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One-Day Behavioral Treatment for Patients with Comorbid Depression and Migraine: A Pilot Study

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Abstract

Background—Migraine is a common and disabling disorder that is highly comorbid with depression. The comorbidity of depression and migraine is a major health concern as it results in poorer prognosis and quality of life. Yet, effective treatments have rarely been investigated.

Method—45 Patients with comorbid migraine and depression were assigned to a 1-day Acceptance and Commitment Training plus Migraine Education workshop (ACT-ED; N=31) or to Wait List/Treatment as Usual (WL/TAU; N=14). Assessment of depressive symptoms, general functioning, and migraine related disability were completed at baseline and 2-, 6-, and 12 weeks after the workshop.

Results—At the 3-month follow up, participants in the ACT-ED condition exhibited significantly greater improvements in depressive symptoms, general functioning, and migraine-related disability than patients in the WL/TAU group.

Conclusion—A 1-day ACT-ED workshop is a promising approach to the treatment for depression and disability in migraineurs that merits further investigation.

Keywords

Acceptance and Commitment Therapy (ACT); Illness Management; Migraine; Depression; Treatment Outcome

Introduction

Migraine affects approximately 35 million US residents (1) and is characterized by severe headaches and marked functional impairment. Migraineurs utilize twice the medical resources – including prescription medications and office and emergency room visits – that

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non-sufferers do (2). In addition, psychiatric disorders are highly prevalent in patients with migraine (3–6). Depression, in particular is three to five times more common among migraineurs than in the general population (7–9). This comorbidity is a major health concern as it results in decreased quality of life, poorer response to headache treatment, and overall worse prognosis (4, 10, 11). It is also associated with increased risk for suicidality, medication overuse, and disability (10–14). Prospective studies suggest that the depression-migraine relationship is bidirectional, with each disorder increasing the risk for onset of the other (7).

Patients with migraine exhibit more avoidance behaviors than healthy controls (15) and those with lower levels of acceptance report more pain-related interference, catastrophizing, and disengagement from activities (16). Avoidant behaviors in medical patients are associated with increased vulnerability to depression and disability (17–19). Conversely, acceptance of pain (i.e., acceptance-based coping) is associated with reduced psychopathology, enhanced physical and social functioning, and greater pain tolerance in patients with chronic pain disorders (20–22). Thus, an intervention aimed at minimizing behavioral avoidance and optimizing acceptance-based coping in patients with comorbid migraine and depression may improve both conditions.

Acceptance and Commitment Therapy (ACT) is an empirically supported behavioral therapy that incorporates acceptance and mindfulness strategies with behavioral change modalities (23, 24). ACT is effective in treating depression and anxiety (25) which are common in migraineurs, as well as illnesses like chronic pain (19, 26–28). In fact, ACT has recently been listed as having “strong research support” for the treatment of chronic pain by the American Psychological Association, Society of Clinical Psychology (29). Importantly, when presented as a brief intervention, ACT has resulted in positive long-term outcomes. For example, compared to illness management (IM) alone, a one-day ACT plus IM in diabetics resulted in improved blood glucose levels, better diabetes self-care, and higher levels of diabetes related acceptance three months later (27). In another randomized controlled trial, 19 patients suffering from pain and stress enrolled in either medical treatment as usual or a 4-hour ACT intervention. At the 6-month follow-up, participants who had received ACT had taken substantially fewer sick days than a treatment as usual group (.5 vs 56) (26). Promising findings with brief ACT interventions have also been reported in patients with obesity, seizures, and psychosis (30–32).

Although the comorbidity of migraine and depression is prevalent, there have been no studies that actively recruit patients with both disorders and examine the impact of a brief behavioral intervention on depression and disability. Thus, we developed a program consisting of a one-day ACT plus migraine education (ACT-ED) group workshop and compared it to a wait list/treatment as usual (WL/TAU) condition. We hypothesized that the workshop, which focuses on enhancing psychological flexibility, would lead to improvements in depression and functioning over a 3-month period. A brief group format was chosen for ease of implementation in primary care settings, allowing more unitary care for migraine and depression. This format is also cost-effective (33), more accessible than weekly treatments for patients from rural communities or with limited functional capabilities (34), and ensures treatment completion, a significant obstacle for effective delivery of mental health services (35).

Methods

Participants and Assignment

784 individuals, ages 18–70, with a history of migraine completed a screening inventory (Figure 1). Of those, 106 individuals met the following screening cutoffs: 1) scored 2 on

the ID Migraine, a self-administered highly-sensitive 3-item screen for migraine (36); 2) reported 4–12 migraine days over the previous month; 3) on the Patient Health Questionnaire-8, a valid screening measure for depression in clinical studies, endorsed at least five of the eight criteria, one of which must be “depressed mood” or “loss of interest or pleasure” (37, 38); 4) no history of brain injury; 5) psychotropic or headache medications stable for at least 4 weeks; 6) no history of schizophrenia, bipolar disorder, or current substance abuse. Sixty six participants completed the in-person assessment of depression and functioning. Of those, 45 were assigned to treatment after meeting the following inclusion/exclusion criteria: 1) diagnosis of current major depressive episode (MDE) on the Structured Clinical Interview (SCID-IV)(39); 2) score of > 17 on the Hamilton Rating Scale for Depression, which suggests moderate to severe symptoms of depression (HRSD) (40, 41); 3) no current imminent suicidality; and 4) reported receiving a diagnosis of migraine from a physician¹.

Eligible participants who were available on dates set for the workshop were assigned to the ACT-ED condition (N=31). Otherwise, they were assigned to WL/TAU (N=14). A 2:1 ACT-ED to WL/TAU assignment ratio was used in order to increase the number of patients with active treatment for estimating the within (treatment) group effect size, while still maintaining adequate power. ACT-ED consisted of a 5-hour group workshop incorporating ACT principles and migraine education. All workshops were held on a Saturday. Participants assigned to WL/TAU were offered the ACT-ED intervention following their 12-week assessment. All participants (N=45) completed follow-up interviews by phone 2, 6, and 12 weeks after the workshop. See Figure 1 for participant flow.

Measures

Depression—The main outcome measure was the 17-item HRSD (40), a well-validated and reliable clinician-rated measure of the severity of current depressive symptoms. Each question has between 3–5 possible responses, which increase in severity. Thus, higher scores represent greater depression severity.

The presence of a current major depressive episode was established with the SCID-IV(39), a semi-structured diagnostic interview to assess DSM-IV disorders. The SCID-IV has demonstrated good clinical utility, validity, and reliability in controlled outcome studies (42).

The Inventory of Depression and Anxiety Symptoms (IDAS), General Depression scale, was used to assess self-reported depressive symptoms over the previous 2-week period (43). The 20-item General Depression scale includes a comprehensive range of depression-related content and has good internal consistency and short-term reliability in psychiatric patient samples (44). Items are answered on a 5-point Likert scale ranging from “not at all” to “extremely.”

Functioning—General functioning was assessed with the World Health Organization Disability Assessment Schedule II (WHO-DAS) and the Short Form Health Survey (SF-36), both self-report instruments. The WHO-DAS is a 36-item measure that assesses behavioral functioning/impairments and has demonstrated good reliability, validity, and sensitivity to change in functional status after treatment (45). Participants rank on a 5-point Likert scale ranging from “mild” to “extreme/cannot do” the degree of difficulty they have in doing various things. Higher scores indicate greater disability. The SF-36 (46) is a 36-item

¹Approximately 58% the participants had medical files in our hospital and we were able to confirm the diagnosis of migraine by a physician through chart review.

measure that assesses the impact of medical problems on functioning and is effective in differentiating the health benefits produced by treatments. Scores range from 0–100 with higher scores representing better health. The Headache Disability Inventory (HDI) (47) is a 25-item measure designed to assess the burden of headaches by inquiring about perceived impact of headaches on daily activities and functioning. Response options are “yes”, “sometimes”, and “no” and the total score can range from 0–100, with higher scores indicating greater impairment.

The HRSD and SCID were completed at intake and 12-week follow-up by a trained research assistant who was not involved in the treatment protocol. The IDAS was obtained at intake and 2-, 6-, and 12-week follow-up. Functioning measures were completed at intake and 2- and 12-week follow up. A master's level clinical researcher, who was blind to study hypotheses and to patient assignment, rated 20% of all HRSD and SCID recordings. Interrater reliability for the HRSD was calculated using intraclass correlation and was .84 and .96 for baseline and week 12 assessments, respectively. Kappa inter-rater reliability for the SCID diagnosis of depression was .87 and 1.0 for baseline and week 12 assessments, respectively. Of note, all medication usage was monitored throughout the trial.

Treatment Protocol

Participants assigned to ACT-ED (N = 31) completed a 5-hour workshop based on ACT and migraine education. Each ACT-ED workshop included 5–8 patients and emphasized three topics. The education component (one hour), implemented by a headache specialist (author A.R.), involved education about the pathology of migraine, risks for migraine chronification, migraine triggers, treatment of migraines, medication overuse migraine, and lifestyle factors contributing to migraine. The ACT component (four hours) was implemented by two psychologists (authors L.D. and J.M.) and included Acceptance and Behavioral Change Training. The former emphasized new ways of managing troubling thoughts, feelings, and pain sensations (e.g., learning how to recognize, and develop cognitive distance from, unhelpful thoughts and learning how to willingly face experiences that cannot be changed). The latter involved teaching patients how to recognize ineffective patterns of behavior and habits, exploring and setting life goals and those related to health, and promoting effective and committed actions to achieve these goals.

Patients in the WL/TAU group waited at least 12 weeks before receiving treatment. Although no treatment was provided by the investigators during this time, participants in the WL/TAU group completed the same clinical assessments as the ACT-ED group. They also continued to take any medications they had been on at entry to the study. As noted above, if participants had been on a stable dose of medication for four weeks or more, they were not excluded from the trial.

We elected to use a WL/TAU for two reasons. First, this was the first study to date to implement a brief ACT protocol in a comorbid psychiatric-medical population. There have been many ACT treatment trials of patients with chronic pain (17–22). However, this was the first 1-day intervention for patients experiencing pain, all of whom also meet criteria for major depression. Thus, the goal was to establish proof of concept. Although there are problems inherent in virtually all psychotherapy placebo models, the use of a no-treatment comparison in psychotherapy trials is acknowledged as a valid comparison condition, and is considered to meet accepted scientific standards for efficacy (48). Second, we wanted to provide all participants with the opportunity to get the ACT-ED treatment at some point.

Data Analyses

Linear mixed model analysis for repeated measures was used to compare the effect of treatment on depressive symptom severity (HRSD, IDAS), general functioning (SF-36, WHO-DAS) and headache related disability (HDI). The fixed effects in the linear mixed model were treatment status (ACT-ED versus WL/TAU), which is a between subject effect, and time (baseline, 2-, 6-, 12-weeks), which is a within subject effect. The model also included treatment by time interaction effect; the test for the interaction effect corresponding to comparing if the mean change due to the ACT-ED intervention differs from WL/TAU. The covariance of the repeated measures was fitted to either a compound symmetry or heterogenous compound symmetry covariance structure with the best fit selected based on the Akaike Information Criterion. From the fitted model, mean estimates of the response variable for the two treatments at each of the time points were computed and then compared using test of mean contrast. This test was used to determine if there was significant change over time within each treatment group, and also compare between groups at each time point.

Pearson Chi-square test was used to assess the impact of treatment condition on SCID-IV diagnosis of depression and percent of participants who exhibited response to treatment on the HRSD (defined a priori as > 50% reduction in symptoms (49)).

Cohen's d was used to calculate effect sizes.

Results

Patient Characteristics

Table 1 presents demographic and clinical characteristics of study participants. Almost all participants were white and tended to be well educated, which is generally consistent with the population from which participants were recruited. Participants were mostly female, consistent with higher rates of depression and migraine in females. Almost all participants had a previous history of depression (94% ACT-ED vs 86% WL/TAU) and were taking acute medications (prescribed or over-the-counter) for their migraine-related pain. Only 26% of those in the ACT-ED and 35% in the WL/TAU condition were taking preventive migraine medications – consistent with findings from the American Migraine Prevalence and Prevention Study (50). Of note, the ACT-ED and WL/TAU groups exhibited similar baseline values on the critical variables of interest.

Outcome analyses

Descriptive statistics for measures of depression and functioning are reported in Tables 2 and 3.

Depression—The HRSD was the main outcome measure. Participants in the ACT-ED condition showed significantly greater improvement in depressive symptoms on the HRSD at the 12-week follow-up compared to WL/TAU, ($F(1, 43) = 13.0, p = .0008$, effect size = 1.18). The mean decrease in HRSD in the ACT-ED condition was 10.8 (95% C.I.: 4.8, 16.8) greater than the WL/TAU group (Table 2). We also evaluated response to treatment on the HRSD, defined a priori as 50% reduction in symptoms (49). A significantly greater proportion of participants treated with ACT-ED responded to treatment (22/31, 71%) than patients in WL/TAU (3/13, 23%; $\chi^2 = 8.6, p = .003$).

By design, all participants were depressed on the SCID-IV at baseline. At the 12-week follow-up, a significantly greater number of people in the ACT-ED condition (24/31, 77%) no longer met criteria for MDE as compared to those in the WL/TAU condition (1/13, 8%; $\chi^2 = 18.15, p < .0001$). The number needed to treat (NNT) was 1.85.

Results on the IDAS General Depression scale revealed a significant overall group by time interaction ($F(3, 127) = 2.88; p = .03$). As shown in Figure 2, there were no differences at baseline between the ACT-ED and WL/TAU groups in General Depression scores. However, the ACT-ED group exhibited significantly greater improvement over time than the WL/TAU group. At the 12-week follow-up, the mean decrease on General Depression score in the ACT-ED group was 11.6 (95% C.I.: 2.9, 19.6) greater than the WL/TAU group ($p = 0.009$; effect size = 0.87).

In sum, both interview and self-report assessments of depression revealed significantly greater improvement for the ACT-ED participants over WL/TAU, with large effect sizes (Table 2).

Functioning—WHO-DAS. The overall treatment group by time interaction was significant ($F(2, 86) = 4.53; p = .01$), with the ACT-ED group showing significantly greater improvement in functioning over time compared to WL/TAU ($p = .008$ and $.01$ at 2- and 12-week follow-up, respectively). As shown in Figure 3, there were no differences in mean disability levels at baseline between the ACT-ED and WL/TAU group ($p = .60$). Over time, however, the differences in mean disability levels between the groups widened ($p = .09$ at week 2, $p = .11$ at week 12). See Table 3.

SF-36. Although the overall treatment group by time interaction on the SF-36 was non-significant ($F(2, 86) = 2.20; p = .11$), the ACT-ED group exhibited significantly greater improvement compared to WL/TAU at the 12-week follow-up assessment ($p < .05$; mean SF-36 increase of 17.0 ± 2.5 vs. 7.7 ± 3.8). As shown in Table 3, the two groups start with similar mean baseline values, but at the 2- and 12-week follow-up the ACT-ED group had significantly higher mean SF-36 scores.

HDI. The overall treatment group by time interaction on the HDI was significant ($F(2, 85) = 3.93; p = .02$), with the ACT-ED group showing greater improvement in headache disability over time than WL/TAU. Again, there were no differences in headache disability levels at baseline and at the two week follow-up between the groups (Table 3). However, at the 12-week follow-up, the ACT-ED group exhibited greater improvement over the WL/TAU group with a mean decrease in HDI of 27.9 in the ACT-ED group compared to 10.7 in the WL/TAU group ($p = 0.006$).

In sum, the ACT-ED group showed continued improvements in functioning over the 12-week follow-up period. In contrast, the WL/TAU group exhibited some improvement at the week 2 follow-up, followed by little change or decline at week 12.

Medication Changes—Seven of thirty one participants in the ACT-ED group (23%) and 7/14 in the WL/TAU group (50%) started or increased their dose of, an antidepressant during the follow-up period. Although a Pearson Chi-square test indicated this difference was not significant, the trend suggested greater antidepressant use in the WL/TAU group compared to the ACT-ED group over the 3-month follow-up period ($\chi^2 = 3.4, p = .07$). Two of thirty-one participants in ACT-ED (6%) and 3/14 (21%) in the WL/TAU had either reduced or discontinued an antidepressant. This difference also was not significant ($\chi^2 = 2.2, p = .17$). Finally, we explored the impact of baseline antidepressant use (yes/no: 14/17 for ACT-ES and 7/7 for WL/TAU) on depression severity (HRSD) and did not find a significant 3-way interaction of time by condition by antidepressant use ($F = .84, p = .36$). That is, antidepressant use at intake did not moderate the effects of treatment outcome at 3 month follow-up on the HRSD.

Discussion

This is the first study utilizing an ACT approach to improve the physical and emotional functioning in patients presenting with comorbid depression and migraine. This pilot study supports the feasibility and acceptability of an intensive 1-day treatment in this difficult-to-treat patient population. In addition, this study showed that a 1-day intervention based on Acceptance and Commitment Training plus migraine education resulted in significant improvement in depression relative to WL/TAU based on (1) reduction in depressive symptom levels as measured by the HRSD and the IDAS-General Depression scale; (2) the proportion of participants who responded to treatment; and (3) the proportion of participants who no longer met DSM-IV criteria for major depression (NNT=1.85). Participants assigned to the WL/TAU group experienced little improvement in depressive symptoms over the 12-week follow-up period (8% were no longer depressed; 23% exhibited response to treatment) suggesting that recovery without treatment occurs slowly. Furthermore, the participants had already been depressed for an average of approximately five months prior to the beginning of the waiting period.

These promising findings on depressive symptoms for patients in the ACT-ED group, the lack of improvement in the WL/TAU, and the long duration of these episodes all point to the importance of treatment for patients with comorbid migraine and depression. Despite the high prevalence of depression in migraine patients, therapeutic guidelines for depression in migraine are lacking. Studies examining the use of antidepressant agents in migraine patients have shown little impact on depressive symptoms (51). This study suggests that a brief intervention emphasizing acceptance of uncontrollable events (i.e., pain) and behavioral change in areas of value can have positive effects on depressive symptoms.

In terms of functioning and quality of life, the ACT-ED and WL/TAU groups started with similar baseline levels of functioning. Over the follow-up period, however, the difference in mean functioning levels between the groups widened. By the 12-week follow-up assessment, patients receiving ACT-ED for comorbid migraine and depression exhibited significant improvement in their general functioning ($p < .01$ on WHO-DAS; $p < .05$ on SF-36), and in headache-related disability (HDI; $p < .01$) compared to patients in the WL/TAU group.

The findings of this trial have important implications, pending replication in a more rigorously designed large-scale randomized controlled trial. First, a 1-day group workshop format is feasible and acceptable for patients with comorbid depression and migraine. The availability of an effective intervention that can be completed in 1-day should be considered as an alternative to the regularly prescribed weekly treatments. A brief intervention ensures treatment adherence and completion, is more feasible for patients who live in rural communities or suffer other barriers to accessing care, and is cost-effective. The extremely high proportion of outpatients who drop out of treatment prematurely presents one of the greatest obstacles to the effective delivery of mental health services. A meta-analysis of 125 studies on outpatient psychotherapy found that 50% of patients end treatment prematurely (35). Furthermore, there is a significant discrepancy between the prescribed number of psychotherapy visits and the number actually completed by patients in outpatient clinics. For example, approximately 40% of patients terminate treatment after the first or second visit (52). A one-day intervention would address these problems by ensuring treatment completion while providing patients with more contact time than is routinely obtained.

Second, a 1-day ACT-ED workshop is a promising treatment for patients with comorbid migraine and depression. These promising initial findings merit further study and replication. Relatively large effects for brief ACT interventions that are maintained through

several months of follow-up have been shown in controlled trials of patients with health problems (26, 27, 30, 31). However, this is the first study to assess the impact of a one-day workshop on distress and disability in a population with comorbid psychiatric and medical problems.

Third, patients suffering from comorbid migraine and depression should be treated for both of their conditions when possible (10, 53–55). There has been extensive epidemiological research documenting the high prevalence of comorbid depression in patients with migraine and the negative effects this comorbidity has on outcomes, including reduced quality of life and response to headache treatment. However, there is a striking paucity of clinical studies addressing this comorbidity. This study provides initial support that a behavioral treatment can have positive effects on depressive symptoms, functioning, and quality of life in depressed migraineurs.

Limitations and Future Directions

This pilot study informed feasibility of a novel 1-day intervention in an undertreated and difficult-to-treat population. It also provided promising new findings on the efficacy of the intervention, which merit further study and await replication with a more rigorous design. For example, future studies should ensure random treatment assignment. In the current study, participant assignment to ACT-ED or WL/TAU was based on availability. It is possible that the participants in the two groups differ in important ways, such as motivation. Furthermore, the 3-month follow-up period in this study is relatively short. Future studies should examine whether the positive treatment effects obtained here persist over longer periods of time or if they begin to wear off at certain times. This could provide important information about timing for booster sessions. Future studies should assess possible mediators of change and enroll a larger number of participants to ensure power to detect those effects.

Because the intervention implemented in this study included both Acceptance and Commitment Training and education about migraine, it is impossible to assess the separate contribution of these different elements. Future studies should compare the efficacy of ACT separately from migraine education and should include assessments of putative change processes. Future studies should also evaluate whether patients did in fact learn and practice the skills taught to them and how this impacts treatment response.

Finally, future studies should examine the effect of an ACT-ED intervention on migraine-related pain, medication use, and healthcare utilization. To date there are no studies that assess the effects of treating psychiatric comorbidity on migraine symptoms. Given the bidirectional influence of depression and migraine, an improvement in one disorder should result in improvement in the other.

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HIGHLIGHTS

- Patients with depression and migraine are assigned to 1-day treatment or waitlist
- Treatment is based on Acceptance and Commitment Therapy and Migraine Education.
- We examine changes in depressive symptoms, functioning, and quality of life.
- At 3-month follow-up, the treatment group exhibited significant improvements.
- 1-day treatment can improve depression and functioning for depressed migraineurs.

Figure 1.
Participant flow chart for the treatment trial.

Figure 2.
Inventory of Depression and Anxiety Symptoms - General Depression mean scores for the ACT-ED and WL/TAU groups at baseline and again at 2-, 6-, and 12-week follow-up.

Figure 3. Mean scores on the World Health Organization – Disability Assessment Schedule for the ACT-ED and WL/TAU groups at baseline and again at 2- and 12-week follow-up.

Table 1

Demographic Variables

Variable	ACT-ED (n=31)	WL/TAU (n=14)	P-value
Age (mean/SD)	32.5 (13.3)	33.5 (12.9)	.80
Gender, % female	97	86	.22
Ethnicity, % Caucasian	94	86	.64
Education, % with > 12 years education	90	86	.63
Working or in school, % yes	96	71	.03*
Current depressive episode length, months	6 (4.5)	5.2 (4.4)	.56
Prior episode of major depressive episode (% yes)	94	86	.22
Currently on an antidepressant medication (% yes)	45	50	.76
Age of onset of Migraines (mean/SD)	19 (10.1)	17.5 (12.7)	.67
Number of migraine attacks during month prior to baseline visit (mean/SD)	7 (3.2)	7.9 (3.5)	.40
Currently taking as needed acute medications for migraine (% yes)	94	93	.68
Currently taking preventive medications for migraine (% yes)	26	35	.31

Note. ACT-ED = Acceptance and Commitment Training plus Migraine Education; WL/TAU = Waitlist/Treatment as Usual.

Table 2

Depression Outcomes

	ACT-ED (N=31)	WL/TAU (N=14)		
	Mean $\pm$ SE		<i>p-value</i>	<i>Effect Size</i>
<u>HRSD</u> *				
Initial	27.9 $\pm$ 1.5	26.5 $\pm$ 2.2	.58	
12-week follow-up	12.9 $\pm$ 1.5	22.2 $\pm$ 2.2	<.001	
Change at wk 12	15.1 $\pm$ 1.6	4.3 $\pm$ 2.5	<.001	1.18
<u>IDAS Depression</u> *				
Initial	62.4 $\pm$ 2.2	66.1 $\pm$ 3.2	.34	
2-week follow-up	49.2 $\pm$ 2.2	60.0 $\pm$ 3.2	<.001	
6-week follow-up	44.4 $\pm$ 2.2	58.1 $\pm$ 3.2	<.001	
12-week follow-up	45.7 $\pm$ 2.2	60.8 $\pm$ 3.3	<.001	
Change at wk 2	13.2 $\pm$ 2.3	6.1 $\pm$ 3.5	.09	
Change at wk 6	18.0 $\pm$ 2.3	8.0 $\pm$ 3.5	<.01	
Change at wk 12	16.6 $\pm$ 2.3	5.4 $\pm$ 3.5	<.01	.87

Note. ACT-ED = Acceptance and Commitment Training plus migraine education; WL/TAU = Wait List/Treatment as Usual. N = 31 in ACT-ED and N = 14 in WL/TAU. HRSD = Hamilton Rating Scale of Depression. SCID = Structured Clinical Interview for DSM-IV. IDAS = Inventory of Depression and Anxiety Symptoms.

* indicates a significant overall treatment group by time interaction.

Table 3

Functioning Outcomes

	ACT-ED (N=31)	WL/TAU (N=14)		
	Mean ± SE		<i>p-value</i>	<i>Effect Size</i>
<u>WHO-DAS Total</u> *				
Initial	30.3 ± 2.4	28.2 ± 3.5	.60	
2-week follow-up	25.1 ± 2.4	32.3 ± 3.5	.09	
12-week follow-up	21.2 ± 2.4	27.8 ± 3.4	.11	
Change at wk 2	-5.2 ± 1.9	4.2 ± 2.9	<.01	
Change at wk 12	-9.1 ± 2.0	-0.3 ± 2.9	<.05	.98
<u>SF-36 Total Score</u>				
Initial	43.2 ± 2.7	39.1 ± 4.0	.41	
2-week follow-up	53.6 ± 2.7	43.5 ± 4.0	<.05	
12-week follow-up	60.1 ± 2.7	46.8 ± 4.0	<.01	
Change at wk 2	10.5 ± 2.5	4.4 ± 3.7	.17	
Change at wk 12	17.0 ± 2.5	7.7 ± 3.8	<.05	.69
<u>HDI Total Score</u> *				
Initial	70.7 ± 3.6	66.0 ± 5.3	.46	
2-week follow-up	52.8 ± 3.6	55.4 ± 5.3	.69	
12-week follow-up	42.8 ± 3.6	55.3 ± 5.4	.06	
Change at wk 2	17.9 ± 3.4	10.6 ± 5.0	.23	
Change at wk 12	27.9 ± 3.4	10.7 ± 5.2	<.01	1.03

Note. ACT-ED = Acceptance and Commitment Training plus migraine education; WL/TAU = Wait List/Treatment as Usual. N = 31 in ACT-ED and N = 14 in WL/TAU. WHO-DAS = World Health Organization Disability Assessment Schedule. SF-36 = Short Form Health Survey. HDI = Headache Disability Inventory. SE=Standard Error.

* indicates a significant overall treatment group by time interaction.