Supplemental Materials

Participant Recruitment

Youth were recruited primarily from two specialty outpatient programs at the University of California, Los Angeles, Child and Adolescent Mood Disorders Program (CHAMP) and the Center for the Assessment and Prevention of Prodromal States (CAPPS). Both youth and parent were screened by telephone for their willingness and ability to participate in the full program, including sessions and assessments in English. Participants with active suicidal behavior, substance abuse, acute psychotic symptoms or severe behavioral issues (i.e., peer aggression, refusal to participate) that would interfere with the group treatment or require more intensive treatment were excluded from this study and referred elsewhere.

Treatment Randomization

Eight treatment cohorts, including four CBT groups and four MBCT groups, were conducted from March 2020 to December 2021. All eight groups were randomized at the outset of the study using a computer-based random number generator done by the study's primary author. Each group was assigned a start date; participants were recruited on a rolling basis and assigned to the most proximal group that had capacity, with each group requiring a minimum of six adolescent participants to commence and capped at twelve participants. Youth and parent participants were not informed of their cohort's randomization (CBT or MBCT) until the first session of their group treatment.

CBT Intervention

The CBT treatment delivered in this study is a modified version of the Unified Protocol for Adolescents (UP-A) – a transdiagnostic CBT protocol originally developed for adolescents

with depressive and/or anxiety disorders (Ehrenreich-May et al., 2017). The UP-A has since been modified in format and tested for preliminary acceptability and efficacy for youth with mood and psychotic spectrum disorders (Weintraub et al., 2022; Weintraub, Zinberg, et al., 2020). The modified UP-A treatment includes nine 90-minute sessions made up of three modules – psychoeducation (termed in the UP-A as "Building of Keeping Motivation" and "Getting to Know your Emotions and Behaviors"), cognitive skills ("Awareness of Emotions" and "Being Flexible in Your Thinking"), and behavioral skills ("Emotion Exposure" and "Scheduling Pleasant Activities"). The psychoeducation module involved identifying areas of difficulties and goals, brainstorming reasons to make a change in behavior, learning about the functions of emotions, and communicating one's emotions (e.g., "I" statements and active listening). The cognitive skills module included the UP-A core components Cognitive skills included thought monitoring, identifying thinking traps (i.e., cognitive distortions), and detective thinking (i.e., cognitive reappraisal). Behavioral skills included various relaxation techniques, opposite action, and pleasant events scheduling. The treatment presents general CBT skills that are not molded to specific psychiatric presentations. Instead, the skills are taught to the entire group uniformly.

MBCT Intervention

The MBCT treatment was a synthesis of developmentally appropriate components adapted from MBCT (Segal et al., 2018), MBCT for Children (Semple & Lee, 2007), and Mindfulness-Based Stress Reduction for Teens (Biegel et al., 2014). The treatment began with a general introduction to mindfulness and its relationship to mental health. Participants were taught about the connection between the body, thoughts, and emotions through practices such as body scans. Participants then learned how to bring awareness to the present and strategies for decentering (stepping outside of one's own mental events leading to an objective, depersonalized

stance) and focusing attention (e.g., sensory- and movement-based awareness and breathing exercises). Through guided drawings and discussion, participants were also assisted in reflecting on their stressors, coping aids, and reactivity when under stress or in negative moods. The benefits of social support and social coping was discussed and targeted within exercises. Participants also learned and practiced cognitive coping strategies for handling difficult thoughts, including exercises for achieving psychological distance from unpleasant internal experiences (e.g., Leaves on a Stream), relating to their experience with acceptance as opposed to reactivity (e.g., The Guest House), self-compassion (Self-Compassion Break), and slowing down for skillful responses (S.T.O.P.). In the final session, clinicians reviewed the skills with the participants and discussed their goals following treatment. Throughout the program therapists incorporated developmentally appropriate metaphors and stories to facilitate psychoeducation and discussion of core concepts, and they encouraged participants to integrate mindfulness into everyday life.

Treatment fidelity

The study included five lead therapists (three doctoral level and two masters level). Three of the lead therapists led only the CBT groups, one therapist only led the MBCT groups, and the fifth therapist was a lead therapist for both treatments. For each treatment cohort, at least one lead therapist facilitated the adolescent group and at least one lead therapist facilitated the parent group. The study also included doctoral psychology interns who helped co-facilitate the treatments (e.g., lead a relaxation exercise) and checked out with families at the end of the treatment sessions.

Treatment fidelity for both groups was measured using MBCT Adherence Scale (MBCT-AS; Segal et al., 2002) and the CBT Adherence Scale (CBT-AS; Hollon et al., unpublished data).

The MBCT-AS and CBT-AS have been shown to reliably measure fidelity to each respective treatment as well as distinguish MBCT from CBT (Segal et al., 2002). The MBCT-AS includes 17 items and the CBT-AS includes 26 items, each of which are measured on a 3-point scale ($0 =$ no evidence for item, $1 =$ slight evidence, $2 =$ definite evidence). Eighteen videotapes (one of each of the nine treatment sessions for both group treatments) were randomly selected for rating. Fidelity raters were two post-baccalaureate research assistants who received training in the theoretical and clinical background to the two treatments and the use and rating of the scales. The fidelity raters were blind to the treatment conditions of the sessions they rated. Fidelity for both treatments was high, and the two treatments were distinguishable based on their scores to both fidelity measures. Fidelity scores on the MBCT-AS were significantly higher for the MBCT group ($M = 28.6$, $SD = 3.6$) than for the CBT group ($M = 22.4$, $SD = 4.4$; $F(1, 16) = 10.25$, $p = 0.006$). Similarly, the fidelity scores on the CBT-AS were significantly higher for the CBT group ($M = 23.8$, $SD = 7.5$) than for the MBCT group ($M = 10.6$, $SD = 3.5$; $F(1, 16) = 23.23$, $p < 0.001$).

Study Assessments

Study assessments were conducted by trained post-baccalaureate, masters, and doctoral level study staff. Study assessors were aware of participants' treatment condition but had no knowledge of the participants' psychiatric status or their degree of participation in the treatment group. Participants were compensated for their time for the study assessments. The primary outcome included youths' depressive symptoms, as depressive symptoms were considered to be the most widely experienced among this heterogenous sample (Addington et al., 2017; Weintraub, Schneck, et al., 2020). Secondary outcomes included youths' manic and attenuated psychotic symptoms and psychosocial functioning.

The Children's Depression Rating Scale, Revised (CDRS) (Poznanski & Mokros, 1996) and the Young Mania Rating Scale (YMRS) (Young et al., 1978). CDRS scores were based on consensus ratings made after the research assessor interviewed both the child and parent at each study assessment. Prior to beginning the study, study assessors independently rated five pre-recorded assessments using the CDRS and YMRS from a previous clinical trial. Interrater reliabilities (intraclass correlations) for the CDRS and YMRS were both 0.86. Depression, Anxiety, and Stress Scale (DASS), with items rated on a 4-point Likert (Henry & Crawford, 2005). Internal reliability for the DASS was excellent (Cronbach's $\alpha = 0.95$). The Prodromal Questionnaire Brief (PQ-B) is a 21-item measure of attenuated psychosis symptom severity, with items rated from 0 (not present) to 5 (present and strongly agree that the experience was frightening, concerning, or caused problems for the individual) (Loewy et al., 2011). Internal reliability was excellent for the PQ-B (Cronbach's $\alpha = 0.90$).

The Global Functioning Scale: Social and Global Functioning Scale: Role measures are 10-point measures of academic and peer/family functioning, respectively (Auther et al., 2006; Cornblatt et al., 2007; Niendam et al., 2006). The KINDL (Ravens-Sieberer & Bullinger, 2000) includes 30 5-point youth-rated items measuring psychosocial functioning across seven domains: physical well-being, emotional well-being, self-esteem, family, friends, school, and illness. Internal reliability for the KINDL was acceptable (Cronbach's $\alpha = 0.75$). The Difficulties with Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) includes 36 items rated on 5-point Likert scales. Higher scores suggest greater problems with emotion regulation. Internal reliability for the DERS was excellent (Cronbach's $\alpha = 0.94$).

The total score of Philadelphia Adverse Childhood Experiences Survey (PHL-ACEs; Cronholm et al., 2015) is the sum of items signaling significant adversity and possible range is 0

to 21. Scores of >3 are indicative of high childhood adversity. Internal reliability for the PHL-

ACEs was acceptable (Cronbach's α = 0.72).

Statistical Analyses

Distributions of the outcome variables (measures of psychiatric symptoms and

psychosocial functioning variables) were examined. Any outcome variable that was significantly

skewed was transformed and re-examined for normality. In this study, only the PQ-B was

negatively skewed, and a square root transformation helped normalize its distribution.

Repeated measures mixed effects models used all available data. Treatment condition and

study visit were both entered as a between-subject categorical factors. Visit was treated

categorically (baseline, post-treatment, follow-up) to allow for different trajectories between

treatment groups and to allow us to examine non-linear trajectories. Within-subjects-level

random intercepts were included to account for within-subject correlations caused by repeated

measures. All other estimations were set to SPSS' default modes, including Satterthwaite

approximations of degrees of freedom, which estimate degrees of freedom using decimal

numbers.

Treatment Completion

The mean number of sessions attended was 7.1 of 9 (SD = 2.5). There were no

differences between treatment conditions in the proportion of youth who completed the two

treatments (24 [75.0%] in CBT and 28 [82.4%] in MBCT; $X^2(1) = 0.53$, $p = 0.47$). Completers

and noncompleters had comparable demographic and baseline clinical variables.

Attenuated Psychosis Symptom Syndrome

When comparing the youth with the APS syndrome to those without, there were no

differences in sex ($X^2(1) = 0.10$, $p = 0.75$), ethnicity ($X^2(1) = 0.42$, $p = 0.52$), or race ($X^2(4) =$

3.97, $p = 0.41$). There were also no differences between those with the APS syndrome and those without on variables of age ($F(1, 63) = 0.08$, $p = 0.78$), family income ($F(1, 63) = 0.37$, $p = 0.71$), or baseline mood symptoms (CDRS: $F(1, 63) = 0.01$, $p = 0.94$; YMRS: $F(1, 63) = 0.001$, $p = 0.97$).

Using mixed effects regression models, we examined whether the presence of the APS syndrome (vs. no APS syndrome) moderated the treatment group comparisons of the primary (i.e., clinician-rated) psychiatric and functional outcomes over the 5-month study period. The APS syndrome did not moderate the effects of treatment and study visit on psychiatric symptoms (CDRS: $F(2, 73.71) = 1.94$, $p = 0.15$; YMRS: $F(2, 67.03) = 0.65$, $p = 0.52$; PQ-B: $F(2, 46.79) = 1.85$, $p = 0.17$). The APS syndrome also did not moderate the effects of treatment and study visit on functioning (Social: $F(2, 65.77) = 1.05$, $p = 0.36$; Role/academic: $F(2, 67.73) = 1.07$, $p = 0.35$).

Treatment Satisfaction and Treatment Outcomes

We first examined the correlations across both treatment conditions between the overall 10-point treatment satisfaction scores as rated by both adolescent and parent participants at post-treatment and changes in depression scores (CDRS), mania scores (YMRS), attenuated psychosis symptoms, or academic or social functioning scores (GF-R, GF-S, respectively) over the study period. We then re-performed the correlational analyses using the CSQ-8 as the measurement of treatment acceptability. There were no significant correlations among these variables ($ps > 0.1$).

We then conducted full factorial ANOVA analyses to examine the effects of treatment condition and overall treatment satisfaction ratings on the above-mentioned outcomes. The analyses were repeated using the CSQ-8 as the treatment satisfaction measure. There were no main effects of either treatment satisfaction measure on study outcomes. There was an

interaction between treatment group and the 10-point overall satisfaction measure on role (academic) functioning ($F(1,46) = 4.91$, $p = 0.03$, partial $\eta^2 = 0.10$). The interaction was such that CBT adolescents who were more satisfied with the treatment had better role functioning over the post-treatment period whereas this effect was not seen for those in the MBCT group. There were no other significant interactive effects between treatment and treatment satisfaction on primary psychiatric or functional outcomes over the study period (ps > 0.2).

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