

The effectiveness of mutual support group intervention for Chinese families of people with schizophrenia: a randomised controlled trial with 24-month follow-up

Abstract

Background: Positive effects on the relapse from illness and compliance with medication by patients have been observed from family intervention for schizophrenia. However, little attention has been paid to the effects on family members, particularly those in non-Western countries. Inconsistent and inconclusive findings were found on the family-related outcomes and longer-term effects of family intervention.

Objective: This study tested the effects of a nine-month family-led mutual support group for Chinese people with schizophrenia, compared with a psycho-education group and standard psychiatric care over a 24-month follow-up.

Design: A randomised controlled trial [registered with ClinicalTrials.gov(NCT00940394)] with repeated-measures, three-group design.

Settings: Two regional psychiatric outpatient clinics in Hong Kong.

Participants: One hundred and thirty-five Chinese family caregivers and their patients with schizophrenia were randomly recruited, of whom 45 family dyads received family-led mutual support group, a psycho-education group, or standard care.

Methods: After completing the pre-test questionnaire, the participants were randomly assigned into one of the three study groups. The mutual support and psycho-education groups comprised 14 two-hour group sessions, with patients participating in at least 5 sessions. Those in standard care (and two treatment groups) received routine psychiatric care. Multiple patient and family-related psychosocial outcomes were compared at recruitment and at one week, 12 months, and 24 months following interventions.

Results: One hundred and twenty-six of 135 family dyads completed the three post-tests and 43 (95.6%) attended at least nine group sessions (60%) of the mutual support group programme. Mean ages of the family caregivers in the study ranged from 41.2(SD=7.0) to 42.7(SD=7.6) years. About two-thirds of the caregivers were male and patients' parent or spouse. The results of multivariate analysis of variance followed by Helmert contrasts tests indicated that the participants in the mutual support group indicated significantly greater improvement in family and patient functioning [$F(2,132)=5.40, p=0.005$ and $F(2,132)=6.88, p=0.001$, respectively] and social support for families [$F(2,131)=5.01, p=0.005$], and in reducing patients' symptom severity [$F(2,132)=4.65, p=0.01$] and length of re-hospitalisations [$F(2,132)=4.78, p=0.01$] at 12- and 24-month follow-ups.

Conclusions: Family-led mutual support group for schizophrenia produces longer-term benefits to both the patients' and families' functioning and relapse prevention for patients, compared with psycho-education and standard care. This group programme can be an effective family intervention for Chinese people with schizophrenia.

Keywords: family intervention, mutual support group, psychoeducation, randomised controlled trial, schizophrenia

What is already known about the topic

- Schizophrenia is a disruptive and devastating illness, not only for patients but also for family members who live and care for the schizophrenia sufferers.
- Different approaches to family intervention in schizophrenia have been shown to produce positive patient outcomes, particularly in improving the mental state of patients and in reducing relapses from illness, as well as in improving the knowledge of the patients' families about the illness and its treatment.
- The peer-led mutual support groups that emerged from the stress-vulnerability and coping model have been increasingly used on people with chronic physical and mental illnesses and their families; however, there is limited evidence of its effectiveness on people with severe mental illness.

What this paper adds

- Family-led mutual support group is a more effective community-based psychosocial intervention for Chinese people with schizophrenia than family psycho-education groups and routine psychiatric care in improving the psychosocial health condition of patients and their family members over a 24-month follow-up.
- The family-led mutual support group, with patients participating in three sessions, improved overall patient and family functioning and the number and length of patient re-hospitalisations over the 24-month follow-up. In comparison, the psycho-education group improved patient and family functioning over the first 12 months.
- The supportive family group intervention can also improve the psychosocial functioning of families caring for a relative with schizophrenia, with only a mild increase in demand (from 3.2 to 3.5 out of 16 services available on the Family Support Service Index) for mental health services.

Introduction

Over half of people with schizophrenia in Western countries and in Hong Kong are cared for by family members, yet still depend on access to community mental health care services (Chien and Chan, 2004, Pitschel-Walz et al., 2004). Family members who live with and care for a relative with schizophrenia often face daily stressors, which include unpredictable, abnormal, and dangerous behaviour on the part of the patient, social discrimination and rejection, and emotional frustration such as feelings of guilt and self-blame in the caring process (Chien et al., 2008). While a heavy burden of care is imposed on family caregivers, recent clinical trials in the US and UK have demonstrated the clinical efficacy of some models of family intervention, particularly psycho-education and behavioural management, in reducing the relapse rates of patients with schizophrenia or other psychotic disorders (Bustillo et al., 2001, Pharoah et al., 2010). The mental health practice guidelines of the American Psychiatric Association (Lehman et al., 2004) suggest that as part of a comprehensive treatment approach, psychosocial intervention can provide better clinical outcomes for patients with schizophrenia in terms of preventing relapses and improving psychosocial functioning and the course of schizophrenia, when integrated with conventional treatments such as pharmacological therapy.

The NICE schizophrenia guidelines in the UK (The National Collaborating Centre for Mental Health, 2009) recommend that some types of psychosocial intervention such as family intervention be offered as core interventions to all family members of people with schizophrenia who live with or are in close contact with the service users (patients), in order to optimise patient recovery and improve family functioning and well-being. In addition, the NICE also suggest that ethnically adapted family interventions for patients with schizophrenia should be implemented and tested to determine concomitant reductions in patient relapse rates and care distress and enable better engagement with this intervention.

Therefore, the wide implementation and testing of an effective model of family intervention is a top priority for improving the quality of contemporary community mental health care.

Family psycho-education and behavioural management interventions for people with schizophrenia are the most frequently used approaches in Western countries (Dixon et al., 2001, Sellwood et al., 2001). Three recent reviews of more than 15 controlled trials concluded that family psycho-education programmes have demonstrated significant positive effects in improving knowledge about mental illness and drug compliance and reducing relapse rates (Pharoah et al., 2010, Pitschel-Walz et al., 2004, Rummel-Kluge and Kissing, 2008). However, eight of 10 clinical trials on family psycho-education for schizophrenia care showed only modest or non-significant effects on the health-related outcomes of other patients and their families, such as psychosocial functioning and caregiving burden (Pharoah et al., 2010, Pilling et al., 2002), in particular at a longer-term follow-up (e.g., >18 months).

Moreover, there is increasing research evidence (e.g., Dixon et al., 2001, Lehman et al., 2004) indicating that the common therapeutic components in the approaches to family intervention, including the sharing of information, psychological support, and practical assistance between peer participants, are associated with greater improvements in the ability of family members to cope with the stress and demands of taking care of a relative with schizophrenia and other severe mental illnesses (Chien and Norman, 2009). Therefore, there is a need to investigate whether any alternative models of family intervention can be effective in improving the psychosocial functioning and well-being of both families and patients. Clinical trials to investigate and compare the effectiveness of any alternative models of family intervention with family psycho-education and/or other current models in different socio-cultural contexts are also recommended (Bae and Kung, 2000, Dixon et al., 2001).

Traditional family therapy for people with schizophrenia and other mental illnesses is usually led by a therapist or health professional with a single family or a multiple-family

group. The literature reviews by Asen (2002) and Chien and Norman (2009) on family intervention in schizophrenia suggest that mental health professionals may be hesitant to implement such a highly structured and intensive form of family therapy due to inadequate resources and a lack of trained therapists. In addition, traditional models of family intervention may not be readily accepted by Chinese families because of their reluctance to openly disclose their thoughts and feelings in the presence of the therapist or other people perceived to be unfamiliar with their family situations and needs. Many Chinese people may even believe that intense emotions such as anger and guilt endanger health and should be self-controlled and hidden, and thus should not be openly expressed or discussed (Bae and Kung, 2000). They may also find it difficult to build trust and rapport with the family therapist (Fung and Ma, 1997). Chien and Lee (2010) have suggested that although Chinese families are often the ones most in need of intervention, they seldom seek help from health professionals.

Mutual support groups were part of a larger social movement of self-help for people affected by chronic illness and mental health problems, whose needs were not being inadequately addressed by standard health care services (Chien et al., 2008, Cook et al., 1999). Mutual support groups for people with mental illness and their family members, such as the National Alliance on Mentally Ill in the United States, were established in the early 1990s to meet the needs of service users and their families. By participating in a mutual support group, each family caregiver can share and re-examine his/her own caregiving difficulties and challenges with other families in a similar situation. During group meetings, each participant can also learn from others by exchanging caregiving experiences and information about mental illness (Asen, 2002). Maton and Salem (1995) applied the concepts of the psychological empowerment of individual participants and the social action process in a mutual support group in a case study on GROW, an international mutual support group

network for mentally ill people that originated in Australia in 1957. They suggested that the empowerment of mutual support group members could be fostered by establishing a peer support system, inspiring individual members and providing them with opportunities to take on meaningful roles to be mutually supportive and strive for better mental health within group.

There has been limited but increasing research evidence on the effectiveness of mutual support groups for families of people with mental illness such as schizophrenia, dementia, and substance abuse on improving family functioning and knowledge of mental illness and its care, as well as on the relapse rates of patients (Chien et al., 2006, Pistrang et al., 2008). Family-led mutual support groups require less intensive training for professionals as facilitators and provide a flexible, interactive, client-directed approach for family members to cope with the stress of caregiving (Bae and Kung, 2000, Gylln et al., 2006). Mutual support groups may potentially be appropriate for Chinese families, who are often reluctant to seek help due to strong perceptions of stigma and an unwillingness to expose family weaknesses or disgrace ('saving face') to outside people (Bae and Kung, 2000; Fung and Ma, 1997). As with many Asian families, however, they may be more willing to accept other family caregivers who are "all in the same boat", and to discuss their problems openly with them, sharing effective strategies and social learning about patient care among group members (Chien et al., 2008, Wiedemann, 2003) One of a few clinical trials of mutual support groups for Chinese family caregivers of people with schizophrenia has indicated that these family-led mutual support groups could provide significantly greater improvements in family burden and functioning and in reducing the relapse rates of patients at the one-year follow-up, when compared with routine psychiatric care (Chien et al., 2008). Otherwise, most mutual support group intervention studies employ a cross-sectional survey and a qualitative exploratory or quasi-experimental single-group design, to explore or evaluate the perceived benefits to

group participants in terms of individual and family psychological and social well-being (Chien & Norman, 2009).

Moreover, most family intervention studies have been developed and tested in Western countries; only few have included Asians or Chinese who have a family-oriented culture (Bae and Kung, 2000). With positive effects found in Caucasian populations, it is important to design and test a client-directed approach to family intervention for Chinese families of people with mental illness. It is also important to acknowledge culturally specific Chinese family values and processes such as extended and close ties and interdependence, collective identity and behaviours and strong traditional Chinese values relating to kindness, loyalty, filial piety, and harmony between family members, and hence utilise them in a group intervention (Chien et al., 2008, Li and Arthur, 2005).

1.1. Aim and hypotheses of the study

This randomised controlled trial was conducted to evaluate and compare the effectiveness of three approaches to family intervention for Chinese outpatients with schizophrenia with regard to patient and family psychosocial functioning over a 24-month follow-up period. The primary outcomes of the trial involved the re-hospitalisation rates and family functioning of the patients; and its secondary outcomes included the severity of the patients' symptoms and their level of functioning, and their families' perceptions of social support and their service utilisation. The main hypotheses were that over the 24-month follow-up, a significantly greater reduction in the severity of the patients' symptoms and in their re-hospitalisation rate, and improvements in the psychosocial functioning of the patients and their families, as well as the families' perceptions of social support and use of community support services were seen in the families in the mutual support group than in those who took part in the psycho-education group intervention or who received standard care only.

2. Methods

A randomised controlled trial with a three-group repeated-measures design was conducted at two regional psychiatric outpatient clinics between December 2008 and January 2012. The enrolment of the participants and their allocation into groups, the interventions, outcome measures, and data analyses are summarised in the flow diagram shown in Figure 1, according to the revised version of the CONSORT statement (Schulz et al., 2010). The trial was registered with ClinicalTrials.gov(NCT00940394, from <https://register.clinicaltrials.gov>).

2.1. Recruitment

Patients primarily diagnosed as suffering from schizophrenia were selected randomly by the first author from the patient lists (in alphabetical order of their names) of the two outpatient clinics in Hong Kong. There were more than 1,100 potential participants (i.e., 10% of the total patient population). One hundred and thirty-five of the 520 patients who met the study criteria listed below were randomly selected and contacted by the first author. They were asked to give their written consent to participate in the study, after being given a full explanation of the purpose and procedure of the study. With the consent of the patients, their main family caregivers were also invited to participate in the study with their informed consent.

The inclusion criteria of family caregivers and patients with schizophrenia were those who were: (a) aged 18 years or above, speaking in Mandarin/Cantonese; (b) one of the main carers who lived with and provided most of the care for their relative who had a primary diagnosis of schizophrenia according to the criteria in the Diagnostic and Statistical Manual, DSM-IV (American Psychiatric Association, 1994); and (c) patients who did not have any co-morbidities in terms of other mental disorders at baseline. Exclusion criteria included those caregivers who themselves suffered from mental illness or who had been the primary

carers for less than three months; and those patients who were mentally unstable or who had been re-hospitalised before the random assignment of the participants into study groups.

After completing the pre-test questionnaires after the outpatient clinic follow-up consultation, family caregivers were assigned into groups of three in terms of their patients' dates of follow-up in the clinics and asked by the first author to draw a labelled card (one of three cards respectively labelled: 1='mutual support'; 2='psycho-education'; and 3='standard care') drawn from an opaque envelope. Based on the label that was drawn out, the family dyads (i.e., pairs of patients and family caregivers) were allocated to one of the three study groups. In the end, 45 family dyads were assigned to each of the three study groups.

2.2. Sample Size and Estimated Study Power

The size of the sample was calculated a priori in terms of the study hypotheses and outcome variables. Based on three clinical trials of family interventions in Chinese people with schizophrenia (Chien et al., 2006, Chien et al., 2008, Li and Arthur, 2005), we estimated that 37 family dyads per intervention were required to provide 80% power (two-sided $p < 0.05$) to detect a difference in family functioning change of 0.6 points with a standard deviation of 1.2, or a difference in change of re-hospitalisation rate of 1 (number of re-admissions over 12 months) with a standard deviation of 0.5, indicating a moderate effect size of 0.48 (i.e., the smallest effect size of the three clinical trials referred to on patient and family functioning, ranging from 0.48-0.60). From 520 family dyads (patient and caregiver) that met the criteria of the study, 135 (26.0%) were randomly selected and allocated to the three study groups (i.e., 45 family dyads in each group), with an expected attrition rate of 20%.

2.3. Measures

With regard to the outcome measures, a research assistant asked the family caregivers to complete the Family Assessment Device (FAD), the Six-item Social Support Questionnaire (SSQ6), and the Family Support Services Index (FSSI); while the patients

were invited to complete the Specific Level of Functioning Scale (SLOF). These scales were translated into Chinese and tested on Chinese patients with schizophrenia, and were found to have satisfactory reliability and validity (Chien and Chan, 2004, Chien et al., 2008). During psychiatric consultations in the outpatient clinics, the attending psychiatrist assessed the severity of the patients' symptoms using the Brief Psychiatric Rating Scale (BPRS, Overall and Gorham, 1962). The average number and duration of the patients' re-hospitalisations over the previous nine months were checked by the research assistant from the patient records of the clinics.

Demographic data of the patients and their caregivers such as their age, gender, level of education, monthly household income, duration of mental illness, and relationship with the patient, were collected by the research assistant at the time of recruitment. Antipsychotic medications were recorded from patient treatment sheets and their dosages were converted into haloperidol equivalents for comparison (Bezchlibnyk-Butler and Jeffries, 1998).

The FAD was used to assess multiple dimensions of family functioning among patients with mental illness and other chronic diseases (Epstein et al., 1983). It consists of 60 items to measure family functioning using a four-point Likert scale (from 1-'strongly disagree' to 4-'strongly agree'). The Chinese version of the FAD demonstrated satisfactory content validity and internal consistency, with Cronbach's alpha coefficients of between 0.78-0.92 for subscales and 0.97 for the overall scale (Chien and Norman, 2004).

The SSQ6 developed by Sarason et al. (1987) measures an individual's satisfaction with the social support available in his/her immediate social environment. The items are rated on a six-point Likert scale, with a higher total score (ranging from 0-6) indicating more satisfaction with the available social support. The translated Chinese version indicated satisfactory content validity and internal consistency (Cronbach's $\alpha=0.90$) when used in Chinese families of people with schizophrenia (Chien et al., 2006).

The 18-item BPRS developed by Overall and Gorham (1962) was used to assess the severity of the patients' symptoms or mental state. This scale has been used globally in research on mental health services, indicating good content validity, inter-rater reliability (Intra-class correlation=0.89), and internal consistency (Cronbach's α =0.85 (Chien et al., 2006, Overall and Gorham, 1962). The mental status of the patients was assessed and rated on a seven-point Likert scale for each item (0=not assessed, 1=not present to 6=extremely severe). The scores ranged from 0-108, with higher scores indicating more severe mental symptoms.

The 16-item FSSI is a checklist (Yes/No response) to measure community service needs and utilisation by families of patients with mental illness (Heller and Factor, 1991). Items were modified by the authors in a previous study to indicate the community services available in Hong Kong (Chien et al., 2008), and the instrument demonstrated satisfactory inter-rater reliability (kappa value=0.82) and internal consistency (Cronbach's α =0.84).

The SLOF is a 43-item assessment scale, in which each item is rated on a five-point Likert scale (from 1-'totally dependent' to 5-'highly self-sufficient') along three functional areas for patients with schizophrenia: self-maintenance, social functioning, and community living skills (Schneider and Struening, 1983). The Chinese version demonstrated satisfactory content validity and internal consistency (Cronbach's α =0.88-0.96 for functional areas and 0.90 for overall scale) among Chinese patients with schizophrenia (Chien et al., 2006).

2.4. Treatment

Forty-five family caregivers participated in a nine-month mutual support group programme, and also received routine psychiatric outpatient care. The group met every two to three weeks for 14 sessions, each lasting about two hours. A peer leader was elected by group members and trained by researchers in a two-day group leadership and facilitation workshop where a variety of teaching methods were used. These included didactic lecturing by experts,

watching and discussing videos, sharing experiences, and participant observation. Major topics included recognising and clarifying the values, roles, and attitudes of the peer leader to the mutual support group, group leading and empowerment skills, effective communication and the facilitating of open discussions and sharing of family caregiving experiences, and ensuring confidentiality, respect, and recognition of the dilemmas and challenges involved in caregiving, as well as updating the participants on knowledge about schizophrenia and its treatment and the available community services. The peer leader worked closely with a group facilitator (i.e., a trained psychiatric nurse), supporting the group development and acting as a resources person, as recommended in the mutual support group literature (Borkman, 1999, Glynn et al., 2006, Pistrang et al., 2008). The peer leaders met the nurse facilitator in between the group meetings (every two weeks) and discussed with her the major challenges and taboo subjects encountered in the previous group meeting. The facilitator gave more guidance and assistance to the peer leaders in the early stage of the development of the group, and suggested and demonstrated effective strategies for leading a peer support group such as sharing information relating to the goal of building trust and/or mutual support for caregiving, mediating differing opinions, strengthening the commitment of group members, and reinforcing empathic and supportive responses to individual needs and concerns.

The main content of the group sessions in the five stages included: orientation and engagement, recognition of psychological needs, recognising and managing the psychosocial needs of oneself and one's family, adopting new caring roles and facing life's challenges, and preparing for the termination of the group and planning for the future (see Table 1). The group leader, together with the facilitator, discussed and decided the goals of all group sessions. The participants in the group met and established the main content and identified definite tasks or discussion topics for each group session. In addition to discussions on the understanding of mental illness and its treatment, and individual feelings and health concerns

with regard to caregiving, specific emphasis was given during and after the meeting to problem-solving and caregiving practices. Specific Chinese cultural characteristics were considered and discussed, including the stigma towards people with mental illness, and being aware of and accepting it. Also discussed were the open disclosure of intense feelings and family and individual health needs, the cultivating of interdependent and collective decisions and actions on caregiving tasks, and the emphasis on practical assistance and psychological support for the patient and family members (Bae and Kung, 2000, Chien et al., 2008, Li and Arthur, 2005).

Insert Table 1

Similarly, another 45 family caregivers participated in 14 two-hour sessions of a psycho-education group programme every two to three weeks, with the programme mainly consisting of psychological support and education on schizophrenia based on the work of McFarlane et al. (1995), as well as receiving routine outpatient care. The group programme was led by an advanced psychiatric nurse trained and experienced in psycho-education and group therapy. While the introduction and orientation to the group programme and its objectives were made during the first two sessions, the other 12 group sessions were mainly conducted by a group leader (advanced psychiatric nurse) or guest speakers (i.e., mental health professionals) using didactic teaching to discuss mental illness and its treatment and the services that are available (Sessions 2-5), common and individual issues in family and patient caregiving (Sessions 5-8), the sharing of the caregiving role and the difficulties faced by the participants and experienced family caregivers (Sessions 8-10), training in problem solving and caregiving skills, and behavioural rehearsals conducted by the clinical psychologists and the group leader (Sessions 9-12), and the development of a social network, coping skills, and future plans in caregiving (Sessions 12-14). The emphasis was placed on the importance of the family environment and relationships and on the demands of caregiving, imparting information about the mental illness and its treatment and available

community services, and discussions on stress management and caregiving skills such as effective communication, medication compliance, establishing interpersonal relationships, and crisis intervention.

Consistent with most family psycho-education and mutual support groups in which patients are invited to attend some or most of the group sessions (Dixon et al., 2011, Lehman and Steinwachs, 1998), patients being cared by the family caregivers in both the mutual support and psycho-education group in this study were invited to attend at least five group sessions. The five sessions attended by the patients mainly consisted of discussions about current knowledge about the mental illness and its treatment, medication use and compliance, family and interpersonal relationships, stress management, and the community mental health services available to the patients. The patients in standard care also attended five education sessions conducted by psychiatric nurses, on similar topics as those discussed with the two treatment groups.

Six experts on psychiatric rehabilitation (including psychiatrists, clinical psychologists, and nurse specialists) independently rated the relevance and appropriateness of the contents of the two group programmes and monitored the progress of the participants by reviewing the audio-taped group sessions (with the prior consent of the participants). Revisions to one topic on personal and community resources, and regular clarifications of problems raised by the group members were made by the research team. In monitoring the fidelity to intervention protocols, the group facilitator in the mutual support groups assisted in monitoring the progress of each group session. Between two group meetings, the research team also held discussions with the professional leader of the psycho-education group and the peer leaders of the mutual support group on the group process and progress with reference to the video- or audio-taped (with the consent of group members) group sessions.

Forty-five family caregivers in standard care (plus those in the mutual support and psycho-education groups) received the routine psychiatric outpatient care, consisting of psychiatric consultations and treatment by a psychiatrist (every 4-6 weeks); a brief education session on mental illness and its treatment and services, conducted by psychiatric nurses (every 1-2 months); training in employment and social skills, conducted by an occupational therapist (when referred by a psychiatrist or social worker); and social welfare services and counselling, offered by a social worker (every 4-6 weeks after the psychiatric consultation).

2.5. Data Collection Procedure

After written consent was obtained from patients and their caregivers in the outpatient clinics, the trained research assistant administered the pre-test questionnaires (and demographic data) before the family dyads were randomly assigned into one of the three study groups (Time 1). During the patients' follow-up in the clinic, the research assistant, who was blind to the participants' intervention conditions, also again asked the patients and their family caregivers to complete the seven outcome measures for three post-tests at one week (Time 2), 12 months (Time 3) and 24 months (Time 4), following the interventions. The patients' re-hospitalisation rates (frequency and days/month of hospitalisations) in the previous nine months were examined.

Insert Figure 1

2.6. Ethical Considerations

Permission to conduct the study was obtained from the outpatient clinics and the Human Subjects Ethics Committee of The Hong Kong Polytechnic University. Before randomisation, written consent was sought from the patients and their family caregivers to participate in the study on a voluntary basis. They were informed of the purpose of the study and what would be expected of them as participants. They were also guaranteed confidentiality on their personal information and the data that was collected, and assured of

their right to terminate their participation in the study at any time without any impact on the patients' treatment.

2.7. Statistical Analyses

Pre-test and post-test scores and demographic data were analysed using the IBM, SPSS for Windows, version 19.0. Analysis of variance or the Kruskal-Wallis test by ranks was used to test any differences in the demographic characteristics of the three groups. To identify any co-variants from the outcome mean scores at baseline, the mean scores of the three groups were compared using the one-way analysis of variance (ANOVA) test (Stevens, 2002). A repeated-measures mixed model MANOVA test was performed for the dependent variables to determine whether the interventions produced the within-between group and group-by-time interaction effects that were postulated. In addition, Helmert contrasts test was used to examine any significant differences in the means of each outcome measure within each group and between the three study groups over time (Tabachnick and Fidell, 2001). For those outcomes showing significant differences between groups, the mean scores of each outcome in the two group interventions were compared between four subgroups assigned according to their time of convenience, using a one-way ANOVA test. The level of statistical significance was set at 5%.

Before proceeding to conduct a multivariate analysis of the eight outcome variables (FAD, SSQ6, SLOF, FSSI, BPRS, number and length of re-hospitalisations, and medication dosage) over time, the assumptions of multivariate normality, linearity, homogeneity of variance, and multi-collinearity for the appropriate use of this analysis were tested. All of the data were analysed on an intention-to-treat basis that maintained the advantages of random allocation or otherwise, which might be lost if subjects were excluded from the analysis due to withdrawal or non-compliance with the intervention or follow-up (Stevens, 2002).

3. Results

3.1. Characteristics of the Participants

Thirty of 165 randomly selected families refused to participate in the study due to a lack of interest and/or time; thus, the response rate was 81.8%. The socio-demographic characteristics of the family caregivers and patients in the three study groups (n=45 in each group) are summarised in Table 2. The mean age of the family caregivers in the three groups was about 42 years (M=42.0, SD=6.8 for mutual support; M=41.2, SD=7.0 for psycho-education; and M=42.7, SD=7.6 for standard care), and they ranged in age from 22 to 58 years. About two-thirds (62%-64%) of the family caregivers were male. Their relationship with the patient was mainly that of parent (33%-36%), spouse (29%-31%), or child (20%-24%).

Insert Table 2

The mean age of the patients in the three groups was about 25 years (M=24.3, SD=6.9 for mutual support; M=25.2, SD=7.6 for psycho-education; M=26.2, SD=8.0 for standard care), and they ranged in age from 18 to 45 years. About two-thirds (60%-64%) of the patients were males. Over half (53%-56%) of the patients in the three groups were taking a medium dosage of anti-psychotics (i.e., the mean values of haloperidol equivalents, as suggested by Bezchlibnyk-Butler and Jeffries, 1998, ranged from M=8.3, SD=2.2 to M=10.0, SD=3.4). About two-thirds of them (64%-68%) were on oral medication and about 18-20% (8 or 9 in each group) were on both oral and depot intramuscular medications. On average, about two family members lived with a patient and the average duration of a patient's illness was about 2 years (M=2.2, SD=1.4 for mutual support; M=2.3, SD=1.5 for psycho-education; and M=2.1, SD=1.4 for standard care), while the range was from 3 months to 5 years.

Forty-three of the 45 family caregivers (95.6%) in both the mutual support and psycho-education group completed the intervention (i.e., those who attended at least nine sessions or 60% of the intervention). Only a few caregivers dropped out or were absent for more than

five group sessions – mutual support (n=2), psycho-education (n=2) and standard care (n=1). Reasons for dropping out or discontinuing their participation from the two group interventions were similar: insufficient time to attend (n=3), the patient’s mental state had worsened (n=3), a lack of interest (n=2), and the family member was the only person taking care of the patient (n=3). Average attendance rates for the mutual support and psycho-education groups were 11.1 sessions (SD=2.1, range=7-14, median=11) and 9.8 (SD=3.0, range=6-14, median=10), respectively.

Insert Figure 1

There were no significant differences in any of the demographic variables among the three groups ($p>0.10$). There were also no significant correlations (Spearman’s $r<0.1$) between the demographic variables and the patient and family measures at baseline, thus indicating no covariate effect.

3.2. Treatment effects

There were no statistical significant differences in any of the mean outcome measure scores at baseline between the groups ($p>0.15$), thus no co-variance analysis was necessary. The mean scores of the outcome variables were all normally distributed and only slightly or moderately correlated (Pearson’s correlations between 0.20-0.35) at the pre-test and did not violate any of the preliminary assumptions for the multivariate analysis. There were only a few pieces of missing data (i.e., one outcome score for the two groups at Time 3 and Time 4) and the analyses were by intent-to-treat with the initial data brought forward, which made a very minimal difference to the results (Tabachnick and Fidell, 2001). The results of the MANOVA test indicated a statistically significant difference between the groups on the combined dependent variables, $F(5,132)=5.62$, $p=0.002$ (Wilks’ Lambda=0.95; a large effect with partial $[\eta]^2=0.34$). The means and standard deviations of the study outcomes at the four time-points as well as their independent F values for the MANOVA test are presented in Table 3. There were statistically significant differences between the three groups over time

(Group x Time interactions) on an improvement in the families' FAD score [$F(2,132)=5.40$, $p=0.005$] and SSQ6 score [$F(2,131)=5.01$, $p=0.005$] and in the patients' SLOF overall score [$F(2,132)=6.88$, $p=0.001$] and subscale scores ($p=0.005-0.001$) and BPRS score [$F(2,132)=4.65$, $p=0.01$]; and a reduction in the length of the patients' re-hospitalisations [$F(2,132)=4.78$, $p=0.01$].

Insert Table 3

Table 3 also shows that the dosages of medication changed slightly over time, and that there were no differences between the three groups. The service utilisation (FSSI scores) of the three groups (from 3.2 to 3.9 out of 16 services available on the list) were also stable between Time 1 and Time 4, indicating no significant change in their demands for mental health care services over time. The most frequently utilised services included: day care and social programmes for patients (e.g., occupational training and recreational activities), family consultation and counselling, home visits by community psychiatric nurses, and family respite care.

The Helmert contrasts test was conducted to test for any significant differences in mean scores of each variable within each group as well as between the three groups at three post-tests. The results (in Table 4) indicated that the mean differences in the outcomes between the mutual support group and the other two groups were statistically significant, including the following:

- The functioning (FAD) and perceived social support (SSQ6) mean scores of the mutual support group improved significantly at Times 3 and 4 ($p=0.01$ and 0.005 for FAD and $p=0.01$ and 0.001 for SSQ6, respectively) when compared with the group that received standard care; and at Time 4 ($p=0.02$), when compared with the psycho-education group.
- The patient functioning (SLOF) mean score of the mutual support group increased and the severity of their symptoms (BPRS score) decreased significantly at Times 3 and 4,

when compared with the standard care groups ($p=0.001$ and 0.0005 for SLOF; $p=0.01$ and 0.001 for BPRS, respectively), and also at Times 3 and 4, when compared with the psycho-education group ($p=0.005$ and 0.001 for SLOF and $p=0.04$ and 0.03 for BPRS, respectively).

- The average length of the re-hospitalisations of patients in the mutual support group decreased significantly at all post-tests ($p=0.05$, 0.02 and 0.01), when compared with the group receiving standard care, and at Time 4 ($p=0.03$), when compared with the psycho-education group. Very slight and inconsistent reductions in both the average number and the length of re-hospitalisations over time were observed with the psycho-education group.

However, the SLOF scores of the psycho-education group increased significantly at Time 3 (from $M=132.4$, $SD=19.5$ at Time 2 to $M=140.0$, $SD=20.4$ at Time 3) and their BPRS score also decreased significantly at Time 4 (from $M=20.5$, $SD=10.2$ at Time 3 to $M=18.9$, $SD=10.5$ at Time 4). Subgroup comparisons of the mean scores on family and patient functioning, perceived social support, and the patients' re-hospitalisation rates at Times 3 and 4 indicated that there were no significant differences on any of these outcome scores at any time point between the four subgroups of both the mutual support and psycho-education group interventions (i.e., p values >0.10).

Insert Table 4

4. Discussion and Conclusion

4.1. Discussion

This trial was one of very few to test the effectiveness of a mutual support group intervention in providing family-centred care for patients with schizophrenia, compared with a psycho-education group and routine psychiatric care. The findings are encouraging for the use of family-led mutual support groups for Chinese people with schizophrenia in community

care, as this will improve perceived social support and psychosocial health outcomes for both patients and their families. The nine-month mutual support group intervention indicates substantial positive effects 24 months after the intervention. This is strong evidence for the use of mutual support groups as an effective family intervention approach for people with schizophrenia, as it is applicable to a non-Western population, as suggested by a few recent controlled trials (Chien et al., 2008, Humphreys and Moos, 2007, Pistrang et al., 2008). The results indicate significant and consistent improvements in overall family functioning, the severity of the patients' symptoms and the length of their re-hospitalisations, and all aspects of patient functioning (i.e., self-maintenance, social functioning, and community living skills), when compared with those receiving psycho-education and routine care.

Indeed, the psycho-education group also demonstrated significant improvements in family and patient functioning over the first 12 months following the intervention. Family psycho-education is well accepted and widely used in the US (Dyck et al., 2002, McFarlane et al., 1995), other Western countries (Sellwood et al., 2001), and mainland China (Guo et al., 2010, Li and Arthur, 2005, Xiong et al., 1994); however, four systematic reviews on clinical trials of family intervention for people with schizophrenia (Asen, 2002, Bustillo et al., 2001, Mueser et al., 2001, Pharoah et al., 2010) have concluded that this approach to family intervention can only produce a modest effect on family functioning and well-being, particularly in the longer term (e.g., >1 year). The findings of this study also revealed that psycho-education groups may not have a substantial effect on the health outcomes of both patients and their family members at 24 months after the intervention. Given the significant positive effects over two years on the psychosocial health of both the patients and their family members that were found in this trial, mutual support groups can be considered an effective alternative approach to family intervention in schizophrenia care.

In spite of an increasing number of descriptive and prospective studies endorsing the use of mutual support groups for people with schizophrenia and other mental health problems such as substance abuse and eating disorders, as well as for their families, few controlled trials have been undertaken on the effectiveness of this intervention in community mental health services (Chien and Chan, 2004, Chien and Norman, 2009). The findings of this trial lend support for the forming of 9-month family-led mutual support groups for schizophrenia patients, as they demonstrate that re-hospitalisations of patients are reduced and their psychosocial functioning improved. In contrast to the psycho-education and behavioural models of family intervention, this mutual support group does not require a family therapist with extensive training or a highly structured working manual. It can be provided in a flexible, interactive, and peer-led manner that may be more feasible in community care with its resource constraints. It will empower service users to become involved in self-care, and is better oriented to family needs (Humphreys and Moos, 2007, Pistrang et al., 2008).

The results also indicated that there was very little change in demand for family support services in both the mutual support and psycho-education groups. The psychotic symptoms (BPRS scores) of the patients in the two intervention groups declined steadily over 24 months and rates of completion of the intervention were high (95.6% in both the mutual support and psycho-education groups) and attrition rates were very low (4.4% and 6.7%, respectively). These results may reflect the high motivation and enthusiasm towards patient recovery and caregiving of the families who voluntarily participated in the interventions, a suggestion that has also been made in other studies on family support (Chien et al., 2006) and needs-based family behavioural management programmes (Sellwood et al., 2001). The findings may also be explained by the fact that, with increased caregiving knowledge and skills, the family caregivers were better able to cope with their caring role and more successful in managing the patients' symptoms and related behaviours, making more appropriate and effective use of

available community support services as needed (Chien and Lee, 2010, Guo et al., 2010). Consistent with the findings from recent studies on mutual support groups (Chien and Norman, 2009, Humphreys and Moos, 2007), mutual support in family groups can be a stress mediator for those experiencing family life crises because group members provide information and instrumental support (or practical assistance) to meet individual family needs, on top of referrals to community resources by mental health professionals, and/or the group facilitator.

This approach to intervention may win over clinicians who have been hesitant to use family interventions given the intensive, specialised training and supervision required for a family therapist (Chien et al., 2008, Pilling et al., 2002), as well families unwilling to attend a programme to obtain what they considered to be a merely modest benefit. In contrast to the suggestion that family intervention should be of a long duration (>1 year) and on a single-family basis, this study provided a flexible, interactive, and mutual learning environment to mutual support groups, a high level of family participation in self-care, and only a nine-month period of intervention. Yet significant positive effects on the patients' functioning and re-hospitalisations and on family functioning were still demonstrated. However, if family interventions are to be effective, they should be culturally sensitive. A few controlled trials (Chien et al., 2008, Glynn et al., 2006, Wiedemann, 2003) have suggested that family-led mutual support groups can improve family functioning and caregiving through two mechanisms: (a) increased social support and, in turn, an enhanced experiential knowledge and sense of control over interpersonal and caregiving skills; and (b) an "all in the same boat" belief, with better sharing and the adoption of effective strategies in patient care among group members. Similar to the findings in this trial, a few studies conducted in Hong Kong (Chien et al., 2006, Chien et al., 2008, Chien and Lee, 2010) suggest that family mutual support groups for Chinese people with severe mental illness are effective in offering practical

assistance and advice on caregiving and in improving the willingness of people to share their caregiving experiences openly with other families, particularly when little help is forthcoming from elsewhere.

4.1.1. Limitations and future research

A few limitations of this trial should be noted. First, the sample was recruited from two of 20 outpatient clinics in Hong Kong and the participants had suffered from schizophrenia for less than five years. Therefore, families might be more optimistic and motivated about the potential for change and the promotion of health (Chien et al., 2008, Guo et al., 2010). Despite the random selection of subjects, those family members in this study who were volunteers and the caregivers of the patients and who had a satisfactory level of education and monthly income might have been more motivated to participate in the mutual support group (e.g., a very high completion rate) than non-participants. Second, in this trial there was a fairly structured treatment protocol followed by the family participants, which allows for more flexibility and consensus in times of discussion and the carrying out of tasks relating to specific, common concerns and difficulties in caregiving (Cook et al., 1999, Humphreys and Moos, 2007). However, the interactive forces and dynamics between group members and the group leading and coordination skills required by peer leaders to induce benefits and positive feelings in the mutual support group might not be easy to standardise as a protocol or manual of the group programme (Chien and Norman, 2009, Solomon, 2000). The contributions of these group interactions and leadership skills to the therapeutic effects of the mutual support group should be further explored in a future study.

Last, the degree of group involvement and interactions outside group meetings may have significant psychosocial effects on the mutual support group members (Wiedemann, 2003), which were not investigated in this trial. Future research on these potential factors of

influence on a mutual support group, involving interviews and observations of its participants, is recommended.

4.2. Conclusion

This controlled trial of a family-led mutual support group for Chinese people with schizophrenia found longer-term desirable effects on the psychosocial health of both the patients and their families in this group when compared with the psycho-education group and the group that received routine psychiatric care. This study supports the view that family-led mutual support groups facilitated by trained mental health professionals are an effective community-based intervention for Chinese people with schizophrenia. In addition to significant improvements in the mental condition and length of re-hospitalisation of patients, this mutual support group can also improve the psychosocial functioning of both family caregivers and patients, without any increase in demand for mental health services over a two-year follow-up. These findings warrant further research on this group programme involving families from different socio-economic and cultural backgrounds in Asian populations, as well as among patients with other co-morbid mental health problems.

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Table 1 Content of family-led mutual support group programme

Stage	Goals	Content	Length of each stage of programme ^a
Orientation and Engagement	Establishment of trust relationship and goals and main tasks	<ul style="list-style-type: none">• Orientation to the group programme and establishing mutual trust and acceptance• Negotiation of individual and group goals/objectives and roles and responsibilities• Initial discussion of schizophrenia, health problems encountered and effects to oneself and the whole family	2 sessions
Recognition of psychological needs	Open sharing and understanding about individual health concerns; exploration and highlights of cultural issues in families	<ul style="list-style-type: none">• Resolution around power, roles and decision making within group• Sharing of intense emotions and feelings about patient care and family interactions• More information sharing about schizophrenia and its related illness behaviour• Discussion about Chinese culture of family and mental illness• Discuss about the ways to deal with negative emotions to patient	3 sessions (2 nd and 3 rd session attended by patients)

<p>Recognising and managing psychosocial needs of self and family</p>	<p>Understanding about important needs for themselves, patient and family</p>	<ul style="list-style-type: none"> • Discussion about each member's psychosocial needs • Information about medications, managing illness, and available mental health services • Effective communication skills with patient and seeking social support from others • Exploration of home management strategies, e.g., finance and budget, environment, activities and lifestyle 	<p>3 sessions (also attended by patients)</p>
<p>Adopting new caregiving roles and facing life challenges</p>	<p>Learning from peer members about social problem-solving and coping with caregiving</p>	<ul style="list-style-type: none"> • Sharing of effective coping skills, difficulties in caregiving and mutual support • Enhancing problem-solving technique by working on different individuals' caregiving situations • Conducting behavioural rehearsals of effective communication and interactions with patient and other family members • Practicing interpersonal and coping skills learned to real family life (in-between group sessions) and evaluate the results in each family 	<p>4 sessions</p>

Ending stage	Future planning; preparing for group termination, or peer-initiated continuation	<ul style="list-style-type: none"> • Preparation for and discussion about future issues, e.g., separation anxiety, independent living and use of communication and coping skills learned • Evaluation of learning and supporting experiences and goal/objective achievement • Discussion about the continuity of care after intervention and utilisation of personal and community support resources • Explanations of post-intervention assessment and follow-up taken over 24 months. 	2 sessions
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^a The mutual support group programme was held bi-weekly or tri-weekly for nine months.

Table 2. Characteristics of family caregivers and patients at recruitment (N=135)

Characteristics	Mutual Support (n = 45) ^a	Psycho-education (n = 45) ^a	Standard care (n = 45) ^a	Test value ^b	P
<u>Family Caregivers</u>					
Gender					
Male	29(64.4)	28(62.2)	27(60.0)	1.83	0.20
Female	16(35.6)	17(37.8)	18(40.0)		
Age (years)					
	M=42.0, SD=6.8	M=41.2, SD=7.0	M=42.7, SD=7.6	1.40	0.30
20-29	8(17.8)	9(20.0)	7(19.5)		
30-39	15(33.3)	16(35.6)	16(35.6)		
40-49	15(33.3)	14(31.1)	15(33.3)		
50 or above	7(15.6)	6(13.3)	7(15.6)		
Education level					
Primary school or below	10(22.2)	9(20.0)	9(20.0)	2.08	0.12
Secondary school	28(62.2)	28(62.2)	27(60.0)		
University or above	7(15.6)	8(17.8)	9(20.0)		
Relationship with patient					
Child	10(22.2)	9(20.0)	11(24.4)	1.88	0.19
Parent	15(33.3)	16(35.6)	15(33.3)		
Spouse	13(28.9)	14(31.1)	14(31.1)		
Others (e.g. sibling & grandparent)	7(15.6)	6(13.3)	5(11.1)		
Monthly household income (HK\$) ^c					
	M=12,400, SD=2,780	M=11,850, SD=2,987	M=11,800, SD=2,538	2.73	0.09
5,000 – 10,000	8(22.9)	9(25.7)	8(22.2)		
10,001 – 15,000	12 (34.3)	13 (37.2)	13 (36.1)		
15,001 – 25,000	10 (28.5)	10 (28.5)	12 (33.3)		
25,001 – 35,000	5 (14.3)	3 (8.6)	3 (8.4)		

<u>Patients</u>					
Gender					
Male	28 (62.2)	27 (60.0)	29 (64.4)	1.42	0.30
Female	17 (37.8)	18 (40.0)	16 (35.6)		
Age (years)					
	M=24.3, SD=6.9	M=25.2, SD=7.6	M=26.2, SD=8.0	1.25	0.31
18-25	25 (55.6)	24 (53.3)	25 (55.6)		
26-30	13 (28.9)	14 (31.1)	13 (28.9)		
31-40	5 (11.1)	5 (11.1)	6 (13.3)		
41-50	2 (4.4)	2 (4.4)	1 (2.2)		
Mental condition ^d					
Worsened	12 (26.7)	13 (28.9)	12 (26.7)	1.98	0.17
Stable	23 (51.1)	23 (51.1)	22 (48.9)		
Improved	10 (22.2)	9 (20.0)	11 (24.4)		
Duration of illness					
3 months – 1 year	13 (28.9)	12 (26.7)	12 (26.7)	1.54	0.26
1 – 2 years	22 (48.9)	21 (46.7)	20 (44.4)		
2 – 3 years	7 (15.6)	10 (22.2)	10 (22.2)		
3 – 5 years	3 (6.7)	2 (4.4)	3 (6.7)		
Medication ^e					
High	11 (24.4)	12 (26.7)	10 (22.2)	1.48	0.28
Medium	24 (53.3)	24 (53.3)	25 (55.6)		
Low	10 (22.2)	9 (20.0)	10 (22.2)		

^a denotes frequency (f %) or M (mean) and SD (standard deviation).

^b An analysis of variance (F-test, df=132) or the Kruskal-Wallis test by ranks (H statistic, df=2) was used to compare the socio-demographic variables of families among three groups.

^c US\$1 = HK\$7.8

^d Family caregiver's rating of patient's mental condition in the previous month, compared with that in the whole year.

^e Dosage levels of antipsychotic medication were compared with the average dosage of medication taken by patients with schizophrenia in Haloperidol equivalent mean values (Bezchlibnyk-Butler and Jeffries, 1998).

Table 3. Clinical measure scores at Pre-Test and three Post-Tests and MANOVA test (Group x Time) results (N = 135)

Instrument	<u>Mutual support group (n = 45)</u>								<u>Psycho-education group (n = 45)</u>								<u>Standard care group (n = 45)</u>								F(2,132)
	<u>Time 1</u>		<u>Time 2</u>		<u>Time 3</u>		<u>Time 4</u>		<u>Time 1</u>		<u>Time 2</u>		<u>Time 3</u>		<u>Time 4</u>		<u>Time 1</u>		<u>Time 2</u>		<u>Time 3</u>		<u>Time 4</u>		
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	
SLOF (43-215) ^a	127.5	18.5	132.8	20.2	158.5	20.1	171.8	20.0	126.7	17.1	132.4	19.5	140.0	20.4	138.1	20.1	128.8	18.9	128.0	25.0	126.3	25.9	128.0	26.3	6.88 ***
Self maintenance	42.1	9.2	47.5	10.0	56.3	13.8	62.7	14.8	42.0	10.3	43.9	11.1	45.9	11.5	44.5	10.1	40.8	10.0	40.4	9.1	39.8	8.1	39.9	8.9	6.95 ***
Social functioning	39.0	9.0	44.8	11.8	48.8	13.2	54.6	13.3	38.7	11.0	40.7	11.2	44.1	12.0	43.3	11.2	39.9	10.4	39.0	9.5	39.5	8.8	40.0	9.5	5.94 **
Community living	46.4	11.1	40.5	13.0	53.4	14.6	54.5	14.2	46.0	10.0	47.8	11.8	50.0	11.2	50.3	12.5	48.1	11.8	48.6	8.9	47.0	9.4	48.1	9.9	5.25 **
FAD (0-50)	29.1	6.2	31.8	8.9	35.8	9.0	37.0	8.1	29.0	5.7	31.3	9.2	32.5	8.5	31.7	9.9	29.4	8.0	28.4	9.2	28.5	9.4	28.8	10.8	5.40 **
FSSI (1-16)	3.3	1.1	3.5	1.9	3.4	1.8	3.2	1.5	3.6	1.2	3.7	1.6	3.8	1.9	3.6	2.0	3.5	1.1	3.7	1.7	3.9	2.2	3.8	2.5	2.16
SSQ6 (0-6)	2.1	1.2	2.4	1.3	3.0	1.0	3.8	1.1	2.0	0.7	2.1	1.0	2.3	1.5	2.3	0.9	2.1	1.0	2.1	1.2	2.0	1.4	2.0	1.3	5.01 **
Re-hospitalisation																									
Number	2.1	0.9	1.8	0.8	1.7	0.9	1.6	1.2	2.1	0.7	1.9	1.0	2.0	1.1	1.9	1.3	2.0	1.0	2.1	1.1	2.3	1.3	2.3	1.9	2.18
Duration ^b	19.2	4.9	16.2	6.8	16.0	5.9	15.0	8.8	20.0	8.7	17.8	7.9	18.5	8.9	19.0	10.9	19.2	10.5	19.8	9.8	20.9	10.8	20.1	12.2	4.78 *
BPRS (0-108)	21.5	9.7	19.8	9.0	15.5	10.9	12.9	7.8	21.1	9.0	20.9	9.8	20.5	10.2	18.9	10.5	21.1	9.5	22.8	9.8	23.5	12.5	25.9	11.0	4.65 *
Medication ^c	12.0	5.3	11.5	6.8	11.0	5.4	11.0	5.0	11.8	6.0	11.5	5.8	11.3	7.5	11.4	7.1	12.2	5.8	12.0	6.2	12.3	8.5	12.0	7.0	1.96

^a Possible range of scores of each scale indicated in parenthesis.

^b Duration of re-admissions in a psychiatric hospital or in-patient unit at Times 1,2, 3, and 4, in terms of average days of hospital stay at four time periods.

^c Medication scores were based on the converted haloperidol equivalents as recommended by the American Psychiatric Association (1994).

Time 1= baseline measurement at the start of intervention; Time 2= One week after intervention; Time 3= 12 months after intervention; Time 4= 24 months after intervention.

SLOF= Specific Level of Functioning Scale; FAD= Family Assessment Device; FSSI= Family Support Service Index; SSQ6= Six-item Scoail Support Questionnaire; BPRS= Brief Psychiatric Rating Scale.

* $p < 0.01$, ** $p < 0.005$, *** $p < 0.001$.

Table 4. Results of Helmert Contrasts test on four outcome variables with significant differences between groups

Instrument	Time 2			Time 3			Time 4		
	MD, SE	F (1, 89), P value	Difference (95% CI)	MD, SE	F (1, 89), P value	Difference (95% CI)	MD, SE	F (1, 88) P value	Difference (95% CI)
SLOF									
Mutual support vs. psycho-education	0.41, 0.32	1.20, 0.27	0.09 – 0.74	18.50, 5.74	9.85, 0.005	13.12 – 24.23	33.70, 8.21	15.94, 0.001	25.18 – 41.90
Mutual support vs. standard care	4.80, 1.80	4.90, 0.10	3.00 – 6.63	32.20, 7.85	13.20, 0.001	25.80 – 40.12	43.80, 9.86	19.56, 0.0005	34.78 – 52.70
Psycho-education vs. standard care	3.60, 1.02	3.81, 0.15	2.58 – 4.64	13.70, 5.21	8.06, 0.01	7.58 – 18.92	10.12, 4.18	8.16, 0.06	6.02 – 14.23
FAD									
Mutual support vs. psycho-education	0.90, 0.18	3.23, 0.15	0.72 – 1.09	3.31, 0.59	4.28, 0.09	2.72 – 3.90	6.30, 0.98	7.98, 0.02	5.21 – 7.29
Mutual support vs. standard care	3.40, 0.75	4.78, 0.07	2.65 – 4.16	8.30, 1.08	9.01, 0.01	7.12 – 9.40	9.21, 1.75	10.12, 0.005	7.86 – 10.98
Psycho-education vs. standard care	2.90, 0.65	4.25, 0.10	2.25 – 3.56	5.00, 0.71	7.45, 0.04	4.28 – 5.72	4.10, 0.71	4.42, 0.10	3.40 – 4.82

SSQ6

Mutual support vs.	0.30,	1.56,	0.26 – 0.34	0.50,	2.53	0.38 – 0.62	1.50,	8.73,	1.25 – 1.76
psycho-education	0.04	0.12		0.12	0.14		0.25	0.008	
Mutual support vs.	0.30,	1.35,	0.27 – 0.33	1.00,	7.92,	0.75 – 1.25	1.80,	10.54,	1.42 – 2.18
standard care	0.03	0.16		0.25	0.01		0.38	0.001	
Psycho-education vs.	0.01,	0.28,	0.00 – 0.02	0.50,	2.70,	0.30 – 0.60	0.30,	1.42,	0.25 – 0.35
standard care	0.01	0.58		0.10	0.15		0.05	0.13	

BPRS

Mutual support vs.	-1.10,	2.56,	-1.57 – -0.63	-5.00,	7.23	-5.98 – -4.01	-6.00,	7.53,	0.49 – 0.71
psycho-education	0.47	0.22		0.98	0.04		1.10	0.03	
Mutual support vs.	-3.00,	4.35,	-3.63 – -2.36	-8.00,	8.92,	-9.40 – -6.62	-12.02,	12.54,	-13.54 – -10.50
standard care	0.63	0.08		1.39	0.01		1.51	0.001	
Psycho-education vs.	-1.91,	3.78,	-2.49 – -1.33	-3.51,	4.12,	-4.43 – -2.60	-7.01,	8.12,	-8.06 – -5.98
standard care	0.58	0.08		0.91	0.07		1.04	0.03	

Re-hospitalisation - Duration ^a

Mutual support vs.	-1.80,	3.72,	-2.43 – -1.19	-2.50,	4.48,	-4.43 – -2.52	-4.00	7.34,	-5.03 – -3.01
psycho-education	0.62	0.09		0.80	0.07		1.02	0.03	
Mutual support vs.	-3.60,	6.83,	-4.52 – -2.71	-4.90,	8.23,	-6.03 – -3.78	-5.11,	9.45,	-7.80 – -4.89

standard care	<i>0.92</i>	<i>0.05</i>		<i>1.12</i>	<i>0.02</i>		<i>1.08</i>	<i>0.01</i>	
Psycho-education vs. standard care	-2.00,	3.82,	-2.67 – -1.33	-2.41,	4.24,	-3.11 – -1.81	-1.10,	1.98,	-1.56 – -0.64
standard care	0.66	0.09		0.69	0.08		0.46	0.20	

^a Duration of re-admissions in a psychiatric in-patient unit at Times 2, 3 and 4, in terms of average days of hospital stay at three time periods.

SLOF= Specific Level of Functioning Scale; FAD= Family Assessment Device; SSQ6= Six-item Social Support Questionnaire; BPRS= Brief Psychiatric Rating Scale.

Time 2= One week after intervention; Time 3= 12 months after intervention; Time 4= 24 months after intervention.

MD= Mean score difference of an outcome measure between two study groups; SE= Standard error of mean difference.

F scores with a significant p value are written in *italics* in the table.

Figure 1. Flow diagram of clinical trial for three study groups

