**[d]
H path	20.52	6.42	20.22	6.04	20.89	6.51	18.81	5.70	20.02	5.63	.21	19.33	6.24	.09	5.02	**.03**[d]
H agen	20.45	6.39	20.50	5.83	20.70	6.25	19.13	6.22	20.18	5.93	.17	19.32	6.39	.03	3.69	.06
H total	40.97	12.03	40.68	11.25	41.56	12.31	37.94	11.35	40.20	11.07	.20	38.89	11.86	.08	5.52	**.02**[d]
QOL 1	3.24	.91	3.20	.81	3.20	.90	3.16	.92	3.30	.87	.16	3.26	.77	.12	1.62	.21
QOL 2	3.05	1.03	3.19	.93	3.08	1.00	2.93	.95	3.17	1.06	.24	3.07	.93	.15	.50	.48
QPhy	56.53	19.05	58.35	17.80	59.46	19.64	56.12	17.35	56.84	15.87	.04	54.86	16.04	.08	.03	.87
QPsy	56.29	19.48	57.71	18.68	59.19	19.27	52.41	19.11	55.52	18.34	.17	55.62	17.85	.17	1.51	.22
QSoc	50.18	21.03	51.54	20.66	51.41	21.53	49.41	19.41	52.56	19.51	.16	52.33	19.52	.15	.65	.42
QEnv	57.94	18.93	59.02	17.84	60.37	18.29	56.67	15.91	58.54	17.06	.11	57.64	17.25	.06	.52	.47
CSWEM	23.07	5.88	23.29	5.28	23.69	5.92	21.65	5.10	22.29	5.56	.12	22.45	5.22	.16	.69	.41

[a]Mixed linear model comparing baseline and post-treatment using education and duration of illness as co-variates.
[b]Cohen's d of baseline and post-treatment in experimental group.
[c]Cohen's d of baseline and 3-month follow-up in experimental group.
[d]Statistically significance.
BPRS-E = Brief Psychiatric Rating Scale Expanded Version; IMRS = Illness Management Recovery Scale; SOFAS = Social and Occupational Functioning Assessment Scale; H Path = Hope Scale Pathway; H Agen = Hope Scale Agency; H Total = Hope Scale Total; QOL 1 = WHO Quality of Life - BREF Question 1; QOL 2 = WHO Quality of Life - BREF Question 2; QPhy = QOL Physical; QPsy = WHO Quality of Life - BREF Psychological; QSoc = WHO Quality of Life - BREF Social; QEnv = WHO Quality of Life - BREF Environment; CSWEM = Chinese Version of the Short Warwick-Edinburgh Mental Well-Being Scale (C-SWEMWBS).

group in terms of illness management, functional, and hope measures after the completion of treatment (Table 3). The significant improvement included Illness Management and Recovery Scale (F = 4.82; p = .03; Cohen's d = .45), Social and Occupational Functioning Scale (F = 10.65; p = .001; Cohen's d = .58), Hope Scale Pathway (F = 5.02; p = .03; Cohen's d = .09), and Hope Scale Total (F = 5.52; p = .02; Cohen's d = .08). The results also showed a trend towards significance in exhibiting fewer psychopathological symptoms and greater motivation to achieve goals in experimental group than control group after completion of treatment as reflected in the measurement of Brief Psychiatric Rating Scale-Extended version (F = 3.76; p = .054; Cohen's d = −.41) and Hope Scale Agency (F = 3.69; p = .06; Cohen's d = .03) respectively.

Discussion

The experimental group had significantly higher improvement than the control group in terms of illness management, functional, and hope measures after the completion of treatment. The results supported the effectiveness of the AIMR program which would be important in the recovery oriented practices in psychiatry. The result is consistent with previous RCTs on the IMR (Hasson-Ohayon et al., 2007; Levitt, et al., 2009). Although the AIMR is a 10-session programme, it contains the main topics and key points of the original IMR programme. Participants could gain essential knowledge on illness management and recovery. The AIMR was implemented using the same strategies of the IMR. The process of setting personal recovery goal and reviewing its progress in each session is essential to enhance the social and occupational functioning of participants within the study period. Successful achievement of personalized recovery goal instills hope towards recovery.

It takes about 9 months to complete the whole IMR in its original package. The long duration of treatment is a concern for community mental health service as much energy is needed to maintain participation of consumers. For example, in the RCT done by Salyers et al. (2014), only 28% of consumers assigned to the IMR group participated in more than half the scheduled groups despite they have been

reminded of the schedule. A recent RCT done by Jensen et al. (2019) also reported the limitation of low participation rate - 13% of the IMR group did not attend a single IMR session and the average number of sessions attended was only 16.4. This is also a practical consideration in occupational therapy services delivery in Hong Kong. In Hong Kong, the average length of stay of psychiatric day hospitals is about 2–3 months, therefore, it is difficult to complete the whole original IMR programme in 9 months. Our AIMR only takes 10 weeks to complete if the programme is implemented weekly or five weeks if it is implemented twice weekly. It seems more realistic for both clinicians and participants. In fact, the average participation rate was over 80% in our study, and the attrition rate was only 6%. Only 3 patients changed their mind and left the programme before completion, and 5 patients were lost to the follow-up at 3-month. The attrition data was excluded in the analysis.

Most previous studies on the IMR were done in western countries. Lin et at (2013) developed a culturally adapted and abbreviated version of the IMR for Taiwanese people with schizophrenia who were ready for discharge from the hospital. She conducted a RCT on it with 1-month follow-up and found significant improvement in participants in terms of illness management knowledge, attitude toward medication, insight, and negative symptoms. This AIMR study employed RCT design with 3-month follow-up. The result added initial evidence on the effectiveness of adapting IMR for people with schizophrenia in Chinese cultures.

The results of this AIMR study also showed a trend towards significance in exhibiting fewer psychopathological symptoms and greater motivation to achieve goals in the experimental group than the control group after completion of treatment. Previous RCTs on the IMR were able to document significant improvement in psychopathological symptoms in the IMR group than the control group (Levitt, et al., 2009). However, in a RCT on a brief and adapted version of the IMR programme done in Taiwan also found no significant difference between the IMR group and the treatment as usual group on Brief Psychiatric Rating Scale except negative symptom subscale (Lin et al., 2013). The RCTs done by Salyers et al. (2014) and Jensen et al. (2019), with low participation rate, also found no significant difference in symptom severity in both IMR treatment and control group. Participants may need more practice to apply symptom management strategies effectively. A longer follow up time may be needed to demonstrate the effect of AIMR on improvement in psychopathological symptoms. Booster session after completion of AIMR may be arranged to further enhance and consolidate participant's symptom management skills.

There was no significant difference in terms of quality of life and mental well-being in this study although there are trends of improvement. These two variables may need a longer time to show its improvement.

There are some limitations of the study. First, we did not include hospitalized people with schizophrenia or schizophrenia spectrum disorders. In other words, our results could not be generalized to those in their acute phase. Second, the study did not involve outcome assessments at a longer time post AIMR training, such as at one-year follow-up. Hence, we did not know if the AIMR effect would fade out or not sometime after the treatment. Third, since the experimental treatment is on top of the conventional treatment, this would favour the experimental group. Forth, the 3-month follow-up of this study might be too short in duration and not be enough to observe improvement in quality of life and mental well-being over time. Fifth, intention-to-treat was not used for the 4 dropouts in the total sample. Further research with longer follow-up for example one year may be needed.

Conclusion

The study has shown that the AIMR can improve people with schizophrenia or schizophrenia spectrum disorder clinical and functional performance in Hong Kong. It would benefit the body of knowledge as well as clinical practice.

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