Acta Psychiatr Scand 2004: 110: 21–28
Printed in UK. All rights reserved

ACTA PSYCHIATRICA SCANDINAVICA

A randomized comparison of group cognitive-behavioural therapy and group psychoeducation in patients with schizophrenia

Bechdolf A, Knost B, Kuntermann C, Schiller S, Klosterkötter J, Hambrecht M, Pukrop R. A randomized comparison of group cognitive-behavioural therapy and group psychoeducation in patients with schizophrenia.
Acta Psychiatr Scand 2004: 110: 21–28. © Blackwell Munksgaard 2004.

Objective: Although the efficacy of cognitive-behavioural therapy (CBT) in schizophrenia has been established in a number of studies, no information is available on the differential efficacy of CBT in comparison with patient psychoeduction (PE).
Method: Eighty-eight in-patients with schizophrenia were randomized to receive a therapy envelope of 8 weeks including either 16 sessions group CBT or 18 sessions group PE treatment. Assessments took place at baseline, post-treatment and 6 month follow-up.
Results: Patients, who received CBT were significantly less rehospitalized than patients in the PE group during the follow-up period. On a descriptive level, CBT resulted in lower relapse rates and higher compliance ratings at post-treatment and at follow-up than PE. Both forms of therapy led to significant psychopathological improvement at post-treatment and at follow-up.
Conclusion: The brief group CBT intervention showed some superiority to the PE programme, which could be of considerable clinical and economical importance.

A. Bechdolf, B. Knost, C. Kuntermann, S. Schiller, J. Klosterkötter, M. Hambrecht, R. Pukrop

Department of Psychiatry and Psychotherapy, University of Cologne, Cologne, Germany

Key words: schizophrenia; psychosocial intervention; cognitive-behaviour therapy

Andreas Bechdolf, Department of Psychiatry and Psychotherapy, University of Cologne, 50924 Cologne, Germany.
E-mail: andreas.bechdolf@medizin.uni-koeln.de

Accepted for publication January 8, 2004

Introduction

Recently, quite a few studies have applied cognitive-behavioural therapy (CBT) to patients with schizophrenia in individual therapy settings (1–10). These interventions are structured and time-limited and mostly involve elements like engagement and assessment, coping strategy work, developing an understanding of the experience of psychosis, working on delusions and hallucinations, addressing mood and negative self-evaluations and relapse prevention (11). There is a growing evidence that CBT in addition to pharmacotherapy may reduce symptoms in medication-resistant patients (4, 5, 7–10) and that it may have a positive impact on relapse and readmission rates or time to readmission at short-time follow-up in patients with recent onset (3, 6) and acute psychosis (1). However, although, for example, the National Health Service in the United Kingdom suggested that all patients with schizophrenia should have some individual psychotherapy, because of the shortage of trained therapists, the length of treatment and therefore the higher short-term costs (12), specific individual CBT treatments are unlikely to become widely available in most health services in the near future. An alternative may be to present CBT in a brief (13) or a group format (14), which offers the likelihood of a more general availability of psychological treatment at a lower cost.

However, some studies suggest that brief individual or group interventions educating patients about schizophrenia and antipsychotic treatment by using standardized presentations of educational material and mainly didactic intervention strategies

(15) may also be effective on symptoms, compliance with medication, relapse and re-hospitalization rates (16–18). As yet, there have been no systematic studies of the differential efficacy of CBT in a group format when compared with a psychoeducational (PE) group programme in patients with schizophrenia, although group therapies have less dependence on expert therapists' time and are therefore more likely to be integrated in mental health services.

Aim of the study

The present randomized trial was conducted among patients with schizophrenia to explore the efficacy of a brief group CBT intervention in comparison with a PE group programme with regard to re-hospitalization, relapse, symptoms and compliance with medication.

Material and methods

Subjects

Patients were recruited from consecutive acute admissions to the in-patient unit of the Department of Psychiatry and Psychotherapy at the University of Cologne between July 1999 and December 2000. They were aged 18–64 years and met criteria for an episode of a schizophrenic or related disorder (ICD-10: F 20, F 23, F 25). Any patient with a primary diagnosis of drug or alcohol dependence, organic brain disease, learning disability or hearing impairment was excluded from the study.

Study design

Within 14 days of hospital admission, responsible psychiatrists were approached to seek permission for the inclusion of their patients in the study. Where permission was given, the case notes were fully perused and the patients were asked for their participation. Patients were randomized to receive either CBT or PE treatment only after they had given full informed consent. Randomization was conducted by computer-generated random numbers for blocks of eight participants. The results were placed in sealed envelopes and only opened at the time of treatment allocation.

Sessions of both interventions were delivered to groups of eight patients within a therapy envelope of 8 weeks. Groups of both interventions were led by an experienced and CBT trained psychiatrist (A.B.) or clinical psychologist (B.K.). The sessions were carried out while the patients were in-patients and continued when they were discharged during the therapy envelope period. All interventions were an adjunct to routine hospital care and patients remained under the medical supervision of the responsible consultant psychiatrist who alone determined the pharmacological regime, timing of discharge and readmission.

Assessments

A wide range of assessments was administered to participants at baseline, post-treatment and at 6 month follow-up. In this paper, we present the effects of both interventions on the primary outcome measures rehospitalization, relapse, psychopathology and compliance with medication. Decisions regarding re-hospitalization and medication were completely independent from the study. With regard to psychopathology and compliance measures, we made attempts to blind assessments by carrying out most of the assessments by independent raters (C.K. and S.S.), who were not involved in treatment. A secondary outcome measure was subjective quality of life as measured by the MSQoL (19). Putative moderating variables of treatment effects – coping behaviour, locus of control and self-efficacy – were assessed by self-rating scales (20, 21). Results regarding secondary outcome and moderating variables will be presented elsewhere.

Measures

Objective information was assessed by a short demographic interview and was extracted from case notes.

Psychopathology was observer rated using the 'Positive and Negative Syndrome Scale (PANSS)' (22). Following a period of training in the instruments, mental state assessments were subject to a reliability check to prevent drift in accuracy of ratings across the study. Intraclass correlation coefficients were 0.87 for the positive syndrome subscale, 0.73 for the negative syndrome subscale and 0.87 for general psychopathology scale.

Clinical significant change was calculated by a two-fold criterion in accordance with Jacobson and Revenstorf (23): (i) improvement of PANSS global score >2 SD beyond the mean of the intake sample at follow-up and (ii) reliable change index exceeds 1.96. The latter is calculated by dividing the absolute magnitude of change by the SE of the change score (follow-up minus pretest).

Compliance was measured by a 4-point rating scale (similar to the one used by Kemp and coworkers, 24), based on corroboration from as

many sources as possible including patient, relatives, psychiatric nurse and psychiatrist-in-charge (mean number of sources approximately 2). The following scores could be obtained on the scale:

1 complete or partial refusal (refused depot or accepts only minimum dose);
2 takes medication irregularly (interruption of medication < 4 weeks), reluctant, requires persuasion, disagrees with psychiatrist-in-charge about dose;
3 takes medication regularly (interruption of medication < 1 week), agrees with psychiatrist-in-charge about dose;
4 active participation, readily accepts and shows some responsibility for regime.

Relapse criteria were similar to the ones used by Ventura and colleagues (25). Relapse was defined by a rating of at least 5 and a 2-point increase compared with the previous assessment in at least one of the items of the positive syndrome subscale of the PANSS.

Re-hospitalization was defined in accordance with Buchkremer and coworkers (26) by a 36-h full hospitalization or a 5-day partial hospitalization because of an exacerbation of acute psychotic symptoms.

Details of medication, converted to chlorpromazine equivalents (27), were taken from medical case notes. Atypicals and antidepressives were noted.

Treatment groups

Group cognitive behavioural therapy (CBT). The group CBT treatment was based on the approach by Tarrier and coworkers (28, 29), who used coping strategy enhancement, problem solving and relapse prevention in patients with psychosis. It proved to be effective with chronic (8–10), recent onset psychotic (3, 6) and 'dually diagnosed' patients (30) in individual therapy settings. The group CBT intervention was focused on the treatment of auditory hallucinations and delusions, associated symptoms and problems (for example, anxiety, depression), relapse prevention and associated problems and enhancing medication compliance. As it was our clinical experience that experiencing psychotic symptoms is recognized by most patients as a kind of personal dysfunction (especially during recovery), which is likely to be associated with negative self-evaluations, we integrated the component 'improving self-esteem' in accordance with Garety (11) into the intervention to foster feelings of hope and engagement with therapy. The intervention included 16 sessions in 8 weeks. Sessions followed a semistructured format and lasted between 60 and 90 min, interrupted by a 5–10 min break. Treatment involved the following elements: (i) assessment and engagement (sharing information about voices and delusions, models of psychosis), (ii) improving self-esteem, (iii) formulation of key-problems, (iv) interventions directed at reducing the severity and the occurrence of key problems, (v) relapse prevention/keeping well. The following specific CBT strategies were used: formulation, guided recovery, symptom monitoring, exposure/focusing strategies for managing voices, hypothesis/reality testing, reframing attributions, rational responding, coping strategy enhancement, distraction techniques, role play, anxiety management, depression and self-esteem work, medication compliance/motivational interviewing, schema work, relapse prevention and keeping well strategies.

Group psychoeducational programme. The PE programme was similar to the PE group training for patients developed by Hornung and coworkers (31), which demonstrated the improvement in medication compliance and re-hospitalization rates in patients with schizophrenia (26, 32). The programme included eight sessions in 8 weeks. Sessions followed a semistructured format and lasted between 60 and 90 min, occasionally interrupted by a 5–10 min break. It covered the following topics: symptoms of psychosis, models of psychosis, effects and side-effects of medication, maintenance medication, early symptoms of relapse, relapse prevention. The approach was primarily didactic and included the following strategies: formulation, guided discovery and motivational interviewing.

Data analysis

Sample characteristics were analysed using *t*-test or chi-squared test to check the randomization. The lost-to-follow-up mechanism was investigated by comparing sociodemographic data, psychopathology and compliance ratings at the pretreatment stage for the group whose ratings were missing at post-treatment or follow-up with the remaining participants for whom scores existed. The effects of treatment on symptoms were checked by using *t*-test for dependent samples (t). All analyses of treatment effects were calculated by intention-to-treat. To test the differential effects of CBT and PE on symptoms and compliance, an ANCOVA was carried out using pretreatment scores as covariants. Two-tailed tests of significance were used in all analyses.

Results

Characteristics of the sample

During the study period, 189 patients fulfilled inclusion criteria. Of these, 57 patients were not approached, either because they were involuntary admissions, formally detained under the Mental Health Act and could therefore not be included in randomized trials or because during their in-patient stay, patient flow was too small to form a group of eight patients to start a group intervention. Of the remaining 132 subjects whose consent to enter the trial was sought, there was a 33.4% non-participation rate ($n = 44$) due to refusal, non-German speaking, inability to complete assessment or rapid discharge. Table 1 shows the characteristics of the 88 patients included in the study. They had, on average, been hospitalized between two and three times and had a mean time since diagnosis of more than 4 years. Most patients were singles and lived alone or with their families. Only a minority was employed on a regular basis. There were no significant differences between the CBT and PE group at inception with regard to age, gender, time since diagnosis, and number of admissions.

Adherence to treatment and follow-up

After randomization one CBT patient and two PE patients attended no treatment session. To eight of 40 patients (CBT, maximum 16 sessions) and to 13 of 48 patients (PE, maximum eight sessions) the maximum number of sessions were delivered. On average in the CBT group patients attended 11.9 sessions (SD, 4.1) and PE patients received at mean 6.4 (SD, 1.8) sessions.

From the initial sample of 88 patients, 71 (80.7%) completed the assessment at 6-month follow-up. There was no significant difference regarding the lost to follow-up rates between both intervention groups. In the CBT group nine of 40 subjects (22.5%) and in the PE group eight of 48 patients (16.7%) were lost to follow-up. Moreover, there were no significant differences on any variable at the pretreatment stage between the group whose ratings were missing at post-treatment or follow-up ($n = 17$) and the remaining participants for whom scores existed ($n = 71$).

Relapse and re-hospitalization

For the 71 patients followed up until 6 months post-treatment there were the following relapse rates according to our criteria: CBT four of 31 (12.9%), PE eight of 40 (20.0%). This difference was not significant ($\chi^2 = 0.63$, $P = 0.43$). During the follow-up period zero of 31 (0.0%) of the CBT group and five of 40 (12.5%) of the PE group were hospitalized. This difference was significant ($\chi^2 = 4.17$, $P = 0.04$). Readmission was not significantly associated with compliance at post-treatment ($r = 0.43$, $P = 0.82$) or follow-up ($r = -0.15$, $P = 0.21$).

Table 1. Sample characteristics ($n = 88$)

	Cognitive-behavioural therapy (CBT, $n = 40$)	Psychoeducation (PE, $n = 48$)	Test statistics and significance
Age, years [mean (SD)]	32.2 (9.9)	31.4 (10.6)	T = −0.37, $P = 0.71$
Gender [*n* (%)]			
Female	22 (55.0)	26 (54.2)	$\chi^2 = 0.06$, $P = 0.94$
Male	18 (45.0)	22 (45.8)	
Time since diagnosis, months [mean (SD)]	56.7 (65.4)	50.0 (58.7)	T = −0.53, $P = 0.59$
Number of admissions [mean (SD)]	2.6 (3.8)	2.4 (3.2)	T = −0.36, $P = 0.72$
ICD-10 diagnoses [*n* (%)]			
F 20	32 (80.0)	37 (77.1)	
F 23	– (0.0)	2 (4.1)	
F 25	8 (20.0)	9 (18.8)	
Marital status [*n* (%)]			
Married, cohabitation	4 (10.0)	6 (12.5)	
Living alone, divorced	36 (90.0)	42 (87.5)	
Employment status [*n* (%)]			
Unemployed	21 (52.5)	24 (50.0)	
Full-/part-time	4 (10.0)	8 (16.7)	
Pension	3 (7.5)	4 (8.3)	
Other	12 (30)	12 (25.0)	
Housing status [*n* (%)]			
Independent	21 (52.5)	18 (37.5)	
Family	17 (42.5)	28 (58.3)	
Staffed/unstaffed home	3 (7.5)	1 (2.1)	
Unknown	– (0.0)	1 (2.1)	

Symptoms

As presented in Table 2, significant and large pretreatment-post-treatment and pretreatment-follow-up improvements were found in the CBT and PE group for the PANSS-positive syndrome (pre-post CBT/PE: $t = 2.65$, $P = 0.01/t = 5.06$, $P < 0.01$; pre-follow-up CBT/PE: $t = 2.0$, $P = 0.05/t = 3.69$, $P < 0.01$), negative syndrome (pre-post CBT/PE: $t = 2.27$, $P = 0.03/t = 4.21$, $P < 0.01$; pre-follow-up CBT/PE: $t = 3.32$, $P < 0.01/t = 3.69$, $P < 0.01$) and general psychopathology (pre-post CBT/PE: $t = 3.10$, $P < 0.01/t = 5.81$, $P < 0.01$; pre-follow-up CBT/PE $t = 2.60$, $P = 0.01/t = 4.26$, $P < 0.01$). On a descriptive level there were advantages for the PE group with regard to positive symptoms at follow-up, negative symptoms at post-treatment and general psychopathology at post-treatment and at follow-up. Similar results an a descriptive level can be observed, when calculating individuals with clinical significant change [CBT: 2/31 (7%); PE 5/40 (13%)]. However, when pretreatment scores were controlled by ANCOVA no significant differences emerged between CBT and PE in any psychopathological syndrome.

Compliance

Compliance with medication was high in both groups at intake. This high compliance level was maintained during the intervention period and declined during follow-up. On a descriptive level, the CBT group showed higher compliance ratings at post-treatment and at follow-up. However, there were no significant differences between the two interventions at any assessment point.

Medication use

The mean dosages of typical antipsychotics converted to chlorpromazine equivalents were nearly the same at baseline and follow-up evaluations, although there was a wide range of dosage within the treatment groups [pretreatment [mg mean (SD)]: CBT 431.7 (201.0), PE 375.0 (349.5); post-treatment: CBT 158.8 (73.3), PE 520.0 (413.3); follow-up: CBT 358.3 (340.4), PE 361.4 (340.9)]. All patients were treated with neuroleptics, most with atypicals (pretreatment: CBT 80%, PE 85%; post-treatment: CBT 93.5%, PE 87.8%; follow-up: CBT 88.9%, PE 89.2%). Around one-third of patients studied also received antidepressive medication (pretreatment: CBT 26.3%, PE 25.0%; post-treatment: CBT 25.8%, PE 38.9%; follow-up: CBT 31.0%, PE 28.9%). No significant differences emerged between treatment groups at pre- and post-treatment or follow-up.

Discussion

The present paper compares a group CBT with a group PE programme in patients with schizophrenia. The results indicated that patients who received CBT experienced significantly less re-hospitalizations during the follow-up period than patients of the PE group. On a descriptive level there were advantages for CBT regarding relapse rates and compliance ratings at post-treatment and follow-up. Both forms of therapy led to significant clinical improvement at the end of treatment and at 6 month follow-up. On a descriptive level there were advantages for the PE group with regard to symptoms and clinical significant change. Results suggest that strategies which include cognitive, affective and psychomotor components such as the group CBT intervention are more likely to change complex behaviour patterns influencing rehospitalization, relapse and compliance than didactic interventions which focus on knowledge and concepts of illness such as the PE programme. These changes of complex behaviour by CBT were associated with a slightly unfavourable psychopathological course during the postacute recovering period when compared with PE.

Table 2. Mean values and SD for positive and negative symptoms, general psychopathology and compliance for group cognitive-behavioural therapy (CBT) and group psychoeducation (PE) at pretreatment, post-treatment and 6-month follow-up and group differences post-treatment and follow-up corrected for pretreatment scores (ANCOVA)

	Pretreatment		Post-treatment		Follow-up		CBT vs. PE post-treatment		CBT vs. PE follow-up	
	CBT mean (SD)	PE mean (SD)	CBT mean (SD)	PE mean (SD)	CBT mean (SD)	PE mean (SD)	*F*-test	*P*-value	*F*-test	*P*-value
PANSS-positive	13.6 (5.3)	15.1 (5.6)	11.3 (4.2)	11.4 (4.5)	11.6 (4.3)	11.4 (4.8)	0.64	0.55	0.31	0.58
PANSS-negative	16.3 (6.4)	17.6 (7.2)	13.9 (4.5)	13.1 (5.2)	12.5 (4.0)	13.0 (6.1)	1.23	0.27	0.02	0.89
PANSS general	33.3 (9.6)	31.6 (8.5)	28.0 (9.2)	25.0 (6.2)	28.5 (8.8)	26.0 (6.9)	2.13	0.15	1.22	0.27
Compliance	3.9 (0.3)	3.8 (0.5)	3.9 (0.3)	3.7 (0.7)	3.5 (0.9)	3.2 (1.0)	2.73	0.10	1.26	0.27

PANSS, Positive and Negative Syndrome Scale (22).

Results of the present study are in accordance with those previously published. The lost to follow-up rate of around 20% is comparable with other trials of CBT and PE in patients with schizophrenia (1–10, 13, 14). In accordance with our findings, other CBT trials which included patients with recent-onset (3, 6) or acute psychosis (1) showed significant impact on relapse and readmission rates or on time to readmission at short-time follow-up, whereas interventions focusing on persistent psychotic symptoms did not prove to be effective with regard to these outcome measures (5, 7–10). Although the CBT intervention showed a significant effect on symptoms and a clinical significant change, which was comparable with other interventions in severe mentally ill (33), we failed to find a significant difference compared with PE with regard to symptoms. On a descriptive level there were even some advantages for PE. There could be a number of reasons for that. (i) Our study population showed comparably low positive syndrome scores, which makes it more difficult for an intervention to show to be effective regarding this issue. (ii) The CBT intervention also addressed other issues than positive symptoms such as relapse associated problems, self-esteem and relapse prevention, which may have reduced the impact of the therapy on symptoms and may have exposed some individuals to additional stress, which might have prolonged symptomatic recovery. (iii) Group CBT interventions in general might be less effective on symptoms than individual CBT. (iv) Power, effect size and sample size of the trial were to small to detect significant differences. Given the small between-group treatment effect sizes and the small power of the study a sample of more than 600 patients would have been needed to observe significant between-group effects on symptoms. However, CBT studies in a group (14) or a brief (13) format or trials also using enriched packages of care as control conditions such as befriending (7) or supportive counselling (3, 6, 8–10) failed to show significant benefits for CBT on symptoms of schizophrenia at some assessment occasions, too. Despite the fact that several authors stated CBT might enhance medication adherence (11), this is the first CBT trial, which on a descriptive level supports this hypothesis using empirical data.

Methodological issues

To our knowledge this is the first study which compared a CBT intervention with PE programme in patients with schizophrenia. Therefore, it is also the first time that conclusions regarding the differential efficacy of CBT in patients with schizophrenia could be drawn from the findings. Although the results of the study are promising, there are some limitations: (i) due to logistic reasons we could only deliver the interventions to in-patients with schizophrenia. Although we doubt that this is a significant source of bias, one might not be able to generalize the results to other clinical settings or other clinical populations without further considerations. (ii) In a trial of psychological interventions it is extremely difficult to make assessments that are totally blind to the treatment condition. Decisions regarding re-hospitalization were made completely independent from the study by the responsible consultants, who were not involved in the trial and were generally not aware of the treatment conditions of the patients. Psychopathology and compliance ratings were mainly carried out by persons, who were not involved in treatment. Although attempts were made to blind ratings, raters could have found out about the treatment conditions of patients during the assessments, which we did not control for. However, these limitations could have led to biased results. (iii) The conclusions about treatment specificity could be limited by the fact that we did not control for contact time. Although both interventions were an adjunct to treatment as usual (including pharmacological treatment, daily clinical assessments, supportive therapy, group meetings, occupational therapy, counselling by social workers) and therefore the difference of attention between the two interventions was small compared with the overall attention, the face-to-face contact with therapists within the trial was twice as much for patients in the CBT group than for patients receiving PE. This varying contact time alone could have accounted for the differences of outcome between the two interventions. Moreover, due to problems of statistical power we did not introduce a non-specific control condition, which again limits conclusions regarding treatment specificity.

Clinical consequences

Despite the limitations mentioned above, the results of this study suggest that CBT in a brief group format also has a strong impact on outcome measures such as re-hospitalization, relapse, symptoms and compliance with medication. Regarding readmission, relapse and compliance the present results indicate the superiority of CBT treatment to PE – at least on a descriptive level. The study has demonstrated that brief group CBT treatment is primarily effective for in-patients but it might also be feasible for out-patients or in community health centres. It may be a practical psychological

treatment, which has less dependence on expert therapists' time than individual CBT and is therefore more likely to become integrated in mental health services. Group CBT may improve the prognosis of many people with schizophrenia, at least in comparison with PE, and could therefore be of considerable clinical and economic importance.

Acknowledgements

This work was supported by grant from the Koln Fortune Program (191/1998)/Faculty of Medicine, University of Cologne, Germany.

References

1. Drury V, Birchwood M, Cochrane R et al. Cognitive therapy and recovery from acute psychosis: a controlled trial. I: Impact on psychotic symptoms. Br J Psychiatry 1996; **169**:593–601.
2. Drury V, Birchwood M, Cochrane R. Cognitive therapy and recovery from acute psychosis: a controlled trial. III: Five-year follow-up. Br J Psychiatry 2000;**177**:8–14.
3. Haddock G, Tarrier N, Morrison AP et al. A pilot study evaluating the effectiveness of individual inpatient cognitive-behavioural therapy in early psychosis. Soc Psychiatry Psychiatr Epidemiol 1999;**34**:254–258.
4. Kuipers E, Garety P, Fowler D et al. London-East Anglia randomised controlled trial of cognitive-behavioural therapy for psychosis. I: Effects of the treatment phase. Br J Psychiatry 1997;**171**:319–327.
5. Kuipers E, Fowler D, Garety P et al. London-East Anglia randomized controlled trial of cognitive-behavioural therapy for psychosis, III: Follow up and economic evaluation at 18 months. Br J Psychiatry 1998;**173**:61–68.
6. Lewis S, Tarrier N, Haddock G et al. Randomised controlled trial of cognitive-behavioural therapy in early schizophrenia: acute-phase outcomes. Br J Psychiatry 2002; **181(suppl. 43)**:91–97.
7. Sensky T, Turkington D, Kingdon D et al. A randomized controlled trial of cognitive-behavioural therapy for persistent symptoms in schizophrenia resistant to medication. Arch Gen Psychiatry 2000;**57**:165–172.
8. Tarrier N, Yusupoff L, Kinney C et al. Randomised controlled trial of intensive cognitive behaviour therapy for patients with chronic schizophrenia. Br Med J 1998; **317**:303–307.
9. Tarrier N, Wittkowski A, Kinney C et al. Durability of the effects of cognitive-behavioural therapy in the treatment of chronic schizophrenia: 12-month follow-up. Br J Psychiatry 1999;**174**:500–504.
10. Tarrier N, Kinney C, McCarthy E et al. Two-year follow-up of cognitive-behavioural therapy and supportive counseling in the treatment of persistent symptoms in chronic schizophrenia. J Consult Clin Psychol 2000;**5**: 917–922.
11. Garety PA, Fowler D, Kuipers E. Cognitive-behavioural therapy for medication-resistant symptoms. Schizophr Bull 2000;**26**:73–86.
12. Stant AD, TenVergent EM, Groen H et al. Cost-effectiveness of the HIT programme in patients with schizophrenia and persistent hallucinations. Acta Psychiatr Scand 2003; **107**:361–368.
13. Turkington D, Kingdon D, Turner T et al. Effectiveness of a brief cognitive-behavioural therapy intervention in the treatment of schizophrenia. Br J Psychiatry 2002;**180**:523–527.
14. Wykes T, Parr AM, Landlau S. Group treatment of auditory hallucinations. Exploratory study of effectiveness. Br J Psychiatry 1999;**175**:180–185.
15. Merinder LB. Patient education in schizophrenia: a review. Acta Psychiatr Scand 2000;**102**:98–106.
16. Bäuml J, Pitschel-Walz G, Kissling W. Psychoedukative Gruppen bei schizophrenen Patienten und Angehörigen. In: Stark A, ed. Verhaltenstherapeutische Ansätze im Umgang mit schizophren Erkrankten. Tübingen: Deutsche Gesellschaft für Verhaltenstherapie, 1995:217–255.
17. Razali MS, Yaha H. Compliance with treatment in schizophrenia: a drug intervention program in a developing country. Acta Psychiatr Scand 1995;**91**:331–335.
18. Owens DGC, Carroll A, Fattah S, Clyde Z, Coffey I, Johnstone EC. A randomized, controlled trial of a brief interventional package for schizophrenic out-patients. Acta Psychiatr Scand 2001;**103**:362–369.
19. Pukrop R, Möller HJ, Steinmeyer EM. Quality of life in psychiatry. A systematic contribution to construct validation and the development of the integrative assessment tool 'modular system of quality of life'. Eur Arch Psychiatry Clin Neurosci 2000;**250**:120–132
20. Janke W, Erdman G, Kallus W. Stress coping questionnaire. Gottingen, Germany: Hogrefe, 1985.
21. Krampen K. Locus of control questionnaire. Goettingen, Germany: Hogrefe, 1991.
22. Kay SR. The Positive and Negative Syndrome Scale (PANSS) of schizophrenia. Schizophr Bull 1987;**13**:261–276.
23. Jacobson NS, Revenstorf D. Statistics for assessing the clinical significance of psychotherapy techniques: issues, problems, and new developments. Behav Assess **10**:133–145.
24. Kemp R, Kirov G, Everitt B, Hayward P, David A. Randomised controlled trial of compliance therapy. Br J Psychiatry 1998;**172**:413–419.
25. Ventura J, Nuechterlein KH, Lukoff D et al. A prospective study of stressful life events and schizophrenic relapse. J Abnorm Psychol 1989;**4**:407–411.
26. Buchkremer G, Klingberg S, Holle R et al. Psychoeducational psychotherapy for schizophrenic patients and their key relatives or care givers. Results of a 2-year follow-up. Acta Psychiatr Scand 1997;**96**:483–491.
27. Atkins M, Burgess A, Bottomley C, Riccio M. Chlorpromazine equivalents: a consensus of opinion for both clinical and research applications. Psychiatr Bull 1997;**21**:224–226.
28. Tarrier N, Kinney C, McCarthy E et al. Coping Strategy Enhancement (CSE): a method of treating residual schizophrenic symptoms. Behav Psychoth 1990;**18**:283–293.
29. Tarrier N, Beckett R, Harwood S et al. A trial of two cognitive-behavioural methods treating drug-resistant residual psychotic symptoms in schizophrenic patients. I Outcome Br J Psychiatry 1993;**162**:524–532.
30. Barrowclough C, Haddock G, Tarrier N et al. Randomized controlled trial of motivational interviewing, cognitive behaviour therapy, and family intervention for patients with comorbid schizophrenia and substance use disorders. Am J Psychiatry 2001;**158**:1706–1713.
31. Hornung WP, Kieserg A, Feldmann R. Psychoeducational training for schizophrenic patients: background, procedure and empirical findings. Patient Educ Couns 1996;**29**:257–268.

32. Hornung WP, Feldmann R, Klingberg S, Buchkremer G, Reker T. Long-term effects of psychoeducational psychotherapeutic intervention for schizophrenic outpatients and their key-persons – results of a five-year follow-up. Eur Arch Psychiatry Clin Neurosci 1999;**29**:162–167.

33. Jacobson NS, Roberts LJ, Berns SB, McGlinchey JB. Methods for defining the clinical significance of treatment effects: description, application, and alternatives. J Consult Clin Psychol 1999;**67**:300–307.