Psychosocial Interventions for Adults With Schizophrenia: An Overview and Update of Systematic Reviews

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Objective: The authors of this systematic review (SR) sought to provide evidence for effects of commonly used psychosocial interventions on several outcomes among adults with schizophrenia.

Methods: MEDLINE, the Cochrane Library, and PsycINFO databases were searched through July 2020. Eligible studies were SRs and trials of at least 12 weeks duration and with ≥50 participants that compared psychosocial interventions with treatment as usual among adults with schizophrenia. Study design, year, setting, country, sample size, eligibility criteria, population, clinical and intervention characteristics, results, and funding source were extracted, along with quality criteria. The evidence was evaluated on quality and strength of evidence stratified by intervention area and outcome, according to the Evidence-Based Practice Centers Methods Guide of the Agency for Healthcare Research and Quality.

Results: Nine SRs and 30 trials (N=23,921 patients) in 11 intervention areas were included. Trials were mostly of fair quality and had low-to-moderate strength of evidence. Compared with treatment as usual, most psychosocial interventions were more effective in improving intervention-targeted outcomes, including core illness symptoms. Compared with treatment as usual, assertive community treatment, cognitive-behavioral therapy (CBT), family interventions, psychoeducation, social skills training, supported employment, and early interventions for first-episode psychosis (FEP) improved various functional outcomes. CBT and early interventions for FEP improved quality of life. Family interventions, psychoeducation, illness self-management, and early interventions for FEP reduced relapse.

Conclusions: Compared with treatment as usual, most psychosocial interventions improved functional outcomes, quality of life, and core illness symptoms, and several reduced relapse frequency among adults with schizophrenia.

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Psychotic symptoms due to schizophrenia and other primary psychotic disorders (e.g., schizoaffective, schizophreniform, or delusional disorders) can be managed with both pharmacological and psychosocial interventions. Comprehensive pharmacological and psychosocial interventions are aimed at reducing positive and negative symptoms and the functional disabilities associated with these illnesses. Many well-researched psychosocial interventions have recently been designed for and tested among individuals who are diagnosed as having psychotic disorders as well as those who are at clinical high risk for psychosis. For many years, national schizophrenia treatment guidelines have recommended several psychosocial interventions for individuals with schizophrenia and other psychotic disorders, although implementation and access to these interventions in routine care settings are lagging behind these recommendations and the evidence (1, 2).

On the basis of structured literature reviews accounting for study design and quality, schizophrenia treatment guidelines

HIGHLIGHTS

- The authors conducted a systematic review, based on nine systematic reviews of 192 trials and 30 additional trials (N=23,921 patients), of the evidence on 11 psychosocial interventions compared with treatment as usual for improving outcomes among adults with schizophrenia.
- Assertive community treatment, cognitive-behavioral therapy (CBT), family interventions, psychoeducation, social skills training, supported employment, and early interventions for first-episode psychosis (FEP) improved functional outcomes.
- Quality of life was improved with CBT and early interventions for FEP, and relapse was reduced with family interventions, psychoeducation, illness self-management, and early interventions for FEP.
- Although not typically a target outcome, core illness symptoms were improved with CBT, family interventions, and illness self-management.

in the United States have recommended evidence-based psychosocial interventions for schizophrenia and other psychotic disorders (3). Ideally, evidence-based psychosocial treatments are individualized and administered within the context of team-based, person-centered care that emphasizes the strengths, resources, and preferences of the client. Interventions should be selected to address specific domains of distress and problems in daily living. For example, previous systematic reviews (SRs) have found that individuals who have poor social functioning and difficulty gaining or maintaining employment are likely to benefit from social skills training (4) and supported employment, offered by the individual placement and support (IPS) approach (5). Similarly, cognitive remediation can ameliorate cognitive challenges that interfere with academic or vocational performance (6). However, these reviews are not recent, and new insights might be drawn from an updated review of the evidence for psychosocial interventions.

In an effort to support the 2020 revision of the American Psychiatric Association Practice Guideline for the Treatment of Patients With Schizophrenia (7), we were commissioned by the Agency for Healthcare Research and Quality (AHRQ) to conduct an SR on both pharmacological and psychosocial treatments for individuals with schizophrenia. This article summarizes the findings of the broader report pertaining to psychosocial interventions that were compared with treatment as usual. Unlike previous reviews, it covers the range of interventions currently recommended in one study. The full report, including detailed evidence tables, appendices, and evidence on antipsychotic medications, is available on the AHRQ website (8).

METHODS

The methods used in this SR followed the AHRQ Methods Guide for Effectiveness and Comparative Effectiveness Reviews, including prioritizing inclusion of preexisting SRs, where possible (9). The scope of the review was guided by input from topic experts and representatives of the guideline writing group. The review scope included comparisons of the psychosocial interventions listed in Table 1 (10–17) with treatment as usual and a common set of prioritized outcomes (e.g., global and social functioning, quality of life, and core symptoms; see an online supplement to this article for details). The selection of treatment as usual as the comparison condition for this review reflected both the broad scope of the overall report and input from an expert panel that decision makers are faced with the choice of whether to add these interventions to standard care. A protocol for the review was posted previously (8).

Literature searches were conducted by a medical librarian in Ovid MEDLINE, the Cochrane Central Register of Controlled Trials, the Cochrane Database of SRs, and PsycINFO. The searches included periods from the databases' inception to February 1, 2017; reference lists of included studies and consultation with experts were used to identify additional studies (see the online supplement). We conducted an additional search of MEDLINE and PsycINFO in July 2020 to identify any new eligible studies. We used a dual-review approach for selecting and quality rating of studies as described in the following.

Studies that met the eligibility criteria were randomized controlled trials (RCTs) and SRs of RCTs that examined psychosocial interventions (Table 1) for adult outpatients with a schizophrenia spectrum diagnosis (≥50% of the study sample), with ≥50 participants, and ≥12 weeks duration. We limited our review to studies conducted in countries listed as high or very high on the United Nations International Human Development Index. The comparison condition was treatment as usual, which varied by study and included no intervention, waitlists, and nonactive interventions. We included the most recent, relevant, high-quality SRs and any RCTs published after the included SR search dates (see the online supplement for more details on the inclusion criteria).

We evaluated SRs and individual RCTs for quality (i.e., risk for bias) according to standard methods, by using dual review and consensus (9, 18). Studies were rated as good, fair, or poor. The strength (i.e., certainty) of each body of evidence was assessed through domains of aggregate study limitations, directness of the evidence, consistency of the findings across studies, and the precision of the point estimates (9, 19). The strength of evidence was assigned a rating of high, moderate, or low or of "insufficient to draw conclusions." Any evidence rated as insufficient is not reported in this article, but can be found in the full report (8), which also contains detailed strength-of-evidence assessments and evidence tables.

RESULTS

After reviewing 3,453 titles and abstracts, we included nine SRs of 192 RCTs and results from 30 trials (N=23,921 patients; see the online supplement for a study flow diagram). The findings are reported in detail in the AHRQ report (8). The characteristics of the included SRs and studies (6, 16, 17, 20–30, 32, 34–43, 45–95) are summarized in Table 2, and evidence on prioritized outcomes is summarized in Table 3 and Table 4.

Assertive Community Treatment

A good-quality SR of 14 RCTs (N=2,281) (20) and one additional trial (21) compared the outcomes of assertive community treatment (ACT) with those of treatment as usual. Patients assigned to ACT were more likely to be living independently (findings of three RCTs, odds ratio [OR]=2.15, 95% confidence interval [CI]=1.34–3.46, I^2=0% [the I^2 represents the percentage of the variability in effect estimates that is due to statistical heterogeneity]) and employed (two RCTs, OR=3.23, 95% CI=2.02–5.17, I^2=34%) and were less likely to be homeless (four RCTs, OR=0.23, 95% CI=0.11–0.46, I^2=28%). ACT and treatment as usual did not statistically significantly differ in the degree of improvement in core illness symptoms or social functioning or in arrests, imprisonment, or police contacts. The SR found that rehospitalization (the

TABLE 1. Psychosocial interventions included in systematic reviews of interventions for adults with schizophrenia[a]

Psychosocial intervention	Brief description	Estimated treatment duration	Outcomes targeted
Assertive community treatment	Intensive, outreach-oriented, community-based model that serves as a platform for integrating elements of several psychosocial interventions to provide individuals experiencing significant functional impairments and continuous high-service use (e.g., multiple acute inpatient stays, long-term hospitalization) with comprehensive community care delivered by a multidisciplinary team (e.g., psychiatric care provider, nurses, employment specialists, co-occurring substance use disorder specialists, and peer specialists).	2 years of weekly treatment	Decrease relapse and hospitalization; enhance treatment retention; improve psychosocial functioning
Cognitive adaptation training	Employs environmental supports to target severe functional impairments associated with psychosis. These supports include techniques such as labeling and utilization of signs and alarms in an individual's environment to encourage activities of daily living, self-care, and medication management (12).	9 months of weekly treatment	Target functional disability while promoting independence and mastery
Cognitive-behavioral therapy (CBT)	Individualized talk therapy focusing on the relationship among thoughts, emotions, and behaviors that teaches individuals coping skills to manage illness-related distress, recognize triggers related to symptom exacerbation, and evaluate maladaptive beliefs.	4–9 months of weekly treatment	Reduce distress and impairment associated with psychosis-related symptoms
Cognitive remediation	Use of cognitive practices and teaching strategies to target cognitive impairments related to schizophrenia (e.g., memory, attention, executive functioning, social cognition). Techniques can be deployed on computer or by paper and pencil (13).	16 weeks of twice weekly treatment sessions	Reduce psychosis-related cognitive impairment
Early interventions for first-episode psychosis (FEP)	Includes a range of interventions to help identify and treat individuals experiencing FEP. Interventions are delivered by a multidisciplinary team that typically provides psychopharmacological treatment, family education, psychosocial interventions (e.g., psychoeducation, CBT, vocational interventions), and peer support (14, 15).	2 years of weekly treatment	Reduce clinical and psychosocial declines related to the onset of psychotic disorders
Family interventions	Most family interventions for psychosis include psychoeducation to educate the family about psychosis and its treatment and to promote collaboration between family members, their loved ones, and the treatment team. Family interventions may promote the use of problem-solving, communication, coping, or illness management skills.	Typically, ≥10 sessions over a 6-month period	Reduce both individual and family distress and hospitalizations
Illness self-management	Aims to empower individuals to develop and achieve their own meaningful recovery goals and have autonomy in their treatment. Typically involves education on illness and illness management, as well as techniques to facilitate medication adherence and social skills acquisition and to develop a personalized relapse prevention plan.	12 weeks of 1–2 sessions per week	Increase illness self-management skills, decrease relapse and hospitalization, improve psychosocial functioning
Psychoeducation	Provides information on diagnosis and treatment options to decrease self-stigmatization and promote treatment engagement (16).	7 months of treatment	Increase knowledge and understanding of illness
Social skills training	Employs techniques (e.g., role modeling, positive reinforcement, behavioral rehearsals) to target	24–67 hours of training over 19–24 weeks	Improve social functioning and increase social supports

continued

TABLE 1, *continued*

Psychosocial intervention	Brief description	Estimated treatment duration	Outcomes targeted
	3 elements of social competence: perception, cognition, and behavioral response.		
Supported employment	Assists individuals in finding competitive employment, supports them in that employment, and teaches them skills and strategies to help maintain that employment (also known as individual placement and support). Ongoing benefits planning is key.	Varied by client and employer needs. Generally, weekly support for the client and employer (separately) during the first month of the job, monthly for at least 12 months with the client, and every few months with the employer depending on need	Increase sustained employment
Supportive therapy	Unlike other structured interventions, supportive therapy is intended to offer general support without aiming to change an individual's current situation. Supportive therapy may include several elements depending on the individual, including empathetic listening, providing encouragement, befriending, or assistance with daily activities (17).	Sessions held weekly or every other week as needed	Provide emotional support

[a] Descriptions are from Mueser et al. (10) and Kopelovich and Wood (11).

target for ACT, but not included as an outcome in our review) was significantly lower with ACT than with treatment as usual (20).

Cognitive Adaptation Training

Three fair-quality RCTs (reported in four published studies, total N=290, range 80–105) compared cognitive adaptive training (CAT) with treatment as usual (22–25). All three RCTs found that CAT improved functioning relative to treatment as usual according to scores on the Social and Occupational Functioning Scale (SOFAS) (in two RCTs) and the Multnomah Community Ability Scale (MCAS) (one RCT). Effect sizes for CAT ranged from 0.41 to 1.47, depending on the scale used and the timing of assessment. One RCT found that patients receiving CAT were significantly less likely to experience relapse after 15 months than were patients receiving treatment as usual (35% [N=23 of 66] vs. 81% [N=17 of 21], $p<0.004$) (24).

Cognitive-Behavioral Therapy

We identified three good-quality SRs comparing cognitive-behavioral therapy (CBT) with treatment as usual. The SRs included between nine and 50 RCTs each (N=895–3,947 patients) (26–28). Studies of individual and group CBT were included and combined in all three SRs, although one conducted separate analyses for individual and group CBT (28). Two SRs (26, 28) assessed only the effect of CBT on total or negative symptoms, so we reviewed the included studies of both reviews for reporting of other outcomes of interest. As a result, we identified seven RCTs reporting functioning, relapse, or quality of life (29–35). Our literature searches also identified five RCTs (25, 36–39) that met the inclusion criteria and had not been included in the SRs. The duration, treatment modality, techniques employed, and intended primary targets of the CBT treatment were variable across these studies.

CBT yielded greater improvement in overall core illness symptoms than did treatment as usual (34 RCTs, standardized mean difference [SMD]=−0.33, 95% CI=−0.47 to −0.19, I^2=68%) (28). In studies with longer-term follow-up after CBT had ended, these differences were not statistically significant, although few of the studies had a treatment-as-usual control group. Two SRs found that CBT was associated with small, clinically nonsignificant improvements in negative symptoms (26, 28).

CBT improved short-term global function assessed with the Global Assessment of Functioning (GAF) score (five RCTs, mean difference [MD]=5.35, 95% CI=1.05–9.65, I^2=77%) (29, 34, 39–41) and social and occupational function assessed with the SOFAS score (two RCTs, SMD=9.11, 95% CI=6.31–11.91, I^2=0%) (39, 42), regardless of CBT treatment target or modality. One RCT conducted with people with chronic schizophrenia and poor functioning at baseline found a positive effect favoring CBT (32); however, an SR (27) and two additional RCTs (25, 35) found no significant difference between CBT and treatment as usual in sustained functional changes >1 year posttreatment.

Since publication of our previous review (8), one new RCT met our eligibility criteria, a study of CBT focused on behavioral activation to improve negative symptoms (43). The results of this study were consistent with those of previous studies, indicating improved negative symptoms and global functioning after 10 weeks of CBT, compared with treatment as usual.

TABLE 2. Characteristics of the studies included in a systematic review of interventions for adults with schizophrenia[a]

Intervention	Included studies	N	Duration of intervention	Follow-up length	Populations	Study quality
Assertive community treatment	SRs: 1 (of 14 studies) (20), RCTs: 1 (21)	2,399	SR: not reported, RCT: 1 year	1 month–2 years	Adults with schizophrenia or schizophrenia-like disorders; bipolar disorder; or depression with psychotic features. Proportion with schizophrenia ≥50%: 8 studies	SR: good; RCT: fair
Cognitive adaptation training	SRs: 0, RCTs: 3 (in 4 publications) (22–25)	290	9 months–2 years	15 months–2 years	Adults with schizophrenia or schizoaffective disorder	RCTs: fair
Cognitive-behavioral therapy	SRs: 3 (89 studies) (26–28), RCTs: 6 (25, 36–39, 43)	8,076	8 weeks–5 years	8 weeks–5 years	Adults with recent-onset or chronic schizophrenia, schizoaffective disorder or nonaffective functional psychosis	SRs: good; RCTs: 1 good, 5 fair
Cognitive remediation	SR: 1 (34 studies) (6), RCTs: 5 (87–91)	3,226	2 weeks–2 years	2 weeks–2 years	Adults with recent-onset or chronic schizophrenia, schizoaffective disorder, or primary psychotic disorder	SRs: 1 good; RCTs: 1 good, 4 fair
Early interventions for first-episode psychosis	SRs: 0, RCTs: 4 (in 9 publications) (45–53)	2,363	1–2 years	1–10 years	Adults with psychotic symptoms and evidence of one of the following diagnoses: schizophrenia, schizoaffective disorder, schizophreniform disorder, or brief or other psychotic disorder with first psychotic episode to no more than 6 months treatment	RCTs: 1 good, 2 fair, 1 poor
Family interventions	SR: 1 (27 studies) (55), RCTs: 6 (30, 56–62)	2,859	6 weeks–3 years	6 weeks–8 years	Adults with schizophrenia, schizoaffective disorder, or nonaffective psychosis and their family members	SR: fair; RCTs: 1 good, 3 fair, 2 poor
Illness self-management	SR: 1 (13 studies) (81), RCTs: 0	1,404	7–49 sessions, 45–90 minutes each	Immediately after intervention to 2 years	Adults with schizophrenia or severe mental illness	SR: fair
Psychoeducation	SR: 1 (10 studies) (16), RCTs: 0	1,125	1–18 months	2 months–5 years	Adults with schizophrenia, schizoaffective disorder, schizophreniform disorder, or schizotypal personality disorder	SR: good
Social skills training	SRs: 0, RCTs: 3 (in 4 publications) (59, 82–84)	433	6 months–2 years	6 months–3 years	Adults with schizophrenia, schizoaffective disorder, bipolar disorder, or major depression	RCTs: fair
Supported employment	SRs: 0, RCTs: 2 (85, 86)	924	12 months–2 years	2 years	Adults with severe mental illness	RCTs: fair
Supportive therapy	SR: 1 (5 studies) (17), RCTs: 0	822	7 months–1 year	7 months–2 years	Adults with schizophrenia or schizophrenia-like illnesses diagnosed through any criteria (including severe mental illness)	SR: good

[a] RCT, randomized controlled trail; SR, systematic review.

TABLE 3. Summary of the main outcomes of psychosocial interventions (vs. treatment as usual) for adults with schizophrenia[a]

Intervention outcome	Evidence strength	Conclusions
Assertive community treatment		
Social function	Low	ACT did not improve social function more than did treatment as usual, according to pooled analysis of 3 studies (MD=.03, 95% CI=−.28 to .34); an additional trial also found no difference (20, 21). No significant differences were detected between groups in arrests (2 RCTs, total N=604, OR=1.17, 95% CI=.60–2.29, I^2=0%), imprisonment (4 RCTs, total N=471, OR=1.19, 95% CI=.70–2.01, I^2=27%), or police contacts (2 RCTs, total N=149, OR=.76, 95% CI=.32–1.79, I^2=84%) (20).
Housing function	Moderate	Patients receiving ACT were more likely to live independently (3 RCTs, OR=2.15, 95% CI=1.34–3.46, I^2=0%) (20), and less likely to be homeless (4 RCTs, OR=.23, 95% CI=.11–.46, I^2=28%) (20, 21) compared with treatment as usual.
Employment	Moderate	Patients receiving ACT were more likely to be employed than those receiving treatment as usual (2 RCTs, OR=3.23, 95% CI=2.02–5.17, I^2=34%) (20).
Core illness symptoms	Moderate	Groups did not differ in core illness symptom (3 RCTs, MD=−.14, 95% CI=−.36 to .08, I^2=23%); one additional trial also found no difference in symptom improvement (20, 21).
Cognitive adaptation training		
Global function	Low	Cognitive adaptation training improved function vs. treatment as usual; magnitude of this effect ranged from medium to large during treatment (3 RCTs, effect size range .41–1.47) (23–25).
Relapse	Low	35% (N=23 of 66) of patients who received cognitive adaptation training relapsed over 15 months compared with 81% (N=17 of 21) of those who received treatment as usual (9 months' treatment, followed by 6 months of follow-up, p<.004).
CBT		
Global, social and occupational function, <6 months follow-up	Moderate	CBT improved short-term global (GAF scale score, 5 RCTs, MD=5.35, 95% CI=1.05–9.65, I^2=77%) (29, 34, 39–41) and social and occupational function (SOFAS score, 2 RCTs, MD=9.11, 95% CI=6.31–11.91) (39, 42) more than did treatment as usual.
Global, social and occupational function, >12 months follow-up	Low	Long-term global and social and occupational function did not differ between CBT and treatment as usual according to GAF and SOFAS scores in one SR and 2 RCTs not included in the SR (25, 27, 35); another RCT, conducted with people with low function at baseline, found a positive effect in favor of CBT (adjusted mean GAS score 58.3 vs. 47.9, p=.03) (32).
Quality of life	Low	CBT improved quality of life more than did treatment as usual in the short term (12–24 weeks follow-up) according to findings based on 2 RCTs (36, 39), but this difference was not observed in 2 RCTs with longer follow-up (18–24 months) (30, 35).
Core illness symptoms	Moderate	CBT had a greater effect on core illness symptoms than did treatment as usual during treatment (8 weeks–5 years) according to findings of a good-quality SR of 34 studies (SMD=−.33, 95% CI=−.47 to −.19) (26).
Negative symptoms	Low	Small differences were observed between CBT and treatment as usual in negative symptom improvement in 2 SRs (26, 28).
Cognitive remediation: global, social, function	Low	The effect of cognitive remediation on measures of global and social function was not statistically significant (3 RCTs, effect size=.16, 95% CI=−.16 to .49) (6).
Early interventions for first-episode psychosis		
Global function	Moderate	Pooled results indicated that the early team-based multicomponent treatment programs resulted in higher functioning, assessed with GAF and GAS scores after up to 2 years of treatment (3 RCTs, WMD=3.88, 95% CI=.91–6.85, I^2=64%) (45, 48, 49, 54).
Social function	Moderate	Early team-based multicomponent treatment programs resulted in significantly more people working or in school after up to 2 years of treatment (3 RCTs, RR=1.22, 95% CI=1.01–1.47) (45, 48, 49, 54).
Housing function	Low	In 2 RCTs, no significant differences were observed between early team-based multicomponent treatment programs and treatment as usual on housing status for up to 2 years of treatment (45, 48, 54).
Quality of life	Moderate	2 RCTs reported significant differences between early team-based multicomponent treatment programs and treatment as usual on quality-of-life scores for up to 2 years of treatment (pooled effect size=.84, 95% CI=.14–1.55) (48, 52).
Reduction in self-harm	Low	No difference was observed in self-harm reduction in two RCTs of early team-based multicomponent treatment programs vs. treatment as usual.

continued

TABLE 3, *continued*

Intervention outcome	Evidence strength	Conclusions
Core illness symptoms	Low	In 3 RCTs, no difference was detected between early team-based multicomponent treatment programs and treatment as usual in core illness symptoms (WMD of PANSS score=−2.53, 95% CI=−5.45 to .39, I^2=55%) (48, 49, 52).
Relapse	Moderate	In 2 RCTs, early team-based multicomponent treatment program participants were significantly less likely to relapse than were those in treatment as usual (RR=.64, 95% CI=.52–.79) (47, 49).
Family interventions		
Social function	Low	No differences were detected in Social Functioning Scale scores (1 RCT) (56).
Occupational function	Low	One SR reported no differences in unemployment rates between participants in family interventions and treatment as usual at 1 year (55).
Reduction in self-harm	Low	Suicide rates were similar for family intervention participants and those who received treatment as usual in one SR, but suicide events were few (55).
Core illness symptoms	Low	Results of 4 RCTs indicated that family interventions reduced core illness symptoms (SMD=−.46, 95% CI=−.73 to −.20, I^2=0%) (30, 58, 77, 80).
Negative symptoms	Low	Findings based on 3 RCTs showed that negative symptoms were reduced with family interventions (SMD=−.38, 95% CI=−.69 to −.07, I^2=0%) (30, 58, 67).
Relapse	Moderate (0–12 months), low (12–24 months), low (>24 months)	Significantly lower relapse rates were consistently observed with family interventions relative to treatment as usual; pooled RRs were .62 (95% CI=.41–.92; I^2=0%) at 0–6 months (3 RCTs) (60, 70, 77), .67 (95% CI=.54–.83; I^2=41%) at 7–12 months (19 RCTs) (30, 58–60, 63–69, 72–79), and .75 (95% CI=0.58–.99; I^2=57%) at 13–24 months (9 RCTs) (63, 65, 66, 68, 71–74, 78). No difference in relapse was observed at 25–36 months (2 RCTs, RR=1.05, 95% CI=.79–1.39; I^2=45%) (65, 73). At 5 years' follow-up, relapse was significantly lower with family interventions (2 RCTs, RR=.82; 95% CI=.72–.94, I^2=0%) (60, 78).
Illness self-management		
Core illness symptoms	Moderate	Participants receiving a self-management education intervention were significantly more likely to have a reduction in severity of core illness symptoms assessed with the BPRS (5 RCTs, WMD=−4.19, 95% CI=−5.84 to −2.54) (81).
Negative symptoms	Low	Negative symptoms measured on the PANSS–negative subscale were reduced (5 RCTs, MD=−4.01, 95% CI=−5.23 to −2.79) (81).
Relapse	Low	Patients receiving illness self-management were less likely to experience relapse than those receiving treatment as usual (5 RCTs, OR=.54, 95% CI=.36–.83) (81).
Psychoeducation		
Global function	Low	One good-quality SR reported that psychoeducation had a greater effect than treatment as usual on global functional outcomes at 1 year of follow-up (3 RCTs, MD=−5.23, 95% CI=−8.76 to −1.71; I^2=79%) (16).
Relapse	Moderate	One good-quality SR reported that psychoeducation had a greater effect than treatment as usual on relapse rates at 9–18 months of follow-up (6 RCTs, RR=.80, 95% CI=.70–.92, I^2=54%) (16).
Social skills training		
Social function	Low	Social function was significantly better among patients receiving 6 months (SMD=1.60, 95% CI=1.19–2.02), 1 year (SMD=2.02, 95% CI=1.53–2.52), and 2 years (SMD=.65, 95% CI=.36–.95) of social skills training in 3 studies (in 4 publications) (59, 82–84).
Core illness symptoms	Low	Results of 2 RCTs revealed that core illness symptoms improved more with social skills training vs. treatment as usual at 6 months (SMD of PANSS score=−1.50 (95% CI=−1.92 to −1.09) and 2 years (SMD=−.81 95% CI=−1.22 to −.40) (59, 84).
Negative symptoms	Low	Negative symptoms were consistently and significantly improved with social skills training relative to treatment as usual in 3 studies (SMD range −.45 to −1.30; in 4 publications) (59, 82–84).
Supported employment: occupational function	Low	Supported employment, using the individual placement and support model, resulted in significantly better employment outcomes over 2 years compared with treatment as usual (more patients were employed, worked more hours, were employed longer, and earned more money) (85).
Supportive therapy: global and social function	Low	Two studies in an SR reported no differences between supportive therapy and treatment as usual for global or social function (17).

[a] ACT, assertive community treatment; BPRS, Brief Psychiatric Rating Scale; CBT, cognitive-behavioral therapy; GAF, Global Assessment of Functioning; GAS, Global Assessment Scale; MD, mean difference; PANSS, Positive and Negative Syndrome Scale; RCT, randomized controlled trial; RR, risk ratio; SMD, standardized mean difference; SOFAS, Social and Occupational Functioning Assessment Scale; SR, systematic review; WMD, weighted mean difference.

TABLE 4. Overview of evidence for psychosocial interventions for prioritized outcomes for patients with schizophrenia[a]

Intervention	Functioning outcomes				Quality of life	Self-harm reduction	Relapse	Core illness symptoms
	Global	Social	Occupational	Housing				
Assertive community treatment		+	++	++				++
Cognitive adaptation training	+						+	
Cognitive-behavioral therapy	+ to ++	+ to ++	+ to ++		+			+ to ++
Cognitive remediation	+	+						
Early interventions for first-episode psychosis	++	++		+	++	+	++	+
Family interventions		+	+			+	+ to ++	+
Illness self-management							+	+ to ++
Psychoeducation	+						++	
Social skills training		+						+
Supported employment			+					
Supportive therapy	+	+						

[a] Evidence for improvement: +, low; ++, moderate.

Cognitive Remediation

We identified a good-quality SR of 34 trials with treatment-as-usual control groups (N=448 patients), limited to studies that used the Cognitive Remediation Experts Workshop (44) definition or that were based on standard cognitive remediation principles (6). The SR found that compared with treatment as usual, cognitive remediation was associated with small positive effects on function that were not statistically significant (three RCTs [N=131], effect size=0.16, 95% CI=−0.16 to 0.49). This lack of significance may have been due to the very small sample sizes in the RCTs reviewed. Inadequate sample sizes may also be the reason for no apparent differences between cognitive remediation and control for other outcomes, including quality of life (one RCT, N=69) and treatment discontinuation (two RCTs, N=218).

Early Intervention Programs for Treating First-Episode Psychosis

We identified four RCTs whose results were presented in nine publications reporting on the effect of team-based multicomponent treatment for first-episode psychosis (FEP) compared with treatment as usual (45–53). These FEP treatments included multidisciplinary combinations of psychopharmacological treatment, family interventions, psychotherapy, employment or educational support, and case management. The interventions significantly improved global functioning after up to 2 years of treatment (three RCTs, weighted MD [WMD]=3.88, 95% CI=0.91–6.85, I^2=64%) (8). Participants in early intervention programs for FEP were also more likely to be working or in school (three RCTs, relative risk [RR]=1.22, 95% CI=1.01–1.47) (45, 48, 49, 54). Early intervention improved quality of life (two RCTs, pooled effect size=0.84, 95% CI=0.14–1.55) (48, 52), and participants in team-based multicomponent early intervention treatment programs were less likely to relapse (two RCTs, RR=0.64, 95% CI=0.52–0.79) (47, 49) than were participants receiving treatment as usual, but total Positive and Negative Syndrome Scale (PANSS) scores did not differ among the intervention groups.

Family Interventions

We identified a fair-quality SR (55) that compared family interventions with treatment as usual. Approximately half of the 53 RCTs included in this SR were conducted in China, and because applicability to United States populations was a concern, we excluded the China-based studies and, where necessary, performed our own analyses with the remaining 27 studies (N=2,297 patients) plus six additional trials (in eight publications, N=562) (30, 56–62). The family interventions varied widely in their intended outcomes but were generally aimed at preventing relapse.

At up to 24 months follow-up, significantly lower relapse rates were observed with family interventions than with treatment as usual. Pooled RR estimates ranged from 0.62 to 0.75 (95% CI=0.43–0.99, I^2=0%–57%), depending on the timing of assessment and based on two to 19 RCTs (30, 58–60, 63–79). Evidence on longer-term relapse rates was more limited. Significant differences were not found during a 25–36-month period in two RCTs (RR=1.05, 95% CI=0.80–1.39, I^2=45%), and at 5-year follow-up, relapse rates were again significantly lower with family interventions (two RCTs, RR=0.82, 95% CI=0.72–0.94, I^2=0%). Family interventions were also associated with improved core illness (four RCTs, SMD=−0.46, 95% CI=−0.73 to −0.20, I^2=0%) (30, 58, 77, 80) and negative symptoms (three RCTs, SMD=−0.38, 95% CI=−0.69 to −0.07, I^2=0%) (30, 58, 67).

Illness Self-Management

One fair-quality SR of 13 trials (N=1,404 patients, range 23–125) examined the effect of self-management education interventions compared with treatment as usual (81). Only

three to five trials (N=257–534 patients) reported results for each outcome of interest. Illness self-management interventions reduced both core (five RCTs, Brief Psychiatric Rating Scale [BPRS] WMD score=−4.19, 95% CI=−5.84 to −2.54) and negative (three RCTs, PANSS WMD score=−4.01, 95% CI=−5.23 to −2.79) symptom severities. Illness self-management interventions were also associated with significant reductions in risk for relapse (OR=0.54, 95% CI=0.36–0.83, I^2 not reported).

Psychoeducation

We identified one good-quality SR of 10 RCTs (N=1,125 patients) of formalized psychoeducation (16). Compared with treatment as usual, psychoeducation was associated with a greater effect on global function at 1 year, assessed with GAF or Global Assessment Scale (GAS) scores (three RCTs, MD=−5.23, 95% CI=−8.76 to −1.71, I^2=79%); evidence from other time points was limited and inconsistent. The risk for relapse was lower with psychoeducation than with treatment as usual at 9–18-month follow-up (six RCTs, RR=0.80, 95% CI=0.70–0.92, I^2=54%). Evidence on other outcomes, including quality of life and core illness symptoms, was limited, with no clear difference between psychoeducation and treatment as usual.

Social Skills Training

We identified three fair-quality RCTs in four publications meeting our inclusion criteria that compared social skills training with treatment as usual (59, 82–84). Social skills training improved global function after treatment for 6 months (GAF SMD score=1.60, 95% CI=1.19–2.02) or 1 year (GAF SMD score=2.02, 95% CI=1.53–2.52), according to results reported in two RCTs (59, 84). The third RCT also reported greater functional improvement with social skills training, assessed with MCAS scores (SMD=0.65, 95% CI=0.36–0.95) (82, 83). Social skills training significantly improved core illness symptoms, as measured with tools such as the PANSS, at 6 months (SMD=−1.50, 95% CI=−1.92 to −1.09) and 1 year (SMD=−0.81, 95% CI=−1.22 to −0.40) (59, 84). Results were similar for negative symptoms at 6 months (SMD=−1.30, 95% CI=−1.70 to −0.90), 1 year (SMD=−0.82, 95% CI=−1.23 to −0.40), and 2 years (SMD=−0.45; 95% CI=−0.74 to −0.15) (59, 83, 84).

Supported Employment

A fair-quality RCT (N=204 patients) examined the effect of IPS compared with a treatment-as-usual control group (85). Supported employment as part of the IPS model was consistently associated with improved occupational functioning relative to treatment as usual, including time to finding employment (197 vs. 219 days, p=0.02), the proportion of patients working >20 hours per week (34% [N=23 of 68] vs. 13% [N=9 of 69], p=0.001), mean monthly salary ($2,078 vs. $618, p<0.001), and weeks worked (30 vs. 5 weeks, p<0.001) for IPS and control groups, respectively. Since the publication of our previous review (8), one new study comparing IPS versus treatment as usual (86) reported findings consistent with those of the study we included (85); after 18 months, the IPS group reported significantly more hours of employment or studying than did the control group (86).

Supportive Therapy

We identified one good-quality SR comparing supportive therapy or supportive care that included 24 RCTs (N=2,126 patients, range 12–315 per study) (17). Only five of the trials had a treatment-as-usual control group (N=822). Interventions were aimed at maintaining current functioning or sought to assist the patients with preexisting coping abilities. Specific treatments received in the treatment-as-usual group were not reported. Three of the RCTs were conducted in an outpatient setting, and two were conducted in the United States. The SR found that outcomes of supportive therapy did not significantly differ from those of treatment as usual, but evidence was limited to one RCT per outcome measure, estimates were imprecise, and the specifics of the control groups were not reported (see the online supplement).

DISCUSSION

Compared with treatment as usual, the psychosocial interventions reviewed (except for supportive therapy) more effectively improved intervention-targeted outcomes, including core illness symptoms (Table 3 and Table 4). Various functional outcome measures were improved more with ACT (housing), CBT (global, and social and occupational), psychoeducation (global), social skills training (social), supported employment (occupational), and early interventions for FEP (global, school or work, and housing). CBT and early interventions for FEP improved quality of life, and family interventions, psychoeducation, illness self-management, and early interventions for FEP reduced relapse (although relapse was variably defined). The strength of this evidence (i.e., our certainty in the findings) was low to moderate, depending on the outcome.

The findings of our previous review (8) have been used in developing the American Psychiatric Association's Practice Guideline for the Treatment of Patients With Schizophrenia (7). On the basis of that earlier review, psychosocial treatments should be considered frontline interventions for patients with schizophrenia by clinicians and health system administrators alike, with the important caveat that the review was not intended to provide an exhaustive list of evidence-based psychosocial interventions for this population. The current review provides a summary of this evidence for consideration in policy development (e.g., enhancing access to multicomponent care). Our findings on ACT and FEP service outcomes underscore the importance of multicomponent, team-based care. We found sufficient evidence that affirms the utility of the unitary interventions we investigated to target clinical and functional outcomes for individuals with schizophrenia.

Our delimited inclusion criteria with regard to target populations, interventions, comparisons, outcomes, and settings

BOX 1. Future research recommendations to study interventions for patients with schizophrenia

Populations

- Randomized controlled trials (RCTs) need to be conducted in broader and better-defined populations, with either separate studies of subpopulations or sufficiently large sample sizes to allow meaningful subgroup analysis.
- Future studies might consider using the National Institute of Mental Health Research Domain Criteria approach to categorizing the disorders of patients.

Interventions

- Interventions should be clearly defined and described, including required components, frequency, and number and duration of sessions; fidelity to the intervention model should be measured whenever possible.
- Studies should measure both the intensity and duration of the intervention required to achieve the best results.
- More studies are needed to determine the effects of cognitive remediation, supported employment, and supportive therapy for multiple key outcomes and outside of the target outcomes of these interventions.

Comparisons

- Studies are needed to address the heterogeneity in treatment-as-usual control groups and must report on the specific services and treatments received and standardize the comparison or control group for attention effects.
- Future studies should use attention-control groups that are well defined and consistently used across the intervention.

Outcomes

- Trials need to define, evaluate, and report patient-valued health outcomes, rather than intermediate or surrogate outcomes, such as general and social functioning, recovery, quality of life, self-harm, and adverse effects assessed with validated or standardized and easily interpretable measures.
- Studies should identify what constitutes clinically meaningful change in scale scores and should intentionally measure adverse events.

Timing

- The long-term benefits vs. risks and costs of treatments remain unclear, in particular for individuals whose illness is resistant or only partially responsive to treatment; additional, well-designed long-term studies are needed.

Study Designs

- RCTs should have adequate sample sizes to address important health outcomes, rather than sample sizes aimed at intermediate or surrogate outcomes.
- Studies should adhere to the current standards for reporting, to enable a better understanding of study methodologies, baseline characteristics of included patients, and results.
- Studies should report exact variance measures for all outcomes, such as p values of 95% confidence intervals, rather than categorical p values (e.g., $p<0.05$, or "not significant").

of the studies served as important context for our findings. Although our findings were largely consistent with those of previous meta-analyses and SRs on psychosocial interventions compared with treatment as usual, our specific approach may account for observed discrepancies with other SRs. For example, Wykes et al.'s (6) meta-analysis of cognitive remediation, which differed from our SR in inclusion criteria, assessment of trial quality, and primary outcomes, found a small-to-moderate effect on cognition (not assessed in the present and in our previous review [8]) and functioning (consistent with our findings). For some interventions, such as early interventions for FEP, studies of populations with other severe mental illness are available that were not included in our SR. Inclusion of these populations resulted in findings in a 2018 review (96) of early interventions versus treatment as usual for "early-phase psychosis" (based on 10 RCTs) that were only slightly different from our findings (based on six RCTs with ≥50% patients with schizophrenia). Our review did not find a significant benefit of these interventions on core symptoms, whereas the 2018 review (96) did find a significant benefit. Findings for other common outcomes were not statistically significant. Previous reviews of CBT for patients with any serious mental illness have indicated sustained benefits at 6-month to 5-year follow-ups (97–99), whereas the studies included in our SR did not support sustained longitudinal functional gains. For more well-established interventions, more evidence may be available for other comparisons.

Although suitable to the objective of informing the American Psychiatric Association's Practice Guideline for the Treatment of Patients With Schizophrenia, the list of interventions included in the present SR was not comprehensive; other interventions may have similar benefits as reported here for function, quality of life, and core illness symptoms. For some of the interventions, the target populations were more broadly defined to include other serious mental illnesses, such as major mood disorders with or without psychotic symptoms. Our list of interventions included both discrete ones as well as treatment packages, which can include a variety of interventions and strategies (e.g., shared decision making and person-centered treatment planning). Our SR did not ascertain which components of care could be mechanistically implicated in producing the observed effects. We observed both ambiguity and heterogeneity within interventions across studies, with few details reported on the specific approach, modality, frequency or number of sessions, timing of follow-up, or differences in the primary treatment targets. Evidence to inform the best duration or schedule of treatment was not available for the psychosocial interventions reviewed and was either not reported by or highly variable across studies. Treatment fidelity was rarely reported in studies, and therefore the extent to which the treatments administered

adhered to the model and were competently delivered is not known.

Treatment-as-usual control groups have limitations that are well described in the literature (26). We found that very few studies attempted to describe what was included in treatment as usual, and none systematically documented what patients in the control group received. Attention-control groups may be useful, adding consistency in the control group intervention. To assess comparative effectiveness, active comparators would need to be assessed.

Our review assessed the same prioritized outcomes across all interventions. Although this approach enhances consistency across the bodies of evidence, it also means that for some interventions the target outcome was not prioritized (Table 1). The outcome of rehospitalization was not included in this SR, because of a lack of confidence that the findings would be valid across time and different health care systems or settings. However, many studies report this outcome, and it is of importance to patients, providers, families, and payers. We also noted considerable variation in outcome reporting, even when the same outcome measure was used, particularly for outcomes measured with continuous scale scores. Many studies reported that the psychosocial interventions yielded small but significant improvements in scale scores, but the clinical importance of these changes was largely unclear. Relatedly, the quality of outcome reporting and small sample sizes in most studies limited our ability to draw conclusions. One-quarter of the studies reported >30% attrition, and 40% either did not conduct an intent-to-treat analysis or were unclear on how they handled missing data. Evidence on subgroups was limited by sample sizes and by the use of post hoc subgroup analyses rather than either preplanned analyses or trials designed to address important subgroups. Potential adverse effects of interventions were not assessed in most studies.

Future trials of psychosocial interventions for individuals with schizophrenia should respond to the limitations noted above, and our recommendations for future research are in Box 1. In light of the cumulative body of evidence and national guidance on their delivery in routine services, future research and funding should also be directed to the implementation of these interventions in public health care settings.

CONCLUSIONS

Compared with treatment as usual, most reviewed psychosocial interventions to treat adult patients with schizophrenia were more effective in improving two or more outcomes, including nontargeted but patient-valued outcomes such as functioning, quality of life, and core illness symptoms. ACT, CBT, psychoeducation, social skills training, supported employment, and early interventions for FEP improved several functional outcomes compared with care as usual. CBT and early interventions for FEP improved quality of life. ACT, CBT, cognitive remediation, illness self-management, psychoeducation, social skills training, and early interventions for FEP improved core illness symptoms. Last, psychoeducation, illness self-management, family interventions, and early interventions for FEP reduced relapse. Other outcomes, such as self-harm, symptom response or remission, and adverse events were rarely reported.

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