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Mindfulness in schizophrenia: Associations with self-reported motivation, emotion regulation, dysfunctional attitudes, and negative symptoms

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ABSTRACT

Mindfulness-based interventions are gaining empirical support as alternative or adjunctive treatments for a variety of mental health conditions, including anxiety, depression, and substance use disorders. Emerging evidence now suggests that mindfulness-based treatments may also improve clinical features of schizophrenia, including negative symptoms. However, no research has examined the construct of mindfulness and its correlates in schizophrenia. In this study, we examined self-reported mindfulness in patients (n = 35) and controls (n = 25) using the Five-Facet Mindfulness Questionnaire. We examined correlations among mindfulness, negative symptoms, and psychological constructs associated with negative symptoms and adaptive functioning, including motivation, emotion regulation, and dysfunctional attitudes. As hypothesized, patients endorsed lower levels of mindfulness than controls. In patients, mindfulness was unrelated to negative symptoms, but it was associated with more adaptive emotion regulation (greater reappraisal) and beliefs (lower dysfunctional attitudes). Some facets of mindfulness were also associated with self-reported motivation (behavioral activation and inhibition). These patterns of correlations were similar in patients and controls. Findings from this initial study suggest that schizophrenia patients may benefit from mindfulness-based interventions because they (a) have lower self-reported mindfulness than controls and (b) demonstrate strong relationships between mindfulness and psychological constructs related to adaptive functioning.

1. Introduction

Based on consensus definition, mindfulness is a metacognitive process with two components: (1) the self-regulation of attention, which involves sustained attention, attention switching, and the inhibition of elaborative processing with (2) an orientation of curiosity, openness, and acceptance towards all aspects of the immediate experience, including thoughts, feelings, and sensations (Bishop et al., 2004). Though specific definitions vary, it is clear that mindfulness is a multifaceted construct that is strongly linked to improved self-regulation through its effects on attentional control, emotion regulation, and self-awareness (Tang et al., 2015).

Scientific interest in mindfulness has steadily increased over the past 30 years, and there has been a surge of published studies since 2011 (over 200 per year). In clinical psychology, mindfulness-based interventions have been developed to treat a wide variety of mental health concerns, from chronic recurrent depression (Segal et al., 2002) to substance use disorders (Bowen et al., 2010) and borderline personality disorder (Linehan, 1993).

Mindfulness-based interventions are also being applied to schizophrenia research. Historically, there was some hesitation about incorporating meditation into treatments for schizophrenia based on a handful of case reports that linked intensive meditation practice with psychosis and mania (e.g., Walsh and Roche, 1979; Yorston, 2001). However, the type of secular meditation that is practiced in mindfulness-based psychotherapy is typically brief (15–45 min) and encourages direct applications of the mindfulness cultivated in meditation to daily life. This style of meditation is very different from the meditation practiced in intensive, religious retreats that are typically offered in remote locations and may also involve fasting and sleep deprivation. In schizophrenia research, some additional modifications to mindfulness-based interventions have been suggested, such as limiting meditation to 10 min, starting sessions with a brief body scan to help ground patients, and offering frequent guidance to limit prolonged periods of silence (Chadwick et al., 2005).

Early clinical trials suggest that mindfulness-based approaches can reduce rehospitalization rates (Bach and Hayes, 2002), improve aspects

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of neurocognition (Tabak and Granholm, 2014), and enhance clinical improvement (Chadwick et al., 2009; Shawyer et al., 2012; Gaudiano & Herbert, 2006; Davis & Kurzban, 2012) in individuals with schizophrenia. In early psychosis, mindfulness training has also led to improved emotion regulation, anxiety, and depression (Khoury et al., 2013a; Samson and Mallindine, 2014). Interestingly, a handful of studies have now documented that mindfulness-based treatments may improve negative symptoms in schizophrenia (Johnson et al., 2011; Shawyer et al., 2012; White et al., 2011). In fact, an initial meta-analysis concluded that, while mindfulness interventions are moderately effective in improving several aspects of psychotic disorders, the effects on negative symptoms are higher than for positive symptoms (Khoury et al., 2013b). These preliminary results are encouraging, as we still do not have effective treatments for persistent and debilitating negative symptoms, such as avolition, anhedonia, and blunted affect.

While mindfulness is increasingly being applied to schizophrenia, basic behavioral research on mindfulness in this disorder is lacking. For example, it is notable that no studies to our knowledge have compared schizophrenia patients with healthy controls on self-reported mindfulness. In addition, no research has examined the correlates of mindfulness in patients with schizophrenia.

This initial study of mindfulness in schizophrenia had three primary objectives: First, we sought to compare levels of self-reported mindfulness in patients with schizophrenia and healthy controls. Because the core mechanisms of mindfulness (attention, emotion regulation, and self-awareness; Tang et al., 2015) are known to be impaired in schizophrenia, we hypothesized that patients would report lower mindfulness than controls. Second, we examined correlations between mindfulness and two interview-based assessments of negative symptoms in patients. The mindfulness-based treatment effects noted above led us to hypothesize that higher mindfulness would correlate with lower negative symptoms. Third, we assessed relationships between mindfulness and key variables linked to negative symptoms and adaptive functioning in schizophrenia, including self-reported motivational tendencies (behavioral activation and behavioral inhibition), emotion regulation, and dysfunctional attitudes (Blanchard et al., 2011; Grant and Beck, 2009; Henry et al., 2007). We hypothesized that mindfulness would be associated with lower behavioral inhibition, greater behavioral activation, more adaptive emotion regulation (i.e., higher use of reappraisal and lower use of suppression) and less dysfunctional attitudes (including defeatist performance beliefs and need for approval) in patients. For comparison, we additionally examined these correlations in control participants. Finally, exploratory analyses examined correlations among mindfulness and other clinical characteristics in patients, including positive symptoms and neurocognition.

2. Methods

2.1. Participants

Participants included 35 outpatients with schizophrenia and 25 healthy controls. Control participants were recruited through online advertisements. They were administered the Structured Clinical Interview for DSM-IV (SCID) Axis I Disorders (First et al., 1996) and portions of the SCID for Axis II Disorders (First et al., 1994). Controls were excluded if they had a history of schizophrenia, other psychotic disorder, bipolar disorder, recurrent major depressive disorder, substance dependence, or substance abuse in the past month, or if they met criteria for avoidant, paranoid, schizoid, schizotypal, or borderline personality disorder. They were also excluded for family history of psychotic disorders among first-degree relatives.

Patients were recruited from outpatient clinics at University of California, Los Angeles (UCLA), the Veterans Affairs Greater Los Angeles Healthcare System (VAGLAHS), and from local clinics and board and care facilities. Patients met criteria for schizophrenia based on the SCID. They were excluded if they met criteria for substance dependence in the past six months, substance abuse in the past month (determined by the SCID), or had an estimated premorbid IQ < 70 (based on review of medical records). All patients were clinically stable as defined by: no mood episodes in the past month (determined by the SCID), no hospitalizations in the past 3 months, and no changes in living situation or medication in the past 6 weeks. Additional exclusion criteria for all participants were: history of loss of consciousness for more than 1 h, significant neurological disorder, or insufficient fluency in English.

All interviewers were trained through the Treatment Unit of the VA VISN 22 Mental Illness Research, Education, and Clinical Center. Interviewers were trained to a minimum kappa of 0.75 for key psychotic and mood items on the SCID and to a minimum kappa of 0.75–0.80 for other symptom measures (Ventura et al., 1998). All participants had the capacity to give informed consent and provided written informed consent after procedures were fully explained, in line with procedures approved by the institutional review board at VAGLAHS.

The majority of patients were on atypical antipsychotic mediations (82.9%); three patients (8.6%) were taking typical antipsychotics and three patients (8.6%) were not on antipsychotic medications. In addition to self-report measures, patients were administered the MATRICS Consensus Cognitive Battery (MCCB; Nuechterlein et al., 2008) and two symptom rating interviews; the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987) and the Clinical Assessment Interview for Negative Symptoms (CAINS; Kring et al., 2013). The sample mean for the MCCB composite was 37.71 (SD = 11.23). On the PANSS, mean symptom scores were 14.88 (SD = 7.27) for positive symptoms and 14.88 (SD = 6.83) for negative symptoms. On the CAINS, mean negative symptom scores were 15.65 (SD = 7.45) for the experiential subscale and 4.94 (SD = 4.26) for the expressive subscale.

2.2. Self-report measures administered to patients and controls

2.2.1. Mindfulness

The Five-Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006) was developed based on factor analyses of a combined pool of items from five previously existing mindfulness questionnaires. It includes 39 items across five facets of mindfulness: observing (noticing and attending to present-moment sensations, perceptions, thoughts, and feelings); describing (labeling these inner stimuli with words); acting with awareness (rather than acting on automatic pilot); nonjudging (not judging of inner experience, including sensations, thoughts, and emotions); and nonreacting (allowing thoughts and feelings to pass, without getting caught in them). Items are rated from 1 (never or very rarely true) to 5 (very often or always true). While the five facets are separable, confirmatory factor analysis also identified a broad mindfulness factor, composed of four of the five facets (describing, acting with awareness, nonjudging, and nonreacting). Cronbach's alpha coefficients for the FFMQ factor score were .81 for patients and .94 for controls.

2.2.2. Motivation

The Behavioral Inhibition and Activation Scales (BIS/BAS; Carver and White, 1994) were used to measure self-reported motivational tendencies. As described by Gray (1987), the BAS responds to appetitive stimuli and the termination of punishment, elicits positive emotions, and leads to approach and active avoidance behavior. The BAS also correlates positively with relatively greater left frontal cortical activity, a validated index of approach motivation (Coan and Allen, 2003). The BIS is sensitive to aversive stimuli, is associated with heightened anxiety and arousal, and leads to withdrawal and passive avoidance (Hewig et al., 2004). While BIS is generally associated with avoidance motivation, the relationship between these constructs is complex (Coan and Allen, 2003).

The BIS/BAS scales include 20 items, each rated from 1 (strongly agree) to 4 (strongly disagree). BAS sensitivity is measured by three subscales: drive, fun seeking, and reward responsiveness. We calculated

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