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Effectiveness of Integrated Psychological Therapy (IPT) for Schizophrenia Patients: A Research Update

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Standardized recovery criteria go beyond symptom remission and put special emphasis on personal and social functioning in residence, work, and leisure. Against this background, evidence-based integrated approaches combining cognitive remediation with social skills therapy show promise for improving functional recovery of schizophrenia patients. Over the past 30 years, research groups in 12 countries have evaluated integrated psychological therapy (IPT) in 36 independent studies. IPT is a group therapy program for schizophrenia patients. It combines neurocognitive and social cognitive interventions with social skills and problem-solving approaches. The aim of the present study was to update and integrate the growing amount of research data on the effectiveness of IPT. We quantitatively reviewed the results of these 36 studies, including 1601 schizophrenia patients, by means of a meta-analytic procedure. Patients undergoing IPT showed significantly greater improvement in all outcome variables (neurocognition, social cognition, psychosocial functioning, and negative symptoms) than those in the control groups (placebo-attention conditions and standard care). IPT patients maintained their mean positive effects during an average follow-up period of 8.1 months. They showed better effects on distal outcome measures when all 5 subprograms were integrated. This analysis summarizes the broad empirical evidence indicating that IPT is an effective rehabilitation approach for schizophrenia patients and is robust across a wide range of sample characteristics as well as treatment conditions. Moreover, the cognitive and social subprograms of IPT may work in a synergistic manner, thereby enhancing the transfer of therapy effects over time and improving functional recovery.

Key words: schizophrenia/cognitive behavior therapy/integrated therapy/cognitive remediation/social skills therapy/meta-analysis

Introduction

Schizophrenia is the third leading cause of disability in young adults worldwide, but its prevalence rate in the general population is only 1%. Less than 50% of schizophrenia patients have access to appropriate care.[1] Even, those patients who have received evidence-based treatments show significant cognitive impairments, negative symptoms, and limited functional recovery.[2–4] In addition to symptom remission, functional recovery demands successful mastery of everyday life, comprising quality of life and satisfaction as well as an adequate level of social integration in work, living, and leisure.[5–7] Functional impairments are a hallmark of schizophrenia[8] and often endure after symptom remission and despite a good response to pharmacological treatment.[4,9] This clearly underlines the importance of psychological interventions to target these unmet needs.

A key issue in understanding and treating schizophrenia patients is cognition, which represents the most powerful empirical predictor of functional recovery.[10,11] The fact that 75–85% of schizophrenia patients have long-lasting neurocognitive and social cognitive deficits, strongly supports their relevance in schizophrenia.[12,13] Furthermore, there is increasing empirical evidence, resulting from structural equation modeling (SEM), that social cognitions function as mediator variables of the relationship between basic neurocognitions and various domains of functional recovery.[14–23] The National Institute of Mental Health supported Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) initiative[24,25] summarizes important findings in this field.

Against this background, therapeutic interventions targeting cognitive and social deficits embedded in a multidimensional treatment concept have received a great deal of interest in recent years. Five main approaches of cognitive behavioral interventions can be distinguished: (1) Psychoeducation and Family Therapy, (2) Cognitive Behavior Therapy, (3) Therapy of Social Competency, and (4) Cognitive Remediation Therapy. A large body of research provides evidence for the efficacy of each of these approaches. Integrated therapies combine some of

these unidirectional approaches. Our definition of integrated neurocognitive treatments includes 2 aspects. An intervention is integrated when the treatment of neurocognitive domains is combined with one or more of the following areas: social cognition, knowledge of the disease/problems ("deficits" and "resources"), social skills (eg, for living, working, and leisure), and thinking styles (eg, irrational beliefs). The term integrated also points to the necessity that cognitive therapy should always be embedded in a broad-based treatment concept tailored to the patients' rehabilitative and cognitive resources and deficits.[10,11] One of the first approaches is integrated psychological therapy (IPT), which combines neurocognitive and social cognitive remediation with social skills therapy and interpersonal problem solving.[10,26–28]

Integrated Psychological Therapy

IPT is a manualized cognitive behavioral therapy program for groups of 5–8 schizophrenia patients. Its conceptualization is based on the assumption that basic deficits in cognitive domains have a pervasive effect on higher levels of behavioral organization such as social skills as well as social functioning.[29–32] IPT is divided into 5 subprograms with increasing levels of complexity. It begins with neurocognition (SP1: Cognitive Differentiation) and social cognition (SP2: social perception), followed by communication (SP3: verbal communication), social skills (SP4: social skills), and problem-solving skills (SP5: interpersonal problem solving). These 5 modular subprograms should be applied sequentially, but they have also been administered separately in practice and research. A detailed description of the IPT concept is available as a manual.[26,33] This manual has been translated into 13 languages.[10] The first study on IPT was carried out in 1980.[34]

Methods

IPT has been evaluated in a large body of research over the past 30 years. Five years ago, we summarized these results in a quantitative review in this journal.[27] In the meantime, further independent studies have contributed to a broader database. Therefore, a more detailed outcome analysis beyond the general effectiveness of IPT was possible. This meta-analysis is built upon our previous publication and includes 6 additional studies. Two studies were excluded because of a lack of sufficient information.[35,36] We used the same criteria for searching and selecting studies as in our former article published in 2006.[27]

Research groups in 12 countries in North and South America, Europe, and Asia have conducted 36 studies, which were selected for this meta-analysis (see table 1). The total sample comprised 1601 patients with schizophrenia (diagnosed according to *Diagnostic and Statistical Manual of Mental Disorders*). Twelve studies evaluated IPT with all 5 subprograms (SP), 1 study evaluated 4 subprograms, and 22 studies used 1, 2, or 3 subprograms. One study replaced the social subprogram with an alternative form of social skills training. Fourteen studies compared IPT with standard care, 9 studies compared IPT with placebo-attention conditions (unspecific group activities to control for the group effect), and 2 studies compared IPT with both. Six studies used an alternative treatment as a control condition. Five studies had no control group (CG). The rigor of the research design differed across the studies, with 20 studies using a randomized patient allocation. IPT was administered in the inpatient and outpatient settings in academic and nonacademic institutions. Ten studies provided follow-up data, 2 of them provided data for the experimental group. The mean sample size of all studies was 44.5. A large number of variables (19.8 variables/study) were included in the analysis (neurocognition: 7.7 variables; social cognition: 3.4; functional outcome: 6.7; and psychopathology: 6.5). The global therapy effect (mean of all assessed outcome variables) was heterogeneous across the studies with regard to IPT and CGs.

Data Analysis

In order to examine the general extent of change in adult patients across the different control conditions, we pooled all outcome variables and computed mean-weighted effect sizes (*ES*s) for each condition: $ES = (M_{\text{pre}} - M_{\text{post or follow-up}})/SD_{\text{pre of pooled groups}}$. *ES* can generally be categorized as small (0.2), medium (0.5), or large (0.8).[27] The potential influence of unequal sample sizes and SEs between the studies was statistically controlled by using a fixed effects model in which the *ES* of each study was weighted by its inverse variance (ES_w, d_w).[27] The homogeneity of variance of the *ES* of the individual studies was tested by calculating Hedges's Q_W.[27] To measure the significance of the weighted *ES*, the CI and *z*-transformation of the *ES* were used.[27] Differences between groups were evaluated by calculating Hedges's Q_B.[27]

We calculated *ES*s for immediate and long-term effects as well as proximal and distal outcomes separately. Proximal outcome measures are closely related to the therapeutic contents. Distal measures are virtually unrelated (or only indirectly related) to the intervention targets and may therefore reflect the generalizability of treatment effects to real-world settings. One study included only adolescent patients; we calculated separate *ES*s for this study. Moreover, the influence of possible moderator variables (type of institution, treatment setting, etc.) was tested. Later, we used the MATRICs domains[24,25] to categorize the neurocognitive and social-cognitive outcome variables of the included studies and calculated *ES*s for each domain. *ES*s of cognitive subprograms were compared with those of social subprograms on proximal and distal outcomes. Finally, we investigated whether integrated

Table 1. Thirty-Six Independent IPT Studies ($N = 1601$)

	Source	Country	IPT	CG	Design	*N*	Therapy duration (wk)	Follow-up (mo)	Setting	Center	IPT GTT (*ES*)	CG GTT (*ES*)
1	Brenner et al[34]	Germany	IPT	TAU or PA	Randomized	43	12	18	Inpatient	Academic	1.23	0.66
2	Brenner et al[37]	Germany	SP4 or SP2	—	Intragroup design	28	12		Inpatient	Academic	0.64	
3	Stramke et al[38]	Switzerland	SP2	PA	Matched	18	4		Inpatient	Academic	0.96	0.06
4	Bender et al[35]	Germany	SP1 + 2	TAU	Not randomized	28	11		Inpatient	Nonacademic		
5	Brenner et al[39]	Germany	IPT	TAU	Matched	18	16		Outpatient	Nonacademic	0.59	0.12
6	Hermanutz and Gestrich[40]	Germany	IPT	PA	Matched	64	8		Inpatient	Nonacademic	0.27	0.21
7	Kraemer et al[41]	Germany	SP1 + 2 + CC	PA	Randomized	30	12		Inpatient	Mix	0.71	0.09
8	Roder et al[42]	Switzerland	IPT	TAU	Matched	17	18		Inpatient	Nonacademic	0.30	−0.05
9	Funke et al[43]	Germany	SP1 + 2	TAU or PA	Randomized	24	40		Inpatient	Nonacademic	0.66	0.06
10	Heim et al[44]	Germany	SP1–3	TAU	Not randomized	65	6		Inpatient	Nonacademic	0.71	0.09
11	Peter et al[45,46]	Germany	SP1–3	—	No CG	83	6		Inpatient	Academic	0.46	
12	Kraemer et al[47]	Germany	SP1 + 2 vs SP4	—	Randomized, No CG	43	14		Inpatient	Academic	0.36	
13	Olbrich and Mussgay[48]	Germany	SP1	PA	Randomized	30	3		Inpatient	Academic	0.52	0.23
14	Roder[49]	Switzerland	SP1	TAU	Not randomized	18	6	1	Inpatient	Nonacademic	0.29	0.04
15	Schüttler et al[50] and Blumenthal et al[51]	Germany	SP1–4	PA	Randomized	95	12		Inpatient	Nonacademic	0.56	0.19
16	Hubmann et al[52]	Germany	SP4 + Token	TAU	Randomized	21	14	18	Inpatient	Nonacademic	0.52	−0.28
17	Gaag van der[53]	The Netherlands	SP1 + 2	PA	Randomized	42	14		Inpatient	Nonacademic	0.47	0.12
18	Takai et al[54]	Japan	IPT	TAU	Matched	34	60		Inpatient	Mix	0.18	0.00
19	Theilemann[55]	Germany	IPT	PA	Randomized	45	6	3	Inpatient	Nonacademic	0.50	0.31
20	Hodel[56]	Switzerland	IPT	—	No CG	21	20		Inpatient	Academic	0.32	
21	Hodel and Brenner[57]	Switzerland	SP1	EMT	Randomized	15	7		Inpatient	Academic	0.72	1.24
22	Spaulding et al[58]	United States	SP1–3 + SST	ST+SST	Randomized	91	24		Inpatient	Academic	0.49	0.35
23	Roder et al[59]	Switzerland, Germany, Austria	SP4	WAF	Matched	143	24	6	Mix	Mix	0.45	0.53
24	Vallina-Fernandez et al[60]	Spain	SP2–4 + PE	TAU	Randomized	35	48	9	Outpatient	Nonacademic	0.59	−0.13
25	Vauth et al[61]	Switzerland	SP4 + 5	TEI	Randomized	57	8	12	Inpatient	Academic	0.72	0.44
26	Vita et al[62]	Italy	IPT	PA	Not randomized	86	12	6	Outpatient	Nonacademic	0.31	0.11
27	Penadés et al[63]	Spain	SP1 + 2	TAU	Not randomized	37	12		Outpatient	Academic	0.70	−0.04
28	García et al[64] and Fuentes et al[65]	Spain	SP2	TAU	Randomized	23	12		Outpatient	Nonacademic	0.47	0.19
29	Lewis et al[36]	United States	SP1–3	PA	Randomized	38	12		Outpatient	Nonacademic		
30	Ueland and Rund[66,67]	Norway	SP1 + 2 + PE	PE	Randomized	26	30	12	Inpatient*	Academic	0.59	0.41
31	Briand et al[68,69]	Canada	IPT + EMT	—	No CG	90	52	3.5	Outpatient	Mix	0.54	
32	Alguero[70]	Panama	IPT	TAU	Randomized	12	12		Inpatient	Nonacademic	1.66	0.11
33	Zimmer et al[71]	Brazil	IPT	TAU	Randomized	56	12		Outpatient	Academic	0.49	−0.11
34	Tomas[72]	Spain	SP1	IT or PCR	Randomized	39	14		Outpatient	Academic	0.42	0.18
35	Gil Sanz et al[73]	Spain	SP2 + EPT	TAU	Randomized	14	10		Outpatient	Nonacademic	0.52	0.28
36	Garcia-Nieto et[74]	United States, Spain	IPT	TAU	Randomized	72	20		Outpatient	Nonacademic	0.55	−0.58

Note: IPT, Complete integrated psychological therapy (subprogram 1–5); SP, IPT subprograms: cognitive differentiation (SP1), social perception (SP2), verbal communication (SP3), social skills (SP4), interpersonal problem solving (SP5); CC, cognitive coping strategies according to Meichenbaum[75]; Token Economy Program; SST, Social Skills Training according to Liberman et al[76]; PE, psychoeducation; EMT, Emotional Management Training according to Hodel et al[77]; EPT, Emotion Perception Training; CG, control group; TAU, treatment as usual; PA, placebo-attention condition (unspecific group activities); ST, Supportive Therapy; WAF, therapy programs targeting the areas of residence, work, and recreation[59]; TEI, Training of Emotional Intelligence[61]; IT, individual therapy; PCR, pc-based remediation; GTT, global therapy effect (mean of all variables) during therapy; *ES*, effect size; *adolescent.

Table 2. Patient Characteristics ($K = 35$* Studies)

	Mean	*SD*
Gender: % male	67.3	14.5
Age (y)	35.5	5.4
IQ	92.5	9.1
Duration of hospitalization (mo)	74.9	72.8
Duration of illness (y)	10.1	5.1
Daily dose of antipsychotics (chlorpromazine values)	826.8	635.7

Note: Exclusion of 2 studies with adolescent population (Ueland and Rund,[66,67]).

therapies including all subprograms revealed larger *ES*s than single subprograms.

Results

The patient characteristics of the entire sample comprising 1575 adult patients in 35 studies are displayed in table 2. The mean treatment period was 16.4 weeks ($SD = 13.4$) or 44.5 hour ($SD = 31.0$). The mean number of therapy sessions was 2.9 ($SD = 1.3$) per week. The average dropout rate during the treatment period was 14.6% ($SD = 12.7$).

General Outcome

In a first step, all outcome variables were pooled to calculate a mean *ES* reflecting the global therapy effect of each treatment condition. IPT revealed a large and significant *ES* on global therapy outcome after treatment. The 2 studies with adolescent inpatients[66,67] showed a moderate *ES* during therapy and follow-up, favoring IPT combined with psychoeducation ($ES = 0.59$) than psychoeducation alone. Both groups still improved after the end of therapy (therapy: $ES = 0.41$; therapy and follow-up: $ES = 0.94$). Data for the placebo-attention condition allowed the estimation of the *ES* of the unspecific group effect (therapy: $ES = 0.23$; therapy and follow-up: $ES = 0.63$). In contrast to the control conditions, IPT effects were larger at follow-up than directly after therapy. All outcome effects are summarized in table 3. Compared with both control conditions, IPT showed significantly higher *ES*s (ES_w) addressing the global therapy effect for changes from baseline to the posttreatment assessment ($Q_B = 29.7$, $df = 2$, $P < .01$) as well as from baseline to follow-up assessment ($Q_B = 8.31$, $df = 2$, $P < .05$).

Compared with the CGs, IPT groups obtained significant within group effects in all proximal (neurocognition, social cognition, and psychosocial functioning) and more distal outcome domains (general psychopathology and negative and positive symptoms). The strongest effect was found in social cognition ($ES = 0.70$), but the *Q* value of the *ES* for social cognitive change suggests heterogeneous effects across studies. With regard to the 2 control conditions, only the placebo-attention group showed significant effects in psychopathology and positive symptoms. Comparing the IPT effects with those of the 2 control conditions, significant effects favoring IPT were evident in neurocognition, social cognition, and functional outcome ($Q_B > 13.7$, $df = 2$, $P < .01$) but not in positive and negative symptoms ($Q_B < 3.3$, $df = 2$, P = NS). To summarize, IPT yielded some significant immediate and long-term effects in more proximal outcomes, but small effects in symptoms.

Moderator Design and Setting Variables

The type of design did not significantly influence the global therapy effect of IPT and CGs. Studies using randomized controlled trials (RCTs) ($K = 20$; IPT: $ES = 0.56$; CG: $ES = 0.08$) showed slightly larger effects than studies with other designs ($K = 13$; IPT: $ES = 0.48$; CG: $ES = 0.11$). IPT revealed significant effects on both designs ($Z > 6.46$; $P < .01$), whereas controls did not ($Z < 0.94$; n.s.). The difference was significant between IPT and CGs ($Q_B >$

Table 3. Effect Sizes (*ES*) Within the IPT Group Under Placebo-Attention Condition and Standard Care

	IPT				Placebo-Attention				Standard Care			
	K	ES_w (95% CI)	*Z*	Q_W	*K*	ES_w (95% CI)	*Z*	Q_W	*K*	ES_w (95% CI)	*Z*	Q_W
Global therapy effect (mean of all variables)												
Treatment phase	34	0.52 (0.42–0.62)	10.24**	13.78	10	0.23 (0.03–0.42)	2.27*	1.83	16	−0.01 (−0.18–0.17)	0.06	11.70
Treatment and follow-up phaseFollow-up: $M = 8.1$ mo	8	0.57 (0.39–0.74)	6.23**	6.27	2	0.15 (−0.31–0.62)	0.65	0.00	3	−0.07 (−0.52–0.38)	0.30	1.94
Functional domains and symptoms												
Cognition (mean)	29	0.53 (0.43–0.64)	9.91**	22.85	10	0.17 (−0.02–0.37)	1.73	4.08	13	0.04 (−0.15–0.24)	0.42	8.46
Neurocognition	27	0.52 (0.41–0.63)	9.48**	11.85	10	0.16 (−0.03–0.36)	1.64	0.30	12	0.03 (−0.17–0.23)	0.31	1.52
Social cognition	15	0.70 (0.54–0.87)	8.29**	32.77	5	0.31 (0.01–0.61)	2.04*	2.09	8	−0.07 (−0.30–0.17)	0.56	3.35
Psychosocial functioning	24	0.42 (0.31–0.54)	7.11**	13.63	4	0.27 (−0.01–0.56)	1.90	1.35	12	0.00 (−0.20–0.21)	0.04	3.78
Psychopathology	27	0.52 (0.42–0.63)	9.61**	20.19	7	0.33 (0.11–0.55)	2.94**	1.22	12	0.03 (−0.18–0.23)	0.27	23.98
Positive symptoms	21	0.45 (0.32–0.57)	7.03**	9.93	6	0.30 (0.07–0.53)	2.56**	1.93	11	0.22 (−0.01–0.45)	1.91	4.34
Negative symptoms	11	0.42 (0.25–0.59)	4.93**	11.79	4	0.25 (−0.02–0.51)	1.80	2.27	4	0.14 (−0.28–0.55)	0.65	2.15

Note: *K*, number of studies; *N*, number of patients; ES_w, weighted effect sizes within the group; 95% CI, 95% confidence interval; *Z*, significance-statistic within the group; Q_w, homogeneity statistics, 2,one-tailed, $df = K-3$; *$P < .05$; **$P < .01$.

6.85, $df = 1$, $P < .01$). Treatment settings had no significant influence on IPT effects, as both mean effects were highly significant after therapy (academic sites: $K = 13$; $ES = 0.56$; nonacademic sites: $K = 16$; $ES = 0.50$). Additionally, IPT groups revealed similar mean *ES*s after therapy whether they were treated as inpatients ($K = 22$; $ES = 0.54$) or as outpatients ($K = 10$; $ES = 0.51$). Inpatients showed larger effects after follow-up ($K = 4$; $ES = 0.79$) than outpatients ($K = 3$; $ES = 0.50$). Although the follow-up effects were significant in both settings ($Z > 4.26$; $P < .01$), there was no significant difference between them ($Q_B = 1.72$, $df = 1$, n.s.). Therefore, no potential moderator variables could be identified.

Cognitive MATRICS Domains

In a further step, we categorized the neurocognitive and social cognitive scores according to the MATRICS domains.[24,25] The results suggest significant IPT effects ($Z > 2.48$; $P < .01$) after therapy in attention and vigilance ($K = 19$ studies; $ES = 0.48$), verbal and visual memory ($K = 18$; $ES = 0.50$), speed of processing ($K = 3$; $ES = 0.28$), and reasoning and problem solving ($K = 17$; $ES = 0.60$). In the area of social cognitions, sufficient data ($K > 2$) were only available for the domains of emotion processing and social perception. IPT showed significant effects ($Z > 2.98$; $P < .01$) in both outcomes (emotion processing: $K = 4$; $ES = 0.58$; social perception: $K = 10$; $ES = 0.78$).

IPT subprograms: What Works in Proximal and Distal Outcomes?

We subdivided studies depending on whether they used cognitive IPT subprograms (COG SPs) or social IPT subprograms (SOC SPs) as an intervention target. The proximal outcomes after therapy were largest in the targeted areas: cognitive variables in COG SP ($K = 14$; $ES = 0.68$; duration of therapy [*DT*] = 11.2 wk; duration of illness [*DI*] = 9.5 y) and variables of social functioning in SOC SP ($K = 5$; $ES = 0.48$; $DT = 14$ wk; $DI = 7.9$ y). Both *ES*s were significant ($Z > 3.68$; $P < .01$).

With regard to distal outcomes, COG SP generated significant effects in social functioning ($K = 10$; $ES = 0.32$) as well as in negative ($K = 3$; $ES = 0.52$) and positive symptoms (K = 8; $ES = 0.42$). Participants of SOC SP showed significant effects in cognition ($K = 3$; $ES = 0.53$). Moreover, SOC SP significantly reduced negative ($K = 3$; $ES = 0.42$) and positive symptoms ($K = 4$; $ES = 0.53$). All of these *ES*s were significant ($Z > 2.46$; $P < .05$).

Additionally, we classified studies according to 3 categories: studies administering (1) the first IPT subprogram "cognitive differentiation" (SP1), (2) the second subprogram "social perception" (SP2), and (3) the last subprograms (SP4–5) addressing social functioning. The same patterns were identified: SP1 revealed the largest significant effect in neurocognition ($K = 5$; $ES = 0.48$; $DT = 8.4$ wk; $DI = 9.6$ y), SP2 in social cognition ($K = 3$; $ES = 1.44$; $DT = 8.7$ wk; $DI = 9.8$ y) and SP4–5 in social functioning ($K = 5$; $ES = 0.48$; $DT = 14.5$ wk; $DI = 7.9$ y). The social cognitive SP (Social Perception) resulted in the largest *ES* ($K = 3$; $ES = 1.66$).

In summary, IPT subprograms revealed the largest effects in the targeted areas.

Advantages of Integrated Interventions

In a final step, we investigated whether integrated interventions (combined subprograms of IPT) have longer lasting effects at follow-up and are more successful in generalizing therapy effects (distal outcome) than single subprograms. After therapy, the effects of IPT including all 5 SPs (K = 15; $ES = 0.50$; $DT = 22.1$ wk; $DI = 11.3$ y) did not differ significantly from the use of single SPs or a combination of them (K = 19; $ES = 0.55$; $DT = 12.1$ wk; $DI = 9.2$ y). Compared with single subprograms ($K = 3$; $ES = 0.48$; follow-up = 8.3 mo), IPT including all subprograms revealed superior effects at follow-up ($K = 5$; $ES = 0.60$; follow-up = 7.9 mo). Nevertheless, all IPT variations resulted in significant *ES*s ($Z > 2.66$; $P < .01$), which did not differ significantly from each other ($Q_B < .5$, $df = 1$, P = NS).

Furthermore, we tested whether a combined treatment of neurocognitive and social cognitive remediation has an additional effect on neurocognitive remediation alone. Therefore, studies using the first IPT subprogram "Cognitive Differentiation" (SP1) were compared with studies including the first 2 or 3 IPT subprograms (SP1–3). Compared with SP1 ($K = 5$; $ES = 0.48$; $DT = 8.4$ wk; $DI = 9.6$ y), SP1–3 ($DT = 15.2$ wk; $DI = 9.8$ y) revealed larger effects on the neurocognitive variables ($K = 8$; $ES = 0.65$). Both *ES*s were significant ($Z > 3.31$; $P < .01$). Additionally, the combined intervention of SP1–3 resulted in significant *ES*s on social cognition ($K = 5$; $ES = 0.81$; $Z = 6.36$; $P < .01$) and social functioning ($K = 5$; $ES = 0.49$; $Z = 4.11$; $P < .01$). The *ES*s of neurocognition and social cognition did not differ significantly ($Q_B < 1.98$, $df = 1$, P = NS). The use of SP1 alone revealed no significant improvements (social cognition: $K = 2$; $ES = 0.31$; $Z = 0.97$; n.s.; social functioning: $K = 4$; $ES = 0.24$; $Z = 1.14$; n.s.). These effects favoring a combined IPT intervention are consistent with the dropout rate of the studies: while SP1–3 studies had a relatively low dropout rate of 13.8%, the rate for SP1 studies was 17.2%. In summary, compared with the use of the cognitive subprogram alone, an integrated intervention resulted in larger effects in distal outcomes and at follow-up.

Discussion

This meta-analysis includes 36 IPT studies that have been conducted during the past 30 years. Research design,

quality, and setting differ across studies. The studies include RCTs as well as studies under routine psychiatric care with inpatient and outpatient samples in academic and nonacademic sites. The total sample comprised 1601 schizophrenia patients. This analysis updates our previous study[27] in which we compared the effects of all studies with those of high-quality studies (RCT-design, controlled medication, and blind-ratings).

The results of this study revealed improvements in proximal and distal outcomes over time and across different research designs as well as setting and sample characteristics. This meta-analysis provides evidence for the efficacy as well as effectiveness of IPT. Other comparable integrated therapy approaches such as Cognitive Enhancement Therapy (CET)[78–81] and Neurocognitive Enhancement Therapy (NET)[17,82] have yielded results that are consistent with the results of IPT. CET and NET are based on broad empirical evidence, indicating improvements in the cognitive performance as well as in the distal areas of psychopathology and psychosocial functioning.[10] The aforementioned integrated approaches are therefore listed in the "Catalog of Clinical Training Opportunities: Best Practice for Recovery and Improved Outcomes for People with Serious Mental Illness" published by the American Psychological Association (CAPP) Task Force on Serious Mental Illness and Severe Emotional Disturbance.[83]

Using only single IPT subprograms generally resulted in lower effects on distal outcomes than a combination of (all) IPT subprograms. These results are in line with the conclusions of other studies and meta-analyses stating that cognitive remediation therapy produces greater cognitive and functional improvements when combined with a psychosocial intervention than when cognitive remediation therapy is used as a stand-alone treatment.[84–87] One explanation for the better distal outcomes may be that IPT generates synergistic effects and optimizes functional outcome by combining neurocognitive remediation therapy with the treatment of social cognitive functions and social skills. Recent studies using SEM support this assumption. The relationship between neurocognition and functional outcome could be explained by the mediating influence of social cognition.[16,18]

Only those patients who participated in all IPT subprograms, including neurocognition, social cognition, and social competence treatment components, continued to improve during the follow-up phase. The maintenance of IPT effects during the follow-up phase is consistent with the integrated model of mutual impact of different levels of neurocognitive, social cognitive, and psychosocial skills functioning.[10,29,88,89] Like IPT, such integrated approaches may provide opportunities to learn and practice strategies and skills relevant for functional recovery in a supportive environment and to tightly link the (re)gained cognitive abilities to everyday life activities. This may finally lead to long-term habits and thereby produce durable treatment outcomes over time. Because of the environmental factors, patients need time to transfer their acquired skills and functional capacity to real-world activities.[90–92]

These findings suggest that future research should clarify the relative contribution of each subprogram to its impact on distal outcomes and on long-term effects in RCTs. Moreover, it remains unclear whether different mechanisms of change are more evident in integrated approaches than in stand-alone treatments. Therefore, a key issue appears to be a better understanding of the active therapy elements in integrated interventions that drive synergistic effects. Detailed analysis must be conducted to identify the cognitive target domains, therapeutic techniques, and participant characteristics that provide the most benefit. More studies to ascertain the crucial factors for the translation of cognitive change into broader concepts of real-life and their underlying neural mechanisms may help further optimize treatment outcomes for schizophrenia patients.

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