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Research Letter

Emotional awareness and expression therapy for migraine: a preliminary randomized controlled trial

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Dear Editor,

Introduction

Adverse childhood events (ACEs) and stressful life experiences are associated with migraine in adulthood, with or without anxiety/depression as mediating factors.[1] ACEs and life stressors are also linked to stress-related psychiatric conditions which frequently co-occur with migraine.[2,3] These associations have led to recommending behavioral interventions targeting stress management (eg, cognitive behavioral therapy and biofeedback) as part of comprehensive migraine care.[4,5] However, these interventions have demonstrated only modest efficacy[6,7] possibly because they do not adequately address unresolved emotional and interpersonal difficulties associated with ACEs and other stressors that may contribute to migraine symptoms. Emotional Awareness and Expression Therapy (EAET) is an evidence-based treatment that focuses on processing emotional and interpersonal stressors. EAET was efficacious in randomized controlled trials (RCTs) evaluating other chronic pain conditions (fibromyalgia, musculoskeletal pain)[8,9] but has not been evaluated in individuals with migraine. Therefore, this RCT evaluated EAET's feasibility, safety, and preliminary efficacy on migraine frequency and secondary outcomes.

Methods

This study was a pre-registered, waitlist-controlled RCT (NCT05837650) evaluating EAET for 30 adults (ages 18–80) diagnosed with episodic/chronic migraine who were on a stable medication regimen (Table 1). Participants were recruited from two migraine clinics and the community via social media advertisements. Participants with uncontrolled psychiatric/substance use disorders, active suicidality, cognitive impairment, health-related litigation, or who were enrolled in other pain studies were excluded. Potential participants were interviewed by the PI

Table 1 Baseline demographics, diagnosis, and ACE scores for the full sample and each of the 2 study arms: Emotional awareness and expression therapy (EAET) and waitlist control (WLC).

Characteristics	Full sample ($N = 30$)	EAET ($N = 15$)	WLC ($N = 15$)
Age (years) M (SD)	45.3 (11.9)	48.0 (11.1)	42.7 (12.4)
Sex: Female n (%)	26 (86.7)	13 (86.7)	13 (86.7)
Race: White *n* (%)	28 (93.3)	14 (93.3)	14 (93.3)
Black *n* (%)	2 (6.7)	1 (6.7)	1 (6.7)
Married/Partnered *n* (%)	16 (53.3)	7 (46.7)	9 (60.0)
Episodic migraine *n* (%)	15 (50.0)	7 (46.7)	8 (53.3)
Chronic migraine *n* (%)	15 (50.0)	8 (53.3)	7 (46.7)
ACE score M (SD)	4.3 (2.7)	5.1 (2.8)	3.5 (2.4)

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to collect demographic information and verify eligibility criteria and were informed about the treatment process and study requirements before consenting.

Once a cohort of approximately 10 participants consented, they completed (via REDCap) a 30-day electronic headache diary and baseline questionnaires on secondary outcomes and were randomized (1:1) to an EAET or waitlist control arm. EAET was delivered through telehealth (Zoom) by the PI and an EAET-trained licensed therapist to groups of 5 participants, who met weekly for 2 hours for a total of eight treatment sessions. Sessions followed a treatment manual covering migraine pathophysiology; the relationship between life stressors, unresolved emotions (anger, sadness, guilt, etc.) and migraine symptoms; and interpersonal communication (assertion and connection). During sessions, participants accessed and expressed unresolved emotions about interpersonal conflicts and practiced new communication skills.

Table 2 Descriptive data (*M*, SD) for each outcome for the RCT comparing EAET and waitlist control and the results of the repeated-measures ANOVA Condition × Time effect, including between-condition effect size (η^2_p).

			Condition × Time		
Measurement	**EAET (*N* = 15)**	**WLC (*N* = 14)**	***F* (1, 27)**	***P*-value**	**Effect Size (η^2_p)**
Monthly migraine days (MMD)					
Baseline	16.4 (7.0)	15 (5.6)	8.07	.008	0.23
Post-treatment/WLC	9.4 (5.6)	13.3 (6.4)			
Change from baseline	−7.0 (5.1)	−1.7 (4.9)			
Within-condition d	−0.93[b]	−0.22			
Quality of life (MSQ)					
Baseline	37.8 (11.7)	40.4 (14.4)	9.07	.006	0.251
Post-treatment/WLC	54.9 (15.3)	45.7 (16.1)			
Change from baseline	17.1 (10.3)	5.3 (10.8)			
Within-condition d	1.35[b]	0.42			
Anxiety (PROMIS-Anxiety SF)					
Baseline	25.7 (5.8)	21.7 (8.7)	6.52	.017	0.194
Post-treatment/WLC	19.8 (6.4)	22.9 (7.6)			
Change from baseline	−5.9 (8.0)	1.2 (4.9)			
Within-condition d	−0.89[a]	0.18			
Depression (PROMIS-Depression SF)					
Baseline	21.4 (5.2)	17.1 (9.1)	6.023	.021	0.182
Post-treatment/WLC	17 (7.3)	18.1 (7.9)			
Change from baseline	−4.4 (6.4)	1.0 (6.1)			
Within-condition d	−0.68[a]	0.16			
Allodynia (ASC)					
Baseline	7.4 (4.8)	5.4 (3.5)	4.343	.047	0.139
Post-treatment/WLC	4.8 (4.2)	6.1 (5.0)			
Change from baseline	−2.6 (5.0)	0.7 (3.4)			
Within-condition d	−0.57	0.15			
Positive Affect (PANAS-SF)					
Baseline	21.7 (7.0)	28.6 (9.3)	5.69	.024	0.174
Post-treatment/WLC	29.2 (6.8)	27.6 (9.5)			
Change from baseline	7.5 (11.4)	−1.1 (6.5)			
Within-condition d	0.85[a]	−0.12			
Negative Affect (PANAS-SF)					
Baseline	26.4 (5.8)	21.2 (8.1)	17.55	< .001	0.394
Post-treatment/WLC	20.5 (5.8)	24.1 (7.6)			
Change from baseline	−5.9 (5.6)	2.9 (5.7)			
Within-condition d	−0.94[b]	0.46			

Within-condition changes were analyzed using paired *t*-tests, and within-condition *d* was calculated as the change score (post minus baseline) divided by the pooled (full sample) baseline SD. MMD was evaluated using an electronic headache diary. Secondary outcomes were participant-reported using validated questionnaires: Quality of life (Migraine Specific Quality of Life questionnaire (MSQ), anxiety (Patient Reported Outcomes Measurement Information System [PROMIS] Anxiety 8-Item Short Form), depressive symptoms (PROMIS 8-Item Depression Short Form), allodynia (Allodynia Symptom Checklist [ASC]), positive and negative affect (Positive and Negative Affect Schedule-Short Form [PANAS-SF)].

[a] $P < .05$.

[b] $P < .001$.

Homework exercises (expressive writing, communication exercises) were provided after each session to reinforce learning. All sessions were video-recorded and reviewed by the treatment developer (ML), who met with the therapists after each session to ensure fidelity to the protocol. Waitlist controls (WLCs) completed measures before and after waiting 8 weeks and if interested, received EAET and were re-assessed again post-treatment.

The study's outcomes included treatment feasibility (session attendance and attrition), safety (reported adverse events), and number of migraine days per month (MMD; primary outcome). Secondary outcomes included quality of life, anxiety, depression, allodynia, and positive and negative affect evaluated using validated questionnaires (Table 2). A 2-way repeated-measures ANOVA examined the interaction of condition (EAET vs WLC) and time (baseline vs post-treatment) on all study outcomes, followed by paired *t* tests to examine change from baseline to post-treatment within each condition. Between-condition effect sizes (partial eta squared [η^2_p]): 0.01 = small, 0.06 = medium, 0.14 = large) were the focus of analyses and interpretation.

Results

The study included 3 cohorts of 5 participants per arm ($N = 30$; 15 per arm): 26 were women (87%), and 28 were White (93%) (Table 1). The average age was 45.3 years (SD = 11.9, range: 21 to 64). Fifteen (50.0%) had episodic migraine, and 15 (50.0%) had chronic migraine. The average ACE score was 4.3 (SD = 2.7). Thirteen of 15 EAET participants (86.7%) completed at least 6 of 8 sessions, and all 15 participants provided post-treatment data. Of the 15 WLCs, 14 provided post-treatment data (93.3%, 1 participant withdrew). Following the RCT, 9 WLCs elected to receive EAET; all completed at least 7 out of 8 sessions and provided post-EAET data. No adverse events were reported during EAET.

EAET had a significant, large between-condition effect on the primary outcome, MMD, which was reduced by 7.0 days (42.7%) from baseline compared to 1.7 days (11.4%) among WLCs ($P = .006$, Table 2). Of the 15 EAET participants, 12 (80.0%) had at least a moderate reduction in MMD (≥30% from baseline), and 6 (40.0%) had a substantial reduction (≥50% from baseline), compared to 5 (35.7%) and 1 (7.1%) of the WLCs, respectively. EAET also had significant and large between-condition effects on all secondary outcomes (Table 2). We also pooled the data from all 24 participants who received EAET (15 in the EAET arm and 9 WLCs), which indicated that EAET had a large within-condition effect on MMD ($P < .001$, $d = -0.86$).

Discussion

EAET views chronic pain as a "danger signal" activated by threats from unresolved emotional traumas, unmet relational needs, and disruptions in psychological safety, associated with life adversities. EAET uses emotional exposure, empty chair dialogues, and interpersonal role-plays to help people with chronic pain process suppressed emotions (anger, grief, guilt, and tender/loving feelings) associated with life adversities and address ongoing sources of interpersonal conflicts thought to contribute to pain. In this RCT, EAET delivered in a group telehealth format over 8 sessions was feasible and safe as reflected in the high completion rate and lack of adverse events. Two-thirds of people receiving EAET had moderate (≥30%) reductions in migraine days, and over one-third had substantial (≥50%) reductions. Although common behavioral interventions carry a grade "A" recommendation by the US Headache Consortium for migraine management,[4,10] such interventions typically reduce migraine frequency by only 1 to 2 MMD.[7] In this study, EAET yielded a large reduction of 7.0 MMDs (5.3 MMD better than randomized controls). Additional gains were observed across multiple secondary outcomes, including large improvements in quality of life, anxiety, depression, positive and negative affect, and allodynia. The results of this preliminary study suggest that EAET may offer a distinct and potent alternative for individuals with migraine, particularly—we hypothesize—for those people whose symptoms co-occur with significant ongoing emotional avoidance and ongoing interpersonal difficulties. Future multi-site, large-scale trials are warranted to compare EAET to gold-standard behavioral interventions and identify those helped most by this intervention.

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Conflicts of interest

All authors declare that they have no conflicts of interest relevant to the content of this manuscript.

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