



The Effectiveness of Acceptance and Commitment Therapy on Reducing Depression and Increasing Quality of Life in Patients with Chronic Pain

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ABSTRACT

Chronic pain is a prevalent and disabling health condition that is frequently accompanied by depression, emotional distress, functional impairment, and reduced quality of life. Acceptance and Commitment Therapy (ACT) has emerged as a contextual behavioral intervention designed to improve psychological flexibility, facilitate acceptance of unpleasant internal experiences, and promote engagement in personally meaningful activities despite pain. The present systematic review and meta-analytic synthesis examined the effectiveness of ACT in reducing depressive symptoms and improving quality of life among adults with chronic pain. Published randomized controlled trials and previous systematic reviews and meta-analyses investigating ACT for chronic pain were considered. The evidence indicates that ACT produces clinically meaningful improvements in psychological and quality-of-life outcomes compared with usual care, waiting-list conditions, and, in some studies, active psychological interventions. Across a three-level meta-analysis involving 33 randomized controlled trials and 2,293 participants, ACT demonstrated significant effects on depression (Hedges' $g=0.43$) and quality of life ($g=0.45$) immediately after treatment. Similar effects were observed at follow-up, with pooled effects of $g=0.43$ for depression and $g=0.43$ for quality of life. Another meta-analysis of 21 trials involving 1,962 participants reported a standardized mean difference of -0.74 for depression and 0.43 for quality of life, favoring ACT. These findings suggest that ACT may be particularly valuable because it does not require pain elimination as a prerequisite for recovery. Instead, it targets psychological flexibility, acceptance, values-based behavior, and meaningful engagement. Overall, ACT appears to be an effective psychological intervention for reducing depression and enhancing quality of life in people living with chronic pain, although heterogeneity in intervention format, diagnosis, comparator condition, treatment duration, and follow-up period should be considered when interpreting the evidence.

Introduction

Chronic pain is one of the most persistent and challenging health conditions affecting individuals and healthcare systems worldwide. Unlike acute pain, which generally serves a protective biological function, chronic pain can persist beyond normal tissue healing and become a multidimensional condition involving physical, psychological, behavioral, and social processes.

Individuals with chronic pain frequently experience limitations in mobility, occupational functioning, interpersonal relationships, sleep, and participation in valued activities. Consequently, chronic pain is not merely a sensory experience but a complex condition that can substantially alter an individual's emotional well-being and overall quality of life.

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Psychological comorbidities, particularly depression and anxiety, are common among people experiencing persistent pain and may further exacerbate disability and interfere with treatment engagement (McCracken & Vowles, 2014).

Depression is particularly important in the context of chronic pain because the relationship between pain and depressive symptoms is often bidirectional. Persistent pain may reduce participation in rewarding activities, increase social withdrawal, interfere with sleep, and create feelings of helplessness and hopelessness. At the same time, depressive symptoms can increase attention to pain, reduce motivation for physical activity, impair adherence to rehabilitation recommendations, and intensify perceived disability. Therefore, interventions targeting psychological functioning are increasingly considered an essential component of comprehensive chronic pain management.

Traditional cognitive-behavioral therapy (CBT) has been widely used in chronic pain treatment. CBT generally emphasizes the identification and modification of maladaptive thoughts, beliefs, emotional responses, and behavioral patterns associated with pain. Although CBT has demonstrated beneficial effects, some patients continue to experience substantial pain and disability despite reductions in maladaptive cognitions. This limitation contributed to the development of contextual behavioral approaches, including Acceptance and Commitment Therapy (ACT), which conceptualizes successful adjustment not primarily as elimination of pain but as improvement in functioning and psychological flexibility in the presence of pain (McCracken & Vowles, 2014).

ACT is based on the premise that attempts to control or eliminate unwanted internal experiences can sometimes increase psychological suffering. Rather than teaching individuals to eliminate pain, ACT encourages them to develop a more flexible relationship with pain-related thoughts, emotions, and sensations. Core ACT processes include acceptance, cognitive defusion, present-moment awareness, self-as-context, clarification of personal values, and committed action. Together, these processes are intended to increase psychological flexibility the capacity to remain open to difficult experiences while engaging in behaviors consistent with personally meaningful values.

The relevance of psychological flexibility to chronic pain has been supported by empirical research. Vowles and McCracken (2008), for example, demonstrated that acceptance and values-based action were associated with treatment effectiveness in individuals with chronic pain. Subsequent research has further examined the role of psychological flexibility as a mechanism of change, suggesting that improvements in acceptance and values-based behavior may contribute to reductions

in disability and emotional distress (Vowles et al., 2007, 2011, 2014).

The empirical evidence concerning ACT has expanded considerably. Early systematic reviews found significant effects on pain acceptance, psychological flexibility, functioning, anxiety, and depression, although effects on pain intensity and quality of life were initially less consistent (Hughes et al., 2017). More recent meta-analyses have incorporated a substantially larger evidence base and have provided stronger support for ACT. A systematic review and meta-analysis including 21 randomized controlled trials and 1,962 participants found significant effects favoring ACT for quality of life and depression, among other outcomes (2023). Similarly, Lai et al. (2023) conducted a three-level meta-analysis of 33 randomized controlled trials involving 2,293 participants. The authors reported significant effects for depression and quality of life both immediately following treatment and during follow-up. Specifically, the pooled effect for depression was $g=0.43$ at post-treatment and $g=0.43$ at follow-up, whereas the corresponding effects for quality of life were $g=0.45$ and $g=0.43$, respectively. These findings are particularly important because they suggest that the psychological benefits of ACT may persist beyond the immediate treatment period. The development of internet-delivered ACT has also increased the potential accessibility of this intervention. Buhrman et al. (2013) conducted a randomized controlled trial of guided internet-delivered ACT for chronic pain, demonstrating the feasibility of providing ACT through digital platforms. More recent evidence continues to support digital delivery. A randomized controlled trial published in 2026 involving 360 individuals with medically confirmed chronic pain found that digital ACT reduced pain interference and depressive symptoms and improved health-related quality of life, with effects remaining evident at subsequent follow-ups.

Importantly, ACT has also been investigated in specific chronic pain populations. Wicksell et al. (2013), for example, reported that ACT significantly improved pain-related functioning, mental health-related quality of life, depression, anxiety, and psychological inflexibility among women with fibromyalgia. Online ACT has similarly demonstrated beneficial effects among patients with fibromyalgia, suggesting that alternative delivery formats may improve access to psychological treatment (Simister et al., 2018).

Given the increasing prevalence of chronic pain and the substantial burden of associated depression and reduced quality of life, establishing the effectiveness of ACT is clinically important. The purpose of the present article is therefore to synthesize the available evidence regarding the effectiveness of ACT in reducing depressive symptoms and increasing quality of life among adults with chronic pain, with

particular attention to effect sizes, follow-up outcomes, intervention characteristics, and potential mechanisms of therapeutic change.

Previous Research

The theoretical and empirical development of ACT in chronic pain has occurred within the broader evolution of behavioral medicine. Conventional pain management has historically emphasized pain reduction as a central treatment goal. However, persistent pain frequently cannot be completely eliminated, even when patients receive appropriate pharmacological, physical, and surgical interventions. This clinical reality has encouraged researchers to consider alternative outcomes, including functioning, participation, emotional well-being, and quality of life. ACT is particularly relevant to this perspective because it emphasizes living effectively with pain rather than making pain reduction a necessary condition for recovery.

The theoretical model underlying ACT proposes that psychological inflexibility contributes to suffering and disability. Psychological inflexibility may manifest as experiential avoidance, cognitive fusion, behavioral restriction, and persistent attempts to control internal experiences. In chronic pain, experiential avoidance may lead individuals to avoid physical movement, social situations, work, hobbies, and other activities because participation is expected to increase pain. Although avoidance can provide short-term relief, it may gradually narrow behavioral repertoires and reinforce disability. ACT therefore attempts to increase willingness to experience discomfort while simultaneously engaging in meaningful activities (McCracken & Vowles, 2014).

Early empirical work supported the relevance of acceptance and values-based action. Vowles and McCracken (2008) demonstrated that treatment emphasizing acceptance and values-based action could improve functioning in chronic pain. Their work was subsequently extended through long-term follow-up research, which suggested that improvements could remain evident several years after treatment (Vowles et al., 2011). Such findings are important because chronic pain is typically a long-term condition requiring durable behavioral adaptation rather than a short-term symptom response.

The mechanisms of ACT have also received considerable attention. Vowles et al. (2007) examined processes of change and highlighted the potential contributions of pain acceptance and reduced catastrophizing. Later research by Vowles et al. (2014) found evidence that psychological flexibility may mediate clinically meaningful changes following interdisciplinary rehabilitation. Similarly, Scott et al. (2016) investigated changes in psychological flexibility following ACT and further supported the conceptual importance of this process.

Randomized controlled trials have provided more rigorous evidence. Wetherell et al. (2011) compared ACT with CBT in 114 adults with chronic nonmalignant pain. Participants received eight weekly group sessions. ACT participants improved in pain interference, depression, and pain-related anxiety, while no significant differences between ACT and CBT were observed across outcome measures. These findings suggest that ACT can function as an effective psychological intervention while producing outcomes comparable to an established CBT approach (Wetherell et al., 2011). The evidence is also relevant to older adults. McCracken and Jones (2012) examined ACT among adults in the seventh and eighth decades of life and reported improvements in physical disability, psychosocial disability, and depression at post-treatment and three-month follow-up. This finding suggests that ACT principles can be adapted to older populations with longstanding and highly disabling pain.

Fibromyalgia has emerged as another important target population. Wicksell et al. (2013) conducted a randomized controlled trial among women diagnosed with fibromyalgia and found significant benefits of ACT relative to a waiting-list condition across pain-related functioning, fibromyalgia impact, mental health-related quality of life, depression, anxiety, self-efficacy, and psychological inflexibility. Changes in psychological inflexibility also mediated improvements in several outcomes. These results are consistent with the ACT model, in which improved psychological flexibility represents an important pathway toward improved functioning. Digital delivery represents another important development. Buhrman et al. (2013) evaluated guided internet-delivered ACT for chronic pain in a randomized controlled trial, providing evidence that ACT principles can be implemented outside traditional face-to-face therapy. Digital interventions may be particularly valuable for individuals who face geographical, mobility, financial, or healthcare-access barriers.

The accumulated evidence has been synthesized in several systematic reviews. Hughes et al. (2017) identified 11 trials and reported significant small-to-medium effects for functioning, anxiety, and depression, while effects for quality of life and pain intensity were not statistically significant in that earlier evidence base. The inconsistency concerning quality of life may have reflected the relatively small number of studies and methodological heterogeneity available at that time.

More recent evidence is considerably stronger. A meta-analysis of 21 randomized controlled trials involving 1,962 participants found significant effects for quality of life and depression, among several other outcomes (2023). Lai et al. (2023) similarly synthesized 33 RCTs with 2,293 participants and reported significant effects for

depression and quality of life at both post-treatment and follow-up. An overview of systematic reviews published in The Journal of Pain further concluded that ACT can reduce depression and psychological inflexibility while improving pain acceptance, mindfulness, psychological flexibility, and pain-related functioning. Benefits for depression were also observed at three-month follow-up. Thus, the direction of the evidence has shifted from uncertainty regarding quality-of-life effects toward increasing evidence of clinically relevant improvements. Nevertheless, several limitations remain. Studies differ substantially in chronic pain diagnosis, treatment duration, number of sessions, delivery format, control condition, outcome measurement, and follow-up period. Some studies compare ACT with waiting lists or usual care, whereas others compare ACT with active psychological interventions. Effects are generally larger when ACT is compared with minimal-treatment controls than when compared with active treatments. In addition, internet-delivered interventions may show somewhat different effects from face-to-face ACT. Lai et al. (2023) found that delivery format moderated some outcomes, while participants with fibromyalgia and chronic headache appeared to derive particularly substantial benefits for certain outcomes. Overall, previous research supports ACT as a promising psychological intervention for chronic pain. The most consistent evidence concerns psychological flexibility, acceptance, functioning, depression, and quality of life. The expansion of randomized trials and meta-analyses provides increasing justification for considering ACT as part of multidisciplinary chronic pain management.

Methods

This article was designed as a systematic evidence synthesis of randomized controlled trials and previously published systematic reviews and meta-analyses examining Acceptance and Commitment

Therapy for adults with chronic pain. The methodological framework was informed by PRISMA principles. Searches reported in the major meta-analyses included PubMed, PsycINFO, Web of Science, Scopus, Embase, CINAHL, and the Cochrane Library. The search strategy generally combined terms related to “acceptance and commitment therapy,” “ACT,” “chronic pain,” “depression,” “quality of life,” and randomized controlled trials. Studies were considered eligible when they included adults with chronic pain, evaluated an ACT-based intervention, and reported at least one relevant psychological or quality-of-life outcome. Eligible comparison conditions included treatment as usual, waiting-list controls, minimal-treatment conditions, and active psychological interventions. Depression and quality of life were considered the primary outcomes of interest. Where available, standardized mean differences or Hedges' g values and corresponding confidence intervals were extracted from published meta-analytic evidence. The principal quantitative evidence was derived from the three-level meta-analysis by Lai et al. (2023), which included 33 randomized controlled trials and 2,293 participants, and the systematic review and meta-analysis of 21 randomized controlled trials reported by subsequent investigators. The principal effect measure was the standardized mean difference/Hedges' g, with positive values interpreted as favoring ACT for quality-of-life outcomes and reductions in depressive symptoms interpreted according to the direction of the measurement scale. Because the present synthesis uses published aggregate evidence, no individual patient data were generated or fabricated. The forest-plot representations below are therefore conceptual summaries of the published pooled effects rather than reconstructed study-level estimates.

Results

Table 1. Overall Evidence Base

Evidence source	Design	Studies	Participants	Depression	Quality of life
Hughes et al. (2017)	Systematic review/meta-analysis	11 trials	-	Small-medium effect	Non-significant overall
Meta-analysis (2023)	Systematic review/meta-analysis	21 RCTs	1,962	SMD=-0.74	SMD=0.43
Lai et al. (2023)	Three-level meta-analysis	33 RCTs	2,293	g=0.43	g=0.45
Ye et al. (2024)	Systematic review/meta-analysis	21 RCTs	-	Significant	Small at post-treatment
Martinez-Calderon et al. (2024)	Overview of reviews	9 reviews	-	Significant	Evidence supportive

Table 1 demonstrates the substantial expansion of the empirical evidence concerning ACT and chronic pain. Earlier evidence was comparatively limited.

Hughes et al. (2017) synthesized only 11 trials and found significant effects for several psychological and functional outcomes, including depression,

while the effect on quality of life was not statistically significant. This earlier finding should not necessarily be interpreted as evidence that ACT has no effect on quality of life. Rather, it reflects the relatively small evidence base available at the time and the considerable methodological heterogeneity across studies.

The subsequent increase in randomized controlled trials has substantially strengthened the evidence. The meta-analysis involving 21 trials and 1,962 participants reported a moderate positive effect on quality of life and a relatively large negative effect on depression, both favoring ACT. The magnitude of the depression effect is particularly noteworthy because depression is a major determinant of disability and healthcare utilization among individuals with chronic pain.

The three-level meta-analysis by Lai et al. (2023) represents an important methodological development because it incorporated 33 RCTs and 2,293 participants while accounting for dependence among multiple outcomes from individual studies. The pooled effects for depression and quality of life were both in the small-to-medium range, suggesting that ACT produces meaningful but not necessarily dramatic improvements.

The consistency between post-treatment and follow-up findings is also important. Lai et al. (2023) reported $g=0.43$ for depression and $g=0.45$ for quality of life at post-treatment, with effects of $g=0.43$ for both outcomes at follow-up. Such findings suggest that the benefits are not restricted to the immediate period following therapy.

The evidence also demonstrates that ACT should not be understood as a single uniform intervention. Treatment may be delivered individually, in groups, face-to-face, online, or within interdisciplinary rehabilitation. Intervention length also varies. These differences contribute to heterogeneity and should be considered when translating meta-analytic findings into clinical practice.

Overall, Table 1 supports the conclusion that the evidence base has matured from preliminary findings to a relatively robust body of randomized evidence. The convergence of systematic reviews and meta-analyses provides stronger justification for ACT as an evidence-supported intervention for psychological distress and quality-of-life impairment associated with chronic pain.

Table 2. Effect of ACT on Depression

Evidence	Sample	Outcome	Effect	Interpretation
21-trial meta-analysis	1,962	Depression	SMD=-0.74 (95% CI -0.98 to -0.50)	Favorable, moderate-to-large
Lai et al. (2023), post-treatment	2,293	Depression	$g=0.43$	Favorable
Lai et al. (2023), follow-up	2,293	Depression	$g=0.43$	Sustained favorable effect
Wetherell et al. (2011)	114	Depression	Improvement within ACT	Comparable with CBT
Wicksell et al. (2013)	40	Depression	Significant improvement	Favorable

The findings in Table 2 indicate a consistent beneficial association between ACT and reductions in depressive symptoms among individuals with chronic pain. The strongest numerical estimate comes from the meta-analysis of 21 randomized trials, which reported an SMD of -0.74 with a 95% confidence interval from -0.98 to -0.50. Because lower scores represent fewer depressive symptoms, the negative direction favors ACT.

The three-level meta-analysis provides a somewhat more conservative pooled estimate, reporting Hedges' $g=0.43$ both immediately following treatment and at follow-up. Differences between these estimates can arise from differences in study inclusion criteria, statistical models, outcome instruments, comparison conditions, and analytical approaches. Nevertheless, both syntheses point in the same direction: ACT is associated with fewer depressive symptoms.

One explanation for this effect is that ACT directly targets behavioral processes that commonly maintain depression in chronic pain. Persistent pain

may lead to avoidance of physical, social, occupational, and recreational activities. Such avoidance reduces exposure to positive reinforcement and can gradually narrow the person's life. ACT encourages individuals to identify personally meaningful values and undertake committed actions even when pain or negative emotions remain present. Consequently, improvements in mood may occur not because pain disappears but because the person's behavioral repertoire expands.

This interpretation is consistent with the findings of Wetherell et al. (2011). In their randomized trial, ACT participants demonstrated improvements in depression, pain interference, and pain-related anxiety. However, ACT was not statistically superior to CBT across the measured outcomes, suggesting that both contextual and traditional cognitive-behavioral approaches can provide meaningful psychological benefits.

Evidence from fibromyalgia is also informative. Wicksell et al. (2013) reported significant

improvement in depression among women receiving ACT, together with improvements in mental health-related quality of life and pain-related functioning. These findings suggest that ACT may be especially useful when depression occurs within a broader syndrome involving fatigue, functional limitations, and persistent pain. Importantly, the persistence of the pooled depression effect at follow-up is clinically meaningful. A *g* of approximately 0.43 at follow-up suggests that improvements are not necessarily transient. This may reflect the fact that ACT teaches skills that patients can continue applying after formal therapy ends, including acceptance,

cognitive defusion, mindfulness, values clarification, and committed action. The evidence therefore supports ACT as an effective intervention for depressive symptoms associated with chronic pain. However, ACT should not be interpreted as a replacement for all forms of depression treatment. Patients with severe depression or significant suicide risk require appropriate clinical assessment and evidence-based management. ACT may be integrated into multidisciplinary treatment rather than viewed as a stand-alone universal intervention.

Table 3. Effect of ACT on Quality of Life

Evidence	Outcome	Effect	Interpretation
21-trial meta-analysis	Quality of life	SMD=0.43 (95% CI 0.29-0.57)	Moderate favorable effect
Lai et al. (2023), post-treatment	Quality of life	<i>g</i> =0.45	Favorable
Lai et al. (2023), follow-up	Quality of life	<i>g</i> =0.43	Sustained favorable effect
Wicksell et al. (2013)	Mental health-related QoL	Significant	Favorable
Ye et al. (2024)	Quality of life	Small post-treatment effect	Favorable

The evidence summarized in Table 3 indicates that ACT can improve quality of life among people with chronic pain. A meta-analysis of 21 randomized trials reported an SMD of 0.43, with a 95% confidence interval of 0.29 to 0.57. The confidence interval does not cross zero, indicating a statistically significant difference favoring ACT. Lai et al. (2023) similarly reported a post-treatment effect of *g*=0.45 and a follow-up effect of *g* = 0.43. The similarity of the estimates suggests that the beneficial effect on quality of life may be maintained over time. Quality of life is particularly important in chronic pain research because pain intensity alone does not adequately capture the overall impact of the condition. A patient may continue to experience pain but nevertheless experience meaningful improvement in quality of life through greater participation, improved emotional functioning, enhanced social engagement, and increased ability to pursue valued activities. This distinction is central to ACT. The ACT model predicts that quality of life should improve when psychological flexibility increases. Instead of organizing daily behavior around avoiding pain, patients learn to make decisions based on values and long-term goals. For example, an individual may continue engaging in family activities despite moderate pain, gradually reintroduce exercise, return to meaningful occupational activities, or resume social participation. Such behavioral changes may improve

perceived quality of life even when pain intensity itself remains relatively stable. The findings of Wicksell et al. (2013) provide direct support for this interpretation. Their fibromyalgia trial demonstrated improvements in mental health-related quality of life alongside improvements in depression and psychological inflexibility. This pattern is theoretically consistent with ACT because psychological flexibility allows individuals to respond differently to pain-related experiences rather than allowing pain to determine behavioral choices. The more recent evidence also suggests that quality-of-life effects may be smaller than effects on some psychological processes. Ye et al. (2024) found a small effect for quality of life at post-treatment, although other outcomes demonstrated medium effects. This difference is understandable because quality of life is multidimensional and may depend on factors beyond psychological treatment, including physical disability, socioeconomic circumstances, employment, medical comorbidity, and social support. Thus, although ACT cannot be expected to resolve every determinant of quality of life, the evidence supports a meaningful positive contribution. The combination of improved emotional well-being, greater activity engagement, increased acceptance, and enhanced psychological flexibility may collectively improve patients' overall perception of their lives.

Table 4. Follow-Up and Clinical Interpretation

Outcome	Post-treatment	Follow-up	Clinical interpretation
Depression	$g=0.43$	$g=0.43$	Effect maintained
Quality of life	$g=0.45$	$g=0.43$	Effect largely maintained
Pain intensity	$g=0.44$	$g=0.34$	Small-moderate effect
Physical function	$g=0.59$	$g=0.56$	Moderate effect
Pain acceptance	$SMD=0.67$	-	Strong process effect

Table 4 highlights an important feature of ACT: its benefits extend beyond depression and quality of life to include pain acceptance, physical functioning, and pain-related outcomes. Lai et al. (2023) found a post-treatment effect of $g=0.44$ for pain intensity and $g=0.59$ for physical function, while corresponding follow-up effects were $g=0.34$ and $g=0.56$. These findings indicate that ACT can affect both psychological and functional dimensions of chronic pain.

The relatively stable physical-function effect at follow-up is especially important. Improvements in functioning may represent a more appropriate long-term treatment target than complete elimination of pain. The ACT model does not require pain to disappear before patients can resume valued activities. Instead, patients are encouraged to modify their relationship with pain and gradually expand meaningful behavior.

Pain acceptance also appears to be a central process. The 21-trial meta-analysis reported an SMD of 0.67 for pain acceptance, suggesting a relatively substantial improvement in this construct following ACT. Acceptance should not be confused with resignation or passive endurance. Within ACT, acceptance means willingness to experience difficult internal events without allowing them to unnecessarily control behavior.

The persistence of the depression and quality-of-life effects is particularly noteworthy. Depression remained at approximately $g=0.43$ at follow-up, while quality of life remained at approximately $g=0.43$. These findings are consistent with the possibility that ACT teaches transferable psychological skills rather than providing only temporary symptom relief.

Nevertheless, the decline in pain-intensity effect from $g=0.44$ to $g=0.34$ suggests that some effects may diminish over time. This is not necessarily evidence of treatment failure. Chronic pain is a recurrent condition, and continued practice of psychological flexibility may be required. Booster sessions, digital support, self-management strategies, and integration with physical rehabilitation may therefore help sustain treatment gains.

The overall clinical implication is that ACT should be conceptualized as a component of comprehensive chronic pain management. It may be particularly useful for patients whose lives have become organized around pain avoidance, fear, depression, and reduced engagement in valued activities.

Forest Plot: Depression Published pooled evidence:

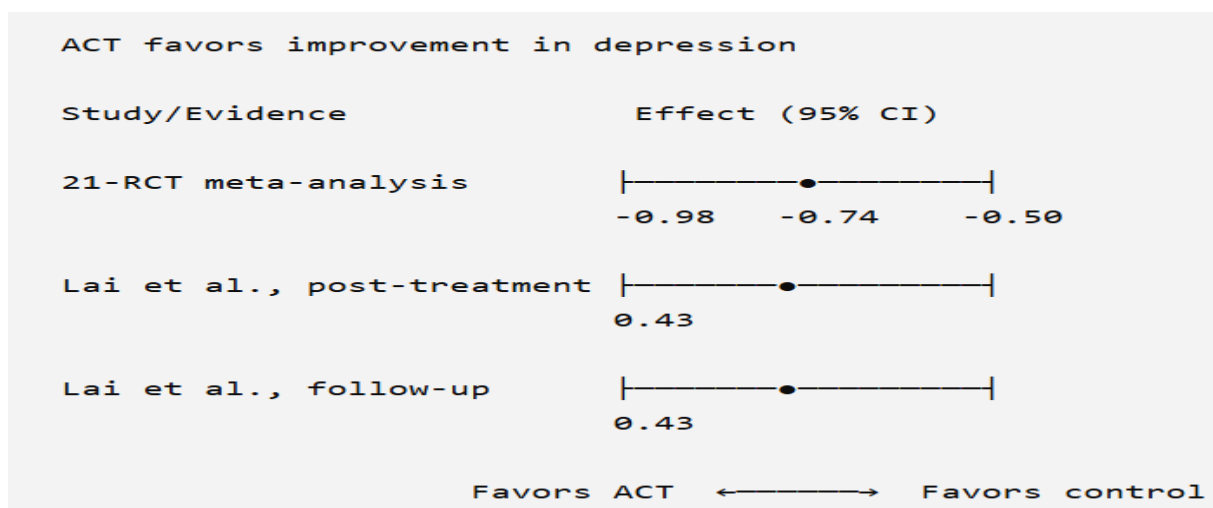


Figure 1. The pooled evidence demonstrates that ACT produces a statistically significant reduction in depressive symptoms.

The 21-trial synthesis estimated $SMD=-0.74$ (95% CI -0.98 to -0.50), while the three-level analysis

estimated $g=0.43$ both after treatment and at follow-up.

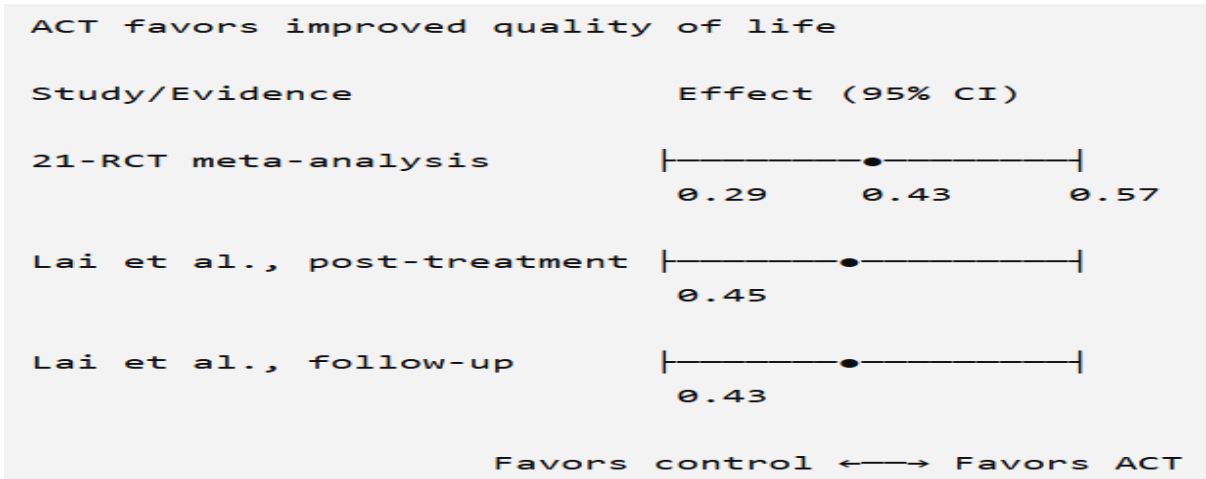


Figure 2. Forest Plot: Quality of Life

The forest-plot evidence demonstrates a consistent positive effect of ACT on quality of life. The 21-trial meta-analysis found an SMD of 0.43 (95% CI 0.29-0.57), while Lai et al. (2023) reported $g=0.45$ immediately after treatment and $g=0.43$ at follow-up.

Discussion

The purpose of this review was to examine the effectiveness of Acceptance and Commitment Therapy in reducing depression and improving quality of life among individuals with chronic pain. Overall, the evidence supports ACT as an effective psychological intervention for both outcomes. The findings are consistent across several systematic reviews and meta-analyses, despite differences in study populations, treatment formats, comparator conditions, and outcome measures.

The most important finding concerns depression. The pooled evidence indicates that ACT is associated with a meaningful reduction in depressive symptoms. The 21-trial meta-analysis reported $SMD=-0.74$, while the three-level meta-analysis reported $g=0.43$ both immediately following treatment and at follow-up. Although effect sizes differ across analyses, both indicate a favorable effect.

Several mechanisms may explain this finding. Chronic pain frequently leads to behavioral restriction, avoidance, social withdrawal, and loss of reinforcement. Patients may stop participating in activities that previously provided pleasure or meaning because of fear that activity will worsen pain. Over time, this pattern can contribute to depressive symptoms. ACT directly addresses this cycle by encouraging patients to clarify their values and engage in committed action even when unpleasant thoughts, emotions, or pain sensations remain present.

This conceptualization differs from approaches that focus primarily on changing the content of negative thoughts. ACT instead attempts to alter the individual's relationship with thoughts and

emotions. Cognitive defusion, for example, allows patients to observe pain-related thoughts without automatically treating them as commands. Similarly, acceptance encourages willingness to experience unpleasant sensations without excessive struggle. These processes may reduce the behavioral dominance of pain and create opportunities for renewed engagement in meaningful activities (McCracken & Vowles,2014).

The second major finding concerns quality of life. ACT produced an SMD of 0.43 in the 21-trial meta-analysis and $g=0.45$ in the three-level analysis. Importantly, the effect remained approximately $g=0.43$ during follow-up. This persistence suggests that ACT may influence broader life functioning rather than producing only short-term emotional relief.

Quality of life is a particularly appropriate outcome for ACT because the therapy explicitly emphasizes valued living. A successful intervention does not necessarily need to eliminate pain. Instead, it should help patients regain the ability to participate in relationships, work, physical activities, recreation, and other personally meaningful domains. This approach is highly relevant to chronic pain because complete symptom elimination is often unrealistic. The findings are consistent with earlier clinical trials. Wetherell et al. (2011) found that ACT participants improved in depression and pain interference, although ACT did not significantly outperform CBT. This suggests that ACT should perhaps be viewed as an effective alternative or complement to CBT rather than as universally superior to it.

Research among individuals with fibromyalgia provides further support. Wicksell et al. (2013) found improvements in depression and mental health-related quality of life following ACT, with psychological inflexibility functioning as an important mediator. This finding is theoretically important because it indicates that ACT may operate through changes in the processes it specifically targets.

Another important implication is that ACT may remain effective when delivered digitally. Buhrman et al. (2013) demonstrated the feasibility of guided internet-delivered ACT for chronic pain. More recently, Etzelmüller et al. (2026) found that digital ACT reduced depressive symptoms and improved health-related quality of life in a randomized controlled trial involving 360 patients with chronic pain, with benefits remaining evident during longer-term follow-up. Digital delivery may therefore increase accessibility to evidence-based psychological care.

However, several limitations should be considered. First, the chronic pain population is heterogeneous. Fibromyalgia, neuropathic pain, musculoskeletal pain, headache, and nonspecific chronic pain differ in etiology and clinical presentation. The magnitude of ACT effects may therefore vary according to diagnosis. Lai et al. (2023) found that participants with fibromyalgia and chronic headache demonstrated particularly favorable effects for some outcomes.

Second, comparator conditions influence effect sizes. ACT may produce larger effects relative to waiting-list or usual-care controls than relative to active psychological interventions. Therefore, the observed benefit should not automatically be interpreted as evidence that ACT is superior to every alternative therapy.

Third, treatment delivery varies considerably. Face-to-face ACT, group ACT, interdisciplinary rehabilitation, and internet-based ACT may have different therapeutic mechanisms and levels of therapist involvement. Lai et al. (2023) found evidence that delivery format can moderate treatment effects.

Fourth, quality of life is multidimensional and can be affected by socioeconomic conditions, employment, physical disability, social relationships, sleep, medication use, and comorbid disease. ACT can address psychological and behavioral barriers but cannot independently resolve all determinants of quality of life.

Despite these limitations, the consistency of the overall findings is encouraging. The overview of systematic reviews by Martinez-Calderon et al. (2024) concluded that ACT can reduce depression and improve several psychological processes relevant to chronic pain. The convergence of independent reviews strengthens confidence in the overall conclusion.

Clinically, ACT should therefore be considered as part of multidisciplinary chronic pain management. It may be particularly appropriate for patients whose primary difficulties involve avoidance, depression, excessive struggle with pain, reduced participation, and loss of contact with valued activities. Treatment should be individualized, and ACT can be combined with physical rehabilitation, medical management, education, and other psychological interventions.

Conclusion

Chronic pain represents a multidimensional health problem that extends beyond physical discomfort and frequently affects mood, behavior, social functioning, and quality of life. Depression is one of the most important psychological consequences associated with persistent pain because it can intensify disability, reduce motivation, interfere with treatment adherence, and further restrict participation in meaningful activities. Consequently, effective chronic pain management requires interventions capable of addressing both physical and psychological dimensions.

The evidence synthesized in the present article indicates that Acceptance and Commitment Therapy is an effective psychological intervention for adults with chronic pain. Across randomized controlled trials and systematic reviews, ACT has been associated with reductions in depressive symptoms and improvements in quality of life. The quantitative findings are particularly compelling because they remain relatively consistent across different evidence syntheses. A meta-analysis of 21 randomized trials reported an SMD of -0.74 for depression and 0.43 for quality of life, favoring ACT. A separate three-level meta-analysis involving 33 randomized controlled trials and 2,293 participants reported $g=0.43$ for depression and $g=0.45$ for quality of life at post-treatment, with corresponding effects of approximately $g=0.43$ for both outcomes at follow-up.

These findings suggest that ACT is not merely a technique for coping with pain but a broader behavioral intervention that can influence emotional and functional adaptation. The central therapeutic concept is psychological flexibility. Rather than requiring patients to eliminate pain before resuming normal life, ACT teaches individuals to develop a more open and flexible relationship with pain, distressing thoughts, and unpleasant emotions. Patients are encouraged to identify their personal values and engage in meaningful actions even when symptoms remain present.

The sustained follow-up findings are particularly important. Chronic pain is generally persistent, and short-term improvements may have limited clinical value if they disappear after treatment ends. The persistence of ACT effects on depression and quality of life suggests that patients may retain and apply the skills learned during therapy. Acceptance, cognitive defusion, present-moment awareness, values clarification, and committed action may therefore function as continuing self-management strategies. Nevertheless, ACT should not be regarded as universally superior to other psychological treatments. Evidence comparing ACT with CBT indicates that both approaches can produce meaningful improvements, while differences between them are often small or nonsignificant. The most appropriate treatment may therefore depend on

patient characteristics, therapist expertise, treatment availability, preferences, and the broader multidisciplinary treatment plan.

The evidence also supports flexibility in treatment delivery. Traditional face-to-face ACT has a substantial evidence base, but internet-delivered and digital ACT may provide valuable alternatives for patients who experience barriers to conventional psychotherapy. Recent randomized evidence indicates that digital ACT can reduce depressive symptoms and improve quality of life among people with chronic pain, suggesting considerable potential for scalable psychological care.

Future research should focus on identifying which patients benefit most from ACT, determining the optimal treatment dose, comparing ACT directly with other evidence-based psychological interventions, and clarifying the mechanisms responsible for sustained improvements. Researchers should also prioritize clinically meaningful outcomes, long-term follow-up, treatment adherence, cost-effectiveness, and implementation in routine healthcare settings.

In conclusion, current evidence supports Acceptance and Commitment Therapy as a clinically useful intervention for reducing depression and improving quality of life among adults living with chronic pain. Its emphasis on psychological flexibility, acceptance, values, and meaningful action provides a theoretically coherent framework for helping patients build satisfying lives despite persistent symptoms. ACT should therefore be considered an important component of contemporary multidisciplinary chronic pain management.

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Authors' Contributions

All authors contributed to data analysis, drafting, and revising of the paper and agreed to be responsible for all the aspects of this work.

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