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Original Article

A Comparative Study of Nurses as Case Manager and Telephone Follow-up on Clinical Outcomes of Patients with Severe Mental Illness

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What Known

- Community-based services provide a suitable mental health care for patients with severe mental illness (SMI).
- It has been shown that home-visit, as a community-based service, is an effective care for patients with SMI
- The composition of the home-care team is important with respect to the cost, manpower, and the feasibility of providing such services.

What's New

- This study introduces two cost-effective alternative services for the national mental health network. It comprises of home-visit by a single nurse and a telephone follow-up.
- The present study showed the feasibility and effectiveness of these two services in the context of our socio-cultural settings.

Abstract

Background: Providing community-based mental health services is crucial and is an agreed plan between the Iranian Mental Health Office and the Regional Committee for the Eastern Mediterranean (affiliated with WHO). The aim of this study was to determine the effectiveness of home-visit clinical case-management services on the hospitalization rate and other clinical outcomes in patients with severe mental illness.

Methods: A total of 182 patients were randomly allocated into three groups, namely, home-visit (n=60), telephone follow-up (n=61) and as-usual care (n=61) groups. Trained nurses as clinical case-managers provided home-visit services and the telephone follow-up tasks. Hospitalization rate as a measure of recurrence, as well as burden, knowledge, general health condition of caregivers with positive/negative symptoms, satisfaction, quality of life, and social skills of the consumers were assessed as the main and secondary outcomes, respectively.

Results: Most clinical variables were improved in both intervention groups compared with the control group. During the one year follow-up, the rate of rehospitalization for the telephone follow-up and as-usual groups were respectively 1.5 and 2.5 times higher than the home-visit group.

Conclusion: Trained clinical case-managers are capable of providing continuous care services to patients with severe mental illness. The telephone follow-up services could also have beneficiary outcome for the consumers, their caregivers, and the health system network.

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Introduction

Since 1950, with the "deinstitutionalization" trend in the developed industrialized nations, large size psychiatric hospitals were shut down and replaced with psychiatric wards in general hospitals and community mental health centers.[1] During the last few decades, various forms of case-management systems[2-5] have been introduced that demonstrated improvements in mental health, lower prevalence of relapse, reduced cost of treatments, improved quality of life, and patient satisfaction.

In the last decade, participation of the consumers of mental health services as staff members have been integrated into

various services such as case-management and assertive community treatment. Utilization of the consumers as staff, had a wide range of benefits.[6-11] A similar study carried by Malakouti et al. and supported by Ahebba (a non-governmental organization) also showed the effectiveness of this approach.[12]

After 25 years of implementing mental health into primary health care (PHC) in rural areas of Iran, because of some remarkable demographic changes in urban areas, new ideas and policies are being developed in mental health strategies and programs. The welfare organization implemented home-visit services for patients with severe mental illnesses and the Mental Health Bureau of the Iranian Ministry of Health decided to provide urban mental health program. Using community-based services in Iran, such as follow-up treatment at home, was established for certain reasons. Currently, a few community-based services such as home-visit and day care centers, provided by a collaboration between welfare organization and the private sector, are actively operating. However, these services are not sufficient in terms of supply versus demand. It is estimated that 15,000 to 20,000 psychiatric beds (depending on the index of rotation factor, rehabilitation rate, and duration of stay) are needed to provide short-term hospitalization services in case of relapse in patients with severe mental illnesses.[13] This is approximately double the amount of currently available beds. Lack of mental health resources, particularly community-based facilities (such as outreach services), is a common issue in developing countries such as Iran. This has caused a great deal of objective and subjective burden on the families and caregivers. The burden could be in the form of inferiority complex, shame, isolation, dealing with impaired behaviors of patients, and the cost of care.[14-16] Although there is a shortage of psychiatric beds in Iran, but there are sufficient resources that could provide effective support[17] to the currently established outreach services in treating patients cared by their families.

The aim of this study is to compare the effectiveness of home-visit clinical case-management services, provided by trained registered nurses through telephone follow-up, in reducing the hospitalization rate (primary outcome) and other clinical symptoms (secondary outcome) in patients with severe mental illnesses.

Patients and Methods

Study Design and Sample

The study design was a multicenter randomized controlled trial (RCT). By block randomization method (using quaternary block) and using a random number table, patients were assigned to different groups. Considering the effect size (ES) related to Chi-square as moderate (ES=0.3) to find the difference of recurrence between groups (power of 80% and type 1 error of 0.05), each group was calculated to include 60 individuals. Assuming 25% drop out, a sample size of 240 (180×1.30) was considered.

A total of 241 patients with severe mental illness were recruited from four psychiatric centers (Razi, Emam Hossein, Taleghani and Rasool hospitals). Patients who declined to sign the informed consent (n=43) and dropped out during the study period (n=16) were excluded. Eventually, 182 patients (75% response rate) were enrolled in the final analysis (Figure 1). Among these patients, 65% (n=119) had bipolar mood disorder diagnosis and 35% (n=63) had spectrum diagnosis of schizophrenia. We defined severe mental illnesses as schizophrenia, schizoaffective and bipolar mood disorder (BMD). The patients were enrolled between December 2007 to March 2008 from outpatient clinics or immediately after discharge from hospital.

The inclusion criteria were being hospitalized at least twice in the last two years, not having good compliance according to her/his caregiver, and having diagnosis of bipolar or schizophrenia spectrum disorders. The exclusion criteria were being in the acute phase of the illnesses, having mental retardation, addiction to psychoactive substances, and concurrently receiving the same services from other sources. We measured baseline variables at the beginning of the study and after 12 months of follow-up period. The patients were randomly assigned to three groups of home-visit, telephone follow-up, and control. The objectives of the study were explained to all patients as well as their families and informed consents were obtained. The study was approved by the Ethics Committee of Mental Health Research.

Selection of Case-Manager and Training Course

Ten registered nurses with at least 5 years care experience with mentally ill patients at psychiatric hospitals or wards were initially considered through advertisements. Following an interview, four nurses were finally selected; from which three were assigned as case-managers (CM) and one for the telephone follow-up contact. During the study, periodical meetings supervised by the main investigator were held to monitor case managers and resolve possible issues.

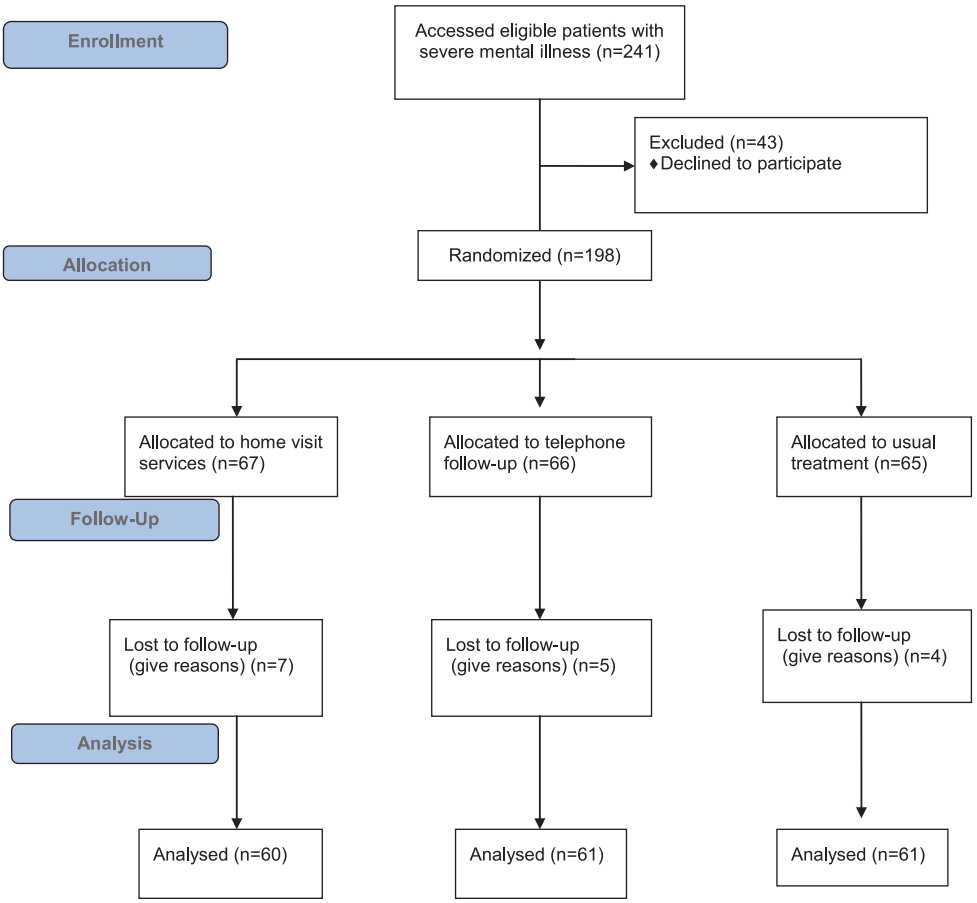

Figure 1: Shows the CONSORT flow diagram for patient selection.

Defining Groups and Intervention

Home-Visit Group

The patients in this group had one face-to-face session (about 45 minutes) per month by a case manager. For every 20 patients, one case manager was assigned. Case managers completed the symptoms and drug side effects checklists; and would forward it to patient's psychiatrist if deemed necessary. Coaching the patients and their family members through informative brochures and accessibility in case of emergency were other form of interventions in this group. The patient or their families were permitted to contact the assigned case-manager on need basis.

Telephone Follow-Up Group

Each patient was contacted by phone as a reminder of her/his appointment. If they missed an appointment, they would be contacted again to probe for the reason. If considered necessary, patients would be encouraged to meet her/his psychiatrist.

Control Group (as-usual)

This group received "as-usual treatment". It is a type of care where patients, who are cared by their family, receive the service on request and by presenting themselves to an outpatient clinic. Typically, the psychiatrists would prescribe the appropriate medicine.

Outcome Measures and Evaluators

The study instruments were completed by a trained psychiatric resident and two clinical psychologists. They were blinded to the assigned group throughout the intervention.

The following measures were used in this study:

- Kohlman Evaluation of Living Skills (KELS):[18] In a pilot study, the Kappa coefficient between two raters for five subscales were 0.86 to 0.99.[14]
- Knowledge questionnaire for caregivers: Modified version of the questionnaire developed by Khazaeilie[19] comprised of 31 items (true/false), including symptoms, treatment, family awareness, and behavior toward the patients. The reliability of this questionnaire via test-retest within a week was acceptable (r=0.83).
- Family Experience Interview Schedule (FEIS): In this study, short-form with 41 items was developed. Test-retest reliability within

a week was 0.89 and Cronbach's alpha coefficient was 0.89 for this instrument.[12] The burden of caregivers was evaluated by this instrument.

- Persian version of the General Health Questionnaire-28 (GHQ-28): This questionnaire has 28 items and 4-point Likert scale. A higher score indicates a possible case of mental disorders. The sensitivity and specificity of this instrument at a cutoff of six were 85% and 94%, respectively.[20] The general mental health of caregivers was evaluated by this instrument.
- Client Questionnaire Satisfaction (CQS): This is a self-administered questionnaire with eight items and 4-point Likert scale. The internal consistency of the CSQ as measured by coefficient alpha, ranged from 0.83 to 0.93. For overall score, sum item responses, range from 8-32, higher score indicates higher satisfaction.[21] This instrument was used to evaluate the satisfaction of the patient.
- Positive and Negative Syndrome Scale (PANSS):[22] It contains 14 items evaluating positive and negative symptoms subscale respectively, 16 items evaluating the general symptom subscales and three supplementary items. Each item has a scale of 0 to 7 with higher score reflected more severe symptoms. Consistency coefficient of this instrument was reported from 0.73 to 0.83. This instrument was used to assess the severity of psychopathology in patients with a diagnosis of schizophrenia.
- Young Mania Rating Scale: To evaluate the severity of symptoms of BMD. The Cronbach's alpha coefficient for the Iranian version of this questionnaire was 0.72.[23] This instrument was used to assess the severity of psychopathology of the study patients with a diagnosis of bipolar mood disorder.
- Short Form of Health Survey-36: The SF-36 contains eight subscales measuring physical and mental aspects of quality of life. Each item has a scale of 0 to 100 with higher score reflected the better quality of life.[24] Cronbach's alpha coefficients ranging from 0.77 to 0.90 for eight domains.

Monitoring Program

The monitoring program was carried out by case managers. It included the collection of patient's caregiver forms for every home-visit, monthly registration of phone calls on a dedicated form, and phone call to consumers or their caregivers every 2 to 3 months to trace their activities.

Statistical Analyses

All analyses were done using SPSS software package version 16.0 (SPSS Inc., Chicago, IL). To compare demographic and clinical variables between the three intervention groups, we used the Chi-square for nominal data and the analysis of variance (ANOVA) for numeric variables. Analysis of variance was also used for comparing the mean score of questionnaires between the groups. We calculated 2×2 comparison of the groups by Scheffe as a post-hoc test. Paired sample t-test was used to compare the mean score of questionnaires before and after interventions among each group. Odds ratio with 95% confidence interval was calculated for the independent effect of each intervention on the recurrence rate using logistic regression. Because all demographic variables were the same across groups, we just entered "group" as independent variable and recurrence as the dependent variable in the model. The level of significance was considered 0.05 for all analyses.

Results

Out of 241 patients, 182 completed the study and enrolled for the final analysis (75% response rate). The mean age was from 37±11.4 to 40±11.5 for each group. The majority of patients were male (60%) and about 32% were married. About 55% were unemployed and half of them had a low-level of education. The groups were similar in all demographic features (Table 1). The mean duration of illness was 13 years and the mean number of hospitalization was 4.5 times lifetime. In other words, the frequency of hospitalization was once per three years for every patient with severe mental illness.

Outcome Measures

Before the intervention, the three groups were similar in terms of psychological aspects. After 12 months of follow up, all psychological aspects were significantly better than baseline measures, except for YOUNG. Using Scheffe as a post-hoc test, we showed PANSS, knowledge on BMD, and CSQ were only significantly different between the home-visit and as-usual (control) groups. Other measures were significantly different across all groups. The home-visit group had better scores (Table 2). There was not any significant difference across groups, neither before nor after intervention for the domains of SF-36 questionnaire (Table 3).

The recurrence rate was 24.6%, 33.3%, and 45% for home-visit, telephone follow-up, and as-usual treatment groups, respectively. This

Table 1: Demographic and clinical characteristics of patients by groups

Variable	Home follow-up visit n=60	Telephone follow-up n=61	As-usual n=61	P value
Mean (SD)				
Age (years)	37 (11.4)	37.7 (11.0)	40.1 (11.5)	0.35
Age of disease onset (years)	23.6 (8.7)	25.2 (10.6)	25.3 (9.0)	0.64
Duration of marriage (years)	7.2 (12.4)	6.0 (12.1)	7.4 (13.2)	0.89
Number of children	0.86 (1.5)	0.98 (2.0)	1.1 (1.6)	0.76
Sex (n, %)				
Male	34 (56.7)	39 (63.9)	35 (57.4)	0.66
Female	26 (43.3)	22 (36.1)	26 (42.6)	
Marital status (n, %)				
Single	34 (56.7)	38 (62.3)	29 (47.5)	0.51
Married	20 (33.3)	17 (27.9)	22 (36.1)	
Other	6 (10.0)	6 (9.8)	10 (16.4)	
Education (n, %)				
Less than high school	25 (42.4)	32 (52.5)	36 (59.0)	0.18
High school graduated	34 (57.6)	29 (47.5)	25 (41.0)	
Occupation				
Unemployed	36 (60.0)	33 (54.1)	32 (52.5)	0.91
Housewife	10 (16.7)	11 (18.0)	13 (21.3)	
Other	14 (23.3)	17 (27.9)	16 (26.2)	
Somatic disorder				
Yes	13 (21.7)	21 (34.4)	16 (26.2)	0.28
No	47 (78.3)	40 (65.6)	45 (73.8)	
Duration of illness (years)	14.0 (12.1)	12.5 (9.7)	15.0 (10.8)	0.53
Frequency of hospitalization	4.9 (6.8)	3.8 (4.2)	4.6 (5.2)	0.53

Table 2: Difference between mean score of questionnaires by groups in pre and post intervention

Variable	Home visit[a]	Telephone[b]	As-usual[c]	P value
Pre-intervention				
PANSS	74.4 (32.6)	73.6 (29.6)	73.7 (30.0)	0.97
YOUNG	14.3 (15.4)	12.1 (11.8)	11.1 (12.2)	0.71
KELZ	8.1 (5.2)	6.8 (4.9)	7.9 (5.7)	0.32
Knowledge on BMD	18.5 (3.5)	16.6 (4.7)	16.7 (4.2)	0.20
Knowledge on schizophrenia	21.0 (3.9)	20.6 (3.5)	19.9 (5.7)	0.57
Burden	124.6 (27.9)	127.2 (26.3)	124.7 (27.9)	0.84
GHQ	58.2 (16.9)	53.5 (14.9)	53.6 (16.5)	0.19
CSQ	22.6 (4.3)	22.6 94.4)	24.0 (4.6)	0.12
Post-intervention				
PANSS	70.7 (31.2)[1]	73.2 (29.3)	91.8 (39.9)[1]	0.02
YOUNG	12.3 (12.7)	7.4 (8.8)	9.7 (12.9)	0.44
KELZ	6.3 (5.0)[1]	6.6 (4.9)[2]	10.5 (5.5)[12]	0.0001
Knowledge BMD	20.7 (2.8)[1]	19.2 (3.8)	17.0 (2.7)[1]	0.005
Knowledge schizophrenia	25.5 (4.1)[1]	23.5 (4.1)[2]	17.1 (3.6)[12]	0.0001
Burden	109.1 (29.0)[1]	109.6 (29.7)[2]	130 (22.6)[12]	0.0001
GHQ	50.8 (12.0)[1]	54.0 (14.5)[2]	60 (13.9)[12]	0.001
CSQ	24.9 (5.1)[1]	23.0 (4.0)	21.3 (5.5)[1]	0.001
Recurrence				
Yes	14 (24.6)	20 (33.3)	27 (45.0)	0.06
No	43 (75.4)	40 (66.7)	33 (55.0)	

[a]: Within group comparison (pre and post difference) shows significant difference for knowledge of schizophrenia (P=0.0001), burden (P=0.005), GHQ (P=0.001), and CSQ satisfaction (P=0.01), [b]: Within group comparison (pre and post difference) shows significant difference for YOUNG (P=0.02), knowledge BMD (P=0.02), Knowledge of schizophrenia (P=0.01), and burden (P=0.001), [c]: Within group comparison (pre and post difference) shows significant difference for KELZ (P=0.004), knowledge schizophrenia (P=0.03), GHQ (P=0.003), and CSQ satisfaction (P=0.004). Note: The results of post-hoc test of ANOVA illustrated by superscript numbers

Table 3: Difference of quality of life domains score within and between groups

SF-36 domains	Home-visit[a]	Telephone[b]	As-usual[c]	P value
Pre-intervention				
Role physical	43.2 (29.7)	53.9 (27.5)	47.0 (27.5)	0.12
Physical functioning	67.5 (29.3)	76.9 (19.9)	75.4 (24.8)	0.09
Bodily pain	61.8 (35.6)	69.7 (26.5)	67.4 (33.3)	0.38
General health	59.9 (25.0)	60.9 (22.2)	61.8 (22.6)	0.90
Vitality	45.8 (25.7)	53.0 (19.7)	50.3 (19.0)	0.22
Social functioning	46.0 (32.4)	52.5 (27.5)	51.6 (29.3)	0.43
Role emotional	41.2 (31.3)	46.4 (27.3)	43.6 (28.1)	0.22
Mental health	48.6 (19.8)	53.1 (20.9)	52.7 (19.4	0.42
Post-intervention				
Role physical	51.6 (29.4)	59.4 (19.9)	51.1 (26.5)	0.16
Physical functioning	68.1 (32.0)	75.9 (21.6)	64.0 (27.4)	0.07
Bodily pain	71.9 (29.2)	71.1 (25.4)	64.2 (26.6)	0.20
General health	56.5 (22.6)	56.9 (21.3)	48.4 (21.7)	0.06
Vitality	48.4 (18.5)	49.3 (16.3)	43.1 (21.2)	0.16
Social functioning	57.2 (30.0)	67.0 (24.9)	54.3 (29.6)	0.05
Role emotional	49.6 (25.0)	58.4 (23.8)	50.7 (24.8)	0.48
Mental health	55.0 (19.6)	45.3 (17.5)	51.2 (17.8)	0.48

[a]: Within group comparison shows significant difference for mental health (P=0.01) and pain (P=0.04), [b]: Within group comparison shows significant difference for role emotional (P=0.002) and social functioning (P=0.003), [c]: Within group comparison shows significant difference for physical functioning (P=0.005), vitality (P=0.01), and general health (P=0.001)

Table 4: Logistic regression analysis of association between groups and risk of rehospitalization

Group	B	SE*	Wald test	Dif	Sig	Odds ratio	CI (95%)
Home-visit	-	-	-	-	-	1 (reference)	-
Telephone follow-up	0.42	0.41	1.08	1	0.29	1.53	0.68-3.44
As-usual	0.92	0.40	5.24	1	0.02	2.51	1.14-5.53

difference was borderline significant at 0.06 level. Calculating the risk of hospitalization between groups revealed that the risk of rehospitalization in the telephone follow-up and as-usual groups was 1.53 (CI 95%, 0.68-3.44) to 2.5 (CI 95%, 1.14-5.53) times more than the home-visit group (Table 4).

Discussion

This study showed that implementation of community-based mental health services is feasible and highly welcomed by patients and their families. Furthermore, it would reduce the rate of hospitalization recurrence. One of the main concerns is regarding the personal safety of a case manager while providing home-visit services. During the present study period, we did not experience any dangerous behavior from patients. This was consistent with a similar study in Iran. Assuming Iran is in the category of low-middle income countries, implementation of such strategy is more applicable to the mental health budget in our setting. Certain measures were taken in advance to prevent possible hazardous conditions. The responsible person in the main office was bound to call the families to inform them about a visit by case manager and the presence of a family member alongside a patient was mandatory during the visit.

The Impact of Clinical Case-Management Service on Hospitalization Rate

Studies in developed countries have demonstrated that case-management services might increase the rate of patient hospitalization (OR=1.84).[25,26] It is shown that such intervention could be effective in reducing family burden, satisfaction with the services as well as the cost of treatment and other clinical characteristics.[27]

The result of the current study showed that patients in the as-usual group were hospitalized 2.5 times and the telephone follow-up group 1.5 times more than the home-visit group. In a study conducted in Iran, the case-managers were only trained psychologist and the hospitalization rate for the as-usual and telephone follow-up groups were 17% and 14%, respectively.[12] The lower rate of hospitalization in the previous study could be related to comprehensive care of patients by the psychiatric team of the Iranian society supporting

individuals with schizophrenia. However, in our study, the psychiatrists were spread across four different hospitals resulting in different drug treatment programs.

Although our case managers were trained nurses rather than psychologists, they did perform effectively in reducing the hospitalization rate. Being in touch with patients and their families, introduced a feel-good factor particularly through accessibility by phone in case of emergency. The patients were socially supported, scrutinized for drug treatment, and were educated to cope better with their disease. It seems that the feel-good factor was important for improved management of the disease and resulted in a lower hospitalization. This is very crucial in our society where the available acute psychiatric beds are only one-third of the required amount.

In this study, we showed that the as-usual approach did not work well in patients with severe mental illnesses. Indeed, it was considered harmful to them. Previous studies have shown that the rate of rehospitalization in Iran for patients with severe mental illnesses could be once for every 1 to 4 years.[12,28] This finding has a relatively wide range of hospitalization as an outcome for such patients. This may be due to sampling error, patient characteristics, or the time trends. We could not exactly specify which explanation is the reason for our findings. However, it could be the time trends because the features of patients with severe mental illnesses could be affected by several factors, such as familial, environmental, and natural variability of psychopathology severity.

Clinical Outcomes of Providing Case-Management Service

The study results showed that all clinical features of the patients and their caregivers have improved in the home-visit group compared with the as-usual group, except for YOUNG. There is a positive relationship between isolation and burden of caring for chronic mentally ill patients.[29-32] Such services could improve the mental health of patients and their family members.

Patients' quality of life was significantly unchanged during the follow-up. At times, there were some within group improvements in a few domains of life quality (such as pain and mental health in home-visit group). However, there was not any significant difference between interventions. One explanation could be that the improvement in the quality of life requires more time and the duration of follow-up in the present study was not sufficient to demonstrate the effect of interventions.

Home-Visit versus Telephone Follow-Up Group

We showed KELZ, knowledge of schizophrenia, burden, and GHQ scores were different between the home-visit and telephone follow-up groups. Given that drug therapy is a crucial principle in the treatment of schizophrenia, regular supervision of patient treatment may lead to a better control of symptoms, alleviate the severity of the disease, and consequently reduce the relapse rate.

Our study had certain strengths and limitations. The most important strength was the study design. We did a randomized controlled trial on severe psychiatric patients. Conducting such trial on these patients and specially intervention in the form of home-visit is exuberant and time consuming. We required compliance of these patients to measure outcome variables; and this was achieved by using trained case managers and supporting them with almost low attrition rate. The other important point was collecting many significant clinical variables using standard questionnaires that allowed us to prepare some hypothesis testing. Although, we resorted to several hospitals to select eligible patients, the small sample size was the main limitation of the current study. However, there was some attrition beyond our control. The other limitation was the probability of visiting the patients by other psychiatrists without our coordination and control.

Conclusion

This study revealed that in our social and cultural conditions, clinical case-management service is capable of reducing rehospitalization and improve the clinical outcomes of individuals suffering from severe mental illness. Additionally, telephone follow-up services could have beneficiary outcome for the consumers, their caregivers, and the health system network. The results of the current study have shown that a trained case manager is capable of providing effective service that is most compatible with the socio-economic conditions of our society as a low-middle income country. Although a few patients requiring community based care are receiving such services by a team organized by the Welfare Organization (such as general physicians, psychologist, and social worker), but clinical case-management service could be cost-benefit in our country where acute psychiatric beds are limited.

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