



Focusing on recovery goals improves motivation in first-episode psychosis

Daniel Fulford¹ · Piper S. Meyer-Kalos² · Kim T. Mueser¹

Received: 28 December 2019 / Accepted: 2 May 2020
© Springer-Verlag GmbH Germany, part of Springer Nature 2020

Abstract

Introduction Diminished motivation (e.g., low drive, curiosity, and engagement in activities) is associated with robust impairment in psychosocial functioning in schizophrenia, yet even the most effective evidence-based interventions rarely effect meaningful change in motivation. Individual Resiliency Training (IRT) is a psychosocial treatment for individuals following a first episode of psychosis, supporting motivation through recovery goal setting and pursuit. The extent to which such an approach might improve motivation over time is unknown.

Method We tested the impact of exposure to IRT modules focused on goal setting and attainment on motivation and functional outcomes among participants in the Recovery After an Initial Schizophrenia Episode-Early Treatment Program (RAISE-ETP). In the sample of 404 individuals with a first episode of psychosis receiving treatment across 34 community sites, we ran mixed-effect models with group (exposed to four or more goal-focused IRT sessions vs. Community Care (CC)), time (baseline, six- and 12-month follow-up), and the group-by-time interaction as predictors of motivation, role and social functioning. We also ran these analyses with those exposed to three or fewer goal-focused IRT sessions compared to CC.

Results Controlling for gender, ethnicity, baseline cognition, and total number of outpatient mental health visits, exposure to four or more goal-focused IRT sessions was associated with greater improvements in motivation and role functioning compared to CC; effects were not observed for social functioning. Participants receiving three or fewer goal-focused IRT sessions did not differ from those in CC in these outcomes. Further, sensitivity analysis showed that general exposure to IRT was not associated with differential outcomes.

Conclusions Findings suggest that sufficient focus on recovery goal setting and support in psychosocial intervention for first-episode psychosis may have specific impact on motivation.

Keywords Motivation · Goal setting · First-episode psychosis · Psychosocial treatment

Focusing on recovery goals improves motivation in first-episode psychosis

The negative symptoms of psychotic disorders, including experiential (e.g., avolition, asociality) and expressive (e.g., alogia, flat affect) deficits, are present across the course

of illness [1–3]. Motivational deficits (i.e., avolition) are primary contributors to impaired psychosocial functioning, such as limited engagement in meaningful roles and reduced quality and quantity of interpersonal relationships [4, 5]. Many empirically supported psychosocial interventions for psychosis do not address motivation directly, but rather focus on outcomes (e.g., work/school participation, social functioning) by targeting social or independent living skills, teaching strategies for coping with low expectations for success, or providing environmental supports to facilitate adaptive skill attainment. For example, while there is some evidence that psychosocial interventions such as social skills training (SST; [6]) and cognitive behavioral therapy for psychosis (CBTp; [7]) can reduce negative symptoms, there is limited evidence for psychosocial interventions effectively reducing motivational impairment specifically.

✉ Daniel Fulford
dfulford@bu.edu

¹ Departments of Occupational Therapy, Rehabilitation Sciences, and Psychological and Brain Sciences, Boston University, Sargent College of Health and Rehabilitation Sciences, 635 Commonwealth Ave. SAR 509, Boston, MA 02215, US

² Department of Psychiatry and Behavioral Sciences, University of Minnesota, Minneapolis, US

Motivation is a multifaceted construct that can be challenging to define, which may make it difficult to target directly in psychosocial interventions. Broadly speaking, motivation is operationalized as drive for or desire to engage in goal-directed activity, and is often measured through self-reported preferences, emotional states (e.g., pleasure in anticipation of a desired outcome), and observed behavior (e.g., effort exerted to attain the desired outcome). Two widely used measures of motivational impairment in psychosis are the Clinical Assessment Interview for Negative Symptoms (CAINS; [8]) and the Heinrich's Quality of Life Scale (QLS; [9]), in which respondents report on recent desires, emotions, and behaviors that serve as indicators of general levels of motivation. Motivational impairment in psychosis is a primary limiting factor of behaviors that facilitate successful goal attainment [1, 4].

Drawing from the broader literature on health behavior change in the general population, supporting people in identifying and setting goals can be an effective intervention across a variety of clinical needs, with a recent meta-analysis showing a unique positive effect of goal-setting interventions on behavior change outcomes ($d=0.34$; [10]). Setting goals that are specific, measurable, attainable, relevant, and time-bound (SMART) allows for the structuring of activities in ways that support regular engagement and sustained motivation; such structuring of goals is believed to enhance expectancies of success [11, 12]. Furthermore, framing goals in terms of their relevance for life values—a set of general and relatively stable beliefs about what is desirable—can influence the salience of different goals and, thus, the motivation to attain them [13, 14]. As such, goal setting is a specific approach to supporting people in engaging in actions that lead to meaningful behavior change.

For people with serious mental illness, existing data suggest that goal setting alone may be insufficient to support the attainment of targeted psychosocial outcomes, such as occupational goals. Typically, goal setting in psychosocial treatment for psychosis is combined with training of specific skills (as in SST) and cognitive-behavioral strategies for reducing barriers to goal attainment. Broad-based psychoeducational programs, like Illness Management and Recovery (IMR) may also incorporate elements of skills training and cognitive-behavioral strategies. Granholm and colleagues (2014) compared their Cognitive-Behavioral Social Skills Training (CBSST) intervention to a control group that consisted of goal setting and support alone [15]. The authors found significant improvements in psychosocial functioning in the CBSST group, but no change in the goal-setting-alone intervention. Thus, goal setting and support may be a necessary but insufficient feature of psychosocial interventions for improving functioning.

Individual Resiliency Training (IRT) was developed as the primary psychotherapy intervention in the

comprehensive NAVIGATE program for first-episode psychosis (Mueser et al., 2015), which was evaluated in a large cluster randomized controlled trial in the Recovery After an Initial Schizophrenia Episode-Early Treatment Program (RAISE-ETP; [16]). A premise of IRT is that helping clients identify and work toward goals that are meaningful to personal recovery will harness the motivation necessary to improve psychosocial functioning outcomes [17]. In IRT, goals are initially explored and identified in the goal setting module, which is typically delivered over several sessions conducted early in the course of IRT, with subsequent follow-up and work on goals occurring throughout the program. Participants begin this module with a discussion of what the word “recovery” means to them, which is followed by consideration of important areas of their life that they would like to change, and their personal character strengths that may help them achieve their goals. The identification or personal strengths is thought to both facilitate goal pursuit and increase the experience of positive affect during the process [18].

While primary outcomes of RAISE-ETP indicated that participants in the NAVIGATE program improved more in motivation and psychosocial functioning than did those who received usual community care, it is unclear whether the amount of time devoted to goal setting in IRT influenced these key outcomes. Thus, in the current report, we evaluated whether gains in motivation and psychosocial outcomes for participants the NAVIGATE program were stronger in participants who received the recommended number of IRT goal setting sessions compared to those who received a sub-optimal number of sessions. Our primary hypothesis was that participants who received an adequate number of goal setting sessions (exposed) would improve more in motivation and associated outcomes (role and social functioning) than did participants in the community care condition.

Methods

Participants

Participants were part of the National Institute of Mental Health (NIMH)-funded RAISE-ETP. RAISE-ETP was a clinical trial that compared comprehensive treatment (NAVIGATE) for first-episode schizophrenia spectrum disorders to usual community care (CC). Four hundred and four participants (aged 15–40) were recruited across 34 community mental health treatment centers in 21 states. All participants received intervention lasting up to two years. Diagnostic inclusion criteria were a single episode of psychosis in the context of schizophrenia, schizoaffective disorder, schizophreniform disorder, brief psychotic disorder, or psychotic disorder NOS. Exclusion criteria were a clinically

significant head trauma, other serious medical conditions, or prior receipt of antipsychotic medications for 6 months or more. All participants provided written informed consent (and assent with parental/guardian consent for participants under 18 years old). This study was approved by the appropriate ethics committee and was conducted in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

NAVIGATE treatment program—Individual Resiliency Training (IRT)

The NAVIGATE program consisted of four integrated interventions that clients participated in based on their treatment preferences and goals (see [17]), including Individual Resiliency Training (IRT), Family Education Program, Supported Employment and Education, and personalized medication management. IRT consists of weekly or biweekly individual psychotherapy designed to support clients in setting and striving for personal recovery goals, enhancing wellness and resiliency, learning about psychosis and treatment, and improving illness self-management [16, 19]. Each IRT session lasts approximately one hour. Across all NAVIGATE participants, the median number of IRT sessions attended in the first 12 months of the program was 12 (i.e., roughly one session per month), with a range from 0 to 50 sessions. IRT incorporates the stress-vulnerability model, the recovery model, psychiatric rehabilitation, and cognitive-behavioral therapy into the conceptual framework of treatment. Recovery goals developed collaboratively early in the intervention are designed to build motivation to learn illness self-management skills similar to the approach in the Illness Management and Recovery (IMR) program [20]. Seven standard modules are recommended for all clients, with seven additional modules designed to be covered on an as-needed basis; all modules are outlined in a detailed treatment manual.

In RAISE-ETP, IRT was mainly provided by master's level clinicians (75%) who received in-person training in the approach. Clinicians received feedback from experts based on audio recordings of treatment sessions rated for adherence to the manuals using standardized fidelity scales as part of the certification process. Clinicians also had access to a series of training videos that demonstrated implementation of IRT skills, also used to train new clinicians. See Mueser et al. [19] for more detailed information regarding treatment fidelity.

One of the standard modules for IRT, and the primary focus of this paper, was the assessment and goal-setting module, which is the first standard module and is designed to be completed immediately following a brief orientation to IRT. As described above, in this module, the client and therapist work together to develop a personalized definition

of recovery or wellness based on what the concept means to the client, and based on that what changes the person would like to see in their life. Because IRT training recommends completing this module in four–six sessions (e.g., roughly one session each covering personal definition of recovery, satisfaction with areas of life, identification of personal strengths, and initiation of goal pursuit), we defined adequate exposure to goal setting as at least four sessions. While the NAVIGATE program as a whole focused on helping clients achieve their personal goals for participating in treatment, more time was devoted to goal setting and follow-through on goals in IRT than any of the other interventions. In addition, IRT clinicians routinely shared information about clients' goals, progress, and challenges with other members of the NAVIGATE team during weekly meetings.

Community care

Community Care (CC) represented routine treatment offered by participating sites. No additional training or supervision was provided; the research team was involved only in assessment procedures. While there was likely substantial variability in intervention content across CC sites, receipt of goal-focused, individual therapy sessions was relatively uncommon (roughly 30–40% of CC participants endorsed receiving such intervention content in any given 30-day period across the first 12 months of the study, compared to roughly 60–80% of those in NAVIGATE) [21].

Measures

Diagnostic (Structured Clinical Interview for DSM-IV [SCID]; [22]) and outcome assessment (Quality of Life Scale [QLS]; [9]) interviews were conducted using video conferencing completed by trained, masked raters and delivered in a remote, centralized location.

The QLS—the primary outcome measure of RAISE-ETP—measures general motivation, social functioning (Interpersonal relations), and engagement in life roles and activities (Instrumental role function) over the past month. Each item is rated from 0 (most severe impairment) to 6 (no impairment). The QLS was completed every 6 months for those enrolled in the program. Outcome domains were based on items of the original subscales identified in a recent factor analysis of the QLS [23]. The motivation domain included the following items: sense of purpose, motivation, curiosity, anhedonia, time utilization, commonplace activities, and capacity for emotional engagement with the interviewer. Social participation was assessed using seven items from the full scale (also identified in factor analysis): intimate interactions, active acquaintances, social activity, involved social network, social initiatives, social withdrawal, and socio-sexual relations. Finally, role functioning was assessed

with three of the original items: extent of role functioning, level of accomplishment, and degree of underemployment.

Cognitive functioning was assessed at baseline and one- and two-year follow-ups at each treatment site with the Brief Assessment of Cognition in Schizophrenia (BACS [24]). Participants also completed on a monthly basis the Services Utilization Recording Form (SURF; [25]), which documents recent use of health care services.

Analyses

First, we examined distributions of variables of interest for skewness/kurtosis and the presence of outliers. We removed any significant univariate (> 3 SDs from mean) and multivariate (> 1.0 Cook's d) outliers from the analysis. We then tested group differences in baseline variables between participants exposed to four or more goal-setting IRT sessions (exposed) and those in CC to determine potential covariates in our primary multivariate analyses.

Following the above preliminary analyses, we ran mixed-effect linear regression models with group (exposed vs. CC), time, and the group-by-time interaction as predictors of motivation, role functioning, and social functioning. Outcomes were modeled across all available time points (i.e., baseline, 6- and 12-month follow-ups). For primary analyses, we were most interested in the group-by-time interaction, which indicated the group difference (exposed vs. CC) in outcomes across the three time points.

We included BACS to control for the potential impact of cognition on outcomes of interest. To account for general exposure to mental health care during the trial, we included the total number of visits for all mental health-related treatment (from the SURF) as a covariate in the analyses. Types of care included visits with the following providers: psychiatrist, nurse practitioner, supported education and employment specialist, peer counselor, alcohol or drug counselor, community mental health center worker, day or partial hospital provider, psychosocial rehabilitation facility provider, or other mental health provider (unspecified). We summed all visits occurring within the first 12 months of enrollment in RAISE-ETP.

Next, we ran parallel mixed models that included those exposed to three or fewer goal-focused IRT sessions (unexposed) compared to those in CC to rule out potential alternative explanations of the primary findings. Finally, as a sensitivity analysis, we examined general exposure to IRT sessions as a predictor of motivation and psychosocial functioning, comparing those with at least 12 sessions of IRT in the first 12 months (median number of sessions across those assigned to NAVIGATE treatment sites) to those in CC. We ran all mixed models with treatment site clustering.

Results

Descriptive statistics of the total sample (goal-setting exposed and CC), and differences at baseline between groups, are provided in Table 1¹. There were a higher proportion of males and people of Hispanic/Latinx ethnicity in the group of IRT participants exposed to the goal setting module than in the CC group. In addition, those assigned to CC had higher QLS Instrumental role functioning scores at baseline but had fewer other mental health visits in the first 12 months of the study compared to those in the exposed group. Thus, in addition to baseline cognition, we included gender, ethnicity, and other mental health visits as covariates in the mixed-model analyses.

Significant group-by-time interactions in the primary mixed-model analyses supported the hypotheses that exposure to four or more goal-focused IRT sessions was associated with greater improvements in both motivation (b (SE) = -0.11 (0.05), $p=0.018$) and role functioning (b (SE) = -0.19 (0.08), $p=0.026$) across the three time points, compared to CC; effects were not observed for social functioning (b (SE) = -0.08 (0.06), $p=0.174$) (see Table 2 and Figs. 1, 2 and 3). Parallel models comparing participants with fewer than four goal-setting sessions to those in CC showed no group differences in motivation or role functioning over time (Group \times Time interaction estimates: motivation: b (SE) = -0.53 (0.41), $p=0.203$; role functioning: b (SE) = -0.46 (0.32), $p=0.150$). In sum, these findings suggest that adequate exposure to IRT goal-setting sessions contributed to specific improvement in motivation and role functioning, but not social functioning, compared to those in CC.

In the sensitivity analysis comparing clients in NAVIGATE who participated in 12 or more IRT sessions in the first year ($n=107$) to clients in CC, no specific association was found between general exposure to IRT and improvement in motivation (Group \times Time interaction estimate: b (SE) = -0.08 (0.05), $p=0.089$). There was, however, a significant Group \times Time interaction for role functioning (b (SE) = -0.21 (0.09), $p=0.018$), suggesting that general exposure to IRT sessions was associated with significantly greater improvement in role functioning compared to CC.

¹ We also compared those in the NAVIGATE group who received fewer than four goal module IRT sessions (i.e., not exposed) to those who were exposed on clinical and demographic characteristics. There were no differences in age, gender, ethnicity, or QLS scores between the two exposure groups; however, the exposed group had slightly higher baseline cognition as measured by average BACS subscale scores (37.51 vs. 35.52, $p=0.04$).

Table 1 Study sample characteristics, variable descriptive statistics, and group differences at baseline

	Total Mean (SD)/% (n=310)	CC baseline Mean (SD)/% (n=180)	IRT goal exposed baseline Mean (SD)/% (n=130)	t or chi-square for baseline group differ- ences	p
Demographics					
Age	23.17 (5.09)	23.01 (4.82)	23.41 (5.45)	- 0.69	0.49
Gender: Male	71.6%	66.7%	78.5%	5.17	0.02
Race				15.23	<0.01
American Indian or Alaskan Native	4.5%	3.3%	6.2%		
Asian	2.9%	2.8%	3.1%		
Black or African American	40.3%	49.4%	27.7%		
Native Hawaiian or Other Pacific Islander	0.0%	0.0%	0.0%		
White	52.3%	44.4%	63.1%		
Ethnicity: Hispanic or Latinx	16.5%	10.0%	25.4%	13.00	<0.01
Outcome variables*					
QLS motivation baseline	2.90 (0.99)	2.96 (1.03)	2.82 (0.94)	1.27	0.20
QLS motivation 6 months	3.19 (1.06)				
QLS motivation 12 months	3.19 (1.01)				
QLS interpersonal relationships baseline	2.39 (1.16)	2.43 (1.15)	2.34 (1.17)	0.67	0.51
QLS interpersonal relationships 6 months	2.78 (1.38)				
QLS interpersonal relationships 12 months	2.87 (1.29)				
QLS instrumental role function Baseline	1.43 (1.68)	1.68 (1.73)	1.08 (1.54)	3.20	<0.01
QLS instrumental role function 6 months	2.27 (1.94)				
QLS instrumental role function 12 months	2.11 (1.79)				
Additional variables					
BACS t scores baseline	37.11 (7.43)	36.83 (7.51)	37.51 (7.32)	- 0.80	0.43
Total mental health visits (SURF) months 0-12	38.19 (44.01)	27.51 (43.87)	53.05 (39.82)	- 5.26	<0.01
IRT sessions (exposed group only) months 0-12	17.55 (9.33)				

BACS brief assessment of cognition in schizophrenia; IRT individual resiliency training; QLS quality of life scale; SURF service utilization report form

*n's range from 310 at baseline to 209 at 12-month follow-up

Table 2 Mixed-effect models with QLS motivation, role functioning, and social functioning as outcomes (baseline, 6, 12 months)

	Motivation				Role functioning				Social functioning			
	b	SE	t	p	b	SE	t	p	b	SE	t	p
Intercept	1.153	0.234	4.926	0.000	- 0.374	0.441	- 0.849	0.397	0.641	0.294	2.175	0.030
IRT goals exposure	0.232	0.146	1.596	0.116	0.801	0.312	2.566	0.013	0.165	0.177	0.932	0.355
Gender	0.155	0.083	1.865	0.063	0.226	0.150	1.507	0.132	0.154	0.105	1.465	0.143
Ethnicity	0.094	0.107	0.873	0.383	0.232	0.197	1.179	0.239	0.176	0.135	1.301	0.194
Baseline cognition (BACS)	0.041	0.005	7.765	0.000	0.035	0.010	3.699	0.000	0.041	0.007	6.226	0.000
Time	0.144	0.035	4.162	0.000	0.328	0.062	5.305	0.000	0.185	0.044	4.181	0.000
Mental health visits (SURF)	0.002	0.001	2.212	0.027	0.001	0.002	0.849	0.396	0.001	0.001	1.346	0.179
IRT goals exposure by time	- 0.111	0.047	- 2.370	0.018	- 0.187	0.084	- 2.232	0.026	- 0.081	0.060	- 1.360	0.174

BACS brief assessment of cognition scale; IRT individual resiliency training; SURF service utilization report form

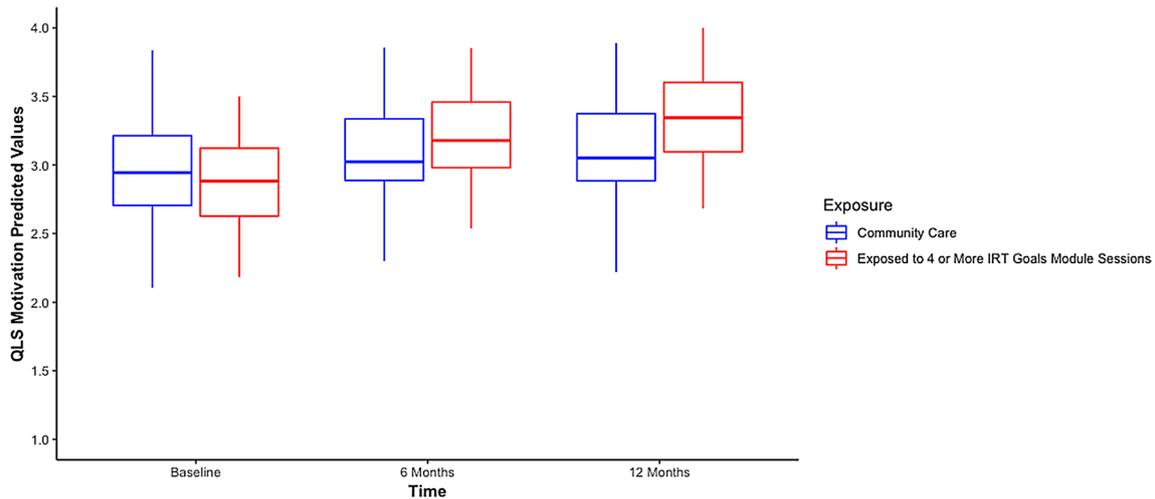


Fig. 1 Changes in motivation over time for those exposed to adequate IRT goal-setting sessions compared to community care

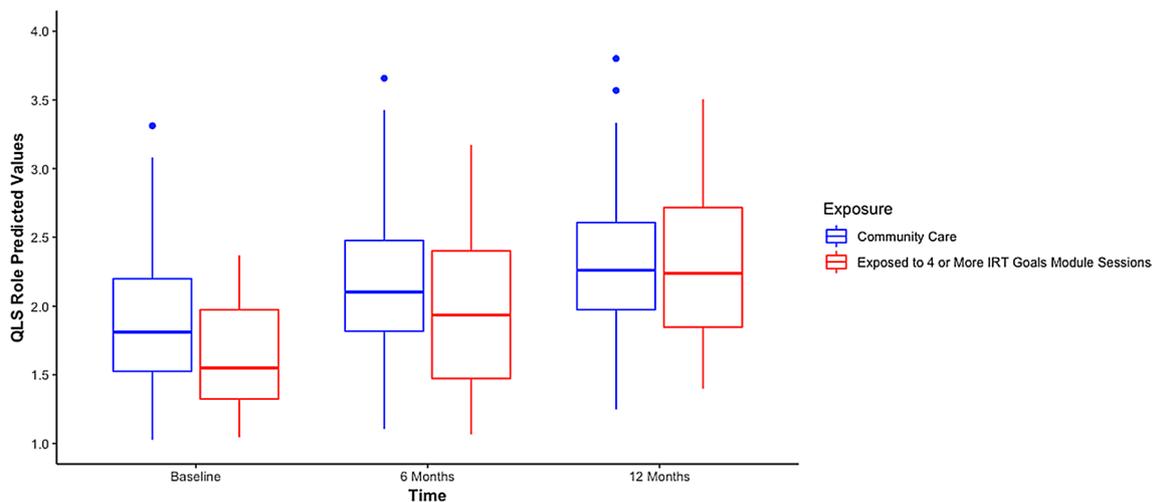


Fig. 2 Changes in instrumental role functioning over time for those exposed to adequate IRT goal-setting sessions compared to community care

Discussion

In sum, we found that exposure to four or more goal-focused IRT sessions in the first year of treatment was associated with greater improvements in motivation over 12 months compared to community care. These findings suggest that a sufficient focus on goal setting in coordinated specialty care for first-episode psychosis was critical to improving motivation. Importantly, findings were robust to important covariates, such as cognition and demographic variables. In addition, we did not find evidence that improved motivation was the result of exposure to either IRT sessions generally, or to other forms of mental health care, increasing confidence in specificity of the impact of goal setting on motivation.

The findings are important considering the lack of evidence-based interventions shown to improve motivation in people with psychosis. Several psychosocial interventions have been developed that target the broader range of negative symptoms through the use of strategies such as cognitive-behavioral approaches to challenging defeatist beliefs and enhancing capacity for anticipatory pleasure [26–28]. While some research suggests that these interventions improve negative symptoms broadly, their specific impact on motivation is unclear, in part because the outcome measures used in these studies are limited in their assessment of motivation (e.g., the Scale for the Assessment of Negative Symptoms; [29]). A limitation of these scales is that they conflate the experience of anhedonia (i.e., limited interest or pleasure in activities) with psychosocial functioning (i.e., engagement

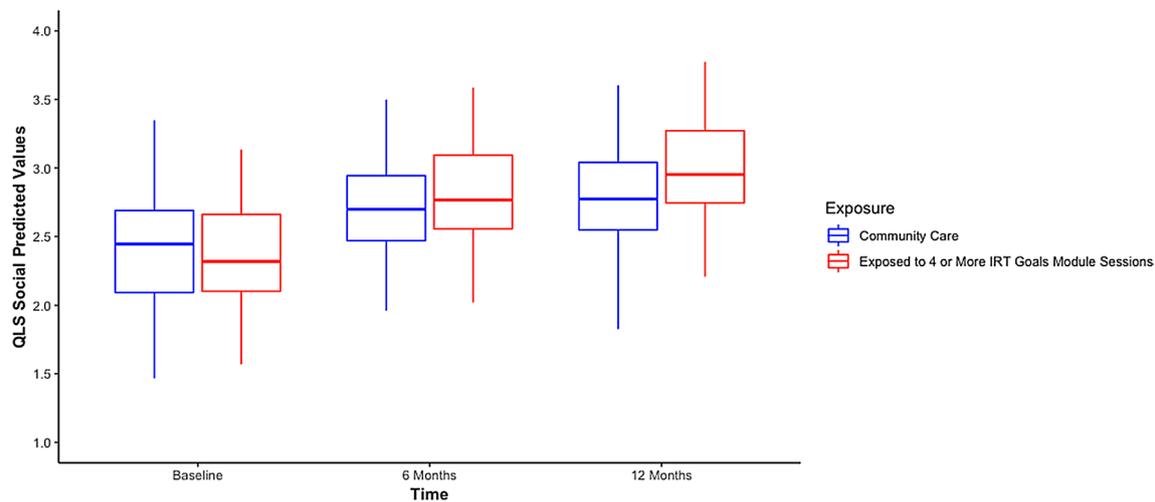


Fig. 3 Changes in social functioning over time for those exposed to adequate IRT goal-setting sessions compared to community care

in instrumental roles), making it challenging to disentangle related constructs that may in fact diverge. Motivation as assessed by the QLS may provide a better assessment of qualities of the construct that reflect broader interest and engagement in a variety of activities that would ostensibly reflect successful goal pursuit. Why would goal setting have such a specific impact on motivation, and why would it require four (or more) sessions to adequately accomplish this? As previously noted, goal setting has a strong evidence base for facilitating behavior change across a variety of health conditions and behaviors in the general population [10]. Setting goals that are both measurable and personally relevant is thought to support motivation and behavior change by providing structure to more general wants and desires, thus facilitating the implementation of changes in daily life, including potential steps towards goals [30]. Existing evidence suggests, however, that generic goal setting alone does not contribute to increases in motivation over time among people with schizophrenia spectrum disorders (e.g., [15]). The unique focus of IRT goal-setting sessions on identifying character strengths may provide an added benefit of enhancing the meaning of recovery goals (viz. the extent to which goals can be tied to important personal values and identity). This focus may also serve to increase confidence that the goal can be achieved, as well as feelings of autonomy related to goal pursuit [31]. Adequate attention could facilitate the identification of more concrete steps towards goal achievement, and such greater specificity could help with monitoring progress and well as taking corrective action/modifying steps when needed. Furthermore, such attention to goal setting may serve as a proxy for a more targeted approach to the client and therapist working collaboratively on these goals over the course of therapy. The suggested number of sessions dedicated to such activity

likely provided opportunities to narrow in on what was most meaningful for the client, and how their unique strengths could be integrated into the process.

Another way in which adequate attention to goal setting may have led to specific increases in motivation is through the extent to which they challenged participants. Locke & Latham (2013) discuss how goals that are more ambitious and specific lead to higher performance, and identify mechanisms underlying those effects. Such goals are believed to: (1) orient attention toward them and away from other goals, (2) mobilize effort, since higher effort is required for more difficult goals, (3) support persistence, as people will work longer on such goals, and (4) enhance knowledge or task strategy—work on the goal may make it clear what additional information and skills are needed to accomplish the goal. Within the IRT goal module sessions, it is possible that spending more time on goal setting led to increased assurance that the goals selected were important to the person, and maximized commitment to goal pursuit.

While role functioning also increased significantly more over time in the group that received sufficient goal setting than the CC group, this was also true among those with more exposure to IRT sessions overall, suggesting a lack of specificity for this outcome. It could be that exposure to other modules of IRT, including those focused on relapse prevention and developing resiliency, had as large or larger impact on role functioning as did goal-setting sessions. However, given more exposure to goal setting should be related to higher rates of participation in the treatment as a whole, it is difficult to disentangle exposure to goal setting from other IRT modules. Another possibility is that more focus on goal setting may have contributed to greater exposure to IRT, as setting more specific and ambitious goals might have increased effort and willingness to complete more IRT

sessions overall. It is also important to note that NAVIGATE included a Supported Employment and Education (SEE) specialist who focused specifically on role functioning for clients with a work or school goal; SEE-focused sessions would ostensibly be most directly associated with changes in role functioning. Furthermore, role functioning was significantly lower at baseline in participants exposed to sufficient goal-setting sessions than it was in those in CC. Thus, it is unclear if changes in role functioning over time were due to specific intervention content or to general improvements during the recovery period following an initial psychotic episode across both groups, or a combination of the two.

A lack of specific impact on social functioning among those adequately exposed to IRT goal-setting sessions relative to community care may reflect the critical importance of targeted approaches for this domain of functioning. Social functioning shows relative stability outside the context of targeted interventions in longitudinal studies (e.g., [32]). Although assistance in social goal setting could support the development and improvement of interpersonal relationships, its impact on social functioning in a more targeted approach, such as an intervention focusing primarily on social skills training, might be stronger. Indeed, in a recent analysis of social and occupational outcomes in RAISE-ETP, levels of motivation were unrelated to social functioning six months later [5], suggesting that enhancing motivation via goal setting may not be sufficient to effect change in social outcomes. Future work could focus on the extent to which adequate exposure to skills-based or other, more targeted approaches to social functioning would impact these outcomes more directly.

A limitation of the current findings is that while we accounted for important covariates (e.g., cognition, exposure to other mental health care), and performed sensitivity analyses that suggested findings were not due to general exposure to IRT sessions, participants were not randomly assigned to varying rates of exposure to goal-setting sessions within IRT. As such, there are other potential explanations for our findings. It is possible, for example, that exposure to adequate goal-setting sessions was due to therapist factors (e.g., more importance placed on these sessions), or that participants who received adequate exposure differed in other unmeasured ways (e.g., they showed more interest in discussing recovery goals with their therapist). Future work could use more experimental approaches to understanding the impact of goal setting on motivation over time.

In sum, findings of the current study suggest that adequate exposure to goal-setting sessions early on in psychosocial treatment for first-episode psychosis may have beneficial impact on motivation over time. Such findings imply that providers could potentially improve motivation for in their clients if they dedicate an adequate number of early sessions to setting recovery goals.

Acknowledgements This study was funded by National Institute of Mental Health grant 271200900019C-7-0-1. We thank all of our core collaborators and consultants for their invaluable contributions, without whom this study would not have been possible. Executive Committee: John M. Kane, M.D., Delbert G. Robinson, M.D., Nina R. Schooler, Ph.D., Kim T. Mueser, Ph.D., David L. Penn, Ph.D., Robert A. Rosenheck, M.D., Jean Addington, Ph.D., Mary F. Brunette, M.D., Christoph U. Correll, M.D., Sue E. Estroff, Ph.D., Patricia Marcy, B.S.N., James Robinson, M.Ed. NIMH Collaborators: Robert K. Heinessen, Ph.D., ABPP, Joanne B. Severe, M.S., Susan T. Azrin, Ph.D., Amy B. Goldstein, Ph.D. Additional contributors to design and implementation of NAVIGATE: Susan Gingerich, M.S.W., Shirley M. Glynn, Ph.D., Jennifer D. Gottlieb, Ph.D., Benji T. Kurian, M.D., M.P.H., David W. Lynde, M.S.W., Piper S. Meyer-Kalos, Ph.D., L.P., Alexander L. Miller, M.D. Ronny Pipes, M.A., LPC-S. MedAvante for the conduct of the centralized, masked diagnostic interviews and assessments; the team at the Nathan Kline Institute for data management. Thomas Ten Have and Andrew Leon played key roles in the design of the study, particularly for the statistical analysis plan. We mourn the untimely deaths of both. We gratefully acknowledge the contributions of Haiqun Lin and Kyaw (Joe) Sint to statistical analysis planning and conduct. We are indebted to the many clinicians, research assistants and administrators at the participating sites for their enthusiasm and terrific work on the project as well as the participation of the hundreds of patients and families who made the study possible with their time, trust and commitment. The participating sites include: Burrell Behavioral Health (Columbia), Burrell Behavioral Health (Springfield), Catholic Social Services of Washtenaw County, Center for Rural and Community Behavior Health New Mexico, Cherry Street Health Services, Clinton-Eaton-Ingham Community Mental Health Authority, Cobb County Community Services Board, Community Alternatives, Community Mental Health Center of Lancaster County, Community Mental Health Center, Inc., Eyerly Ball Iowa, Grady Health Systems, Henderson Mental Health Center, Howard Center, Human Development Center, Lehigh Valley Hospital, Life Management Center of Northwest Florida, Mental Health Center of Denver, Mental Health Center of Greater Manchester, Nashua Mental Health, North Point Health and Wellness, Park Center, PeaceHealth Oregon/Lane County Behavioral Health Services, Pine Belt Mental HC, River Parish Mental Health Center, Providence Center, San Fernando Mental Health Center, Santa Clarita Mental Health Center, South Shore Mental Health Center, St. Clare's Hospital, Staten Island University Hospital, Terrebonne Mental Health Center, United Services and University of Missouri-Kansas City School of Pharmacy.

Compliance with ethical standards

Conflict of interest No sponsor or funder was involved in the design and conduct of the study; collection, management, analysis, and interpretation of the data; or preparation, review, or approval of the manuscript. The authors report no conflicts of interest associated with the study or preparation of this manuscript.

References

1. Fulford D et al (2013) Symptom dimensions and functional impairment in early psychosis: more to the story than just negative symptoms. *Schizophr Res* 147(1):125–131
2. Schlosser DA, Fisher M, Gard D, Fulford D, Loewy RL, Vinogradov S (2014) Motivational deficits in individuals at-risk for psychosis and across the course of schizophrenia. *Schizophr Res* 158(1):52–57

3. Strauss GP et al (2013) Deconstructing negative symptoms of schizophrenia: avolition and apathy and diminished expression clusters predict clinical presentation and functional outcome. *J Psychiatr Res* 47(6):783–790
4. Foussias G, Remington G (2010) Negative symptoms in schizophrenia: avolition and occam's razor. *Schizophr Bull* 36(2):359–369
5. Fulford D, Piskulic D, Addington J, Kane JM, Schooler NR, Mueser KT (2017) Prospective relationships between motivation and functioning in recovery after a first episode of schizophrenia. *Schizophr Bull* 44(2):369–377
6. Bellack AS, Mueser KT, Gingerich S, Agresta J (2004) Social skills training for schizophrenia: A step-by-step guide, 2nd edn. Guilford Press, New York
7. Granholm EL, McQuaid JR, Holden JL (2016) Cognitive-behavioral social skills training for schizophrenia: a practical treatment guide. Guilford Press, New York
8. Kring AM, Gur RE, Blanchard JJ, Horan WP, Reise SP (2013) The clinical assessment interview for negative symptoms (CAINS): final development and validation. *Am J Psychiatry* 170(2):165–172. <https://doi.org/10.1176/appi.ajp.2012.12010109>
9. Heinrichs DW, Hanlon TE, Carpenter WT (1984) The Quality of Life Scale: an instrument for rating the schizophrenic deficit syndrome. *Schizophr Bull* 10(3):388
10. Epton T, Currie S, Armitage CJ (2017) Unique effects of setting goals on behavior change: Systematic review and meta-analysis. *J Consult Clin Psychol* 85(12):1182
11. Carver CS, Scheier MF (2000) "On the structure of behavioral self-regulation", in *Handbook of self-regulation*, Book, Section vols. Elsevier, Amsterdam, pp 41–84
12. Eccles JS, Wigfield A (2002) Motivational beliefs, values, and goals. *Annu Rev Psychol* 53(1):109–132
13. Feather NT (1988) Values, valences, and course enrollment: testing the role of personal values within an expectancy-valence framework. *J Educ Psychol* 80(3):381
14. Sheldon KM, Kasser T, Smith K, Share T (2002) Personal goals and psychological growth: testing an intervention to enhance goal attainment and personality integration. *J Pers* 70(1):5–31
15. Granholm EL, Holden J, Link PC, McQuaid JR (2014) Randomized clinical trial of cognitive behavioral social skills training for schizophrenia: Improvement in functioning and experiential negative symptoms. *J Consult Clin Psychol* 82(6):1173
16. Meyer PS, Gottlieb JD, Penn D, Mueser K, Gingerich S (2015) Individual Resiliency Training: An Early Intervention Approach to Enhance Well-Being in People with First-Episode Psychosis. *Psychiatr Ann* 45(11):554–560. <https://doi.org/10.3928/00485713-20151103-06>
17. Mueser KT et al (2015) The NAVIGATE program for first-episode psychosis: rationale, overview, and description of psychosocial components. *Psychiatr Serv* 66(7):680–690. <https://doi.org/10.1176/appi.ps.201400413>
18. Seligman ME (2002) Positive psychology, positive prevention, and positive therapy. *Handb Posit Psychol* 2(2002):3–12
19. Mueser KT et al (2019) Implementation and fidelity assessment of the NAVIGATE treatment program for first episode psychosis in a multi-site study. *Schizophr Res* 204:271–281. <https://doi.org/10.1016/j.schres.2018.08.015>
20. Meyer PS, Gingerich S, Mueser KT (2010) A guide to implementation and clinical practice of illness management and recovery for people with schizophrenia. In: Rubin A, Springer DW, Trawver K (eds) *Psychosocial treatment of Schizophrenia*. Wiley, Hoboken, pp 23–87
21. Kane JM et al (2016) Comprehensive versus usual community care for first-episode psychosis: 2-year outcomes from the NIMH RAISE Early Treatment Program. *Am J Psychiatry* 173(4):362–372. <https://doi.org/10.1176/appi.ajp.2015.15050632>
22. First Michael B, Williams Janet BW, Spitzer Robert L, Gibbon M (2007) Structured clinical interview for DSM-IV-TR Axis I disorders, clinical trials version (SCID-CT). Biometrics Research, New York State Psychiatric Institute, New York
23. Mueser KT, Kim M, Addington J, McGurk SR, Pratt SI, Addington DE (2017) Confirmatory factor analysis of the quality of life scale and new proposed factor structure for the quality of life scale-revised. *Schizophr Res* 181:117–123
24. Keefe RS, Goldberg TE, Harvey PD, Gold JM, Poe MP, Coughenour L (2004) The brief assessment of cognition in schizophrenia: reliability, sensitivity, and comparison with a standard neurocognitive battery. *Schizophr Res* 68(2–3):283–297
25. Rosenheck R, Kaspro W, Frisman L, Liu-Mares W (2003) Cost-effectiveness of supported housing for homeless persons with mental illness. *Arch Gen Psychiatry* 60(9):940–951
26. Favrod J et al (2015) Positive Emotions Program for Schizophrenia (PEPS): a pilot intervention to reduce anhedonia and apathy. *BMC Psychiatry* 15(1):231
27. Granholm E et al (2005) A randomized, controlled trial of cognitive behavioral social skills training for middle-aged and older outpatients with chronic schizophrenia. *Am J Psychiatry* 162(3):520–529
28. Velligan DI et al (2015) A randomized pilot study of motivation and Enhancement (MOVE) Training for negative symptoms in schizophrenia. *Schizophr Res* 165(2–3):175–180
29. Andreasen NC (1989) The Scale for the Assessment of Negative Symptoms (SANS): conceptual and theoretical foundations. *Br J Psychiatry* 155(7):49–58
30. Locke EA, Latham GP (eds) (2013) *New developments in goal setting and task performance*. Routledge/Taylor & Francis Group, New York
31. Deci EL, Ryan RM (2011) Self-determination theory. *Handb Theor Soc Psychol* 1(2011):416–433
32. Velthorst E et al (2016) The 20-Year longitudinal trajectories of social functioning in individuals with psychotic disorders. *Am J Psychiatry* 174(11):1075–1085. <https://doi.org/10.1176/appi.ajp.2016.15111419>