

Effects of the Illness Representation Based Education Program (IRBEP) on Medication Adherence among Patients with Schizophrenia in Indonesia

นิพนธ์ต้นฉบับ

Original Article

ศรี โนวิตายานี^{1*}, วีณา คันฉ่อง², วันดี สุทธิรงค์ และ จารุวรรณ กฤตย์ประชา³

¹ นักศึกษาปริญญาโทสาขาการพยาบาลสุขภาพจิตและจิตเวช คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ หาดใหญ่ จ.สงขลา

² สาขาการพยาบาลสุขภาพจิตและจิตเวช คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ หาดใหญ่ จ.สงขลา

³ สาขาการพยาบาลอายุรศาสตร์ คณะพยาบาลศาสตร์ มหาวิทยาลัยสงขลานครินทร์ หาดใหญ่ จ.สงขลา

* ติดต่อผู้พิมพ์: vieta_sny@yahoo.co.id

วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2557;9(3):105-111

Sri Novitayani^{1*}, Weena Chanchong², Wandee Suttharangsee² and Charuwan Kritpracha³

¹ Master Degree Student in Nursing Science, Faculty of Nursing, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand

² Department of Mental Health and Psychiatric Nursing, Faculty of Nursing, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand

³ Department of Medical Nursing, Faculty of Nursing, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand

* Corresponding author: vieta_sny@yahoo.co.id

Thai Pharmaceutical and Health Science Journal 2014;9(3):105-111

บทคัดย่อ

วัตถุประสงค์: เพื่อเปรียบเทียบการยึดติดในการใช้ยาของผู้ป่วยจิตเภทระหว่างกลุ่มเข้าร่วมโปรแกรมการศึกษาโดยใช้ภาพตัวแทนความเจ็บป่วย (Illness Representation Based Education Program; IRBEP) และกลุ่มที่ไม่ได้รับ และเพื่อเปรียบเทียบการยึดติดในการใช้ยาระหว่างก่อนและหลังการเข้าร่วมโปรแกรม **วิธีการศึกษา:** การศึกษานี้ใช้รูปแบบการวิจัยเชิงกึ่งทดลอง (quasi-experimental design) โปรแกรม IRBEP สร้างขึ้นตามแนวทางการให้การศึกษแก่ผู้ป่วยโดยใช้ภาพตัวแทนความเจ็บป่วย (representational approach to patient education) เป็นแนวทางซึ่งพัฒนาจากแนวคิดของ Common Sense Model และ Conceptual Change Model ผู้ป่วยจิตเภท 40 รายถูกจัดเข้ากลุ่มทดลองและกลุ่มควบคุมจำนวนเท่า ๆ กัน โดยวิธีการสุ่มประเภทปรับปัจจัยแปรปรวน (covariates adaptive randomization) ปัจจัยแปรปรวนที่ควบคุมคือ การสนับสนุนของครอบครัวและความถี่ของการให้ยา ประเมินการยึดติดในการใช้ยาด้วยแบบสอบถามพฤติกรรม การยึดติดในการใช้ยา (Behavior of Medication Adherence Questionnaire; BMAQ) **ผลการศึกษา:** ผู้ป่วยในกลุ่มทดลองมีการยึดติดในการใช้ยาสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญ ($t = 6.53, P < 0.01$) ผู้ป่วยในกลุ่มทดลองหลังเข้าโปรแกรม IRBEP มีการยึดติดในการใช้ยาสูงกว่าก่อนเข้าโปรแกรมอย่างมีนัยสำคัญ ($t = -6.09, P < 0.01$) **สรุป:** ผลการศึกษาแสดงถึงประสิทธิผลของโปรแกรม IRBEP ในการเพิ่มการยึดติดในการใช้ยาของผู้ป่วยจิตเภท

คำสำคัญ: การยึดติดในการใช้ยา, การให้ศึกษาแก่ผู้ป่วยโดยใช้ภาพตัวแทนความเจ็บป่วย, จิตเภท, อินโดนีเซีย

Abstract

Objective: To compare medication adherence of patients with schizophrenia between the patients who attended the Illness Representation Based Education Program (IRBEP) and the patients who did not, and to compare medication adherence before and after the IRBEP.

Method: This study employed a quasi-experimental research design. The IRBEP was developed based on the Common Sense Model and Conceptual Change Model, a representational approach to patient education. Forty patients with schizophrenia were assigned into an experiment or control group equally by using covariates adaptive randomization. The controlled covariates were family support and dosage frequency. The Behavior of Medication Adherence Questionnaire (BMAQ) was used to capture medication adherence. **Results:** The patients in the experiment group had significantly higher medication adherence than those in control group ($t = 6.53, P < 0.01$). Experiment group had significantly higher medication adherence after attending the IRBEP than that at baseline ($t = -6.09, P < 0.01$). **Conclusion:** The findings showed that the IRBEP was effective in enhancing medication adherence among patients with schizophrenia.

Keywords: medication adherence, a representational approach to patient education, schizophrenia, Indonesia

Introduction

Schizophrenia is a chronic mental illness which impacts a large number of individuals.¹ The pharmacological approach is a main treatment for schizophrenia. Antipsychotic medication can help patients from experiencing a relapse,² reduce re-hospitalization,³ reduce symptoms, and improve functioning,⁴ and quality of life.⁵ Although medication provides benefit for patients, suboptimal adherence to prescribed medication has been documented. The reasons that patients do not adhere to their medication include believing that their illness is cured while the symptoms are relieved, believing that medication does not work while the

symptoms persist, or experiencing uncomfortable side effects from the medication.⁶

Researchers have sought of interventions to enhance medication adherence in patients with schizophrenia. However, not all interventions have been proved to offer an effective enhancement. Moreover, results were inconsistent. A pilot study in five patients with schizophrenia was conducted by Staring, Mulder, and Priebe.⁷ The researchers provided incentive to each patient for each time they took depot injection of medication. The study was conducted for a one year period. The results revealed an increase of

medication adherence during the study period of one year, but there were no long-term results.

In other studies, Shon and Park provided an intervention,⁸ comprising of 12 sessions of group education based on self management framework. Each session was 70-minute long. The result showed an increase in medication adherence. Vreeland, together with colleagues, conducted a study providing a 24-week psycho-education intervention focusing on illness management.⁹ The results revealed only an improvement in knowledge but not in medication adherence.

Even though some studies showed the benefit of time consuming intervention,^{7,8} a review of the intervention for schizophrenia with medication adherence as an outcome showed the benefit of intervention with fewer sessions.¹⁰ The study reported that interventions were more effective to improve outcome even with fewer sessions (4-6 sessions) with focus on medication adherence and use of cognitive strategies.

A representational approach focused on an individual's perception has been used in several studies for individual with physical illness.^{11,12} The findings showed that the interventions were effective to change individuals' behaviors for dealing with their health problems. However, there was no study of patients with mental illness.

This research was designed with an attempt to examine the effect of the Illness Representation Based Education Program (IRBEP) on medication adherence. The intervention was developed based on a representational approach to patient education which was developed by Donovan et al.¹³ The Common Sense Model (CSM)¹⁴ and Conceptual Change Model¹⁵⁻¹⁷ are the basis theories underpinning a representational approach to patient education.¹⁷ The CSM stated that cognitive illness representation influences coping strategies, such as medication adherence, that are used to overcome an illness.¹⁴ The five components of cognitive illness representation involve components of identity, cause, timeline, consequences, and controllability. The cognitive illness representation can be accommodated according to experience and information received by each individual. Cognitive illness representation based on misconceptions, gaps and confusion can be intervened and restructured using conceptual change model. The conceptual change model may help each individual successfully accommodate their current perceptions which includes: (1) dissatisfaction

with the current perception because the current perceptions do not make sense to the individual and cannot be used to face the problem, (2) receiving new information which is intelligible and plausible, and (3) believing the new information to be fruitful in solving the problem.¹⁵⁻¹⁷

This study examined effects of the IRBEP on medication adherence in patients with schizophrenia. Medication adherence, according to Vuckovich,¹⁸ is an individual's behavior in voluntary and actively continuing taking medication as prescribed in order to maintain mental health. Medication adherence consists of four attributes which are 1) voluntary which refers to the individuals' willingness in taking medication, 2) active participation which refers to taking responsibility regarding taking medication by themselves, 3) following the prescription which refers to individuals' behavior following instructions regarding medication which is recommended by a psychiatrist, and 4) continuity which refers to individuals' behavior in taking their medication continuously until the last dose prescribed. This study aimed to determine medication adherence in patients with schizophrenia, comparing those who did and those who did not the IRBEP, and to compare medication adherence before and after attending IRBEP. Therefore, research hypotheses included 1) medication adherence score in those attending the IRBEP was higher than those not attending, and 2) among those attending IRBEP, medication adherence score after IRBEP program was higher than that at baseline.

Methods

This study was approved by the Ethics Committee of the Faculty of Nursing, Prince of Songkla University. Forty subjects were recruited from the outpatient clinic of Psychiatric Hospital Banda Aceh, Indonesia. The inclusion criteria were as follows: Patients that (1) were diagnosed with schizophrenia by the psychiatrists at the Psychiatric Hospital Banda Aceh, (2) were aged between 18 to 60 years old, (3) were hospitalized at least twice due to medication non-adherence since diagnosis, (4) scored less than 41 on the Brief Psychiatric Rating Scale (BPRS), (5) were contactable by phone, (6) had intact communication acuity, (7) willingly participated in the study throughout the course of the study.

Due to the reason that no previous study used the representational approach in patients with mental illness

including schizophrenia, a sample size calculation was not possible. Therefore, initially a minimum of 20 subjects per group were recruited. However, on post-hoc computation, the effect size was calculated, and yielded a value of 2.06. With a one-tailed test at a significant level of 0.01 ($\alpha = 0.01$), an effect size of ≥ 1.40 , and number of samples of 20 per group, the power of the test was 0.97.¹⁹ This finding was satisfactory and confirmed that the sample size of this study was adequate.

Patients were assigned into an experiment or control group by using covariates adaptive randomization. The two controlled covariates were family support and dosage frequency. Family support was assistance oriented, tasked with helping patients to complete the course of medication, with three levels of low, moderate, and high. The dosage frequency had two levels: once per day and more than once per day. Therefore, there were six subgroups based on the combination of covariates.

For patients in the experiment group, they participated in the Illness Representation Based Education Program (IRBEP) individually. The IRBEP consists of seven process components, involving (1) representation assessment in which the patient described his or her perception about schizophrenia regarding to the five dimensions of cognitive illness representation (identity, cause, timeline, consequences, and controllability) and the researcher identifies gaps, misconceptions, and/or confusion in the patient's perception, (2) identifying and exploring the gaps, misconceptions and confusion about schizophrenia in which the researcher understands how any gaps, misconceptions and confusion about schizophrenia developed and evaluates the strength of those in patient's behavior of medication adherence, (3) creating the condition for conceptual change, in which the patient recognizes the limitation of current perceptions by realizing the negative consequences of those perceptions, in order to overcome the schizophrenia, (4) introducing replacement information in which the researcher gives information associated with the concept of schizophrenia that is intelligible, plausible and fruitful in order to replace misconception, fill the gaps, and clarify any confusing issue, (5) summary in which the researcher and the patient summarize and discuss the benefit of the new perception while the patient uses it to overcome the schizophrenia, (6) goal setting and strategy planning in order to enhance medication adherence in which the patient

decides upon goals toward taking medication then writes them down on the form that is provided by the researcher, as a strategy to enhance medication adherence, and (7) following up the goals and the strategies by phone allowing the researcher to evaluate the actions and the goals, and barriers.

In the experiment group, after completing the pre-test data, patients were provided the first six components of the IRBEP. In the following week, the researcher provided the follow up session which was the seven-process component of the IRBEP. One week after that, the post-test data and complete patients' monitoring form were collected. The monitoring form was completed in order to assess if the patients received any other intervention programs during their participation in this study. In the control group, patients received standard care. The pre-test and post-test (two weeks after pre-test) data in the control group were collected. Pre-test and post-test in the experiment and control groups were collected by a trained research assistant (RA) who works in a ward of the Psychiatric Hospital Banda Aceh and has graduated with a Bachelor of Nursing degree. The RA was trained to better understand the content of each questionnaire and to better perform data collection. The RA was blinded to patients regarding the intervention assigned.

Measurements tools used in this study included the Brief Psychiatric Rating Scale (BPRS), the Demographic Data Questionnaire (DDQ), the Family Support as Assistance Oriented Task in Taking Medication Questionnaire (FSATMQ), the Cognitive Illness Representation Questionnaire for Schizophrenia (CIRQS) and the Behavior of Medication Adherence Questionnaire (BMAQ). Details of the instruments are follows. Firstly, the BPRS, developed by Overall and Gorham,²⁰ was used to screen potential patients in this study. The BPRS consists of 18 items measuring psychiatric symptoms with a Likert-type rating scale from 1 (not present) to 7 (extremely severe), yielding a possible range of 18 - 126.

Secondly, the DDQ which was developed by the researcher was used to assess demographic and clinical characteristics. Thirdly, the FSATMQ developed by the researcher was used to measure the level of family support with a Likert-type rating scale from 1 (never) to 5 (always). The FSATMQ is divided into three levels with a possible range of 5 to 25, categorized into high level (19 - 25), moderate level (12 - 18) and low level (less than or equal

11). Fourthly, the CIRQS, modified from IPQS developed by Lobban, Barrowclough and Steven,²¹ was used to assess the cognitive illness representation. This information obtained from the CIRQS was used to ascertain the patients' cognitive illness representation before and after intervention.

Fifthly, the BMAQ was used to measure medication adherence with a Likert scale from 1 (never) to 4 (all the time) for positive statement and from 1 (all the time) to 4 (never) for negative statement. The BMAQ was developed by the researcher based on the literature review on medication adherence reported by Cohen,²² Vrijens et al²³ and Vuckovich.¹⁸ There were four subscales: voluntary, active participation, following prescription, and continuity. After score reversal of appropriate items, the higher score of BMAQ indicates higher medication adherence behavior with a possible range of 15 to 60.

Validity of the study instruments (the IRBEP, goal setting and planning strategies form, the DDQ, the FSATMQ, the CIRQS and the BMAQ) were evaluated by three experts, including two lecturers from the Faculty of Nursing, Prince of Songkla University, an expertise in CSM and a psychiatric nurse, and one lecturer from the Faculty of Nursing, Indonesia University, an expertise in psychiatric nursing. The researcher revised the instruments by following suggestions from three experts. Content Validity Index (CVI) was calculated only for the FSATMQ, the CIRQS and the BMAQ, and acceptable content validity index (CVI) was found with value of 1.00, 0.89 and 0.80.

Cronbach's alpha coefficient was used to test reliability for FSATMQ, BMAQ, label which is one part of identity dimension of CIRSQ, cause dimension of CIRSQ, timeline dimension (chronic/acute and cycle) of CIRSQ, consequences dimension of CIRSQ, controllability dimension of CIRSQ and Kappa coefficient was used to test reliability of symptoms part which is one part of identity dimension of CIRSQ. Result showed acceptable reliability (Cronbach's alpha coefficients of 0.72 - 0.87), except for chronic/acute as a part of the timeline dimension and consequences dimension (Cronbach's alpha coefficients of 0.56 and 0.52 respectively). Kappa coefficient for symptoms part of the identity dimension of CIRSQ was 0.69.

Statistical analysis

The demographic and clinical characteristics of the patients were analyzed by using descriptive statistics which

consists of frequencies, percentages, mean (M) and standard deviation (SD). The chi-square test, Fisher's exact test, Likelihood Ratio or Independent t-test were used to examine the differences between the experiment and control groups. Differences of medication adherence behaviors were analyzed using inferential statistics. The assumption of normality and homogeneity of variance were tested. The independent t-test statistic for between the groups and paired t-test statistic for within the group were used to detect significant differences of medication adherence. A statistical significance level of 0.05 was used.

Results

Of 40 patients, 20 in each group, they were in an age range of 21 – 60 years with comparable average ages (36.95 years in experiment group and 35.20 in control group) (Table 1). There were more male patients in both groups (65.0% in both groups). All of them were Muslim. The majority in both groups was single (65.0% and 50.0% in experiment and control groups respectively), and had senior high school educations (45.0% and 40.0% in experiment and control groups respectively). While three-quarters (75.0%) of patients in experiment group were currently employed, 50% in control group were not. Regarding monthly income, while the majority in control group (50.0%) had no income, those in experiment group had income in a wider range. Most patients had their family members to take care of them (85.0 % and 100.0% in experiment and control groups respectively). All differences between the two groups mentioned above were not statistically significant.

Regarding clinical status, the experiment and control groups had comparable number of hospitalization (3.75 and 3.62 times, respectively) and length of illness (9.77 and 8.37 years, respectively) (Table 2). In terms of transportation, however, most patients in experiment group used personal transportation (70.0%) while those in control group used public (35.0%), personal (45.0%), and both public and person transportation (20.0%) with a statistical significance ($P = 0.04$). The majority in both groups used atypical antipsychotics (95.0% and 85.0%, respectively), with two-time daily dosing (65.0% and 75.0%, respectively), and experiencing medication side effects (90.0% and 85.0%, respectively). They had comparable BPRS scores (23.80 and 23.35 in experiment and control groups, respectively).

Table 1 Demographic characteristics of participants (N = 40)

Characteristics	Experiment		Control		Statistics Test value	P
	Group (n = 20)		Group (n = 20)			
Age (Year) (min-max = 21 – 80) — M (SD)	36.95 (7.73)		35.20 (8.96)		0.66 ^a	0.51
Gender					0.00 ^b	1.00
Male — n (%)	13 (65.00)		13 (65.00)			
Female — n (%)	7 (35.00)		7 (35.00)			
Religion					0.00 ^b	1.00
Islam — n (%)	20 (100.00)		20 (100.00)			
Non Islam — n (%)	0 (00.00)		0 (00.00)			
Marital status					1.95 ^c	0.37
Single — n (%)	13 (65.00)		10 (50.00)			
Married — n (%)	4 (20.00)		8 (40.00)			
Widower/ Widow — n (%)	3 (15.00)		2 (10.00)			
Educational level					5.58 ^c	0.35
No formal education — n (%)	0 (0.00)		1 (5.00)			
Elementary school — n (%)	2 (10.00)		3 (15.00)			
Junior high school — n (%)	3 (15.00)		6 (30.00)			
Senior High school — n (%)	9 (45.00)		8 (40.00)			
University — n (%)	5 (25.00)		1 (5.00)			
Others — n (%)	1 (5.00)		1 (5.00)			
Occupation					2.67 ^b	0.10
Employee — n (%)	15 (75.00)		10 (50.00)			
No employee — n (%)	5 (25.00)		10 (50.00)			
Monthly income (IDR)					4.34 ^c	0.23
No income — n (%)	5 (25.00)		10 (50.00)			
< 500,000 — n (%)	6 (30.00)		4 (20.00)			
500,000 - 1,000,000 — n (%)	3 (15.00)		4 (20.00)			
> 1,000,000 — n (%)	6 (30.00)		2 (10.00)			
Number of family member in household					1.32 ^c	0.52
>4 persons — n (%)	3 (10.00)		6 (15.00)			
4 – 5 persons — n (%)	10 (50.00)		8 (15.00)			
>5 persons — n (%)	7 (35.00)		6 (30.00)			
Family members take care					3.24 ^d	0.23
No — n (%)	3 (15.00)		0 (0.00)			
Yes — n (%)	17 (85.00)		20 (100.00)			

Note: ^a = Independent t-test, ^b = Chi-square test, ^c = Likelihood Ratio, ^d = Fisher Exact test.

Table 2 Clinical characteristics of participants (N = 40)

Characteristics	Experiment		Control		Statistics Test value	P
	Group (n = 20)		Group (n = 20)			
Number of hospitalization (min-max = 2 – 15 times) — M (SD)	5.55 (3.75)		4.85 (3.62)		0.60 ^a	0.55
Length of illness — M (SD) (Range = 1 years – 42 years and 8 months)	13.57 (9.77)		11.09 (8.37)		0.86 ^a	0.39
Transportation					6.72 ^c	0.04
Public — n (%)	6 (30.00)		7 (35.00)			
Personal — n (%)	14 (70.00)		9 (45.00)			
Public and Personal — n (%)	0 (0.00)		4 (20.00)			
Experience of side effects					0.23 ^d	1.00
No — n (%)	2 (10.00)		3 (15.00)			
Yes — n (%)	18 (90.00)		17 (85.00)			
Past experience on joining therapy programs					2.67 ^b	0.10
No — n (%)	10 (50.00)		5 (25.00)			
Yes — n (%)	10 (50.00)		15 (75.00)			
Antipsychotics						
Typical — n (%)	3 (15.00)		8 (40.00)		3.14 ^b	0.08
Atypical — n (%)	19 (95.00)		17 (85.00)		1.11 ^d	0.61
Dosage Frequency (times/day)					1.67 ^c	0.43
One time — n (%)	2 (10.00)		3 (15.00)			
Two times — n (%)	13 (65.00)		15 (75.00)			
Three times — n (%)	5 (25.00)		2 (10.00)			
BPRS score (Range = 18 – 30) — M (SD)	23.80 (3.04)		23.35 (2.83)		0.49 ^a	0.63

Note: ^a = Independent t-test, ^b = Chi-square test, ^c = Likelihood Ratio, ^d = Fisher Exact test, BPRS = Brief Psychiatric Rating Scale

Result of medication adherence between groups is shown in table 3. Comparing the medication adherence between experiment group and control group, there was a significant difference at post-test ($t = 6.53, P < 0.01$) with no

difference at pre-test ($t = 0.64, P > 0.05$). At post-test, the total mean score of medication adherence of experiment group was significantly higher ($M = 56.65, SD = 3.28$) than control group ($M = 45.00, SD = 7.28$) ($P < 0.001$).

Table 3 Comparison of the medication adherence between groups using independent t-test (N = 40)

	Experiment		Control		t	P
	Group (n = 20)		Group (n = 20)			
	M	SD	M	SD		
Pre-test						
Total	45.35	8.41	43.75	7.45	0.64	0.530
Voluntary	12.75	3.24	12.35	2.96	0.41	0.686
Active participation	8.35	2.66	7.35	2.13	1.31	0.198
Following prescription	12.45	2.48	12.55	1.82	-0.15	0.885
Continuously	11.80	2.69	11.50	3.20	0.32	0.750
Post-test						
Total	56.65	3.28	45.00	7.28	6.53	< 0.001
Voluntary	15.40	.99	12.60	2.98	3.99	< 0.001
Active participation	10.85	1.14	7.55	2.24	5.89	< 0.001
Following prescription	15.05	1.09	12.75	1.77	4.93	< 0.001
Continuously	15.35	1.18	12.10	3.02	4.48	< 0.001

The result of medication adherence within group is shown in table 4. The medication adherence of patients in the experiment group had significant difference between Pre-test and Post-test ($t = -6.09, P < 0.01$). The total mean score of medication of the patients in the experiment group at post-

Table 4 Comparison of the medication adherence within group using paired t-test (N = 40)

	Pre-test		Post-test		t	P
	M	SD	M	SD		
Experiment Group (n = 20)						
Total	45.35	8.41	56.65	3.28	-6.09	< 0.001
Voluntary	12.75	3.24	15.40	.99	-3.54	0.002
Active participation	8.35	2.66	10.85	1.14	-4.32	< 0.001
Following prescription	12.45	2.48	15.05	1.09	-4.54	< 0.001
Continuity	11.80	2.69	15.35	1.18	-5.91	< 0.001
Control Group (n = 20)						
Total	43.75	7.45	45.00	7.28	-1.23	0.236
Voluntary	12.35	2.96	12.60	2.98	-1.16	0.262
Active participation	7.35	2.13	7.55	2.24	-0.61	0.551
Following prescription	12.55	1.82	12.75	1.77	-0.75	0.464
Continuity	11.50	3.20	12.10	3.02	-0.99	0.337

-test was significant higher ($M = 56.65, SD = 3.28$) than pre-test ($M = 45.35, SD = 8.41$). The medication adherence of the patients in the control group was not significantly different between pre-test and post-test ($t = -1.23, P > .05$), although the total means score of the medication adherence in the post-test ($M = 45.00, SD = 7.28$) was higher than pre-test ($M = 43.75, SD = 7.45$).

Discussions and Conclusion

In this clinical study to determine effect of IRBEP program to improve medication adherence among Indonesian schizophrenic patients, the patients in the experiment group had significantly higher medication adherence than the patients in the control group ($t = 6.53, P < 0.01$). The patients in the experimental group had significantly higher medication adherence after attending the IRBEP than before attending IRBEP ($t = -6.09, P < 0.01$).

Findings supported that IRBEP improved medication adherence in schizophrenia patients. Patients' perceptions towards schizophrenia influenced their behavior in taking prescribed medication. Patients accommodated their current perceptions which were misconceptions, gaps, and/or confusion to new perceptions after the IRBEP. Awareness of negative consequences and limitations of current perceptions were raised. A new perception was formed after receiving new information that was intelligible, plausible, and fruitful.¹⁶ In this study, in order to achieve successful outcomes, the researcher had educated patients by providing new information about concepts of schizophrenia, which was relevant to patients' past experience and ability to solve the schizophrenia by means of a crucial factor, namely medication adherence. Therefore, the patients would accommodate their current perceptions to new perceptions.

Enhancing medication adherence among the patients in the experimental group was contributed by the perceptions' of the patients about cause, timeline and controllability of schizophrenia. Firstly, after the patients in the experimental group learned that chemical imbalance in the brain causes schizophrenia, adherence improved to a higher than before when they more than likely perceived that Allah SWT (spiritual belief) as the cause of their schizophrenia. For example, at the beginning, patients believed that the cause of the illness was a punishment from Allah SWT, for their past bad behavior, or as a test from Allah SWT to draw them closer to Allah SWT and doing what Allah SWT orders to Muslims following the holy Al-Qur'an. Therefore, after their mental health improved, patients would not continue to take medication, but rather pray and practice good faith as taught in their religion. Patients with mental illness who believed God was the cause of the mental illness perceived that using spiritual solutions would be more useful than using medication.²⁴ The reason that patients in the experiment

group were more likely to adhere to medication after the IRBEP was because they believed that medication has a role balancing the chemicals in the brain.

Secondly, perception of the timeline of schizophrenia, most of the patients in the experimental group after intervention perceived schizophrenia as a chronic and cyclic illness rather than as an acute illness. Adherence to long term medication was higher in this group. Our findings were supported by Aflakseir,²⁵ who also found that medication adherence was significantly influenced by the perception of illness as a chronic illness.

Thirdly, the positive perception of medication controllability to overcome schizophrenia was significantly different between the two groups, both before and after the IRBEP. According to Lobban and colleagues²⁶ patients with schizophrenia were more likely to adhere to their medication if they believed that the treatment would be able to control their symptoms. It is also supported by several studies,^{4, 25, 27} that the belief of medication efficacy to control unwanted symptoms has been associated with medication adherence.

Developing goals setting, creating strategies to achieve those goals and close monitoring during follow up, played a significant role in improving medication adherence in our study. Specifically setting goals and planning strategies provided by the individual is needed to set the individual's behavior to overcome the health problem.¹⁴ In our study, subjects had the opportunity to set goals which aimed to enhance medication adherence and chose the strategies appropriate to achieve their goals. From a review of literature of intervention for patient with schizophrenia, focusing on medication adherence as a primary goal, suggested that intervention had a successful effect on enhancing medication adherence.¹⁰ During the follow up, if the subjects experienced any barrier while applying the strategies, the researcher would discuss and suggest a way to deal with. Using a follow up in the interventions for schizophrenic patients has shown to be effective in enhancing medication adherence.¹⁰

This quasi-experimental study provides the effectiveness of the intervention on medication adherence in patients with schizophrenia. The strength of this study was the intervention of the IRBEP that focused on individual's representation of illness in which the representation was documented to influence medication adherence. The IRBEP replaced the individual's representation that was

misconception, gaps or confusion. The process of the IRBEP focused on representation that is unique for each individual. The limitation of this study was the measurement used. The Behavior of Medication Adherence Questionnaire (BMAQ) and the Cognitive Illness Representation Questionnaire for Schizophrenia (CIRQS) were developed and used for the first time. Further studies are needed to support the findings.

Conclusion

An improvement of medication adherence among schizophrenia patients undergoing the IRBEP is evident in this study. Medication adherence is influenced by an individual's cognitive illness representation, especially the representation of the cause, timeline and controllability of schizophrenia. It is thus important for health care providers to know how an individual's thoughts relate to his/her health and illness behaviors. Furthermore, using the IRBEP in these patients as a discharge planning tool will significantly augment cooperation and improve patients' outcomes.

References

- World Health Organization. Schizophrenia. (Accessed on Feb. 9, 2012, at http://www.who.int/mental_health/management/schizophrenia/en/)
- Morken G, Widen JH, Grawe RW. Non-adherence to antipsychotic medication, relapse and rehospitalization in recent-onset schizophrenia. *BMC Psychiatry* 2008;8:1-7.
- Gilmer TP, Dolder CR, Lacro JP, et al. Adherence to treatment with antipsychotic medication and health care costs among Medicaid beneficiaries with schizophrenia. *Am J Psychiatry* 2004;161(4):692-699.
- Nicolino PS, Vedana KG, Miasso AI, Cardoso L, Galera SA. Schizophrenia: adherence to treatment and belief about the disorder and the drug treatment. *Rev Esc Enferm USP* 2011;45(3):706-713.
- Adelufosi AO, Adebowale TO, Abayomi O, Mosanya JT. Medication adherence and quality of life among Nigerian outpatients with schizophrenia. *Gen Hosp Psychiatry* 2012;34(1):72-79.
- Moller MD. Neurobiological responses and schizophrenia and psychotic disorder. In: Stuart GW, Laraia MT (eds.). *Principle and practice of psychiatric nursing*, 8th ed. St. Louis. Elsevier Mosby, 2005: p.788-789.
- Staring ABP, Mulder CL, Priebe S. Financial incentives to improve adherence to medication in five patients with schizophrenia in the Netherlands. *Psychopharmacol Bull* 2010;43(1):5-10.
- Shon KH, Park SS. Medication and symptom management education program for the rehabilitation of psychiatric patient in Korea: the effect of promoting schedule on self efficacy theory. *Yonsei Med J* 2002; 43(5):579-589.
- Vreeland B, Minsky S, Yanos PT, et al. Efficacy of the team solutions program for educating patients about illness management and treatment. *Psychiatr Serv* 2006;57(6):822-827.
- Zygmunt A, Olfson M, Boyer CA, Mechanic D. Interventions to improve medication adherence in schizophrenia. *Am J Psychiatry* 2002; 159(10):1653-1664.
- Heidrich SM, Brown RL, Egan JJ, et al. An individualized representational intervention to improve symptoms management (IRIS) in older breast cancer survivors: three pilot studies. *Oncol Nurs Forum* 2009;36(3):E133-E143. (doi: 10.1188/09.ONF.E133-E143)
- Ward SE, Serlin RC, Donovan HS, et al. A randomized trial of a representational intervention for cancer pain: does targeting the dyad make a difference? *Health Psychol* 2009;28(5):588-597.
- Donovan HS, Ward SE, Song MK, Heidrich SM, Gunnarsdottir S, Phillips CM. An update on the representational approach to patient education. *J Nurs Scholarsh* 2007;39(3):259-265.
- Leventhal H, Meyer D, Nerenz D. The common sense representation of illness danger. In: Rachman S (ed.). *Medical psychology* (Vol. 2). New York. Pergamon, 1980: p.7-30. (Accessed on Feb. 9, 2012, at http://www.academia.edu/259452/The_Common_Sense_Representation_of_Illness_Danger)
- Hewson PW, Hewson MG. Effect of instruction using students' prior knowledge and conceptual change strategies on science learning. *J Res Sci Teach* 1983;20:731-743.
- Posner GJ, Strike KA, Hewson PW, Gertzog WA. Accommodation of a scientific conception: Toward a theory of conceptual change. *Sci Educ* 1982;66:211-227.
- Hewson PW. Conceptual change in science teaching and teacher education. Paper presented at the National Center for Education Research, Documentation, and Assessment; 1992 June. Madrid, Spain. 1992: p.Hewson-1-15. (Accessed on Feb. 9, 2012, at <http://www.learner.org/workshops/lala2/support/hewson.pdf>)
- Vuckovich PK. Compliance versus adherence in serious and persistent mental illness. *Nurs Ethics* 2010;17(1):77-85.
- Cohen J. *Statistical power analysis for the behavioral sciences*, 2nd ed. New York. Psychology Press, 1988: p.28.
- Leucht S, Kane JM, Kissling W, Hamann J, Etschel E, Engel R. Clinical implication of brief psychiatric rating scale score. *Br J Psychiatry* 2005;187:366-371.
- Lobban F, Barrowclough C, Jones S. Assessing cognitive representations of mental health problems. I. The illness perception questionnaire for schizophrenia. *Br J Clin Psychol* 2005;44:147-162.
- Cohen SM. Concept analysis of adherence in the context of cardiovascular risk reduction. *Nurs Forum* 2009;44:25-36.
- Vrijens B, Geest SD, Hughes DA, et al. A new taxonomy for describing and defining adherence to medications. *Br J Clin Pharmacol* 2012; 73(5):691-6705.

Editorial note

Manuscript received in original form on January 5, 2014;
accepted in final form on December 23, 2014