

Effectiveness of a Low-Intensity Home-Based Aftercare for Patients with Severe Mental Disorders: A 12-month Randomized Controlled Study

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Received: 13 August 2011 / Accepted: 27 June 2012 / Published online: 7 July 2012
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Abstract To examine the effectiveness of a low-intensity home-based aftercare service, 130 patients with schizophrenia, schizoaffective disorder or bipolar disorder were randomized to receive either home aftercare or treatment-as-usual. In home aftercare, a general practitioner and a social worker made home visits once in a month after discharge from the hospital wherein they provided education and treatment. In a 1-year follow-up, home aftercare led to greater reduction in rehospitalization rate, more improvement in psychotic symptoms and global illness severity, as well as greater service satisfaction. The implementation of this low-intensity aftercare is recommended, especially in less resourceful settings.

Keywords Community mental health · Severe mental illness · Home-based care · Health service research

Introduction

Patients with severe mental disorders such as schizophrenia and bipolar disorder experience repeated hospitalizations. It is estimated that 35–50 % of patients with severe mental illnesses will be rehospitalized within 1 year after discharge (Bergen et al. 1998). Rehospitalization rates would be lower if patients receive specialized and outreach services, such as home-based ambulatory treatments. These services have been shown not only to reduce readmission rate, but also to increase compliance, to improve clinical status of patients, and to bring more service satisfaction as compared with conventional individual outpatient treatment (Burns et al. 1993; Kampman et al. 2003; Pai et al. 1985; Pai and Roberts 1983; Tyrer et al. 1998).

Assertive Community Treatment (ACT) and Intensive Case Management, that include home care as a main component, have led to a dramatic decrease in hospitalization, increase in service contact, and client satisfaction (Dieterich et al. 2010; Marshall et al. 2011). These services provide intensive care that typically includes frequent home visits (up to several in a week) in which health and social care are integrated and a range of psychosocial services such as psychotherapeutic and rehabilitative interventions are provided. Prolonged service delivery at such high intensity could inadvertently increase costs and limit some patients' access by committing limited resources to clients who could receive a less intensive level of services without loss of benefit (Rosenheck et al. 2010). In addition, implementation of these complex interventions could be burdensome and may not be feasible in settings with limited resources such as those in developing countries. Therefore, a less resource demanding alternative may be more feasible and could be more easily implemented.

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There are examples of such less intensive home-based services from Finland (Kampman et al. 2003) and India (Pai et al. 1985) in which nurses took care of home visits for chronic psychiatric patients and the frequency of visits was much less than the above-mentioned models. However, none of these studies were prospective randomized trials. Moreover, the effectiveness of other less intensive services such as case management is inconclusive (MacDonald et al. 2005; Marshall et al. 2011).

Since 2004, a home aftercare service for patients with severe mental illnesses was implemented in several centers across Iran. This is a low intensity care in which home visits are made once in a month by only two health professionals (a general practitioner and a social worker). The care includes symptom/medication management, patient and family education and helping the family in order to access the supportive and community resources. However, the effectiveness of this recently developed home care service had not been examined.

We aimed to examine the effectiveness of the above-mentioned home-based aftercare in comparison to usual services for patients with severe mental illnesses discharged from a psychiatric hospital in Tehran (Iran) through a 12-month parallel group randomized controlled study. The primary outcome was the rehospitalization rate and the secondary outcomes were severity of symptoms, functioning, quality of life, and service satisfaction. Our hypothesis was that the patients in the home aftercare would fare better in terms of the primary and secondary outcomes.

Methods

Sample

This study is registered in Iranian Registry of Clinical Trials (Registration No: IRCT138807162557N1). The subjects included those having a severe mental disorder discharged from Roozbeh psychiatric hospital in Tehran, Iran. Patients were consecutively enrolled if they met the following criteria: having a DSM-IV diagnosis of schizophrenia, schizoaffective disorder or bipolar disorder (severe episode with psychotic features), the age range of 15–65, previous history of psychiatric hospitalization(s), residing in the catchment area of the hospital, and giving written informed consent. The exclusion criteria were mental retardation and severe organic conditions. After discharge, patients were randomized into two groups: the home aftercare service and the treatment-as-usual group. Stratified randomization with allocation concealment was employed in which stratification was made by diagnosis (schizophrenia/schizoaffective disorder and bipolar disorder). At index hospitalization, antipsychotic medications

had been started for all patients in therapeutic doses and a mood stabilizer (lithium, carbamazepine or sodium valproate) for those with bipolar disorder.

Intervention

The home aftercare program consisted of home visits by home care teams. Each team was comprised of a general practitioner and a social worker, who provided the services under a plan of care established and reviewed by a faculty member psychiatrist. Team members had special training and experience in psychiatric home health care. The visits were scheduled on a monthly basis. In the first 3 months after discharge, the social workers made some extra visits (one or two in a month) to ensure the continuity of care.

The care included bio-psychosocial assessment of the patient; development and coordination of plan of care, prescription of drugs and dosing adjustments, educating both the patient and the family about the nature of the illness and the appropriate use of the medications as well as the warning signs for a relapse, recognition of early phases of a relapse and conducting necessary procedures that may include raising the dosage and/or referral for a hospital admission, as well as helping the family in order to access the supportive and community resources. Weekly meetings were held for the teams with psychiatrists where home visits and any raised problems were discussed to reach individualized decisions for each patient. Patients were told that there is no need to come to the hospital for follow-up, unless they feel dissatisfied with home care and would like to refer to the outpatient department.

The treatment-as-usual group received the existing services provided by the outpatient or inpatient services of the hospitals and any service outside the hospital that might be contacted by the patients. The hospital outpatient service usually included visits by a psychiatrist or a psychiatric resident at the hospital who prescribed medications for the patient and there were no psychosocial and rehabilitative component.

Data Collection

All patients were followed for 1 year following discharge; they were assessed at the times of admission and discharge, as well as 4, 8, and 12 months after discharge. The following measures were used at each point: the Positive and Negative Symptoms Scale (Kay et al. 1987), the Young Mania Rating Scale (Young et al. 1978), the Global Assessment of Functioning Scale (Association 1994), the WHOQoL-Bref (Skevington et al. 2004), and the Client Satisfaction Questionnaire-8 (Attkisson and Zwick 1982) (in those who had a contact with a service in the 4 months prior to assessments). The questionnaires have already

been translated into Persian and back-translated into the original language and have shown good cross-cultural adaptations and adequate psychometric properties. Interrater reliability for the measurements showed adequate agreements (intraclass correlation coefficients higher than 0.7 for all instruments). The primary outcome measure was the rate of rehospitalization. Ratings were done by trained interviewers who were general practitioners with clinical experience in psychiatry. They were not blind to the group allocations; however, they were not among service providers to the patients.

Ethical Considerations

Participants and their guardians gave written informed consent to be included in this study. Completed questionnaires and consent forms were stored in a locked file cabinet to which only the investigators had access. If participants failed to enroll or declined from the study, they were able to receive existing services from the hospital. There are no known conflicts of interest. The study was approved at the Ethics Committee of Tehran University of Medical Sciences.

Data Analysis

At the end of follow-up the two groups were compared on the basis of the outcome measures. Improvement in secondary outcome measures was calculated by subtracting the 12-month from the baseline rating divided by the baseline rating multiplied by 100 that provides the percentage improvements. For quantitative variables, Mann–Whitney U was used as most variables did not have normal distributions, and Chi square test was used for categorical variables. A linear regression analysis was also used to evaluate the predictors of the primary outcome. All *P* values less than 0.05 were regarded as significant (two tailed).

Results

A total of 130 patients were enrolled (70 with bipolar disorder and 60 with schizophrenia/schizoaffective disorder). They were randomized to receive either home aftercare (*n* = 66) or treatment-as usual (*n* = 64). Mean age was 32.7 (SD = 12.0) in the experimental group and 36.1 (SD = 14.1) in the control group. There were 22 female subjects (33.3 %) in the home aftercare group and 21 (32.8 %) in the control group. The two groups were comparable with regard to other demographic variables, illness duration, comorbid substance use, symptom ratings, functioning and quality of life; however, the rate of previous hospitalizations was 1.3 per year (SD = 4.4) in the

experimental group compared to 0.8 per year (SD = 0.7) in the control group.

The average duration of home care in the 12-month period was 10.6 months (SD = 3.1) and the average number of home visits was 11.5 (SD = 4.5). In the home care group, 48 patients (77.4 %) remained in the service for 12 months. No patient in the treatment-as-usual received home care or any other specialized psychosocial or rehabilitative services. The two groups were assessed at 4-month intervals after discharge. Complete data were available for less than 75 % of the subjects at 4 and 8-month intervals, but the rate was over 75 % at 12 month. Therefore, comparisons were made only at the 12 month interval. Baseline features of patients, whom we were unable to trace later at all, had been similar to those who were rated.

In the home care group, 16 patients was rehospitalized for one or more times in comparison with 26 in the treatment-as-usual group ($\chi^2 = 3.5$; *P* = 0.061). When 12-month rehospitalization rate were subtracted from the previous average annual hospitalization rate, it was shown that reduction in hospitalization was significantly more in the home aftercare group than in the control group; reduction in annual rehospitalization rate was 0.4 in the home aftercare versus 0.07 in the as usual group (Mann–Whitney *U* = 1,133.5; *P* = 0.01). Home aftercare led to more reduction of psychotic symptoms (25 vs. 8 %; Mann–Whitney *U* = 748.5; *P* = 0.01), depressive symptoms (38 vs. –2 %; Mann–Whitney *U* = 687.0; *P* = 0.003) and clinical global impression of severity of disorder (35 vs. 21 %; Mann–Whitney *U* = 681.5; *P* = 0.008). Other comparisons were not significant.

A linear regression analysis was performed with rehospitalization rate as dependent variable and subject group (home visit/treatment-as usual), diagnosis (bipolar disorder/schizophrenia or schizoaffective disorder) and previous hospitalization rate as predictor variables. The predictors were included through the stepwise model. The model was significant ($F_{2,109} = 5.68$, adjusted $R^2 = 0.078$; *P* = 0.005). Group and diagnosis remained predictive of the main outcome. In other words, patients in the home care had less rehospitalizations (standardized beta = –0.233; *t* = –2.55; *P* = 0.01) as well as in those with bipolar disorder (standardized beta = –0.197; *t* = –2.15; *P* = 0.03). A collinearity diagnostic procedure was performed to investigate the correlation between the predictor variables. Tolerance and VIF values were equal to 1.0, indicating no significant relationship between the predictors.

Discussion

Psychiatric home health care is an alternative to inpatient and residential services which offers care in a continuous

and comprehensive fashion to the patients outside the hospitals and assists them to remain functional in the comfort of their own homes (Burns et al. 1993; Kampman et al. 2003; Pai et al. 1985; Pai and Roberts 1983; Wasylenki et al. 1997). The target of home care services usually includes the group of patients with severe and chronic illnesses; especially those who are noncompliant with treatments or are homebound.

The prototype of the effective modes of community and home-based care is Assertive Community Treatment (ACT). In ACT a multidisciplinary team is responsible for the whole care that patients may need including health and social care. The caseload is small and there is the capacity for multiple visits 7 days a week. In addition to medical management, psychotherapeutic interventions and rehabilitative services are offered. However, these services are costly and difficult to implement in the contexts with limited resources and weak infrastructure for community care. On the other hand, it is shown that less intensive and therefore less expensive care such as Case Management (especially the brokerage model) may not be effective and even may increase the rehospitalization rate (Marshall et al. 2011). Therefore less intensive and cheaper forms of community services are highly needed.

There are few such low-intensive home-based care models and fewer studies have specifically examined the differences in outcome between hospital-based outpatient treatment and home-based treatment for patients who are not in acute crisis. Kampman et al. (2003) investigated the 4-year outcome of non-compliant schizophrenia patients treated with a home-based outpatient care provided by psychiatric nurses that visited patients every 2–4 weeks. In this nonrandomized trial, half of the patients in the home-based care did not need hospitalization at all in the follow-up period and the number of days of hospitalization group diminished by almost four-fifths compared with the previous 4 years. Moreover, there are other nonrandomized studies from India (Pai et al. 1985; Pai and Roberts 1983) and Iran (Malakouti et al. 2009) that report less rehospitalization in home care provided by trained nurses or consumer's family members.

An important negative finding of our study was that the home care program was not superior to the usual care in improving quality of life and global functioning. This may be explained by the fact that our program did not include a specific rehabilitative intervention; Some authors have strongly suggested the inclusion of specialized rehabilitative services in aftercare services in addition to outreach programs (Sellwood et al. 1999).

There were limitations to the study. The missing data was high enough that we were not able to analyze the trend of outcomes throughout the follow-up period. This happened despite our best efforts to reduce it; many subjects

were hard to trace and did not answer phone and when traced, many failed appointments, often repeatedly. In some cases patients were visited at home for the purpose of clinical ratings. At baseline, patients who later we were unable to trace at all had been similar to those who were rated. Another limitation was that blind ratings were not possible and this may bias the results. However, we selected raters not from the service providers.

The design of this study does not allow us to indicate the source of the superiority of home care; i.e., whether it was due to its being based at patient's living place, educating patients and families, assertive follow-up, or one team being responsible for all care components. Differently designed studies are needed to address this question. However, Burns et al. (2001) showed that the main components of home care that bring about its effectiveness are home visiting and regular intervals of visits, both of which were among our service components. In addition, some may argue that more intensive care (such as ACT) would lead to greater effect sizes in outcome measures and the greater effectiveness may compensate for the additional costs of its implementation.

In conclusion, we found that this low-intensity home care is an effective mode of care for patients with severe mental disorders. It decreases rehospitalization; this is a very important finding in Iranian context where we can observe very high, psychiatric bed shortage; and spread of home care across the country can decrease the unmet demands. We recommend implementation of home aftercare within the aftercare services for patients with severe mental disorders.

Acknowledgments This study was supported by a grant from the Undersecretary of Research at Tehran University of Medical Sciences. We would like to thank Dr. Payam Sobhebidari, Dr. Alireza Manouchehri, Elham Miri, Faezeh Razmjoo, and Elnaz Moghaddasi for their kind contributions to the study.

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