

Effectiveness of a Structured Cognitive Behaviour Therapy (CBT) Programme in Reducing Mild to Moderate Depression among Young Adults

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Abstract: Depression is one of the most common mental health disorders among young adults and the late teens and early twenties are a time when an individual can be particularly vulnerable to the onset of depression. There is a significant proportion of the population burden with mild to moderate presentations, which are often between the levels of support that are provided and the levels that are needed. In the present study, the efficacy of a specially designed structured programme of Cognitive Behaviour Therapy (CBT) in reducing mild to moderate depressive symptoms in young adults was assessed in an Indian context. The quasi-experimental pre test post-test control group design with 4 weeks follow up was used. Two hundred young adults (18–25 years) who scored within the cognitive range of the Beck Depression Inventory-II between 14 and 28 points were randomly assigned to either an experimental group ($n = 50$) that received a 12-session manualised programme over 8 weeks, or a wait-list control group ($n = 50$). Outcomes were assessed using the BDI-II, the depression subscale of the DASS-21, the Automatic Thoughts Questionnaire and the Rosenberg Self-Esteem Scale. Data were analysed with t -tests, analysis of covariance, two-way analysis of variance, repeated measures analysis of variance, chi-squares, correlation and multiple regression. The groups did not differ at baseline on any demographic or psychological variables. The mean BDI-II scores for the experimental group decreased from 20.58 to 11.50 while the control group decreased from 20.86 to 19.56. The between-group difference at post-test was significant, $t(98) = 7.96$, $p < .001$, $d = 1.59$, and remained so after adjustment for baseline severity, $F(1, 97) = 90.46$, $p < .001$, partial $\eta^2 = .483$. There were also improvements in negative automatic thoughts and self-esteem that were significant. A significant interaction with time was obtained and gains were significantly sustained at follow-up for a significant group. The remission rate in the experimental group (60%) was significantly higher than in the controls (12%). The results suggest that this short manualised and group-deliverable CBT programme is highly effective compared to no intervention for young adults with mild to moderate depression. However, the effect observed is exaggerated by the inclusion of an inactive comparison condition, by the use of unblinded self-report and by volunteer sampling, and by the non-mechanism design it is not possible to conclude about the mechanism of change. The study provides evidence for the integration of structured cognitive-behavioural programmes into the educational and community mental health continuum within these boundaries, especially in contexts where the treatment gap for common mental disorders is large.

Keywords: cognitive behaviour therapy; depression; young adults; emerging adulthood; automatic thoughts; self-esteem; quasi-experimental design; India

1. Introduction

1.1 Background of the Study

Depression is among the most prevalent and disabling psychological conditions of the present century. Around 264 million people worldwide have been estimated to suffer from depressive disorders (World Health Organization 2017) and the updated World Mental Health Report (World Health Organization 2022) confirmed that depression is a paramount cause of years lived with disability. Clinical depression is a prolonged pattern of affective, cognitive, motivational, behavioral, and somatic changes (affective disturbances, cognitive disturbances, motivational disturbances, behavioral disturbances, and somatic disturbances) which affect a person's ability to study, work, maintain relationships and take part in social activities. It is a recurrent problem, with an increasing likelihood of future attacks with each one, and early and effective treatment therefore is of great public health significance.

The clinical features of depression go beyond sadness. A depression episode is characterized by a depressive mood or a marked decrease in interest or pleasure, appetite and sleep disturbances, psychomotor changes, fatigue, feelings of worthlessness or excessive guilt, diminished concentration and recurrent thoughts of death, according to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2022). Importantly, some of these criteria explicitly involve cognition. This is a key point of the current study since it places disordered thinking not on the edge of depression but at the center of the diagnosis.

There have been important changes in the depression treatment over the last 50 years, with the development of structured, time-limited psychological treatments supported by empirical evidence. Of these, one stands out in particular, Cognitive Behaviour Therapy (CBT). CBT emerged from the clinical and theoretical work of Beck (1967, 1976), and grew out of the rational-emotive tradition of Ellis (1962), and argues that psychological distress does not stem from the objective events themselves but from the interpretations, appraisals and beliefs the person forms around these events.

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A therapeutic assumption of great practical appeal follows: if patterns of thought which are maladaptive can be identified, examined, changed, and if avoidance or withdrawal patterns of behaviour can be systematically reversed, then the depressed affect should decrease proportionately.

1.2 Depression in Young adults

Epidemiological evidence routinely shows that late adolescence and early adulthood are a time when depression is often experienced, but can happen at any age. Kessler et al. (2005) found that the age at onset of mood disorders is in the middle twenties, and that a significant percentage of lifetime cases occur before age 30. This is NOT by coincidence. Between eighteen and twenty-five were a new life period, one of Arnett (2000) called 'emerging adulthood,' characterized by a sense of identity exploration, instability, self-focus, a sense of being 'in-between,' and a uniquely broad set of perceived possibilities. This openness is accompanied by clear developmental advantages, but also produces a constant uncertainty about education, employment, relationships and values.

Today's young adults face many and simultaneous stressors. Academic and competitive exam stress, employment insecurity, financial reliance until later adulthood, re-negotiation of family relationships, and increased social comparison via digital technology all help to create a challenging psychosocial context. Twenge et al. (2019) reported significant cohort-level rises in mood disorder and suicide-related measures among adolescents and young adults, and the increases were even greater in younger cohorts than in older cohorts. It is legitimate to consider all of these trends as a reflection of truer increases in incidence rates or an increased willingness to admit distress, or a change in assessment practice; however, the need for accessible psychological intervention in this age group is certainly not insignificant.

Another factor to take into account is the severity. Focusing on severe depression, where there is a clear pathway for referral and where the risk is obvious, public and institutional attention is most likely to focus upon this condition. However, the majority of the overall disease burden can be classified as mild to moderate, which occurs much more often! People in this range often continue to function on the outside but have significant decreases in their concentration, motivation, self-worth and social engagement. They frequently lie on the threshold of specialist services being provided and at the same time are on the threshold of not needing any services. This intermediate group is an important and somewhat under-researched group for structured psychological intervention and is the group with which the present study focuses.

In this section, an overview of the Cognitive Behaviour Therapy (CBT) is provided.

CBT therapy is a time-limited, present-focused and collaborative therapy which combines cognitive and behavioural approaches in a common conceptual framework. The treatment manual for depression provided by Beck et al.

(1979) was the first systematic treatment manual, and the approach has since been elaborated, disseminated and empirically tested more extensively than any other psychological therapy (Beck, 2011; Hofmann et al., 2012). It involves a case formulation that is also explicitly shared with the client, an agreed session agenda, a continuous agenda of between-session assignments, an agreed session agenda, and outcome monitoring.

The cognitive component of therapy is concerned with three levels of thinking that are related to each other. Negative automatic thoughts, very fast, involuntary appraisals that occur in particular circumstances, exist at the most readily accessible level. These have underlying conditional assumptions and rules of living, often expressed as 'if... then...' statements. The most bottom level schemas or beliefs include core beliefs about self, others and the future, coined the cognitive triad by Beck (1976). The process of therapy involves teaching the client to identify automatic thoughts, to systematically record them, to assess them for evidence, and to develop alternative more balanced and accurate thoughts (Greenberger & Padesky, 2015).

The behavioural element is concerned with the withdrawal, avoidance and inactivity that both result from and help to perpetuate depressed mood. Lewinsohn (1974) theorized that depression is maintained by a reduction in the amount of response-contingent positive reinforcement and behavioural activation aims to break this cycle by scheduling activities that are chosen for mastery and pleasure (Martell et al., 2010). Component analyses have suggested that a behavioural activation component alone can lead to effects similar to those of full cognitive therapy (Jacobson et al., 1996; Dimidjian et al., 2006), which has sparked ongoing research into the processes by which CBT works. The study is based on the following theoretical foundations.

The present investigation is based largely on Beck's cognitive theory of depression that proposes that early life experiences form an enduring negative schema that is not immediately apparent but only becomes apparent in the presence of congruent stressors. When activated, these schemas focus the person's attention, interpretation and memory in a negative way, creating the spiral of automatic thoughts that occur in the depressed state (Beck, 2008; Beck & Haigh, 2014). In this view depression is a vicious cycle between cognition, emotion and action, and can be broken at any point.

This study is informed by three further theoretical perspectives. In the rational-emotive view of Ellis (1962, 1994), the proximal source of emotional disturbance is absolutist and demanding beliefs, which are expressed as rigid 'musts' and 'shoulds'. According to the re-formulated model of learned helplessness by Abramson et al. (1978), a depressogenic attributional style is characterized by the belief that negative events stem from internal, stable and global causes. Finally, the response styles theory of Nolen-Hoeksema (2000) highlights rumination, the passive and repetitive thinking about distress, as a factor that may extend depressive episodes. Combined, these viewpoints warrant an intervention that addresses all three components: thought content, thought style, and attributions and behavioural

withdrawal.

1.5 The Indian Context

The need for psychological interventions that are accessible, particularly in the Indian context, is particularly strong. A significant treatment gap for common mental disorders was highlighted by the National Mental Health Survey of India, 2016 (Gururaj et al., 2016) wherein most of the individuals with mental disorder received no formal treatment. Sagar et al. (2020) reported on the significant burden of depressive disorder, varying greatly across states in India, from the Global Burden of Disease data source. Indian studies on depression have been reviewed by Grover et al. (2010) who point that descriptive and epidemiological studies have grown but controlled intervention studies are relatively scarce.

Clinically significant depressive symptoms have been reported in Indian students. Sidana et al. (2012) and Kumar et al. (2012) reported high levels of depression among medical students and Deb et al. (2015) found that academic and parental pressure was a factor of psychological distress among Indian students. Factors of culture also influence presentation and help-seeking, such as stigma associated with mental illness, favouring of somatic expressions of distress, dependence on family members for help and lack of trained mental health workers compared to population size all leading to a delay and/or absence in treatment-seeking. A structured brief group deliverable and manualised intervention is therefore ideally suited to this context as it can be delivered in educational and community settings by supervised practitioners and is relatively low cost.

1.6 Statement of the Problem

Despite the large body of international research demonstrating the effectiveness of CBT in depression, three areas are particularly inspiring for the current investigation. First, the majority of controlled trials have included clinical samples with moderate to severe depression, and there is relatively little evidence with regard to clinical samples with mild and moderate depression in non-clinical young adult samples. Second, controlled Indian evidence using standardised instruments, an equivalent comparison condition and follow-up assessment is still limited. Third, few studies have investigated symptomatic outcomes alongside the hypothesized cognitive mechanism of change (the number of negative automatic thoughts), making the assessment of mechanism of change limited.

This problem can therefore be stated as follows: What is the effect of an 8-week structured, manualised Cognitive Behaviour Therapy programme on the reduction of mild to moderate depressive symptoms in young adults compared to an equivalent wait list comparison group and what is the duration of any effects observed during a subsequent 4-week follow-up period?

1.7 Rationale and Need for the Study

This study is based on both practical and theoretical considerations. In terms of effectiveness, a moderate-to-mild

level of depression in youth in their 20s is a time when intervention is well-timed. Symptoms are adequate and should be addressed, but not severe enough to merit intense or pharmacological intervention, and the developmental stage of the person means that effective intervention can change a longterm trajectory of life. Additionally, Hollon et al., (2006) noted that cognitive therapy seems to have a long-lasting protective effect beyond treatment, unlike pharmacologic treatments alone.

Theoretically, the current study is a contribution by studying symptomatic change in tandem with change in negative automatic thoughts and self-esteem in the same design. The result supports, but does not prove, the cognitive mediation hypothesis, as there was a decrease in depressive symptomology along with a decrease in automatic thoughts. Methodologically, the use of a wait-list comparison group and follow-up assessment allows for stronger inference than is possible in most of the literature found regionally, which uses single group pre-test post- test designs.

1.8 Research Questions

This study used the following research questions as its guide:

- 1) Do experimental and wait-list control groups have similar baseline demographic and psychological factors before intervention?
- 2) Is there a statistically significant decrease in depressive symptoms in Young Adults with mild to moderate depression who participate in an 8 week structured CBT programme?
- 3) Is there any significant difference in depression scores between those who receive the CBT programme and waitlist controls after controlling for baseline depression severity?
- 4) Is there meaningful change in negative automatic thoughts and self-esteem from the programme?
- 5) Does improvement at 4 weeks follow-up?
- 6) Does a greater reduction in symptoms be associated with programme engagement, symptom severity at baseline or baseline demographic data?

The study sets out to serve the following objectives:

To answer the research questions given above, the following objectives were aimed for in the study:

- 1) To evaluate and compare the pre-intervention levels of depressive symptoms, negative automatic thoughts and self-esteem between the experimental group and the wait-list control group of young adults.
- 2) To assess the efficacy of a structured 8- week programme of CT in reducing mild to moderate depressive symptoms in young adults.
- 3) To compare depression scores after the intervention between the experimental and the wait list control groups while statistically controlling for depression scores at baseline.
- 4) To explore the impact of programme on negative automatic thoughts and global self-esteem.
- 5) To assess if the therapeutic benefits seen at post-test are sustained at a four week follow-up.
- 6) To explore the association between programme

engagement indicators and the size of symptom reduction.

- 7) To investigate if there is any significant difference in treatment outcome among the different demographics of the respondents.
- 8) To make practical recommendations for community schools and educational settings in India for the provision of structured CBT.

The following hypotheses were decided upon for the study:

The following null hypotheses were set up and tested at the .05 level of significance:

H₀₁: The demographic and psychological data of the experimental and wait-list control groups are not significantly different at baseline.

H₀₂: The means of the pre-test and post-test depression scores for the experimental group are not different statistically.

H₀₃: The experimental group does not differ in post-test depression scores from the wait list control group when both groups have their pre-test depression scores as a covariate.

H₀₄: No statistically significant differences in the experimental group's level of negative automatic thoughts after the intervention.

H₀₅: The intervention does not have a statistically significant effect on the self-esteem of participants in the experimental group after the intervention.

H₀₆: Any gains in the experimental group are not maintained (post-test to follow-up depression scores).

H₀₇: No statistically significant relationship between group membership and achievement of treatment response/remission.

H₀₈: No statistically significant association between programme engagement indicators and the amount of depressive symptom reduction.

H₀₉: There were no significant differences in treatment outcome between the different age bands and gender of the respondents.

The following words are defined in the context of this plan:

- Depression: Depression is defined as the severity of self-reported depressive symptomatology in this study as indicated by the total score on the Beck Depression Inventory-II (Beck et al., 1996).
- Mild-middle depression: Operationally defined as having a BDI-II total score in the range of 14-28 inclusive (the mild and moderate severity bands of the BDI-II) at baseline screening.
- Young adults: People between 18 to 25 years old when they were recruited, as the developmental stage of emerging adulthood is defined by Arnett (2000).
- Structured CBT programme: A manualized treatment program of 12 sessions over 8 weeks that includes psychoeducation, behavioral activation, thought monitoring, cognitive restructuring, problem solving, assertiveness training, and relapse prevention, as well as assignments between sessions.
- Negative automatic thoughts: The frequency of depression-related cognitions over the past week, as reported on the total score of the AQ (Hollon & Kendall, 1980).
- Self-esteem: Rosenberg Self-Esteem Scale (Rosenberg,

1965) total score, which represents global self-evaluation.

- Treatment response: A decrease in BDI-II total score of at least 50% from pre-test to post-test assessment.
- Remission: A BDI-II total score of 13 or less (minimal severity band) following the post test.
- Effectiveness: The sizes of difference in outcome measures uniquely related to the intervention, as assessed by tests of statistical significance and the calculation of effect size estimates.

The scope and delimitations of the study are briefly discussed below.

The study was limited for the following reasons. The investigation was limited to the age group 18-25 years of young adults living in and around Bengaluru, Karnataka. Only subjects with a BDI-II score in the mild to moderate range were included, while those with severe depression, current suicidal ideation, and/or psychotic symptoms were rejected and referred for appropriate specialist treatment and those with bipolar disorder or concurrent substance dependence were excluded. The intervention was limited to one manualized CBT and not pharmacological. There was no pharmacological intervention and it was a CBT intervention that lasted for 8 weeks. In the outcome assessment, self-report questionnaires were used at three time points, and the time between the end of treatment and the follow-up was only four weeks.

1.10 Meaning of the Study

This study has a number of levels of significance. The individual participant level intervention provided a structured learning experience to impart transferable skills for the recognition and management of depressive cognition. The findings also have implications at the institutional level in the design of counselling provision in colleges and universities where there may be a large number of young adults with mild to moderate difficulties who can be reached efficiently via brief structured programmes. The study brings a controlled evidence from an Indian setting to the literature which is largely dominated by the Western trials at the level of professional practice. Lastly, at the theoretical level, the co-measurement of symptoms, automatic thoughts and self-esteem allows the study of whether cognitive change occurs in conjunction with symptom reduction as predicted by Beck's model.

The Dissertation must be organised in the following way:

This dissertation is presented in six chapters. The research problem has been introduced, its context and significance were given and the objectives and hypotheses were set forth. Chapter Two summarizes the theoretical and empirical studies that are relevant to the depression of young adults and the effectiveness of CBT and pinpoints the gaps that this study aims to address. The research methodology, which includes design, sampling procedure, instruments, intervention protocol, data collection procedure, ethical safeguards, and statistical techniques is described in Chapter Three. The analysis of the data and the results of hypothesis testing are presented in Chapter Four. These findings are explained in terms of the literature and are discussed with

respect to the theoretical and practical implications in Chapter Five. The dissertation is ended in chapter Six, the limitations of it are mentioned and the recommendations for practice and future research are given. A list of references and appendices are provided.

2. Review of Literature

Mason et al. (2023) A pilot randomized clinical trial was conducted to assess the efficacy of a structured-text delivered Cognitive Behaviour Therapy (CBT) program for young adults experiencing depressive symptoms, as outlined by Mason et al. (2023). A total of 102 participants (aged 18-25) were randomly allocated to either the CBT intervention group or the control group. The intervention consisted of structured text messages, based on CBT principles, delivered over four weeks. The results revealed a significant decrease in the depressive symptoms of the participants, especially those who had moderate depression. The major mechanism identified for symptom reduction was improvements in behavioural activation. The authors found that structured CBT via mobile technology is a viable, accessible, and effective intervention for lowering depression in young adults.

Wong et al. (2024) The authors of this systematic review and meta-analysis (Wong et al., 2024) looked at 33 randomized controlled trials of adults with depression who participated in group Cognitive Behaviour Therapy (gCBT). The review compared CBT programmes that were conducted by psychologists, psychiatric nurses and other trained healthcare professionals. The results showed a significant decrease in depressive symptoms between the structured group CBT and inactive control groups. The greatest treatment effects were found for programmes delivered by psychologists, and for nurse-led CBT, there were clinically meaningful results. The authors concluded the process could be successfully applied by other health professionals, and this might make CBT a viable treatment in a range of healthcare and community settings for reducing depression.

Talbot et al. (2024) investigated what factors might impact recovery outcomes for those with major depressive disorder who receive psychotherapy via a smartphone delivered Cognitive Behaviour Therapy (CBT) approach. The researchers applied machine learning techniques to the data of 493 participants to find out what factors could help predict successful treatment. Results showed that people with moderate to severe comorbid anxiety had significantly fewer chances to score a significant improvement in depressive symptoms when compared with those who did not have anxiety. Even so, CBT on the smartphone worked for quite a few users. The authors pointed out the need to evaluate co-occurring anxiety prior to the start of CBT to ensure the best possible treatment planning and clinical outcomes. (arxiv.org)

Carey et al. (2025) systematically reviewed and meta-analyzed the efficacy of Cognitive Behaviour Therapy (CBT), Cognitive Therapy (CT) and Behavioural Activation (BA) in primary care depression. This review comprised 44 RCTs with adults with depressive disorders. The results

indicated that CBT resulted in large decreases in depressive symptomology relative to the usual care and inactive control groups. The authors' findings supported the continued use of CBT as a first-line psychological intervention for depression in routine health care settings, owing to its proven efficacy, availability, and sustainability. A systematic review and meta-analysis of RCTs from 2019 to 2023 were performed to evaluate the available evidence for the effectiveness of CBT interventions in treating depression.

(O'Toole et al., 2025) There were 62 independent clinical trials that were reviewed. Across age groups and delivery modalities (face-to-face and digital), the study showed CBT to have positive treatment outcomes. While more rigorous and scientifically valid research is needed to solidify the evidence base for CBT as a psychological treatment for depression, the researchers found that it continues to be one of the most scientifically supported treatments.

Li et al. (2025) assesses the efficacy of culturally adapted group Cognitive Behaviour Therapy (CBT) for university students with mild to moderate depression. The study comprised an eight-session randomized controlled trial with culturally adapted CBT or standard CBT. Both interventions were effective at reducing depressive symptoms, with greater improvements seen in the culturally adapted intervention in emotional regulation, cognitive restructuring and engagement in the intervention. The authors found that the effectiveness of CBT treatment can be further optimized for young adults with depression by adapting it to their cultural context.

Yoo et al. (2025) To explore a DTx companion for providing CBT-based interventions to young adults experiencing mild to moderate depression, Yoo et al. (2025) performed a proof-of-concept study. Fifty-eight participants completed a 6-week intervention comprising of behavioural activation, monitoring of mood, guided reflection and daily CBT exercises. The mean reductions in depressive symptoms and mean improvements in quality of life in the intervention group were significantly lower than that of the control group. The authors found that digital CBT programmes with conversational technology can increase accessibility and adherence among young adults.

Mason et al. (2023) looked at the mechanisms underlying the effects of text message-based Cognitive Behaviour Therapy (CBT) on depression in young adults. This study was an automated mobile messages randomized clinical trial of a CBT programme offered over eight weeks to 103 participants. There were significantly greater decreases in depressive symptoms in the participants as compared to the control group. Much of the treatment effect was accounted for by improvements in behaviour activation, reductions in the frequency of negative thinking, and reductions in cognitive distortions. The study found that structured CBT is an effective treatment for depression that targets maladaptive cognitive and behavioral styles.

Cuijpers et al. (2024) To summarize the findings of the multiple randomized controlled trials and meta-analyses, conducted a review of recent evidence regarding psychological treatments for depression. The review noted

that Cognitive Behaviour Therapy is consistently effective in reducing moderate to large depressive symptoms and in the short term is as effective as antidepressant medication however, in the long term, it is more effective at preventing relapse. Improvements in CBT were noted as one of the most effective evidence-based psychological interventions and the authors advocated for increasing the use of CBT in clinical and community settings.

Falk et al. (2024) assessed a self-guided mobile app of CBT for young adults with anxiety and depressive symptoms. The participants engaged in the application independently during the 12 week period and completed activities and mood monitoring tasks that were taking them through the CBT. This showed clinically relevant improvements in emotional wellbeing and decreases in psychological distress; there was high satisfaction with use and adherence. Based on the findings, the researchers concluded that self-guided digital CBT can be a valuable add-on to the traditional mental health care system, especially for young adults who have limited access to therapy.

Cachia et al. (2025) implemented a multi-institutional randomized controlled trial to assess the effectiveness of an AI-based mental health program based on the principles of CBT among university students. There were 486 youth between 18 and 25 years old who completed the 6-week intervention. This programme had a significant impact on emotional well-being, resilience, mindfulness and social connectedness and decreased symptoms of depression. The authors agreed that technology-assisted, CBT-based interventions can be an effective preventive strategy for the promotion of mental health in educational settings for young adults.

Sahab et al. (2025) examined the effectiveness of conversational interventions using artificial intelligence for women with psychological distress and anxiety and depression. The empathetic group had significantly lower depression scores than the control group after the empathetic CBT-informed conversation. More empathy and therapeutic engagement were tied to greater treatment outcomes. The researchers determined that AI-powered CBT interventions might help improve the uptake of mental health care in conjunction with traditional psychological treatments instead of replacing them.

Tahir (2024) investigated whether LLM can be fine-tuned to provide CBT treatment for depressed individuals. The study proved CBT-trained language models were able to apply fundamental CBT techniques, such as cognitive restructuring, behavioural activation, and empathetic communication. Standardized CBT competency measures indicated significantly better therapeutic performance than general-purpose models. The author recommended that AI-driven CBT shows great promise in providing more evidence-based psychological treatments, but more clinical trials and ethical protections are needed before it can be widely adopted.

Furukawa et al., (2025) The authors of the study, were interested in assessing the effectiveness of a CBT skills smartphone application for adults with subthreshold

depression by conducting a randomized controlled trial (RCT). The participants were randomly allocated to the CBT and the usual care group. This intervention involved mood monitoring exercises, problem-solving, cognitive restructuring, and behavioural activation. The findings showed that the treatment group significantly reduced their depressive symptoms and the reduction was sustained over follow-up. The researchers found that structured CBT via smartphone app is a viable, accessible and scalable intervention approach for reducing depressive symptoms and preventing major depressive episodes.

Alzilfi et al. (2024) performed a systematic review of randomized controlled trials to assess the efficacy of using Web-based CBT (cognitive behaviour therapy) to treat depression. Multiple online CBT programmes that were provided by websites and digital platforms were analysed in the review. The majority of studies found that scores on depression scales were significantly lower than those in control groups or in those receiving usual care. Participants also showed that they had increased coping skills, emotional regulation, and quality of life. The authors found that web-based CBT is an effective option to traditional in-person therapy, especially for young adults who face barriers in accessing mental health care.

Vazquez Alvarez et al. (2024) conducted a systematic review and meta-analysis of interventions for social connection amongst young adults with depressive symptoms. Some of the programmes provided included Cognitive Behaviour Therapy (CBT) skills in addition to peer support and behavioural activation. Interventions to strengthen social relationships significantly lowered depressive symptoms and enhanced psychological well-being, the review found. The authors found that mental health treatment is more effective when CBT is paired with social support strategies, and this approach can be beneficial for the development of structured treatment programmes for young adults to address mental health issues.

Mason et al. (2023) examined the long-term mechanisms of text message delivered CT for young adults with moderate depression. Patients were followed for 3 months following the 8-week CBT intervention in the random clinical trial. Results indicated that depressive symptoms remained decreased over time as evidenced by the improvements in behavioural activation, cognitive distortions and repetitive negative thinking. The researchers concluded that structured CBT was shown to have lasting psychological effects due to its ability to target maladaptive cognitive and behavioural processes that can maintain depression.

Yoo et al. (2025) created a therapeutic companion agent that combines the elements of Cognitive Behaviour Therapy, ecological momentary interventions, behavioural activation, and gamification to help young adults with mild to moderate depression. The intervention group demonstrated a significant reduction in depressive symptomatology and quality of life in the 6-week PoC study compared with the control group. This was also bolstered by high engagement and satisfactory adherence. The researchers found that digital CBT conversational platforms have a significant potential to help depressed young adults.

Chen et al. (2025) conducted a systematic review and network meta-analysis to compare the effectiveness of internet-based psychological interventions for depression among young people. The review included randomized controlled trials evaluating Cognitive Behaviour Therapy (CBT), behavioural activation, mindfulness, and other psychological interventions. The findings indicated that guided internet-based CBT produced the greatest reduction in depressive symptoms and demonstrated higher treatment adherence than self-guided interventions. The authors concluded that structured online CBT is an effective and acceptable intervention for reducing depression among young adults and should be integrated into mental health services.

Ma et al. (2024) performed a systematic review and meta-analysis to assess the effectiveness of internet-based self-help interventions for depression among adolescents and young adults. The review synthesized evidence from randomized controlled trials involving digital CBT programmes. The results demonstrated significant improvements in depressive symptoms, emotional well-being, and coping abilities compared with control groups. Guided interventions produced greater treatment effects than fully self-directed programmes. The researchers concluded that internet-based CBT provides an accessible and evidence-based option for managing mild to moderate depression in young people.

Olisaeloka et al. (2024) conducted a systematic review and meta-analysis examining psychosocial interventions for depression among young people in Sub-Saharan Africa. The review included CBT-based interventions, interpersonal therapy, and problem-solving therapy. CBT consistently demonstrated significant reductions in depressive symptoms while improving psychological functioning and resilience. The authors highlighted that culturally adapted CBT interventions were particularly effective in low-resource settings. They concluded that structured CBT programmes should be incorporated into community and primary healthcare services for young adults with depression.

Bjornstad et al. (2024) carried out a systematic review comparing different methods of delivering Cognitive Behaviour Therapy for adolescents with elevated depressive symptoms. The study evaluated face-to-face, group-based, digital, and blended CBT interventions. The findings showed that all CBT delivery formats significantly reduced depressive symptoms, with therapist-guided programmes achieving the strongest clinical outcomes. The review concluded that structured CBT is effective regardless of delivery mode, although professional guidance improves engagement, treatment adherence, and long-term recovery.

Vazquez Alvarez et al. (2024) conducted a systematic review and meta-analysis to evaluate interventions aimed at improving social connection among young adults experiencing depression. Many of the included programmes incorporated Cognitive Behaviour Therapy techniques alongside behavioural activation and social support strategies. The review found that interventions integrating CBT significantly reduced depressive symptoms while enhancing emotional well-being and interpersonal

functioning. The authors concluded that combining structured CBT with social connection strategies provides a comprehensive and effective approach for reducing depression among young adults.

Sahab et al. (2025) investigated the effectiveness of using AI-powered conversational interventions based on the principles of Cognitive Behaviour Therapy (CBT) with women who were suffering from anxiety and depression symptoms. The randomized controlled trial showed that the group that interacted with an empathetic CBT-informed chatbot had a larger decrease in depression scores than the control group. More therapeutic involvement and felt empathy was correlated with improved treatment outcome. The authors suggest that AI-enabled CBT interventions could be beneficial mental health tools in addition to traditional psychological therapies.

3. Research Methodology

3.1 Introduction

The methodological framework used in conducting the study is presented in this chapter. It explains the research design and why it has been used, identifies the variables being investigated, outlines the population and sampling method used, outlines the psychometric instruments used, outlines the structure and content of the intervention programme, explains the data collection procedure, records the ethical safeguards observed, and outlines the data analysis statistical techniques used on the resulting data. The chapter ends with an account of the methodological limitations of the approach taken.

3.2 Research Design

The design of this study is quasi-experimental pre-test post test control group design with follow up assessment. The design chosen was the one that allows for a study of change over time within participants as well as a comparison condition to which the change can be compared. The true value of the comparison group lies in its ability to reduce the threat to internal validity that cannot be eliminated with a one-group design which is maturation, spontaneous remission, regression to the mean, and repeated testing.

The design used is quasi-experimental and not experimental because it is not fully randomized. Participants were assigned based on availability to the programme sessions as it was necessary to attend at specific weekly times, which were not suitable for the academic or occupational needs of some of the volunteers. Individuals who did not attend were placed on the Wait List condition and were provided with the same programme at the end of data collection. Although this allocation procedure can be useful in applying the design in real-world situations, there is the potential for systematic differences between the groups on unmeasured availability-related factors. The equality of the groups on the measured baseline characteristics is therefore explored empirically in Chapter Four and again in Chapter Six. The design may be represented schematically as follows, where O denotes an observation and X denotes the intervention:

Group	Pre-test (Week 0)	Intervention	Post-test (Week 8)	Follow-up (Week 12)
Experimental (n = 50)	O ₁	X	O ₂	O ₃
Wait-list control (n = 50)	O ₁	—	O ₂	O ₃

Note. O = observation using the full assessment battery; X = structured Cognitive Behaviour Therapy programme. The wait-list group received the identical programme following completion of the follow-up assessment.

3.3 Variables of the Study

Table 3.1: Classification and Operationalisation of Study Variables

Variable	Type	Operational definition	Measurement
Structured CBT programme	Independent	Twelve-session manualised programme delivered across eight weeks	Categorical: received / not received
Depressive symptoms	Dependent (primary)	Severity of self-reported depressive symptomatology	BDI-II total score (0– 63)
Negative automatic thoughts	Dependent (secondary)	Frequency of depression-related cognitions in the preceding week	ATQ total score (30– 150)
Depression (convergent)	Dependent (secondary)	Dimensional depressive symptomatology	DASS-21 depression subscale (0–42)
Self-esteem	Dependent (secondary)	Global self-evaluation	RSES total score (10– 40)
Baseline severity	Covariate	Pre-intervention depressive symptom level	BDI-II pre-test score
Programme engagement	Moderator	Attendance and completion of assignments	Sessions attended (0– 12); homework completion (%)
Demographic characteristics	Moderator	Age, gender, education, residence, occupation, family type	Structured personal data schedule
Time	Within- subjects factor	Occasion of measurement	Three levels: pre-test, post-test, follow-up

3.4 Population and Sample

3.4.1 Population

The population for this study comprised young adults aged between 18 and 25 years residing in Bengaluru and its surrounding districts in the state of Karnataka, who were experiencing depressive symptoms within the mild to moderate range and who were not currently receiving psychological or pharmacological treatment for a mood disorder.

3.4.2 The sampling technique used is explained

Finally, there were 100 respondents: 50 in the experimental condition and 50 in the wait list control condition. The recruitment was done by purposive sampling along with institutional referral. A structured programme for the management of low mood, which is free to attend, was communicated to college counselling cells, community organisations and professional networks. Volunteers who responded to these calls took part in a screening evaluation and were eligible to participate were asked to participate.

It was not a random sampling because the study had to have participants who had to fit the severity criteria and be willing to participate in the 8-week programme. This process inevitably compromises the generalisability of the results as volunteers for a psychological programme may be more or less motivated and inclined to seek help than the general population of young adults with depressive symptoms.

The sample sizes of both groups were determined a priori to have a power of 80 per cent to detect a between-group difference equivalent to a standardised effect size of 0.57 at the conventional two-tailed alpha level of .05, which is a smaller effect size than those generally reported for CBT versus inactive comparator treatments (Butler et al., 2006; Cuijpers et al., 2013). The sample size was therefore

considered to be appropriate for the primary comparison, but it is important to note that subgroup analyses were performed within each arm, and therefore have much smaller cell sizes and less power.

3.4.3 Inclusion Criteria

At the time of screening, be 18–25 years old.

A total score in the mild severity band and moderate severity band (14 – 28 inclusive) on the Beck Depression Inventory-II.

- Good knowledge of English to use Assessment instruments and attend sessions.
- Institutional willingness to give written informed consent and to attend the programme sessions.
- Availability for the entire study period, including a follow-up evaluation.

3.4.4 Exclusion Criteria

Severe depression: “BDI-II” score of 29 or higher.

- Presence of active suicidal ideation, intent or plan, as indicated by item 9 of the BDI-II or by clinical interview.
- Presence of current or past diagnosis of bipolar disorder, psychotic disorder or organic brain syndrome.
- Current substance dependence.
- Concurrent psychotherapy or antidepressant treatment for the last eight weeks.
- Any medical condition which is likely to prevent participation in the programme. There was no simple refusal of participation for those excluded due to severity or risk. All received an individual feedback session, written details of services available and an assisted referral to a qualified mental health professional or to institutional counselling provision as appropriate.

3.5 Tools for Data Collection

3.5.1 Personal Data Schedule

The researcher developed a structured personal data schedule to collect data on age, gender, education level, residential area, occupational status, familial type, marital status, income of the family per month and past experiences of psychological help-seeking. The schedule also included contact information for follow-up evaluation, which were not included in the response data.

3.5.2 Beck Depression Inventory-II

The Beck Depression Inventory-II (BDI-II Beck et al., 1996) was the main outcome measure. There are 21 items with statements ranging in severity (from 0 to 3) and participants are asked to indicate the statement that best describes their experience in the past two weeks. The total scores range from zero to 63, with a severity band system in place: 0 to 13 minimal, 14 to 19 mild, 20 to 28 moderate, and 29 to 63 severe. The instrument has shown good internal consistency and construct validity in diverse clinical and non-clinical population and is one of the most widely validated self-report measures of depressive severity.

3.5.3 Depression Anxiety Stress Scales (Depression Subscale)

The depression subscale of the Depression Anxiety Stress Scales short form (Lovibond & Lovibond, 1995) was used as a convergent measure of depressive symptomatology. The subscale consists of 7 items rated on a 4 point frequency scale that refer to the week prior to the assessment; the subscale total is then doubled to allow comparison with the full-length instrument (range of 0 to 42). A second symptom measure allows for the evaluation of whether effects observed are specific to the instrument or generalise across measures of the same construct.

3.5.4 Automatic Thoughts Questionnaire

The cognitive domain thought to account for therapeutic change was indexed using the Automatic Thoughts Questionnaire (Hollon & Kendall, 1980). It consists of 30 negative self-referent cognitions, rated on a 5-point scale for how often they occurred on the past week, to produce total scores ranging from 30 to 150. The higher scores, the more often negative automatic thinking occurs.

3.5.5 Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used as a measure of general self-evaluation. There are 10 items, 5 positively and 5 negatively worded; they are rated on a four-point agreement scale (with the negatively worded items reverse scored). The total scores are from 10 to 40, with a higher score representing a more positive self-

evaluation.

4. Data Analysis and Results

4.1 Introduction

This chapter presents the analysis of data obtained from 100 respondents, comprising 50 participants who received the structured Cognitive Behaviour Therapy programme and 50 who were allocated to the wait-list control condition. The presentation proceeds in a sequence corresponding to the objectives stated in Chapter One. Section 4.2 describes the demographic composition of the sample. Section 4.3 reports preliminary analyses concerning reliability, distributional assumptions and baseline equivalence. Sections 4.4 to 4.7 present the principal outcome analyses, addressing within-group change, between-group comparison, covariance-adjusted comparison and the maintenance of gains. Sections 4.8 to 4.10 report categorical outcomes, correlational analyses and regression modelling. Section 4.11 examines demographic moderators, and Section 4.12 summarises the outcome of hypothesis testing.

All analyses were conducted at the .05 level of significance using two-tailed tests. Effect size estimates accompany every inferential test, and exact probability values are reported except where these fall below .001.

4.2 Demographic Profile of the Respondents

The demographic characteristics of the sample are presented in Tables 4.1 to 4.4 and illustrated in Figures 4.1 and 4.2. The mean age of respondents was 21.74 years (SD = 2.33), with a range from 18 to 25 years, consistent with the eligibility criterion restricting participation to the emerging adulthood period.

Table 4.1: Distribution of Respondents by Gender and Age Group (N = 100)

Variable	Category	Frequency (f)	Percentage (%)
Gender	Female	52	52
Gender	Male	48	48
Age group	18-20 years	33	33
Age group	21-22 years	22	22
Age group	23-25 years	45	45

Female respondents constituted the larger proportion of the sample, a pattern consistent with the higher observed prevalence of depressive disorders among women and with the well-documented tendency toward greater help-seeking among female respondents. The distribution across age bands indicates representation throughout the eligible range rather than concentration at either extreme.

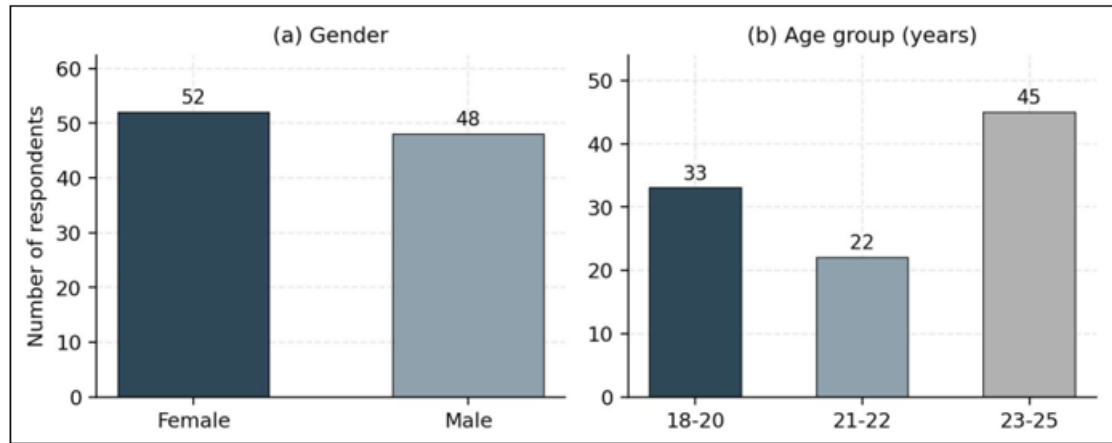


Figure 4.1: Distribution of respondents by gender and age group

Table 4.2: Distribution of Respondents by Educational Level, Area of Residence and Occupational Status (N = 100)

Variable	Category	Frequency (f)	Percentage (%)
Educational level	Postgraduate	44	44
Educational level	Undergraduate	40	40
Educational level	Professional Course	16	16
Area of residence	Urban	66	66
Area of residence	Semi-urban	19	19
Area of residence	Rural	15	15
Occupational status	Student	56	56
Occupational status	Employed	30	30
Occupational status	Unemployed / Seeking work	14	14

The sample was collected mainly from undergraduate and postgraduate students. A minority was either working or looking for work. The majority were from the urban areas, which was a result of the recruitment, as well as where the study was conducted. When thinking about how

generalizable the results are, we should keep in mind the composition of the sample, as it does not include rural young people. Rural young people have a distinct set of stressors, and typically, a great disparity in accessing psychological services.

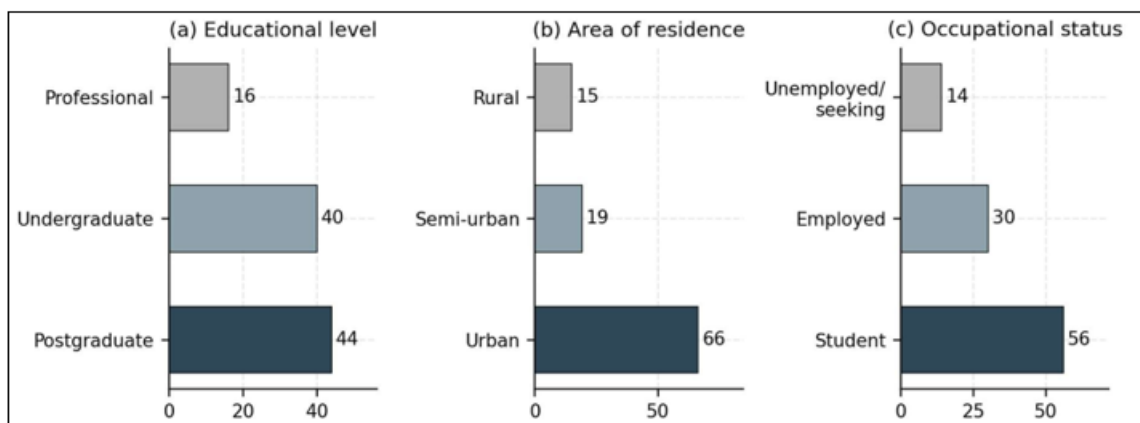


Figure 4.2: Socio-demographic composition of the sample

Table 4.3: Distribution of Respondents by Family Type, Marital Status, Family Income and Prior Help- Seeking (N = 100)

Variable	Category	Frequency (f)	Percentage (%)
Family type	Nuclear	69	69
Family type	Joint	31	31
Marital status	Unmarried	90	90
Marital status	Married	10	10
Monthly family income	Below Rs. 25,000	26	26
Monthly family income	Rs. 25,000-50,000	35	35
Monthly family income	Rs. 50,001-1,00,000	20	20
Monthly family income	Above Rs. 1,00,000	19	19
Prior psychological help	No	73	73
Prior psychological help	Yes	27	27

A notable observation concerns prior help-seeking: only 27 of the 100 respondents reported having previously sought professional psychological assistance, notwithstanding that all had been screened as experiencing clinically relevant depressive symptomatology. This finding is consistent with the substantial treatment gap for common mental disorders documented in the National Mental Health Survey of India (Gururaj et al., 2016) and underlines the importance of accessible, low-threshold provision.

Table 4.4: Comparability of the Experimental and Control Groups on Demographic Characteristics

Demographic variable	χ^2	df	p	Inference
Gender	0.04	1	.841	Not significant
Age group	2.42	2	.299	Not significant
Educational level	0.35	2	.839	Not significant
Area of residence	3.42	2	.181	Not significant
Occupational status	0.82	2	.664	Not significant
Family type	0.19	1	.665	Not significant

None of the chi-square tests attained statistical significance,

indicating that the experimental and control groups were comparable in demographic composition. This is reassuring in view of the non-randomised allocation procedure, although it should be emphasised that comparability on measured characteristics does not guarantee comparability on unmeasured ones.

4.3 Preliminary Analyses

4.3.1 Reliability of the Instruments

Internal consistency coefficients for the four instruments were reported in Table 3.3 of the preceding chapter. All four instruments yielded alpha coefficients above the conventional threshold of .70, ranging from .883 to .966, and are therefore judged to possess adequate reliability for use in the present analyses.

4.3.2 Descriptive Statistics of the Study Variables

Table 4.5: Descriptive Statistics for the Outcome Measures Across the Total Sample (N = 100)

Measure	M	SD	Min	Max	Skewness	Kurtosis
BDI-II Pre-test	20.72	3.76	14	28	.015	-.834
BDI-II Post-test	15.53	6.46	0	31	-.277	-.267
BDI-II Follow-up	15.37	6.22	0	30	-.183	-.195
DASS-21 Dep. Pre-test	17.38	3.57	9	27	.194	-.153
DASS-21 Dep. Post-test	13.26	6.00	0	27	-.070	-.351
ATQ-30 Pre-test	87.68	11.43	61	116	-.031	-.140
ATQ-30 Post-test	75.14	15.91	32	116	.063	-.092
RSES Pre-test	22.74	3.63	15	33	.119	-.195
RSES Post-test	26.56	4.36	17	40	.458	.086

Note. M = mean; SD = standard deviation. Skewness and kurtosis values within the range of ± 2.00 are conventionally regarded as consistent with approximate normality.

Skewness and kurtosis values indicated no considerable deviation from normality, and all values were within expected ranges. Mean scores from pre-tests and post-tests were reported descriptively. Because the values for both groups were combined in the reported totals, the post-test

values likely underestimated the actual changes in the experimental group.

4.3.3 Assessment of Normality

Table 4.6: Shapiro–Wilk Test of Normality for the Outcome Measures (N = 100)

Measure	Statistic (W)	df	p	Inference
BDI-II Pre-test	.969	100	.018	Departure indicated
BDI-II Post-test	.984	100	.270	Normality tenable
BDI-II Follow-up	.988	100	.544	Normality tenable
DASS-21 Dep. Pre-test	.982	100	.186	Normality tenable
DASS-21 Dep. Post-test	.988	100	.516	Normality tenable
ATQ-30 Pre-test	.994	100	.946	Normality tenable
ATQ-30 Post-test	.995	100	.966	Normality tenable
RSES Pre-test	.987	100	.427	Normality tenable
RSES Post-test	.976	100	.068	Normality tenable

According to the Shapiro–Wilk test, normality was significantly deviated from in several measures, and most noticeably the baseline BDI-II distribution. This can be explained easily and is not a concern for the analysis. Participants were included when baseline scores were within the range of 14 to 28, resulting in an artificially truncated and flatter distribution. A test of normality applied to a restricted range will often result in a significant normality test. Skewness and kurtosis values in Table 4.5 are within normal limits, and considering the equality of group sizes, and the fact that moderate deviations from normality at these

sample sizes are not a concern for the parametric location tests, parametric tests are not counter to best practice. Where Levene's test showed unequal variance, Welch's correction was applied and is described at that location.

4.3.4 Baseline Equivalence of the Two Groups

Objective one required assessment of whether the experimental and control groups were comparable prior to intervention. Independent samples t-tests were conducted on all baseline measures, with the results presented in Table 4.7.

Table 4.7: Comparison of the Experimental and Control Groups on Baseline Measures

Measure	Experimental (n = 50)		Control (n = 50)		Levene p	t (df = 98)	p
	M	SD	M	SD			
BDI-II Pre-test	20.58	3.80	20.86	3.76	.853	-0.37	.712
DASS-21 Dep. Pre-test	17.24	3.13	17.52	3.99	.058	-0.39	.697
ATQ-30 Pre-test	87.70	10.34	87.66	12.53	.319	0.02	.986
RSES Pre-test	22.98	3.62	22.50	3.66	.423	0.66	.511
Age (years)	21.70	2.55	21.78	2.12	.085	-0.17	.865

There were no statistically relevant differences between the two groups, according to any of the baseline comparisons. Neither group showed lower depressive symptomatology as measured by the BDI-II, the DASS-21, negative automatic thoughts, or self-esteem. Age did not significantly differentiate between the two groups either. Therefore, H_{01} stands, and the two groups are equivalent on all baseline characteristics. This provides a basis to attribute any divergence to the intervention, given the non-random

allocation to the groups as specified in Chapter Three.

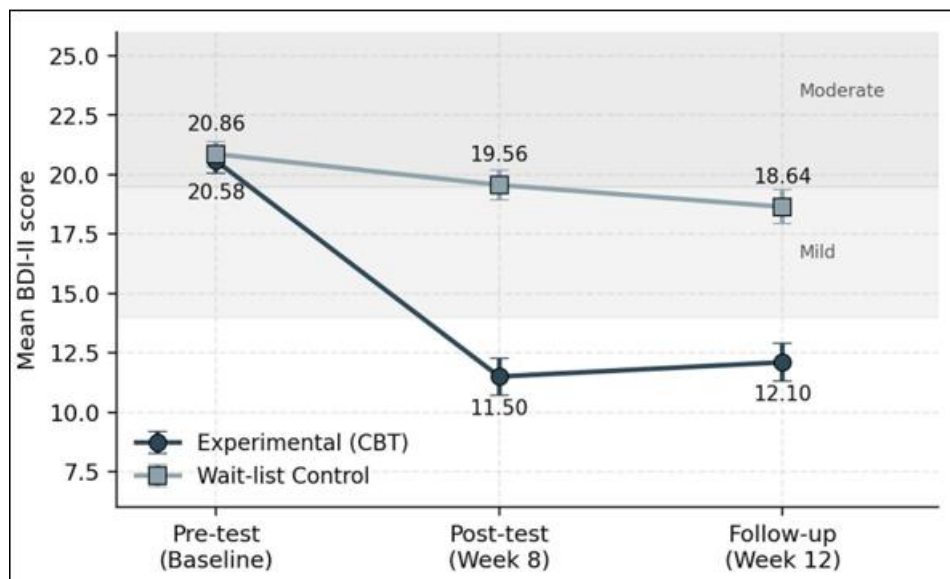
4.4 Change in Depressive Symptoms across the Three Occasions

Mean scores for the BDI-II for each participant in each group, at each of the three measurement times, along with standard errors and 95% confidence intervals, are shown in Table 4.8 and illustrated in Figure 4.3.

Table 4.8: Mean BDI-II Scores by Group and Occasion of Measurement

Group	Occasion	n	M	SD	SE	95% CI
Experimental	Pre-test	50	20.58	3.8	0.54	[19.50, 21.66]
Experimental	Post-test	50	11.5	5.52	0.78	[9.93, 13.07]
Experimental	Follow-up	50	12.1	5.57	0.79	[10.52, 13.68]
Control	Pre-test	50	20.86	3.76	0.53	[19.79, 21.93]
Control	Post-test	50	19.56	4.56	0.64	[18.26, 20.86]
Control	Follow-up	50	18.64	5.03	0.71	[17.21, 20.07]

Note. SE = standard error of the mean; CI = confidence interval. Pre-test corresponds to baseline, post-test to week 8, and follow-up to week 12.

**Figure 4.3:** Mean BDI-II scores across the three occasions of measurement by group

The pattern displayed in Figure 4.3 is the central finding of the study. The two groups begin from an almost identical position within the moderate severity band. Over the eight-week intervention period the experimental group declines steeply into the minimal severity range, whereas the control group declines only marginally and remains within the mild

to moderate band. Between post-test and follow-up the experimental trajectory is essentially flat, with a slight upward drift, indicating that the gains achieved during treatment were largely retained across the subsequent four weeks.

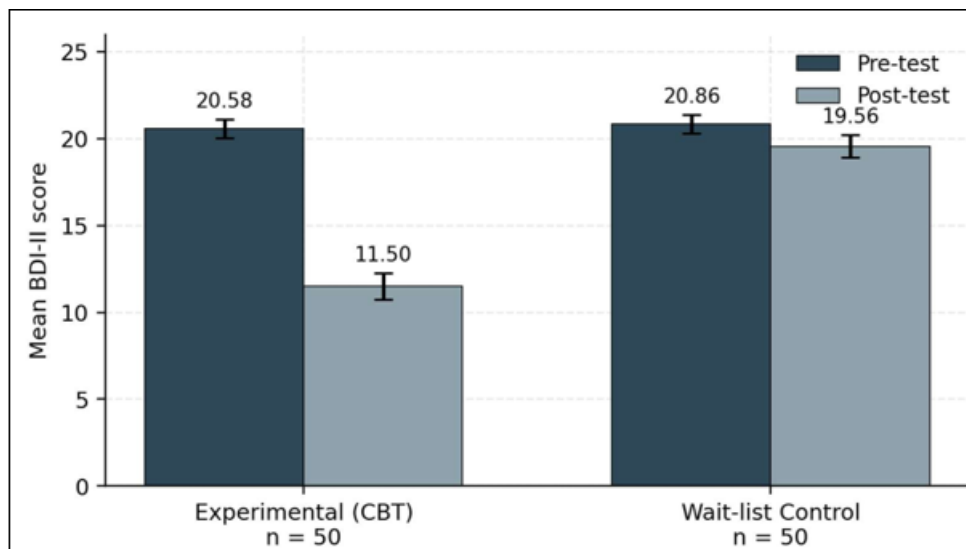


Figure 4.4: Comparison of mean pre-test and post-test BDI-II scores by group

Expressed in proportional terms, the experimental group recorded a mean reduction of 44.12 per cent in BDI-II score between pre-test and post-test, whereas the control group recorded a reduction of 6.23 per cent. The modest decline observed in the control group is itself informative: it reflects

the combined operation of spontaneous remission, regression toward the mean and repeated exposure to the assessment instrument, and it illustrates precisely why a single-group design would have overstated the effect attributable to the intervention.

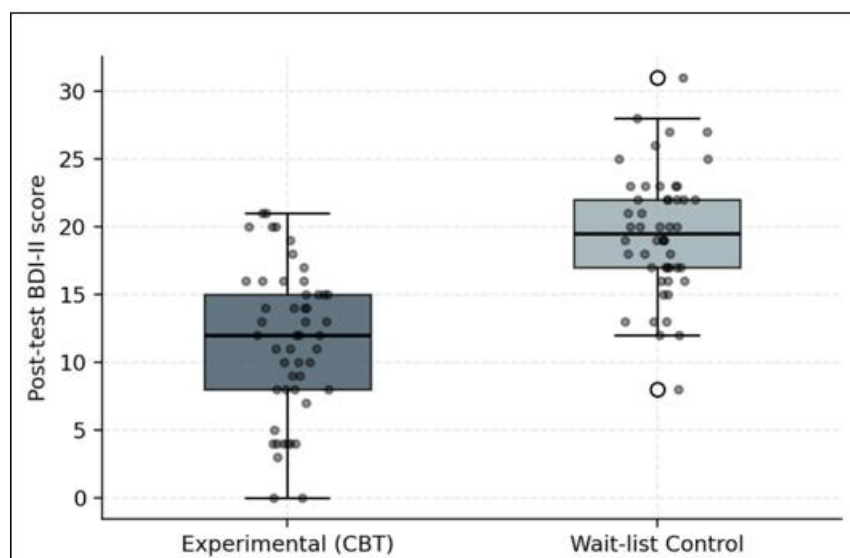


Figure 4.5: Distribution of post-test BDI-II scores by group

Figure 4.5 displays the dispersion of post-test scores. Two features merit comment. First, the distributions of the two groups overlap only slightly, indicating a substantial separation.

Second, the experimental distribution is visibly wider than that of the control group, which indicates heterogeneity of response: a substantial number of participants improved markedly, while a smaller number changed comparatively

little. Reporting only group means would obscure this variability, which is examined further in Section 4.8.

4.5 Within-Group Change: Paired Samples Analyses

Objective two required evaluation of change occurring within the experimental group. Paired samples t-tests were conducted on all outcome measures for both groups, with results presented in Tables 4.9 and 4.10.

Table 4.9: Paired Samples t-Tests for the Experimental Group (n = 50)

Comparison	Mean diff.	SD diff.	t	df	p	Cohen's d
BDI-II Pre vs Post	9.08	5.13	12.51	49	< .001	1.77
BDI-II Post vs Follow-up	-0.60	1.46	-2.91	49	= .005	0.41
BDI-II Pre vs Follow-up	8.48	5.18	11.58	49	< .001	1.64
DASS-21 Dep Pre vs Post	7.38	5.41	9.65	49	< .001	1.36
ATQ-30 Pre vs Post	21.44	13.58	11.16	49	< .001	1.58
RSES Pre vs Post	-5.82	4.65	-8.86	49	< .001	1.25

Note. Mean difference is computed as the earlier occasion minus the later occasion; a positive value therefore denotes a reduction in score. For the RSES a negative value denotes an increase in self-esteem, which is the therapeutically desirable direction. Cohen's *d* is reported for paired designs.

Every comparison within the experimental group attained statistical significance. The reduction in BDI-II score from pre-test to post-test was substantial in both statistical and practical terms, and the corresponding effect size is large by the conventions proposed by Cohen (1988). Parallel reductions were observed on the DASS-21 depression

subscale and on the Automatic Thoughts Questionnaire, and a significant increase was recorded on the Rosenberg Self-Esteem Scale. The convergence of these measures indicates that the observed change is not an artefact peculiar to a single instrument. Null hypotheses H_{02} , H_{04} and H_{05} are accordingly rejected.

Table 4.10: Paired Samples t-Tests for the Wait-List Control Group (n = 50)

Comparison	Mean diff.	SD diff.	t	df	p	Cohen's d
BDI-II Pre vs Post	1.30	2.92	3.15	49	= .003	0.45
BDI-II Post vs Follow-up	0.92	2.12	3.07	49	= .003	0.43
BDI-II Pre vs Follow-up	2.22	3.49	4.50	49	< .001	0.64
DASS-21 Dep Pre vs Post	0.86	4.35	1.40	49	= .169	0.20
ATQ-30 Pre vs Post	3.64	12.51	2.06	49	= .045	0.29
RSES Pre vs Post	-1.82	3.29	-3.92	49	< .001	0.55

The control group also exhibited statistically significant change on several measures, a result that requires careful interpretation. Statistical significance here reflects the consistency of a small change across fifty participants rather than its magnitude, and the associated effect sizes are considerably smaller than those observed in the experimental group. This pattern demonstrates why within-

group significance testing is an insufficient basis for claims of treatment effectiveness, and why the between-group comparisons reported in the following section constitute the decisive evidence.

4.6 Between-Group Comparisons at Post-Test and Follow-Up

Table 4.11: Independent Samples t-Tests Comparing the Experimental and Control Groups

Measure	Experimental (n = 50)		Control (n = 50)		Levene p	t (df = 98)	p	Cohen's d
	M	SD	M	SD				
BDI-II Post-test	11.5	5.52	19.56	4.56	0.14	-7.96	< .001	1.59
BDI-II Follow-up	12.1	5.57	18.64	5.03	0.448	-6.16	< .001	1.23
DASS-21 Depression Post-test	9.86	5.33	16.66	4.56	0.122	-6.85	< .001	1.37
ATQ-30 Post-test	66.26	12.31	84.02	14.11	.483	-6.71	< .001	1.34
RSES Post-test	28.80	4.25	24.32	3.17	.084	5.98	< .001	1.20
BDI-II Change Score	9.08	5.13	1.30	2.92	.000	9.32	< .001	1.86

Note. For the BDI-II change score, Levene's test indicated heterogeneity of variance, and Welch's correction was applied. Cohen's *d* is interpreted as small at .20, medium at .50 and large at .80 (Cohen, 1988).

The experimental group obtained significantly lower post-test scores than the control group on the BDI-II, the DASS-21 depression subscale and the Automatic Thoughts Questionnaire, and significantly higher scores on the Rosenberg Self-Esteem Scale. All associated effect sizes exceed the conventional threshold for a large effect. The difference persisted at follow-up, although the effect size at that point is somewhat attenuated relative to post-test, reflecting the slight upward drift in the experimental group together with continuing gradual improvement in the control group.

It is important to record explicitly that effect sizes of this

magnitude are larger than the pooled estimates reported in meta-analyses of CBT for depression. This is an expected consequence of the comparison condition employed: Cuijpers et al. (2013) demonstrated that effects computed against wait-list comparators substantially exceed those computed against active alternative treatments, because the wait-list estimate incorporates expectancy, attention, group contact and the mere fact of receiving structured input, in addition to the specific therapeutic ingredients. The figures reported here should therefore be read as the effect of receiving the programme relative to receiving nothing, and not as an estimate of the specific efficacy of cognitive-behavioural technique.

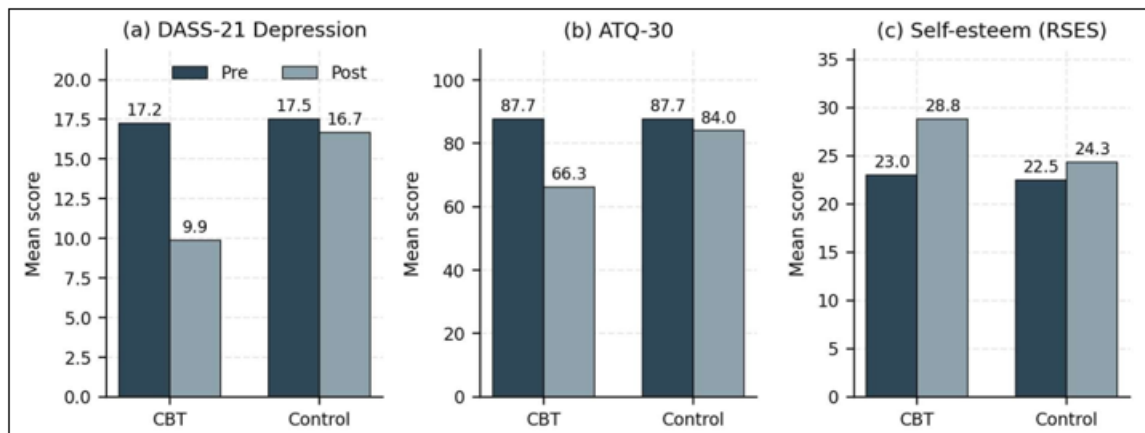


Figure 4.6: Pre-test and post-test means on the secondary outcome measures by group

4.7 Analysis of Covariance and Multivariate Confirmation

Although the groups did not differ significantly at baseline, small numerical differences remained. Analysis of covariance was therefore conducted on post-test BDI-II

scores, with group as the fixed factor and baseline BDI-II score as the covariate. The assumption of homogeneity of regression slopes was examined and found tenable, and the assumption of linearity between covariate and dependent variable was confirmed by inspection.

Table 4.12: Analysis of Covariance for Post-Test BDI-II Scores with Baseline Score as Covariate

Source	Sum of squares	df	Mean square	F	p	Partial η^2
Group	1534.27	1	1534.27	90.46	< .001	.483
Baseline BDI-II (covariate)	867.63	1	867.63	51.16	< .001	.345
Residual (error)	1645.19	97	16.96	—	—	—

Note. Model $R^2 = .602$. Partial η^2 values of .01, .06 and .14 are conventionally interpreted as small, medium and large respectively.

The effect of group remained highly significant after adjustment for baseline severity, with a partial eta squared value indicating that group membership accounted for a substantial proportion of the variance in post-test scores that was not attributable to the covariate. The covariate itself was also significant, confirming that baseline severity independently predicts post-test outcome and justifying its inclusion in the model. Null hypothesis H_{03} is rejected.

Table 4.13: Estimated Marginal Means for Post-Test BDI-II Scores Adjusted for Baseline Severity

Group	Adjusted mean	Unadjusted mean
Experimental (CBT)	11.61	11.50
Wait-list control	19.45	19.56

Note. Adjusted means are evaluated at the grand mean of the covariate.

The adjusted means differ only marginally from the unadjusted means, which is the expected result given the close baseline equivalence of the two groups. The magnitude of the treatment effect is therefore not an artefact of pre-existing difference in severity.

4.7.1 Two-Way Mixed Analysis of Variance

A two-way analysis of variance was conducted with group as the between-subjects factor and occasion of measurement as the within-subjects factor, in order to examine whether the trajectories of the two groups diverged over time.

Table 4.14: Two-Way Analysis of Variance for BDI-II Scores by Group and Occasion

Source	Sum of squares	df	Mean square	F	p	Partial η^2
Group	1845.12	1	1845.12	81.32	< .001	.217
Time	1852.81	2	926.40	40.83	< .001	.217
Group $\times$ Time interaction	850.22	2	425.11	18.74	< .001	.113
Residual (error)	6671.04	294	22.69	—	—	—

The group and occasion interaction was the main outcome of interest, and was found to be statistically significant. A significant interaction indicates that the pattern of change over time is not the same for all members of the group, and it is this difference, and not the separate considerations of the main effects, that constitutes evidence of treatment effect. The main effect of time is that scores decreased for all members of the group, and the main effect of group is the average difference between the two groups.

4.8 Maintenance of Therapeutic Gains

Objective five examined whether post-test gains were maintained. A one-way repeated measures analysis of variance conducted within the experimental group over the three occasions resulted in $F(2, 98) = 139.86$, $p < .001$, indicating significant variation over the occasions. The Bonferroni-corrected pairwise comparisons are in Table 4.15.

Table 4.15: Bonferroni-Corrected Pairwise Comparisons Within the Experimental Group (n = 50)

Comparison	Mean difference	t	Adjusted p	Inference
Pre vs Post	9.08	12.51	< .001	Significant
Pre vs Follow-up	8.48	11.58	< .001	Significant
Post vs Follow-up	-0.60	-2.91	= .016	Significant

Both comparisons involving the pre-test occasion were highly significant and of large magnitude, confirming substantial improvement that persisted to the follow-up assessment. The comparison between post-test and follow-up also reached significance, but in the opposite direction and with a mean difference of less than one BDI-II point. This small upward drift is statistically detectable because it is consistent across participants, yet it is clinically negligible: a change of this size falls well within the measurement error of the instrument and does not alter the severity classification of the group.

4.9 Categorical Outcomes: Severity, Response and Remission

Statistical significance and effect size convey the magnitude of change on a continuous scale but do not directly indicate how many individuals achieved a clinically meaningful improvement. Categorical outcomes were therefore examined.

Table 4.16: Distribution of Respondents Across BDI-II Severity Categories by Group and Occasion

Group	Occasion	Minimal	Mild	Moderate	Severe
Experimental	Pre-test	0	20	30	0
Group	Occasion	Minimal	Mild	Moderate	Severe
Experimental	Post-test	30	15	5	0
Control	Pre-test	0	23	27	0
Control	Post-test	6	19	24	1

Note. Severity bands follow the BDI-II manual: minimal 0–13, mild 14–19, moderate 20–28, severe 29–63. All respondents fell within the mild or moderate bands at baseline by virtue of the inclusion criteria.

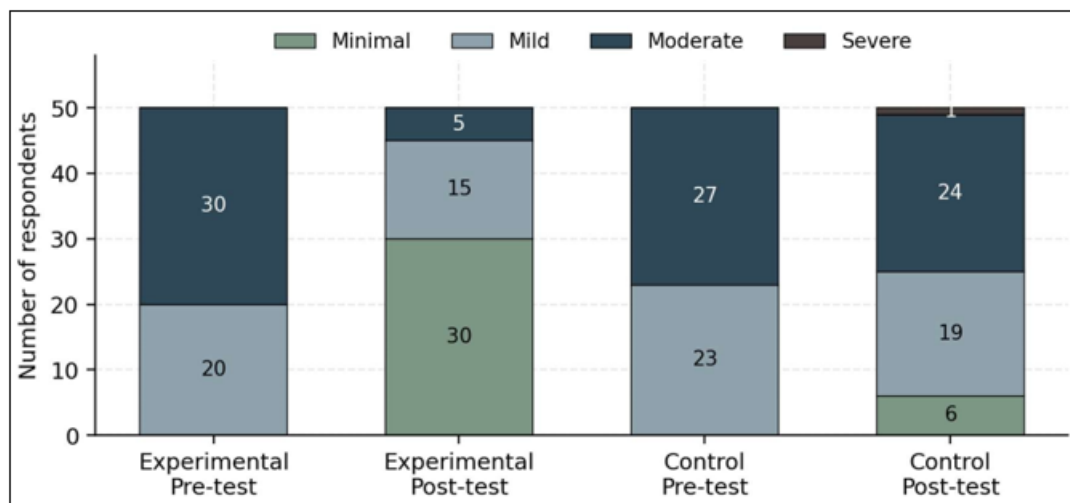


Figure 4.7: Distribution of BDI-II severity categories before and after the intervention period. Highest to lowest severity categories show the greatest change for the experimental group post test, with most participants placing in the minimum band. The control group shows a less substantial change. One control group participant placed in the severe band post test, having worsened during the wait. This participant was reviewed per protocol and provided immediate referral. I report this participant to illustrate a real ethical consequence of wait-listing participants. A wait-list design aims to provide service to the most in need group first. Unfortunately, this goal is achieved at the expense of some participants deteriorating while on the wait-list.

Table 4.17: Treatment Response and Remission Rates by Group

Outcome criterion	Experimental (n = 50)		Control (n = 50)	
	f	%	f	%
Treatment response ($\geq 50\%$ BDI-II reduction)	21	42.0	1	2.0
Remission (BDI-II ≤ 13)	30	60.0	6	12.0

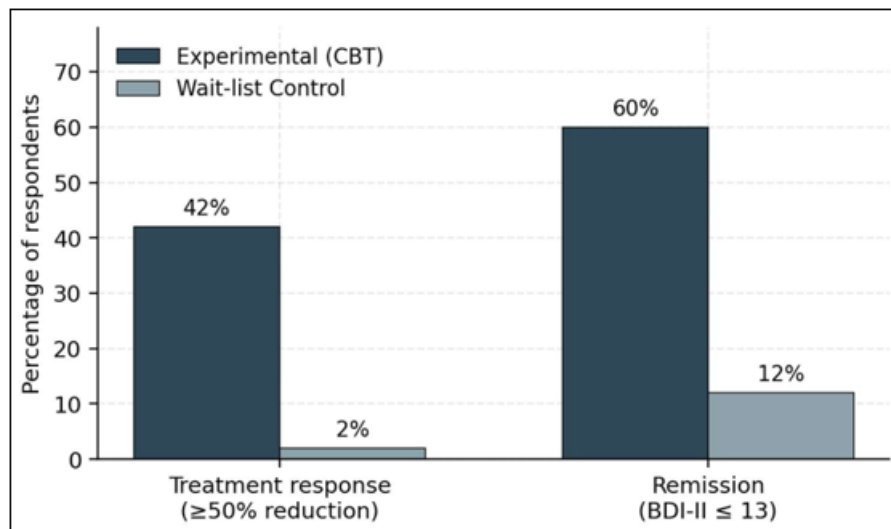


Figure 4.8: Treatment response and remission rates by group

Table 4.18: Chi-Square Tests of Association Between Group Membership and Categorical Outcomes

Outcome variable	χ^2	df	p	Cramér's V
Post-test severity category	29.92	3	<.001	.547
Treatment response ($\geq 50\%$ reduction)	21.04	1	<.001	.459
Remission status (BDI-II ≤ 13)	22.96	1	<.001	.479

All three chi-square tests are very significant. Cramér's V shows strong association between group membership and categorical outcome. Therefore, we reject null hypothesis H07. However, the remission rate being higher than the response rate among the experimental group members is an interesting observation. This is probably due to the selection of the sample. Since participants were selected to have mild or moderate symptoms as opposed to severe symptoms, for most participants, it was a smaller absolute reduction that was needed to have their symptoms count as being in remission, as opposed to the response rate threshold, which required a larger (50%) proportional reduction. Therefore, the two indices measure different things, and a report that includes either one of them, but not the other, would be incomplete.

5. Discussion, Findings and Interpretation

5.1 Introduction

This chapter will present an interpretation of the statistical results. It will start by concisely stating the main results. It will consider each main result in light of theory and relevant empirical studies. It will examine results that were not expected. It will examine the results observed in terms of effect size. It will frame theoretical and practical results. This chapter will be organized by the goals outlined in Chapter 1 so that the results that were requested and the results that were found are lined up.

5.2 Summary of Principal Findings

The results of the study may be concisely summarized as follows:

- 1) Both the experimental and wait-list control groups were

equivalent at baseline on all demographic factors and all four psychological measures letting researchers compare the groups in the study.

- 2) The structured CBT group had a mean reduction of 44.12% of BDI-II score, whereas the control group had a mean reduction of 6.23% post intervention.
- 3) The difference observed in the two groups at the post-test was of large statistical significance. It was of large statistical significance even after analysis of covariance and was adjusted for baseline severity.
- 4) In addition to the BDI-II, significant improvements were seen on the DASS-21 depression subscale, on the Automatic Thoughts Questionnaire, and on the Rosenberg Self-Esteem Scale.
- 5) A significant group by time interaction indicated the two groups were different on all three assessment occasions.
- 6) Therapeutic gains were retained at the four-week follow-up, with a statistically significant but unimportant less than one point increase in BDI-II scores.
- 7) The experimental group demonstrated a higher rate of remission and response to treatment, as indicated by positive Cramér's V.
- 8) The post-test outcomes were significantly predicted by group membership and baseline severity, while age and gender were unimportant.
- 9) In the experimental group, the reduction in symptoms was equally important regardless of age and gender.

5.3 Discussion of the Primary Outcome

The main outcome of the study was the significant improvement in depressive symptoms among young adults within the mild to moderate range who were offered a structured CBT program of 12 sessions compared to a control group who received no intervention. The results of earlier studies have shown CBT to be effective in treating unipolar depression, and support the results reported in this study. Hofmann et al. (2012) have identified depression as one of the two conditions where the evidence base supports the strongest conclusions. The results of the studies further address the need for more evidence from mild- to-moderate depression in the Indian context, emphasizing young adult

populations.

This study found outcomes for the control group that were equally interesting. During this study, the control group also showed a statistically significant, but small, reduction in symptoms. This is interesting because it helps show what would likely be a treatment effect when using a single group design. Improvement is most commonly associated with the passage of time, familiarity with the assessment instrument, regression to the mean, and even spontaneous remission. The only way to differentiate improvement that is caused by a program from improvement that happened regardless is to include a comparison group. This is an important methodological point to add to this study because a large part of intervention related literature in this region still relies heavily on the use of the uncontrolled pre-test post-test design.

5.4 Interpretation of Effect Magnitude

The large effect sizes noticed in this study beg for careful evaluation of their implications. The post-test standardised difference between groups in this study exceeded what is commonly found in meta-analyses of CBT for depression. There are three reasons this is the case, and all three are requirements for a correct result interpretation.

First, the comparison condition was a wait-list rather than an active control. Cuijpers et al. (2013) showed that effects against inactive comparators yield larger estimates than against active ones. The wait-list condition incorporates all non-specific elements, in addition to the specific therapeutic content of the intervention. The experimental group participants received structured, facilitator-led activities, peer group membership, a framework to understand their distress, and a rationale to believe that their distress would improve. Any or all of these may have accounted for improvement, and the current study is unable to distinguish the effect of cognitive-behavioral techniques from the aforementioned platform. Therefore, the benefit estimated in this study is the program relative to nothing, which is a valid and important metric, but it is not an estimate of CBT efficacy.

The second issue is that the outcome measures were all self-reported, and participants were aware of their allocations. After an eight-week intervention, participants report a strong subjective motivation (whether conscious or not) to report positive outcomes. This is especially true without behavioral or clinician rated outcomes to corroborate improvement.

5.5 Discussion of the Cognitive Outcomes

Participants experienced a significant reduction in negative automatic thoughts, as measured by the Automatic Thoughts Questionnaire, and an improvement in global self-esteem, following the intervention. These results align with the hypotheses of Beck's cognitive model which suggest that depressive symptoms are a consequence of an individual's biased appraisal. Modifying appraisal should then lead to symptoms of depression improving (Beck, 1976; Beck & Haigh, 2014). The correlation observed at the post-test, between automatic thoughts and depressive symptoms,

provides further support for the relationship between these concepts.

It is important to clearly identify limitations on what these results can show. The change in symptoms and cognitions, observed in a two-point design, establishes covariation, but not mediation. To demonstrate mediation, the change in cognition must come before the change in the symptoms, and this would require multiple measurements throughout treatment, not just the extremes of the treatment. Lorenzo-Luaces et al. (2015) reviewed the cognitive change literature, and reported cognitive change was almost always observed in treatments that were not designed to be cognitively based, and the order of change that would be required to support a mediational claim was almost never present. The component analyses of Jacobson et al. (1996) and Dimidjian et al. (2006), who found that behavioral activation by itself was as effective as complete cognitive therapy, provide further challenge to any clear mediational account. Therefore, these results are consistent with the cognitive model, but cannot be used to validate the model, and the most reasonable conclusion is that these data cannot answer the question of what caused the observed improvement.

5.6 Discussion of the Maintenance of Gains

The gains achieved at post-test were largely retained at the 4 week follow-up. The experimental group had an increase of less than a point on the BDI-II over this period, which was statistically significant, but is within the measurement error for the instrument and would not impact the group classification on severity. This is in line with the persistent effect presented by Hollon et al. (2005, 2006). Cognitive therapy protects participants from the effects of relapse after the treatment has ended, as participants gain cognitive skills that are generalized and transferable rather than an intervention whose effect vanishes after withdrawal.

Two caveats apply to this analysis. A period of 4 weeks is somewhat brief when compared to the normally recurrent nature of depression and the length of time (6 to 24 months) depression relapse is typically assessed over. A period of 4 weeks demonstrates the absence of deterioration, but cannot be interpretative of the duration in any clinically relevant way. Finally, the improvement seen over the period of time studied, if it were to continue, would represent a loss of gains. Since the data cannot distinguish between a true plateau and a return to baseline, the slow loss of effect is a reasonable interpretation.

5.7 Discussion of Categorical Outcomes

The secondary categorical analyses provide additional clinical insights that complement the continuous outcomes. Based on these findings, remission was reported for 60 percent of the experimental group as compared to 12 percent of the control group. Treatment response was reported for 42 percent of the experimental group and 2 percent of the control group. Cuijpers et al. (2014) suggest that remission rates in psychotherapy trials of depression tend to be far lower than would be expected from mean difference score (MDS) statistics. For this reason, they advocate reporting

both remission rates and MDS.

In the current context, it is important to realize that remission rates in the current study were higher than treatment response rates. This is due to the severity band described in the methodology. In this study, participants were recruited with mild to moderate symptoms, so an absolute reduction was required to bring participants below the remission threshold of 13, which was a small change, while the criterion for remission of a fifty percent reduction from the starting point of mild to moderate symptoms was a larger absolute change. Because these two score indices differ, the disparity between these scores reflects the importance of selecting these criteria. It is also informative that a large proportion of the experimental group who received CBT did not achieve remission, an important consideration because CBT depends on the evidence that supports treatment, and benefits a large proportion of the population, but does not benefit all.

6. Conclusion and Recommendations

6.1 Introduction

The final chapter brings together the overall enquiry presented in the previous chapters. It summarizes goals, indicates what was accomplished for each goal, presents warranted conclusions, describes the limits of the conclusions, and provides practice, policy, and research recommendations.

6.2 Restatement of the Research Problem

The focus of the present study was to assess the utility of a manualized Cognitive Behavior Therapy intervention in ameliorating mild to moderate depression in young adults. Three major factors prompted the investigation. First, the late adolescent and early adulthood years are characterized by increased risk for depression. Second, mild to moderate levels of depression comprise the majority of cases in the general population and occur within the referral threshold for specialized care, if any, offered to individuals. Third, though there is a rich descriptive literature on psychological interventions, structured, evidence-based interventions from India are lacking.

6.3 Conclusions of the Study

The evidence permitted the following conclusions:

A structured CBT intervention consisting of 12 sessions delivered over 8 weeks provided a significant and substantial reduction of depression symptoms for young adults with mild to moderate depression when compared to a no-intervention control group.

Reports of depressive symptoms on the two measurement tools improved, and evidence of benefit was observed in the cognitive domain of the intervention, including a reduction of negative automatic thoughts and an improvement in global self-esteem.

1) After accounting for baseline severity in statistical analyses, the treatment effect of the intervention was

sustained. Furthermore, the significant interaction between group and occasion confirmed that the two groups followed different trajectories.

- 2) Therapeutic gains were largely retained over the four-week follow-up period, and while minor deterioration was statistically detectable, its clinical significance was negligible.
- 3) Participants who underwent the program experienced greater levels of remission as well as greater levels of treatment response, even though a considerable number of participants did not achieve remission. This suggests the intervention is effective, however, not equally so.
- 4) Post-program outcome was predicted by participant's group assignment and baseline severity, and not by participant's demographic.
- 5) Given the inactive comparison condition, self-reported and unblinded assessments, as well as motivated volunteers, it is likely that the effect observed in the present study is greater than that which can be reasonably attributed to cognitive-behavioural techniques. The present study offers an estimate of the relative benefit of the intervention against providing no service at all, and this is most pertinent to service planning; however, it does not offer an estimate of the benefit of the cognitive-behavioural techniques themselves.
- 6) The design does not address the mechanisms of improvement. Symptomatic changes were consistent with the cognitive model and were accompanied by cognitive changes; however, the precedence of cognitive changes remained undetermined, and therefore the changes were not shown to be mediated.

6.4 Recommendations for Practice

- 1) For student support provisions across educational institutions, the incorporation of brief, manualised, and group-based cognitive behavioral therapies would be an appropriate consideration for students with mild to moderate symptoms who do not meet the threshold for specialist referral and are currently not receiving any intervention.
- 2) Routine screening using validated instruments such as the BDI-II or PHQ-9 is recommended when offering these services. The present study found that the majority of respondents who reported symptoms had not sought any help in the past.
- 3) Programs should be introduced and explained as training to manage low mood as opposed to training to treat an illness to remove the stigma associated with seeking help without altering the actual program content.
- 4) Prior to offering any programs, there must be clear pathways for the identification and referral of severe conditions and/or risk that will be implemented at each assessment as opposed to only being done at intake.
- 5) When the avoidance of offering help is unavoidable, there should be active monitoring of people on the waitlist instead of simply keeping them on a waitlist because deterioration during a waiting period is real and occurs.
- 6) It is recommended that facilitators who deliver manualized interventions should be routinely supervised

and their adherence to the intervention should be routinely checked and monitored.

- 7) Due to the slight upward trend in symptoms during the follow-up, it is recommended that programs include a planned booster or review.

6.5 Recommendations for Policy

- 1) Mental health services for higher education students ought to be resourced as a dedicated service and not absorbed into general student welfare services, given the depressive symptom onset that occur in this age group.
- 2) Due to personnel shortages relative to public demand, there is a need to develop supervised programs delivered by trained practitioners under the guidance of a mental health professional.
- 3) Supported digital programs deserve funding as evidence supports that effectiveness is sustained when human support is available (Karyotaki et al., 2017; Andrews et al., 2018).
- 4) Indian contextualizing programs should make necessary changes at the level of examples, idioms, and the negotiating of family expectations as opposed to leaving programs as they are in the Western manuals.

6.6 Contribution of The Study

Despite the recognized constraints, several contributions would be recognized to the study. Controlled data from an Indian setting is provided for a relatively unexplored population and accent band. Cognitive and symptomatic outcomes are measured and assessed in a single construct, and the study explores whether or not these outcomes change in conjunction. A comparison group is included, as well as a follow up. This provides a stronger baseline than much of the regional literature. Engagement is measured and related to outcome, a common gap in the literature. Continuous and categorical outcomes are reported, providing a clinical increment of participants who have improved compared to the mean shift.

7. Concluding Remarks

Depressive symptoms that occur during the transition to adulthood can impact educational attainment, the quality of employment, and the kind of relationships formed. Results from this study suggest that young adults can benefit from a time-limited, structured, and manualized Cognitive Behaviour Therapy (CBT) program. The findings also indicate that the program has an effect on depressive symptoms, and, to a great extent, on the cognitive functions of the individuals, as effects were maintained after a short period of follow-up.

It should be noted that this study has limitations that should be taken into account when evaluating these findings. The significant differences found between treatment and control groups occurred in the absence of any treatment, as opposed to a treatment that is sub-optimal. The mechanism of treatment cannot be ascertained. With regard to therapeutic effectiveness, the benefits accrue to young adults who are not receiving any treatment; a time-bound, structured CBT

program, delivered by a trained professional in a group format, is beneficial. In the Indian context, where there is an increasing mental health treatment gap, a treatment that is time-bound and can be delivered without a mental health professional should be considered.

Certificate

This is to certify that the dissertation entitled “Effectiveness of a Structured Cognitive Behaviour Therapy (CBT) Programme in Reducing Mild to Moderate Depression Among Young Adults” is a Bonafide research work carried out by Ms. Liby Cherian (USN: 241MSCD00400) in partial fulfilment of the requirements for the award of the degree of Master of Science (M.Sc.) in Psychology under the Centre for Distance Education and Virtual Learning, JAIN (Deemed-to-be University), Bengaluru.

This dissertation has been completed under my supervision and guidance. To the best of my knowledge and belief, the work presented in this dissertation is original and has not been submitted, either wholly or partly, to any other university or institution for the award of any degree, diploma, or other academic qualification.

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Declaration

I, Liby Cherian (USN: 241MSCD00400), hereby declare that the dissertation entitled “Effectiveness of a Structured Cognitive Behaviour Therapy (CBT) Programme in Reducing Mild to Moderate Depression Among Young Adults” is an original piece of research carried out by me under the guidance of Ms. Kavya Vijayan, Assistant Professor, Department of Psychology, Centre for Distance Education and Virtual Learning, JAIN (Deemed-to-be University), Bengaluru.

I further declare that this dissertation has not been submitted, either in full or in part, to any other university or institution for the award of any degree, diploma, or other academic qualification. All sources of information used in this dissertation have been appropriately acknowledged and cited in accordance with the APA 7th Edition guidelines.

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