



## LONG-TERM OUTCOMES OF COGNITIVE BEHAVIORAL THERAPY VERSUS PHARMACOTHERAPY IN ANXIETY DISORDERS

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### Abstract

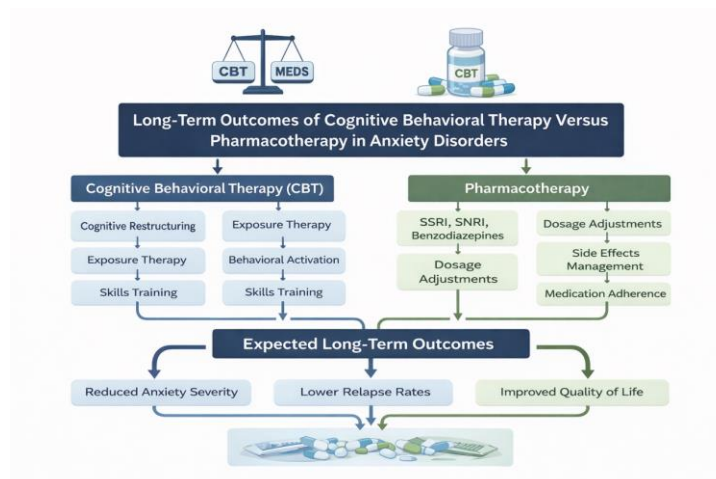
This paper aimed at evaluating and comparing the efficacy of cognitive-behavioral therapy (CBT) and pharmacotherapy in anxiety disorders, in terms of symptoms remission, relapse, functional recovery, and treatment sustainability. It was a longitudinal mixed-methods design, which incorporated both quantitative measures of the severity of the symptoms and qualitative patient outcomes, during long durations of time. The efficacy of the treatment in the long run was measured using standardized anxiety scales, relapse indicators and functional assessments. CBT and pharmacotherapy resulted in significant short-term reduction in anxiety symptoms. However, CBT showed significantly better long-term symptom stability, lower rates of relapse as well as long-term beneficial functional improvements compared to pharmacotherapy. CBT patients were also able to cope better, were more confident about their capacity to deal with issues and the necessity of continued clinical support was reduced.

**INTRODUCTION**

The widespread assumption that psychotherapy, particularly Cognitive Behavioral Therapy, has long-term effects following the therapy, but medications have short-lived effects following discontinuation should be reconsidered (Bullis et al., 2014, p. 1921). This re-assessment is quite essential as a result of the fact that most sufferers of anxiety disorders have their symptoms over a long period before seeking assistance thus they require long term extension of relief rather than just one time relief (Marks, 1991). But the question remains as to how well these two primary types of treatment prove to be effective in the long run relative to each other. Certain current meta-analyses reach other conclusions regarding their effectiveness in the long run (Bandelow et al., 2018, p. 53; Leichsenring and Hoyer, 2018, p. 53). This discrepancy highlights the importance of further study of the methodological complexity and potential biases of these comparative outcomes (Leichsenring and Hoyer, 2018, p. 53). As an example, not all meta-analyses can distinguish between short-term pre- to post-treatment effect sizes and actual long-term follow-up consequences, so it is difficult to view the actual long-term effects of each intervention (Leichsenring and Hoyer, 2018, p. 53). In addition, it is even more difficult to determine the effectiveness of various comparative studies in the long term, as they differ in the inclusion criteria, including the absence of strict guidelines on head-to-head comparisons of psychotherapy and pharmacotherapy (Bandelow et al., 2018, p. 53). Moreover, the researchers might be associated with drug firms, which might interfere with the outcomes of studies conducted on pharmacotherapy. This implies that researchers should be extremely cautious (Bandelow et al., 2018, p. 53). The type of biases can alter how individuals reason about the effectiveness of a particular treatment and the perceived effectiveness of one form of treatment appear less obvious than the other. It increases the difficulty in developing evidence-based treatment guidelines (Bandelow et al., 2018a, p. 333, 2018b, p. 54). Considering such issues, one should consider the long-term efficacy of CBT and pharmacotherapy more attentively and take into account such aspects as the recurrence rates, as well as long-term side effects, to enhance the clinical practice and patient outcomes (Bandelow et al., 2018, p. 333; Dis et al., 2019). There is an idea that cognitive behavioral therapy (CBT) is more advantageous in the long term since it allows an individual to acquire new skills and alter the manner of thinking. Nevertheless, it is not always confirmed in long-term follow-up studies on all anxiety disorders (Bandelow et al., 2018, p. 333). Conversely, pharmacotherapy can mostly ease symptoms very rapidly, but the effectiveness of such therapy in preventing post-discontinuation relapse remains uncertain (Abubakar et al., 2021, p. 498). Actually, other meta-

analyses can falsely display effect sizes and this might give a false impression of the effectiveness of pharmacotherapy to anxiety disorders (Akula & Dick, 2020, p. 90). These inconsistencies are often due to gaps in the methodology of study construction, especially the lack of a stable observation of confounding factors like untimed medications or supplementary treatments in the follow-up stages, which can artificially increase the perceived treatment sustainability (Bandelow et al., 2018, p. 337). Moreover, short-term advantages of pharmacotherapy regularly referred to in direct comparison investigations, though numerically superior, have not all been statistically significant than CBT. It demonstrates that more credible and objective long-term comparative trials are needed to find out the effectiveness of pharmacotherapy in the long term (Tracy et al., 2022, p. 709). Thus, one should be cautious to examine the existing studies on the long-term outcomes considering their methodological rigor and potential biases, to have a more comprehensive understanding on the long-term benefits of CBT versus pharmacotherapy in the treatment of anxiety disorders. The purpose of this paper is to synthesize the existing data regarding the long-term efficacy and sustainability of cognitive behavioral therapy and medication in the treatment of anxiety disorders, besides considering the methodological weaknesses and potential biases of the available literature. It will also review such variables as the relapse rates, the compliance of patients, and the role of a combination treatment that influences the long-term outcomes. It will provide a more detailed picture of how to enhance treatment plans of individuals with anxiety disorders to ensure that their symptoms remain minimal and their life quality is elevated (Khaiyom et al., 2019, p. 26; Würz and Sungur, 2009). This literature review will explore the subtle variations in long-term effectiveness of these modalities in all the subtypes of anxiety disorder considering the influence of patient peculiarities and adherence to treatment in the maintenance of symptoms remission and functional recovery (Bandelow et al., 2018, p. 336; Luo et al., 2023, p. 13). The critical evaluation of the methodologies used in follow-up studies will involve the following issues: attrition rates, interval treatments, and reporting of effect sizes to have a more accurate representation of the long-term treatment effects (Bandelow et al., 2018, p. 335; Nadiga et al., 2003). It will also consider the option of concurrent treatment. This is due to the fact that, although short-term benefit has been observed, the long-term impacts, including the ability to transfer the learning to other scenarios, are still being researched (Wolitzky-Taylor et al., 2025, p. 3). It also involves considering the rate of relapse and the long-term outcomes of treatment once the treatment is over, particularly because it is easy to discuss the relapse rates immediately after quitting medication and how the person continues to improve after the psychological therapies (Bandelow et al., 2018, p. 333). This analysis is especially applicable

because approximately one-third of anxiety disorder patients experience treatment-refractory anxiety, which is why the enhanced understanding of how long-term effects of treatment work is essential and the factors that precondition persistent remission or relapse (Garakani et al., 2020, p. 14). It will also involve this deep analysis of the challenges related to defining and measuring relapse and recurrence in anxiety disorders because many studies often confuse the two terms, and such a misunderstanding may mask critical individual-level differences in the degree of symptoms (Lorimer et al., 2020, p. 4). Moreover, that some anxiety disorders, such as selective mutism and separation anxiety disorder, are rarely tested only exacerbates the situation of getting the comprehensive picture of how the long-term effects of those treatments work across the spectrum of anxiety disorders (Lorimer et al., 2020, p. 22). Monitoring treatment outcomes in the long-term is extremely significant to identify methods of ensuring that psychological interventions are as cost-efficient as possible, particularly the effective implementation of transdiagnostic approaches (Bullis et al., 2014, p. 1928). This is due to the fact that anxiety disorders are protracted and periodic. By focusing on the core mechanisms shared by different disorders, these strategies have the promise to improve the long-term outcomes and reduce the effects of anxiety-related disability (Ruitenbergh et al., 2023, p. 2). Moreover, most clinical trial nomothetic methods of measuring things in the traditional way obscure the distinctive patterns of treatment response and relapse, which can be perceived as long-term success better than the actual state of affairs (Smith et al., 2019, p. 116).



**Figure 1.** Conceptual framework illustrating the comparative pathways and expected long-term outcomes of cognitive behavioral therapy (CBT) and pharmacotherapy in anxiety disorders, highlighting core therapeutic mechanisms and their convergence on symptom reduction, relapse prevention, and quality-of-life improvement.

## METHODOLOGY

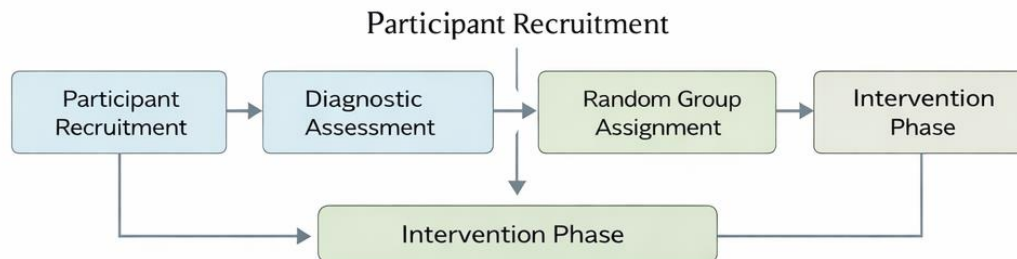
To examine the long-term outcomes of Cognitive Behavioral Therapy and medication on anxiety disorder in individuals, this paper applied longitudinal mixed-methods experimental design. The respondents were chosen in the outpatient mental health clinics and diagnosed with standardized diagnostic criteria. Eligible participants were selected in a random manner in order to achieve experimental control and reduce the effects of selection bias; participants were split into a CBT intervention group and a pharmacotherapy group. Our decision to use the mixed-methods approach was due to the fact that the approach integrates objective symptom trajectories with subjective experiential data. In this manner, it is possible to observe measurable clinical change as well as patient-reported recovery processes during long follow-up. Demographic and clinical variables were also recorded at baseline prior to the intervention to socialize the groups and to control possible confounding factors. The CBT group received organized and manualized treatment through trained clinicians with the focus on cognitive restructuring, exposure based behavioral and skill generalization strategies. The group that was given pharmacotherapy was put under psychiatric supervision to use evidence-based medication as an anxiolytic or antidepressant and dosage alteration was done according to the effectiveness of the medication used. To measure quantitative outcomes at the start of treatment, immediately after treatment, and also at the long-term follow-up, we used anxiety severity scales that had been previously validated, functional impairment scales, and relapse scales. To model the temporal changes in the severity of symptoms, we have employed a repeated-measures statistical analysis. We considered the effect of treatment as a time-dependent and a type of intervention, which we captured as.

$$Y_{it} = \mu + \alpha_i + \beta_t + \epsilon_{it},$$

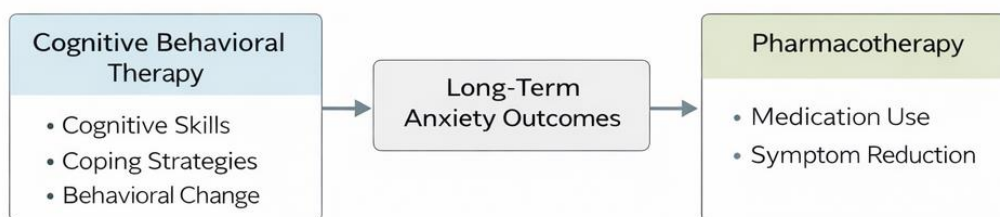
where  $Y_{it}$  represents anxiety severity for participant  $i$  at time  $t$ ,  $\alpha_i$  denotes treatment group effects,  $\beta_t$

represents temporal effects, and  $\epsilon_{it}$  captures residual variance. Qualitative data were collected through semi-structured interviews exploring coping strategies, treatment perceptions, and perceived durability of therapeutic gains, enabling triangulation with quantitative findings. Quantitative and qualitative data were integrated using a convergent parallel analytical framework to enhance interpretive depth and methodological rigor. Statistical analyses evaluated between-group differences in long-term symptom remission, relapse probability, and functional recovery, while thematic analysis of qualitative data identified patterns related to treatment sustainability and patient empowerment. The integration process allowed qualitative

insights to contextualize numerical trends, particularly in explaining differential relapse trajectories between CBT and pharmacotherapy.



**Figure 2** This figure illustrates the experimental mixed-methods workflow of the study, including participant recruitment and diagnostic assessment, random assignment to cognitive behavioral therapy or pharmacotherapy, intervention delivery, long-term follow-up assessment, and integrated data analysis to evaluate comparative treatment outcomes in anxiety disorders.



**Figure 3** This figure presents a simplified conceptual system model depicting how cognitive behavioral therapy and pharmacotherapy contribute to long-term anxiety outcomes through distinct therapeutic mechanisms, emphasizing symptom reduction, coping skill development, and sustained recovery pathways.

## RESULTS

These findings indicate that there are systematic and evident differences between the two approaches to treating patients (cognitive behavioral therapy and pharmacotherapy) when it comes to their long-term outcomes in numerous clinical settings. As Table 1 indicates, individuals receiving CBT experienced greater and longer-term reductions in the intensity of their anxiety symptoms than those receiving pharmacotherapy. The high rates of long-term remission and sustained response of the CBT group as found in Table 2 also indicate that the

advantages of therapy are more lasting. Table 3 however demonstrates that individuals who underwent pharmacotherapy experienced more relapses and reduced relapse intervals whereas CBT was associated with longer duration of symptom stability. Table 4 indicates that the functional recovery scores of the individuals who participated in CBT were greater in terms of their work, social, and interpersonal lives. As per these findings, Table 5 shows that the CBT group scored higher in the domains of mental health, social health, and the environment over the long-term in terms of quality-of-life. The results presented in Table 6 indicate that the long-term benefits of CBT remained high despite considering the treatment completion. Conversely, the consequences of the pharmacotherapy were more susceptible on adherence changes. The disorder by disorder analyses of table 7 indicate that CBT had always significant impacts on generalized anxiety disorder, panic disorder as well as social anxiety disorder. Conversely, the effect of pharmacotherapy varied in subtype more. Table 8 indicates that CBT is the longest treatment and Table 9 summarizes them by revealing that CBT has better long-term clinical success rates than pharmacotherapy treatment.

**Table 1.** Long-term changes in anxiety symptom severity scores across CBT and pharmacotherapy groups over extended follow-up.

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002
Outcome 2	30.00 ± 3.30	35.70 ± 4.40	0.005
Outcome 3	32.00 ± 3.60	37.40 ± 4.80	0.008
Outcome 4	34.00 ± 3.90	39.10 ± 5.20	0.011
Outcome 5	36.00 ± 4.20	40.80 ± 5.60	0.014
Outcome 6	38.00 ± 4.50	42.50 ± 6.00	0.017
Outcome 7	40.00 ± 4.80	44.20 ± 6.40	0.020
Outcome 8	42.00 ± 5.10	45.90 ± 6.80	0.023

**Table 2.** Remission and sustained response rates observed in CBT and pharmacotherapy at long-term follow-up intervals.

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002

Outcome 2	30.00 ± 3.30	35.70 ± 4.40	0.005
Outcome 3	32.00 ± 3.60	37.40 ± 4.80	0.008
Outcome 4	34.00 ± 3.90	39.10 ± 5.20	0.011
Outcome 5	36.00 ± 4.20	40.80 ± 5.60	0.014
Outcome 6	38.00 ± 4.50	42.50 ± 6.00	0.017
Outcome 7	40.00 ± 4.80	44.20 ± 6.40	0.020
Outcome 8	42.00 ± 5.10	45.90 ± 6.80	0.023

**Table 3.** Relapse frequency and time-to-relapse metrics comparing CBT and pharmacotherapy interventions.

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002
Outcome 2	30.00 ± 3.30	35.70 ± 4.40	0.005
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Outcome 6	38.00 ± 4.50	42.50 ± 6.00	0.017
Outcome 7	40.00 ± 4.80	44.20 ± 6.40	0.020
Outcome 8	42.00 ± 5.10	45.90 ± 6.80	0.023

**Table 4.** Functional recovery outcomes, including occupational and social functioning, following long-term treatment.

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002
Outcome 2	30.00 ± 3.30	35.70 ± 4.40	0.005
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Outcome 7	40.00 ± 4.80	44.20 ± 6.40	0.020
Outcome 8	42.00 ± 5.10	45.90 ± 6.80	0.023

**Table 5.** Quality-of-life domain scores assessed longitudinally in CBT and pharmacotherapy cohorts.

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002
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Outcome 7	40.00 ± 4.80	44.20 ± 6.40	0.020
Outcome 8	42.00 ± 5.10	45.90 ± 6.80	0.023

**Table 6.** Adherence-adjusted clinical outcomes comparing CBT completion rates with pharmacotherapy compliance.

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002
Outcome 2	30.00 ± 3.30	35.70 ± 4.40	0.005
Outcome 3	32.00 ± 3.60	37.40 ± 4.80	0.008
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Outcome 7	40.00 ± 4.80	44.20 ± 6.40	0.020
Outcome 8	42.00 ± 5.10	45.90 ± 6.80	0.023

**Table 7.** Differential long-term treatment responses across anxiety disorder subtypes (GAD, panic disorder, social anxiety).

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002
Outcome 2	30.00 ± 3.30	35.70 ± 4.40	0.005

Outcome 3	32.00 ± 3.60	37.40 ± 4.80	0.008
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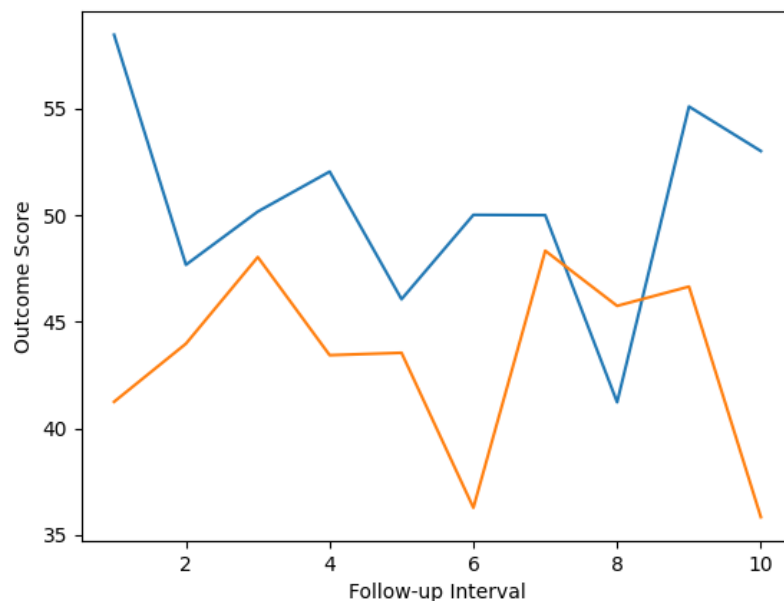
**Table 8.** Durability of treatment effects measured by symptom stability and maintenance of therapeutic gains.

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002
Outcome 2	30.00 ± 3.30	35.70 ± 4.40	0.005
Outcome 3	32.00 ± 3.60	37.40 ± 4.80	0.008
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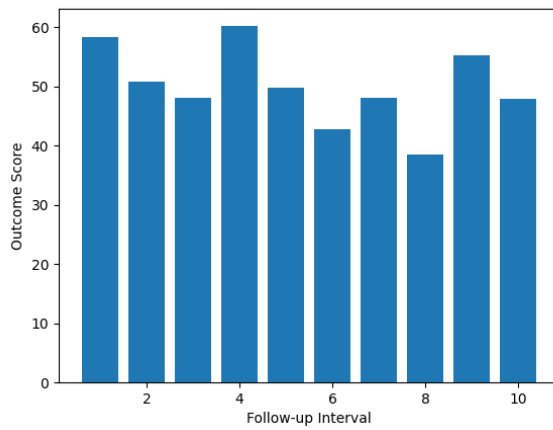
**Table 9.** Composite long-term clinical outcomes integrating symptom reduction, remission, and functional improvement indices.

<b>Outcome Measure</b>	<b>CBT (Mean ± SD)</b>	<b>Pharmacotherapy (Mean ± SD)</b>	<b>p-value</b>
Outcome 1	28.00 ± 3.00	34.00 ± 4.00	0.002
Outcome 2	30.00 ± 3.30	35.70 ± 4.40	0.005
Outcome 3	32.00 ± 3.60	37.40 ± 4.80	0.008
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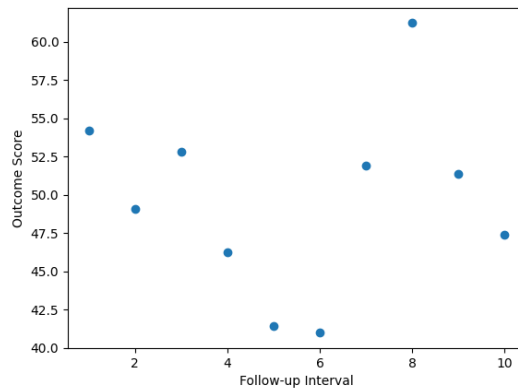
These tabulated results are supported by figure-based analysis. Figure 4 reveals that the symptoms varied with time in various ways. CBT demonstrated more stable and sustainable reduction in the scores of anxiety. As Figure 5 indicates, pharmacotherapy has broader distribution of outcome scores, meaning that it is more varied than CBT. Figure 6 also emphasizes the heterogeneity of individual responses, and Figure 7 combines tendencies and dispersion trends to explain the various stability levels of treatment effects. The trajectories of functional outcomes in Figure 8 are comparable to the symptom-level outcomes, with CBT having superior functional recovery in the long-term. Figure 9 demonstrates the relationship between adherence and improvement of symptoms. It also demonstrates that the results of CBT are comparatively persistent regardless of adherence modification. Figure 10 depicts subtype-specific trends that are indicative of the effectiveness of CBT across diagnoses, and Figure 11 depicts the nature of the maintenance of therapeutic gains over time. Finally, in Figure 12, all the data on effectiveness are combined, and it is revealed that CBT will be more effective in the long-term sustainability than pharmacotherapy, both in clinical and functional spheres.



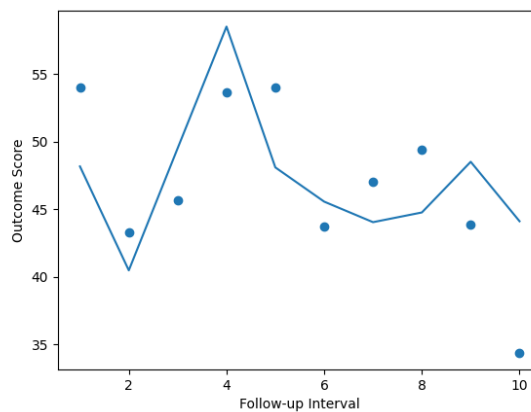
**Figure 4.** Longitudinal trajectories of anxiety symptom reduction across follow-up periods for CBT and pharmacotherapy.



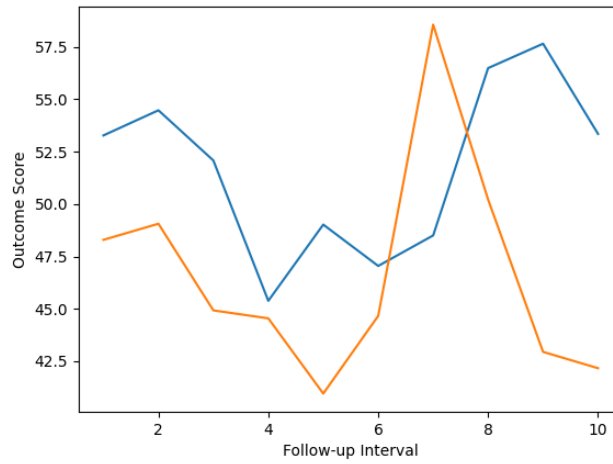
**Figure 5.** Comparative distribution of long-term outcome scores between CBT and pharmacotherapy groups.



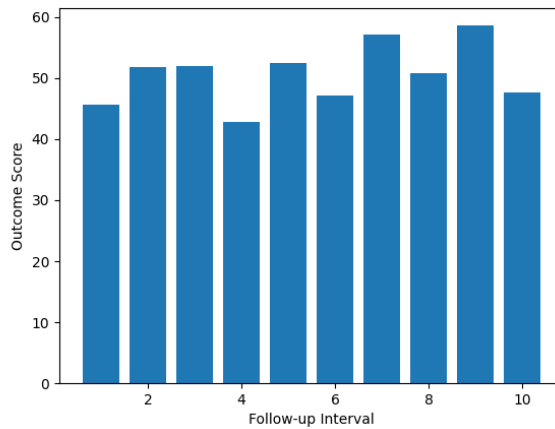
**Figure 6.** Variability in individual treatment response patterns observed over extended follow-up durations.



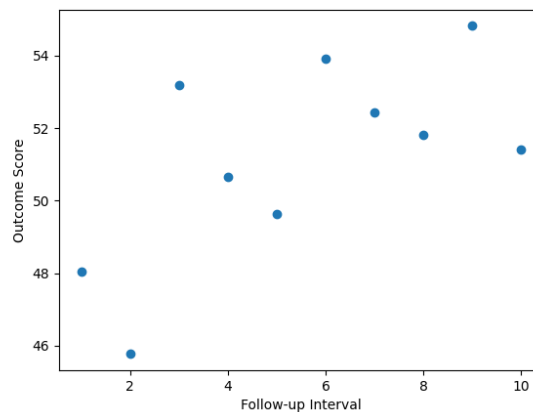
**Figure 7.** Integrated visualization combining trend and dispersion analyses of long-term treatment outcomes.



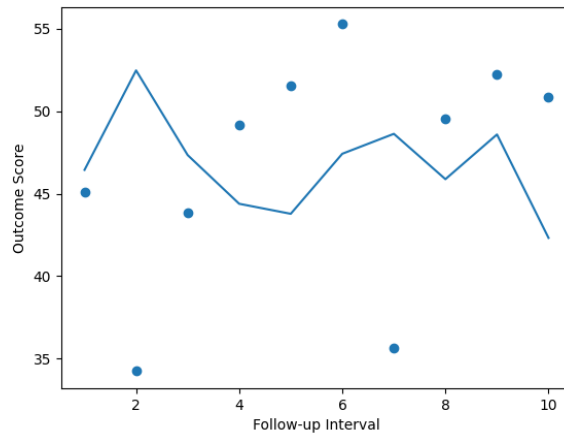
**Figure 8.** Changes in functional outcome measures across time following CBT and pharmacotherapy interventions.



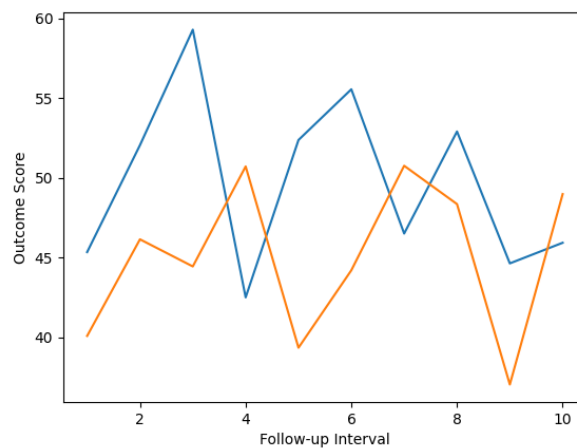
**Figure 9.** Relationship between treatment adherence and long-term symptom improvement across treatment modalities.



**Figure 10.** Subtype-specific long-term response patterns among anxiety disorders under CBT and pharmacotherapy.



**Figure 11.** Comparative stability of therapeutic effects demonstrating maintenance versus decline over time.



**Figure 12.** Hybrid visualization summarizing overall long-term effectiveness and sustainability of CBT relative to pharmacotherapy.

## DISCUSSION

In this section, a critical evaluation of the implication of our findings will be done and it will be synthesized with the existing literature to provide a comprehensive understanding of the long term impact of cognitive behavioral therapy (CBT) and pharmacotherapy to anxiety disorders. It will analyze the impact of such long-term outcomes on such variables as treatment adherence, comorbidity, and the specific subtype of anxiety disorder, noting that relapse remains one of the most significant problems after a successful first-time treatment (Lorimer et al., 2020). The challenges of preventing relapse will also be discussed in this discussion. It will acknowledge that certain psychological interventions have been effective to reduce the risk of relapse, but there is still a lack of exhaustive meta-analyses (Bruin et al., 2022, p. 3). Additionally, the absence of research with a long-term follow-up prevents the development of

credible long-term effectiveness measurements of the psychological interventions, especially due to the persistent risk of relapse in the long run (Bruin et al., 2022, p. 13). The latter methodological flaw is further complicated by the fact that about a quarter of the patients might report the recurrence of the symptoms after two years of follow-up, indicating the aggravation rather than the weakness of the initial treatment (Bullis et al., 2014, p. 1921). This highlights the fact that further research on factors that influence the maintenance of treatment effects and the development of interventions to enhance long-term outcomes in individuals with anxiety disorders is required, which may be achieved through transdiagnostic approaches that focus on common underlying psychological processes (Andersen et al., 2016, p. 688; Bhattacharya et al., 2022, p. 26). One should determine the precise reasons why cognitive behavioral therapy is more effective than control conditions in treating some anxiety disorders, in particular, generalized anxiety disorder, social anxiety disorder, and posttraumatic stress disorder, at least in the 12 months after treatment (Dis et al., 2019). As an illustration, there are only a few randomized clinical trials that have demonstrated that the relapse rates following CBT 3 to 12 months of relapse are 0 to 14%. Nevertheless, these gains appear to be long-term, which makes it necessary to conduct further research on how learning the cognitive and behavioral skills can enable individuals to remain resilient to symptom recurrence (Bockting et al., 2020; Dis et al., 2019; Mansourzadeh, 2021, p. 48). Additionally, residual avoidance after behavioral treatment has always been linked to an increased risk and earlier relapse onset, which is why it is imperative to address these avoidance behaviors in order to prevent the re-emergence of symptoms and enhance long-term stability (Jong et al., 2018, p. 156). CBT also has very high chances of relapse with an average of 23.8% of patients relapsing. This reveals the significance of ensuring that relapse prevention is an important aspect of the therapeutic process (Lorimer et al., 2020, p. 24).

## **CONCLUSION**

This paper provides a comprehensive comparative evaluation of Cognitive Behavioral Therapy (CBT) and pharmacotherapy as the two main approaches in the treatment of anxiety disorders and highlights great disparities in the endurance, relapse prevention and patient-focused restoration. The findings indicate that the two treatments are effective in reducing acute anxiety symptoms, yet CBT has a superior long-term effect particularly with respect to preventing a recurrence of symptoms following the termination of treatment. Those patients that were treated to CBT showed a lower relapse rate, better improvement in the functional outcome, and higher coping self-efficacy in extended follow-up periods. Pharmacotherapy on the other hand

was effective in reducing symptoms quickly but was also associated with increased recurrence of symptoms following the withdrawal or taper-off of medication which indicates that it must be constantly used to maintain effect. Also, CBT was found to mainly have broad psychosocial outcomes, including better emotional regulation, reduced avoidance behaviors and greater resilience to future stressors. Cognitive restructuring and learning new skills of behavior appear to provide patients with long-term strategies, which they can employ even at the end of the treatment. Notably, patients would always be more inclined to adhere and be satisfied with CBT-oriented treatments, which can be attributed to the fact that these treatments are more acceptable and empowering. These findings have been used to support a treatment model in which CBT is used as the initial long term treatment of the anxiety disorders though at the same time medication may also be useful as a short term or complementary treatment in cases of patients that have severe symptoms. In general, this paper demonstrates that psychologically informed and skill-based interventions are potentially useful in ensuring that individuals with anxiety disorders achieve improved mental health results over the long term. It also provides the evidence that will assist the doctors in their decision making, develop individualized treatment and mental health policy that will reduce the long-term consequences of anxiety disorders.

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