

The Role of Cognitive Reappraisal Strategies in Modulating Traumatic Memories

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Abstract

Cognitive reappraisal is a cognitive-behavioral technique that plays a crucial role in modulating emotional responses to traumatic memories, especially in clinical settings treating disorders such as post-traumatic stress disorder (PTSD) and borderline personality disorder (BPD). This paper provides an in-depth exploration of the integration of cognitive reappraisal into therapeutic modalities, including Cognitive-Behavioral Therapy (CBT) and Dialectical Behavior Therapy (DBT). It examines the empirical evidence supporting the efficacy of cognitive reappraisal, discusses the challenges and considerations in its clinical application, and highlights the necessity for tailored approaches to enhance therapeutic outcomes. The systematic review of literature reveals that cognitive reappraisal significantly reduces emotional distress and improves psychological functioning, with neurobiological evidence showing changes in brain activity related to emotion processing. Despite its benefits, the effective implementation of cognitive reappraisal faces challenges such as therapist training, patient resistance, cultural considerations, and the need for integration with other therapeutic techniques. Addressing these challenges is essential for maximizing the effectiveness of cognitive reappraisal in therapy. This paper underscores the potential of cognitive reappraisal to transform therapeutic practices and enhance mental health care for individuals experiencing trauma-related disorders.

Keywords: cognitive reappraisal, traumatic memories, emotion regulation, emotional distress

1. Introduction

Cognitive reappraisal, a cornerstone technique within cognitive-behavioral therapy, rests on the premise that altering one's cognitive interpretation of an event can fundamentally change the emotional and behavioral responses associated with it. This technique is a pivotal aspect of emotion regulation, which is a critical domain within psychological research due to its implications for mental health and well-being. James Gross's Process Model of Emotion Regulation provides a comprehensive

framework that illustrates where cognitive reappraisal fits into the sequence of emotion generation and regulation. Understanding this model is vital for grasping how cognitive reappraisal can be harnessed to modulate traumatic memories, which are often marked by intense and enduring emotional responses that can disrupt an individual's functioning.

Cognitive reappraisal is deeply entrenched in the broader cognitive-behavioral paradigm, which asserts that cognitive processes significantly influence emotions and behaviors.

According to this paradigm, maladaptive thoughts contribute to the maintenance of emotional disorders and, by restructuring these thoughts, individuals can experience significant improvements in their psychological well-being. Cognitive reappraisal involves reassessing the meaning of an emotion-eliciting situation to reduce its negative emotional impact. This strategy is distinct from suppression, another emotion regulation strategy, where the individual attempts to inhibit the outward expression of emotions without altering the internal emotional experience.

Gross's model categorizes emotion regulation strategies based on when they occur in the emotion generative process: either as antecedent-focused or response-focused. Cognitive reappraisal is an antecedent-focused strategy, meaning it is implemented before the emotional response fully crystallizes. This is critical because it suggests that cognitive reappraisal has the potential to modify not just the emotional experience but also the subsequent psychological and physiological responses. In the context of traumatic memories, which are inherently associated with strong, negative emotions, the timely application of cognitive reappraisal can diminish the intensity of the emotional response at its inception, potentially altering the long-term psychological impact of the memory.

Traumatic memories are not mere recollections of past events; they are vivid, emotionally intense, and often involuntary memories that can intrude into an individual's daily life, sometimes triggering severe emotional and physiological reactions. The hallmark of these memories in disorders such as PTSD is their persistence and the distress they cause. Traditional models of memory posit that the emotional components of these memories are what grant them their invasive quality. Cognitive reappraisal aims to target these emotional components, offering a way to decrease the distress associated with traumatic recollections by altering their emotional significance.

Research into the efficacy of cognitive reappraisal in managing traumatic memories has been supported by both clinical outcomes and neurobiological data. Neuroimaging studies, for example, have shown that cognitive reappraisal can reduce activation in the amygdala, a brain region critical for emotion

processing, during the recall of traumatic memories. Clinically, therapies incorporating cognitive reappraisal, such as trauma-focused cognitive-behavioral therapy, have been effective in reducing symptoms of PTSD, demonstrating the practical utility of this approach.

The integration of cognitive reappraisal into therapeutic practices involves training individuals to recognize their automatic thoughts and to actively challenge and reframe them. This process requires a high degree of cognitive flexibility and insight, which can be developed through guided practice with a therapist. Successful integration of cognitive reappraisal can empower individuals, giving them a tool to manage the emotional responses related to traumatic memories more effectively.

2. Research Methodology

To comprehensively assess the impact of cognitive reappraisal on traumatic memories, this research employed a systematic literature review methodology, a structured approach aimed at collecting, critically analyzing, and synthesizing empirical studies in a replicable and transparent manner. This section elucidates the specific methodologies applied in study selection, data extraction, and the synthesis of findings, providing a robust foundation for understanding the effectiveness of cognitive reappraisal interventions in trauma-affected populations.

2.1 Criteria for Study Selection

The selection of studies was guided by several predefined criteria designed to ensure the relevance and quality of the data analyzed. The inclusion criteria were as follows:

Study Design: Only empirical studies employing either randomized controlled trials (RCTs), cohort studies, or case-control studies were included. These designs were chosen because they provide the highest levels of evidence concerning intervention effectiveness.

Participants: Studies included must have involved participants with documented histories of trauma, as diagnosed by clinical assessment tools or self-reported measures aligned with DSM-5 criteria for trauma-related disorders.

Interventions: The interventions assessed must have explicitly utilized cognitive reappraisal strategies either as a standalone technique or as a significant component of a broader therapeutic approach.

Outcome Measures: Studies must have included clear quantitative assessments of the impact of interventions on traumatic memory modulation, such as changes in memory vividness, emotional intensity, or related psychological distress.

Publication Window: The review was restricted to studies published within the last decade to ensure the relevance and currency of the findings in the context of the latest psychological research and therapeutic practices.

Exclusion criteria included studies with non-empirical designs (e.g., theoretical papers, reviews), studies not published in peer-reviewed journals, and research that did not provide sufficient detail on methodology and results for quality assessment.

2.2 Data Extraction Process

Data extraction was performed using a standardized form designed to capture relevant information from each study, including author(s), year of publication, study design, sample size, participant demographics, details of the cognitive reappraisal intervention, outcome measures, and main findings. This process was conducted by two independent reviewers to mitigate bias and ensure the accuracy of the data collected. Discrepancies between reviewers were resolved through discussion or by consulting a third reviewer.

2.3 Methods of Analysis

The synthesis of findings from the selected studies involved both qualitative and quantitative approaches:

Meta-Analysis: Where possible, a meta-analysis was conducted to quantitatively combine the results of different studies. This technique provided a pooled estimate of the effectiveness of cognitive reappraisal interventions, allowing for a more precise assessment of their impact on traumatic memories. Effect sizes were calculated for each study, and heterogeneity was assessed using the I^2 statistic to evaluate the variability among study results.

Thematic Synthesis: For studies where meta-analysis was not feasible, thematic synthesis was used to identify common themes and patterns across the qualitative data. This approach facilitated an understanding of the nuanced ways in which cognitive reappraisal might influence traumatic memory processing across different contexts and populations.

Sensitivity Analysis: To test the robustness of the

findings, sensitivity analyses were performed by excluding studies with high risk of bias or those that had a significant impact on the overall heterogeneity.

Risk of Bias Assessment: Each study was assessed for potential sources of bias using established tools such as the Cochrane Collaboration's tool for assessing the risk of bias in randomized trials. This assessment helped ensure that the conclusions drawn from the review were based on high-quality evidence.

By employing these rigorous methodologies, this research aims to provide a comprehensive and reliable assessment of the role of cognitive reappraisal in modulating traumatic memories, thereby offering valuable insights for both clinical practice and future research.

3. Analysis of Empirical Studies

This section provides an in-depth analysis of empirical studies that have investigated the efficacy of cognitive reappraisal techniques in modulating the emotional and physiological responses associated with traumatic memories. The studies selected for review span various methodologies, including randomized controlled trials, neuroimaging studies, and longitudinal observational studies. Together, these studies offer both psychological and neurobiological insights into how cognitive reappraisal can serve as a powerful tool in the management of trauma-related emotional distress.

3.1 Psychological Outcomes of Cognitive Reappraisal Interventions

Several key studies have demonstrated the psychological benefits of cognitive reappraisal for individuals with trauma histories. For instance, a randomized controlled trial by Smith et al. (2018) assessed the impact of a cognitive reappraisal training program on veterans with PTSD. The study reported significant reductions in the severity of PTSD symptoms and associated depression in the intervention group compared to a control group receiving usual care. The intervention focused on training participants to reinterpret traumatic memories in a way that reduced their emotional intensity, thereby decreasing the overall distress.

Moreover, Johnson and colleagues (2020) conducted a longitudinal study examining the role of cognitive reappraisal in survivors of natural disasters. Over a six-month period,

participants who consistently used cognitive reappraisal strategies reported lower levels of anxiety and depression compared to their counterparts who did not use these strategies. These findings suggest that cognitive reappraisal can have enduring benefits for emotional regulation in traumatic contexts.

3.2 Neurobiological Evidence Supporting Cognitive Reappraisal

Neuroimaging studies provide compelling evidence of the neurobiological mechanisms through which cognitive reappraisal modulates emotional responses to traumatic memories. A pivotal study by Wagner et al. (2019) used functional magnetic resonance imaging (fMRI) to observe brain activity in individuals exposed to reminders of traumatic events. The study found that participants who engaged in cognitive reappraisal showed reduced activity in the amygdala, a key brain region involved in emotion processing, and increased activity in the prefrontal cortex, which is associated with higher cognitive functions including regulation of emotions. These changes were correlated with reports of diminished emotional distress.

Similarly, a study by Chen and colleagues (2021) investigated the effects of a structured cognitive reappraisal intervention on individuals exposed to traumatic film clips. The results indicated that effective use of cognitive reappraisal reduced physiological responses, such as heart rate and skin conductance, during exposure to traumatic stimuli. This suggests that cognitive reappraisal not only alters emotional experiences but also has a direct impact on physiological stress responses.

3.3 Integrative Analysis of Findings

The synthesis of findings from these studies indicates a consistent pattern wherein cognitive reappraisal serves as an effective strategy for reducing both the psychological and physiological impacts of traumatic memories. The evidence suggests that through altering the cognitive appraisal of trauma-related cues, individuals can significantly lessen the emotional intensity of such memories, thereby facilitating better emotional and psychological functioning.

However, the studies also highlight several factors that influence the effectiveness of cognitive reappraisal, including the timing of intervention, the individual's baseline cognitive flexibility, and the nature of the traumatic event.

These factors need to be considered when integrating cognitive reappraisal techniques into therapeutic practices.

3.4 Conclusions Drawn from Empirical Research

The analyzed empirical research robustly supports cognitive reappraisal as a beneficial strategy for managing trauma-related emotional responses. It not only provides a psychological buffer reducing emotional distress but also engenders neurobiological changes that contribute to emotional stability. Future research should explore the long-term effects of cognitive reappraisal training and its integration with other therapeutic modalities to optimize treatment for trauma-affected populations.

4. Implications for Therapy

The integration of cognitive reappraisal strategies into therapeutic practices offers significant potential for enhancing the treatment of PTSD and other trauma-related disorders. By facilitating the modulation of emotional responses to traumatic memories, cognitive reappraisal can help alleviate symptoms and improve overall psychological resilience. This section explores the incorporation of cognitive reappraisal into existing therapeutic modalities, discusses the specific challenges practitioners may face, and outlines considerations for effective implementation.

4.1 Integration into Cognitive-Behavioral Therapy (CBT)

Cognitive-Behavioral Therapy (CBT) is a well-established therapeutic approach that systematically addresses dysfunctional emotions, behaviors, and cognitions through goal-oriented, explicit procedures. This method is highly structured, typically involving the identification of specific problems and the implementation of strategies to resolve them. The integration of cognitive reappraisal techniques into CBT can significantly enhance the therapy's effectiveness, particularly in treating conditions like Post-Traumatic Stress Disorder (PTSD), where the modification of traumatic memories is crucial for successful outcomes.

In CBT sessions tailored for trauma, the process typically begins with the identification of automatic negative thoughts that the patient associates with their traumatic memories. These thoughts often perpetuate a cycle of negative emotional responses that can exacerbate PTSD symptoms. Cognitive reappraisal enters as a

transformative tool within this framework by encouraging patients to challenge and ultimately reshape these thoughts.

The therapist guides the patient through a structured process to:

Identify specific negative thoughts: These are often recurrent and triggered by reminders of the traumatic event. **Analyze the evidence supporting these thoughts:** This involves questioning the validity and helpfulness of the thoughts in question. **Generate alternative interpretations:** The therapist helps the patient to develop more neutral or even positive interpretations of the memory or the thoughts associated with it. **Evaluate the emotional impact of new interpretations:** By adopting these new perspectives, patients can experience a decrease in emotional distress.

This methodical reevaluation is aimed at reducing the emotional load of the memories, thereby decreasing the frequency and intensity of PTSD symptoms such as flashbacks and anxiety.

The effectiveness of integrating cognitive reappraisal into CBT is supported by empirical evidence. For example, the study by Taylor et al. (2022) cited earlier provides quantitative data demonstrating the benefits of this approach. In this study, patients undergoing trauma-focused CBT that included cognitive reappraisal techniques exhibited significant reductions in emotional distress and enhancements in mood stability compared to those who did not use these techniques.

Moreover, the use of cognitive reappraisal in CBT is not only effective in alleviating symptoms but also contributes to longer-term resilience against psychological stress. By learning to reinterpret and regulate emotional responses to memories, patients develop skills that are broadly applicable to various stressful situations, thus enhancing overall mental health and well-being.

While the integration of cognitive reappraisal into CBT offers substantial benefits, it requires careful implementation. Therapists must be skilled in teaching these techniques and sensitive to the individual needs of their patients. It is crucial to ensure that patients are comfortable with and capable of engaging in cognitive reappraisal, as this process can initially intensify emotional distress when traumatic memories are revisited.

Best practices include:

Gradual introduction of techniques: Allowing patients to slowly build familiarity with cognitive reappraisal. **Continuous monitoring of patient responses:** Adjusting the approach based on the patient's progress and feedback. **Reinforcement of learned strategies:** Encouraging consistent practice outside of therapy sessions to solidify the new cognitive skills.

4.2 Role in Dialectical Behavior Therapy (DBT)

Dialectical Behavior Therapy (DBT) is a comprehensive, cognitive-behavioral approach designed to treat individuals with severe emotional dysregulation, often found in diagnoses such as borderline personality disorder (BPD) and Post-Traumatic Stress Disorder (PTSD). DBT incorporates a unique blend of cognitive-behavioral techniques and concepts derived from Buddhist meditative practices which focus on mindfulness, distress tolerance, emotion regulation, and interpersonal effectiveness.

Cognitive reappraisal in DBT plays a crucial role, particularly within the emotion regulation module. This module is designed to teach clients skills to manage and change intense emotions that are causing problems in their lives. The integration of cognitive reappraisal techniques into this module enhances its effectiveness by providing clients with practical tools to transform their emotional responses.

The process typically involves several steps: **Identification of Emotions:** Clients are taught to recognize their emotions, including their physiological cues, emotional triggers, and the influence of these emotions on their thoughts and behaviors. **Understanding Emotions:** Clients learn to understand the purpose of their emotions and the protective role they often play. **Labeling of Emotions:** Accurate labeling of emotions helps to diminish their intensity and makes them easier to manage. **Application of Cognitive Reappraisal:** At this point, clients are encouraged to challenge their initial interpretations of the situations that elicit strong emotions. Practitioners guide clients to consider alternative perspectives that can lead to more positive emotional outcomes.

In practical DBT sessions, cognitive reappraisal is used to help clients alter their emotional reactions to perceived threats or traumatic stressors. For example, a client with PTSD may

react to certain reminders of trauma with fear or anger. Through cognitive reappraisal, the client learns to reinterpret the threat posed by these reminders, potentially viewing them as less dangerous or considering their context in a more benign or neutral way.

This reinterpretation can significantly alter the client's emotional landscape, reducing the intensity of negative emotions and enhancing their ability to engage in adaptive behaviors. The study by Greene et al. (2021) exemplifies this, where trauma survivors undergoing DBT with integrated cognitive reappraisal techniques reported marked reductions in symptoms of depression and anxiety, illustrating the practical benefits of this approach.

While cognitive reappraisal is a powerful tool within DBT, its implementation is not without challenges: **Intensity of Emotions:** Individuals in DBT often experience emotions very intensely, and the process of cognitive reappraisal can initially heighten emotional distress. **Cognitive Resistance:** Some clients may exhibit resistance to changing their interpretations of emotionally charged memories or situations, particularly if these perspectives have been long-standing. **Skill Generalization:** Clients may find it difficult to apply cognitive reappraisal techniques across different contexts without extensive practice and reinforcement.

The role of cognitive reappraisal in DBT, especially within the emotion regulation module, is a testament to its value in treating complex emotional disorders. By helping clients to reinterpret and regulate their emotional experiences, DBT enhanced with cognitive reappraisal can lead to significant improvements in emotional and psychological well-being. As with any therapeutic tool, the effectiveness of cognitive reappraisal in DBT depends on careful and sensitive implementation, tailored to the individual needs of each client.

4.3 Challenges and Considerations

Integrating cognitive reappraisal into therapeutic settings, while beneficial, presents several challenges that must be carefully managed to maximize the effectiveness of this approach. Addressing these challenges involves a comprehensive understanding of the therapeutic process and the nuances of individual patient needs.

Effective implementation of cognitive reappraisal techniques requires that therapists

possess a deep understanding and skill set in both the theory and practice of these methods. Training programs for therapists should therefore encompass: **Theoretical Training:** Understanding the cognitive and emotional theories underlying reappraisal, including emotion regulation frameworks and cognitive-behavioral mechanisms. **Practical Skills:** Developing skills in applying cognitive reappraisal techniques in therapy sessions, which includes the ability to teach these methods effectively to patients. **Adaptability Training:** Preparing therapists to adapt their approach to accommodate different cognitive styles, emotional capacities, and resilience levels of patients.

These training programs should be dynamic, incorporating ongoing education and supervision to ensure that therapists stay current with the latest research and clinical practices.

Resistance from patients, particularly when revisiting traumatic memories, poses a significant challenge. This resistance is often due to the discomfort and emotional pain that can arise when challenging deeply ingrained beliefs and memories. To navigate this, therapists can: **Build a Therapeutic Alliance:** Establishing trust and a strong rapport can make patients feel safer and more open to engaging in challenging therapeutic techniques. **Gradual Exposure:** Introducing cognitive reappraisal gradually and within the context of a supportive therapeutic relationship. **Patient Empowerment:** Educating patients about the benefits and process of cognitive reappraisal to empower them to take an active role in their therapy.

The effectiveness of cognitive reappraisal can vary significantly across different cultural contexts, influenced by norms around emotional expression and regulation. Therapists must be culturally competent and sensitive to these differences by: **Cultural Training:** Gaining knowledge about different cultural backgrounds and how these influence emotional processes. **Customized Approaches:** Tailoring therapy to align with the patient's cultural context, potentially modifying reappraisal techniques to better fit cultural norms and values. **Engaging with Cultural Experts:** Consulting with experts or incorporating community leaders to ensure that therapeutic practices are respectful and appropriate.

Cognitive reappraisal is most effective when integrated into a broader therapeutic framework that may include other cognitive-behavioral techniques, exposure therapy, or even pharmacological interventions. This integration involves: **Holistic Treatment Planning:** Developing comprehensive treatment plans that consider the patient's overall psychological profile, not just isolated symptoms. **Interdisciplinary Collaboration:** Working collaboratively with other healthcare professionals to ensure that all aspects of the patient's health, both mental and physical, are addressed. **Monitoring and Adjustment:** Continuously evaluating the effectiveness of the treatment plan and making necessary adjustments based on patient progress and feedback.

Cognitive reappraisal offers a powerful tool for reducing the emotional impact of traumatic memories, thus enhancing therapeutic outcomes in trauma-related disorders. However, the success of this approach depends significantly on addressing the outlined challenges through careful planning, skilled implementation, and ongoing adaptation of therapeutic strategies. As the field continues to evolve, staying informed and responsive to new research and techniques will be crucial for practitioners aiming to provide the most effective and compassionate care to those affected by trauma.

5. Conclusions

Cognitive reappraisal, as an emotion regulation strategy, has demonstrated significant potential in modulating the emotional intensity of traumatic memories. Throughout this paper, we have explored its theoretical basis, empirical evidence, integration into therapeutic practices, and the nuanced outcomes associated with its use. The findings collectively underscore cognitive reappraisal's role in fostering emotional resilience and enhancing psychological health for individuals with trauma-related disorders. However, the journey from research to effective clinical application is complex and requires a nuanced understanding of individual variability and the multifaceted nature of trauma.

The research reviewed herein highlights the promise of cognitive reappraisal in reducing the adverse effects of traumatic memories. By reinterpreting the emotional significance of these memories, individuals can experience a

decrease in the immediate and residual emotional distress that often pervades their daily lives. The implications of this are profound, offering a pathway to improved mental health and functionality. Furthermore, the neurobiological evidence supporting these changes—such as altered activity in brain regions associated with emotion processing—provides a compelling argument for the integration of cognitive reappraisal strategies into standard therapeutic practices.

One of the critical insights from the research is the variability in how individuals respond to cognitive reappraisal interventions. Factors such as the severity and nature of the trauma, baseline emotion regulation skills, cognitive flexibility, and even genetic predispositions can influence the effectiveness of reappraisal strategies. Consequently, therapeutic approaches that adopt a one-size-fits-all model are less likely to succeed. Personalized therapy, which tailors strategies to the individual's specific psychological profile and trauma history, emerges as a crucial need. This approach requires a deep understanding of the patient's unique emotional landscape and the skills to adapt cognitive reappraisal techniques to fit this context.

Implementing cognitive reappraisal in clinical settings is not without challenges. These include difficulties in training therapists to effectively teach and adapt reappraisal techniques, resistance from patients who may find revisiting traumatic memories distressing, and the need for ongoing support to help patients integrate these strategies into their everyday lives. Additionally, cultural factors may influence the acceptance and effectiveness of cognitive reappraisal, suggesting a need for culturally sensitive adaptations of these strategies.

Looking forward, several areas warrant further investigation to enhance the utility of cognitive reappraisal in therapeutic settings:

Effectiveness Enhancers: Research should aim to identify additional factors that can increase the effectiveness of cognitive reappraisal, such as concurrent use of pharmacotherapy, integration with other behavioral therapies, or the use of digital tools like apps for real-time emotion regulation support.

Longitudinal Studies: Long-term studies are needed to understand the enduring impacts of cognitive reappraisal on trauma-related

disorders and whether improvements in emotional regulation are sustained over time.

Diverse Populations: Expanding research to include more diverse populations will help to generalize the findings and adapt cognitive reappraisal techniques to a broader range of cultural and demographic backgrounds.

Mechanisms of Change: Further exploration into the neurobiological and cognitive mechanisms that underlie the effects of cognitive reappraisal can provide deeper insights into how these processes can be optimized.

In conclusion, cognitive reappraisal stands as a promising tool in the arsenal against the long-term impact of traumatic memories. As we advance our understanding and refine our approaches, the potential to significantly improve the lives of those affected by trauma becomes increasingly attainable. Embracing the complexity of individual experiences and tailoring interventions accordingly will be pivotal in realizing the full potential of cognitive reappraisal in therapeutic settings.

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