The effect of mindfulness-based cognitive therapy on PTSD and depression symptoms in trauma-exposed black adults: Pilot randomized controlled trial results

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Abstract

Low-income, urban-dwelling Black adults are disproportionately affected by traumatic experiences, post-traumatic stress disorder (PTSD), and depression and encounter inequities in treatment access. In addition to the benefits Mindfulness-Based Cognitive Therapy (MBCT) for depression, there is preliminary evidence of successful symptom reduction in PTSD via MBCT across two prior pilot studies in veterans. Studies examining the effects of MBCT among

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trauma-exposed Black adults remains limited, and examination of effects across specific PTSD clusters is almost nonexistent. We examined the preliminary efficacy of adapted MBCT versus waitlist control (WLC) on PTSD and depression symptoms in a pilot randomized controlled trial (RCT). Black adults (N = 80; 86.10 % women) with repeated trauma exposure, who screened positive for PTSD and depression, were recruited from an urban public hospital and randomized to 8-week adapted MBCT or WLC. Symptoms were measured pretreatment and posttreatment with the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) and the Beck Depression Inventory-II (BDI-II). Mixed model analyses were conducted with an intent-to-treat approach, examining change in PTSD and depression scores between MBCT and WLC over time. There was no significant difference in total PTSD and depression symptom change between MBCT and WLC. CAPS-5 avoidance symptoms showed a nominally significant decrease in the MBCT group (F[1, 68.10] = 5.98, p = .017; t[71.60] = 3.61, p < .001). Findings suggest MBCT might be helpful for addressing avoidance symptoms among Black adults with comorbid PTSD and depression. Although lacking power to draw final conclusions about treatment efficacy, this study provides preliminary data suggesting the importance of future fully powered trials.

1. Introduction

Black adults with limited socioeconomic resources living in urban areas represent a population disproportionately exposed to traumatic incidents [1]. Low-resourced environments and repeated trauma exposure, paired with racism, contribute to elevated rates of post-traumatic stress disorder (PTSD) and depression among urban-dwelling Black adults [1,2]. Yet, access to mental health treatment remains limited, and stigma around help-seeking among Black communities can impact care engagement generally [3] as well as with trauma-focused treatment for PTSD [4]. Importantly, depression commonly co-occurs with PTSD [5], and among Black adults specifically [6], which further increases the burden of symptoms, treatment resistance and dropout rates [7]. Thus, establishing effective transdiagnostic treatment approaches that address both PTSD and depression but do not require engagement in trauma-focused treatment and can be incorporated into settings where Black adults already engage with medical care, like urban public hospital clinics, is crucial for improving treatment engagement and outcomes for this population.

One promising transdiagnostic treatment approach is Mindfulness-Based Cognitive Therapy (MBCT). MBCT is a cognitive therapy that enhances mindfulness through techniques like focusing on the present and relating to thoughts and feelings in a new way [8]. In addition to psychoeducation and cognitive reframing, MBCT encourages individuals to practice acceptance of unpleasant emotions and take a non-judgmental stance [8]. Already an established treatment for depression [9], initial evidence of efficacy of MBCT in reducing PTSD symptoms has been shown across two prior pilot studies with veteran samples [10,11]. However, while a pilot study on Mindfulness-Based Stress Reduction (MBSR), a

mindfulness-based intervention that does not include cognitive therapy elements, previously showed efficacy in decreasing PTSD symptoms in a predominantly Black civilian sample [12], there are no studies examining MBCT specifically in a Black civilian sample. Unlike in exposure treatments, individuals do not have to engage directly with trauma content in MBCT, yet still have contact with thoughts, feelings, or body sensations that may have been previously avoided, leading to positive change. This might make MBCT a helpful fit for members of the Black community where stigma against mental health issues is often high [3] and initiation in trauma-focused treatment remains low [4]. To date, the representation of Black adults in mindfulness research remains limited [13], and the benefits of MBCT in socioeconomically marginalized Black adults with PTSD and depression is untested.

To address gaps in MBCT research in trauma-exposed Black adults, our team conducted a pilot randomized controlled trial (RCT) to examine the feasibility and acceptability of an adapted 8-week 90-minute MBCT group intervention versus waitlist control (WLC) for trauma-exposed Black adults who screened positive for PTSD and depression and utilized medical care at an urban public hospital. Group content was modeled after the MBCT manual for depression [14], but contained trauma-adaptions including (1) psychoeducation on trauma- and stress-related psychopathology, (2) language emphasis on autonomy during mindfulness practices (e.g., optional to close one's eyes during mindful meditation), (3) grounding exercises at the beginning of each session and (4) reduced time for sitting meditations ($\leq$ 10 min). The manual was developed in collaboration with Black clinicians with expertise in mindfulness and trauma and content and delivery was adapted to prioritize cultural and socioeconomic considerations relevant to the patient population (e.g., delivery in a public hospital medical setting to increase accessibility, prioritization of delivery by therapists self-identifying as Black or African American). MBCT was delivered on-site in facilities of the urban public hospital to decrease barriers to treatment access but shifted online after the outbreak of the COVID-19 pandemic. Given that the RCT transitioned to a fully virtual model in 2020, it offered the unique opportunity to compare outcomes across the in-person and online delivery of MBCT in the target population. Results from the in-person [15] and virtual [16] feasibility and acceptability studies showed adequate feasibility and high levels of acceptability among those that completed the MBCT group; retention levels among group members were slightly higher among the in-person [15] versus virtual [16] cohort. Importantly, perceived barriers to psychological treatment among participants were high, and the most common perceived barriers were participation restrictions (such as physical limitations) and personal barriers (such as perceived stigma or the lack of motivation among the participants).

Given that the aims of the RCT were to evaluate feasibility and acceptability, initial efficacy of MBCT on overall clinician-rated PTSD and self-reported depression symptoms from the full sample of this RCT has not yet been evaluated. While this pilot RCT was not powered to test the efficacy of the adapted MBCT among trauma-exposed Black adults, secondary analysis of PTSD and depression outcomes from the full trial would enable us to evaluate preliminary outcome results in an under-represented population that could inform future large-scale efficacy trials. Understanding the effect of MBCT on specific PTSD symptom clusters may also help us gain greater understanding of what symptoms were best addressed through this adapted MBCT intervention. Evaluating the differential effects of MBCT

on PTSD symptom clusters is of value given the heterogeneity of PTSD across its four symptom clusters (i.e., intrusions, avoidance, negative cognitions and mood, and alterations in arousal and reactivity). To our knowledge, only one study has examined change across PTSD symptom clusters from MBCT [10]; results showed that an 8-week pilot MBCT intervention with White veterans led to a significant reduction of PTSD avoidance symptoms [10]. It remains relatively unclear if MBCT, specifically, targets some PTSD symptoms better than others and whether results replicate in a civilian sample of Black adults with PTSD and depression.

Aiming to address existing gaps in the literature on the efficacy of MBCT in civilian PTSD samples, this secondary analysis study investigated the preliminary effect of an 8-week adapted MBCT group intervention versus WLC delivered to urban-dwelling Black adults with PTSD and depression recruited from a public hospital setting. The primary goal of this secondary analysis study was to examine change in PTSD and depression symptoms over time (pre- to post-assessment) by treatment group (MBCT versus WLC). Although evaluating the reduction of total symptoms was the primary focus, a secondary exploratory goal of the study was to conduct outcomes analyses by PTSD symptom cluster:

Hypothesis 1.

Total PTSD symptoms will significantly decrease from pre- to post-assessment for individuals randomized to MBCT but not those in the WLC condition. Exploratory post-hoc analyses were also conducted by PTSD symptom cluster by treatment condition.

Hypothesis 2.

Total depression symptoms will significantly decrease from pre- to post-assessment for individuals randomized to MBCT but not those in the WLC condition.

2. Methodology

This study is a secondary analysis of outcome results from a pilot RCT [NCT03922581] of an 8-week 90-minute MBCT group intervention versus WLC.

2.1. Sample

The sample included N = 80 randomized participants. A summary of sample characteristics and measurements at baseline is available in Table 1 (overall sample and by treatment condition) and a CONSORT chart with full sample details is included in Fig. 1. Inclusion criteria were positive screens for both PTSD (Primary Care PTSD Screen for DSM-5 [PC-PTSD-5]   3, [17]) and depression symptoms (Patient Health Questionnaire [PHQ-9]   10, [18]), repeated trauma exposure (Traumatic Events Inventory [TEI]   3 lifetime traumatic incidents, [19]), self-identification as being Black/African American, and being aged 18–65. Exclusion criteria were a current manic episode, current psychosis, moderate-to-severe substance or alcohol misuse symptoms during the past month, or cognitive impairment that impacted study engagement (as determined by study staff).

2.2. Procedure

2.2.1. Screening procedure—Participants were recruited from medical clinics or via provider referrals or electronic medical record identification based on upcoming medical appointments within a large public hospital in the southeastern United States. If interested, they were screened in a separate room in the facility, or remotely via video call. Trained research assistants assessed the history of traumatic incidents and psychopathology throughout the life course. Interested participants were enrolled in the RCT. Participants were compensated following completion of the screening.

2.2.2. RCT—This RCT adhered to the guidelines of the Code of Ethics of the World Medical Association (Declaration of Helsinki) and its revisions, and equivalent ethical standards. The Emory University Institutional Review Board and the Grady Research Oversight Committee granted approval for the study. Informed consent was gathered from all subjects before voluntarily participating in the study. Clinical trial details were registered on April 22, 2019 and are available for insight under NCT03922581. On March 16, 2020, all study sessions were fully transitioned to virtual format because of the emerging global COVID-19 pandemic. Transition from in-person to virtual format halfway through data collection was approved by all involved ethical review boards, and virtual delivery was realized using software approved for therapeutic treatment delivery.

Graduate students and postdoctoral residents trained and supervised by a psychologist conducted the initial and post-intervention diagnostic assessments with the participants. Participants received an initial diagnostic assessment of PTSD, mood disorders, psychosis and substance use disorders. Participants received a compensation of $60 at the end of the baseline diagnostic assessment. Following baseline assessment, participants were randomized to eight weeks of MBCT treatment or a WLC condition with the option to receive MBCT after study completion.

Participants in the MBCT treatment group received weekly reminders for sessions. They were paid $20 per attended in-person session or $10 per attended virtual session (amount reduced due to reduced time/transportation demand for virtual attendance). Participants in the WLC condition were contacted five weeks after randomization and again for post-assessment. Participants in the in-person cohort received $20 for the post-assessment, and participants in the virtual cohort received $60 for post assessments (payment increased at this stage to better reflect time demands for assessment engagement). Participants also completed a 1-month follow-up assessment, but only pre- and post-assessment data is included in the current secondary analysis study.

2.3. Materials

2.3.1. Initial Screening measures for Study Inclusion

2.3.1.1. Primary Care PTSD Screen for DSM-5 (PC-PTSD-5, [17]).: The PC-PTSD-5 was used for the identification of PTSD symptoms within the last 30 days. This self-report screening instrument includes five items reflecting DSM-5 diagnostic criteria for PTSD, with possible total scores in the range between 0 and 5. It has been validated across samples displaying diverse psychopathology [20] and age ranges [21]. The PC-PTSD-5 is

a psychometrically sound instrument for the detection of PTSD in the civilian population, since it has high sensitivity [20] and good test- retest reliability (*r*=.83, [17]). A total score of   3 was used as a cutoff for inclusion [17]. The PC-PTSD-5 screen was used to assess inclusion criteria (as opposed to formal diagnosis) with future real-world implementation in a primary care clinic setting in mind, given that it is a screening tool used in primary care contexts to identify patients in need of behavioral health support.

2.3.1.2.   Patient Health Questionnaire (PHQ-9, [18]).: The PHQ-9 is a 9-item self-report measure of depression symptoms. Items are rated on a 4-point Likert scale from 0 (*not at all*) to 3 (*nearly every day*), resulting in possible total scores of up to 27. The PHQ-9 displays good test-retest reliability (*r*=.74, [22]) and has been validated in a wide range of ethnicities and in primary care [18]. A total score of   10, indicating at least moderate depression was used as a cutoff for study inclusion. Similarly to the PC-PTSD-5, the PHQ-9 was used to assess inclusion criteria with future real-world implementation in mind.

2.3.1.3.   Traumatic Events Inventory (TEI; [19]).: The TEI is a self-report scale used to establish the number of traumatic events throughout a person's lifetime, such as physical assault or serious injury. The frequency in which they occurred is measured with a scale ranging from 0 (*one time*) to 8 (*greater than 20 times*), with separate ratings for events experienced and events witnessed. The TEI has been validated in a sample of trauma-exposed Black women [23]. A cutoff of at least 3 lifetime incidents was used for study inclusion.

2.3.2.   Outcome measures

2.3.2.1.   Clinician-Administered PTSD Scale for DSM-5 (CAPS-5, [24]).: The CAPS-5 is a clinician-administered, structured interview for the assessment of PTSD symptom severity and diagnosis across the four clusters: intrusions, avoidance, negative cognitions and mood, and alterations in arousal and reactivity. PTSD symptom severity is assessed per item using a 5-point Likert scale ranging from 0 (*absent*) to 4 (*extreme/incapacitating*). Higher total scores indicate more severe PTSD symptoms. The CAPS-5 has high internal consistency (a = .88) as well as high interrater reliability (intraclass correlation [ICC] =.91) and test-retest reliability (ICC =.91, [24]). Trained interviewers first assessed all prior criterion A traumas, identified the criterion A trauma causing the most current symptoms, and then conducted the CAPS-5 related to that trauma. The same trauma was used in the post-assessment, conducted by different clinicians who were blind to randomization and prior assessment results. The CAPS-5 was administered at pre- and post-assessment and used to assess total PTSD symptom scores, PTSD cluster-specific symptom scores and the presence of a formal diagnosis with PTSD.

2.3.2.2.   Beck Depression Inventory-II (BDI-II, [25]).: The BDI-II is a 21-item self-report scale for reporting psychological and somatic depressive symptoms and their severity, with higher total scores indicating higher symptom severity. Participants are asked to respond based on their experiences during the past two weeks. Groups of statements about depressive symptomology are included in the BDI-II, from which participants choose the statement most suitable for their situation. The BDI-II has high test-retest reliability (*r* =

.96) and high internal consistency (a = .90, [26]). The BDI-II was administered at pre- and post-assessment for obtaining total depression severity scores.

2.3.2.3.   Mini-International Neuropsychiatric Interview (MINI, [27]).: To assess formal diagnoses with major depressive disorder (MDD) at pre- and post-assessment, the MINI depression module was used. The MINI is a validated structured interview and is widely used both in clinical trials and practice [27]. Trained interviewers conducted the MINI; post-assessment MINI assessments were conducted by different clinicians who were blind to randomization and prior assessment results.

2.3.3.   Intervention conditions

2.3.3.1.   MBCT.: MBCT was delivered in eight weekly 90-minute-long sessions by two trained therapists in a rolling admission format, in groups of one to six participants. Therapists were supervised by a licensed and board-certified psychologist who watched all session tapes to ensure intervention fidelity. The manualized intervention was adapted from MBCT for depression [14] and included psychoeducation, skills training, group discussions and mindfulness practice. The feasibility and acceptability of the described MBCT format for Black adults has been previously published across both in-person and virtual delivery [15,16].

2.3.3.2.   WLC.: Participants randomized to WLC were offered a list of resources following the pre-assessment; there were no restrictions on care engagement outside of the study. WLC participants were offered the opportunity to participate in the MBCT group following completion of their participation in the study.

2.4.   Data analyses

2.4.1.   Descriptive statistics—Baseline characteristics were calculated for the full sample and by treatment group using the software SPSS Statistics version 28.0.1.0 [28] and summarized in Table 1. Correlations between the outcomes were calculated and tested using SPSS statistics and displayed in Supplementary Table 1. Additionally, t-tests were run using the software jamovi [29] to test for significant group (MBCT versus WLC) differences in demographics and baseline characteristics of the sample.

2.4.2.   Group by time effects on symptom improvement—The group by time effect on treatment outcomes (Hypotheses 1 and 2) was analyzed with an intent-to-treat approach. Multiple mixed model analyses were conducted with the data set in long format using the GAMLj macro in jamovi [29,30]. Group (MBCT or WLC), time (pre- and post-assessment), and the group by time interaction were added as fixed factors, and participant number was added as the cluster variable. Given that there was a wide age range within the sample, age was included as a covariate in models to ensure that any potential age-related effects were controlled. Further, sex was added as a covariate to control for an uneven distribution of the sex variable. Variances were estimated using the maximum likelihood (ML) approach at a 95% confidence interval (CI) with an alpha-level of a=.05. Random intercepts for the participants were included as a random coefficient. Overall CAPS-5 symptom severity scores and separate CAPS-5 PTSD symptom cluster scores (intrusions,

avoidance, negative cognition and mood, alterations in arousal and reactivity), and the total BDI-II score, were each entered as the dependent variable in separate mixed model analyses to test for group by time interactions on each outcome. This resulted in six separate mixed model analyses (2 primary, 4 secondary). If a group by time interaction on an outcome was significant (p<.05), the direction of the effect was further investigated using post-hoc t-tests. To correct for multiple testing of CAPS-5 PTSD symptom clusters, Bonferroni correction was applied, resulting in an adjusted a of $a_{Bonferroni}$ =.05 / 4 = .0125.

Given the use of two forms of delivery (in-person and online), a sensitivity analysis was conducted to determine whether type of delivery influenced the primary outcomes. To examine delivery format as a potential moderator of the group by time effect on total PTSD and depression symptoms, mixed model analyses were run with the data set in long format using the GAMLj macro in jamovi [29,30]. Group, time, delivery format (0= *in-person*, 1= *online*) and all two-way and three-way interactions between the variables were added as fixed factors; age and sex were added as covariates; participant number was added as the cluster variable. Variances were estimated using the maximum likelihood (ML) approach at a 95% CI and a=.05. Random intercepts for the participants were included as a random coefficient. Overall CAPS-5 and BDI-II scores were each entered as the dependent variable in a separate mixed model analysis to check for a significant three-way interaction (group by time by delivery format) on total PTSD or depression symptoms. If a three-way interaction was significant (p<.05), the direction of the effect was investigated using post-hoc t-tests.

3. Results

No significant differences in sex (t(156)= 1.87, p=.064), age (t(156)= 0.09, p=.925), baseline CAPS-5 total score (t(129)= 0.44, p=.658), CAPS-5 intrusion symptoms (t(129)= 0.65, p=.516), CAPS-5 avoidance (t(129)= −0.12, p=.909), CAPS-5 negative cognition and mood (t(129)= 0.49, p=.622), CAPS-5 alterations in arousal and reactivity (t(129)= 0.07, p=.945) or BDI-II total (t(123)= 0.71, p=.480) were found between treatment groups.

3.1. Group by time effects on overall PTSD and depression symptom improvement

Regarding overall PTSD symptom improvement, mixed linear model analysis yielded no significant interaction effect of group by time on the CAPS-5 total severity score (p=.08); the average CAPS-5 total severity score from pre to post decreased by 7.13 in the MBCT group and 3.38 in the WLC group. Regarding depression symptom improvement, there was no significant interaction effect of group by time on the BDI-II total score. Overall and group-specific means of all outcomes at pre and post, additional to numbers of formal diagnoses with PTSD and MDD, are available in Table 2, and detailed outcomes of the statistical analyses are available in Table 3. Sensitivity analyses yielded no significant moderation effect of delivery format (in-person versus virtual) on the group by time interaction on CAPS-5 total (β= −1.42, F[1, 60.8] = 0.08, p=.780, 95% CI [−11.35, 8.50]) or BDI-II total β= −2.62, F[1, 55.6] = 0.2, p=.656, 95% CI [−14.09, 8.85]).

3.2. Group by time effects on PTSD symptom clusters

As a secondary exploratory analysis, we examined severity scores across the individual PTSD symptom clusters. There was no significant interaction effect of group by time on CAPS-5 intrusion symptoms, negative cognition and mood, or alterations in arousal and reactivity. However, there was a nominal significant interaction effect of group by time on CAPS-5 avoidance symptoms. Specifically, as established with post-hoc testing, there was no significant reduction in avoidance symptoms from pre- to post-assessment in the WLC condition (t[63.40] = 0.39, p=.701), but there was a nominally significant reduction of avoidance in the MBCT group (t[71.60] = 3.61, p<.001). The interaction effect, however, did not survive Bonferroni correction for multiple testing, as the p-value exceeded the adjusted $\alpha_{Bonferroni}$ =.0125. A visual of these results is available in Fig. 2. For detailed information on statistical outcomes, see Table 3.

4. Discussion

This secondary analysis study examined the preliminary effect of an 8-week adapted MBCT intervention on PTSD and depression symptom change. The treatment was delivered to Black adults with repeated trauma exposure (3 lifetime traumatic events) in an accessible primary care setting (or virtually following the COVID-19 pandemic). The main goal of the study was to examine the preliminary effect of the MBCT intervention on overall PTSD and depression symptoms. Contrary to hypotheses, we did not see a significant group by time effect on total PTSD or depression symptoms. Exploratory analyses by PTSD symptom cluster revealed a significant decrease in clinician-assessed PTSD avoidance symptoms in the MBCT group but not WLC from pre- to post-assessment, although did not survive Bonferroni correction for multiple testing. Overall, findings from this pilot study suggest that MBCT may be beneficial in reducing PTSD avoidance symptoms among trauma-exposed Black adults with comorbid PTSD and depression and a fully powered trial is needed to better evaluate efficacy.

The effect of MBCT on PTSD avoidance is of interest given that avoidance increases the likelihood of repeated PTSD through maintaining symptoms and preventing recovery [31] and high levels of avoidance of traumatic memories and triggers in individuals with PTSD has been associated with treatment dropout [31]. Other therapy approaches for PTSD, such as Prolonged Exposure (PE), have previously been demonstrated to show a significant decrease of avoidance symptoms in PTSD, too [32]. In this study, levels of PTSD avoidance in the MBCT group may have been reduced through the employed mindfulness techniques. In MBCT, individuals are taught and encouraged to take a non-judgmental stance and observe and accept feelings and thoughts as they are, instead of either dwelling on them or avoiding them [8]. Results from a previous systematic review of mindfulness-based treatments and their effect on PTSD clusters showed that most mindfulness-based treatments had the largest impact on PTSD avoidance as opposed to other PTSD clusters [33]. Previous research posits that veterans showed reduced PTSD avoidance after a mindfulness intervention based on the decreased avoidance of unpleasant thoughts and emotions [10]. Improved mindfulness has been shown to be an important mechanism of action in MBCT [9,34], and so mindfulness elements like nonjudgment and observation may be especially

useful to decrease avoidance symptoms in the target population. It is also possible that the cognitive elements of MBCT led to reductions in avoidance symptoms. Another possibility is that these results may have been nominally significant because of regression to the mean from slightly higher baseline symptoms in the MBCT group. Future efficacy trials are necessary to determine the benefits of MBCT in this population and to directly test mechanisms underlying symptom change for MBCT among trauma-exposed Black adults with PTSD.

It remains unclear if MBCT would be beneficial in a primary care setting as either a stand-alone or adjunctive treatment for PTSD and efficacy trials could test whether the reduction of avoidance through MBCT may present a valuable first step in the PTSD treatment process. It is possible that an 8-week-long MBCT intervention might not be of sufficient duration to yield significant relief from PTSD and depression symptoms when the disorders co-occur. PTSD-MDD co-occurrence increases treatment resistance to standard psychotherapeutic interventions once Black individuals enter psychotherapy [35]. Moreover, the presence of depression with comorbid PTSD has been associated with an increase of treatment dropout rates [5]. In previous research, it was established that in individuals with higher complexity of psychopathological symptoms, longer duration of MBCT interventions is needed to achieve an impact on symptom change [36]. Given racial marginalization and high numbers of low-resourced individuals among the Black population, Black adults with repeated trauma exposure face an elevated risk for developing PTSD and depression, but also lower chances of recovery based on the high comorbidity of PTSD and depression in this population [6]. Many of the individuals that participated had repeated trauma exposure over much of their life, potentially negatively impacting the likelihood of quick recovery of symptoms following the brief treatment. However, the positive effects on post-traumatic avoidance in this study suggests that there is clear value in further evaluation of MBCT efficacy in this population.

Contrary to our hypothesis, we did not see any significant differences in the change of depression symptoms as a result of MBCT compared to WLC. This was surprising and it is unclear why depression symptoms were less subject to significant change. This RCT is one of the few studies not finding an effect of MBCT on depression and a full efficacy trial will be a critical next step. A possible explanation for the equal trend of depression symptom reduction across groups could be spontaneous recovery in the WLC condition. Further, participants in the WLC condition received medical attention through the hospital and study reminders of the research team, possibly improving depression symptoms. All participants in this study were receiving medical care at an urban public hospital, mostly through the primary care clinic. It is possible that the high level of comorbid (chronic) medical conditions plays a role in the persistence of depression in the MBCT group [37], and future research should include examination of physical health comorbidities and their role in treatment response to MBCT.

Given that this RCT switched from online to in-person delivery halfway through data collection, the gathered data offered the unique opportunity to compare the usefulness of in-person versus online delivery of MBCT and differences in symptom change between those formats. Analyses yielded no moderating effect of delivery format on any of the outcomes,

suggesting equal effectiveness and promising effects of online delivery of therapeutic interventions. Importantly, retention levels were slightly lower in online delivery of MBCT in this sample [16], suggesting that further investigation is necessary to understand the best delivery format for this population and what barriers need to be addressed to improve retention and intervention outcomes.

There are limitations to this study that must be acknowledged and significant results must be interpreted with care. No a priori power analysis was conducted. Further, compensation for study visits and treatment engagement shifted during the trial, which could have affected participant engagement. Being paid for attending intervention sessions does not translate into real-world situations, which might impact generalizability of the results. Including participants from other parts of the country and those who are not currently seeking medical treatment would help increase the generalizability of future studies. Given that there were not significant differences in outcomes based on the in-person versus virtual delivery, it seems unlikely to have affected the results of this study but could have played a role in overall study participation or retention. Finally, it must be acknowledged that the emerging global COVID-19 pandemic may have impacted the number of traumatic incidents and severity of psychopathology among the participants. Future directions for research may include a comparison of MBCT versus PE or other forms of cognitive therapy for PTSD to extract whether the driving force behind symptom change were mindfulness-based elements of MBCT.

5. Conclusion

MBCT can be adapted for use in an accessible primary care setting and may be a useful tool to decrease PTSD avoidance symptoms among a sample of urban-dwelling Black adults. Future studies should include a fully powered efficacy trial of MBCT in primary care with trauma-exposed patients to determine if this is a beneficial treatment option and evaluate the appropriate length of the intervention needed. Given the substantial inequities in mental health care access and barriers to trauma treatment for Black adults, continued research in this area is warranted and a better understanding of who benefits most from MBCT is needed.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Funding source

Declaration of Competing Interest

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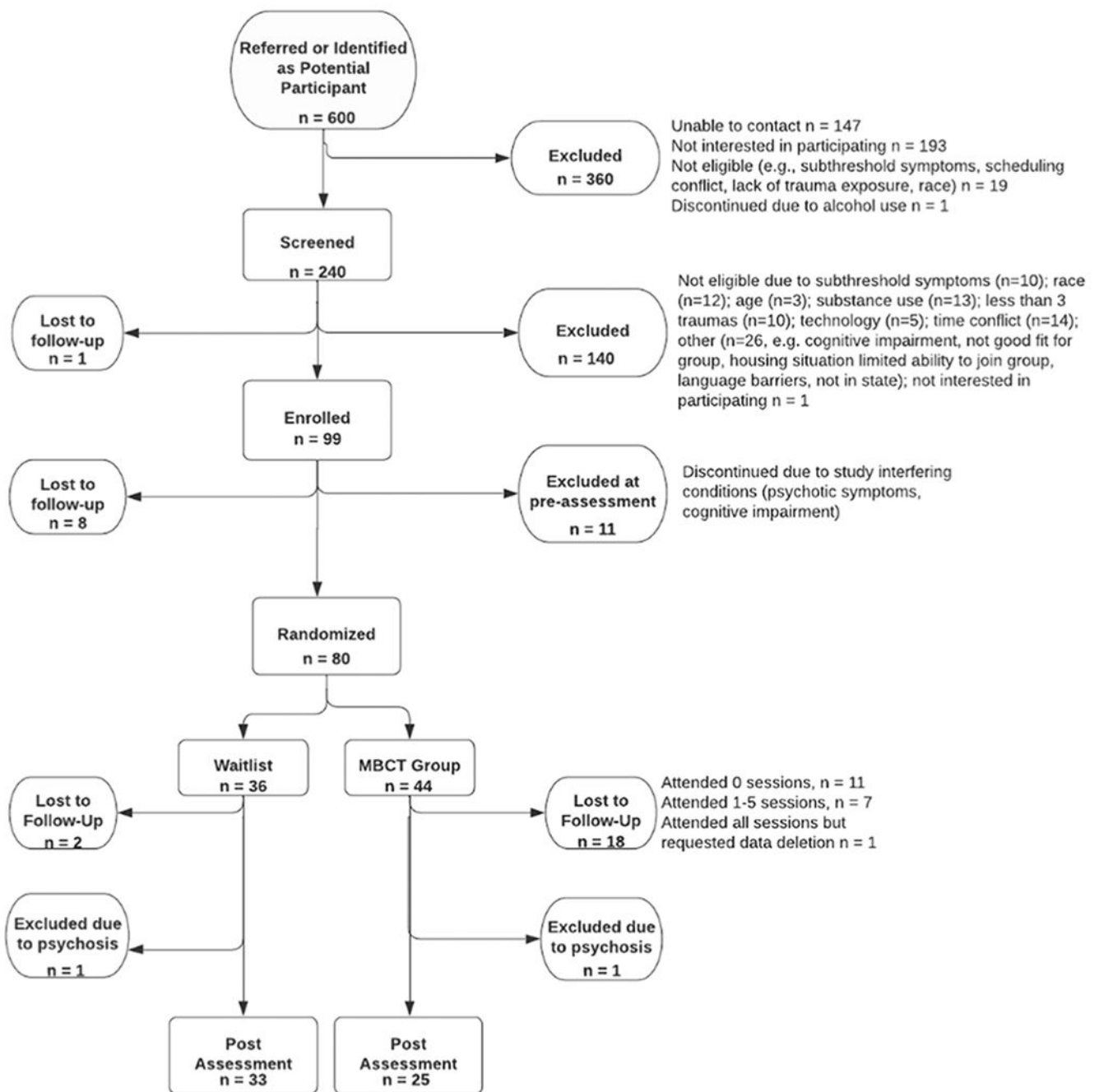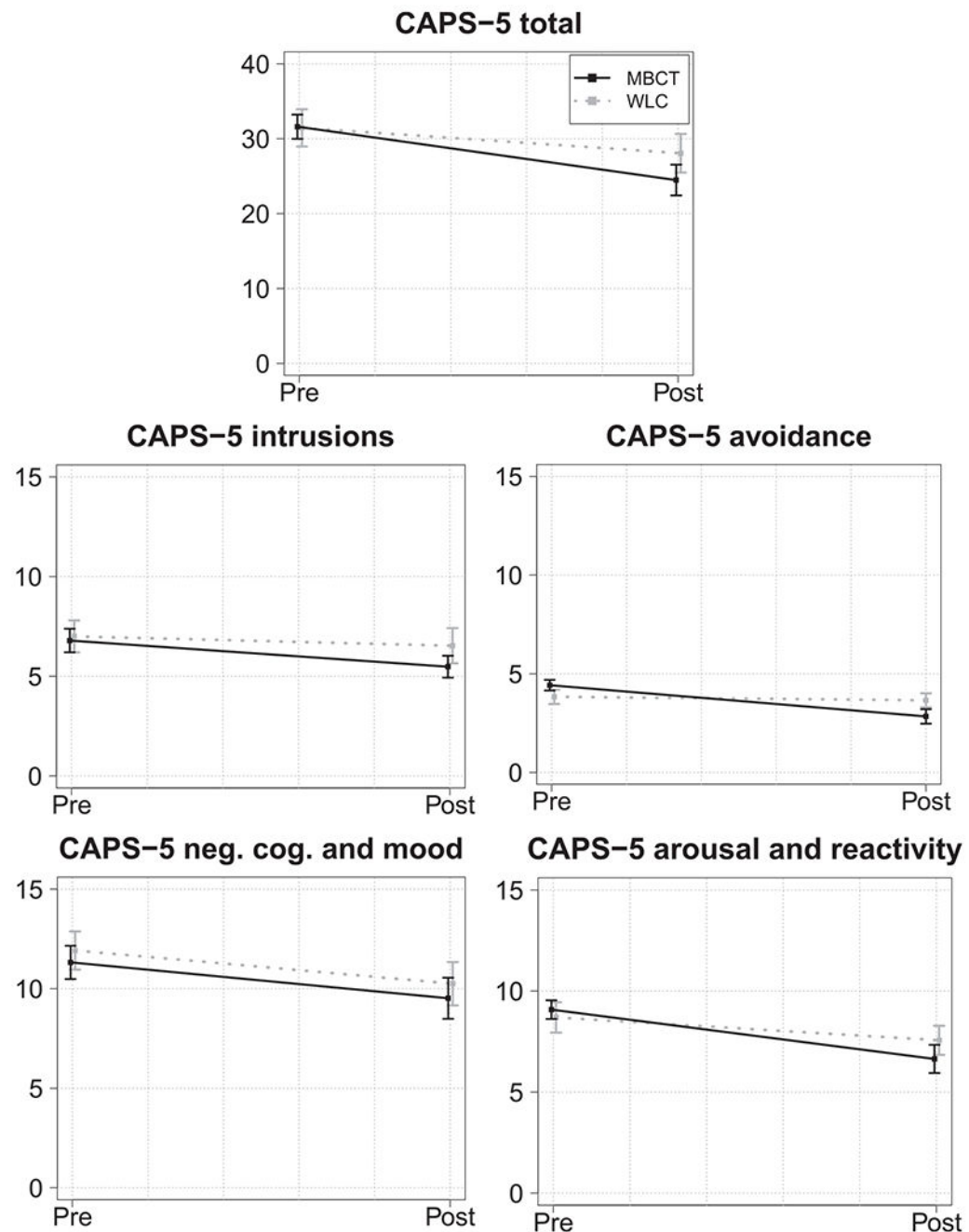
Fig. 1.
CONSORT chart.

Fig. 2.
PTSD Symptom Change Visualized through Average Scores of Groups across Time Points

Note. Points reflect the average CAPS-5 total or symptom cluster-specific score per group. Bars reflect standard errors. MBCT = Mindfulness-Based Cognitive Therapy; WLC = waitlist control; CAPS-5 = Clinician-Administered PTSD Scale for DSM-5.

Table 1

Total and Group-Specific Sample Characteristics and Outcome Measurements at Baseline.

Measure	Full sample		MBCT		WLC	
	n	(%)	*n*	(%)	*n*	(%)
Sex assigned at birth						
Female	68	(85.00)	35	(43.75)	33	(41.25)
Male	11	(13.75)	8	(10.00)	3	(3.75)
Marital status						
Single, never married	41	(51.25)	23	(28.75)	18	(22.50)
Married	11	(13.75)	7	(8.75)	4	(5.00)
Divorced	12	(15.00)	5	(6.25)	7	(8.75)
Separated	5	(6.25)	1	(1.25)	4	(5.00)
Widowed	6	(7.50)	4	(5.00)	2	(2.50)
Domestic partner	4	(5.00)	3	(3.75)	1	(1.25)
Employed[a]	25	(31.25)	14	(17.50)	11	(13.75)
Supported by disability[a]	46	(57.50)	23	(28.75)	23	(28.75)
Monthly household income						
$0 to 249	6	(7.50)	3	(3.75)	3	(3.75)
$250 to 499	4	(5.00)	2	(2.50)	2	(2.50)
$500 to 999	16	(20.00)	10	(12.50)	6	(7.50)
$1000 to 1999	26	(32.50)	13	(16.25)	13	(16.25)
$2000 or more	17	(21.25)	10	(12.50)	7	(8.75)
	M (SD), **Range**		*M (SD)*, **Range**		*M (SD)*, **Range**	
Age	44.81 (12.98), 19–65		44.72 (13.15), 20–65		44.92 (12.96), 19–62	
CAPS–5 total score	31.53 (12.82), 4–55		31.61 (10.7), 4–55		31.44 (14.90), 4–55	
CAPS–5 intrusions	6.89 (4.33), 0–16		6.79 (3.91), 0–16		7.00 (4.79), 0–15	
CAPS–5 avoidance	4.14 (2.00), 0–8		4.42 (1.81), 0–8		3.83 (2.17), 0–7	
CAPS–5 neg. cog. and mood	11.61 (5.63), 0–24		11.32 (5.56), 0–24		11.92 (5.76), 0–23	
CAPS–5 arousal and reactivity	8.89 (3.81), 0–16		9.08 (3.06), 0–14		8.69 (4.50), 0–16	
BDI-II	35.03 (10.80), 7–56		33.80 (11.13), 7–55		36.39 (10.42), 15–56	

Note. Presented in this table are all assessed variables and outcomes based on the whole sample. $N = 80$ ($n = 44$ for MBCT; $n = 36$ for WLC). MBCT = Mindfulness-Based Cognitive Therapy; WLC = waitlist control; PTSD = posttraumatic stress disorder; M = mean; SD = standard deviation; CAPS-5 = Clinician-Administered PTSD Scale for DSM-5; BDI-II = Beck Depression Inventory-II.

[a] Reflects the number and percentage of participants answering "yes" to this question.

Table 2

Means and Standard Deviations of Outcome Measures per Group and Diagnoses across Time Points.

Measure	MBCT			WLC		
	Pre	Post	Pre-post	Pre	Post	Pre-post
	M (SD)	M (SD)	M	M (SD)	M (SD)	M
CAPS–5 total score	31.61 (10.70)	24.48 (13.64)	−7.13	31.44 (14.90)	28.06 (15.44)	−3.38
CAPS–5 intrusions	6.79 (3.91)	5.48 (3.63)	−1.31	7.00 (4.79)	6.53 (5.30)	−0.47
CAPS–5 avoidance	4.42 (1.81)	2.84 (2.44)	−1.58	3.83 (2.17)	3.66 (2.12)	−0.17
CAPS–5 neg. cog. and m.	11.32 (5.56)	9.52 (6.85)	−1.80	11.92 (5.76)	10.25 (6.52)	−1.67
CAPS–5 arousal and react.	9.08 (3.06)	6.64 (4.62)	−2.44	8.69 (4.50)	7.56 (4.30)	−1.13
BDI-II	33.80 (11.13)	24.94 (14.25)	−8.86	36.39 (10.42)	25.96 (13.45)	−10.43
	n (%)	n (%)	n	n (%)	n (%)	n
Formal diagnosis PTSD	32 (72.73)	9 (20.45)	−23	21 (58.33)	21 (58.33)	0
Formal diagnosis MDD	26 (59.10)	12 (27.27)	−14	23 (63.89)	16 (44.44)	−7

Note. Presented in this table are outcome variables and the number of formal diagnoses with PTSD and major depressive disorder (MDD) at both time points of assessment based on the whole sample. Percentages of formal diagnoses are based on the size of each group. $N = 80$ ($n = 44$ for MBCT, $n = 36$ for WLC). MBCT = Mindfulness-Based Cognitive Therapy; WLC = waitlist control; M = mean; SD = standard deviation; CAPS–5 = Clinician-Administered PTSD Scale for DSM–5; BDI-II = Beck Depression Inventoiy-II.

Table 3

Fixed Main and Interaction Effects of Group and Time on PTSD and Depression Symptoms.

Outcome measure	Fixed effect	Estimate	SE	95% CI Lower	95% CI Upper	df	F	P	R² Marg.	R² Cond.
CAPS–5 total	Group	−2.14	2.96	−7.94	3.66	75.70	0.52	.472		
	Time	−4.88	1.29	−7.41	−2.35	61.60	14.28	< .001	.038	.740
	Group * time	−4.60	2.58	−9.66	0.46	61.60	3.18	.080		
CAPS–5 intrusions	Group	−0.80	0.95	−2.67	1.06	76.00	0.72	.401		
	Time	−0.82	0.49	−1.79	0.14	63.20	2.82	.098	.017	.639
	Group * time	−1.19	0.98	−3.11	0.74	63.20	1.46	.231		
CAPS–5 avoidance	Group	−0.14	0.42	−0.96	0.69	76.40	0.10	.748		
	Time	−0.88	0.30	−1.46	−0.30	68.10	8.85	.004	.063	.423
	Group * time	−1.45	0.59	−2.61	−0.29	68.10	5.98	**.017**		
CAPS–5 neg. cog. and mood	Group	−0.79	1.30	−3.32	1.75	75.80	0.37	.545		
	Time	−1.51	0.67	−2.83	−0.19	63.20	5.03	.028	.017	.633
	Group * time	−0.37	1.35	−3.01	2.27	63.20	0.08	.784		
CAPS–5 arousal and react.	Group	−0.31	0.85	−1.97	1.36	76.50	0.13	.721		
	Time	−1.75	0.50	−2.74	−0.76	65.40	12.09	< .001	.048	.555
	Group * time	−1.38	1.01	−3.35	0.60	65.40	1.87	.176		
BDI-II	Group	−1.61	2.56	−6.63	3.41	79.80	0.40	.531		
	Time	−8.87	1.46	−11.73	−6.01	56.10	37.00	< .001	.118	.656
	Group * time	0.87	2.92	−4.84	6.59	56.10	0.09	.766		

Note. Displayed are statistical outcomes of the tested fixed effects. Outcomes were assessed using age and sex as covariates. *SE* = standard error; CI = confidence interval; *df* = degrees of freedom; Group = MBCT/WLC; Time = pre/post; CAPS–5 = Clinician-Administered PTSD Scale for DSM-5; BDI-II = Beck Depression Inventory-II.