

Support management in schizophrenia: a systematic review of current literature

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Background: Schizophrenia is generally considered a chronic disorder characterized by psychotic symptoms and relatively stable neurocognitive and interpersonal deficits. Antipsychotic medication has proven beneficial in reducing psychotic symptoms, but is often not enough to treat cognitive or functional impairments. Residual cognitive impairments are barriers to a patient's full recovery from schizophrenia. Rehabilitation is an alternative and important approach which may be useful, and encompasses a variety of treatments including social skills training and psychoeducational and cognitive behavioral treatments.

Objective: To investigate the efficacy of psychosocial treatments in schizophrenia, evaluating its effects in the short and long term, comparing psychosocial treatments with pharmacotherapy, and assessing the effects of treatment and the main indications for use in patients with schizophrenia.

Methods: A careful MEDLINE®, Excerpta Medica, PsycLIT®, PsycINFO®, and Index Medicus search was performed to identify all papers and book chapters in English for the period 1970–2012.

Results: Findings from the studies included in this qualitative analysis suggest that social skills therapy, cognitive behavioral therapy, family intervention therapy, cognitive remediation therapy, and other nonpharmacological therapeutic strategies may be beneficial for patients with significant functional and symptomatic impairments.

Conclusion: Schizophrenic patients treated with nonpharmacological techniques have more rapid remission and relapse less frequently than patients treated only pharmacologically.

Keywords: schizophrenia, support management, nonpharmacological treatment, cognitive behavioral therapy

Introduction

Schizophrenia is generally considered a chronic disorder characterized by psychotic symptoms and relatively stable neurocognitive and interpersonal deficits. Antipsychotic medication has proven effective in reducing psychotic symptoms and preventing relapses, but is often not enough to treat the associated cognitive or functional impairments. Moreover, residual cognitive impairments are barriers to a patient's full recovery.¹

Individuals diagnosed with schizophrenia often experience social disability and/or occupation dysfunction. For example, these patients frequently have difficulties in work settings, social interactions, and activities of daily living.^{2,3} They also demonstrate poor treatment adherence and experience recurrent relapses.⁴

There is a widespread stigma toward mental illness in many societies across the world,^{5–9} and diagnosed individuals are commonly weakened by the

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process of stigmatization.^{10–12} Some researchers have argued that public stigma is mainly due to the misconception that all psychiatric patients are dangerous and that self-stigmatization is regarded as the self-discredit of individuals via the internalization of negative stereotypes towards themselves and/or their social group.^{8,13–15} Although schizophrenia mainly affects cognition, it also usually contributes to chronic behavioral and emotional problems. Cognitive dysfunctions are present in 80% of schizophrenic patients.¹⁶ These patients experience impairments in daily life, social functioning, and rehabilitation outcome. The medication treatments for individuals with schizophrenia improve clinical symptoms and decrease rates of relapse; however, many aspects of the illness only partially respond to pharmacotherapy. A considerable number of patients with schizophrenia who have been treated with neuroleptic drugs experience little beneficial effect on negative symptoms, residual cognitive impairments, and social functioning.¹⁷

Although antipsychotic medications may effectively reduce the clinical symptoms, cognitive dysfunction remains largely unaffected.¹⁸ Thus, it is important that multiple psychosocial treatments be pursued to address these needs. The effective nonpharmacological treatments include patient and family education, cognitive behavior therapy, training of social competences, supported employment, and psychotherapies. The cognitive impairments associated with schizophrenia are present prior to the onset of the psychotic symptoms of the illness, and seem to be relatively stable over time and independent of clinical state.¹⁹ Furthermore, the cognitive impairments are considered to be the greatest hindrance to psychosocial and vocational rehabilitation.^{20–22} In fact, many studies have demonstrated that various types of cognitive training (CT) may improve neuropsychological performance, psychosocial functioning, and psychiatric symptoms severity.^{23–25} The aim of the present paper was to evaluate the efficacy of nonpharmacological treatments in patients affected by schizophrenia including cognitive behavioral therapy (CBT), social skills therapy (SST), family intervention therapy (FIT), cognitive remediation therapy (CRT), and other nonpharmacological therapeutic strategies.

Material and methods

In order to provide a new and timely systematic review, according to the PRISMA statement for reporting systematic reviews on the management of therapeutic support in schizophrenia,²⁶ a careful MEDLINE®, Excerpta Medica, PsycLIT®, and PsycINFO®, and Index Medicus search

was performed to identify all papers and book chapters in English for the period 1970–2012. The following search terms were used: (psychosocial treatment OR coping) AND (schizophrenia). Textbooks on psychiatry were also consulted. The selection of papers suitable for this review allowed for the inclusion of only those articles published in English peer-reviewed journals, including studies that added an original contribution to the literature. Where a title or abstract seemed to describe a study eligible for inclusion, the full article was obtained and examined to assess relevance based on the inclusion criteria. Any discrepancies between the two reviewers who, blind to each other, examined the studies for possible inclusion were resolved by consultations with senior authors. In addition, reference lists were examined and experts in the field were contacted.

The principal reviewer (MP) inspected all reports. Then, three reviewers (AL, MP, GS) independently inspected all citations of studies identified by the search and grouped them according to topic. Reviewers acquired the full article for all identified papers. Where disagreement occurred, this was resolved by discussion with GS who, also with double-blind features, inspected all articles and grouped them following the major areas of interest identified by all authors. If doubt remained, the study was put on the list of those awaiting assessment, pending acquisition of more information. Any studies vaguely reporting on the subject were excluded from the analysis. Results of this search are presented in the paragraphs regarding support management in schizophrenia. By reviewing selected articles, some specific fields of interest were identified. A number of international experts in the field were also consulted to determine whether studies selected were relevant for discussing the subject matter. The authors and experts that were consulted performed a careful analysis of the literature data and agreed on a number of key subjects relevant to the aim of this paper. Therefore, this paper offers an overview of studies dealing with support management in schizophrenia.

Results

Search strategy

The combined search strategies yielded a total of 139 records screened, of which the most relevant articles were selected for this review (Figure 1). After a complete analysis of the abstracts, 90 full-text articles were reviewed and nine were excluded. Abstracts that did not explicitly mention nonpharmacological treatments of schizophrenia were excluded. Three studies that included data related to treatments of schizophrenia but were not clear about follow-up times were

excluded. Additionally, two studies were excluded because the method of statistical analysis was not specified and 13 studies were excluded because diagnostic criteria or the number of patients studied were unclear. Finally, 64 studies met the inclusion criteria and were included in the present review.

Study outcomes

The study outcomes of the reviewed articles are summarized in Table 1.

FIT and integrated treatment

Chien et al compared three different groups of families of outpatients with schizophrenia: a family mutual support group, a family psychoeducational group, and a group receiving standard psychiatric care.²⁷ The researchers demonstrated substantial positive effects following the family mutual support group intervention. In comparison with psychoeducation and standard care, the results indicated significant and consistent improvements in patient and family functioning, daily life and activities, interaction with the patient, and caregiver burden over the intervention and follow-up periods. These findings support the beneficial effects of an intervention addressing the family's health needs and competence in caregiving.

Giron et al also evaluated the efficacy of FIT in fifty patients with schizophrenia and persistent positive symptoms.²⁸ The patients were allocated to either a psychosocial family intervention or to individual counseling and standard treatment. The researchers found that the family intervention significantly reduced the number of clinical relapses, major incidents, positive and negative symptoms, and admissions to the hospital as well as improved social functioning and employment status.

Several studies have demonstrated that an appropriate family therapy involving patients and their relatives can reduce the distress and burden on the family unit itself with respect to those who had standard care. Moreover, family therapy has proven effective in providing knowledge enhancement about mental illness and its treatment and consequently may offer a better ability to cope with the patients and their disease.^{29–32}

Thorup et al compared integrated treatment and standard treatment in 547 patients experiencing a first episode of psychosis.³³ The integrated treatment focused on social skills, information about the pharmacological therapy, its side effects, and relapse prevention. The authors reported a significant reduction in both psychotic and negative symptoms

in the integrated treatment group when compared to patients receiving standard treatment. The results were stable over the follow-up period and, interestingly, more patients in the control group failed to attend subsequent meetings.³³ Also, other authors found that integrated treatment is more effective than other nonpharmacological therapy in reducing negative symptoms and psychotic episodes and stabilizing positive symptoms.^{34–36} Only Thorup et al showed that integrated treatment did not affect the amount of social contact at a 2-year follow-up observation.³⁷

The positive effect on psychotic symptoms was also established in a study on 76 elderly schizophrenic patients randomly allocated to standard treatment or standard treatment plus SST. The researchers found that the patients receiving the combined treatment performed social functioning activities significantly more frequently than those patients in treatment as usual. Moreover, the standard treatment plus SST group demonstrated a significantly greater reduction of symptoms and achieved significantly greater cognitive insight, indicating more objectivity in reappraising psychotic symptoms, and demonstrated greater skill mastery.³⁸

Similar randomized controlled trials have corroborated these findings. For example, after 1 year and 2 years of follow up, patients who enrolled in the integrated treatment group demonstrated a significant reduction of psychotic symptoms as compared to the standard treatment group.³⁹ A subsequent study also confirmed the improvement of social functioning and psychiatric symptoms, particularly with regard to negative symptoms. In a study of 96 Chinese schizophrenic patients who were randomly assigned to either to the Community Reentry Module (CRM; $n = 48$) or to the supportive counseling group ($n = 48$), enhancing social skills – which represents a cornerstone of the CRM, in addition to providing information and motivation – was found to reduce the rates of rehospitalization and relapse.⁴⁰

Peer support groups and CBT

One randomized controlled trial found that patients enrolled in a guided peer support group experienced an increase in social support, which resulted in significant improvements in self-efficacy and quality of life (ie, less negative symptoms and distress) as compared to the control group. Further, the guided peer support group was led by a nurse and the patients were separated into pairs in order to enhance their relational skills. Another noteworthy finding was that the costs of the two conditions did not differ, suggesting that the treatment group had no financial consequences.⁴¹

Table 1 A summary of the study outcomes of the reviewed articles

Author	Study design	Aim	Sample size
CBT			
Velligan et al ⁵¹	RCT	Assess the improvement in cognitive adaptation.	64 outpatients
Vauth et al ²⁴	RCT	Evaluate the improvements in cognitive failure and negative symptoms in three groups of patients.	138 inpatients
Penades et al ⁶⁰	RCT	Evaluate the effectiveness of CRT on neurocognitive function and later on social functioning and symptomatology.	60 chronic patients
Barrowclough et al ²⁵	RCT	Investigate the effectiveness of CBT in a group of schizophrenic patients.	113 patients with persistent positive symptoms
Lindenmayer et al ⁵⁹	RCT	Assess the improvement of cognitive and work functioning for intermediate- to long-stay psychiatric inpatients.	85 inpatients
Velligan et al ⁵²	RCT	Evaluate the efficacy of environmental supports for adherence to antipsychotic medications and functional outcome.	95 outpatients
Granholtm et al ³⁸	RCT	Evaluate treatment as usual with the combination of treatment as usual plus cognitive behavioral social skills training in older patients.	76 middle-aged and older outpatients
Velligan et al ⁵⁰	RCT	Assess the effect of CAT in patients recently discharged from a psychiatric institute.	45 patients
Grant et al ⁴²	RCT	Demonstrate that negative symptoms can be diminished using CBT in low-functioning patients.	60 patients
Tarrier et al ⁴⁸	RCT	Evaluate the reduction of drug-resistant residual psychotic symptoms in patients through the use of two CBT methods.	49 patients: 27 entered the trial and completed posttreatment assessment and 23 were reassessed at 6 months.
Silverstein et al ⁵³	Multisite randomized trial	Assess how integrating AS into a skills training group affects attention and skill acquisition compared with standard presentation and if AS has effects on psychiatric symptoms.	82 patients
Naismith et al ⁵⁴	RCT	Determine the effects of NEAR on cognition in patients with schizophrenia.	40 patients

Follow-up	Main results	Conclusion
12 months	The CAT group used the supports more than the generic environmental supports group (80% versus 44%). Those in the CAT group were heavy users of supports (66% versus 13%). The CAST group improved a lot in terms of memory and verbal attention and this was important for success in the workplace in the 12 months of follow-up (odds ratio for CAST versus vocational rehabilitation alone was 2.3) The training of self-management skills for negative symptoms group failed to demonstrate improvements in negative symptoms.	Improvement in the adaptive features can be done through CAT provided that the supports are individualized for each patient. There was a cognitive improvement in the CAST group, which was associated with better success in work placement.
6 months	CRT produced an overall improvement in neurocognition. CBT showed the expected treatment effect on general psychopathology but produced only a slight nonspecific improvement in neurocognition.	Patients receiving CRT showed improvement in social functioning, demonstrating that cognitive improvements are clinically meaningful.
12 months	CBT group had a reduction in feelings of hopelessness and improvement in self-esteem but no significant difference was demonstrated with regard to symptoms, social functioning, and relapse.	CBT may have important benefits, including feeling less negative about oneself and less hopeless about the future.
12 months	The CRT group had, in 3 months, significantly greater improvements compared to the control group in terms of verbal learning, psychomotor speed, and global cognitive functioning.	CRT has proved capable of improving the results of work and hence is advantageous in social and cognitive functioning.
6 months	The CAT and environmental support groups were superior to the treatment as usual group in improving adherence to the prescribed treatment ($P < 0.0001$) Full CAT treatment improved functional outcome more than the other two groups. Also, the survival time from relapse was longer in both the CAT and environmental support groups with respect to the treatment as usual group. Patients receiving combined treatment performed social functioning activities significantly more frequently than the patients in treatment as usual. Patients receiving cognitive behavioral social skills training achieved significantly greater cognitive insight, indicating more objectivity in reappraising psychotic symptoms, and demonstrated greater skill mastery.	Environmental supports targeted at global functional outcome improved global community functioning in individuals with schizophrenia. With cognitive behavioral social skills training, middle-aged and older outpatients with chronic schizophrenia learned coping skills, evaluated anomalous experiences with more objectivity (achieved greater cognitive insight), and improved social functioning.
9 months	Patients who underwent CAT showed greater improvements in all fields compared with the patients who received other treatments. Patients treated with CBT showed a clinically significant mean improvement in global functioning from baseline to 18 months and showed a greater mean reduction in avolition/apathy and positive symptoms.	Compensatory strategies, such as CAT, may help patients with schizophrenia and schizoaffective disorders in coping better with everyday life. CBT can be successful in promoting clinically meaningful improvements in functional outcome, motivation, and positive symptoms in low-functioning patients.
6 months	Patients who received both CBT had a significant reduction in psychotic symptoms compared to the control group. Patients receiving social skills training augmented with AS showed a significant increase in attention and a greater ability to acquire skills. It was also demonstrated that the improvement in levels of attention wasn't linked to ingestion and dosage of antipsychotic drugs.	The use of CBT has proved very useful in schizophrenic patients in reducing psychotic symptoms of the disease. AS is a viable strategy of supported cognition because it has been shown to improve cognitive skills in the environmental context in which patients had difficulties.
4 months	Subjects receiving NEAR had a significant improvement in executive functioning, attention, verbal and visual memory, and in social and occupational outcomes. Moreover, these positive effects were maintained even after 4 months of stopping treatment.	NEAR is useful and effective in improving cognition. Such findings can be extended to show a generalization of effects to social/occupational outcomes and persistence of effects in the short term.

(Continued)

Table 1 (Continued)

Author	Study design	Aim	Sample size
Eack et al ⁵⁶	RCT	Evaluate if CET is associated with a significant improvement in the neurocognitive and social status of patients.	58 outpatients randomly assigned to CET or enriched supportive therapy.
Fisher et al ⁵⁷	RCT	Evaluate the effects of a heavy schedule of computerized training delivered as a stand-alone treatment.	32 clinically stable patients
Medalia et al ⁴⁹	RCT	Verify the efficacy of NEAR for problem solving in an acute care service.	28 acute inpatients randomly assigned to the experimental group or the placebo/control group.
Twamley et al ²³	RCT	Explore individual factors predicting treatment outcome.	89 outpatients diagnosed with a primary psychotic disorder (51% schizophrenia, 44% schizoaffective disorder, and 5% psychosis not otherwise specified).
Tsai et al ⁵⁸	RCT	Determine whether participants previously classified as having high negative/poorer attention would continue to have lower self-esteem, higher self-stigma, and also higher levels of anxiety and avoidant coping 5 months later.	99 participants: 77 (77.8%) completed follow-up procedures.
Family education program			
Hazel et al ²⁹	RCT cohort study	Investigate the effects of multiple-family group therapy among members of families of schizophrenic patients with regard to psychosocial resources and distress.	97 patients living in a community at the time of recruitment.
Li et al ¹¹¹	RCT	Investigate the effect of patient and family education in a sample of Chinese people with schizophrenia.	101 patients and their families
Pickett-Schenk et al ³⁰	RCT	Examine the efficacy of a family educational program.	231 family members were randomly assigned to the intervention group (Journey of Hope) and 231 were randomly assigned to a control group.
Barrowclough et al ¹¹²	RCT	Evaluate a needs-based family intervention service for outpatients and their carers.	77 schizophrenic patient–carer pairs
Merinder et al ⁶⁶	RCT	Examine how effective either a short program of patient education or a short program of family education is on outcomes such as compliance and social functioning.	46 patients aged 18–49 years
Lenior et al ³¹	RCT	Assess the social functioning and the course of psychotic symptoms in young patients with early-onset schizophrenia and related disorders.	97 families formerly underwent the intervention program but 73 (51 men and 22 women) participated in the follow-up study.
Chien and Lee ³²	RCT	Evaluate the effectiveness of a schizophrenia care management program for family caregivers of Chinese patients with schizophrenia in Hong Kong.	500 Chinese family members of patients with schizophrenia and 200 (40%) patient caregivers.

Follow-up	Main results	Conclusion
2 years	CET was associated with a greater improvement in cognitive style, social cognition, social adjustment, and symptomatology, including negative symptoms, anxiety, and depression.	Early utilization of CET may improve cognitive functions and functional outcome.
6 months	Patients of both targeted cognitive training groups had a considerable improvement in the control of cognitive and verbal learning/memory. Only targeted cognitive training subjects who performed 100 hours of training achieved a sustained improvement in global cognition and processing speed.	If patients with schizophrenia devote more time to cognitive training, they proportionately obtain many more benefits.
6 months	Compared to the control group, the experimental group improved significantly on the comprehension task, Positive Symptom Distress Index, and Global Pathology Index. There were no significant differences between participants who completed cognitive training and those who began but later dropped out. Cognitive training-associated improvement was correlated with worse baseline scores on measures of cognitive performance, symptom severity, functional capacity, and self-rated quality of life, cognitive problems, and strategy use.	These results support the effectiveness of CRT in improving verbal problem solving abilities in acutely ill psychiatric inpatients. People who are lower functioning at baseline have more room to improve (and do benefit from cognitive training). Higher levels of positive symptoms were associated with more improvement in functional capacity. Older participants show more benefit from CRT.
5 months	The high negative/poorer attention group had significantly poorer social functioning, lower appraisal of their competence, higher levels of anxiety, and a higher preference for ignoring stressors 5 months after classification. Clients with more deficits reported relatively worse psychosocial function.	Negative symptoms with concomitant attention deficits may lead to more social and psychological dysfunction than negative symptoms or attention deficits alone. CRT and social skills training have both shown potential in ameliorating neuropsychological impairments and negative symptoms, respectively.
2 years	In the multiple-family group, the caregivers had a reduction of distress but there was no improvement in psychosocial resources compared to the group receiving standard care.	An appropriate family therapy involving patients and their loved ones can reduce the distress and burden on the family unit itself with respect to those who had standard care.
9 months	The experimental group showed a marked improvement for what concerns the symptoms: during hospitalization and after discharge. Even psychosocial functioning showed a statistically significant difference between the two groups at 9 months after discharge.	Family education has proved effective in improving symptoms and knowledge of Chinese schizophrenic patients.
Baseline or 1 month before the start of the course, 3 months postbaseline, and 8 months postbaseline	Random regression analyses and general linear models confirmed the significant increase in knowledge and decrease in information needs on coping with positive and negative symptoms and problem management in the intervention group compared to the standard group.	Educational intervention programs for relatives of severely mentally ill patients, such as the Journey of Hope, are effective in providing knowledge enhancement and consequently may offer a better ability for patients to cope with their disease.
6 months	Family-treated patients showed superior relapse outcomes.	The effectiveness of family interventions in routine service settings was demonstrated.
12 months	This kind of intervention was found useful for improving communication skills regarding both knowledge of illness and treatment and more existential issues.	A short educational program does not influence relapse, compliance, psychosocial functioning, and insight as much as other more intensive programs.
5 years	There was no differential treatment effect on the course of the illness. Patients who had received additional family intervention spent fewer months in institutions for psychiatric patients than patients who'd had the standard intervention.	Family intervention for patients with schizophrenia, although not specifically focused on social rehabilitation, may diminish institutional care.
15 months	Families in the schizophrenia care management program reported significant improvements in families' and patients' functioning. Caregivers perceived social support. The number and length of patients' rehospitalizations were reduced.	It is important to implement this family-oriented intervention and to validate its long-term effects by comparing it with other family programs.

(Continued)

Table 1 (Continued)

Author	Study design	Aim	Sample size
Psychosocial education program			
Vreeland et al ⁶⁷	Randomized single-blind study	Improve ability to manage their disease for a group of schizophrenic patients through a program of psychoeducation.	71 patients
Patterson et al ⁶⁸	RCT	Evaluate the effects of a psychosocial intervention in a group of elderly patients with severe mental illness.	21 patients
Chabannes et al ⁶⁵	Multicentric open RCT	Evaluate the efficacy and impact of a new psychoeducational program on the 1- and 2-year rate of relapse.	220 patients
Kulhara et al ⁶⁹	RCT	Estimate the effectiveness and impact on parameters related to patients and caregivers of a structured psychoeducational intervention for schizophrenia.	76 patients and their caregivers
Shin and Lukens ⁷⁰	RCT	Evaluate the implication of a psychoeducational intervention in schizophrenic Korean patients.	48 patients: 24 in the experimental group and 24 in the control group.
Klingberg et al ⁶³	RCT	Determine which subpopulation of patients may profit from a psychoeducational program and CBT.	191 outpatients: 156 took part in the study
Barrowclough et al ⁴³	RCT	Evaluate the advantages of an integrated psychological and psychosocial treatment program compared to routine psychiatric care for patients with comorbid schizophrenia and substance use disorders.	36 patients aged 18–65 years
Herman et al ⁷¹	RCT	Examine the effects of a psychosocial intervention (CTI) on the cardinal symptom dimensions of schizophrenia, namely negative, positive, and general psychopathology.	96 patients (men)
Gil Sanz et al ⁵⁵	RCT	Describe the efficacy of the Social Cognition Training Program in emotion recognition and social perception.	14 patients
Giron et al ²⁸	RCT	Study the efficacy and effectiveness of psychosocial family intervention with regard to clinical and social functioning and family burden after controlling for compliance and several prognostic factors.	50 patients
Jahn et al ⁷²	RCT	Examine whether illness knowledge after psychoeducation could be predicted more precisely from the neurocognitive status than the psychopathological status of the patients and which neurocognitive domains are best predictors.	116 inpatients

Follow-up	Main results	Conclusion
6 months	Although there were no improvements in functioning or symptoms, the intervention group reported better knowledge of the disease and greater satisfaction.	The knowledge of a disease as complex as schizophrenia can be enhanced through participation in the Team Solutions psychoeducational program.
6 months and 12 months	The improvement of skills in patients in the training program was significantly higher and remained greater even during the period of follow-up.	This training program targeted at older Latinos has proven effective in terms of skills and independence.
2 years	The effects were fewer in the SOLEDUC® group compared with the control group (21.6% versus 28.4% after 1 year and 84.4% versus 90.8% after 2 years) but the differences were not statistically significant. The risk of relapse was significantly reduced for patients who took at least seven modules ($P = 0.015$ Anderson–Gill test, $P < 0.001$ Prentice, Williams, and Peterson test).	There were no major differences between the SOLEDUC® group and the control group. Attendance of at least seven out of 21 program sessions was required to see a modest, but significant, 2-year relapse prevention in schizophrenia.
9 months	There were better results on several indices including disability, psychopathology, caregiver support, and caregiver satisfaction.	Structured psychoeducational intervention is a viable option for the treatment of schizophrenia, conferring some additional benefits even in developing countries like India.
1 week after the end of the intervention	The severity of symptoms, stigma perception, and coping skills improved over time and significantly more in the experimental group.	The findings support the relevance of psychoeducational techniques as an instrument to approach schizophrenic patients.
2 years	Subjects with better prognosis and social functioning who underwent the specific treatment showed a better course of the disease but the outcome was less favorable in the nonspecifically treated group.	More vulnerable patients are not sufficiently capable of learning and using coping strategies for relapse prevention.
1 year	For patients with comorbid substance abuse disorders and schizophrenia, an intensive treatment program integrating routine care with motivational interviewing, CBT, and family intervention resulted in significant improvement in the main outcome of patients' general functioning when compared with routine care alone.	The advantage of the integrated treatment was evident in terms of both symptom improvement and reduction in substance use.
6 months	CTI is associated with a statistically significant decrease in negative symptoms at the 6-month follow-up, reflecting modest clinical improvement, with no significant effect on positive or general psychopathology symptoms.	Although CTI was originally designed and tested with homeless men leaving a shelter, it may also be fruitfully applied in other settings including psychiatric hospitals and correctional facilities.
1 year	Improvement in social perception and interpretation in the experimental group compared to the control group, but not in emotion recognition.	The data obtained should not be generalized to the entire population of people with schizophrenia.
2 years	Family intervention was associated with fewer clinical relapses, hospitalizations, and major incidents, and an improvement in positive and negative symptoms, social role performance, social relations, employment, and family burden. The reduction in hospitalizations in the family intervention group was significantly greater than that observed in the group of patients who refused to participate but this was not the case for the control group.	Psychotic episodes result from the interaction between the individual vulnerability of the patient and the level of environmental stress the patient is exposed to. The improvement in patients' clinical conditions and social functioning may be related to changes in relatives' attitudes as a result of the psychosocial intervention.
9 months	The patients' neurocognitive status might be a more important predictor of psychoeducation outcome than psychopathology, at least with regard to illness knowledge. A patient with extreme psychomotor excitement or strong preoccupation caused by hearing voices will probably be unable to attend a psychoeducational treatment group, let alone take advantage of it.	Neurocognition (particularly memory acquisition) is a significant predictor of illness knowledge after psychoeducation, while the level of psychopathology is not.

(Continued)

Table I (Continued)

Author	Study design	Aim	Sample size
Chien and Chan ⁷³	RCT	Assess the improvement of psychosocial functioning in a group of schizophrenic patients through a multiple-family group with respect to a psychoeducation group and standard care group.	96 Chinese families who were caring for a relative with schizophrenia.
Chien et al ²⁷	RCT	Investigate the effectiveness of a mutual support group versus psychoeducation and standard care in Chinese families of people with schizophrenia.	96 families of outpatients with schizophrenia
Horan et al ⁷⁴	RCT	Assess key aspects of social cognition (social perception, affect perception, attributional style, theory of mind) in outpatients with psychosis subjected to a new twelve-session social cognitive skills training program.	31 clinically stabilized outpatients
Xiang et al ⁴⁰	RCT	Investigate the effectiveness of the CRM on social functioning, symptoms, relapse rate, and rehospitalization in a group of Chinese schizophrenic patients.	96 outpatients
Xiang et al ⁹⁴	RCT	Evaluate the effectiveness of the CRM (a module of a standardized, structured social skills training program devised at the University of California, Los Angeles) in Chinese patients with schizophrenia.	103 patients
Patterson et al ⁷⁵		Evaluate the effectiveness of a FAST intervention focused on everyday living skills for middle-aged and older patients.	32 patients
Patterson et al ⁷⁶	RCT	Improve the everyday skills in a group of elderly patients with severe mental disorders through a psychosocial approach.	240 patients
Torres et al ⁷⁷	RCT	Test the effectiveness of a game called El Tren (The Train) in developing social behaviors in patients with schizophrenia.	49 patients: 36 men and 13 women receiving antipsychotic medication.
Glynn et al ⁷⁸	RCT	Evaluate improvements in social adjustment and quality of life comparing patients receiving clinic-based skills training with or without the addition of manual-based in vivo training.	Ages ranged from 18–50 years. 63 patients
Hogarty et al ⁷⁹	RCT	Evaluate a personal therapy that was specifically designed to prevent late relapse in schizophrenic patients.	151 patients
Hogarty et al ⁸⁰	RCT	Study the effects of personal therapy on adjustment of patients and consider the effects of relapse.	151 patients
Marder et al ⁸¹	RCT	Evaluate the outcomes of both social skills training and group therapy on improving social adjustment and preventing psychotic relapse in schizophrenic outpatients.	80 male schizophrenic outpatients stabilized with fluphenazine decanoate (plus oral fluphenazine or placebo).

Follow-up	Main results	Conclusion
12 months	The mutual support intervention showed an improvement in social functioning and rehospitalization but not for the use of ambulatory services as compared to the other two groups.	This study emphasizes the importance of peer support and empowerment among members of the same family but also between those of different families who feel united not only by experience that relates to the disease but also from membership in the mutual support group.
18 months	There were substantial benefits for the mutual support group throughout the period of the follow-up in terms of reducing the burden on families in a financial sense, the activities of daily life, and interaction with patients, including all aspects of overall self-functioning.	The mutual support group improves the functioning of the patients, the load on caregivers, and an improvement on the family in general terms.
4 months	Great improvement in facial affect perception in the social cognition group compared to the control group. Furthermore, this improvement appeared to be independent of changes in basic neurocognitive functioning or symptoms.	Social cognitive intervention is very effective and useful in community-dwelling outpatients. Further development of this therapeutic approach should be encouraged in order to achieve even greater improvements in social cognition and generalization of treatment gains.
6 months	Participants in the CRM improved in symptoms and in social functioning as well as in the rates of relapse and rehospitalization but had no statistically significant differences in the latter case.	The Chinese version of the CRM has proven to be effective in improving symptoms, social functioning, rates of relapse and rehospitalization, and more generally on psychopathology.
24 months	A significant improvement in social functioning, insight, and psychiatric symptoms in the CRM group compared to the psychoeducation group. Moreover, the reemployment rate was significantly higher and relapse and rehospitalization rates were significantly lower in the CRM group.	The results show CRM to be an effective and possible psychosocial intervention for Chinese patients with schizophrenia.
3 months	FAST-treated patients increased their independence and performance in everyday living skills. These results were evident immediately after intervention and also at the 3-month follow-up. There was no significant improvement in psychopathology.	FAST may be useful for older patients participating in this skills training program.
6 months	The FAST group had improved social skills, but there was no effect on the ability of medication management.	Participation in the FAST group improved daily living skills and social functioning, even if used in a sample of patients with chronic disorders.
6 months	The participants in the group practicing El Tren had a significant improvement in social withdrawal, interpersonal functioning, recreational activities, and work.	El Tren can be usefully added in a package of psychiatric rehabilitation.
60 weeks	Patients who received augmented skills training in the community had significant improvements.	There should be generalization training in the community to improve the social functioning of persons with schizophrenia.
3 years	Personal therapy was more effective than family and supportive therapies in preventing adverse outcomes among patients who lived with family but it increased psychotic relapse for patients living independent of family.	A personal therapy intervention might work better if delayed until patients are stable in symptoms and residential arrangements.
3 years	Both in patients living with family and living independent of family there were positive effects of personal therapy on social adjustment. Although, patients receiving personal therapy showed more anxiety than the ones receiving family or supportive therapy.	Personal therapy has positive effects on the social adjustment of schizophrenic patients. Personal therapy is a valid psychosocial intervention, and it continues to improve social adjustment 2–3 years after discharge.
2 years	Social skills training and social adjustment were more effective than supportive group therapy when fluphenazine decanoate was supplemented with oral fluphenazine.	Social skills training – when associated with active drug supplementation – can improve social adjustment in schizophrenic outpatients.

(Continued)

Table 1 (Continued)

Author	Study design	Aim	Sample size
Fardig et al ⁴	RCT	Evaluate the effects of the IMR program on symptoms and psychosocial functioning of individuals with schizophrenia or schizoaffective disorder in an outpatient setting in Sweden.	41 patients
Lysaker et al ⁸²	RCT	Examine the relationship of insight to compliance with a work rehabilitation program and with levels of psychopathology and psychosocial functioning.	85 patients: 81 males and four females.
Errorless learning training			
Kern et al ¹¹³	RCT	Evaluate the advantages of errorless learning training focused on teaching entry-level job tasks to patients with serious mental disease.	65 clinically stable outpatients
Kern et al ¹¹⁴	RCT	Evaluate the effectiveness of errorless learning for deficits in social problem solving skills in patients with schizophrenia.	60 patients
Integrated treatment			
Thorup et al ³³	RCT	Investigate the efficacy of an integrated treatment in a group of patients at their first psychotic episode with regard to negative, psychotic, and disorganized symptoms.	547 patients
Grawe et al ³⁴	RCT	Evaluate benefits derived from continued integrated biomedical and psychosocial treatment for recent-onset schizophrenia.	50 patients
Thorup et al ³⁷	RCT	Evaluate what predicts the number of family members and friends in the social network after 2 years of treatment, and above all to clarify if an intensive psychosocial and integrated treatment model would influence that.	547 first-episode psychotic patients
Jenner et al ³⁵	RCT	Verify the efficacy of hallucination focused integrative treatment in chronic schizophrenics with drug-resistant auditory hallucinations.	76 patients: 37 in the experimental group.
Galderisi et al ³⁶	RCT	Test if an integrated rehabilitation program, including individualized cognitive and social skills training, is more effective than the SLA carried out in many Italian mental health departments.	30 patients (21 males and nine females) randomized to the SSANIT group and 30 (19 males and eleven females) patients to the SLA group.
Coping skills module			
Leclerc et al ¹¹⁵	RCT	Evaluate the effectiveness of the coping skills module on patients' symptomatology, attitude, and individual perceptions.	99 patients: 55 in the experimental group and 44 in the standard group.

Follow-up	Main results	Conclusion
12 months	IMR program participants demonstrated significantly greater improvement in illness management than the control group. Participants in treatment improved on the self-control coping factor. A statistically significant decrease in suicidal ideation was found for IMR program participants between baseline and follow-up.	The IMR program improves the ability of individuals with schizophrenia to manage their illness.
9 months	Individuals with schizophrenia and poor insight have greater difficulty remaining in a course of treatment, regardless of whether it is psychosocial or pharmacologic. Significant relationships exist between insight and conceptual disorganization, suspiciousness, poor rapport, stereotyped thinking, and active social avoidance items.	Insight appears to be associated with a variety of other symptoms including lack of spontaneity, stereotyped thinking, difficulty in abstract thinking, and excitement. It is intimately related to other manifestations of psychopathology, in particular symptoms of cognitive dysfunction.
3 months	This training method seems more effective at teaching entry-level job tasks than conventional methods and improving patients' accuracy in these tasks even if there is no improvement in speed of performance.	This training method produced improvement on work performance and it may be usefully included in the work rehabilitation programs.
3 months	In all three areas of competence of the training there was a decided improvement in the management of symptoms.	An application of the method in a wider range of skills is desirable to improve the quality of life, social functioning, and work functioning.
2 years	Compared to the group receiving standard care, the integrated treatment group had better outcomes in both positive and negative symptoms.	The integrated approach has proven crucial in particular for this group of patients at their first psychotic episode.
2 years	Integrated treatment is definitely more effective than standard treatment in reducing negative symptoms and psychotic episodes in children and stabilizing the positive symptoms.	The evidence-based treatment brings significant benefits to these patients with recent-onset schizophrenia compared to pharmacotherapy alone.
2 years	The integrated treatment did not affect the amount of social contact after 2 years of observation. Further, the limited social contacts were associated mainly with male gender, negative symptoms, and a long duration of untreated psychosis, but not with young age and the number of days of hospitalization.	Even if the integrated treatment was not sufficient in this study, it is extremely important to try to improve personal skills, social contacts, and social integration with strategies that supplement standard therapies.
9 months	The experimental group reported a significant improvement in positive symptoms, disorganization, general psychopathology, and burden.	Hallucination focused integrative treatment has positive effects on patients' quality of life, particularly in subjective burden and social functioning. Furthermore, this treatment is a cost-effective procedure that may improve patients' mental state.
6 months	The two groups of patients did not differ at baseline on psychopathology, neurocognition, and personal/social functioning. After 6 months of treatment, personal and social functioning was significantly better in patients assigned to SSANIT than in those assigned to usual rehabilitation activities practiced in mental health departments.	The study results showed higher efficacy in the SSANIT program compared to the SLA program after 6 months of activities.
6 months	Patients who underwent the module reported a decrease in delusions on the Positive and Negative Syndrome Scale and an increase in self-esteem. These positive outcomes persisted over the 6-month period during follow-up, while they remained stable for the control group. The patients' hygiene capacity was also maintained during follow-up, whereas the control group showed a decline over time.	This module improves patients' competence in both knowledge about their abilities to cope and in adopting adequate coping strategies that consequently enhance their general state of mental health.

(Continued)

Table 1 (Continued)

Author	Study design	Aim	Sample size
Andres et al ⁴⁶	Controlled pilot study	Compare the different effect of a coping-oriented group therapy to a supportive group therapy and to identify relevant factors of this therapy.	32 patients: 17 in the coping-oriented group and 15 in the supportive group.
Norman et al ⁴⁷	RCT	Evaluate the impact of a stress management program added to other rehabilitation interventions for patients with schizophrenia.	121 patients clinically stable aged 17–50 years.
Self-esteem enhancement program			
Borras et al ⁴⁵	Randomized crossover study	Analyze the effectiveness of a self-esteem enhancement program for people with severe mental disorders.	54 outpatients
Lecomte et al ⁴⁴	RCT	Evaluate a self-esteem module for improving coping in severely handicapped schizophrenic patients.	95 patients (23 women and 72 men)
Others			
Ulrich et al ⁸⁸	RCT	Evaluate the effect of music therapy for schizophrenic in-patients needing acute care.	37 patients
Buchain et al ¹¹⁶	RCT	Evaluate the effectiveness of occupational therapy in addition to standard care in a group of patients with severe mental illness that resist treatment.	18 patients
Vancampfort et al ¹¹⁷	RCT	Analyze the subjective state of wellbeing, psychological distress, and state anxiety after a single session of yoga and after acute aerobic exercise and compare the response to a control group who did not practice exercise.	57 patients: 40 participants underwent the final analysis.

Abbreviations: AS, attention shaping; CAST, computer assisted cognitive strategy training; CAT, cognitive adaptation training; CBT, cognitive behavioral therapy; CET, cognitive enhancement therapy; CRM, community re-entry module; CRT, cognitive remediation therapy; CTI, critical time intervention; FAST, functional adaptation skills training; IMR, illness management and recovery; NEAR, neuropsychological educational approach to remediation; RCT, randomized controlled trial; SLA, structured leisure activities; SSANIT, social skills and neurocognitive individualized training.

Twamley et al found that patients who reported lower scores at baseline improved more and benefited from cognitive training.²³ The researchers found that these patients may have more room to improve and perhaps are more open to employing new strategies and are further motivated to address their cognitive problems. Specifically, they demonstrated – as compared to the group randomized to standard pharmacotherapy alone – that those receiving CT showed significantly more improvement on measures of attention, memory, negative symptoms, and subjective quality of life.²³

Similarly, Grant et al randomly assigned participants to either the study intervention condition (CT plus standard treatment) or to the control condition (standard treatment alone).⁴² They reported that the CT plus standard treatment patients showed a clinically significant mean improvement in global functioning from baseline to 18 months compared

to the control group. The researchers explained this finding by suggesting that the patients who received the treatment became motivated to engage in tasks that moved them out of their withdrawn state. Moreover, the treatment encouraged patients to fix objectives related to their daily functioning.⁴² Furthermore, Barrowclough et al demonstrated the effectiveness of a program of routine care integrated with motivational interviewing, CBT, and family intervention over routine psychiatric care alone for patients with comorbid schizophrenia and substance use disorders.⁴³

Lecomte et al examined a schizophrenic population postulating that empowering these individuals' self-esteem would improve competence in coping skills.⁴⁴ They developed the “self-esteem module” around five principal areas regarding sense of security, identity, belonging, purpose, and a sense of competence. Ninety-five subjects were randomly

Follow-up	Main results	Conclusion
12 months and 18 months	Both groups showed a reduction in the severity of psychopathology and negative symptoms. The weighting on the first coping factor and the third coping dimension, characterized by resignation and helplessness, resulted in better psychopathology and symptomatology after 1 year of therapy.	The results of this small pilot study underline the clinical importance of specific coping styles supporting the suitability of coping behavior in psychological interventions for schizophrenia patients.
1 year	Patients attending the program have had less hospital admissions after treatment.	Stress management training gives patients new skills that may decrease subsequent acute exacerbation of symptoms with need for hospitalization.
3 months	Positive effect on self-esteem, self-evaluation on implementation of active coping strategies, and the reduction of positive symptoms in patients who adhered to the general form of self-esteem as opposed to those receiving traditional care.	Subjects with schizophrenia derive positive effects from the self-esteem module, especially when they are involved in a rehabilitation program.
6 months	The efficacy of the self-esteem/empowerment module was demonstrated by an increase in the coping abilities of these patients.	This kind of intervention could be useful both at the beginning of and during the rehabilitation process.
8 months	Music therapy is important in reducing the negative symptoms of patients and improving their sense of self and their interpersonal contacts.	Music therapy is useful as a tool to foster social development and to improve the adaptive capacity of patients after discharge from hospital.
6 months	The occupational therapy group proved to be effective throughout the intervention and in particular from the fourth month until the end of treatment.	The addition of occupational therapy to clozapine appears to be effective in patients resistant to treatment than those treated with clozapine alone.
8 months	Patients who participated in a session of yoga and aerobic exercise showed greater subjective wellbeing and reduced psychological distress and anxiety compared to the control group.	Yoga and aerobic exercise are useful tools to reduce anxiety and stress. They may be used with great benefit in patients with schizophrenia.

assigned either to the experimental group (n = 51) or to the control group (n = 44). The experimental group demonstrated a significant increase in their active coping strategies and a significant reduction in their positive symptoms as compared to the control group, whose symptoms ultimately remained stable over the course of the study. It is important to note that the patients who experienced the best outcomes were those having the lowest coping abilities and presenting with more symptoms at baseline.⁴⁴ The results of this study underscore the importance of a healthy environment which actively involves the patients and empowers them to positively promote their capabilities. These findings were recently corroborated by another randomized study employing the same self-esteem module in which the researchers found improvements in patients' psychotic symptomatology, coping skills, and self-esteem.⁴⁵ Another study of interest is the work of Andres

et al, who investigated the role of several coping methods as outcome variables and their effectiveness in patients diagnosed with schizophrenia.⁴⁶ Leclerc¹¹⁵ proposed a coping and competence module based on seven steps, which includes paper work, discussion, and peer support with the primary aim of promoting patients' competence and teaching them coping strategies to effectively manage complex situations. Specifically, participants are taught to recognize emotional, physical, and cognitive symptoms, sources of stress, to relate the latter to the symptomatology, to understand whether aspects of the stressor are modifiable or not, to evaluate possible resources available to cope with these stressors, and to generate strategies to deal with them. Patients who participated in the module reported a decrease in delusions on the Positive and Negative Syndrome Scale and an increase in self-esteem as reported on the Rosenberg Self-Esteem Scale. Moreover, these

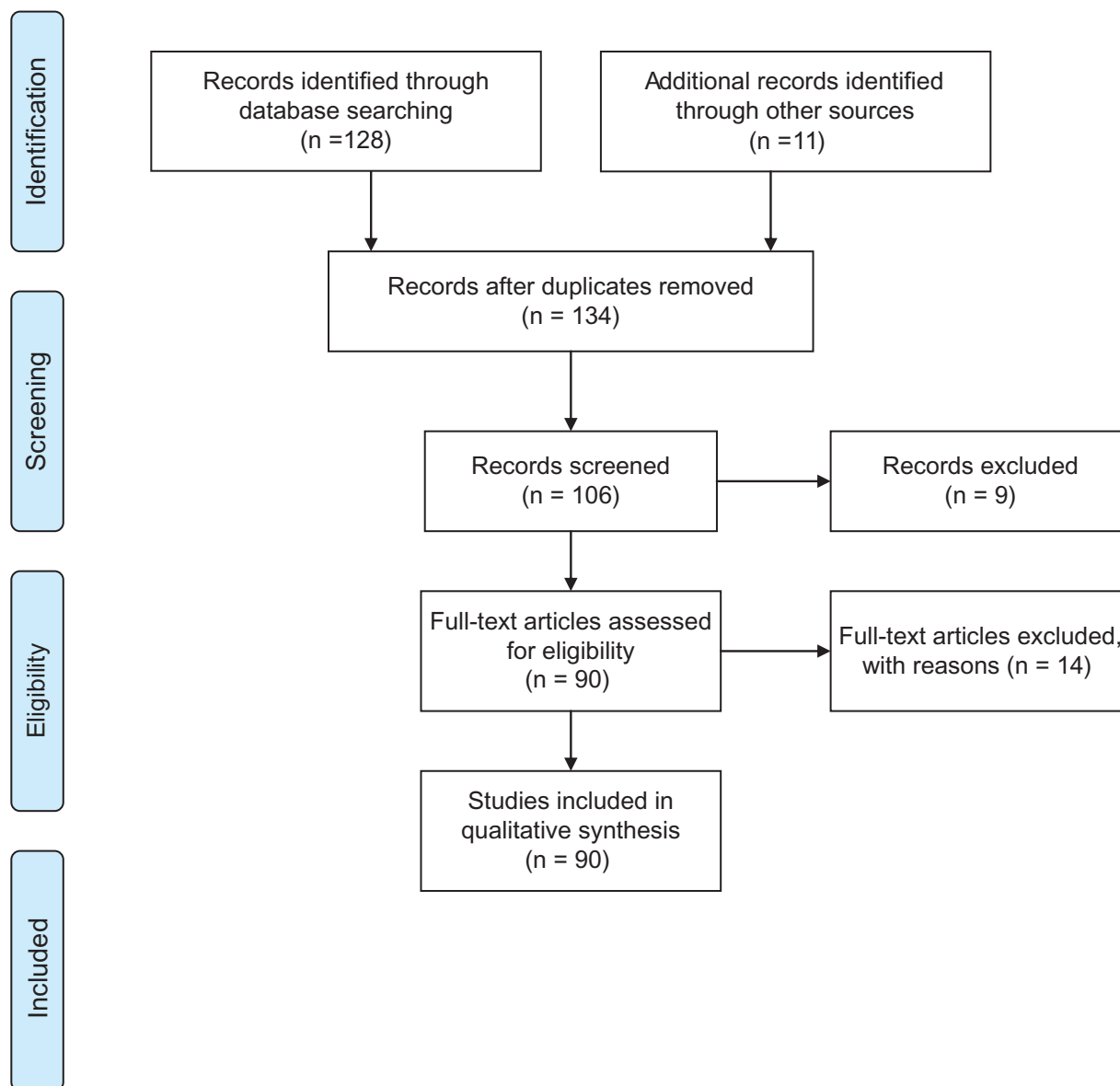


Figure 1 PRISMA 2009 flow diagram.

Note: For more information, visit <http://www.prisma-statement.org>. Adapted from Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *PLoS Med.* 6(6):e1000097. doi:10.1371/journal.pmed1000097.¹¹⁰

positive outcomes persisted over a 6-month period during follow-up, but remained stable for the patients not involved in the module. In addition, the patients' hygiene capacity was also maintained during follow-up, whereas the control group showed a decline over time.

In accordance with these findings, there was a subsequent study confirming the effectiveness of specific stress management training for schizophrenic patients. Specifically, the patients receiving the 12-week relaxation program (based on reducing physiological stress by the use of autogenic training and muscular relaxation, improving physical resistance and cognitive and behavioral ability) had lower rates of

posttreatment hospitalization compared to the control group over the 1-year follow-up period.⁴⁷

Also, other authors have demonstrated that CBT contributed to significantly greater improvements in terms of verbal learning, psychomotor speed, and global cognitive functioning.^{24,25,48–58} Many of the studies that were reviewed have demonstrated the effectiveness of the CRT intervention. For example, Lindenmayer et al evaluated the feasibility and efficacy of a CRT program for improving cognitive and work functioning for intermediate- to long-stay psychiatric inpatients.⁵⁹ In this study, symptoms were assessed with the Positive and Negative Syndrome Scale at

baseline, midtreatment, posttreatment, and at 6-month and 12-month follow-ups. Results indicated that patients in the CRT group demonstrated significantly greater improvements over 3 months than the control group in overall cognitive functioning, psychomotor speed, and verbal learning, and worked more weeks than the control group over the 12-month follow-up period.⁵⁹ These findings suggest that this program may be beneficial for patients with significant functional and symptomatic impairments.

A similar randomized controlled trial was conducted by Penades et al.⁶⁰ In this study, the researchers examined the effects of a neurocognitive intervention in treating chronic schizophrenia outpatients in a clinical setting. They showed that CRT significantly improved neurocognition, particularly in verbal and nonverbal memory, and improved social and executive functioning. Further, these positive outcomes remained present at the 6-month follow-up and CRT also had a positive, but nonsignificant, effect on symptomatology.⁶⁰ These results support the efficacy of CRT and it may be concluded that this treatment is useful in improving neurocognitive abilities such as attention, memory, and executive functioning.

Other nonpharmacological therapeutic strategies

In a small scale study among adolescents, Rund et al showed that a program of psychoeducation reduced relapse in twelve patients with schizophrenia compared to twelve controls who received standard treatment.⁶¹ Moreover, other studies have also shown positive results.^{62–64} Furthermore, Chabannes et al investigated the impact of a new psychoeducational program (SOLEDOC[®]) on rates of relapse (rehospitalization) over 2 years in 220 patients with schizophrenia.⁶⁵ The risk of relapse was significantly reduced for patients who followed at least seven modules of the psychoeducational program ($P=0.015$ Anderson–Gill test, $P<0.001$ Prentice, Williams, and Peterson test).

Merinder et al compared the effectiveness of a shorter (in comparison with a standard family psychoeducation) program of patient education and a shorter program of family education.⁶⁶ Results revealed a statistically significant increase in knowledge of schizophrenia and aspects of satisfaction in both relative and patient programs at postintervention. Further, the educational interventions were found to be useful in improving communication skills regarding treatment and more existential issues. However, the programs did not influence relapse, compliance, psychosocial functioning, or insight as much as other more comprehensive programs.

Vreeland et al investigated the efficacy of a psychoeducation treatment termed Team Solutions, which aimed to

improve the knowledge of illness management and treatment in a group of patients diagnosed with schizophrenia or schizoaffective disorder.⁶⁷ The results from this study demonstrated that patients belonging to the Team Solutions psychoeducation group showed significant improvements in their knowledge; however, participation in the program did not demonstrate superiority over treatment as usual with respect to secondary and tertiary outcomes, such as symptom severity, treatment adherence, and global functioning.

Additionally, other studies have demonstrated that the advantage of psychoeducational techniques was evident in terms of both symptom improvement and reduction in substance use and, above all, they were important in helping individuals with mental illness cope with self-stigmatization, enhance their readiness for change, and facilitate their psychosocial treatment participation.^{4,43,55,63,68–82}

Lecomte et al evaluated a self-esteem module for improving coping strategies in severely handicapped schizophrenic patients.⁴⁴ The researchers found an increase in coping abilities among these patients, demonstrating the efficacy of the self-esteem/empowerment module. This kind of intervention may be useful both at the beginning of and during the rehabilitation process.

In another study, which followed the work of Lecomte et al,⁴⁴ Borrás et al developed a module of self-esteem, and recruited 54 outpatients with schizophrenia to receive the treatment.⁴⁵ The researchers found significant positive self-esteem module effects on self-esteem, self-assertion, and active coping strategies, and a reduction of positive symptoms in patients who adhered to the general form of self-esteem compared to those receiving traditional care. These results are also in line with the findings of previous studies.^{44,83,84} Moreover, several studies have demonstrated the importance of motivation and self-esteem for the acquisition and maintenance of adaptive and/or coping strategies.^{85,86}

In a recent study, 37 patients with schizophrenia were examined and randomly assigned into two different groups – one of which, in addition to receiving all the care and treatments for the specific disease, was enrolment into music therapy programs.⁸⁷ The obtained results highlighted the importance of music therapy in reducing the negative symptoms among schizophrenic patients as well as improving their sense of self and their interpersonal contacts. These positive effects underscore the potential usefulness of music therapy as a tool to foster social development and to improve the adaptive capacity of patients after discharge from the hospital.

Moreover, several studies and mounting evidence has suggested that the CRM is an effective method for the rehabilitation of patients suffering from schizophrenia.^{88–92} For example, the results obtained by Xiang et al revealed that CRM was an effective and feasible psychosocial intervention for Chinese patients with schizophrenia.⁹³ Specifically, the results indicated a significant improvement in social functioning, insight, and psychiatric symptoms in the CRM group as compared to the control group receiving only psychoeducation. Furthermore, another important finding in this study was that the reemployment rate was significantly higher and the relapse and rehospitalization rates were significantly lower in the CRM group.

Discussion

As previously noted, there are several psychosocial treatments for schizophrenia, which are frequently assembled together composing different pathways; however, the main categories are SST, CBT, FIT, CRT, and other nonpharmacological therapeutic strategies.

Social skills are defined as the ability to express verbal and nonverbal emotions, both positive and negative, which constitutes the basis of everyday social interactions (ie, socialization). These behaviors are socially determined and therefore are situation specific. Although socially skilled behaviors are generally acquired during natural development, they are also learnable through training. Schizophrenia is associated with severe impairment of social functioning, which in turn contributes to a variety of issues including stress, frustration, isolation, delusion, and worsening of the symptoms often affecting patients' quality of life and thus, the outcome. Therefore, the aim of SST is to teach individuals how to recognize and correctly interpret these forms of social communications in order to appropriately cope with emotions and sufficiently relate to others and society.^{81,94} Moreover, addressing these social impairments and communication difficulties should reinforce social networks, which positively affect patients' mental health wellbeing such as the rates of relapse, rehospitalization, and severity of the symptomatology. It should also be noted that SST is considered an adjunct therapy given that the best outcomes are obtained when it is combined with pharmacological treatment.⁸¹

The aforementioned assumptions are in line with evidence found in other studies. Specifically, researchers have observed significantly more improvement in schizophrenia patients' social functioning and their self-esteem when enhancing social skills as compared to controls undergoing standard treatment.^{44,45,78}

Family interventions for schizophrenia can reduce patient relapse and improve medication adherence.²⁷ The efficacy of FIT is generally consistent, but the evidence intervention effects on positive and negative symptoms and family burden is contradictory. Moreover, the effect on employment among individuals diagnosed with schizophrenia has not been specifically established.²⁸ However, this intervention has been shown to improve communication, reduce criticism and conflict, enhance problem solving skills, improve activity, and improve the emotional processing of grief, loss, and anger. Throughout therapy, the available family members are invited to participate in sessions focusing on one issue at a time with the aim of identifying the problems of each individual as they define them. During the interviews, the family members learn to recognize warning signs and agree on an appropriate intervention, which often includes medication adherence. Sessions are collaborative and the programs of the intervention consist of multiple supportive strategies, such as schizophrenia care education, problem solving skills, and stress management. In the current research, several studies were found that evaluated these techniques with good results.

The effects of family interventions may be direct (intervening in a crisis, solving problems, or achieving a positive change in attitude) or indirect (resulting from the effect on another outcome variable). The key elements of the program were: establishing a therapeutic alliance, providing information, active listening and clarifying of emotions, improving communication, problem solving techniques, diminishing critical attitudes and overinvolvement, and training in empathy.²⁸ In the review of FITs, it was found that many researchers suggested that psychosocial treatment for schizophrenia should be available in community-based care given that patients' presence is relatively simple, supportive, and educational.⁹⁵

CRT has been used in the treatment of schizophrenia with positive results. CRT is a novel rehabilitation approach designed to improve neurocognitive abilities such as attention, working memory, executive functioning, cognitive flexibility, and planning. It utilizes commercially available educational software to create a rich learning environment which is intrinsically motivating and rewarding.⁴⁹ CRT is an approach using practice with pen and paper or computerized tests of cognitive skills to improve deficits. This technique involves a combination of "drill and practice" exercises that teach strategies to improve cognitive functioning. Thus, treatments that improve cognition are of significant interest.⁹⁶

There are several assumptions regarding how CRT may improve work performance, although there is no definitive answer. It is possible that by learning compensatory strategies, an aspect of CRT, in the weekly group discussion for coping contributes to better work outcomes. Another explanation is that some nonspecific effects such as motivation or sense of self-confidence contribute to improved work performance.

Life stressors, psychological environment, protective factors (including personal psychological capacities to cope and competence of the patient), and therapeutic interventions interact with each other, modifying and determining the course of the pathology.^{97,98} Learning how to cope with disabilities is fundamental for these patients and has become an essential objective for the management of schizophrenia symptomatology.⁹⁹

Peer support groups consist of people, including former and current patients, who share similar life experiences with those to whom their help is beneficial. These individuals have usually achieved a level of knowledge and mastery over their own disability, which allows them to establish a profound and unique connection with others suffering from the same disease and/or dysfunction. Peer groups are based on mutual support (which represents the basis of family group therapy), emotional support, empathy, understanding, acceptance, and providing information about the illness and its implications.¹⁰⁰ Accordingly, a safe place is established where patients can cope with their common problems and concerns related to their disabilities resulting from the illness, which in turn reduces social isolation.^{101–104} Peer support groups should not be confused with self-help groups or self-help therapy in which the mental health professional has a more active role.⁴¹

Only a handful of studies have focused attention on the effectiveness and feasibility of this psychosocial treatment for psychotic patients. Moreover, emotional support led to patients feeling understood, while recommendations and advice from peers enhanced problem solving capabilities. The collective effect increased patients' hope and social functioning, as confirmed by another pilot study demonstrating a significantly greater improvement in the relationship perspective, problem solving perspective, and clarification perspective among patients participating in peer group treatment, as compared to the standard treatment group.¹⁰⁵

Randomized controlled trials for depression comparing CT to medication appeared in 1997. CBT is now recognized as an effective empirically supported treatment for several psychiatric disorders. A number of influential research stud-

ies have demonstrated that patients with schizophrenia who are treated with CBT often experience a reduction in delusions, hallucinations, and negative symptoms that go beyond the results of pharmacotherapy alone.^{24,25,35}

CBT is partly based on the evidence that emotional processes, information processing deficits, reasoning, and appraisal biases contribute to the formation and maintenance of delusions and hallucinations, and partly on changing these processes through cognitive intervention. CBT has significant effects on brain functioning and other biological processes. Moreover, CBT can influence electroencephalographic sleep profiles,¹⁰⁶ thyroid hormone levels,¹⁰⁷ and multiple brain pathways for the processing of cognition and emotion.^{108,109}

Limitations

The current review should be considered in the light of some limitations. First, a meta-analysis was not carried out because data from most of the studies that were focused on the main topic did not permit it. Specifically, samples included different measurements and different outcomes, and they assessed patients at different time points.

Although, the current review adequately summarizes the research in this field, the inclusion and exclusion of papers cited in this paper may reflect the authors' choice, both on the basis of their expertise and the consultations that they engaged in with experts in the field.

The studies included in this review have several shortcomings. First, some studies had a small sample size, which reduces the power of the research. Second, a number of methodological problems often made the results difficult to interpret (eg, not all studies included specific follow-up periods).

Similarly, many studies investigated a mixture of age groups, and future research should take the age of patients into account. Most of the studies were carried out in heterogeneous samples, mixing patients at different stages of their illness. Moreover, some studies only considered inpatients, studied only a few variables, and did not include a control group.

Conclusion

In schizophrenia, despite the proven efficacy of psychopharmacological treatment, a significant percentage of patients can be considered as "resistant" to treatment. Results from this review demonstrate that patients treated with nonpharmacological techniques have more rapid remission and relapse less frequently than patients treated only pharmacologically. Specifically, CBT was found to

be very useful in reducing delusions, hallucinations, and negative symptoms. The studies included in this review also demonstrated that patients can improve significantly in their social functioning, severity of negative symptoms, and insight, as well as reducing their hospital admissions in the years following treatment.

Disclosure

The authors report no conflicts of interest in this work.

References

- Bell MD, Bryson G. Work rehabilitation in schizophrenia: does cognitive impairment limit improvement? *Schizophr Bull.* 2001;27(2):269–279.
- Green MF, Kern RS, Braff DL, Mintz J. Neurocognitive deficits and functional outcome in schizophrenia: are we measuring the “right stuff”? *Schizophr Bull.* 2000;26(1):119–136.
- Novick D, Haro JM, Suarez D, Perez V, Dittmann RW, Haddad PM. Predictors and clinical consequences of nonadherence with antipsychotic medication in the outpatient treatment of schizophrenia. *Psychiatry Res.* 2010;176(2–3):109–113.
- Fardig R, Lewander T, Fredriksson A, Melin L. Evaluation of the Illness Management and Recovery Scale in schizophrenia and schizoaffective disorder. *Schizophr Res.* 2011;132(2–3):157–164.
- Phelan JC, Link BG, Stueve A, Pescosolido BA. Public conceptions of mental illness in 1950 and 1996: what is mental illness and is it to be feared? *J Health Soc Behav.* 2000;41(2):188–207.
- Yang LH, Pearson VJ. Understanding families in their own context: schizophrenia and structural family therapy in Beijing. *J Fam Ther.* 2002;24(3):233–257.
- Tsang HW, Tam P, Chan F, Cheung WM. Stigmatizing attitudes towards individuals with mental illness in Hong Kong: implications to their recovery. *J Community Psychol.* 2003;31(4):383–396.
- Corrigan P. How stigma interferes with mental health care. *Am Psychol.* 2004;59(7):614–625.
- Fung KM, Tsang HW, Corrigan PW. Self-stigma of people with schizophrenia as predictor of their adherence to psychosocial treatment. *Psychiatr Rehabil J.* 2008;32(2):95–104.
- Corrigan PW. Mental health stigma as social attribution: implications for research methods and attitude change. *Clin Psychol (New York).* 2000;7(1):48–67.
- Corrigan PW, Watson AC. The paradox of self-stigma and mental illness. *Clin Psychol (New York).* 2002;9(1):35–53.
- Fung KM, Tsang HW, Corrigan PW, Lam CS, Cheung W. Measuring self-stigma of mental illness in China and its implications for recovery. *Int J Soc Psychiatry.* 2007;53(5):408–418.
- Corrigan PW. The impact of stigma on severe mental illness. *Cogn Behav Pract.* 1998;5(2):201–222.
- Hayward P, Bright JA. Stigma and mental illness: a review and critique. *J Ment Health.* 1997;6(4):345–354.
- Fung KM, Tsang HW, Cheung WM. Randomized controlled trial of the self-stigma reduction program among individuals with schizophrenia. *Psychiatry Res.* 2011;189(2):208–214.
- Wiersma D, Wanderling J, Dragomirecka E, et al. Social disability in schizophrenia: its development and prediction over 15 years in incidence cohorts in six European centres. *Psychol Med.* 2000;30(5):1155–1167.
- Pfammatter M, Junghan UM, Brenner HD. Efficacy of psychological therapy in schizophrenia: conclusions from meta-analyses. *Schizophr Bull.* 2006;32(Suppl 1):S64–S80.
- Rund BR, Borg NE. Cognitive deficits and cognitive training in schizophrenic patients: a review. *Acta Psychiatr Scand.* 1999;100(2):85–95.
- Christensen BK, Girard TA, Benjamin AS, Vidailhet P. Evidence for impaired mnemonic strategy use among patients with schizophrenia using the part-list cuing paradigm. *Schizophr Res.* 2006;85(1–3):1–11.
- Green MF, Kern RS, Heaton RK. Longitudinal studies of cognition and functional outcome in schizophrenia: implications for MATRICS. *Schizophr Res.* 2004;72(1):41–51.
- Green CA, Fenn DS, Moussaoui D, Kadri N, Hoffman WF. Quality of life in treated and never-treated schizophrenic patients. *Acta Psychiatr Scand.* 2001;103(2):131–142.
- Vesterager L, Christensen TO, Olsen BB, et al. Cognitive training plus a comprehensive psychosocial programme (OPUS) versus the comprehensive psychosocial programme alone for patients with first-episode schizophrenia (the NEUROCOM trial): a study protocol for a centrally randomised, observer-blinded multi-centre clinical trial. *Trials.* 2011;12:35–43.
- Twamley EW, Burton CZ, Vella L. Compensatory cognitive training for psychosis: who benefits? Who stays in treatment? *Schizophr Bull.* 2011;37(Suppl 2):S55–S62.
- Vauth R, Corrigan PW, Clauss M, et al. Cognitive strategies versus self-management skills as adjunct to vocational rehabilitation. *Schizophr Bull.* 2005;31(1):55–66.
- Barrowclough C, Haddock G, Lobban F, et al. Group cognitive-behavioural therapy for schizophrenia. Randomised controlled trial. *Br J Psychiatry.* 2006;189:527–532.
- Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration. *BMJ.* 2009;339:b2700.
- Chien WT, Chan SW, Thompson DR. Effects of a mutual support group for families of Chinese people with schizophrenia: 18-month follow-up. *Br J Psychiatry.* 2006;189:41–49.
- Giron M, Fernandez-Yanez A, Mana-Alvarenga S, Molina-Habas A, Nolasco A, Gomez-Beneyto M. Efficacy and effectiveness of individual family intervention on social and clinical functioning and family burden in severe schizophrenia: a 2-year randomized controlled study. *Psychol Med.* 2010;40(1):73–84.
- Hazel NA, McDonnell MG, Short RA, et al. Impact of multiple-family groups for outpatients with schizophrenia on caregivers' distress and resources. *Psychiatr Serv.* 2004;55(1):35–41.
- Pickett-Schenk SA, Lippincott RC, Bennett C, Steigman PJ. Improving knowledge about mental illness through family-led education: the journey of hope. *Psychiatr Serv.* 2008;59(1):49–56.
- Lenior ME, Dingemans PM, Linszen DH, De Haan L, Schene AH. Social functioning and the course of early-onset schizophrenia: five-year follow-up of a psychosocial intervention. *Br J Psychiatry.* 2001;179:53–58.
- Chien WT, Lee IY. The schizophrenia care management program for family caregivers of Chinese patients with schizophrenia. *Psychiatr Serv.* 2010;61(3):317–320.
- Thorup A, Petersen L, Jeppesen P, et al. Integrated treatment ameliorates negative symptoms in first episode psychosis – results from the Danish OPUS trial. *Schizophr Res.* 2005;79(1):95–105.
- Grawe RW, Falloon IR, Widen JH, Skogvoll E. Two years of continued early treatment for recent-onset schizophrenia: a randomised controlled study. *Acta Psychiatr Scand.* 2006;114(5):328–336.
- Jenner JA, Nienhuis FJ, Wiersma D, van de Willige G. Hallucination focused integrative treatment: a randomized controlled trial. *Schizophr Bull.* 2004;30(1):133–145.
- Galderisi S, Piegari G, Mucci A, et al. Social skills and neurocognitive individualized training in schizophrenia: comparison with structured leisure activities. *Eur Arch Psychiatry Clin Neurosci.* 2010;260(4):305–315.
- Thorup A, Petersen L, Jeppesen P, et al. Social network among young adults with first-episode schizophrenia spectrum disorders: results from the Danish OPUS trial. *Soc Psychiatry Psychiatr Epidemiol.* 2006;41(10):761–770.

38. Granholm E, McQuaid JR, McClure FS, et al. A randomized, controlled trial of cognitive behavioral social skills training for middle-aged and older outpatients with chronic schizophrenia. *Am J Psychiatry*. 2005; 162(3):520–529.
39. Petersen L, Jeppesen P, Thorup A, et al. A randomised multicentre trial of integrated versus standard treatment for patients with a first episode of psychotic illness. *BMJ*. 2005;331(7517):602–608.
40. Xiang Y, Weng Y, Li W, et al. Training patients with schizophrenia with the Community Re-Entry Module: a controlled study. *Soc Psychiatry Psychiatr Epidemiol*. 2006;41(6):464–469.
41. Castelein S, Bruggeman R, van Busschbach JT, et al. The effectiveness of peer support groups in psychosis: a randomized controlled trial. *Acta Psychiatr Scand*. 2008;118(1):64–72.
42. Grant PM, Huh GA, Perivoliotis D, Stolar NM, Beck AT. Randomized trial to evaluate the efficacy of cognitive therapy for low-functioning patients with schizophrenia. *Arch Gen Psychiatry*. 2012;69(2): 121–127.
43. Barrowclough C, Haddock G, Tarrier N, et al. Randomized controlled trial of motivational interviewing, cognitive behavior therapy, and family intervention for patients with comorbid schizophrenia and substance use disorders. *Am J Psychiatry*. 2001;158(10):1706–1713.
44. Lecomte T, Cyr M, Lesage AD, Wilde J, Leclerc C, Ricard N. Efficacy of a self-esteem module in the empowerment of individuals with schizophrenia. *J Nerv Ment Dis*. 1999;187(7):406–413.
45. Borrás L, Boucherie M, Mohr S, Lecomte T, Perroud N, Huguélet P. Increasing self-esteem: efficacy of a group intervention for individuals with severe mental disorders. *Eur Psychiatry*. 2009;24(5):307–316.
46. Andres K, Pfammatter M, Fries A, Brenner HD. The significance of coping as a therapeutic variable for the outcome of psychological therapy in schizophrenia. *Eur Psychiatry*. 2003;18(4):149–154.
47. Norman RM, Malla AK, McLean TS, et al. An evaluation of a stress management program for individuals with schizophrenia. *Schizophr Res*. 2002;58(2–3):293–303.
48. Tarrier N, Sharpe L, Beckett R, Harwood S, Baker A, Yusopoff L. A trial of two cognitive behavioural methods of treating drug-resistant residual psychotic symptoms in schizophrenic patients. II. Treatment-specific changes in coping and problem-solving skills. *Soc Psychiatry Psychiatr Epidemiol*. 1993;28(1):5–10.
49. Medalia A, Revheim N, Casey M. Remediation of memory disorders in schizophrenia. *Psychol Med*. 2000;30(6):1451–1459.
50. Velligan DI, Bow-Thomas CC, Huntzinger C, et al. Randomized controlled trial of the use of compensatory strategies to enhance adaptive functioning in outpatients with schizophrenia. *Am J Psychiatry*. 2000; 157(8):1317–1323.
51. Velligan DI, Mueller J, Wang M, et al. Use of environmental supports among patients with schizophrenia. *Psychiatr Serv*. 2006;57(2): 219–224.
52. Velligan DI, Diamond PM, Maples NJ, et al. Comparing the efficacy of interventions that use environmental supports to improve outcomes in patients with schizophrenia. *Schizophr Res*. 2008;102(1–3): 312–319.
53. Silverstein SM, Spaulding WD, Menditto AA, et al. Attention shaping: a reward-based learning method to enhance skills training outcomes in schizophrenia. *Schizophr Bull*. 2009;35(1):222–232.
54. Naismith SL, Redoblado-Hodge MA, Lewis SJ, Scott EM, Hickie IB. Cognitive training in affective disorders improves memory: a preliminary study using the NEAR approach. *J Affect Disord*. 2010;121(3): 258–262.
55. Gil Sanz D, Diego Lorenzo M, Bengochea Seco R, et al. Efficacy of a social cognition training program for schizophrenic patients: a pilot study. *Span J Psychol*. 2009;12(1):184–191.
56. Eack SM, Greenwald DP, Hogarty SS, et al. Cognitive enhancement therapy for early-course schizophrenia: effects of a two-year randomized controlled trial. *Psychiatr Serv*. 2009;60(11):1468–1476.
57. Fisher M, Holland C, Subramaniam K, Vinogradov S. Neuroplasticity-based cognitive training in schizophrenia: an interim report on the effects 6 months later. *Schizophr Bull*. 2010;36(4):869–879.
58. Tsai J, Lysaker PH, Vohs JL. Negative symptoms and concomitant attention deficits in schizophrenia: associations with prospective assessments of anxiety, social dysfunction, and avoidant coping. *J Ment Health*. 2010;19(2):184–192.
59. Lindenmayer JP, McGurk SR, Mueser KT, et al. A randomized controlled trial of cognitive remediation among inpatients with persistent mental illness. *Psychiatr Serv*. 2008;59(3):241–247.
60. Penades R, Catalan R, Puig O, et al. Executive function needs to be targeted to improve social functioning with cognitive remediation therapy (CRT) in schizophrenia. *Psychiatry Res*. 2010;177(1–2):41–45.
61. Rund BR, Moe L, Sollien T, et al. The Psychosis Project: outcome and cost-effectiveness of a psychoeducational treatment programme for schizophrenic adolescents. *Acta Psychiatr Scand*. 1994;89(3): 211–218.
62. Herz MI, Lamberti JS, Mintz J, et al. A program for relapse prevention in schizophrenia: a controlled study. *Arch Gen Psychiatry*. 2000;57(3): 277–283.
63. Klingberg S, Buchkremer G, Holle R, Schulze Monking H, Hornung WP. Differential therapy effects of psychoeducational psychotherapy for schizophrenic patients – results of a 2-year follow-up. *Eur Arch Psychiatry Clin Neurosci*. 1999;249(2):66–72.
64. Motlova L, Spaniel F, Vanurova I, Klaschkal J. Psychoeducation and relapse of schizophrenia. *Eur Psychiatry*. 2000;15(Suppl 2):S349.
65. Chabannes JP, Bazin N, Leguay D, et al. Two-year study of relapse prevention by a new education program in schizophrenic patients treated with the same antipsychotic drug. *Eur Psychiatry*. 2008;23(1):8–13.
66. Merinder LB, Viuff AG, Laugesen HD, Clemmensen K, Misfelt S, Espensen B. Patient and relative education in community psychiatry: a randomized controlled trial regarding its effectiveness. *Soc Psychiatry Psychiatr Epidemiol*. 1999;34(6):287–294.
67. Vreeland B, Minsky S, Yanos PT, et al. Efficacy of the team solutions program for educating patients about illness management and treatment. *Psychiatr Serv*. 2006;57(6):822–828.
68. Patterson TL, Bucardo J, McKibbin CL, et al. Development and pilot testing of a new psychosocial intervention for older Latinos with chronic psychosis. *Schizophr Bull*. 2005;31(4):922–930.
69. Kulhara P, Chakrabarti S, Avasthi A, Sharma A, Sharma S. Psychoeducational intervention for caregivers of Indian patients with schizophrenia: a randomised-controlled trial. *Acta Psychiatr Scand*. 2009;119(6):472–483.
70. Shin SK, Lukens EP. Effects of psychoeducation for Korean Americans with chronic mental illness. *Psychiatr Serv*. 2002;53(9):1125–1131.
71. Herman D, Opler L, Felix A, Valencia E, Wyatt RJ, Susser E. A critical time intervention with mentally ill homeless men: impact on psychiatric symptoms. *J Nerv Ment Dis*. 2000;188(3):135–140.
72. Jahn T, Pitschel-Walz G, Gsottschneider A, Frobose T, Kraemer S, Bauml J. Neurocognitive prediction of illness knowledge after psychoeducation in schizophrenia: results from the Munich COGPIP study. *Psychol Med*. 2011;41(3):533–544.
73. Chien WT, Chan SW. One-year follow-up of a multiple-family-group intervention for Chinese families of patients with schizophrenia. *Psychiatr Serv*. 2004;55(11):1276–1284.
74. Horan WP, Kern RS, Shokat-Fadai K, Sergi MJ, Wynn JK, Green MF. Social cognitive skills training in schizophrenia: an initial efficacy study of stabilized outpatients. *Schizophr Res*. 2009;107(1):47–54.
75. Patterson TL, McKibbin C, Taylor M, et al. Functional adaptation skills training (FAST): a pilot psychosocial intervention study in middle-aged and older patients with chronic psychotic disorders. *Am J Geriatr Psychiatry*. 2003;11(1):17–23.
76. Patterson TL, Mautsach BT, McKibbin C, Goldman S, Bucardo J, Jeste DV. Functional adaptation skills training (FAST): a randomized trial of a psychosocial intervention for middle-aged and older patients with chronic psychotic disorders. *Schizophr Res*. 2006;86(1–3): 291–299.
77. Torres A, Mendez LP, Merino H, Moran EA. Improving social functioning in schizophrenia by playing the train game. *Psychiatr Serv*. 2002; 53(7):799–801.

78. Glynn SM, Marder SR, Liberman RP, et al. Supplementing clinic-based skills training with manual-based community support sessions: effects on social adjustment of patients with schizophrenia. *Am J Psychiatry*. 2002;159(5):829–837.
79. Hogarty GE, Kornblith SJ, Greenwald D, et al. Three-year trials of personal therapy among schizophrenic patients living with or independent of family, I: description of study and effects on relapse rates. *Am J Psychiatry*. 1997;154(11):1504–1513.
80. Hogarty GE, Greenwald D, Ulrich RF, et al. Three-year trials of personal therapy among schizophrenic patients living with or independent of family, II: effects on adjustment of patients. *Am J Psychiatry*. 1997;154(11):1514–1524.
81. Marder SR, Wirshing WC, Mintz J, et al. Two-year outcome of social skills training and group psychotherapy for outpatients with schizophrenia. *Am J Psychiatry*. 1996;153(12):1585–1592.
82. Lysaker P, Bell M, Milstein R, Bryson G, Beam-Goulet J. Insight and psychosocial treatment compliance in schizophrenia. *Psychiatry*. 1994;57(4):307–315.
83. Khazaal Y, Favrod J, Libbrecht J, et al. A card game for the treatment of delusional ideas: a naturalistic pilot trial. *BMC Psychiatry*. 2006;6:48–52.
84. Tarrier N. Cognitive behaviour therapy for schizophrenia – a review of development, evidence and implementation. *Psychother Psychosom*. 2005;74(3):136–144.
85. Benton MK, Schroeder HE. Social skills training with schizophrenics: a meta-analytic evaluation. *J Consult Clin Psychol*. 1990;58(6):741–747.
86. Liberman RP. Psychosocial treatments for schizophrenia. *Psychiatry*. 1994;57(2):104–114.
87. Ulrich G, Houtmans T, Gold C. The additional therapeutic effect of group music therapy for schizophrenic patients: a randomized study. *Acta Psychiatr Scand*. 2007;116(5):362–370.
88. Liberman RP, Wallace CJ, Blackwell GA, Eckman TA, Vaccaro JV, Kuehnel TG. Innovations in skills training for the seriously mentally ill: the UCLA social and independent living skills module. *Innov Res*. 1993;2:43–59.
89. Smith TE, Hull JW, MacKain SJ. Training hospitalized patients with schizophrenia in community reintegration skills. *Psychiatr Serv*. 1996;47(10):1099–1103.
90. Anzai N, Yoneda S, Kumagai N, Nakamura Y, Ikebuchi E, Liberman RP. Training persons with schizophrenia in illness self-management: a randomized controlled trial in Japan. *Psychiatr Serv*. 2002;53(5):545–547.
91. Naoki K, Nobuo A, Emi I. Randomized controlled trial on effectiveness of the community re-entry program to inpatients with schizophrenia spectrum disorder, centering around acquisition of illness self-management knowledge. *Seishin Shinkeigaku Zasshi*. 2003;105:1514–1531. Japanese.
92. Rossotto E, Wirshing DA, Liberman RP. Rehab rounds: enhancing treatment adherence among persons with schizophrenia by teaching community reintegration skills. *Psychiatr Serv*. 2004;55(1):26–27.
93. Xiang YT, Weng YZ, Li WY, et al. Efficacy of the community re-entry module for patients with schizophrenia in Beijing, China: outcome at 2-year follow-up. *Br J Psychiatry*. 2007;190:49–56.
94. Bellack AS. Skills training for people with severe mental illness. *Psychiatr Rehabil J*. 2004;27(4):375–391.
95. Bustillo J, Lauriello J, Horan W, Keith S. The psychosocial treatment of schizophrenia: an update. *Am J Psychiatry*. 2001;158(2):163–175.
96. Hodge MA, Siciliano D, Withey P, et al. A randomized controlled trial of cognitive remediation in schizophrenia. *Schizophr Bull*. 2010;36(2):419–427.
97. Zubin J, Spring B. Vulnerability – a new view of schizophrenia. *J Abnorm Psychol*. 1977;86(2):103–126.
98. Nuechterlein KH, Dawson ME. A heuristic vulnerability/stress model of schizophrenic episodes. *Schizophr Bull*. 1984;10(2):300–312.
99. Anthony WA, Liberman RP. The practice of psychiatric rehabilitation: historical, conceptual, and research base. *Schizophr Bull*. 1986;12(4):542–559.
100. Carpinello S, Felton CJ, Pease EA, DeMasi M, Donahue S. Designing a system for managing the performance of mental health managed care: an example from New York State's prepaid mental health plan. *J Behav Health Serv Res*. 1998;25(3):269–278.
101. Gordon RE, Edmunson E, Bedell J, Goldstein N. Reducing rehospitalization of state mental patients. Peer management and support. *J Fla Med Assoc*. 1979;66(9):927–933.
102. Mowbray CT, Moxley DP, Collins ME. Consumers as mental health providers: first-person accounts of benefits and limitations. *J Behav Health Serv Res*. 1998;25(4):397–411.
103. Dennis CL. Peer support within a health care context: a concept analysis. *Int J Nurs Stud*. 2003;40(3):321–332.
104. Davidson L, Chinman M, Sells D, Rowe M. Peer support among adults with serious mental illness: a report from the field. *Schizophr Bull*. 2006;32(3):443–450.
105. Rummel-Kluge C, Stiegler-Kotzor M, Schwarz C, Hansen WP, Kissling W. Peer-counseling in schizophrenia: patients consult patients. *Patient Educ Couns*. 2008;70(3):357–362.
106. Thase ME, Fasiczka AL, Berman SR, Simons AD, Reynolds CF 3rd. Electroencephalographic sleep profiles before and after cognitive behavior therapy of depression. *Arch Gen Psychiatry*. 1998;55(2):138–144.
107. Joffe R, Segal Z, Singer W. Change in thyroid hormone levels following response to cognitive therapy for major depression. *Am J Psychiatry*. 1996;153(3):411–413.
108. Brody AL, Saxena S, Schwartz JM, et al. FDG-PET predictors of response to behavioral therapy and pharmacotherapy in obsessive compulsive disorder. *Psychiatry Res*. 1998;84(1):1–6.
109. Goldapple K, Segal E, Garson C, et al. Modulation of cortical-limbic pathways in major depression: treatment-specific effects of cognitive behavior therapy. *Arch Gen Psychiatry*. 2004;61(1):34–41.
110. Moher D, Liberati A, Tetzlaff J, Altman DG; PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. 2009;6(7):e1000097.
111. Li Z, Arthur D. Family education for people with schizophrenia in Beijing, China: randomised controlled trial. *Br J Psychiatry*. 2005 Oct;187:339–345.
112. Barrowclough C, Tarrier N, Lewis S, et al. Randomised controlled effectiveness trial of a needs-based psychosocial intervention service for carers of people with schizophrenia. *Br J Psychiatry*. 1999 Jun;174:505–511.
113. Kern RS, Liberman RP, Kopelowicz A, Mintz J, Green MF. Applications of errorless learning for improving work performance in persons with schizophrenia. *Am J Psychiatry*. 2002 Nov;159(11):1921–1926.
114. Kern RS, Green MF, Mitchell S, Kopelowicz A, Mintz J, Liberman RP. Extensions of errorless learning for social problem-solving deficits in schizophrenia. *Am J Psychiatry*. 2005 Mar;162(3):513–519.
115. Leclerc C, Lesage AD, Ricard N, Lecomte T, Cyr M. Assessment of a new rehabilitative coping skills module for persons with schizophrenia. *Am J Orthopsychiatry*. 2000 Jul;70(3):380–388.
116. Buchain PC, Vizzotto AD, Henna Neto J, Elkis H. Randomized controlled trial of occupational therapy in patients with treatment-resistant schizophrenia. *Rev Bras Psiquiatr*. 2003 Mar;25(1):26–30.
117. Vancampfort D, De Hert M, Knape J, et al. State anxiety, psychological stress and positive well-being responses to yoga and aerobic exercise in people with schizophrenia: a pilot study. *Disabil Rehabil*. 2011;33(8):684–689.

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