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Mindful cognitive enhancement training for psychosis: A pilot study

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Despite decades of research, the question of how to improve cognition in schizophrenia is still under investigation. The burgeoning field of mindfulness neuroscience provides insight into one promising approach, which has not been explored. In non-clinical samples, systematic training in mindfulness has been associated with improved attention and working memory capacity (Tang et al., 2007; Lutz et al., 2008; Mrazek et al., 2013). Clinical applications of mindfulness have been successfully utilized for a variety of physical and mental health conditions, and there is emerging support for its safety and efficacy in psychosis (Khoury et al., 2013). However, no research has examined whether the purported cognitive benefits of mindfulness training extend to this population. The purpose of this pilot study was to conduct an initial evaluation of the feasibility, tolerability, and clinical utility of mindful cognitive enhancement training for patients with psychotic disorders.

The sample included ten Veterans with psychotic disorders (based on chart review: 60% schizophrenia, 30% schizoaffective disorder, 10% major depressive disorder with psychotic features) and GAF < 50, recruited from an outpatient psychosocial rehabilitation program at VA San Diego Healthcare System. Mean age was 45.10 (SD = 14.99) with 90% male. Mean education was 13.40 years (SD = 2.46) with 100% unemployed. The study was approved by the VA Human Subjects Protection Committee.

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Contributors

NTT and EG designed the study, interpreted the results, and wrote the manuscript. NTT conducted the mindfulness training sessions and assessments with supervision by EG. All authors have contributed to and approved the final manuscript.

Conflict of interest

All authors declare that they have no conflicts of interest arising from this manuscript.

Mindfulness training included six weekly 60-min individual sessions, adapted from existing mindfulness-based therapies (e.g. Stahl and Goldstein, 2010). Between sessions, participants were encouraged to practice daily (5–15 min) using a CD of guided meditations. Training was conducted by a doctoral-level therapist (NTT) with prior experience in practicing and teaching mindfulness. The mindfulness intervention was added to usual care, which included medication management, recovery coaching, and group therapy.

Participants were assessed at baseline and post-treatment on neurocognitive [MATRICS Consensus Cognitive Battery (MCCB; Nuechterlein et al., 2008)] and symptom measures [Beck Anxiety Inventory (Beck et al., 1988), Beck Depression Inventory-II (Beck et al., 1996), and Psychotic Symptoms Rating Scale (Haddock et al., 1999)]. Feasibility was assessed by session attendance and daily practice record worksheets. Participants monitored time spent in meditation and mood (0 = most depressed–10 = happiest) and stress level (0 = none–10 = worst imaginable) before and after each practice.

Due to the small sample size, nonparametric Wilcoxon signed-rank tests were used to compare participants' scores on dependent variables before and after training. Participants also provided qualitative feedback about the intervention. Ten participants were originally recruited, but some were excluded from analyses because they did not complete post-intervention assessments (N = 7 for neurocognitive measures; N = 5 for symptom measures).

Two participants did not complete the intervention, because they were hospitalized for unrelated reasons (substance use and surgery), and the remaining eight participants attended all sessions. Based on daily self-report, most participants practiced mindfulness 5–7 times/week (M = 8.61 min; SD = 4.29; range = 0–13.81). On homework sheets, participants commented on how mindfulness affected emotions ("I'm starting to notice the difference between similar emotions and how I'm reacting to them, like excitement vs. enthusiasm"), cognitions ("It helped me slow down and catch my thoughts"), and symptoms ("When I really think about the CD, the voices aren't as loud"). Self-reported mean stress levels significantly decreased from 6.66 (SD = 1.23) before practice to 4.75 (SD = 2.20) after practice ($p = 0.03$), while mean mood ratings significantly improved from 4.46 (SD = 2.05) before practice to 5.92 (SD = 2.43) after practice ($p = 0.03$).

Large effects were found (see Table 1) in processing speed and working memory, which are the most impaired domains in schizophrenia (Kern et al., 2011). Medium effects were found for verbal and visual learning, and small effects were found for attention/vigilance (small to medium) and reasoning/problem solving. On clinical measures, participants reported large decreases in anxiety, depression, and conviction in and preoccupation with delusions. There were no changes in frequency, duration, or distress associated with auditory hallucinations. Thus, the mindfulness practice led to meaningful reductions in the severity of some psychiatric symptoms and did not exacerbate psychosis.

Mindfulness-based interventions are emerging as promising novel approaches for improving cognition and clinical outcomes in healthy and psychiatric populations. This pilot study provides preliminary evidence for the tolerability and feasibility of brief mindful cognitive enhancement training for psychosis. Excellent attendance at mindfulness sessions and good

compliance with at-home practice demonstrated that the training was acceptable and feasible. In two cases, substance use and medical problems required immediate attention and therefore interfered with treatment completion; this comorbidity is not uncommon in Veteran populations.

There were some notable limitations to this study. The small sample of only Veterans limits generalization to larger populations. In addition, without a control group, it is not clear that observed improvements were the result of mindfulness practice. However, based on prior research and results from this feasibility study, mindfulness training for psychosis holds promise as an area of further study.

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Table 1

Baseline and post-training scores on neurocognition and clinical symptoms.

	Baseline M (SD)	Post-training M (SD)	Z	p	Effect size
Neurocognition					
Processing speed	24.14 (4.85)	30.14 (10.30)	1.63	0.10	0.61
Attention/vigilance	36.83 (15.43)	39.17 (9.35)	1.16	0.25	0.47
Working memory	32.71 (8.18)	38.71 (11.56)	2.21	0.03	0.84
Verbal learning	33.86 (11.10)	35.71 (9.43)	0.84	0.40	0.32
Visual learning	39.43 (9.69)	43.17 (11.82)	0.73	0.46	0.30
Reasoning/prob. Solving	39.86 (6.64)	40.43 (8.50)	0.53	0.60	0.20
Clinical symptoms					
Anxiety	34.00 (9.36)	26.40 (15.13)	1.48	0.14	0.66
Depression	40.00 (14.63)	25.80 (19.22)	1.63	0.10	0.73
Hallucinations	31.00 (9.88)	29.20 (8.87)	0.00	1.00	0.00
Delusions	17.33 (5.96)	14.00 (5.15)	1.84	0.07	0.82

Note: N = 7 for neurocognitive measures; and N = 5 for clinical symptoms. Mean MCCB domain scores are reported as age- and gender-corrected T-scores. Effect sizes for nonparametric tests: $r = \frac{Z}{\sqrt{N}}$.