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ORIGINAL PAPER

A randomized-controlled trial of treatment for self-stigma among persons diagnosed with schizophrenia-spectrum disorders

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Abstract

Purpose A substantial body of research indicates that self-stigma is associated with poorer outcomes related to recovery among people with severe mental illnesses. Narrative Enhancement and Cognitive Therapy (NECT) is a structured, group-based approach which targets the effects of self-stigma. A randomized-controlled trial was conducted to examine the efficacy of NECT.

Methods One hundred and seventy persons, recruited from both outpatient and comprehensive treatment settings, meeting criteria for schizophrenia-spectrum disorders and moderate-to-elevated self-stigma, were randomly assigned to NECT or supportive group therapy and assessed at four time points over the course of nearly a year. Participants completed measures of self-stigma, hope, self-esteem, functioning, psychiatric symptoms, coping with symptoms, and narrative insight.

Results Analyses indicated that NECT participants in outpatient sites improved significantly more over time in self-stigma compared to supportive group therapy participants in outpatient sites, while NECT participants in comprehensive (including day treatment and psychiatric rehabilitation program) sites improved significantly more in hopelessness and narrative insight than other participants. NECT participants as a group showed decreases in the social withdrawal component of self-stigma, decreased in their use of avoidant coping strategies, and were more engaged in treatment than supportive group therapy participants. There was no evidence for effects of NECT on social functioning or psychiatric symptoms.

Conclusions Findings suggest that NECT primarily impacts self-stigma and related outcomes, and that the degree of its effects is partially dependent on the treatment context in which it is offered.

Keywords Self-stigma · Coping · Insight · Recovery · Group therapy

Introduction

Population surveys indicate that many among the general public endorse negative stereotypes about schizophrenia and other forms of severe mental illness (SMI). These include expectations of violence [endorsed by 60% of United States (US) residents] and inability to work (endorsed by over 50% across 16 countries) [1, 2]. Research supports that most people with SMI are aware of these attitudes (referred to as stigma), with over 70% anticipating discrimination [3], and 60–70% agreeing that "most people" would reject someone with a mental illness as a friend, neighbor, or co-worker [4, 5]. Although people with SMI may respond to awareness of stigma with indifference or righteous anger [6], self- (or internalized) stigma can occur when they accept that negative stereotypes about SMI are true about them. The largest study found that 41% of people with schizophrenia-spectrum

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disorders demonstrated elevated self-stigma [4], and other studies have observed similar rates [5, 7].

A substantial body of research suggests that degree of self-stigma is associated with poorer outcomes related to recovery from SMI. A meta-analysis [8] found moderate-to-strong relationships between self-stigma and hope, self-esteem, self-efficacy, subjective quality of life, symptom severity, and treatment adherence. Self-stigma may be both a consequence and a cause of adverse outcomes among people diagnosed with SMI. To the extent that it plays a causal role, it is a potentially important treatment target. Yanos and colleagues [9] proposed the "Illness Identity" model, which provides a set of detailed and testable hypotheses regarding the potential causal role that self-stigma plays in influencing outcomes related to recovery from SMI (see [10] for an extensive discussion of the model). This model posits that, when identity is influenced by self-stigma, people believe that recovery is not possible, reducing hope (i.e., expectancies regarding the future [11]) and self-esteem (i.e., one's belief in their inherent value or worth [12]). Hopelessness and low self-esteem, in turn, increase risk for suicide, decrease social interaction (a component of what is often referred to as "social functioning" [see 13 for a review]), lead to the use of passive strategies to cope with symptoms and stressors, and decrease engagement in treatment. As individuals use more avoidant strategies, they may also avoid work (also typically considered a component of social functioning). Finally, avoidant coping, social isolation, and decreased vocational functioning may all increase psychotic symptom severity. Support for this model was found in two path analyses conducted by separate research teams [14, 15].

Given the evidence for the importance of self-stigma in the recovery process, several interventions have been developed that specifically target it [16]. Narrative Enhancement and Cognitive Therapy (NECT) [17] is a structured, group-based approach which combines psychoeducation addressing stigmatizing views, cognitive restructuring focusing on teaching and practicing skills challenging negative thoughts about the self, and elements of narrative psychotherapy focusing on meaning-making and transforming one's life story in more empowering ways. NECT is believed to generate improvements in self-stigma and related outcomes via three mechanisms: providing information that counteracts negative stereotypes, providing participants with an adaptive coping tool (cognitive restructuring) that can be used in place of avoidant strategies, and facilitating "narrative insight" which allows participants to construct their own personal meaning of their experiences. NECT is group-based as this allows participants to gain feedback and support from peers and provides opportunities for interactions with an audience in the narrative process. NECT employs a user-friendly manual which can be implemented with fidelity in routine treatment settings [17].

Findings from three controlled investigations of NECT in three different countries and languages have been published to date. The first included 39 persons with SMI at two US sites randomly assigned to NECT or treatment as usual (TAU). The study found no statistically significant differences between participants in NECT vs. TAU at post-treatment, but noted a trend favoring NECT for self-stigma and insight with effect sizes of .3–0.5 [18]. The second study, a quasi-experiment conducted in Israel with 119 public mental health service recipients, found that participants in NECT improved significantly compared with TAU in self-stigma, self-esteem, and perceived quality of life, with effect sizes of 0.3–0.6 [19]. A third study, a randomized-controlled trial (RCT) conducted in Sweden, compared NECT to TAU in 87 people with psychotic disorders [20]; assignment to NECT was associated with significant improvements in self-stigma and self-esteem, with effect sizes of roughly 0.5, with improvements persisting at 6-month follow-up.

Taken together, findings suggest that NECT can enhance subjective aspects of recovery compared with TAU. However, prior studies: (1) did not test whether NECT would produce changes superior to an active treatment with a similar degree of attention (i.e., 20 small group sessions); (2) were focused broadly on persons with SMI rather than schizophrenia; and (3) did not determine whether NECT influences objective outcomes (e.g., social functioning). Given: (1) evidence that experiences of self-stigma are most common among persons diagnosed with schizophrenia-spectrum disorders [4] in contrast with affective disorders [21]; (2) the need to test the possibility that superior findings in contrast with TAU are due to the effects of attention alone; and (3) the Illness Identity model's view that self-stigma is related to functional impairment, the present study examined the efficacy of NECT in comparison to an active control condition, was restricted to persons meeting criteria for schizophrenia-spectrum disorders, and explored both subjective (e.g., self-stigma, self-esteem and hopefulness) and functional outcomes. We predicted that randomization to NECT would lead to significantly greater improvements in self-stigma, more distal outcomes such as better social functioning, and potential mechanisms of action, including coping strategies and narrative insight.

Method

An RCT was conducted with persons meeting criteria for schizophrenia-spectrum disorders showing evidence of moderate-to-elevated self-stigma. An initial screening study was conducted first to identify persons with moderate-to-elevated self-stigma.

Ethics

All human research procedures were approved by the appropriate ethics committees and Institutional Review Boards, and were, therefore, performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Written informed consent was obtained from all participants, and participants were compensated for completing all interviews (including the screening).

Procedure

Participants were recruited from five sites for both the screening study and the RCT: two partial hospitalization programs and one outpatient clinic in Newark and Piscataway, New Jersey, an outpatient program in Indianapolis, Indiana, and a VA Medical Center psychiatric rehabilitation program in Indianapolis. Outpatient programs offer services such as monthly medication monitoring and weekly case management meetings. Both partial hospitalization programs offer 6 h of group services 3–5 days per week; the psychiatric rehabilitation program offers a flexible array of services including group treatment, individual psychotherapy, and supported employment services. All sites serve persons meeting criteria for "severe mental illness," with a majority meeting criteria for psychotic disorders. Trained research assistants (RAs) recruited participants from waiting rooms and community meetings at the program sites for the initial screening.

After providing informed consent, participants were screened with the Internalized Stigma of Mental Illness (ISMI; see below) scale and a short demographic questionnaire. If participants exceeded a cut-off mean score of 1 (on a 0–3 scale) on the ISMI, suggesting moderate or elevated levels of self-stigma, RAs briefly described the overall project and, if participants indicated interest, arranged to meet to complete informed consent and the baseline interview.

At the baseline interview, RAs first administered the *Structured Clinical Interview for DSM-IV* (SCID-IV) to determine diagnostic eligibility (schizophrenia or schizoaffective disorder and lack of current substance dependence). After confirming diagnostic criteria, the remaining scales (see below) were administered and participants were randomly assigned to NECT or Supportive Group Therapy (SGT: described below). Random assignment was stratified based on self-stigma severity to ensure that roughly equivalent numbers of participants with "moderate" (1–1.5) and "elevated" scores (1.5–3) on the ISMI were represented. Participants were invited to complete follow-up assessments after the intervention phase. Participants were interviewed at four time points over the course of nearly a year: baseline, post-treatment (approximately 5 months after baseline), and 3- and 6-months post-treatment.

Figure 1 presents a Consort diagram demonstrating the flow of participants through the course of the project, recruited and assessed between October 2014 and December 2017. Seventy-eight percent of screened participants met elevated self-stigma criteria, but 47 (17% of those eligible) did not meet diagnostic criteria, while another 61 (22%) were not interested in participating or were unavailable for other reasons, leaving 170 randomized participants. Note that 40% of screened participants scored in the 1.5–3 ("elevated") range, with 35% scoring in the 1–1.5 ("moderate") range on the ISMI, which is consistent which was found in prior research (4) (note that these researchers used the terms "moderate" and "low" for these ranges, however).

Participants

Demographic and clinical characteristics of participants are shown in Table 1. Participants were predominantly African–American (63%), male (60%), diagnosed with schizophrenia (64%), and in their mid-40′s, with 12 years of education and 8 past hospitalizations. Participants in NECT and SGT did not differ in demographic characteristics with the exception of age and number of past hospitalizations, which were both significantly higher among participants assigned to NECT, despite random assignment.

Measures

Assessment instruments, with the exception of demographics and the SCID-IV, were repeated at each interview.

Diagnostic eligibility (diagnosis of schizophrenia/schizoaffective disorder and no current substance dependence) was assessed using the mood, psychotic, and substance use disorders, which modules the SCID-IV [22], a commonly used structured diagnostic interview.

Primary outcome

Self-stigma was assessed using the Internalized Stigma of Mental Illness scale (ISMI) [23] (alpha = 0.88), a 29-item self-report measure, which presents participants with first-person statements and asks them to rate them on a four-point scale. Items are summed to provide four major scale scores: Alienation, which reflects feeling devalued as a member of society, Stereotype Endorsement, which reflects agreement with negative stereotypes of mental illness, Discrimination Experience, which reflects current mistreatment attributed to the biases of others, and Social Withdrawal, which reflects avoidance of others because of mental illness. The fifth additional score, Stigma Resistance, asks about the participant's

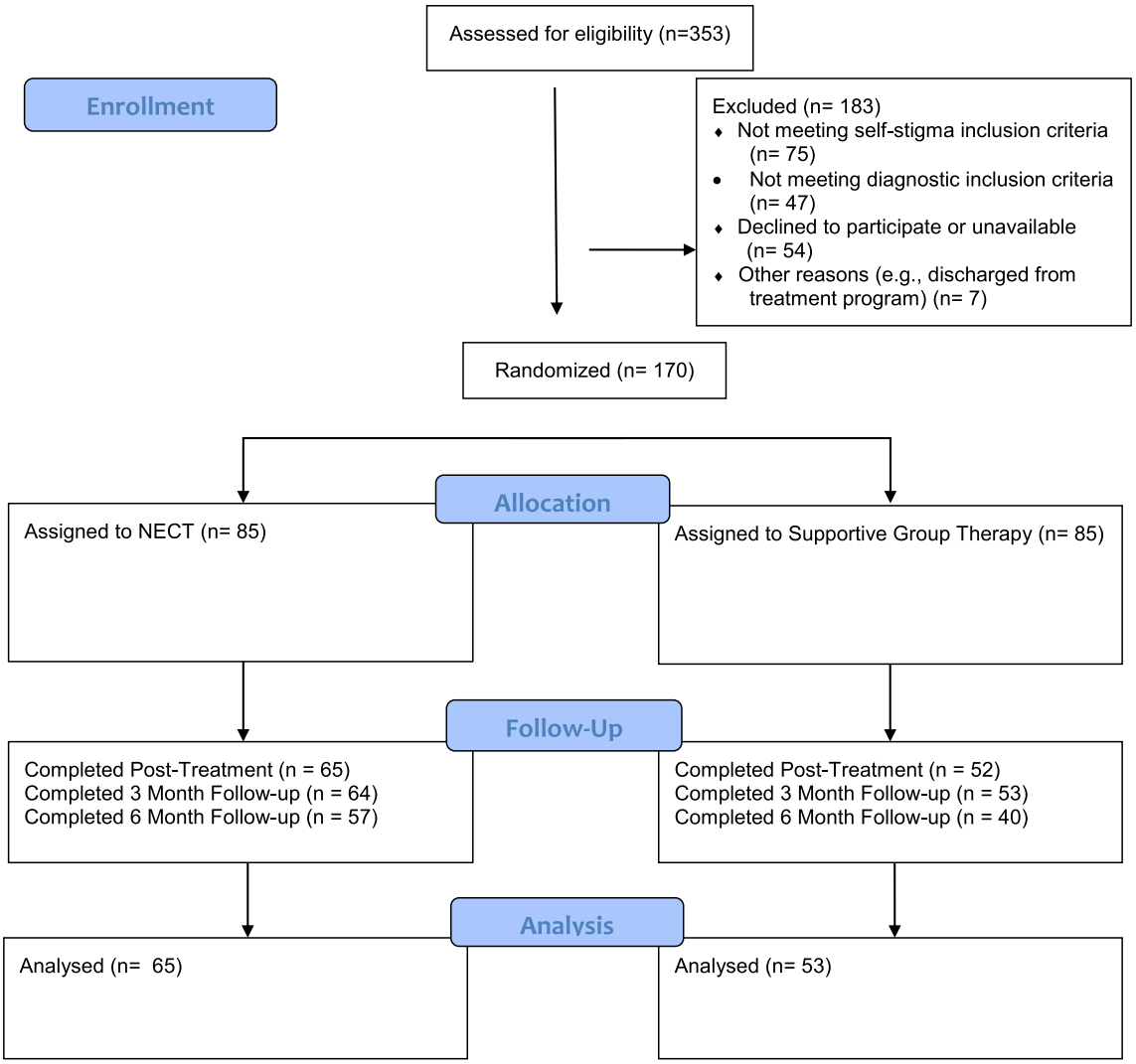

Fig. 1 CONSORT 2010 flow diagram

perceived ability to deflect stigma. Consistent with prior work [4], we excluded the stigma resistance subscale, which tends to correlate poorly with the other subscales.

Secondary outcomes

Self-esteem was assessed using the *Rosenberg Self-Esteem Scale* (RSES [10]) (alpha = 0.73), a 10-item self-report scale. Hope was measured using the Beck Hopelessness Scale (BHS [11]) (alpha = 0.92), a 20-item self-report true/false measure. Social functioning was measured with the Quality-of-Life Scale (QLS [24]), a 21-item rating scale administered via a semi-structured interview with four subscales: intrapsychic foundations (motivation and engagement), interpersonal relations (quality and quantity of interpersonal relationships), instrumental function (work, education and related activity), and commonplace objects and activities (participation in community-based activities). Inter-rater reliability for audio recordings of interviews rated across sites was good to excellent, with intra-class correlations (ICCs) ranging from 0.82 to 0.95. The Multidimensional Scale of Independent Functioning (MSIF [25]) was used to examine more nuanced aspects of functioning in the domains of work, education, and housing. Within each domain, three dimensions are measured to capture the multidimensional aspects of functioning: (1) role responsibility; (2) presence and level of support, and (3) quality of performance. Each domain receives a global rating that combines the subareas into a composite, and a total score is derived across all three domains of functioning. Inter-rater reliability for vignettes based on participants that were rated across sites was found to be excellent (ICCs ranging from 0.91 to 0.95). Psychiatric symptoms were measured using the Positive and Negative Syndrome Scale (PANSS [26]), a 30-item clinician-rated

Table 1 Demographic characteristics of participants at baseline

	NECT $N=85$ N (%)	Supportive $N=85$ N (%)	Total $N=170$ N (%)	X^2	*df*	*p*
Gender						
Male	51 (60)	51 (60)	102 (60)	2.06	1	0.36
Female	32 (38)	34 (40)	66 (39)			
Transgender	2 (2.4)	0 (0)	2 (.1)			
Race						
African–American	56 (66)	51 (60)	107 (63)	5.34	2	0.33
European–American	21 (25)	18 (21)	39 (23)			
Latino/a/x	4 (5)	6 (7)	10 (6)			
Other	4 (5)	10 (12)	14 (8)			
Diagnosis						
Schizophrenia	56 (66)	53 (62)	109 (64)	0.23	5	0.38
Schizoaffective	29 (34)	32 (38)	61 (36)			
Site						
Newark outpatient	16 (18.8)	17 (20)	33 (19.4)	0.13	4	0.99
Newark partial	16 (18.8)	17 (20)	33 (19.4)			
Piscataway partial	14 (16.5)	15 (17.6)	27 (15.9)			
Indiana outpatient	23 (27.1)	23 (27.1)	46 (27.1)			
VA rehabilitation	16 (18.8)	15 (17.6)	31 (18.2)			
	M (SD)	M (SD)	M (SD)	*t*	*df*	*p*
Age	47.4 (11.8)	43.6 (11.2)	45.5 (11.7)	2.15	1, 168	0.03
Year of education	12 (2.3)	12.2 (2.6)	12.1 (2.4)	−0.52	1, 168	0.61
Number of past hospitalizations	10.6 (15.1)	6.3 (6.7)	8.5 (11.9)	2.39	1, 168	0.02
Age at first hospitalization	23.2 (9.7)	23.8 (10.1)	23.5 (9.8)	−0.59	1, 156	0.55

measure evaluating positive symptoms, negative symptoms, and general psychopathology. Inter-rater reliability for audio recordings of interviews rated across sites was good to excellent (ICCs ranging from 0.89 to 0.94).

Coping with symptoms was assessed using the Coping with Symptoms Checklist (CSC [27]), which assesses the use of coping strategies across five symptom areas including anxiety, depression, delusions, hallucinations, and mania. Participants who endorsed experiencing any of these symptoms on the PANSS were asked to indicate the frequency in which each strategy was used to manage the symptom in the past 2 weeks. Each domain contains strategies classified as problem-centered, avoidant, or neutral; responses across symptom domains were then summed and averaged into summary scores. We found good internal consistency for problem-centered (alpha = 0.89), neutral (alpha = 0.83), and avoidant coping (alpha = 0.87).

Narrative insight was assessed using the Illness Awareness subscale of the Scale to Assess Narrative Development (STAND [28]), an instrument designed to evaluate four components of self-experience related to recovery (Illness Awareness, Social Alienation, Personal Agency and Social Worth). Illness Awareness concerns the degree to which the participant can coherently explain their experience of mental illness, and corresponds with the construct of "narrative insight," which NECT is believed to impact. To rate the STAND, personal narratives are collected through the administration of the Indiana Psychiatric Illness Interview (IPII [29]), a semi-structured interview asking participants to narrate the story of their life, and discuss whether mental illness has impacted important life areas, the amount of control which they exhibit over mental illness, and the way which it affects and is affected by others. Interviews were audio-recorded, transcribed, and rated on the STAND by trained raters at the Indiana site.

Interviewer training and blinding

RAs initially completed a full day of training on all measures, and then completed ratings of standard training materials (including recordings with prior consensus ratings) of the SCID-IV, PANSS, QLS, and MSIF. After demonstrating adequate agreement with consensus ratings, RAs then observed senior team members conducting live interviews, providing opportunities for further discussion of the rating process. RAs conducted at least one observed interview before proceeding to independence, and remained blind to participant treatment assignment at all sites. RAs completed inter-rater reliability assessments of audio recordings

of interviews for all measures for at least eight recordings distributed over the course of the study. RAs completed ratings for items requiring behavioral observation to the best of their ability as privacy concerns restricted our ability to transmit video recordings between sites.

Treatment programs

Eleven pairs of NECT and SGT groups (six in New Jersey and five in Indiana) with 5–8 participants each were held over the course of the study. Pairs of groups were run simultaneously (i.e., within the same weeks) and by the same facilitators. Participants at the outpatient sites were reimbursed for travel and lunch expenses to encourage attendance, since they were not provided with transportation funds or lunch by the service settings.

NECT

NECT is a manualized, structured, 20 session, group-based intervention. Groups were conducted by two facilitators. NECT exercises are conducted in a sequential fashion via a manual; in each meeting, group members are encouraged to read from the manual, complete exercises and prompts, and share them with other group members, and to discuss their views and experiences related to them. Table 2 provides an overview of NECT group topics. As can be seen in Table 2, NECT has three major foci, each of which targets a specific domain: (1) psychoeducation about stigma, self-stigma and myths about mental illness, (2) teaching cognitive restructuring skills for changing negative thoughts about the self, and (3) story-telling exercises in which participants are encouraged to tell stories about themselves, receive feedback from group members and facilitators, and consider integrating more empowering themes into their personal life narratives.

Supportive group therapy (SGT)

SGT consisted of 20 weekly meetings facilitated by two co-facilitators, and followed a manualized approach described previously [30, 31]. The main focus of SGT is to offer participants the opportunity to share recent experiences, problems, and concerns with the group and to receive feedback from facilitators and group members.

Standard services

Clients in both NECT and SGT continued to receive standard services at their site, including medication monitoring, case management, and psychotherapy.

Clinical training and treatment adherence monitoring

Therapist training, supervision, and fidelity monitoring

Twelve clinicians participated in 1-day training events in both NECT and SGT led by the first, second, and last authors. Trainings included discussion and hands-on role-playing exercises of group situations that were observed by the trainers, who then provided corrective feedback. The first and second authors also provided 1 h of weekly on-site supervision for NECT and SGT with the involved clinicians at their respective sites. Treatment fidelity was monitored by listening to audio recordings of three group sessions from the early, middle, and late phases of each group (both NECT and SGT). NECT fidelity was monitored using the NECT Fidelity Scale (a 1–5 rating) (see Appendix 1); fidelity to SGT was also monitored, and this helped insure that these groups were not using strategies such as cognitive restructuring and narrative enhancement. Supervisors rated fidelity and provided feedback to the clinicians after each rating. All NECT groups demonstrated acceptable fidelity to NECT criteria (average overall rating of 4.8) and all SGT groups demonstrated lack of fidelity to NECT criteria (average overall rating of 1.6).

Randomization and follow-up assessments

Randomization was conducted using a web-based randomization program (https://www.randomizer.org/), by an RA who was unaware of participant identities. Treatment assignments were made as sets of approximately 16 participants who were found to be eligible at each site (enough to assign eight each to NECT and SGT). Separate randomizations were conducted at each study site, and randomization was stratified at each site by severity of self-stigma (moderate vs. elevated).

Statistical analyses

Using the power analysis program GPower3 [32], based on an expectation of a moderate effect size of 0.3 for the ISMI and other scales, an alpha level of 0.05 and a power level of 0.8, we anticipated that we would need a sample size of 65 participants in each group, or 130 total.

Demographic and clinical differences at baseline were evaluated using Chi-square analyses or t tests. Main treatment effects were investigated using mixed-effects modeling (SPSS “Mixed” procedure). Mixed-effects analyses are an

Table 2 Structure of NECT topics

Intervention section	# of sessions	Purpose	Key elements
Introduction	1	Orient participants to intervention. Begin the process of assessing the person's experience of self, and relation of self to illness	–Overview of intervention –Exercise asking participant to describe him/herself, and describe the problem for which he or she is seeking help
Psychoeducation	3	Provide participants with the current empirical knowledge about the prognosis of schizophrenia and the inaccuracy of stigmatizing views about it	–Information on stigma and how self-stigma develops –Common myths about mental illness are presented and challenged
Cognitive restructuring	8	Teach cognitive restructuring as a skill to address self-stigmatizing thoughts and beliefs	–Information on the connection between thoughts and feelings, how thoughts and feelings influence behavior, –Information on types of "negative thoughts" –Techniques for challenging "negative thoughts" –Common "negative thoughts" related to stigma –Strategies for challenging negative thoughts: "be a scientist," "no judgment zone" and "take your own advice"
Narrative Enhancement	8	Help participants develop richer self-narratives that replace disempowered themes influenced by stigma with themes emphasizing personal agency and hope. Integration of information from cognitive restructuring and psychoeducation sections into narrative	–Participants write (or dictate) and share stories about past or recent events -–Guidelines for providing feedback to others' stories are presented –Facilitators and participants listen to stories and provide feedback on coherence and themes –Group members are encouraged to integrate feedback into new stories –Group members continue to write stories with a range of instructions designed to help them consider alternate perspectives in self-narration –Group accomplishments are summarized

appropriate and adaptive statistical method for repeated measures designs, because they allow for modeling of correlations between cases and an unequal number of repetitions (i.e., missing observations). A series of mixed-effects models investigated the influence of treatment group membership on the multiple outcome variables of interest in this study. Intent-to-treat analyses were first conducted for the full sample of randomized participants regardless of group attendance. Next, "exposed" analyses included only individuals who attended at least six group sessions. Fixed effects included treatment group, type of site, and assessment time, as well as interactions between treatment group and assessment time, and between group-by-time-by-site.

Results

Dropout and treatment exposure

Forty-four (26%) of 170 participants who completed baseline assessments did not complete post-treatment assessments. Participants who dropped out did not differ from others with regard to demographic characteristics, baseline positive and negative symptoms, or self-stigma. A majority (61%) of participants who dropped out had been assigned to SGT, and group assignment were a statistically significant predictor of dropout ($\chi^2 = 4.64$, $df = 1$, $p < 0.05$).

The majority (63%) of participants attended six sessions or more, and were considered "exposed" to treatment based on an a priori criterion; however, NECT participants attended significantly more sessions than SGT participants (10.8 vs. 8.2) ($F = 4.8$, $df = 1149$, $p < 0.05$), and were significantly more likely to be considered "exposed" (74% vs. 52%) ($\chi^2 = 8.05$, $df = 1$, $p < 0.01$).

Intent-to-treat outcome analyses

Tables 3, 4 present findings on the relationship between intervention assignment and change in outcomes over time. Note that these analyses include all participants regardless of whether they dropped out of treatment. After exploring for site effects, we noted that there appeared to be differential patterns of results as a function of type of site (either outpatient or "comprehensive" settings, including partial hospital and psychiatric rehabilitation programs), so analyses examined both two- (group by time) and three-way (group-by-time-by-site type) interactions.

As shown in Table 3, there was a significant group-by-time-by-site interaction ($p < 0.05$) for self-stigma, indicating that NECT participants in outpatient sites improved significantly more over time in comparison to SGT participants in outpatient sites. NECT participants improved in self-stigma scores over time at both sites and improvements were maintained at 6-month follow-up. However, SGT participants in comprehensive settings also improved, while SGT participants in outpatient settings did not improve over time. Participants in NECT improved the most on the Social Withdrawal subscale, for which the group-by-time interaction was significant. There was also a significant group-by-time-by-site interaction for the Discrimination Experience subscale, with NECT participants in outpatient sites improving significantly more over time in comparison to SGT participants in outpatient sites. Effect sizes for change between baseline and post-treatment among NECT participants (in comparison with SGT participants) were in the 0.3–0.4 range for three of the self-stigma subscales, indicating a small-to-moderate effect.

We also examined paired group-by-time interactions for the ISMI overall and for each subscale. These analyses indicated a significant group-by-time interaction favoring participants assigned to NECT when comparing baseline and 3-month follow-up ($F = 4.31$, $df = 1, 112$, $p < 0.05$), but not when comparing baseline with post-treatment or baseline with 6-month follow-up. The same pattern was evident for the stereotype endorsement subscale of the ISMI, for which there was a significant group-by-time interaction favoring NECT when comparing baseline and 3-month follow-up ($F = 4.51$, $df = 1, 112$, $p < 0.05$), but not for the other comparisons. However, ISMI social withdrawal subscale scores were associated with a significant group-by-time interaction favoring NECT when comparing both baseline against post-treatment ($F = 4.07$, $df = 1, 124$, $p < 0.05$) and baseline against 3-month follow-up ($F = 5.26$, $df = 1, 113$, $p < 0.05$). There were no significant paired group-by-time interactions for the other subscales of the ISMI. These findings indicate that participants assigned to NECT differed most from participants assigned to SGT at 3-month follow-up, and that the greatest changes occurred in the stereotype endorsement and social withdrawal aspects of the ISMI.

Table 4 presents findings for secondary outcomes. As shown in Table 4, there was also a significant group-by-time-by-site interaction for the BHS, but, in this case, findings favored NECT participants in "comprehensive settings," where there was a notable decrease in hopelessness at post-treatment, while participants in outpatient sites did not improve in hopelessness. There was also a significant group-by-time interaction for avoidant coping, indicating that participants in NECT decreased overall in their use of avoidant coping strategies over time, in contrast with participants in SGT, although an examination of mean changes indicated the majority of improvement occurred between baseline and post-treatment among NECT participants in "comprehensive" settings. Finally, there was a significant group-by-time-by-site interaction for STAND Illness Conception, with NECT participants in "comprehensive settings" improving significantly more than both NECT and

Table 3 Estimated marginal means and standard deviations for self-stigma outcomes for NECT and SGT groups by type of site (outpatient [OPD] vs. comprehensive [COMP])

Measures	Group/site	Baseline $n=170$		Post-treatment $n=117$		3 months $n=117$		6 months $n=97$		Group-by-time interaction				Group-by-time-by-site interaction		
		M	SD	M	SD	M	SD	M	SD	ES*	*F*	*df*	*p*	*F*	*df*	*p*
ISMI[a] total (0–3)	NECT OPD	1.74	0.46	1.32	0.57	1.42	0.60	1.33	0.52	0.25	2.19	3347	0.09	2.12	7344	0.04
	NECT COMP	1.52	0.32	1.29	0.57	1.19	0.59	1.27	0.57							
	SGT OPD	1.65	0.45	1.70	0.61	1.57	0.54	1.44	0.55							
	SGT COMP	1.52	0.44	1.23	0.60	1.30	0.63	1.21	0.63							
ISMI stereotype endorsement (0–3)	NECT OPD	1.43	0.44	1.13	0.56	1.18	0.61	1.11	0.51	0.28	2.03	3339	0.11	0.92	7335	0.49
	NECT COMP	1.21	0.55	0.96	0.62	0.93	0.64	0.97	0.52							
	SGT OPD	1.30	0.53	1.36	0.58	1.34	0.53	1.18	0.55							
	SGT COMP	1.15	0.49	0.94	0.64	1.03	0.51	1.05	0.60							
ISMI alienation (0–3)	NECT OPD	1.79	0.55	1.34	0.70	1.46	0.70	1.38	0.63	0.37	1.83	3347	0.14	1.52	7344	0.16
	NECT COMP	1.61	0.50	1.36	0.67	1.27	0.68	1.32	0.60							
	SGT OPD	1.67	0.51	1.74	0.67	1.60	0.75	1.49	0.63							
	SGT COMP	1.60	0.61	1.29	0.84	1.29	0.67	1.23	0.71							
ISMI social withdrawal (0–3)	NECT OPD	1.82	0.58	1.33	0.64	1.48	0.65	1.42	0.68	0.34	3.06	3346	0.03	1.59	7341	0.14
	NECT COMP	1.62	0.56	1.33	0.67	1.19	0.73	1.41	0.70							
	SGT OPD	1.73	0.63	1.79	0.68	1.62	0.72	1.54	0.73							
	SGT COMP	1.61	0.57	1.37	0.77	1.40	0.80	1.25	0.80							
ISMI discrimination experience (0–3)	NECT OPD	1.92	0.45	1.49	0.63	1.56	0.60	1.42	0.67	0.01	0.4	3348	0.75	2.21	7341	0.03
	NECT COMP	1.65	0.53	1.5	0.64	1.39	0.63	1.39	0.64							
	SGT OPD	1.89	0.54	1.91	0.61	1.73	0.64	1.58	0.48							
	SGT COMP	1.74	0.59	1.32	0.75	1.48	0.77	1.31	0.77							

**ES* Effect size for overall change from baseline to post-treatment in NECT versus SGT

[a]Internalized Stigma of Mental Illness Scale. Higher scores indicate more self-stigma

Table 4 Estimated marginal means and standard deviations for other outcomes for NECT and SGT groups by type of site (outpatient [OPD] vs. comprehensive [COMP])

Measures	Group/site	Baseline $n=170$		Post-treatment $n=117$		3 months $n=117$		6 months $n=97$		Group-by-time interaction				Group-by-time-by-site interaction		
		M	SD	M	SD	M	SD	M	SD	ES*	*F*	*df*	*p*	*F*	*df*	*p*
RSES (0–3)[a]	NECT OPD	1.51	0.52	1.74	0.59	1.74	0.50	1.76	0.52	0.01	0.04	3333	0.99	1.65	7336	0.12
	NECT COMP	1.77	0.52	1.79	0.49	1.80	0.51	1.90	0.50							
	SGT OPD	1.59	0.59	1.55	0.59	1.65	0.61	1.73	0.66							
	SGT COMP	1.66	0.57	1.91	0.57	1.85	0.65	1.86	0.58							
BHS (0–1)[b]	NECT OPD	0.43	0.26	0.50	0.32	0.44	0.29	0.47	0.30	−0.15	2.02	3341	0.11	2.96	7334	0.01
	NECT COMP	0.41	0.30	0.30	0.27	0.42	0.33	0.37	0.35							
	SGT OPD	0.49	0.31	0.55	0.32	0.42	0.29	0.36	0.31							
	SGT COMP	0.51	0.33	0.34	0.36	0.34	0.32	0.32	0.33							
QLS (0–6)[c]	NECT OPD	3.11	0.79	3.34	0.87	3.40	0.86	3.25	0.79	0.02	0.54	3328	0.66	1.74	7335	0.10
	NECT COMP	3.28	0.88	3.43	0.82	3.49	1.00	3.55	0.95							
	SGT OPD	3.08	0.81	3.01	1.01	3.36	0.99	3.45	0.74							
	SGT COMP	3.00	0.82	3.33	0.94	3.31	0.86	3.32	0.74							
MSIF-overall global rating (1–7)[d]	NECT OPD	4.08	1.24	3.58	1.32	3.72	1.51	3.55	1.71	0.08	0.49	3331	0.69	0.33	7336	0.94
	NECT COMP	4.41	1.29	3.90	1.40	4.00	1.56	3.78	1.34							
	SGT OPD	4.25	1.43	3.72	1.56	3.66	1.80	3.37	1.59							
	SGT COMP	4.27	1.42	4.01	1.51	3.82	1.76	3.90	1.66							
CSC-problem-Centered (0–3)[e]	NECT OPD	1.71	0.56	1.79	0.68	1.87	0.47	1.69	0.57	−0.16	0.65	3292	0.58	1.14	7291	0.34
	NECT COMP	1.89	0.50	1.64	0.50	1.75	0.56	1.79	0.61							
	SGT OPD	1.72	0.60	1.82	0.78	1.78	0.53	1.65	0.73							
	SGT COMP	1.63	0.57	1.66	0.54	1.73	0.68	1.75	0.71							
CSC-avoidant (0–3)[f]	NECT OPD	1.52	0.59	1.60	0.34	1.61	0.38	1.47	0.54	0.08	3.19	3284	0.02	1.71	7286	0.11
	NECT COMP	1.46	0.50	1.17	0.55	1.42	0.58	1.25	0.57							
	SGT OPD	1.49	0.43	1.54	0.55	1.35	0.39	1.36	0.51							
	SGT COMP	1.43	0.52	1.43	0.46	1.33	0.39	1.33	0.45							
PANSS positive (1–7)[g]	NECT OPD	2.41	0.87	2.32	0.74	2.33	0.82	2.33	0.93	0.06	0.18	3330	0.91	0.45	7334	0.87
	NECT COMP	2.63	0.84	2.59	0.88	2.49	1.04	2.48	1.01							
	SGT OPD	2.81	0.99	2.84	1.01	2.72	1.10	2.54	1.07							
	SGT COMP	2.70	0.92	2.61	0.95	2.65	1.02	2.61	1.03							
PANSS negative (1–7)[h]	NECT OPD	1.72	0.51	2.12	0.73	2.04	0.74	2.01	0.66	−0.20	2.31	3345	0.08	1.14	7338	0.34
	NECT COMP	1.93	0.77	1.96	0.92	2.07	0.81	2.07	1.03							
	SGT OPD	2.07	0.77	2.02	0.64	1.99	0.69	2.06	0.51							
	SGT COMP	2.16	0.68	2.13	0.64	2.15	0.59	2.19	0.56							

Table 4 (continued)

Measures	Group/site	Baseline $n=170$		Post-treatment $n=117$		3 months $n=117$		6 months $n=97$		Group-by-time interaction				Group-by-time-by-site interaction		
		M	SD	M	SD	M	SD	M	SD	ES*	*F*	*df*	*p*	*F*	*df*	*p*
STAND Illness conception (1–5)[i]	NECT OPD	3.25	0.90	3.22	1.15	2.94	1.52	3.23	0.56	0.04	0.29	3273	0.84	2.66	7286	0.01
	NECT COMP	3.05	0.88	3.23	0.94	3.60	0.97	3.67	1.08							
	SGT OPD	2.95	0.78	3.13	1.02	2.67	0.79	3.42	0.90							
	SGT COMP	3.31	1.15	3.22	1.03	4.09	0.95	4.00	1.09							

*ES Effect size for overall change from baseline to post-treatment in NECT versus SGT. Negative sign indicates direction favoring SGT

[a]Rosenberg Self-Esteem Scale. Higher scores indicate more self-esteem

[b]Beck Hopelessness Scale. Higher scores indicate more hopelessness

[c]Heinrich Quality-of-Life Scale. Higher scores indicate better social functioning

[d]Multidimensional Scale of Independent Functioning. Higher scores indicate more social disability

[e]Coping with Symptoms Scale—Problem-Centered. Higher scores indicate more problem-centered coping

[f]Coping with Symptoms Scale—Avoidant. Higher scores indicate more avoidant coping

[g]Positive and Negative Syndrome Scale, Positive Subscale. Higher scores indicate more positive symptoms

[h]Positive and Negative Syndrome Scale, Negative Subscale. Higher scores indicate more negative symptoms

[i]Scale to Assess Narrative Development Illness Conception Subscale. Higher scores indicate more awareness of mental illness and its impacts

SGT participants in outpatient settings (note, however, that SGT participants also improved in Illness Conception at 3- and 6-month follow-up). There were no other significant findings for intent-to-treat analyses (for QLS, MSIF, positive and negative symptoms, and problem-centered coping), and for some variables (problem-centered coping and negative symptoms) effect sizes favored participants assigned to SGT, although none of these findings were significant.

Analyses for exposed participants

Analyses were also conducted for participants regarded as being exposed (defined as participants who attended at least six intervention sessions; analyses not shown). For the overall self-stigma scale, we found a significant group-by-time interaction favoring NECT ($F=3.09$, $df=3, 220$, $p<0.05$) and the group-by-time-by-site-type interaction was not replicated. There were also significant group-by-time interactions favoring NECT for the self-stigma alienation subscale ($F=2.98$, $df=3, 221$, $p<0.05$), and the BHS ($F=3.65$, $df=3, 215$, $p<0.05$).

Discussion

Findings from the present study indicate that NECT had a small but significant main effect on self-stigma, particularly in the social withdrawal domain. These effects were most evident at 3-month follow-up and were sustained at 6-month post-treatment. The strongest effects were observed among outpatient participants, due, in part, to the finding that participants in SGT demonstrated improvements on a number of outcome variables at the comprehensive settings. This may have been partly the result of the highly structured, daily, multi-hour nature of the services offered at these programs, in which participants are exposed to a range of skills training and psychoeducational services. Although there was no evidence for a main effect of NECT on hopelessness, self-esteem, or other outcomes in the intent-to-treat analyses, there was evidence for effects of NECT on hopelessness, avoidant coping, and narrative insight, but only among participants assigned to NECT within comprehensive settings. It is plausible that there was an interaction between NECT and the psychoeducational/skills training services available in comprehensive settings that particularly impacted these domains. Furthermore, there was evidence for an impact of NECT on hopelessness among exposed participants. NECT was also associated with greater treatment engagement compared to SGT participants, who were significantly more likely to have dropped out of the study.

Participation in NECT was unrelated to changes in symptoms across the time points studied. While this is somewhat of an unexpected finding, especially regarding negative

symptoms, which have been proposed to result from self-defeating cognitions [33], it is consistent with a great deal of literature on recovery, which posits that the extent of a person's change of identity, moving away from preoccupation with the patient role, can be independent of symptom level [34]. Furthermore, although participants generally improved in the QLS over time, NECT did not demonstrate significantly stronger effects on functioning than SGT as rated by the QLS and MSIF. It is possible that NECT does not lead to changes in residential, educational, and/or vocational functioning, or that changes in these domains may not be observable until a person has been operating with a lower level of self-stigma for a longer period than we studied. Another possibility is that NECT has a stronger impact when combined with specific interventions in those areas of functioning. Support for this possibility comes from the cognitive remediation literature for schizophrenia which indicates that effects of this intervention on work outcomes are greatly enhanced when it is combined with supported employment [35]. Given the strong level of engagement associated with participation in NECT, studies examining interactive effects with other interventions (such as supported employment) would likely be feasible. Regarding the MSIF, it is possible that it measured functioning in an overly general manner and did not capture subtle aspects of functioning that may be affected by reduced self-stigma. Scores on different measures of functioning are not always highly correlated with each other or correlated at similar levels with other relevant variables (e.g., cognition [36]). We, therefore, recommend that future studies of this issue examine real-world functioning in a multivariate fashion.

This study had several limitations. As noted, attrition appeared to be differential. It is plausible that this may have biased findings in favor of SGT, as participants with less favorable outcomes may have been more likely to drop out of treatment leaving participants with better outcomes in the study. The population studied was predominantly male and African–American, and restricted to persons diagnosed with schizophrenia-spectrum disorders; findings may, therefore, not extend to all persons receiving public mental health services. Finally, although we intended to examine site effects, the interaction between type of site and NECT impact was not initially anticipated, so these findings should be considered with caution. As discussed above, although there are plausible explanations for the finding of greater impact for NECT on self-stigma in the low-intensity settings, this requires replication, because it was not initially hypothesized.

Overall, this study replicates prior controlled studies in indicating that NECT significantly reduced self-stigma among people with schizophrenia-spectrum disorders and extends that literature by demonstrating its impact relative to an active control condition. Given the finding of reductions in avoidant coping in the intent-to-treat analyses, and the higher rates of engagement in NECT relative to SGT, there is potential for NECT to contribute to treatment effects both directly via reduced self-stigma and its correlates, and indirectly via greater treatment engagement. Future studies that examine the longer term influence of self-stigma reduction on clinical presentation and real-world functioning are needed, as are studies that explore the interactive effects of NECT with other evidence-based interventions.

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Compliance with ethical standards

Conflict of interest The authors report no conflicts of interest.

Appendix 1

NECT FIDELITY SCALE

For each item, assess the group facilitator(s) on a scale of 1-5 and record the rating on the line next to the item number. Rate all appropriate items depending on what phase of treatment the group is in (i.e., psychoeduction, cognitive restructuring or narrative enhancement).

1	2	3	4	5	NA
Poor	Borderline	Satisfactory	Good	Excellent	Not Applicable

1) ***Structural issues***

A) Provide in a group of 8 consumers or less
B) Group lasts roughly 1 hour

2) ***Group leader activities***

A) Sets an agenda

- Articulates specific agenda
- Identifies other issues
- Implements specific agenda
- Explicitly connects the daily agenda to the more general goal of the program

B) Adheres to manual and uses educational materials

- Follows session format
- Uses of manual rationale & teaching strategies
- Shows flexibility in face of problems
- Utilizes handouts & worksheets
- Distributes & reviews materials
- Elicits & answers questions

C) Teaches effectively

- Instills motivation to learn information & skills
- Teaches information & skills
- Moderates/Practices skills
- Reinforcement of small steps/Shaping
- Encourages
- Gets help from group members to facilitate learning

D) Is Interpersonally Effective*

- Facilitates communication (empathic nature)
- Uses client's own language & phrases
- Warm/Confident/Professional
- Provides hope

E) Efficiently uses time

- Session length kept to 1 hour
- Efficient structuring of time
- Tactful limiting of peripheral & unproductive discussion

F. Reduces Client Distress

- Identifies & responds to client distress
- Empathy to show understanding
- Uses education or CBT skills to reduce distress
- Makes plan to address persistent distress

G. Encourages active exploration of stigma and self stigma issues

- Conveys interest and curiosity
- Accepting and nonjudgmental
- Reinforces exploration efforts

3. Orientation

- *Setting a hopeful context and*
- *Defining Self-stigma and explaining how it can be a barrier to recovery*
- *Presenting the purpose of the group*
- *Providing and overview and rational*
- *Describing the potential benefit of participating in NECT*
- *Brief overview of the "HOW"*

4.Psychoeducation

- Stigma and its impact
- Self-stigma and its impact
- Myths about mental illness
- Explores dilemma of disclosure
- Encourages sharing of personal experience to illustrate and demonstrate relevance of these issues
- Practitioners balances between teaching information and exploring clients personal experiences with these issues

5. Cognitive Restructuring

Thought-feeling model

- Connect negative feelings to thoughts
- Practice "Be a scientist" strategy (traditional CR of examining evidence),
- Practice "Take you own advice" (taking a different perspective on the situation),
- Practice "No judgment zone" (focusing on the judgmental nature of the words that are used in the thought)
- Using positive self talk
- Incorporating the above into everyday life

6. Narrative enhancement

- Group members write and share the story writing assignments
- The group leader sets a tone of interest and excitement about the stories
- The group leaders help the participants identify themselves as actors within their own stories
- The group leaders uses "Tips on Storytelling" (there is no single or "correct" way to describe an event, there can be different stories for different audiences, stories can be told from multiple angles/perspectives, stories one tells about oneself and one's mental illness can help cope, reject stigma and feel connected to other people, stories have many parts and some of them can be expected to change over time)
- The group leader uses the feedback guide to elicit groups members responses to shared narratives.

7. Wrapping up, sum and closure

Overall Rating:

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