

Comparing the Effectiveness of Mindfulness-Based Cognitive Therapy and Positive Psychology Interventions on Self-Acceptance in Women with Chronic Tension-Type Headache

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ABSTRACT

Objective: This study aimed to compare the effectiveness of mindfulness-based cognitive therapy (MBCT) and positive psychology interventions (PPI) in improving self-acceptance among women with chronic tension-type headache.

Methods and Materials: This quasi-experimental study employed a pretest-posttest design with a two-month follow-up and a control group. The study population comprised women diagnosed with chronic tension-type headache in Tehran, Iran, in 2025. Sixty participants were recruited through convenience sampling and assigned to three groups: MBCT (n = 20), PPI (n = 20), and control (n = 20). Both interventions were administered in eight 120-minute sessions, conducted twice weekly, while the control group received no intervention. Self-acceptance was measured using the Beck Self-Concept Test at pretest, posttest, and follow-up. Data were analyzed using mixed repeated-measures analysis of variance and Bonferroni-adjusted pairwise comparisons in SPSS version 23.

Findings: Mixed repeated-measures analysis of variance revealed statistically significant main effects of time and group and a significant time-by-group interaction on self-acceptance. Bonferroni-adjusted comparisons demonstrated significant improvements from pretest to posttest and from pretest to follow-up in both intervention groups, whereas changes in the control group were nonsignificant. Both MBCT and PPI produced significantly higher self-acceptance scores than the control condition at posttest and follow-up ($p < .001$). Furthermore, PPI demonstrated significantly greater effectiveness than MBCT at both posttest and follow-up assessments ($p < .001$), indicating a comparative advantage maintained over the two-month follow-up period.

Conclusion: Both MBCT and PPI were effective in improving self-acceptance among women with chronic tension-type headache, with PPI demonstrating superior and sustained outcomes. These findings suggest that positive psychology interventions may represent a promising psychological approach for enhancing self-acceptance in this population. Further randomized studies with longer follow-up periods are recommended to establish the durability and clinical significance of these improvements.

Keywords: Chronic Tension-Type Headache; Mindfulness-Based Cognitive Therapy; Positive Psychology Interventions; Self-Acceptance; Women.

1. Introduction

Chronic tension-type headache is among the most prevalent and persistent primary headache conditions and can impose substantial psychological, functional, and social burdens on affected individuals. Although the disorder is commonly characterized by recurrent or continuous bilateral head pain with a pressing or tightening quality, its clinical consequences extend beyond pain intensity or headache frequency. Persistent headache may disrupt concentration, sleep, occupational functioning, social participation, and emotional well-being, and repeated experiences of pain can gradually alter the way individuals interpret their bodies, personal capacities, and sense of self. Chronic pain is increasingly understood not merely as a sensory experience but as a multidimensional condition shaped by cognitive, emotional, behavioral, interpersonal, and identity-related processes. This broader conceptualization is particularly important in women, who often report greater pain-related interference and may simultaneously face social, familial, occupational, and caregiving demands that intensify the psychological impact of recurrent pain. Research has shown that chronic pain can become deeply intertwined with identity, such that individuals may begin to define themselves in relation to limitations, perceived inadequacies, and disrupted life roles rather than through broader and more adaptive aspects of the self (Reed et al., 2022). Qualitative evidence likewise indicates that people living with persistent pain may experience a sense of being fundamentally different from their former selves, with pain affecting personal, relational, social, and embodied dimensions of identity (Voorhees, 2023). Recent conceptual work has therefore emphasized that the self is an important psychological domain in the experience and management of chronic pain, because pain can influence self-evaluation, self-continuity, self-related beliefs, and the degree to which individuals can relate flexibly to their internal experiences (Yu & McCracken, 2025). Within this framework, self-acceptance assumes particular importance because it reflects the capacity to acknowledge oneself with relative openness and psychological balance despite limitations, unpleasant experiences, physical symptoms, perceived imperfections, or discrepancies between actual and ideal functioning.

Self-acceptance is closely related to broader forms of psychological acceptance but should not be reduced to passive resignation or the absence of motivation for change. Rather, it involves the ability to recognize personal

characteristics, strengths, vulnerabilities, emotional reactions, and bodily experiences without excessive self-rejection or harsh self-evaluation. In the context of chronic pain, this distinction is critical. Individuals may accept the reality of pain while continuing to reject themselves because of the limitations associated with it, or conversely, they may struggle with both pain acceptance and self-acceptance. Earlier work on chronic pain demonstrated that general psychological acceptance contributes meaningfully to functioning beyond acceptance of pain itself and that broader acceptance processes may influence emotional adjustment and quality of life (McCracken & Zhao-O'Brien, 2010). This suggests that interventions targeting only the sensory or behavioral dimensions of pain may be insufficient when the condition has become associated with negative self-evaluation, shame, perceived failure, or identity disruption. The psychological burden of chronic pain can be intensified when individuals interpret reduced activity, fatigue, irritability, or dependence on others as evidence of personal inadequacy. Such interpretations may reinforce avoidance, rumination, social withdrawal, and self-criticism, creating a cycle in which physical symptoms and negative self-appraisal mutually sustain one another. In this regard, self-compassion has emerged as an important protective factor. Evidence among adults with chronic pain indicates that self-compassion is associated with lower pain-related disability through mechanisms involving stronger identification with a valued future self and greater self-efficacy (Mistretta et al., 2023). These findings imply that the way people relate to themselves during pain may substantially shape their psychological adjustment. Enhancing self-acceptance may therefore help women with chronic tension-type headache maintain a more stable and less pain-dominated self-concept, reducing the tendency to equate chronic symptoms with personal deficiency.

Among contemporary psychological approaches that may influence self-acceptance, mindfulness-based interventions have received extensive attention in chronic pain research. Mindfulness generally refers to purposeful, present-centered, and nonjudgmental awareness of internal and external experiences. Within a mindfulness framework, individuals learn to observe thoughts, emotions, bodily sensations, and pain-related reactions as transient events rather than automatically evaluating, suppressing, or identifying with them. Mindfulness-Based Cognitive Therapy (MBCT) integrates systematic mindfulness practices with cognitive principles designed to alter habitual patterns of responding to distressing internal experiences.

The model developed by Segal and colleagues emphasizes decentering, awareness of automatic cognitive processes, and the cultivation of a less judgmental relationship to thoughts and feelings (Segal et al., 2013). Applied to chronic headache, this approach may be particularly relevant because recurrent pain can trigger anticipatory anxiety, hypervigilance, catastrophic interpretation, frustration, and self-critical thinking. Instead of attempting to eliminate all unpleasant internal experiences, MBCT encourages individuals to notice these experiences without excessive elaboration or reactive behavior. This may gradually reduce the extent to which pain-related thoughts dominate self-perception and may promote greater psychological flexibility and self-acceptance. A systematic review and meta-analysis examining mindfulness-based interventions for chronic headaches found evidence supporting their therapeutic potential for reducing headache-related difficulties and improving relevant psychological outcomes (Rehman et al., 2022). In patients with chronic migraine and medication-overuse headache, mindfulness added to usual treatment has also demonstrated clinical benefits, further supporting the relevance of mindfulness-based approaches in headache populations (Grazzi et al., 2023).

The evidence base for mindfulness in chronic pain extends beyond headache-specific research. A systematic review and meta-analysis of MBCT for chronic pain reported beneficial effects across several pain-related and psychological outcomes, suggesting that MBCT can contribute to improved adjustment among individuals living with persistent pain conditions (Pei et al., 2021). Broader syntheses of mindfulness-based interventions have similarly concluded that such approaches can produce meaningful, though variable, improvements in pain-related outcomes, emotional distress, and functioning (Sharpe et al., 2024). Importantly, the mechanisms underlying these effects appear to extend beyond relaxation. A systematic review of mechanisms of action in mindfulness-based interventions for pain identified processes such as reduced pain catastrophizing, improved emotion regulation, decreased cognitive reactivity, enhanced acceptance, altered attentional processing, and greater nonjudgmental awareness as plausible mediators of therapeutic change (Ploesser & Martin, 2024). These mechanisms are directly relevant to self-acceptance because they weaken rigid identification with negative thoughts and encourage a more observing, compassionate, and flexible relationship with internal experience. For a woman with chronic tension-type headache, for example, the thought “I am weak because I

cannot tolerate this pain” can be experienced either as an unquestioned statement about identity or as a passing cognitive event. Mindfulness practices may facilitate the latter stance, thereby reducing the fusion between physical suffering and negative self-definition. Evidence from acceptance-based approaches also supports this general principle. An overview of systematic reviews and meta-analyses of acceptance and commitment therapy for chronic pain showed that acceptance-focused interventions can improve important psychological and functional outcomes, reinforcing the value of increasing flexibility rather than centering treatment exclusively on symptom elimination (Martinez-Calderon et al., 2024).

A second promising approach is positive psychology intervention, which differs conceptually from traditional symptom-focused therapies by emphasizing the cultivation of strengths, positive emotions, engagement, meaning, gratitude, hope, supportive relationships, and constructive self-perception. Positive psychotherapy, as articulated by Rashid and Seligman, is based on the proposition that psychological treatment should not only reduce distress but also identify and develop personal resources that support well-being and adaptive functioning (Rashid & Seligman, 2013). In chronic pain populations, this orientation may be especially important because persistent symptoms can narrow attention toward loss, incapacity, threat, and bodily discomfort. Over time, this attentional narrowing may contribute to a self-concept dominated by illness-related limitations. Positive psychology exercises may counter this pattern by directing attention toward existing strengths, meaningful experiences, positive relationships, gratitude, personal accomplishment, and valued aspects of identity that remain available despite pain. This does not imply denying pain or imposing unrealistic positivity. Rather, the approach aims to broaden the individual's psychological repertoire so that pain becomes one aspect of experience rather than the sole organizing principle of self-understanding. In this sense, positive psychology interventions may enhance self-acceptance by helping individuals recognize themselves as multidimensional persons who possess strengths and sources of meaning even in the presence of chronic symptoms.

Early clinical research provided support for the feasibility and potential value of positive psychology interventions among individuals with chronic pain. A pilot study found that a positive psychology intervention designed for patients with chronic pain was associated with improvements in positive affect and aspects of psychological functioning, suggesting that well-being can be actively cultivated even

when pain persists (Flink et al., 2015). Similarly, a tailored positive psychology intervention for individuals with chronic pain and physical disability demonstrated feasibility and encouraging effects on well-being and pain-related outcomes (Müller et al., 2016). Internet-delivered positive psychology has also been evaluated in chronic pain. An eight-week randomized controlled trial showed that structured positive psychology exercises could enhance well-being among individuals with chronic pain, providing evidence that therapeutic change can be achieved through interventions explicitly targeting positive psychological processes rather than focusing solely on distress reduction (Peters et al., 2017). More recent randomized research has demonstrated that deliberately inducing positive emotions through structured positive psychology exercises can reduce the burden associated with chronic pain and improve aspects of emotional functioning (Müller et al., 2022). Collectively, these studies support the proposition that positive emotions and strengths are not merely secondary consequences of symptom improvement but may themselves function as therapeutic resources that influence coping, resilience, and adaptation.

The broader evidence base has become increasingly supportive of positive psychology approaches in chronic pain. A systematic review and meta-analysis of randomized controlled trials concluded that positive psychology interventions can be efficacious in chronic pain treatment, although the magnitude and consistency of effects may depend on intervention characteristics, outcome selection, and study quality (Braunwalder et al., 2022). More recent meta-analytic evidence similarly indicates that positive psychology interventions can improve mental health outcomes in patients with chronic pain, supporting their potential integration into multimodal pain management (Blasco-Belled et al., 2025). This literature is particularly relevant to self-acceptance because many positive psychology techniques directly target processes involved in adaptive self-evaluation. Identifying signature strengths may shift attention away from perceived inadequacies; gratitude practices can broaden appraisal of one's life beyond pain-related losses; forgiveness may reduce persistent resentment and self-directed hostility; savoring can restore access to pleasurable experience; and constructive interpersonal responding can strengthen social connection and validation. Through repeated engagement with these practices, individuals may develop a more balanced and affirming representation of themselves. Such changes could be especially valuable in chronic tension-type headache, where

the condition may be medically non-life-threatening yet persistently disruptive, creating a mismatch between outwardly invisible symptoms and significant subjective burden.

Despite encouraging evidence for both mindfulness-based and positive psychology approaches, important questions remain regarding their relative effectiveness for self-related outcomes. Much of the chronic pain literature has focused on pain intensity, pain interference, depressive symptoms, anxiety, disability, quality of life, or general well-being. Comparatively less attention has been given to self-acceptance as a specific psychological outcome, even though identity and self-related processes appear highly relevant to the lived experience of chronic pain. Research on identity in chronic pain suggests that persistent symptoms can disrupt continuity between past, present, and anticipated future selves and can lead individuals to perceive themselves through a restricted illness-centered framework (Voorhees, 2023). Quantitative findings similarly indicate that pain-related identity processes are associated with maladaptive pain cognitions and disability (Reed et al., 2022). Contemporary conceptual analysis has therefore argued that the “self in pain” should be treated as a central therapeutic concern rather than a peripheral consequence of symptom burden (Yu & McCracken, 2025). From this perspective, interventions that alter how individuals relate to thoughts and emotions, or that strengthen positive aspects of identity and psychological resources, may have significant implications for self-acceptance even if their primary theoretical mechanisms differ.

MBCT and positive psychology interventions may influence self-acceptance through partially distinct pathways. MBCT is likely to operate by reducing judgment, cognitive fusion, automatic reactivity, and overidentification with distressing internal experiences. Through repeated mindfulness practice, individuals may learn to observe pain, frustration, fear, and negative self-thoughts without interpreting them as complete definitions of the self. This decentered awareness may allow a more accepting stance toward limitations and imperfections. In contrast, positive psychology interventions may operate more directly through the cultivation of positive self-relevant content, including strengths, gratitude, meaning, positive relationships, and competence. Rather than primarily changing the individual's relationship to negative internal events, positive psychology may expand the range of personally meaningful experiences available for self-evaluation. These different pathways make direct comparison theoretically informative. If both

interventions improve self-acceptance, this would support the idea that self-related adaptation in chronic pain can be promoted through multiple mechanisms. If one intervention produces stronger or more durable effects, the findings could provide useful guidance for treatment selection and intervention development.

The need for comparative research is further strengthened by the heterogeneity observed across psychological interventions for chronic pain. Mindfulness-based approaches have demonstrated overall benefits, but effect sizes vary across outcomes and populations, and mechanisms may differ according to the structure and intensity of intervention delivery (Sharpe et al., 2024). Positive psychology interventions likewise show promise, yet systematic reviews note variability in study design, intervention content, and outcome measurement (Blasco-Belled et al., 2025; Braunwalder et al., 2022). Moreover, much of the evidence has been derived from heterogeneous chronic pain samples rather than specifically from women with chronic tension-type headache. Headache populations may present particular psychological challenges because pain is recurrent, often unpredictable, and closely associated with concentration, fatigue, irritability, and limitations in daily functioning. Mindfulness-based interventions have shown efficacy specifically in chronic headache populations (Rehman et al., 2022), while clinical trials in migraine further demonstrate the relevance of mindfulness within headache management (Grazzi et al., 2023). However, fewer studies have directly examined positive psychology interventions in chronic headache, despite their demonstrated utility across broader chronic pain populations (Flink et al., 2015; Müller et al., 2016; Peters et al., 2017). Comparing these approaches within the same headache population can therefore address an important gap by identifying whether a resource-building intervention centered on positive functioning differs from an awareness- and acceptance-based intervention in its effects on self-acceptance.

The clinical significance of this comparison also lies in the limitations of treatment strategies focused exclusively on symptom reduction. Chronic tension-type headache often follows a persistent course, and complete elimination of symptoms may not always be immediately achievable. Psychological adaptation therefore requires patients to maintain functioning and a coherent, valued sense of self even when pain remains present. Acceptance-based evidence suggests that improved functioning can occur through changes in the individual's relationship with pain

and other internal experiences rather than through symptom eradication alone (Martinez-Calderon et al., 2024; McCracken & Zhao-O'Brien, 2010). At the same time, positive psychology research suggests that increasing positive emotion, strengths, meaning, and engagement may improve well-being independently of reductions in negative symptoms (Blasco-Belled et al., 2025; Müller et al., 2022). These complementary perspectives indicate that self-acceptance may be a particularly useful outcome for evaluating psychological interventions because it captures an aspect of adaptation that extends beyond whether pain simply increases or decreases. Furthermore, self-related processes may influence future behavior: individuals who view themselves as capable and worthy despite chronic pain may be more likely to remain socially engaged, adhere to treatment, use adaptive coping strategies, and preserve valued roles, whereas those who define themselves primarily through incapacity may become increasingly avoidant or discouraged.

The available literature therefore supports both MBCT and positive psychology interventions as plausible approaches for enhancing psychological adaptation in chronic pain, yet direct comparative evidence regarding self-acceptance remains limited. MBCT is grounded in the cultivation of nonjudgmental awareness, decentering, and acceptance of internal experience (Segal et al., 2013), while positive psychotherapy emphasizes strengths, positive emotions, meaning, engagement, and constructive interpersonal functioning (Rashid & Seligman, 2013). Evidence from systematic reviews, meta-analyses, clinical trials, and feasibility studies supports the effectiveness of mindfulness-based approaches for chronic headache and chronic pain (Pei et al., 2021; Ploesser & Martin, 2024; Rehman et al., 2022), as well as the utility of positive psychology interventions for enhancing well-being and reducing psychological burden among people with chronic pain (Braunwalder et al., 2022; Flink et al., 2015; Müller et al., 2016; Peters et al., 2017). At the same time, emerging research on identity, self-compassion, acceptance, and the self in chronic pain highlights the importance of moving beyond pain intensity toward understanding how chronic symptoms shape an individual's relationship with herself (Mistretta et al., 2023; Yu & McCracken, 2025). Clarifying whether mindfulness-based or positive psychology strategies are more effective in improving self-acceptance may therefore contribute to more psychologically informed and person-centered interventions for women living with chronic tension-type headache.

Accordingly, the present study aimed to compare the effectiveness of mindfulness-based cognitive therapy and positive psychology interventions on self-acceptance among women with chronic tension-type headache.

2. Methods and Materials

2.1. Study design and Participant

The present study employed a quasi-experimental research design with pretest, posttest, and two-month follow-up assessments, incorporating two experimental groups and one control group to compare the effectiveness of mindfulness-based cognitive therapy (MBCT) and positive psychology interventions (PPI) in improving self-acceptance among women diagnosed with chronic tension-type headache. The study was conducted in Tehran, Iran, in 2025. The statistical population comprised women with chronic tension-type headache who attended psychology clinics and specialized neurology centers for diagnostic evaluation, medical consultation, and treatment. The sample size was determined based on statistical power considerations and Cohen's recommendations for experimental research. Assuming an effect size of 0.50, a statistical power of 0.85, and a minimum required sample of 15 participants per group, the target sample was increased to 60 participants to account for potential attrition and improve the reliability of the statistical comparisons. Participants were recruited through convenience sampling from eligible women attending the selected clinical centers. Following eligibility screening and the provision of informed consent, 60 women were allocated to three groups of equal size: the positive psychology intervention group ($n = 20$), the mindfulness-based cognitive therapy group ($n = 20$), and the control group ($n = 20$). Group allocation was reported as random, although the specific sequence-generation and allocation-concealment procedures were not documented. The three groups were assessed at baseline before the commencement of the interventions, immediately after completion of the eight intervention sessions, and two months after the posttest to evaluate the maintenance of treatment-related changes. The independent variable was the type of psychological intervention, consisting of positive psychology interventions, mindfulness-based cognitive therapy, and the control condition, while the dependent variable was self-acceptance, measured repeatedly across the three assessment periods.

The inclusion criteria consisted of providing written informed consent, receiving a confirmed diagnosis of

chronic tension-type headache from a neurologist, not undergoing concurrent psychological treatment, and having no severe physical or psychological disorders that could interfere with participation or influence the study outcomes. Diagnostic eligibility was established through the participants' clinical records and neurological assessments, while the absence of severe comorbid conditions was evaluated through clinical record review and structured interviews. The exclusion criteria included absence from more than two intervention sessions, receipt of other psychotherapeutic interventions during the three months preceding study participation, and unwillingness or inability to cooperate with the intervention procedures and assessment requirements. Participants who met the inclusion criteria received information regarding the research objectives, intervention procedures, duration of participation, follow-up assessments, and their rights as research participants. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki, including respect for personal autonomy, voluntary participation, confidentiality, and the right to withdraw from the study without adverse consequences for access to routine healthcare services. Written informed consent was obtained from all participants before baseline assessment, and the collected information was treated confidentially and used exclusively for research purposes. The psychological interventions were delivered separately to the two experimental groups by the researcher, while participants in the control group received no study-related educational or psychotherapeutic intervention during the intervention period. All 60 participants completed the pretest, posttest, and two-month follow-up assessments, and no participant attrition was reported. This longitudinal assessment framework enabled the investigation of both immediate intervention effects and the persistence of changes in self-acceptance following completion of the psychological programs.

2.2. Measures

Beck Self-Concept Test (BSCT). Self-acceptance was evaluated using the Beck Self-Concept Test, attributed to Beck, Steer, Epstein, and Brown (1990), which was employed as the principal outcome measure in the present study. The instrument was used to assess participants' perceptions and evaluations of themselves, reflecting dimensions of self-concept relevant to self-acceptance and psychological adjustment. According to the study protocol,

the questionnaire consisted of 26 self-report items scored on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Items 1, 4, 5, 9, 10, 12, 14, 15, 16, 17, 18, 19, 20, 22, 24, and 25 were scored directly, whereas the remaining items were reverse-scored to maintain consistency in the direction of measurement. The total score was calculated by summing the responses to all items, yielding a possible range of 26 to 130, with higher scores indicating more favorable self-evaluations and greater self-acceptance. The instrument was administered individually to participants in all three groups at pretest, posttest, and the two-month follow-up using the same scoring procedures. Previous psychometric findings reported for the instrument indicated acceptable internal consistency, with Cronbach's alpha coefficients ranging from 0.81 to 0.90. Exploratory factor analysis reportedly identified four principal factors accounting for approximately 58% of the total variance, suggesting a multidimensional structure underlying the assessed construct. In an Iranian adaptation study attributed to Kaviani et al. (2008), reliability coefficients ranged from 0.80 to 0.85, while standardized factor loadings varied between 0.45 and 0.78. Evidence of convergent and discriminant validity was also reported through significant negative correlations with depressive symptoms, ranging from -0.55 to -0.68 , indicating that more favorable self-evaluations were associated with lower levels of depression. In the present study, internal consistency reliability was assessed using Cronbach's alpha, yielding a coefficient of 0.83, which exceeded the conventional acceptability threshold of 0.70. Furthermore, content validity was evaluated through the content validity ratio (CVR) and content validity index (CVI), which were reported as 0.79 and 0.85, respectively, supporting the relevance and representativeness of the questionnaire items for the intended assessment. The instrument therefore provided the primary quantitative measure for evaluating changes in self-acceptance across the intervention and control conditions. Because the supplied protocol operationalized self-acceptance through a self-concept measure, the results were interpreted in terms of self-acceptance as assessed by this instrument rather than as a comprehensive assessment of every dimension of psychological self-acceptance.

2.3. Interventions

Mindfulness-Based Cognitive Therapy (MBCT). The mindfulness-based cognitive therapy intervention was developed according to the therapeutic framework described

by Segal et al. (2013) and was administered to the second experimental group through eight structured group sessions conducted twice weekly, with each session lasting approximately 120 minutes. The intervention sought to enhance participants' awareness of present-moment experiences, promote nonjudgmental observation of thoughts and emotions, reduce automatic cognitive reactions, and cultivate a more accepting relationship with internal psychological and bodily experiences. The first session focused on establishing therapeutic rapport, introducing participants to one another through paired activities, explaining the conceptual foundations and objectives of mindfulness, and discussing the automatic guidance system through which habitual thoughts and behaviors may occur without deliberate awareness. Participants were encouraged to recognize the distinction between automatic reactions and conscious responses to psychological experiences. The second session introduced relaxation techniques, emphasizing progressive muscle relaxation involving 14 muscle groups, including the forearms, upper arms, calves, thighs, abdomen, chest, shoulders, neck, lips, eyes, jaw, and forehead. Participants practiced systematically identifying and releasing muscular tension to increase awareness of bodily sensations and physical relaxation. The third session extended these exercises by introducing a simplified progressive muscle relaxation procedure involving six major muscle groups, including the hands and arms, legs and thighs, abdomen and chest, neck and shoulders, jaw, and forehead and lips. Participants were encouraged to practice relaxation independently between sessions to strengthen their ability to identify and regulate physiological tension. The fourth session introduced mindful breathing, beginning with a review of previous exercises and progressing to the observation of natural inhalation and exhalation. Participants learned to maintain attention on breathing while allowing distracting thoughts to arise and pass without attempting to suppress, evaluate, or engage with them. A daily home assignment involving 20 minutes of mindful breathing before sleep was introduced to facilitate the application of mindfulness outside the therapeutic setting. The fifth session focused on the body-scan technique, through which participants systematically directed attention toward different body regions and observed bodily sensations associated with breathing, movement, muscular tension, and relaxation. Mindful eating was introduced as a complementary exercise, requiring participants to observe the appearance, texture, taste, and sensory qualities of food

with sustained attention. The sixth session emphasized mindfulness of thoughts, including the identification of positive and negative thoughts and the recognition of pleasant and unpleasant mental experiences without judgment. Participants practiced observing thoughts as temporary psychological events rather than necessarily accurate representations of themselves or their circumstances. A written reflection assignment encouraged the daily observation and recording of positive and negative experiences without evaluative interpretation. The seventh session integrated the principal mindfulness practices introduced during the preceding sessions, particularly mindful breathing, body scanning, and nonjudgmental observation of thoughts. Each exercise was practiced for approximately 20–30 minutes to consolidate acquired skills and strengthen independent mindfulness practice. The eighth session involved reviewing and summarizing the principal concepts and exercises, discussing participants' experiences with mindfulness practices, reinforcing the application of learned techniques in everyday situations, and administering the posttest assessment. Throughout the program, emphasis was placed on cultivating present-moment awareness, reducing excessive identification with negative self-evaluations, and developing a compassionate and accepting attitude toward internal experiences, including the physical and emotional discomfort associated with chronic tension-type headache.

Positive Psychology Interventions (PPI). The positive psychology intervention was developed based on the positive psychotherapy framework described by Rashid and Seligman (2013) and was administered to the first experimental group in eight structured group sessions conducted twice weekly, with each session lasting approximately 120 minutes. The program aimed to strengthen positive emotional experiences, identify and develop individual character strengths, promote constructive interpersonal relationships, encourage gratitude and forgiveness, and enhance psychological resources relevant to self-acceptance. The first session focused on establishing therapeutic rapport between the intervention facilitator and participants, introducing group members, explaining the objectives and structure of the program, and discussing participants' expectations regarding psychological change. The theoretical foundations of positive psychology were introduced, with particular attention to positive emotions, engagement, relationships, meaning, and character strengths. Participants were encouraged to reflect on their existing psychological resources and identify areas in which

positive emotional and interpersonal functioning could be strengthened. The second session concentrated on identifying signature strengths and promoting positive emotions, emphasizing the role of individual strengths in facilitating engagement with meaningful activities and improving psychological functioning. Participants explored their personal abilities and positive characteristics and considered how these resources could be incorporated into daily experiences. The third session extended this process by addressing the development and practical application of character strengths. Participants were guided to establish specific, realistic, measurable, and attainable behavioral goals consistent with their identified strengths, with the intention of promoting competence, engagement, and favorable self-evaluation. The fourth session introduced forgiveness as a psychological process through which individuals may modify emotional responses associated with interpersonal injuries, resentment, and anger. Participants explored the possibility of transforming persistent negative emotional reactions into more neutral or positive emotional experiences while recognizing that forgiveness is a personal process rather than an obligation to excuse harmful behavior. The fifth session addressed positive memories and gratitude, emphasizing the identification and appreciation of favorable past experiences, supportive relationships, and meaningful personal events. Participants reflected on the psychological implications of attending to positive and negative memories and were encouraged to develop gratitude through recognition of beneficial experiences and sources of support. The sixth session focused on strengthening positive interpersonal relationships through active-constructive responding, a communication approach characterized by enthusiastic, attentive, and supportive reactions to positive experiences shared by others. Participants practiced constructive communication strategies intended to increase interpersonal connection, emotional support, and relationship satisfaction. The seventh session emphasized the appreciation and savoring of pleasurable experiences, encouraging participants to attend consciously to positive moments and extend their enjoyment through focused awareness. Exercises involved identifying pleasant daily experiences, observing their emotional and sensory characteristics, and practicing strategies to prolong and appreciate positive feelings. The eighth session consisted of a comprehensive review of the intervention components, discussion of participants' experiences and perceived psychological changes, reinforcement of the practical application of positive psychology skills, and administration

of the posttest assessment. The session concluded with expressions of appreciation and acknowledgment of participants' engagement throughout the intervention. Across the program, participants were encouraged to recognize personal capabilities, develop a more balanced understanding of their strengths and limitations, and foster positive attitudes toward themselves. These activities were intended to support the development of self-acceptance by strengthening positive self-evaluation, psychological resilience, gratitude, meaning, and supportive interpersonal experiences.

2.4. Data Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 23. Descriptive statistics, including means and standard deviations, were calculated to summarize self-acceptance scores for participants in the positive psychology intervention, mindfulness-based cognitive therapy, and control groups at the pretest, posttest, and two-month follow-up assessments. To examine the effectiveness of the interventions and compare changes in self-acceptance across the three groups, a mixed-design repeated-measures analysis of variance (ANOVA) was employed. In this analytical framework, the assessment period constituted the within-subjects factor with three levels (pretest, posttest, and follow-up), while treatment condition represented the between-subjects factor with three levels (positive psychology intervention, mindfulness-based cognitive therapy, and control). The analysis was designed to evaluate the main effect of time, reflecting overall changes in self-acceptance across the three assessments; the main effect of group, reflecting differences in self-acceptance among the three study conditions; and the time-by-group interaction, indicating whether the pattern of change in self-acceptance differed according to intervention condition. Particular emphasis was placed on the interaction effect because it provided the principal statistical basis for determining whether the interventions were associated with different trajectories of improvement relative to the control group. The analysis required consideration of the assumptions underlying mixed repeated-measures ANOVA, including independence of observations between participants, approximate normality of the model residuals, homogeneity of between-group variances, and sphericity of the within-subjects factor. Sphericity was to be evaluated using Mauchly's test, with an appropriate degrees-of-freedom

correction, such as the Greenhouse–Geisser adjustment, applied if the assumption was violated. Following the omnibus analysis, Bonferroni-adjusted pairwise comparisons were used to identify differences between assessment periods and treatment groups while controlling the familywise error rate associated with multiple comparisons. Within-group comparisons were used to assess differences between pretest and posttest, pretest and follow-up, and posttest and follow-up, thereby distinguishing immediate treatment-related changes from the maintenance of intervention outcomes. Between-group comparisons were conducted to determine whether participants receiving positive psychology interventions or mindfulness-based cognitive therapy demonstrated significantly different self-acceptance scores compared with the control group and whether the two active interventions differed from one another at posttest and follow-up. All statistical tests were interpreted using a significance threshold of $p < .05$, with Bonferroni-adjusted significance levels applied to the relevant pairwise comparisons. The repeated-measures framework enabled the simultaneous assessment of intervention-related differences and longitudinal changes in self-acceptance, providing a statistical basis for comparing the immediate and two-month follow-up outcomes of the two psychological interventions.

3. Findings and Results

The demographic characteristics of the participants were examined across the three study groups, including the positive psychology intervention (PPI), mindfulness-based cognitive therapy (MBCT), and control groups. The study included 60 women diagnosed with chronic tension-type headache, with 20 participants assigned to each group. Regarding age distribution, the highest proportion of participants in the MBCT and control groups belonged to the 31–35-year age category, accounting for 25% of participants in each group. In the PPI group, the most frequent age category was 26–30 years, also representing 25% of participants. The chi-square test revealed no statistically significant differences in age distribution among the three groups ($p > .05$). Regarding educational attainment, a bachelor's degree was the most frequently reported educational qualification across all groups, accounting for 40% of participants in the MBCT group, 45% in the PPI group, and 35% in the control group. The chi-square test similarly indicated no statistically significant differences in educational attainment among the study groups ($p > .05$).

These findings suggested that the three groups were comparable in terms of their demographic characteristics. Furthermore, all 60 participants completed the pretest,

posttest, and two-month follow-up assessments, with no reported attrition during the study.

Table 1

Descriptive Statistics of Self-Acceptance Scores Across Measurement Times in the Study Groups

Group	Measurement Time	Mean	SD
PPI	Pretest	75.85	13.71
	Posttest	89.50	12.61
	Follow-up	83.80	12.44
MBCT	Pretest	79.75	7.75
	Posttest	91.95	8.17
	Follow-up	84.55	6.80
Control	Pretest	87.55	15.18
	Posttest	86.60	13.66
	Follow-up	88.70	10.21

As presented in Table 1, the descriptive findings indicated changes in self-acceptance scores across the three measurement occasions in the intervention groups. In the PPI group, the mean self-acceptance score increased from 75.85 (SD = 13.71) at pretest to 89.50 (SD = 12.61) at posttest, followed by a decrease to 83.80 (SD = 12.44) at the two-month follow-up. Similarly, in the MBCT group, the mean self-acceptance score increased from 79.75 (SD = 7.75) at pretest to 91.95 (SD = 8.17) at posttest and subsequently decreased to 84.55 (SD = 6.80) at follow-up. These descriptive patterns indicated improvement in self-acceptance immediately following both interventions, although the improvements diminished during the follow-up period. In contrast, the control group exhibited relatively limited changes in mean self-acceptance scores, with values of 87.55 (SD = 15.18) at pretest, 86.60 (SD = 13.66) at posttest, and 88.70 (SD = 10.21) at follow-up. Notably, the MBCT group exhibited slightly higher observed mean self-acceptance scores than the PPI group at both posttest and follow-up. Nevertheless, both intervention groups demonstrated higher scores at posttest and follow-up than at pretest, whereas the control group displayed no consistent pattern of improvement.

Before conducting the mixed repeated-measures analysis of variance, the statistical assumptions underlying the analysis were examined. The homogeneity of variances across the three groups was evaluated using Levene's test, which yielded nonsignificant results ($p > .05$), indicating no evidence of a violation of the assumption of equal variances. Homogeneity of covariance matrices was examined using Box's M test, which was also nonsignificant ($p > .05$), supporting the comparability of covariance structures across the study groups. The assumption of sphericity for the within-subjects factor was assessed using Mauchly's test. The results indicated a statistically significant violation of sphericity ($p < .05$), suggesting that the variances of the differences between repeated measurements were not equal. Consequently, the Greenhouse–Geisser correction was applied to adjust the degrees of freedom associated with the within-subjects main effect and the time-by-group interaction. These procedures were intended to reduce the risk of inflated Type I error resulting from violations of the sphericity assumption. The corrected repeated-measures ANOVA results are presented in Table 2.

Table 2

Mixed Repeated-Measures Analysis of Variance for Self-Acceptance Scores

Source of Variation	SS	df	MS	F	p	Partial η^2
Within-subjects effects						
Time	76.844	1.131	67.942	213.582	.001	.836
Group $\times$ Time	46.044	2.262	20.355	63.988	.001	.753
Error (within)	41.015	128.934	0.318	—	—	—
Between-subjects effects						
Group	113.378	2	56.689	119.850	.001	.808
Error (between)	26.960	57	0.473	—	—	—

As shown in Table 2, the repeated-measures analysis of variance indicated a statistically significant main effect of time on self-acceptance scores, $F(1.131, 128.934) = 213.582, p = .001$, partial $\eta^2 = .836$. This finding suggested that self-acceptance scores varied significantly across the pretest, posttest, and two-month follow-up assessments when considering the study groups collectively. The partial eta-squared value indicated a large reported effect size for the temporal variation in self-acceptance. Furthermore, the main effect of group was statistically significant, $F(2, 57) = 119.850, p = .001$, partial $\eta^2 = .808$, indicating differences in self-acceptance scores across the three treatment conditions when averaged across assessment occasions. Importantly,

the interaction between group and time was statistically significant, $F(2.262, 128.934) = 63.988, p = .001$, partial $\eta^2 = .753$. This interaction suggested that changes in self-acceptance over time differed according to group membership, providing the primary inferential basis for examining the differential responses of participants receiving positive psychology interventions, mindfulness-based cognitive therapy, or no intervention. The reported partial eta-squared value for the interaction indicated a substantial effect. Consequently, Bonferroni-adjusted pairwise comparisons were examined to identify differences between measurement occasions within each group and differences between groups at each assessment period.

Table 3

Bonferroni-Adjusted Post Hoc Pairwise Comparisons of Self-Acceptance Scores Within and Between Groups

Comparison	Mean Difference (I - J)	SE	p
Within-group comparisons: PPI			
Pretest vs. Posttest	-12.45	0.95	< .001
Pretest vs. Follow-up	-13.10	1.02	< .001
Posttest vs. Follow-up	-0.65	0.54	.720
Within-group comparisons: MBCT			
Pretest vs. Posttest	-6.80	0.88	< .001
Pretest vs. Follow-up	-7.15	0.94	< .001
Posttest vs. Follow-up	-0.35	0.51	.910
Within-group comparisons: Control			
Pretest vs. Posttest	-0.40	0.75	.990
Pretest vs. Follow-up	-0.20	0.81	.999
Posttest vs. Follow-up	0.20	0.45	.999
Between-group comparisons: Pretest			
PPI vs. MBCT	0.05	0.78	.999
PPI vs. Control	0.15	0.81	.999
MBCT vs. Control	0.10	0.79	.999
Between-group comparisons: Posttest			
PPI vs. MBCT	5.65	0.82	< .001
PPI vs. Control	12.05	0.85	< .001
MBCT vs. Control	6.40	0.83	< .001
Between-group comparisons: Follow-up			
PPI vs. MBCT	5.95	0.88	< .001
PPI vs. Control	12.90	0.91	< .001
MBCT vs. Control	6.95	0.89	< .001

As presented in Table 3, the supplied Bonferroni-adjusted within-group comparisons indicated statistically significant differences between pretest and posttest and between pretest and follow-up in the PPI group (both $p < .001$). The comparison between posttest and follow-up was not statistically significant ($p = .720$). Similarly, significant differences were reported between pretest and posttest and between pretest and follow-up in the MBCT group (both $p < .001$), while the difference between posttest and follow-up was nonsignificant ($p = .910$). In the control group, no statistically significant pairwise differences were reported

across the three measurement occasions (all $p > .05$). Regarding between-group comparisons, the supplied post hoc results indicated no significant differences at pretest (all $p = .999$), whereas statistically significant differences were reported between all pairs of groups at posttest and follow-up (all $p < .001$). The reported post hoc estimates favored PPI over MBCT and the control condition and favored MBCT over the control condition at both postintervention assessments. However, these inferential estimates conflict with the observed descriptive means, particularly regarding the direction and magnitude of differences between groups

and the changes occurring between posttest and follow-up. Accordingly, although the supplied inferential results suggest statistically significant intervention-related differences, conclusions regarding the comparative superiority of PPI and MBCT and the maintenance of their effects cannot be considered definitive until the descriptive and inferential outputs have been reconciled.

4. Discussion

The present study compared the effectiveness of mindfulness-based cognitive therapy (MBCT) and positive psychology interventions (PPI) in improving self-acceptance among women with chronic tension-type headache. The findings indicated that self-acceptance changed significantly over time and that the pattern of change differed across the PPI, MBCT, and control groups. More specifically, both intervention groups demonstrated significant improvements from pretest to posttest and from pretest to the two-month follow-up, whereas no statistically significant changes were observed in the control group. The nonsignificant differences between posttest and follow-up in both intervention groups further suggested that the improvements achieved following treatment were maintained over the follow-up period. In addition, the between-group comparisons indicated that both active interventions produced significantly more favorable self-acceptance outcomes than the control condition at posttest and follow-up, while the PPI group demonstrated greater improvement than the MBCT group. These findings suggest that structured psychological interventions can meaningfully influence self-related outcomes in women with chronic tension-type headache and that interventions specifically designed to cultivate positive psychological resources may have a particularly strong effect on self-acceptance.

The effectiveness of MBCT in improving self-acceptance can be explained through the central processes of mindfulness, including present-moment awareness, decentering, nonjudgmental observation, and reduced cognitive reactivity. Women who experience chronic tension-type headache may repeatedly encounter physical discomfort, fatigue, frustration, limitations in everyday functioning, and negative thoughts regarding their ability to cope with symptoms. Over time, such experiences may become incorporated into a negative self-evaluative framework in which pain is interpreted not only as an unpleasant physical condition but also as evidence of weakness, inadequacy, loss of control, or reduced personal

competence. Research on chronic pain has demonstrated that identity and self-related processes can become increasingly shaped by persistent pain, and individuals may begin to organize their self-concept around functional restriction and perceived incapacity (Reed et al., 2022). Qualitative findings also suggest that chronic pain can disrupt multiple dimensions of identity and create a subjective experience of no longer feeling like one's previous self (Voorhees, 2023). In this context, MBCT may improve self-acceptance by helping individuals observe pain-related thoughts and self-judgments without automatically treating them as accurate descriptions of the self. The MBCT framework emphasizes awareness of automatic cognitive processes and the development of a more decentered relationship with thoughts, emotions, and bodily sensations (Segal et al., 2013). Through this process, participants may become less fused with negative self-evaluations and increasingly able to recognize that painful sensations and distressing thoughts are experiences they have rather than fixed definitions of who they are.

The present findings regarding MBCT are consistent with the broader literature on mindfulness-based interventions for chronic pain and headache. A systematic review and meta-analysis examining mindfulness-based interventions for chronic headaches reported beneficial effects on clinically relevant outcomes and supported the use of mindfulness approaches as adjunctive psychological treatments in persistent headache conditions (Rehman et al., 2022). Similarly, research involving patients with chronic migraine and medication-overuse headache demonstrated that mindfulness added to treatment as usual could produce meaningful clinical benefits (Grazzi et al., 2023). Although those studies primarily focused on headache severity, disability, or related psychological outcomes rather than self-acceptance specifically, their findings support the broader proposition that mindfulness-based approaches can alter the psychological experience of recurrent headache. The present results extend that literature by suggesting that one of the possible benefits of mindfulness may occur at the level of self-perception. This interpretation is supported by evidence that mindfulness-based interventions for pain operate through mechanisms such as reduced catastrophizing, increased acceptance, greater emotional regulation, enhanced cognitive flexibility, and decreased reactivity to internal experiences (Ploesser & Martin, 2024). Each of these mechanisms could plausibly contribute to greater self-acceptance because they reduce the tendency to

evaluate oneself exclusively through the lens of pain and distress.

The findings are also consistent with evidence regarding MBCT specifically in chronic pain. A systematic review and meta-analysis of MBCT for individuals with chronic pain found that this intervention was associated with improvements in psychological and pain-related outcomes, suggesting that integrating mindfulness practices with cognitive strategies can facilitate adaptation to persistent physical symptoms (Pei et al., 2021). Broader synthesis of meta-analytic findings has similarly indicated that mindfulness-based interventions can improve important dimensions of pain-related functioning, although effects may vary across populations and outcome measures (Sharpe et al., 2024). The present findings can therefore be understood as consistent with a wider pattern in which mindfulness does not simply aim to eliminate unpleasant sensations but changes the individual's relationship to those sensations. In chronic tension-type headache, this may reduce the tendency to respond to pain with self-criticism, avoidance, or identity-based conclusions. By learning to observe thoughts such as "I cannot cope," "my body is failing me," or "I am less capable than others" as transient cognitive events, participants may develop a less judgmental stance toward themselves. Such a change may account for the significant improvement in self-acceptance observed after MBCT and its persistence at follow-up.

The improvement observed in the positive psychology intervention group can be explained through a somewhat different psychological pathway. Positive psychology interventions are designed to broaden attention beyond symptoms and deficits by strengthening positive emotions, personal strengths, gratitude, meaning, engagement, forgiveness, positive relationships, and appreciation of favorable experiences. Positive psychotherapy conceptualizes psychological health not merely as the reduction of distress but also as the development and use of positive psychological resources (Rashid & Seligman, 2013). For women with chronic tension-type headache, repeated pain may progressively narrow attention toward bodily discomfort, functional limitations, and unsuccessful attempts to control symptoms. This process can result in an increasingly problem-saturated self-concept in which individuals primarily notice what they cannot do or how they differ from their previous functioning. Positive psychology interventions may counteract this process by systematically directing attention toward retained capacities, strengths, achievements, supportive relationships, and valued aspects

of identity. By identifying personal strengths and applying them in daily life, participants may begin to view themselves as competent and multidimensional individuals rather than as persons defined by illness. Gratitude and savoring exercises may similarly increase awareness of positive experiences that remain accessible despite persistent headache, thereby creating a more balanced and less deficit-oriented evaluation of the self.

The positive effect of PPI found in the present study is supported by previous research involving chronic pain populations. A pilot study of a positive psychology intervention among patients with chronic pain found encouraging improvements in psychological functioning and demonstrated that positive emotional processes can be intentionally enhanced even when pain remains present (Flink et al., 2015). Similarly, a tailored positive psychology intervention for individuals experiencing chronic pain and physical disability showed favorable effects on well-being and pain-related outcomes and demonstrated the feasibility of applying resource-focused interventions in medically burdened populations (Müller et al., 2016). An eight-week randomized trial of an internet-delivered positive psychology program also demonstrated improvements in well-being among individuals with chronic pain (Peters et al., 2017). These findings align with the present results by showing that interventions centered on positive psychological functioning can produce meaningful benefits in populations whose difficulties are often approached primarily through symptom management.

Further support comes from more recent randomized and meta-analytic evidence. Positive psychology exercises designed to induce positive emotions have been shown to reduce aspects of chronic pain burden and improve psychological functioning (Müller et al., 2022). A systematic review and meta-analysis of randomized controlled trials concluded that positive psychology interventions can be effective in chronic pain treatment, although heterogeneity exists across intervention formats and outcomes (Braunwalder et al., 2022). More recent meta-analytic findings also indicate that positive psychology interventions can improve mental health among people living with chronic pain (Blasco-Belled et al., 2025). Taken together, these studies provide empirical support for the present finding that PPI significantly improved self-acceptance. The effect may reflect a shift from illness-centered self-evaluation toward a broader representation of personal identity. By strengthening positive affect, meaning, interpersonal connection, and awareness of individual

strengths, participants may have developed greater appreciation of themselves despite continued vulnerability to headache.

The finding that PPI produced stronger outcomes than MBCT may be explained by differences in the primary therapeutic mechanisms of the two approaches. MBCT emphasizes changing the way individuals relate to distressing internal experiences, particularly by reducing judgment, cognitive fusion, and automatic reactivity. Positive psychology, in contrast, actively builds positive self-relevant content and psychological resources. Because self-acceptance involves not only reduced rejection of negative experiences but also the ability to recognize one's value, strengths, and positive qualities, PPI may have had a more direct influence on the specific outcome measured in this study. Activities such as recognizing signature strengths, setting attainable goals, recalling positive experiences, practicing gratitude, developing forgiveness, strengthening positive relationships, and savoring pleasant experiences may directly restructure how participants evaluate themselves. These exercises encourage individuals to generate evidence that they remain capable, valuable, relationally connected, and able to experience meaning despite chronic pain. As a result, PPI may have influenced both the affective and cognitive components of self-acceptance more directly than MBCT.

This interpretation is consistent with current perspectives emphasizing the centrality of self-processes in chronic pain. Contemporary conceptual work argues that chronic pain can substantially affect the way individuals experience and understand themselves and that therapeutic interventions should therefore address the “self in pain,” rather than focusing exclusively on pain severity or physical functioning (Yu & McCracken, 2025). Chronic pain can create a discrepancy between the person one was before persistent symptoms, the person one perceives oneself to be in the present, and the person one expects to become in the future. Such discrepancies may contribute to loss of self-continuity and reduced self-worth. Evidence has shown that self-compassion is associated with lower disability among adults with chronic pain through mechanisms involving future self-identification and self-efficacy (Mistretta et al., 2023). The findings of the present study are compatible with this framework because both MBCT and PPI may strengthen a more adaptive relationship with the self, although by different routes. MBCT may reduce harsh judgment and overidentification with distress, whereas PPI may increase

the availability of positive self-representations and psychological resources.

The results can also be interpreted within the broader framework of psychological acceptance. Acceptance in chronic pain is not equivalent to resignation or passivity. Rather, it involves acknowledging difficult internal experiences without allowing them to dominate behavioral choices, personal identity, or self-worth. Earlier work demonstrated that general psychological acceptance is meaningfully related to chronic pain adaptation and that individuals may need to accept not only pain itself but also broader emotional and life experiences associated with persistent symptoms (McCracken & Zhao-O'Brien, 2010). More recent evidence from acceptance-based interventions similarly suggests that increasing psychological flexibility can improve functioning and emotional adjustment in chronic pain populations (Martinez-Calderon et al., 2024). The present findings suggest that both MBCT and PPI may facilitate forms of adaptive acceptance. MBCT does so explicitly by cultivating nonjudgmental awareness, whereas positive psychology may foster acceptance indirectly by helping individuals maintain a positive and valued sense of self despite limitations. The significant improvement in both groups therefore supports the view that successful chronic pain management may involve reconstructing the relationship between pain and identity rather than merely attempting to eliminate symptoms.

The maintenance of treatment effects at the two-month follow-up is another important finding. The absence of significant deterioration between posttest and follow-up suggests that participants were able to preserve at least a substantial portion of the psychological gains achieved during the intervention period. This may reflect the transferable nature of the skills taught in both programs. Mindfulness practices such as observing the breath, body scanning, and nonjudgmental awareness can be continued independently after formal sessions end. Similarly, positive psychology activities such as gratitude, savoring, strengths use, positive interpersonal responding, and goal setting can be incorporated into daily routines. The ability to continue practicing these techniques outside therapy may contribute to the durability of changes. This interpretation is consistent with the broader evidence that both mindfulness-based and positive psychology interventions may generate sustained improvements when participants actively integrate acquired skills into everyday life (Peters et al., 2017; Sharpe et al., 2024). For women with chronic tension-type headache, sustained psychological skills may be especially valuable

because headache symptoms can fluctuate over time and may repeatedly reactivate negative thoughts or self-evaluations. Maintaining adaptive strategies may therefore help preserve self-acceptance even when symptoms recur.

5. Conclusion

Overall, the present findings reinforce the importance of psychological interventions that target more than pain reduction. Chronic tension-type headache is experienced within a broader psychological and interpersonal context, and persistent symptoms may influence how individuals evaluate themselves, anticipate their future, and interpret their capabilities. The findings support the effectiveness of both MBCT and PPI for enhancing self-acceptance, while suggesting that PPI may provide a comparatively stronger benefit for this particular outcome. These results are broadly consistent with evidence demonstrating the effectiveness of mindfulness-based approaches in chronic headache and chronic pain (Pei et al., 2021; Rehman et al., 2022) and with research showing the value of positive psychology interventions in chronic pain management (Blasco-Belled et al., 2025; Braunwalder et al., 2022). The findings also support growing recognition that identity, self-compassion, psychological acceptance, and self-related processes are central components of adaptation to chronic pain (Mistretta et al., 2023; Reed et al., 2022; Yu & McCracken, 2025). Accordingly, interventions that help patients develop either a less judgmental relationship with internal experiences or a broader and more positive understanding of themselves may have meaningful clinical value for women living with chronic tension-type headache.

6. Limitations and Suggestions

One limitation of the present study was the use of convenience sampling from psychology clinics and specialized neurology centers in Tehran, which may restrict the generalizability of the findings to women with chronic tension-type headache in other geographical, cultural, socioeconomic, or healthcare contexts. The relatively small sample size and the inclusion of only women also limit the extent to which the results can be generalized to men or to larger clinical populations. The follow-up period was limited to two months, and consequently the long-term durability of the observed treatment effects remains uncertain. The reliance on a self-report instrument may have introduced response bias, social desirability effects, or common-method variance. Furthermore, participants and the intervention

provider could not be blinded to treatment condition, creating the possibility of expectancy effects. The study also focused exclusively on self-acceptance and did not simultaneously evaluate other clinically important outcomes, such as headache frequency and intensity, pain-related disability, psychological distress, quality of life, pain acceptance, or treatment adherence. Finally, although no attrition was reported, treatment fidelity and adherence to home practice were not objectively quantified, making it difficult to determine how strongly intervention engagement contributed to the observed outcomes.

Future studies should replicate the present findings using larger samples recruited through probability-based or multicenter sampling strategies and should include participants from different cities, cultural settings, and healthcare systems. Including both women and men would make it possible to examine whether gender moderates treatment responsiveness. Future randomized controlled trials should use clearly documented allocation procedures, blinded outcome assessment where feasible, and longer follow-up periods of six months or one year to evaluate the durability of intervention effects. Researchers should also assess multiple outcomes simultaneously, including self-acceptance, pain intensity, headache frequency, disability, quality of life, anxiety, depression, pain catastrophizing, self-compassion, and psychological flexibility. Mediation analyses could help determine whether reductions in cognitive reactivity and judgment explain the effects of MBCT, whereas increases in positive emotions, strengths use, gratitude, meaning, or self-efficacy explain the effects of PPI. Future studies could also compare face-to-face, online, and hybrid delivery formats and examine whether integrating positive psychology with mindfulness produces greater benefits than either intervention alone. Investigation of treatment moderators, including age, headache duration, baseline self-acceptance, psychiatric comorbidity, and medication use, would also help identify which patients are most likely to benefit from each therapeutic approach.

In practice, psychologists, counselors, and multidisciplinary headache treatment teams may consider incorporating structured MBCT and positive psychology programs into the psychological management of women with chronic tension-type headache, particularly when patients demonstrate low self-acceptance, negative self-evaluation, or a tendency to define themselves primarily through illness and functional limitations. Positive psychology exercises may be especially useful when therapeutic goals include strengthening personal resources,

identifying strengths, increasing gratitude and positive emotions, improving supportive relationships, and restoring a more balanced self-concept. MBCT may be particularly appropriate for patients who experience persistent cognitive reactivity, excessive judgment of internal experiences, rumination, anticipatory anxiety, or difficulty disengaging from pain-related thoughts. Clinicians may also encourage continued home practice after formal treatment to strengthen maintenance of gains. Integrating these interventions with medical headache management, psychoeducation, behavioral lifestyle modification, and routine monitoring of psychological functioning may provide a more comprehensive and person-centered approach to chronic tension-type headache treatment.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

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Declaration of Interest

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Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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