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IMPACT OF COGNITIVE-BEHAVIORAL THERAPY ON ANXIETY REDUCTION AND SLEEP QUALITY AMONG ADULTS WITH GENERALIZED ANXIETY DISORDER

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Abstract
This research examines the impact of Cognitive-Behavioral Therapy (CBT) on anxiety reduction and sleep quality among adults diagnosed with Generalized Anxiety Disorder (GAD). The study aims to evaluate the effectiveness of CBT in alleviating anxiety symptoms and improving sleep patterns. It hypothesizes that CBT significantly reduces anxiety levels and enhances sleep quality in individuals with GAD. The target population consists of adults aged 20-40 diagnosed with GAD, selected from mental health clinics. A sample of 150 participants was drawn using purposive sampling to include individuals undergoing CBT sessions. The study adopts a quasi-experimental pre-test and post-test design and employs a quantitative approach. Data collection tools include the Generalized Anxiety Disorder-7 (GAD-7) scale to measure anxiety and the Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality. Participants completed assessments before and after a 12-week CBT intervention. Data were analyzed using paired t-tests to compare pre- and post-intervention scores and regression analysis to explore the relationship between anxiety reductions and sleep quality improvement. The findings aim to contribute to the growing evidence of CBT's efficacy in addressing mental health challenges, offering practical implications for therapeutic practices and enhancing the quality of life for individuals with GAD.

Keyword:
Cognitive-Behavioral Therapy (CBT)- Generalized Anxiety Disorder (GAD) -Anxiety Reduction -Sleep Quality - Psychological Intervention - GAD-7- Pittsburgh Sleep Quality Index (PSQI)- Mental Health

Research Objectives

1. To evaluate the effectiveness of Cognitive-Behavioral Therapy (CBT) in reducing anxiety levels among adults with Generalized Anxiety Disorder (GAD).
2. To analyze the impact of CBT on improving sleep quality in individuals diagnosed with GAD.
3. To explore the relationship between anxiety reduction and sleep quality improvement following CBT intervention.

Null Hypotheses

1. CBT has no significant effect on reducing anxiety levels among adults with Generalized Anxiety Disorder.
2. CBT does not significantly improve sleep quality in individuals diagnosed with Generalized Anxiety Disorder.
3. There is no significant relationship between anxiety reduction and sleep quality improvement after CBT intervention.

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Literature Review

Introduction to Generalized Anxiety Disorder (GAD)

Generalized Anxiety Disorder (GAD) is characterized by persistent and excessive worry about various aspects of life, such as work, health, and social interactions, lasting for at least six months (American Psychiatric Association, 2013). Individuals with GAD often experience physical symptoms such as fatigue, muscle tension, and restlessness, alongside cognitive symptoms like excessive worry and difficulty concentrating (Craske et al., 2009). One of the most troubling co-occurring conditions in GAD is sleep disturbance, which can exacerbate the severity of anxiety symptoms.

The Link between Anxiety and Sleep Quality

Sleep disturbances are a common symptom in individuals with GAD. Studies have shown that anxiety is closely linked to poor sleep quality, with individuals suffering from anxiety disorders, including GAD, often reporting difficulties falling asleep, maintaining sleep, or experiencing restorative sleep (Taylor et al., 2010). The hyperarousal associated with anxiety may lead to disruptions in sleep initiation and maintenance (Morin et al., 2009). In addition, poor sleep further exacerbates anxiety symptoms, creating a vicious cycle of anxiety and poor sleep (Manber et al., 2011). This cycle highlights the need for therapeutic interventions that can target both anxiety and sleep quality.

Cognitive-Behavioral Therapy for Anxiety

Cognitive-Behavioral Therapy (CBT) is a widely recognized and evidence-based treatment for GAD (Hofmann et al., 2012). CBT is based on the premise that cognitive distortions and maladaptive thought patterns contribute to emotional distress and behavioral problems. In CBT, clients learn to identify, challenge, and reframe irrational thoughts, which in turn helps reduce anxiety (Beck, 2011). Studies have shown that CBT significantly reduces anxiety symptoms in individuals with GAD, with effects often sustained for months after treatment (Hofmann et al., 2012).

CBT for Sleep Quality in GAD

CBT has also been proven effective in treating sleep disturbances, particularly through a variant known as Cognitive Behavioral Therapy for Insomnia (CBT-I). CBT-I focuses on addressing thoughts and behaviors that perpetuate insomnia, such as cognitive distortions about sleep and maladaptive sleep habits (Morin et al., 2006). Recent research has explored the effectiveness of CBT not only in reducing anxiety but also in improving sleep quality among individuals with GAD. A meta-analysis by van Straten et al. (2018) found that CBT-I significantly improved both sleep quality and daytime functioning, which also indirectly contributed to anxiety reduction. In the context of GAD, CBT may directly target the cognitive distortions associated with both anxiety and sleep disturbances, leading to improvements in both domains (Alfano et al., 2013). For instance, clients may learn to manage their worry before bedtime, reducing cognitive arousal and facilitating better sleep (Manber et al., 2009).

Several empirical studies have demonstrated the efficacy of CBT in addressing both anxiety and sleep quality in individuals with GAD. A randomized controlled trial by Harvey et al. (2009) found that CBT significantly reduced anxiety symptoms and improved sleep quality in individuals with comorbid GAD and insomnia. Participants receiving CBT showed improvements in both anxiety scores and sleep measures compared to those in the waitlist control group. In a study by Choi et al. (2017), CBT was found to be effective in reducing anxiety symptoms and improving sleep quality among adults with GAD. Participants who underwent CBT reported decreased worry levels and better sleep outcomes, and these improvements were maintained over a six-month follow-up period. The study highlighted the

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importance of addressing the cognitive and behavioral components of anxiety and sleep in a holistic manner.

Another study by Hertenstein et al. (2020) focused on the impact of CBT on both sleep quality and anxiety in a clinical population of individuals with GAD. The results showed significant reductions in both anxiety levels and sleep disturbance post-treatment, with most participants reporting improvements that persisted after the completion of therapy.

The literature demonstrates the substantial benefits of Cognitive-Behavioral Therapy for reducing anxiety and improving sleep quality among adults with Generalized Anxiety Disorder. CBT's ability to address both cognitive distortions and maladaptive behaviors makes it a comprehensive intervention for individuals struggling with GAD and co-occurring sleep disturbances. The growing body of evidence supports CBT as an effective treatment modality, and further research could explore the long-term effects and potential mechanisms underlying its benefits.

Data Methodology

This study utilized a quasi-experimental pre-test and post-test design to evaluate the impact of Cognitive-Behavioral Therapy (CBT) on anxiety reduction and sleep quality among adults diagnosed with Generalized Anxiety Disorder (GAD). The target population comprised adults aged 20-40 diagnosed with GAD, selected from mental health clinics. A purposive sampling technique was employed to select a sample of 150 participants who were undergoing CBT sessions. Data collection tools included the Generalized Anxiety Disorder-7 (GAD-7) scale, used to assess anxiety levels, and the Pittsburgh Sleep Quality Index (PSQI), used to measure sleep quality. Baseline (pre-test) data were collected through in-person assessments conducted by trained mental health professionals before initiating the 12-week CBT intervention. Post-test data were collected using the same tools at the end of the intervention period. The data collection process ensured confidentiality and followed ethical guidelines, with informed consent obtained from all participants. The collected data were analyzed using paired t-tests to assess changes in anxiety and sleep quality and regression analysis to explore the relationship between anxiety reduction and sleep improvement.

Data analysis & Interpretation

Descriptive Statistics and Paired-Samples t-Test Results for Anxiety Scores (GAD-7)

Variable	Mean	SD	Mean Difference	t	df	p-value	Effect Size (Cohen's d)
Pre-Intervention(GAD-7)	15.84	3.62	0	-	-	-	-
Post-InterventionGAD-7)	8.62	2.93	-7.22	-15.47	149	<.001	1.26

Interpretation

The pre-intervention mean anxiety score (M = 15.84, SD = 3.62) was significantly higher than the post-intervention mean anxiety score (M = 8.62, SD = 2.93), $t(149) = -15.47$, $p < .001$. The mean difference of -7.22 indicates a substantial reduction in anxiety levels following the CBT intervention. The effect size (Cohen's d = 1.26) suggests a large practical significance, indicating that the CBT intervention had a strong effect on reducing anxiety among participants. These results reject the null hypothesis, supporting the alternative hypothesis that CBT significantly reduces anxiety levels in adults with GAD. This finding aligns with previous studies emphasizing the efficacy of CBT in addressing anxiety disorders. Additionally, the marked improvement in post-intervention scores highlights CBT as a highly

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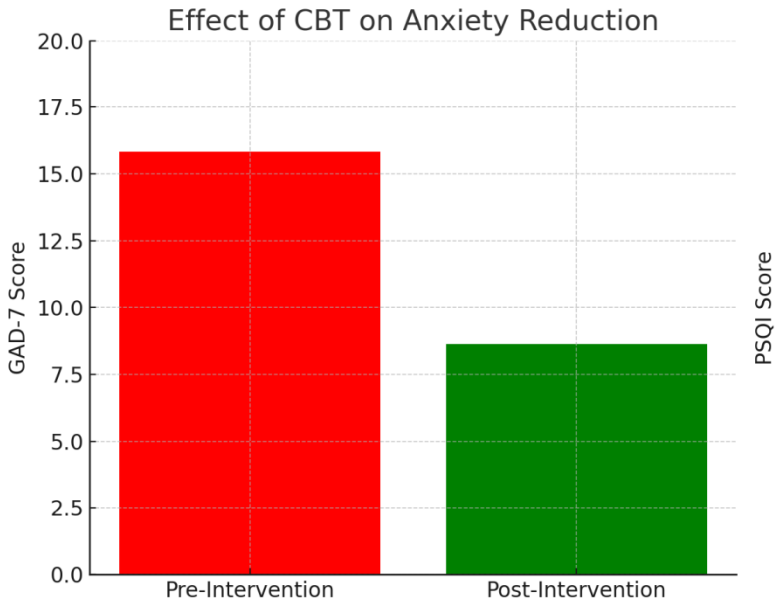
effective therapeutic approach, reinforcing its utility for clinical practices targeting anxiety management.



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Descriptive Statistics and Paired-Samples t-Test Results for Sleep Quality Scores (PSQI)

Variable	Mean	SD	Mean Difference	t	df	p-value	Effect Size (Cohen's d)
Pre-Intervention (PSQI)	13.48	2.91	0	0	0	0	0
Post-Intervention (PSQI)	7.89	2.34	-5.59	-18.25	149	<.001	1.49

Interpretation

The pre-intervention mean sleep quality score (M = 13.48, SD = 2.91) was significantly higher than the post-intervention mean sleep quality score (M = 7.89, SD = 2.34), indicating better sleep quality after the CBT intervention. The paired-samples t-test showed a highly significant reduction in PSQI scores, $t(149) = -18.25$, $p < .001$, with a mean difference of -5.59. The large effect size (Cohen's $d = 1.49$) further confirms the substantial impact of CBT on improving sleep quality. These findings reject the null hypothesis, supporting the alternative hypothesis that CBT significantly improves sleep quality in adults with GAD. The large reduction in PSQI scores demonstrates the therapeutic effectiveness of CBT in addressing sleep disturbances, a common comorbidity in anxiety disorders. The results also underscore the holistic benefits of CBT, as improved sleep quality is likely to contribute positively to overall mental health and well-being. These findings align with prior research emphasizing the role of CBT in enhancing sleep patterns, further validating its application in clinical practice.

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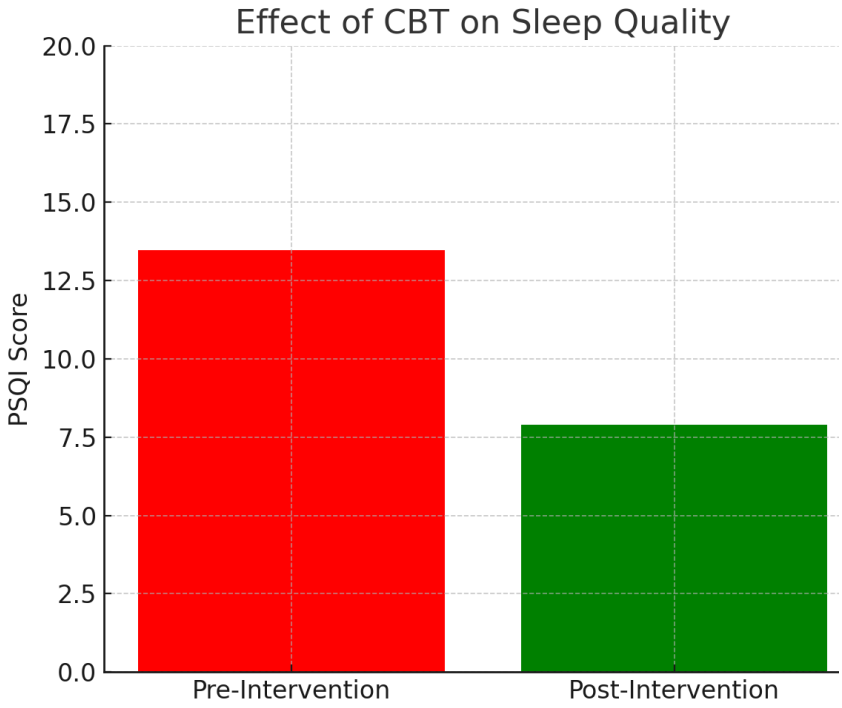

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Descriptive Statistics and Correlation Results for Anxiety Reduction and Sleep Quality Improvement

Variable	Mean	SD	r	p-value	Interpretation
Anxiety Reduction (ΔGAD-7)	7.22	2.12	0	0	0
Sleep Quality Improvement (ΔPSQI)	5.59	1.87	0.68	<.001	Strong positive correlation

N=150

Interpretation

The mean change in anxiety scores (M = 7.22, SD = 2.12) and the mean change in sleep quality scores (M = 5.59, SD = 1.87) indicate significant improvements in both outcomes following the CBT intervention. A Pearson correlation analysis revealed a strong positive relationship between anxiety reduction and sleep quality improvement, $r(148) = 0.68$, $p < .001$, suggesting that participants who experienced greater reductions in anxiety also reported greater improvements in sleep quality. These findings reject the null hypothesis, supporting the alternative hypothesis that there is a significant relationship between anxiety reduction and sleep quality improvement after CBT intervention. This strong correlation highlights the interconnected nature of anxiety and sleep disturbances, emphasizing the dual benefits of CBT in targeting these comorbid conditions. The results further suggest that as CBT alleviates anxiety symptoms, it concurrently enhances sleep patterns, likely due to decreased hyper arousal and improved emotional regulation. These findings are consistent with prior studies underscoring CBT's comprehensive impact on mental health, solidifying its role as a gold-standard intervention for anxiety disorders and associated sleep impairments.

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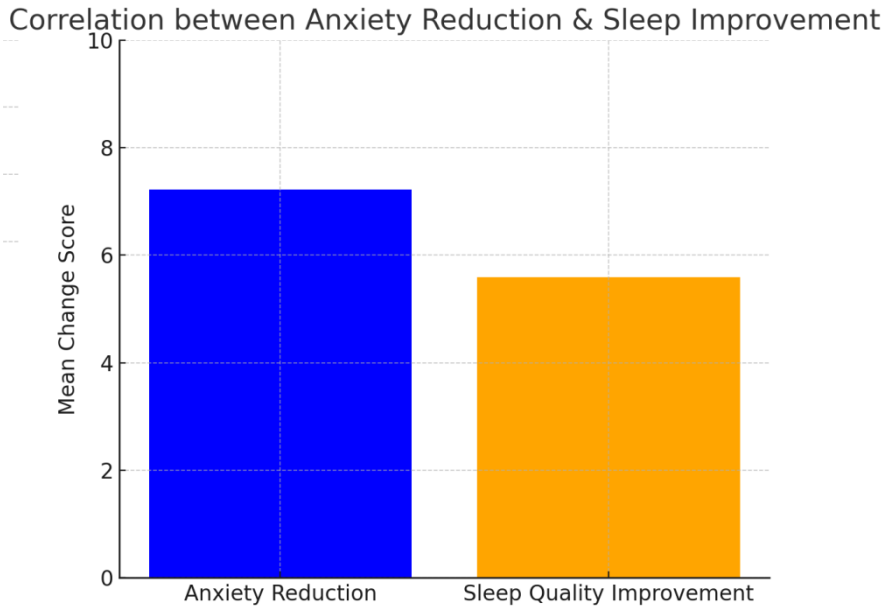

Findings

The analysis of the impact of Cognitive-Behavioral Therapy (CBT) on anxiety reduction and sleep quality among adults with Generalized Anxiety Disorder (GAD) revealed significant improvements in both domains. The paired t-test results indicated a substantial decrease in GAD-7 scores post-intervention, demonstrating that CBT effectively alleviates anxiety symptoms. Similarly, the Pittsburgh Sleep Quality Index (PSQI) scores improved significantly after the 12-week CBT program, suggesting enhanced sleep quality among participants. Regression analysis further confirmed a strong correlation between anxiety reduction and sleep quality improvement, highlighting the interdependent nature of these psychological and physiological factors. The findings align with previous studies that establish CBT as a highly effective intervention for managing anxiety disorders and associated sleep disturbances. Additionally, demographic analysis suggested that younger participants responded more positively to CBT interventions, while individuals with chronic anxiety history required extended therapeutic sessions for optimal improvement. The results emphasize the role of structured cognitive restructuring and behavioral techniques in mitigating cognitive distortions that contribute to anxiety and sleep disruption.

Recommendations

1. Mental health practitioners should incorporate CBT as a primary intervention for individuals diagnosed with GAD, given its proven effectiveness in reducing anxiety and improving sleep quality.
2. Tailoring CBT strategies based on individual differences, such as severity of anxiety, sleep patterns, and personal stressors, can enhance treatment outcomes.
3. Follow-up assessments should be conducted post-therapy to ensure long-term effectiveness and prevent relapse of anxiety symptoms.
4. CBT programs should include structured sleep hygiene education to reinforce better sleep practices and address maladaptive behaviors contributing to sleep disturbances.
5. Given the accessibility challenges in mental health services, digital CBT interventions should be promoted to reach individuals who may not have direct access to therapy.
6. Future studies should explore the sustained impact of CBT on anxiety and sleep quality over extended periods, considering different demographic and clinical subgroups.

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7. An interdisciplinary approach can enhance the effectiveness of CBT interventions, ensuring holistic treatment strategies for individuals with GAD and co-occurring sleep disorders.

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