Changes in experience and behavior of schizophrenic patients in therapy groups improve functioning and symptoms. RCT with 154 outpatients in CR-group compared to TAU

Rosa Mueller-Szer, Fabienne I. Wechsler, Daniel R. Mueller

University Hospital of Psychiatry and Psychotherapy Bern, Switzerland

daniel.mueller2@unibe.ch

Abstract

For the treatment of schizophrenia patients, some evidence-based group therapy approaches with different treatment goals are available today, also in cognitive remediation. However, there is little to no data on how the group factor, as an unspecific mechanism of change, affects the treatment outcome in schizophrenia patients. Does participation in goal-directed groups per se affect treatment outcome?

Methods: To address this gap, a group approach to cognitive remediation developed in our laboratory (Integrated Neurocognitive Therapy, INT) was compared with control patients who did not participate in therapy groups (Treatment As Usual, TAU). 154 outpatients with schizophrenia were randomly assigned to INT (N=79) or TAU (n=75). INT was administered twice a week for a therapy duration of 15 weeks. A comprehensive test battery was assessed before and after therapy, as well as at the 1-year follow-up in both comparison groups. The group factor was assessed with the newly developed short questionnaire "Experience and Behavior in Therapy Groups EBIT", which comprises 11 items.

Results: The therapy group showed significantly better effects in EBIT outcome compared to controls regarding the global score (mean of all EBIT items) (GLM: F=5.42, p <.01) as well as the empirical 2-factor solution using factor analysis: factor 1 (inactivity and fear) (GLM: F=5.05; p <.01) and factor 2 (eye contact and attention during communication) (F=4.02, p=.02). Additionally, EBIT scores are significantly associated with improvement in cognition, negative and general symptoms after treatment. Furthermore, EBIT scores are also significantly correlated with treatment motivation and therapy attendance rate but not with positive symptoms and medication.

Conclusion: The group factor can be identified and measured using a brief questionnaire. Additionally, the experience and behavior in groups have a supplement positive effect on various group outcome variables.

Introduction

Today, there are several evidence-based group therapy approaches available for the treatment of schizophrenia patients, each focusing on different treatment goals. One such approach is Cognitive Remediation (CR). However, there is a lack of data regarding the **impact of the group factor** as **unspecific mechanism of change** on treatment outcomes in schizophrenia patients. There seems to be a research gap in understanding how group therapy works (Burlingame, 2013). Does the participation in goal-oriented groups per se affect therapy outcomes? Patients' self-reports using validated instruments are crucial for a better understanding of group therapeutic processes. Nevertheless, only a few questionnaires are available to assess factors such as group cohesiveness (e.g. Yalom, 1995), and even fewer are specifically designed for schizophrenia patients. Therefore, there is a demand for **a brief questionnaire with a few items including short, simple questions that are easy to understand for schizophrenia patients**. Such a questionnaire should use terminology relevant to behavior therapy and cognitive therapy and be suitable for the use in RCT designs in research. Additionally, it should be appropriate for patients not participating in group therapy.

Experience and Behavior In Therapy groups questionnaire (EBIT, Mueller 2012).

The following questions refer to the experience and behavior in groups: for example, therapy group, interest group, sports group, discussion group in day clinics, outpatient department or clinic ward. Please tick only one of the given **6 answer options** (six-point Likert scale: strongly applies, applies, somewhat applies, does rather not apply, does not apply and does not apply at all) for each question.

When I'm in a group as described above…

1. …I talk to the others in the group.
2. …I actively participate in the group discussion.
3. …I have some eye contact when I say something to someone.
4. …I get scared.
5. …I don' t say anything personal about myself.
6. …I retire as soon as possible.
7. …I'm able to express myself well.
8. …I have eye contact when someone speaks to me.
9. …I can't utter a word.
10. …I get nervous.
11. …I listen attentively to what the others tell me.

Methodology

Design

For this purpose, the **cognitive remediation group approach** Integrated Neurocognitive Therapy, INT, (Roder & Mueller 2015; Mueller et al. 2015, 2017, 2020) has been compared with control patients who did not parti-cipate in therapy groups (Treatment as Usual, TAU). INT was developed in our lab and follows a restitution and compensation learning approach. INT consists of 5 modules that address all NIMH-MATRICS domains of neuro- and social cognition. At the end of the last module, emotion regulation and stress reduction tasks are included (Fig. 1). INT was conducted twice a week over a therapy duration of 15 weeks.

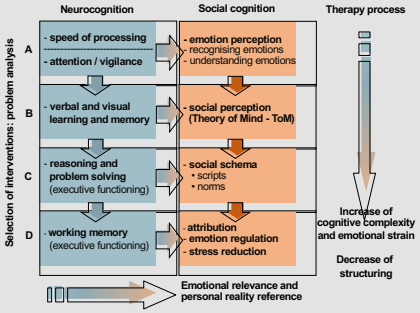

Fig. 1 Integrated Neurocognitive Therapy (INT).

Assessments

The group factor was assessed by the EBIT- questionnaire. Additionally, the following assessments instruments were used: Symptoms: Positive and Negative Syndrome Scale PANSS (Kay et al. 1987); functioning: Global Assessment of Functioning Scale GAF (DSM-IV); Attention-Test D2 (Brickenkamp et al. 2010); Cognition: speed: Trail Making Test TMT, Part A (Reitan 1958); CPT, Continuous Performance Test, total number of ommission errors (Knye et al., 2003); SCST, Schema Component Sequencing Task (Vauth et al., 2004); FPTM, questionnaire psychotherapy motivation (Schulz, 1995). The complete test battery was assessed before and after therapy, as well as at 1-year follow up in both comparison groups.

Sample

A total of 154 schizophrenia outpatients (ICD 10) have been randomly assigned to INT (N=79) or TAU (n=75). Patient characteristics are summarized in Table 1.

Patient characteristics

None of the Patient characteristics summarized in table one showed a significant difference at baseline between INT and TAU (Table 1).

Tab. 1: Patient characteristics (N=154)

	INT (*n*=79)		TAU (*n*=75)		*t*/χ^2	*p*
	M	(*SD*)	*M*	(*SD*)		
Age at baseline (years)	34.5	(8.4)	34.0	(8.0)	0.3	.73
Age at first admission (years)	24.3	(7.4)	23.5	(6.3)	0.7	.49
Duration of illness (years)	10.1	(7.4)	9.9	(7.0)	0.2	.81
Number of hospitalization	3.6	(3.2)	4.3	(4.3)	1.2	.25
IQ (WAIS-R)	105.6	(10.0)	102.7	(11.8)	1.5	.12
Education (years)	10.9	(2.1)	10.4	(2.0)	1.3	.21
Symptoms (PANSS sum score)	66.3	(16.4)	68.3	(16.4)	0.8	.45
GAF	48.9	(8.0)	48.7	(9.1)	0.2	.81
Medication (chlorpromazine equivalents)	422.3	(420.9)	456.0	(380.2)	0.4	.66
Gender (% male)	63.7		75		2.3	.13

Abbreviations: INT, Integrated Neurocognitive Therapy; TAU, Treatment As Usual; WAIS-R, Reduced Wechsler Intelligence Test (WIP, Dahl, 1986); PANSS, Positive and Negative Syndrome Scale (Kay et al., 1987); GAF, Global Assessment of Functioning Scale (DSM-IV); *t*, *t*-tests for normally distributed variables; χ^2, χ^2-tests for categorical variables.

Results

1. EBIT Outcome for INT and TAU over the study interval

A factor analysis, including the 11 EBIT-items, obtained a 2-factor solution (reliability value for both factors >.80): **Factor 1: Inactivity and fear in the group** (Item 1,2,4,5,6,7,9,10); **Factor 2: Eye Contact and attention in communication** (Item 3,8,11). Firstly, we statistically analyzed by GLM the course of both EBIT factors as well as for the mean score of all 11 EBIT-items (total score) over the 3 assessment points (pre- and post therapy and follow-up between INT and TAU groups). The results showed significant improvement in the total score as well as in both factors favoring patients in INT group during therapy (Fig.2-4). However, the effects were lost at follow-up.

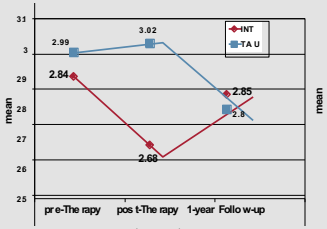

Fig. 2 EBIT: mean score (11 items): Therapy and follow-up phase (GLM: F=5.42; p<.01); lower scores indicate better functioning

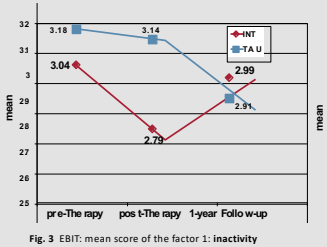

Fig. 3 EBIT: mean score of the factor 1: **inactivity and fear in the group**: Therapy and follow-up phase (GLM: F=5.05; p<.01): lower scores indicate better functioning

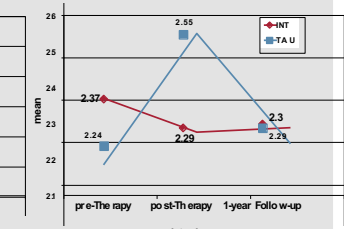

Fig. 3 EBIT: mean score of the factor 2: **eye contact and attention in communication**: Therapy and follow-up phase (GLM: F=4.02; p=.02); lower scores indicate better functioning

2. Impact of EBIT to symptoms functions, attendance and motivation

In a second step, we **correlated the EBIT scores** with all patient characteristics, attendance rate, and outcome assessments of INT group at **post-therapy** (Table 2): Regarding patient characteristics, only EBIT factor 2 (eye contact and attention) at post-therapy was associated with number of hospitalizations, but with none of the three EBIT variables correlated with patient characteristics (e.g., medication). With the exception of positive symptoms, all symptom variables (PANS) as well as therapy motivation (FPTM) were significantly associated with all EBIT scores. Social functioning (GAF) and attendance rate were correlated only with EBIT mean score, as well as factor 1 (inactivity and fear). Cognition showed only significant correlations for all EBIT scores with CPT commission (wrongful marking) scores, which assesses attention. The two other variables regarding attention (CPT omission and D2 [missings]) had no significant impact on EBIT. TMT, which assesses the speed of processing, only showed a correlation with the EBIT factor 1 (inactivity and fear). SCST assessing social schema as part of social cognition, correlated with EBIT mean score and EBIT factor 1 (inactivity and fear).

Tab. 2: INT group: Pearson correlation coefficients (p) between patient characteristics and outcome variables at post-therapy assessment

	EBIT all	EBIT F1	EBIT F2	N Hospital.	PANSS Pos.Symp.	PANSS Neg.Symp.	PANSS Gen.Symp.	PANSS tot	GAF	TMT A	D2	CPT Omiss.	CPT Comiss.	SCST	FPTM Motivat.	Attend. Rate[1]
EBIT all		.**59***** (<.01)	.**57***** (<.01)	.08 (.54)	.10 (.43)	.**41***** (<.01)	.**58***** (<.01)	.**59***** (<.01)	-.**36**** (<.01)	.17 (.16)	-.14 (.27)	.10 (.44)	.**27**** (.03)	-.**29**** (.02)	-.**33**** (.02)	.**31**** (.01)
EBIT F1			.**43***** (<.01)	.01 (.91)	.11 (.36)	.**40***** (<.01)	.**55***** (<.01)	.**51***** (<.01)	-.**36**** (<.01)	.13 (.29)	-.12 (.35)	.07 (.58)	.22* (.07)	-.**26**** (.03)	-.**29**** (.05)	.**30** (.01**)
EBIT F2				.**29**** (.05)	-.06 (.43)	.**28**** (.02)	.22* (.06)	.22* (.07)	-.08 (.49)	.**24**** (.04)	-.11 (.39)	.09 (.45)	.**31**** (.01)	-.18 (.13)	-.**31**** (.05)	-.19 (.13)
N Hospital.				.**24**** (.05)	.09 (.46)	-.16 (.21)	.19 (.12)	-.09 (.50)	.01 (.97)	.00 (.99)	.12 (.36)	.20 (.11)	-.19 (.14)	-.03 (.87)	-.13 (.28)	
PANSS Pos.Sym.					.**35***** (<.01)	.**63***** (<.01)	.**74***** (<.01)	-.**47***** (<.01)	.01 (.09)	.01 (.92)	.17 (.16)	.00 (.10)	.03 (.83)	-.22 (.13)	-.10 (.42)	
PANSS Neg.Sym.						.**61***** (<.01)	.**81***** (<.01)	-.**59***** (<.01)	-.14 (.23)	-.04 (.76)	.14 (.24)	.**57***** (<.01)	-.**28**** (.03)	-.**35**** (.02)	-.12 (.31)	
PANSS Gen.Sym.							.**91***** (<.01)	-.**66**** (<.01)	-.**36**** (<.01)	.06 (.62)	-.09 (.45)	.19 (.12)	-.**28**** (.02)	-.18 (.15)	-.**34**** (<.01)	-.**24**** (.03)
PANSS tot								-.**70***** (<.01)	-.09 (.46)	.09 (.64)	-.06 (.68)	.21* (.08)	-.**42**** (<.01)	-.19 (.11)	-.**42**** (<.01)	-.21 (.09)
GAF									.14 (.25)	-.14 (.22)	.14 (.22)	-.15 (.**04**)	-.**29**** (.03)	.13 (.29)	-.**33**** (.02)	.15 (.24)
TMT A										-.**59***** (<.01)	.18 (.14)	.19 (.12)	-.**34**** (<.01)	-.**28**** (.05)	-.06 (.62)	
D2											-.15 (.22)	-.12 (.34)	.23* (.06)	.02 (.88)	.00 (.96)	
CPT Omiss.												.19 (.13)	.23* (.06)	-.16 (.29)	-.08 (.66)	
CPT Comiss.													-.**42**** (<.01)	-.07 (.63)	-.06 (.66)	
SCST														.18 (.12)	.11 (.36)	
FPTM Motivation															.**52** (<.01)	
Attend. rate																

Note: level of significance *p>.1, **p<.05, ***p<.01; [1]Attendance rate only for participants in INT group; [2]assessed with the Reduced Wechsler Intelligence Test (Dahl, 1986); N Hospital.: Number of hospitalization; EBIT: Experience and Behavior In Therapy groups questionnaire (Mueller, 2012); PANSS: Positive and Negative Syndrome Scale (Kay et al., 1987); GAF: Global Assessment of Functioning Scale of the DSM; TMT A: Trail Making Test, Part A (Reitan, 1958); D2: attention measured with the d2 task (Brickenkamp et al., 2010); CPT: Continuous Performance Test (Knye et al. 2003); SCST: Schema Component Sequencing Task-Revised (Vauth et al., 2004); FPTM: Questionnaire of psychotherapy motivation (Schultz et al., 1995)

3. Outcome in symptoms and functions

In contradiction to the EBIT outcome over time (Figure 2-4), the outcome in symptoms and cognition showed a benefit for INT patients compared to TAU in negative and general symptoms, functioning assessed by GAF, TMT (speed of processing), D2 (attention), and SCST (social schema). **The treatment effects were maintained during the 1-year follow up**. Exceptions were positive symptoms, omission and commission scores of CPT, as well as therapy motivation (FPTM).

Conclusion

To some extent, EBIT may serve as an appropriate measure of the group factor in treatment groups with schizophrenia patients. Both the sum score and a 2-factor solution of the 11 EBIT items can be utilized. The group factor demonstrates efficacy during therapy but diminishes at follow-up. EBIT exhibits a strong association with therapy motivation and attendance, which represents the adherence rate. The findings suggest that **EBIT captures an unspecific factor of therapy groups** that may contribute to improved functional outcomes. The group factor is significantly linked to negative symptoms and social functioning, both of which represent **generalization effects** of proximal outcome in cognitive remediation. Additionally, there is a moderate association with certain social cognitive and neurocognitive functions.