Skill Building: Assessing the Evidence

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Objective: **Skill building for adults involves multiple approaches to address the complex problems related to serious mental illness. Individuals with schizophrenia are often the research focus. The authors outline key skill-building approaches and describe their evidence base.** ***Methods:*** **Authors searched meta-analyses, research reviews, and individual studies from 1995 through March 2013. Databases surveyed were PubMed, PsycINFO, Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Services Abstracts, Published International Literature on Traumatic Stress, ERIC, and CINAHL. Authors chose from three levels of evidence (high, moderate, and low) on the basis of benchmarks for the number of studies and quality of their methodology. They also described the evidence of service effectiveness.** ***Results:*** **Over 100 randomized controlled trials and numerous quasi-experimental studies support rating the level of evidence as high. Outcomes indicate strong effectiveness for social skills training, social cognitive training, and cognitive remediation, especially if these interventions are delivered through integrated approaches, such as Integrated Psychological Therapy. Results are somewhat mixed for life skills training (when studied alone) and cognitive-behavioral approaches. The complexities of schizophrenia and other serious mental illnesses call for individually tailored, multimodal skill-building approaches in combination with other treatments.** ***Conclusions:*** **Skill building should be a foundation for rehabilitation services covered by comprehensive benefit plans that attend to the need for service packages with multiple components delivered in various combinations. Further research should demonstrate more conclusively the long-term effectiveness of skill building in real-life situations, alone and in various treatment combinations. Studies of diverse subpopulations are also needed. (*Psychiatric Services* 65:727–738, 2014; doi: 10.1176/appi.ps.201300251)**

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Developing or regaining basic skills needed to function adaptively in real-world situations is essential for individuals who are struggling with serious mental illness, substance use disorders, or co-occurring mental and substance use disorders. The neurodevelopmental nature of certain severe mental illnesses (1)—in which multiple and complex skill deficits emerge early in development, persist through adulthood in the absence of targeted treatment, and affect virtually every aspect of life functioning—has led to a vast array of approaches to skill building. These approaches are typically applied in various combinations.

The inherent complexity of skill building adds a high degree of challenge to assessing levels of evidence and effectiveness for such a diverse array of treatment modalities and methods. In this review, we examined four key components of skill building: social skills training (including life skills training), social cognitive training, cognitive remediation, and cognitive-behavioral therapies that target skills for coping with psychotic processes. Each of these approaches addresses specific skill areas that underlie adaptive functioning and can be considered building blocks for integrated approaches (for example, Integrated Psychological Therapy and Illness Management and Recovery) that help individuals manage their illness, build daily living skills, and succeed in recovery.

Approaches to skill building span many fields, including occupational

About the AEB Series

The Assessing the Evidence Base (AEB) Series presents literature reviews for 13 commonly used, recovery-focused mental health and substance use services. Authors evaluated research articles and reviews specific to each service that were published from 1995 through 2012 or 2013. Each AEB Series article presents ratings of the strength of the evidence for the service, descriptions of service effectiveness, and recommendations for future implementation and research. The target audience includes state mental health and substance use program directors and their senior staff, Medicaid staff, other purchasers of health care services (for example, managed care organizations and commercial insurance), leaders in community health organizations, providers, consumers and family members, and others interested in the empirical evidence base for these services. The research was sponsored by the Substance Abuse and Mental Health Services Administration to help inform decisions about which services should be covered in public and commercially funded plans. Details about the research methodology and bases for the conclusions are included in the introduction to the AEB Series (7).

therapy, psychiatric rehabilitation, applied clinical psychology, substance abuse treatment, and neuropsychology. Integrative approaches that combine various skill-building strategies also constitute a vast area of inquiry. In-depth review of these areas is beyond the scope of this report. Instead, we provide brief summaries of literature regarding each of the selected skill-building components, with emphasis on reviews and selected individual studies that are most recent and comprehensive. We note that the interventions selected for this review map closely to those selected in the federally financed schizophrenia Patient Outcomes Research Team (PORT) analysis and psychosocial treatment recommendations (2), and readers are encouraged to consult the PORT publication for a detailed analysis of the existing literature on general treatment of schizophrenia. We conclude with a discussion of the challenges in evaluating the effectiveness of specific approaches in isolation, because the complexities of serious mental illnesses such as schizophrenia call for integrated, multimodal approaches that address neuropsychological issues together with challenges in specific skill areas.

The objectives of this review were to describe the components of skill building, including a summary of service activities and provider roles; rate the level of research evidence (that is, methodological quality and number of confirming versus disconfirming studies); and summarize the effectiveness of the service as indicated by the research literature. The results will provide stakeholders with an accessible summary of the evidence for a range of skill-building services with implications for practice. This information will help consumers and providers of this type of service as well as payers and policymakers who need to make informed choices about their inclusion as covered benefits.

Description of the service

This article reports the results of a literature review that was undertaken as part of the Assessing the Evidence Base Series (see box on this page). For purposes of this series, the Substance Abuse and Mental Health Services Administration has defined skill building as a direct service that helps individuals enhance their capacity to accomplish a task or goal successfully. Skill-building services generally are based on psychoeducational and cognitive-behavioral approaches. They assist people with developing or improving competencies in the areas of self-help, self-care, adaptation, or socialization. The ultimate goals for people with serious mental illness are to develop the capacity to manage their illness and to restore or improve levels of functioning in order to function adaptively in society. Table 1 presents a summary of this service.

Skill-building activities help an individual learn decision-making, interpersonal, community integration, and functional skills. Building such skills and supports helps individuals achieve social integration, optimal health, and role productivity (3,4). In the behavioral health arena, most of the skill-building literature pertains to adults with schizophrenia. The service is implemented in outpatient and inpatient mental health settings, day treatment programs, and, in some cases, the homes of consumers. Although skill-building approaches may appear prescriptive, they are tailored to the personal goals set by the client in the context of a person-centered therapeutic relationship.

In our review, we identified four key areas of functioning that are addressed in the fundamental skill-building approaches summarized here. Although we discuss them separately, these areas and the approaches developed to address them can be considered building blocks of adaptive functioning that often hinge upon each another and overlap. These key areas (and their associated skill-building approaches) are the ability to learn and apply social skills that pertain to specific social and daily living situations (social skills training); the ability to accurately interpret social interactions and respond appropriately (social cognitive training); the ability to use cognitive functions, such as memory and attention, to support psychosocial skills and thinking (cognitive remediation); and the ability to manage the distress and disability associated with psychotic process, depression, and other negative symptoms (cognitive-behavioral approaches). Our review of social skills training includes life skills training, which targets daily living skills, also known in the field as activities of daily living (for example, personal hygiene), and higher-level instrumental activities of daily living (for example, managing a bank account). Life skills training covers broad areas of functioning, and for that reason it is often integrated with other treatment approaches to address complex problems—a common theme in skill-building practice and research. We conclude with a discussion of Integrated Psychological

Therapy and Illness Management and Recovery as examples of programs that integrate skill-building approaches.

Methods

Search strategy

We reviewed meta-analyses, research reviews, and individual studies from 1995 through March 2013. We conducted a survey of major databases: PubMed (U.S. National Library of Medicine and National Institutes of Health), PsycINFO (American Psychological Association), Applied Social Sciences Index and Abstracts, Sociological Abstracts, Social Services Abstracts, Published International Literature on Traumatic Stress, the Educational Resources Information Center, and the Cumulative Index to Nursing and Allied Health Literature. We used combinations of the following search terms: skills teaching, skills training, cognitive remediation, trauma skill building, social skills training, psychiatric rehabilitation, skills in activities of daily living, and occupational therapy for substance use and mental health. We also identified publications through review of bibliographies and consultation with content experts.

Inclusion and exclusion criteria

This review was limited to U.S. and international studies in English and focused on individuals with mental disorders, substance use disorders, or co-occurring mental and substance use disorders. It included randomized controlled trials (RCTs), quasi-experimental studies, single-group time-series design studies, and review articles such as meta-analyses and systematic reviews.

Excluded were studies of populations with autism spectrum and pervasive developmental disorders, Alzheimer's disease, brain injury, intellectual disabilities, Parkinson's disease, and fetal alcohol spectrum disorder. Also excluded were studies of the following services: parenting and caregiver skills training, HIV/AIDS risk reduction for individuals with substance use disorders, universal prevention programs, and sensory integration interventions. Cognitive-behavioral therapy (CBT) was reviewed only in regard to its use in coping with the psychotic process, although we recognize that cognitive-behavioral strategies are used in many skill-building approaches. Services that are strictly psychoeducational were not included, because consumer and family psychoeducation is reviewed in a separate article in this series (5). In addition, because of the relative lack of skill-building research with children and adolescents, this review focused only on adults.

Skill-building approaches are frequently used as enhancements for other services, such as supported employment and supported education. However, another article in this series is devoted solely to supported employment (6); therefore, an in-depth examination of this service and of supported education (for which there is relatively little research) was not included in our review. Coping-skills training in the treatment of alcohol and drug use disorders has also been studied to some extent; however, the evidence in this important area of treatment is limited, and findings are not consistent. Therefore, we did not review this intervention, but we note that it as an area in which more service development and research may be needed.

Table 1

Description of skill building

Feature	Description
Service definition	Skill building is a direct service that helps individuals enhance their capacity to successfully accomplish a task or goal. Skill-building services generally are based on psychoeducational and cognitive-behavioral approaches. They assist individuals with developing or improving competencies in the areas of self-help, self-care, adaptation, or socialization. These skills can help prevent relapse and aid recovery from mental and substance use disorders.
Service goals	Assist in illness self-management, medication management, and management of physical health; improve life skills (for example, activities of daily living and community living skills such as transportation, financial management, shopping, and cooking); and improve cognitive and intellectual skills (for example, learning and organizational skills, attention, and memory), interpersonal and intrapersonal skills, self-help and advocacy skills, and skills in functional areas such as employment and education
Populations	Adults who have serious mental illnesses (usually schizophrenia, schizophreniform, or schizoaffective disorders), adults with substance use disorders or co-occurring mental and substance use disorders, and adults with bipolar and other affective disorders (limited research)
Settings for service delivery	Outpatient mental health centers, day treatment programs, inpatient facilities, consumers' homes

Strength of the evidence

The methodology used to rate the strength of the evidence is described in detail in the introduction to this series (7). The research designs of the studies identified during the literature search were independently examined. Three levels of evidence (high, moderate, and low) were used to indicate the overall research quality of the collection of studies. Ratings were based on predefined benchmarks that considered the number and methodological quality of the studies. If the ratings were dissimilar, a consensus opinion was reached.

In general, high ratings indicate confidence in the reported outcomes and are based on three or more RCTs with adequate designs or two RCTs plus two quasi-experimental studies with adequate designs. Moderate ratings indicate that there is some adequate research to judge the service, although future research could influence reported results. Moderate ratings are based on the following three options: two or more quasi-experimental studies with adequate design; one quasi-experimental study plus one RCT with adequate design; or at least two RCTs with some methodological weaknesses or at least

three quasi-experimental studies with some methodological weaknesses. Low ratings indicate that research for this service is not adequate to draw evidence-based conclusions. Low ratings indicate that studies have nonexperimental designs, there are no RCTs, or there is no more than one adequately designed quasi-experimental study.

We accounted for other design factors that could increase or decrease the evidence rating, such as how the service, populations, and interventions were defined; use of statistical methods to account for baseline differences between experimental and comparison groups; identification of moderating or confounding variables with appropriate statistical controls; examination of attrition and follow-up; use of psychometrically sound measures; and indications of potential research bias.

Effectiveness of the service

We also described the effectiveness of the service—that is, how well the outcomes of the studies met the service goals. We compiled the findings for separate outcome measures and study populations, summarized the results, and noted differences across investigations. We considered the quality of the research design in our conclusions about the strength of the evidence and the effectiveness of the service.

Results

Level of evidence

Our literature search found that more than 100 RCTs on skill building have been summarized in multiple reviews, covering decades of research that extend into 2013. In general, individual studies that were not included in reviews and meta-analyses did not appear to add to the findings summarized therein. Thus, with a few exceptions, we have not included summaries of individual studies in this report; rather, we focus on the reviews and meta-analyses that thoroughly cover the available research.

Our review of the literature revealed a high level of research evidence for the different approaches to skill building. The progression of research reflects increasing levels of evidence in tandem with a growing understanding of the complex behavioral and neuropsychological factors involved in serious mental illness—most commonly schizophrenia. Methodological limitations in skill-building research published prior to 1995 include a lack of firmly established protocols, inadequate descriptions of the populations studied, lack of blind research designs, failure to investigate confounding variables, and small samples. Overall, however, research in this area has evolved, and there have been many rigorous studies testing different skill-building approaches. Below, we summarize the level of evidence for each service approach. Table 2 summarizes selected reviews and meta-analyses that represent the approaches we reviewed.

Social and life skills training. Life skills training is usually coupled with social skills training, and thus we review these approaches together. More recent approaches have also coupled social skills training methods with psychoeducation to help clients develop skills relevant to illness self-management, including medication self-management, according to person-centered recovery goals. The interventions are delivered by trained, credentialed professionals, either in clients' homes or in clinical settings, such as outpatient, inpatient, or day treatment programs.

As described by Mueser and colleagues (8), social skills training targets social perception, processing, and behavioral responses. It involves behavioral instruction, role modeling and rehearsal, corrective feedback, and positive reinforcement to teach basic social skills, such as how to manage a greeting or an introduction (2). It is most often used to address social skill challenges characteristic of schizophrenia that affect functional areas such as work, education, and the ability to maintain relationships. Social skills training allows participants to "receive, process, and express socially relevant cues" (9). In vivo training, facilitated by a leader in natural settings, helps achieve generalization to community settings, and participants are often given homework to practice on their own in their home environments. Social skills training is usually conducted in groups, which helps reduce stigma, takes advantage of peer feedback, and can be cost-effective.

Life skills training targets functional domains, such as managing one's household, finances, personal hygiene, and daily schedule (10). This includes self-care skills, such as bathing, shaving, hair care, and brushing teeth; domestic tasks, such as washing dishes, cooking, cleaning, doing laundry, and managing money; and other tasks, such as shopping, practicing good nutrition, using transportation, and managing a schedule. Communication and social skills as well as illness management skills are also targeted in life skills training packages. Life skills training programs can be distinguished from social skills training in that they often place less of an explicit focus on social learning principles and have a greater focus on instrumental skills needed to manage daily living tasks successfully.

A 2008 review of social skills training cited 23 existing RCTs, most of which had adequate design, which indicates a high level of evidence (11). There is less evidence for life skills training. Three Cochrane reviews found insufficient evidence for this approach (10,12,13), and the first Cochrane meta-analysis in 1998 of 129 life skills programs concluded that only two studies met criteria for an RCT (12). Further, an update of this review conducted ten years later found only two additional studies that met criteria for an RCT, and these had very small samples (13). A subsequent Cochrane review in 2012 concluded that in this area, "the quality of scientific evidence is low and uncertain" (10).

These reviews may not do justice to life skills programs in that these programs are commonly implemented in the context of more comprehensive social skills training as well as in overall psychosocial rehabilitation approaches; thus they are difficult to assess in isolation. However, some individual studies of life skills training are of adequate design to support an assessment of the evidence. For example, Arbesman and Logsdon (14) cited three RCTs supporting the effects of the Social and Independent Living Skills program as well as three

Table 2

Selected reviews and meta-analyses of skill building included in the review[a]

Study	Focus of review	Outcomes measured	Summary of findings
Mueser et al., 2002 (26)	Illness management approaches, including medication management, relapse prevention, coping skills training, and cognitive-behavioral tailoring	Medication adherence; relapses and rehospitalizations; severity of symptoms, including psychotic symptoms; social adjustment; quality of life	Behavioral tailoring improved taking medication as prescribed; symptom severity, psychotic symptoms, relapses, and rehospitalizations were all reduced in multiple RCTs. Several studies of illness management found improvement in social adjustment and quality of life.
Pilling et al., 2002 (27)	Social skills training and cognitive remediation for treating negative symptoms of schizophrenia	Social skills training: relapse, treatment compliance, global adjustment, social functioning, quality of life. Cognitive remediation: attention, verbal memory, visual memory, mental state, executive functioning	No reliable benefits were associated with social skills training or cognitive remediation. The interventions were not recommended for clinical practice.
Twamley et al., 2003 (39)	Cognitive training for individuals with schizophrenia	Cognitive performance, symptoms, everyday functioning	Cognitive training was effective in improving cognitive performance, psychiatric symptoms, and everyday functioning, but it was not effective in lessening cognitive impairments characteristic of schizophrenia.
Bellack, 2004 (29)	Psychosocial rehabilitation strategies (social skills training, cognitive-behavioral therapy, and cognitive remediation) for individuals with schizophrenia and other severe mental illness	Social skills training: psychotic symptoms, relapse, behavioral skills, social role function, specialized behavioral skills, self-efficacy. Cognitive-behavioral therapy: delusions, hallucinations, overall symptoms, relapse, social role functioning, depression, negative symptoms, durability of effects	The strongest support was for effectiveness of social skills training, which is most appropriate for treating social impairment rather than schizophrenia more broadly. Results showed promising preliminary support for cognitive-behavioral therapy among people with psychotic disorders.
Kopelowicz et al., 2006 (31)	Social skills training for individuals with schizophrenia	Disease management, independent living skills	Inconsistent evidence was found for effectiveness of social skills training on psychopathology. Social skills training should not be considered as a stand-alone treatment, but it is important to include it as part of a holistic rehabilitation program.
Pfammatter et al., 2006 (9)	Social skills training, cognitive remediation, cognitive-behavioral therapy, and coping interventions for people with schizophrenia, families, and others	Social skills training: acquisition of social skills and assertiveness, psychopathology, hospitalization rates. Cognitive remediation: executive functioning, cognitive processing. Cognitive-behavioral therapy: acquisition of cognitive strategies, symptom severity	Social skills training: inconsistent findings in RCTs did not support the large effects found in quasi-experimental studies of acquisition of social skills and assertiveness and low to moderate effects for reductions in psychopathology and hospitalization rates. Author meta-analysis of 19 RCTs confirmed large and enduring effects on social skills, moderate improvement in social functioning, a slight reduction in psychopathology, and a significant decrease in hospitalization rate at follow-up. Cognitive remediation: RCTs did not support evidence of effectiveness. Quasi-experimental studies supported small to moderate effects on general cognitive functioning. Cognitive-behavioral therapy: studies supported medium to large effects on severity of symptoms through cognitive restructuring and cognitive enhancement strategies, with stability at follow-up.
Roder et al., 2006 (46)	Integrated Psychological Therapy for individuals with schizophrenia[b]	Neurocognition, psychopathology, psychosocial functioning	Integrated Psychological Therapy was more effective than control conditions across all outcomes, including symptoms, psychosocial functioning, and neurocognition. Results were consistent across settings (inpatient and outpatient, academic and nonacademic) and phases of treatment (acute and chronic).

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Table 2

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Study	Focus of review	Outcomes measured	Summary of findings
McGurk et al., 2007 (40)	Cognitive remediation for individuals with schizophrenia	Cognitive performance, symptoms, psychosocial functioning	A medium effect was found for improved cognitive performance, a slightly lower effect for improved psychosocial functioning, and a small effect for improved symptoms. Studies in which adjunctive psychiatric rehabilitation was provided found significantly greater effects on psychosocial functioning than studies that provided cognitive remediation alone.
Kurtz and Mueser, 2008 (11)	Social skills training for individuals with schizophrenia	Content mastery, performance-based skill measures, community functioning, negative symptoms, general symptoms, relapse	Impact of social skills training was strongest for content mastery, followed by performance-based measures of social and independent living skills and psychosocial functioning. Impact was least strong for negative symptoms. Impact was weakest on relapse and positive symptoms.
Wykes et al., 2008 (24)	Cognitive-behavioral therapy for individuals with schizophrenia	Positive and negative symptoms of psychosis, functioning, mood, hopelessness or suicidality, social anxiety	Cognitive-behavioral therapy had modest effects on positive and negative symptoms, functioning, mood, and social anxiety, but it may exacerbate hopelessness or suicidality.
Dixon et al., 2010 (2)	Psychosocial interventions (including skills training) for individuals with schizophrenia	Interpersonal and everyday living skills as indicated by proximal (for example, role play) and distal (for example, community functioning) measures	Skills training that is focused on clearly defined activities, situations, and problems can improve social interactions, independent living, and other community functioning outcomes for individuals with schizophrenia. Evidence was weaker regarding the effect of skills training on relapse, symptoms, and general psychopathology.
Arbesman and Logsdon, 2011 (14)	Occupational therapy interventions for individuals with serious mental illness	Independent living skills	Skills training improved independent living skills.
Roder et al., 2011 (25)	Integrated Psychological Therapy for individuals with schizophrenia[b]	Documented symptoms, neurocognitive and social functioning, quality of life, well-being, treatment satisfaction	Integrated Psychological Therapy was more effective than control conditions across outcomes (including symptoms, psychosocial functioning, and neurocognition), settings (inpatient and outpatient, academic and nonacademic), and phases of treatment (acute and chronic). Those who had been ill longer were less likely to improve.
Wykes et al., 2011 (23)	Cognitive remediation therapy for individuals with schizophrenia	Cognition, symptoms, functioning	Cognitive remediation had durable effects on global cognition and functioning but unreliable effects on symptoms. Effects were the strongest when patients were clinically stable, cognitive remediation was provided in combination with other psychiatric rehabilitation, and a strategic approach was adopted along with adjunctive rehabilitation.
Anaya et al., 2012 (41)	Cognitive remediation for individuals with schizoaffective disorder, affective psychosis, and unipolar and bipolar affective disorders	Cognitive functioning	Cognitive remediation was at least as effective for affective and schizoaffective disorders as it was for schizophrenia.
Kurtz and Richardson, 2012 (19)	Behavioral training programs for individuals with poor social cognitive functioning	Proximal social cognitive measures, treatment generalization (symptoms and observer-rated community and institutional functioning)	Social cognitive training had moderate to large effects on facial affect recognition and small to moderate effects on theory of mind, but it did not affect social cue perception or attribution style. For measures of generalization, moderate to large effects were noted on total symptoms and observer-rated community and institutional functioning. Effects of social cognitive training programs on positive and negative symptoms of schizophrenia were nonsignificant.

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Table 2

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Study	Focus of review	Outcomes measured	Summary of findings
Tungpunkom et al., 2012 (10)	Life skills programs for individuals with chronic mental health problems	Life skills, relapse, mental state, global state, service outcomes, general functioning, behavior, adverse effects, engagement with services, satisfaction with treatment, quality of life, economic outcomes	No significant change was noted in life skills. Samples were "so small that any firm conclusions are impossible." None of the outcomes were significantly different between the life skills, peer support, and control groups.
Mueser et al., 2013 (8)	Psychosocial treatment (including social skills training and supported education) for individuals with schizophrenia	Social skills training: skills acquisition, content mastery, assertiveness, social and community functioning, social and daily living skills, psychopathology. Supported education: work or school outcomes	Strong evidence was found for effectiveness of social skills training in improving aspects of social competence. Integrated programs, including supported education, were associated with improvements in work and school compared with usual treatment.

[a] Reviews are listed in chronological order. Individual studies are not included in the table because the focus of this article is on reviews and meta-analyses. Abbreviation: RCT, randomized controlled trial

[b] Integrated Psychological Therapy is a cognitive-behavioral therapy program that combines neurocognitive and social cognitive interventions with psychosocial rehabilitation that includes building social, self-care, and vocational skills.

others examining the effects of a cognitive-behavioral life skills program for schizophrenia. An RCT of Functional Adaptation Skills Training was conducted by Patterson and colleagues (15). Thus there is at least a handful of RCTs that provide somewhat mixed evidence regarding specific life skills approaches.

Social cognitive training. Social cognition refers to the mental operations involved in perceiving, understanding, and interpreting one's social world. Social cognitive training programs focus on addressing deficits in at least one of four major domains of social cognition: facial affect recognition (for example, differentiating a happy from a sad face), social perception (for example, detecting and appropriately responding to social cues, such as body language or vocal intonation), theory of mind (for example, the ability to take another person's perspective), and attributional style (for example, the ability to make appropriate conclusions about the cause of events). These interventions address the close links between social cognition and functional outcomes among individuals with schizophrenia or other severe mental illness (16,17) in light of growing evidence that social cognitive deficits mediate the relationships between other domains of functioning, such as cognition, negative symptoms, and functional outcomes (18).

Reviews of treatment studies targeting social cognition are sparse in relation to other skill-building approaches, and there has been only one formal meta-analysis of social cognitive approaches to date (19). That meta-analysis assessed a total of 19 comparison studies that included a total of 692 clients; 16 of these studies involved randomization, indicating a level of evidence that, although high, does not have a research base as extensive as some other areas of skill building.

Cognitive remediation. Cognitive remediation is a group of behavioral interventions that apply science-based learning techniques to enhance skills in attention, memory, language, and problem solving and other key cognitive skills. Cognitive impairment is a core symptom of schizophrenia and bipolar disorder that can persist throughout the course of these illnesses and be resistant to the effects of psychotropic medication (20). A deterioration in cognitive functioning frequently occurs during the development of schizophrenia, and most people with the disorder have neurocognitive impairment (21,22). Given the frequency of cognitive impairment among individuals with serious mental illness, a growing number of studies over the past 20 years have investigated approaches to remediating neuropsychological deficits in cognition to improve functioning. Cognitive remediation approaches range from computer-assisted to individualized person-to-person administration. They may also focus on training that ranges from the development of elementary sensory processing skills to the acquisition and appropriate deployment of cognitive strategies for bypassing and compensating for cognitive deficits.

These skills are intertwined with and support the skills addressed in social skills training and social cognitive training. Although there are differences in curricula across various cognitive remediation interventions, they all share a focus on improving cognitive skills through repeated task practice or the acquisition of cognitive strategies for bypassing deficits. Over 40 RCTs to date support the efficacy of this intervention (23); thus the evidence base is rated as high.

Cognitive-behavioral therapy. Our review of CBT specifically targeted how CBT strategies are used in skill building (in particular with regard to how one interprets life events), the ways in which systematic negative biases in thinking influence these interpretations, and the consequences of such interpretations for the way one feels and behaves. In this application of CBT, cognitive restructuring is used to change these patterns of thinking and is coupled with instruction in coping strategies. This is especially important for people who

have psychotic processes and need to manage how their condition affects their stress level and behavioral reactions, either of which can exacerbate disabilities. According to this approach as applied to schizophrenia, emotional and behavioral responses to specific psychotic experiences can increase overall distress and decrease functioning. Thus the goal of therapy is not to eliminate psychotic experiences per se but rather to provide alternate ways of understanding these experiences and, in turn, reduce associated distress and disabling behaviors.

The targets of this therapy have been highly variable from study to study. There are also concerns that more rigorous research designs replicate some but not all of the effects of less rigorous studies, thus qualifying conclusions about the level of evidence. Nonetheless, the corpus of over 33 RCTs to date (24) supports a rating of high for the evidence base in this research area.

Integrated approaches. Although a full review of research on ways of integrating skill-building approaches is beyond the scope of this work, we review Integrated Psychological Therapy and Illness Management and Recovery as two examples of structured integrative approaches.

Integrated Psychological Therapy combines neurocognitive and social cognitive remediation with social skills training and social problem solving. At least 21 RCTs of this approach (using cognitive remediation in conjunction with other skill-building approaches) were cited by Roder and colleagues (25) in 2011; two additional RCTs on this approach were cited in a comprehensive review of skill building by Mueser and colleagues (8) in 2013. Therefore, we rate the level of evidence in this area as high.

In the Illness Management and Recovery program, people with serious mental illness receive psychoeducation about mental illness and treatment, behavioral tailoring to support treatment adherence, formulation of a relapse prevention plan, and instruction in coping strategies for serious and persistent symptoms in order to help them achieve their personal recovery goals (8). CBT techniques are applied to reduce the magnitude of symptoms and associated distress. A comprehensive 2002 review by Mueser and colleagues (26) of illness self-management approaches covered CBT and various other intervention strategies with which it is integrated, including coping-skills training, relapse prevention strategies, and psychoeducation. The authors cited 40 RCTs as evidence for this group of interventions, thus supporting a high level of evidence.

Effectiveness of the service

Social and life skills training. There is some disagreement in the review literature regarding the effectiveness of social skills training. In 2002, Pilling and colleagues (27) conducted a meta-analysis of nine RCTs of social skills training and concluded that there was little evidence of benefit in any outcomes. However, this conclusion was contested in 2004 by Mueser and Penn (28), who questioned the methodology used in the meta-analysis. Also in 2004, Bellack (29) reviewed four meta-analyses of skills training—two of which had been published since 1995 and are included in our review (27,30). Bellack's findings contradicted those of Pilling and colleagues, with Bellack concluding that social skills training has a significant effect on behavioral skills, social role functioning (including defined skill areas such as medication management), and client satisfaction and self-efficacy but not on symptom reduction and relapse. Similar findings were described in a 2006 review by Kopelowicz and colleagues (31), which also included studies of the Social and Independent Living Skills Program. A 2006 analysis of 19 RCTs by Pfammatter and colleagues (9) found "large, homogeneous and enduring" positive effects for skill acquisition, as well as improvements in social functioning, assertiveness, and overall psychopathology. In the most comprehensive meta-analytic investigation to date, which included 23 RCTs, Kurtz and Mueser (11) found strong positive effects for content mastery; moderate effects for social and daily living skills, community functioning, and negative symptoms; and a smaller but still significant effect for relapse prevention and other symptoms.

In their 2013 review, Mueser and colleagues (8) reported that findings from meta-analyses support the conclusion that social skills training improves "certain aspects" of social competence. With regard to more distal outcomes, Kopelowicz and colleagues (31) found that existing reviews and meta-analyses have not consistently supported positive effects of social skills training on outcomes such as relapse rates, psychotic symptoms, and quality of life. However, it is important to note that the primary targets of social skills training are social competence and social functioning rather than symptoms or relapse.

Researchers have identified a few factors that may influence the effectiveness of social skills training. Mueser and colleagues (8) noted that deficits in attention may limit the effects of social skills training approaches. Roberts and Velligan (32) also suggested that social cognition appears to mediate the relationship between neurocognition and social functioning, which is why social skills training, social cognitive approaches, and cognitive remediation are often bundled.

Findings for the life skills component of social skills training are somewhat mixed. Three Cochrane reviews (10,12,13) conducted between 1998 and 2012 investigated life skills programs (teaching skills in budgeting, communication, domestic living, personal self-care, and community living). Their results are best summarized by the most recent review (10), in which the authors stated that there is "no good evidence to suggest that life skills programs are effective for people with chronic mental illnesses." In particular, there were no significant differences in life skills performance, psychotic process, or quality-of-life scores between life skills training and standard care or between life skills training and support groups. Furthermore, the authors questioned the wisdom of pressuring clients to participate in life skills training, voiced concerns about wasting time and money on the practice, and even suggested that it could be harmful.

These findings were not corroborated by Arbesman and Logsdon's

(14) review of life skills training programs. They cited six RCTs indicating that findings in support of the effectiveness of daily living skills training combined with social skills training were "strong" (15,33–37). Of these, three RCTs examined the effects of the Social and Independent Living Skills Program and found the practice to be effective in improving independent living skills (33–35). The three remaining RCTs (15,36,37) of Functional Adaptation Skills Training with older adult patients and with Latino participants who had chronic psychosis were implemented by Patterson (a developer of the program) and colleagues (37). The authors found improvement in everyday living skills for program participants, compared with those in usual care. An RCT conducted by Patterson and colleagues, for example, demonstrated that the Functional Adaptation Skills Program was effective in improving everyday living skills for middle-aged and older participants with chronic psychotic disorders. The positive effects were observed immediately after treatment and at the three-month follow-up assessment, although no significant changes in psychopathology were found. Adaptive skills for living in the community are the primary target of this and other life skills interventions, and improving psychotic symptoms and preventing relapse are not primary treatment goals. Therefore, it is not surprising that significant results usually have not been found for symptom reduction in studies of life skills training.

Arbesman and Logsdon (14) noted that methodological problems in some studies included small samples, sampling bias, and lack of blindness to treatment allocation, and these issues as well as others undoubtedly contributed to the disagreement between their review and the Cochrane systematic reviews. For example, the most recent Cochrane review (10) cited high risk of reporting bias and lack of reported protocols in two studies by Patterson and colleagues (15,37), as well as high risk of attrition bias in one of these studies (37). Four of the six studies cited by Arbesman and Logsdon (33–36) were not included in the 2012 Cochrane review, although the reasons for their exclusion are not clear because these studies were not cited in the Cochrane review's summary of excluded studies. Despite the conflicting findings of these reviews, the positive results of studies cited by Arbesman and Logsdon indicate that additional well-designed research using specific protocols for improving life skills is warranted.

Social cognitive training. A review of studies of social cognitive training indicated moderate to large effects of social cognitive training on facial affect recognition (18 studies), small to moderate effects on theory-of-mind measures (seven studies), and generalization of treatment effects to overall symptoms and to ratings of community and inpatient functioning (six studies) (38). Of the 16 RCTs in this meta-analysis, all showed improvement on proximal measures of social cognitive skill for treated individuals compared with individuals in control groups. Participants in these studies were nearly exclusively individuals with schizophrenia and schizoaffective disorder, although initial trials for patients with bipolar disorder have been promising (38). We note the heterogeneity of approaches in this area (for example, treatment of a specific deficit area versus broad-based strategies, as well as methodological variability within each of these approaches). There is also large variability in duration of treatment (from one to 93 hours). Thus, even though the findings are positive, these confounding factors make prescriptions regarding specific interventions a challenge.

Cognitive remediation. Meta-analyses in this research area reflect the rapid growth of the evidence base. A 2003 meta-analysis of cognitive remediation found methodological problems, such as small samples, poorly defined experimental and control conditions, and poor generalizability because limited populations were studied (39). In 2006, the meta-analysis by Pfammatter and colleagues (9) of six other meta-analyses found no effects of cognitive remediation in RCTs, but there were small to medium (but robust) effects on general cognitive functioning in quasi-experimental studies. The authors concluded that findings support the effectiveness of cognitive remediation on attention, executive functioning, memory, and social cognition.

This conclusion is largely supported by more recent work, with the caveat that cognitive remediation effects are more likely to generalize to functioning in everyday life when offered in the context of other psychiatric rehabilitation interventions. In the two most recent and comprehensive meta-analyses of controlled cognitive remediation studies to date (23,40), medium-sized effects were found on measures of cognition and of daily functioning. When these cognitive remediation interventions were offered in concert with other rehabilitative treatments, improvements in psychosocial functioning were found relative to rehabilitation alone, but not when cognitive remediation plus usual services was compared with usual services alone. In addition, durability studies showed that the effects of cognitive remediation on cognitive skills remained in the moderate range when measured eight months, on average, after the cessation of treatment. Unfortunately, the substantial heterogeneity of approaches to remediation of cognitive skills (for example, strategy-based versus drill-and-practice approaches) and the mixed results on effectiveness make it difficult to offer recommendations regarding specific interventions. The focus of these studies has been almost exclusively on people with schizophrenia and schizoaffective disorder. Thus specific recommendations regarding cognitive remediation for other disorders would be premature, although studies of cognitive remediation for cognitive deficits in affective disorders show promise (41). It should also be noted that recently published consensus recommendations by McGurk and colleagues (42) describe the specific parameters of cognitive remediation programs that are likely to be successful in improving psychosocial functioning.

Cognitive-behavioral therapy. Recent quantitative reviews have confirmed the value of CBT for a variety of psychological difficulties among individuals with psychosis as well as negative symptoms and other problems in functioning. For example, a review by Wykes and colleagues

(24) of 33 trials showed that there were beneficial effects of CBT in the moderate range on target symptoms (33 studies), positive symptoms (32 studies), negative symptoms (23 studies), functioning (15 studies), mood (13 studies), and social anxiety (two studies), whether or not they were targeted by CBT. Of note, the authors observed a 50%–100% inflation of effect sizes in studies that failed to employ raters blind to study conditions. When only the most rigorously designed studies were included, effects of CBT on negative symptoms became nonsignificant. These results suggest that more controlled studies with stronger designs and methods that specifically target negative symptoms will be necessary to understand the true value of CBT for this aspect of skill building.

Integrated approaches. Many of the studies discussed above suggest that no single intervention is as effective as approaches that integrate most or all of the practices with other treatments. Indeed, our review revealed considerable overlap between skill-building approaches and between the skill areas that they address. Research indicates that integrative strategies strengthen effects, particularly with regard to decreasing symptoms and improving social skills (43–46). Here we discuss effectiveness findings for Integrated Psychological Therapy and Illness Management and Recovery, two examples of approaches to integrating skill-building components.

A 2006 meta-analysis of Integrated Psychological Therapy by Roder and colleagues (46) found significant improvements in neurocognitive and social skills as well as reduced psychopathological symptoms compared with control groups, although individuals who had been ill the longest were less likely to have positive outcomes. Stronger results were found in academic settings than in nonacademic settings and in inpatient settings than in outpatient settings; nonetheless, participants whose symptoms had been stabilized and those with acute conditions showed significant treatment effects compared with those in control groups.

In a 2011 update of 36 studies of Integrated Psychological Therapy that included 1,601 people with schizophrenia, Roder and colleagues (25) reported on 21 studies that were RCTs and a number of others that employed matched comparison groups. Compared with the control conditions, Integrated Psychological Therapy had significant effects on all outcomes related to social cognition, psychosocial functioning, and neurocognition (proximal outcomes) as well as on negative and positive symptoms and general psychopathology (more distal outcomes). Effect sizes were larger for proximal outcomes (for example, they were in the high range for social cognition) than for distal outcomes, such as ongoing symptoms. Individuals who participated in all of the components of this treatment approach continued to improve during the follow-up phase, compared with those who participated in only one component. It should be noted that most studies of Integrated Psychological Therapy were conducted in Europe, thus limiting our knowledge about its effectiveness in the United States.

In their 2013 review of Illness Management and Recovery, Mueser and colleagues (8) noted that three RCTs have been completed in the United States, Israel, and Sweden since the formal development of the Illness Management and Recovery program. In all three studies, individuals in this program showed significantly greater improvements than those in usual care in illness self-management and community functioning. The authors concluded that the evidence qualifies this approach as an "evidence-based" practice rather than a "promising" practice. In a 2013 review, McGuire and colleagues (47) cited the evidence of three additional quasi-experimental trials and three pre-post treatment trials. The authors noted that methodological issues, such as barriers to implementation, require further study.

Specific populations. Research directly assessing the relative effectiveness of skill building across various racial and ethnic populations is limited (41). A number of studies in the reviews we have summarized typically involved young-adult or middle-aged white males (27); however, skills training programs have been adapted successfully for Latino clients (36,48), including outpatient services for older people with psychotic disorders of long duration. Some studies have included substantial numbers of participants with different ethnic and racial backgrounds in their study samples (49), including a number of studies with participants who were predominantly African American (50,51). Examples of other cross-cultural studies include an RCT of illness self-management conducted with hospitalized individuals with schizophrenia in Japan (33) and an RCT of successful skill-building interventions conducted in a Chinese psychiatric hospital (52). To our knowledge, no studies have reported using race or ethnicity as an independent variable for determining the relative effectiveness of skill-building approaches for people with serious behavioral health problems. This does not necessarily mean that these differences were not investigated; researchers often examine racial and ethnic differences, but they may not report the differences if they are not significant.

Discussion

Skill building represents a vast area of the field of psychiatric rehabilitation, and there is a high level of evidence for most skill-building approaches (see box on next page). This review almost exclusively assessed meta-analyses and comprehensive reviews rather than individual studies, in part because they help organize and evaluate the extensive body of literature on this topic. Overall, the evidence in support of the short-term effectiveness of various skill-building approaches is robust. The evidence in support of the effectiveness of CBT is mixed, in that it is strong for addressing the psychotic process but less robust regarding other areas of functioning. The evidence in support of life skills programs is somewhat mixed and lower than the levels of evidence for social skills training, social cognitive training, cognitive remediation, and integrated approaches such as Integrated Psychological Therapy or Illness Management and Recovery.

Clearly, the complex interplay between training in specific skills and

the numerous interventions needed to address the cognitive, neuropsychological, interpersonal, and mental status of each individual brings significant challenges to service planning and research. For example, the effects of life skills training may be amplified and may operate synergistically when it is combined with other psychosocial rehabilitation interventions, especially those that address the neuropsychological building blocks of cognition and behavior. Combining approaches, as in Integrated Psychological Therapy, appears to achieve a higher level of effectiveness for proximal outcomes targeted by the intervention, compared with distal outcomes. Further research on combinations of skill-building approaches will help address the significant issue of generalizing functional gains to real-world contexts over the long term—an ongoing challenge for clinicians as well as researchers.

These points also underscore the challenges for consumers, decision makers, and payers, who must decide which skill-building services to use and support. Our review indicates that combined approaches that include social skills training, social cognitive training, cognitive remediation, and CBT are necessary. Our findings also suggest that the specific types of skill-building services should be based on an individual's constellation of skills, challenges, and motivations. Integrated Psychological Therapy and Illness Management and Recovery are examples of how various approaches can be combined successfully. Selecting or supporting only one approach is likely to be a mistake. Rather, continuously adjusting the service mix on the basis of an individual's progress and needs has the best chance of achieving outcomes and being cost-effective in practice, even though evaluation of highly individualized interventions presents challenges to researchers.

Future research should examine the possible differential effects of skill building across specific subpopulations, as well as the effects of moderating variables, such as treatment setting, medication type and dosage, age, and baseline skill levels. Research should also examine the potential for skill-building approaches to improve outcomes in the treatment of substance use disorders and co-occurring mental and substance use disorders. Meta-analyses need to pay closer attention to fidelity in implementing evidence-based practices and to the training and qualifications of service providers.

More research on intermediate and long-term effectiveness would also be helpful, with increased focus on the complex issue of how the remediation or acquisition of specific skills translates into sustained adaptive functioning in real-world contexts. Emerging approaches in person-centered, self-directed care also call for ongoing investigation of the role of self-determination and personal empowerment in skill building and other aspects of recovery, which has been a tenet of practice in this area but remains largely unstudied.

Evidence for the effectiveness of skill building: high

Compared with control conditions, skill building for adults demonstrates mixed but relatively positive evidence for the following outcomes:

- Improved cognitive functioning (attention and memory)
- Improved social and daily living skills and associated functioning in the community
- Reduced symptomatology and improved illness management
- Reduced relapses

Conclusions

The current body of research has established the value of skill-building approaches. Although further research will help clarify their effects on some outcomes, research is not needed to support the decision to include skill-building approaches as covered services, particularly for individuals with schizophrenia and other psychotic disorders. Payers, providers, and people who use skill-building services can be confident that the various components of this service are effective when they are used in combination and with other therapeutic interventions. This review should help stakeholders at all levels make decisions about including skill-building components in covered benefits as treatment alternatives for providers and for people needing this complex array of treatment strategies.

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