Aftercare services for patients with severe mental disorder: A randomized controlled trial

Majid Barekatain, Mohammad Reza Maracy[1], Fatemeh Rajabi[2], Hajar Baratian[3]

Psychosomatic Research Center, [1]Behavioral Sciences Research Center, [2]Department of Psychiatry, Isfahan University of Medical Sciences, Isfahan, [3]Department of Psychology, Khorasgan Branch, Islamic Azad University, Isfahan, Iran

Background: Although evidences emphasize on the importance of aftercare programs to achieve continuity of care, different studies have revealed controversial results about the outcome. The objective of this study was to investigate the effect of aftercare program on outcome measures of patients with severe mental disorders. **Materials and Methods:** Of a total 123 eligible patients with severe mental disorders, 61 patients were randomly assigned to the intervention group and 62 patients to the control group. The interventions included follow-up phone calls, home visits, and psychoeducation for families. Assessments were performed on hospital admission, discharge and the following 3rd, 6th and 12th month. Young Mania Rating Scale (YMRS), Hamilton Depression Rating Scale (HDRS), Positive and Negative Syndrome Scale (PANSS), Global Assessment of Functioning (GAF), Clinical Global Impression (CGI), and the World Health Organization Quality of Life Questionnaire (WHO-QOL) were used. Data were analyzed through Chi square, t-test, Mann-Whitney-U, and Repeated Measures Analysis of Co-Variance. **Results:** Mean of the HDRS scores revealed significant difference between the two groups when HDRS scores on the admission day were controlled ($P = 0.028$). The level of functioning was significantly different between the two groups based on the sequential assessments of GAF ($P = 0.040$). One year after the onset of trial, the number of psychiatric readmissions were significantly different between the two groups ($P = 0.036$). **Conclusion:** Readmission rates could be reduced by aftercare services, through the first year, after discharge of patients with severe mental disorders. On the other hand, higher levels of functioning would be expected after one year.

Key words: Aftercare services, global assessment functioning, mental disorders, quality of life, readmission

INTRODUCTION

Mental disorders are associated with a considerable burden of disease directly because of relative high estimates of prevalence, mortality, disabilities, and costs.[1-3] These disorders may also be the risk factors for many other health problems, e.g., somatic diseases, substance misuse, drug side effects, and suicide.[4] They may also contribute to social problems such as poverty, marginalization, and social disadvantage. Finally, they directly or indirectly are held up progress toward achievement of many of the Millennium Development Goals.[5,6]

Considering this serious burden, accurate and effective management has been believed as an essential component of any mental health programs. Hospitalization, pharmacotherapy, and psychotherapy for patients with severe psychiatric disorders have been effective interventions, worldwide. However, most of the patients experience prolonged hospitalizations and repeated readmissions that impose grave burden not just on patients' quality of life but on fragile financial resources of mental health programs.[7,8]

After beginning of deinstitutionalization reform, clear change happened in the strategy of mental health services. Key to this philosophy is the concept that the needs of patients with severe mental disorders best served when mental healthservices are centered on the individual patient, sensitive to the family, and founded on the community resources.[7-9] One of the essentials of deinstitutionalization reform is the principle of "continuity of care".[10] A basic assumption of the continuum of care is that patients, who passed a period of hospitalization due to severe psychiatric disorders, should be able to move easily between different outpatient settings to prevent relapse and subsequent readmission.[11] However, gaps in continuity of care for patients with severe mental disorders may occur similar to those of other chronic medical conditions.[12] Poor insight, non-adherence to treatment, and weak financial support are additional causes for interruption in continuity of care in patients with mental disorders.[13-17]

Body of evidence attests to the importance of aftercare programs for patients' continuity of care. Regarding aftercare, different services have been designed to

Address for correspondence: Miss Hajar Baratian, Department of Psychology, Khorasgan Branch, Islamic Azad University, Nour Hospital, Ostandari Street, Isfahan, Iran. E-mail: baratian268@yahoo.com

discuss possible solutions, such as intermediate settings ("step-down" services), residential treatment centers, or home-based facilities.[18] Of the home-based services, case management,[19] follow-up phone calls,[20-22] or home visits are the most common.[23-26]

In developed countries, aftercare programs have been based on Community Mental Health Centers (CMHCs) and their social workers. However, in middle and low-income countries, establishment of classic CMHCs may hardly be attainable. For example, employment of social workers in delivery of mental healthcare has faced enormous challenges. Therefore, instead of social workers, engagement of supportive families in the programs would be one of the feasible approaches for integration and effectiveness of existing aftercare services.[27-29] However, it is not known, whether participation of family members in aftercare services prevents readmission, and predicts better post-discharge adherence.

Although aftercare services have been scaled up to developing countries, most of the countries have no mechanisms to monitor progress.[30] In Iran, as a developing country, scattered studies revealed controversial results about impact of aftercare services on outcome of management of severe mental disorders.[26,31-33] Objective of this study was to investigate whether the defined aftercare program and psycho-education for family members were associated with change in re-hospitalization rate, quality of life, level of functioning, and severity of psychopathology.

MATERIALS AND METHODS

This study was a quasi-experimental, prospective randomized controlled trial registered in the Iranian Registry of Clinical Trials and approved by the Deputy of Research of Isfahan University of Medical Sciences and Ethics Committee.

Participants

Participants were patients with severe mental disorders, who were admitted to Nour hospital, affiliated to Isfahan University of Medical Sciences, Isfahan, Iran, from April 2009 to August 2011. The inclusion criteria were:
a. diagnoses of acute episodes of Bipolar I Disorder (mania or mixed), schizophrenia, or schizoaffective disorder based on the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV),[34]
b. history of at least one previous hospitalization,
c. age between 18 and 65 years,
d. permanent address in Isfahan,
e. living with his or her family.

The exclusion criteria were:
a. neurological disorders,
b. substance dependency,
c. severe general medical diseases, and
d. cognitive impairment, severe enough to preclude informed consent.

Sampling

Of a total 1187 patients with severe mental disorders who were admitted to Nour hospital from April 2009 to July 2010, 123 patients met the inclusion criteria. Out of the total, 482 patients did not have history of previous hospitalization and 391 patients were not permanent address in Isfahan. Total of 103 patients did not sign the agreement for research and 88 of them had severe substance related disorder, medical disease, or cognitive disorder. Of 123 eligible patients, 61 patients were randomly assigned to the intervention group and 62 patients to the control group. Patients or their legal guardians were given detailed information about the study, and written consents were obtained.

Interventions

The interventions included weekly follow-up phone calls, monthly home visits, and psycho-education sessions for family members. For ethical respects, these interventions offered to the control group after the end of this study. Both of the groups received routine psychiatric treatments.

In follow-up phone calls, current mental state of the patients was asked; the patient was prompted to adhere more to treatment, and emergency psychiatric intervention was provided if needed.

The home visit team consisted of a trained general practitioner and a clinical psychologist. They assessed patients' mental and physical state, prescribed the drugs, and arranged professional psychiatric interventions, if needed.

The psycho-education program included six sessions. The heading of these sessions are as the following: First session on introduction of family education and story of families, the second session on explanation of psychiatric disorders and symptoms, the third session on treatment and follow-up, the fourth on grounds of family help, the fifth session on problem solving methods, and the final session on specific issues and crisis intervention.[35]

The team also included a chief psychiatrist, who was the senior executive of the project, and two psychiatrists as consultants. The team received 30 hours of theoretical and practical training before the onset of the study. The whole group gathered for weekly meetings in Nour hospital to review the process, to give feedback, and to solve the problems.

Instruments

The severity of psychopathology in all patients of the two groups was assessed by "Young Mania Rating

Scale" (YMRS),[36,37] "Hamilton Depression Rating Scale" (HDRS),[38] and "Positive and Negative Syndrome Scale" (PANSS).[39] Global Assessment of Functioning (GAF),[40] Clinical Global Impression-severity index (CGIS),[41] and the WHO Quality of Life Questionnaire (QOL)[42] were also used. All patients were evaluated at the time of admission, on hospital discharge and in the 3rd, 6th, and 12th months after discharge. The clinical rater who rated the patients and filled the questionnaires was different from the care providers, and blinded to the group allocation of the patients.

Data were analyzed through chi square and Repeated Measures Analysis of Co-Variance (ANCOVA). Age, gender, and scores of psychopathologies, GAF, CGIS, and QOL on admission day were considered as covariates.

RESULTS

Table 1 presents the basic information of patients. Four patients in the intervention group and nine patients in control group withdrew consents at time of discharge. Three patients in intervention group and seven patients in control group did not find for evaluation at the third month after discharge. One patient died because of suicide in intervention group. At the end of the study, one more patient died in the intervention group due to suicide and two more patients were not accessible in control group.

There was not any significant difference between the two groups in terms of sequential assessments of CGIS scores on hospital discharge, and in the 3rd, the 6th, and the 12th month following it ($P = 0.437$). There was no significant

differences between the CGIS scores of the two groups when age, gender and the CGIS score on admission day were controlled ($P > 0.05$) [Table 2]. Figure 1 presents the changes in the mean CGIS scores of each group during the course of the study.

Data analysis also indicated that the severity of depressive symptoms was not significantly different between the groups based on the sequential assessments of HDRS ($P = 0.856$). There was no significant differences between the HDRS scores of the two groups when age and gender were controlled ($P > 0.05$). However, HDRS scores revealed

Table 1: Baseline characteristics of patients

	Intervention Group N (%)	Control Group N (%)	P-value
Gender			
Male	40 (65.5)	35 (56.5)	0.3
Female	21 (43.4)	27 (43.5)	chi square
Diagnosis			
BID-Manic episode	23 (37.7)	22 (35.5)	0.65
BID-Mixed episode	4 (6.6)	8 (12.9)	chi square
Schizophrenia	26 (42.6)	26 (49.1)	
Schizoaffective	8 (13.1)	6 (9.7)	
Frequency of admission			
2	32 (52.4)	29 (46.8)	0.40
3	10 (16.4)	10 (16.1)	chi square
4	10 (16.4)	11 (17.7)	
5	5 (8.2)	9 (14.5)	
6	2 (3.3)	2 (3.2)	
7 and more	1 (1.6)	2 (3.3)	
Age	32.1±8.2	33.4±10.4	0.40

BID = Bipolar one disorder

Table 2: Sequential measures of patients

Time Measure	On admission IG: n = 61 CG: n = 62	On discharge IG: n = 57 CG: n = 53	3rd month IG: n = 53 CG: n = 46	6th month IG: n = 53 CG: n = 46	12th month IG: n = 52 CG: n = 44
HDRS					
Intervention group	18.8±6.7	10.6±4.8	12.3±6.8	10.9±6.6	10.9±6.6
Control group	20.1±6.3	11.8±4.2	13.7±6.7	13.9±6.1	13.7±6.4
YMRS					
Intervention group	32.4±8.2	14.9±7.6	16.9±8.9	15±9.5	13.9±9.2
Control group	29.5±9.3	14.6±6.8	17.3±9.8	17.1±9.3	16.5±9.1
PANSS					
Intervention group	35.4±12.8	17.1±9.8	18.9±10.5	16.7±11.3	14.8±10.2
Control group	32.7±9.9	16.1±8	18.1±10.2	18.5±9.3	17.4±10.1
GAF					
Intervention group	2.52±0.65	3.37±0.59	3.72±0.97	4.02±1.26	4.35±1.45
Control group	2.56±0.59	3.34±0.48	3.59±0.83	3.54±0.91	4.89±1.10
CGI					
Intervention group	6.48±0.54	5.15±0.39	4.28±0.86	4.02±1.13	3.62±1.16
Control group	6.42 ±0.49	5.11 ±0.32	4.26 ±0.98	4.26± 1.12	4.02 ±1.23
WHO-QOL					
Intervention group	80.4±12.9	80.9±13.3	77.3±13.1	74.3±17.3	78.2±18.1
Control group	76.3±14.7	81.3±4.1	76.7±14.2	75.1±12.4	74.3±17.5

IG = Intervention group; CG = Control group; HDRS = Hamilton depression rating scale; YMRS = Young mania rating scale; PANSS = Positive and negative syndrome scale; GAF = Global assessment of functioning; CGI = Clinical global impression scale; WHO-QOL = World health organization quality of life questionnaire

significant difference between the two groups when HDRS score on the admission day were controlled ($P = 0.028$) [Table 2]. Figure 2 represents the changes in the mean HDRS scores of each group during the course of the study.

The severity of psychotic symptoms, which were evaluated through sequential rating of PANSS on discharge time, and in the 3rd, the 6th, and the 12th month following discharge, was not significantly different between the control and the intervention groups ($P = 0.097$). The difference was still insignificant after controlling variables of age, gender and admission day PANSS score ($P > 0.05$) [Table 2]. Figure 3 shows the changes of mean PANSS score during the course of the study.

Moreover, the severity of manic symptoms, rated based on YMRS through sequential assessments, was not significantly different between the two groups ($P = 0.065$). The difference was still insignificant after controlling variables of age, gender and admission day YMRS score ($P > 0.05$) [Table 2]. Figure 4 indicates the changes in the mean YMRS score during the course of the study.

The level of functioning was significantly different between the groups based on the sequential assessments of GAF ($P = 0.040$). Results can be viewed in Table 6. However, GAF scores were not significantly different between the two groups when age, gender, and GAF scores on the admission

day were controlled ($P > 0.05$) [Table 2]. Figure 5 represents the changes in the mean GAF scores of each group during the course of the study.

No significant differences were observed between the two groups, in terms of sequential assessments of QOL on hospital discharge, in the 3rd, the 6th, and the 12th month following discharge from the hospital ($P = 0.446$). There were no significant differences between the QOL scores of the two groups when age, gender and the QOL score on the admission day were controlled ($P > 0.05$) [Table 2]. Figure 6 presents the changes in the mean QOL scores of each group during the course of the study.

Regarding the frequency of re-hospitalization, no significant differences were observed between the two groups three ($P = 0.552$) and six months (0.099) following discharge from the hospital. However, one year after the onset of trial, the number of psychiatric re-hospitalizations was significantly lower in the intervention group ($P = 0.036$) [Table 3].

Table 3: Rates of re-admission after discharge

| Group time	Intervention *n* (%)	Control *n* (%)	*P*-value Chi square
3rd month after discharge	5 (10.2)	3 (6.1)	0.522
6th month after discharge	9 (19.1)	4 (7.8)	0.099
12th month after discharge	3 (6.4)	10 (21.3)	0.036
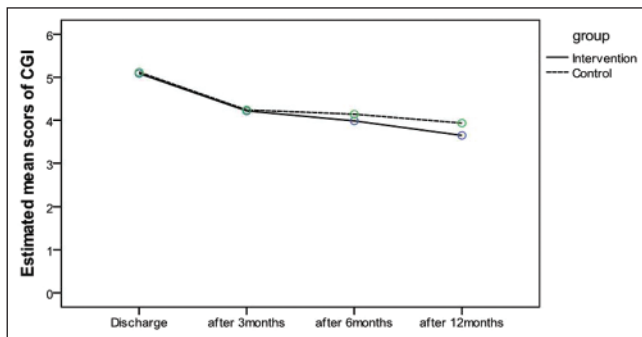
Figure 1: Changes in the mean CGIS scores of each group during the course of the study
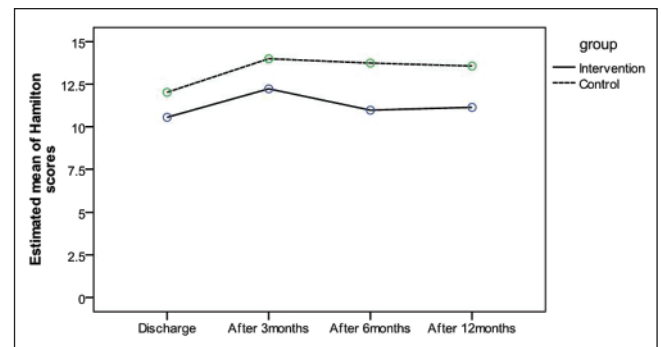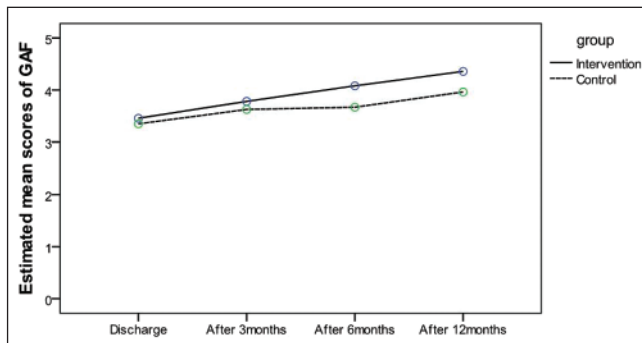

Figure 2: Changes in the mean HDRS scores of intervention and control groups during the course of the study
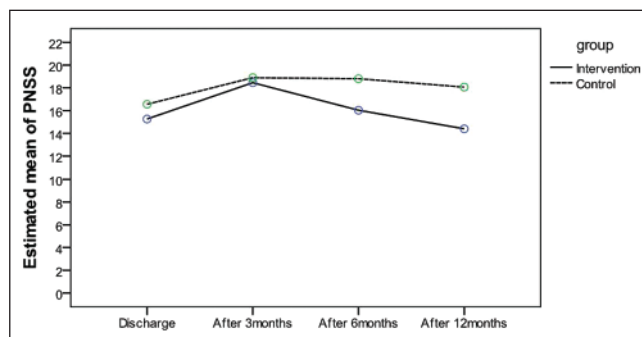
Figure 3: Changes of mean PANSS score in intervention and control groups during the course of the study
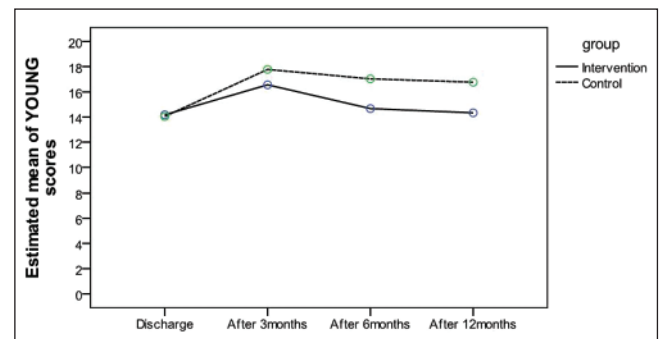
Figure 4: Changes in the mean YMRS score in intervention and control groups during the course of the study

Figure 5: Changes in the mean GAF scores of each group during the course of the study

Figure 6: Changes in the mean QOL scores of intervention and control groups during the course of the study

Analysis of frequencies of referring to psychiatrist and level of drug compliance did not reveal significant differences between the two groups in the 3rd ($P = 0.639$), the 6th ($P = 0.686$), and the 12th months ($P = 0.795$) following discharge.

DISCUSSION

Our study revealed that psychiatric readmissions could be reduced by aftercare services, through the first year, after discharge in patients with severe mental disorders. These findings are similar to other studies that reported reduction in total days of hospitalization and number of readmissions.[24,43,44] Although, sum of the number of the re-admissions were equal for both groups, 3 patients in the intervention group were repeatedly admitted for 8 times. Whereas in the control group, there were 2 patients with 5 re-admissions. In addition, temporal distributions of re-hospitalizations were not same in the 2 groups. So, different patterns of distributions might have a role in this clinically significant finding. This result was similar to findings of other studies that reported reduction in total days of hospitalization and number of readmissions.[24]

Severity of depressive symptoms was also decreased during the first year after discharge, which were consistent with previous studies.[45]

The results also showed that aftercare services could also be associated with higher levels of functioning after one year. Whereas other studies reported opposite findings or revealed controversies regarding GAF level.[14,46,47]

Regarding symptomatic re-admission and severity of psychopathology, there was no clear effect, which specifically could be attributed to aftercare services, except for depression. There may be two possible explanations for this finding. The first one is simple: Aftercare service is ineffectual. Another interpretation, however, is also possible: As referrals to psychiatrist or receiving the drugs
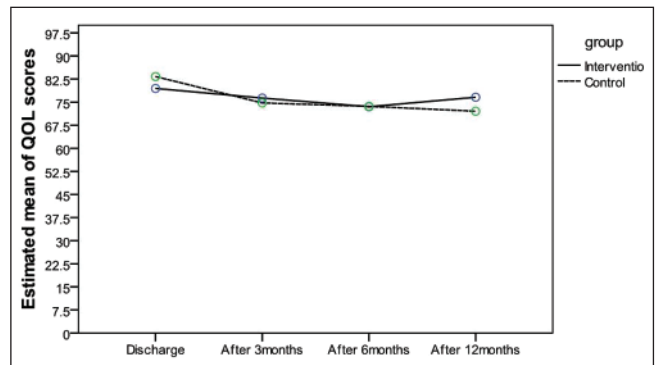
were similar in both groups, the response rates regarding the severity of psychopathology were also similar.

This study was limited in some ways. First, patients were not homogeneous regarding their psychiatric diagnoses. Second, combining follow-up phone calls and home visit might obscure the conclusion that which one is more effective? Third, studies with larger samples and longer follow-up duration are needed for strengthening these results. Finally, we had two cases of suicide in the intervention group, which we were not capable of clarification.

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