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An Experimental Investigation to Assess the Efficacy of cognitive behavior therapy for Depression in Teenagers.

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ABSTRACT

Introduction: Teenagers' depression is a widespread mental health problem that is mostly brought on by gender, helplessness, attribution style, family conflict, poor social problem-solving abilities, cognitive distortions, alienation, perceived criticism, etc. It is influenced by a variety of factors, and there is a need to develop more effective care and rehabilitation plans.
Objective: The purpose of the study is to find out the prevalence of depression in teenagers and to check the effect of cognitive behavior therapy on depression levels in teenagers.
Methodology: Teenagers in the age group of 16 to 18 years of age, enrolled in Dehradun's private and public schools, participated in this pre-posttest study. Written consents were obtained, and all study participants who met the inclusion and exclusion criteria were chosen at random. The Beck Depression Inventory was utilized to gather data on depression, and a total of 15 CBT sessions were employed to manage depression levels. The Statistical Package for Social Science, version 28.0, was used to analyze the data.
Findings*:* Of the 80 participants, the first degree of depression was in the extremely severe category. After 15 CBT sessions, the subjects' depression reduced to a mild mood disturbance, with an average reduction of 65.98%.
Conclusion: This investigation is in fact a diagnostic study that is aimed at managing the level of depression in teenagers for the improvement of their mental and physical health. The study discovered that teenagers' depression levels were significantly reduced following CBT. The findings in male and female teenagers were similar across trials, and the results were stable. Both male and female teenagers' depression scores were significantly reduced after CBT. In general, it is found that CBT is useful in managing teenagers' depression.

Key words: teenagers, depression, gender, cognitive behavior therapy.

Abbreviation: CBT: cognitive behavior therapy

1.0 Introduction

Depression and other mental health issues are more common among students than in the general population. The early onset of depression has been linked to various mental, functional, physical, and health implications, with a high percentage of people with early depression symptoms going on to experience depressive episodes as adults. Traumatic events are a strong predictor of future mental health issues. Depression ranks third worldwide and accounts for 4.3% of all mental diseases across the lifespan. If current trends continue, it will be the leading cause of illness by 2030. Depression is the fourth leading cause of disease burden, accounting for 4.4% of total disability-adjusted life years (DALYs) in 2000, and the largest amount of non-fatal burden, accounting for almost 12% of all total years lived with disability worldwide. Depression, for example, might cause a loss of motivation or energy. We may influence our brain's chemical production by rewarding ourselves for simple tasks like putting away dishes. If we do so, we are more likely to repeat the behavior. Lessening the power of non-behavioral techniques is a key component of CBT.

CBT uses a mix of cognitive and behavioral strategies to treat depression. Suggestions for coping with negative thoughts are rationalized and questioned, lessening their power over the patient. One will use cognitive restructuring to evaluate the thinking, the emotion or trigger, and the situation. To reduce cognitive illusions like "mind-reading," when we imagine we know what others are thinking, we adopt a more realistic attitude. Treatment for depression that uses behavioral approaches entails rewarding oneself for small improvements in behavior.

2.0 Review of literature

As per the prevailing situations in India with regards to the significant lesser availability of trained therapists in most of the places and patients' preferences, pharmacological interventions are offered as the first-line treatment modalities for the treatment of depression. Treatment guidelines for depression suggest that psychological interventions are an effective and acceptable strategy for treatment and are most commonly used for mild-to-moderate depressive episodes. Cognitive behavioral therapy (CBT) is one of the most evidence-based psychological interventions for the treatment of several psychiatric disorders, such as depression, anxiety disorders, somatoform disorders, and substance use disorders. The uses have recently extended to psychotic disorders, behavioral medicine, marital discord, stressful life situations, and many other clinical conditions. A sufficient number of studies have been conducted and shown the efficacy of CBT in depressive disorders. A meta-analysis of 115 studies has shown that CBT is an effective treatment strategy for depression, and combined treatment with pharmacotherapy is significantly more effective than pharmacotherapy alone **(Fennell M. 2012).** Evidence also suggests that the relapse rate of patients treated with CBT is lower in comparison to patients treated with pharmacotherapy alone **(APA 2010).**

Cognitive behavioral therapy (CBT) is recommended as an evidence-based psychological treatment for mild, moderate, and severe depression by the National Institute for Health and Care Excellence (NICE) **(Murray and Cartwright-Hatton, 2006).** Despite its efficacy, CBT has been shown in meta-analyses to have only a small to moderate effect size when used as a preventative measure or treatment for children and teenagers **(Hetrick et al., 2016; Yang et al., 2016).** The scale of the effects of alternative medicines has not yet increased. For instance, CBT has not been shown to be more beneficial than interpersonal psychotherapy (IPT) in treating teenage depression **(Weisz et al., 2017).** Because of the potential for an increased risk of suicide, the use of pharmaceutical treatments is often unsuccessful and disputed **(Cipriani et al., 2016).** As a result, evidence-based psychological therapies are frequently used as an initial course of care. **Tindall et al. (2017)** conducted a meta-analysis that found behavioral activation to be effective in the treatment of depression in young people. This is in line with the results of another study that surveyed young people. Behavioral activation and challenging thoughts were viewed as practicable and useful approaches to reducing depression symptoms by children and teenagers **(Ng, Eckshtain, & Weisz, 2016);** however, 65% of the other components of CBT were not judged successful.

The first factor in the genesis of depression is the quality of the attachment relationship **(Brumariu and Kerns 2010, Brenning et al. 2011).** While CBT is not designed to strengthen attachment bonds, it does help children learn healthy coping strategies, and it shows parents they have their backs by having them attend sessions. The quality of the attachment relationship could be improved by incorporating these factors. Second, the possibility of control transfer in children may improve intervention fidelity and the child's understanding of the therapy process outside of the actual sessions. The transfer of the control component of CBT has been shown to result in the long-term maintenance of treatment benefits **(Manassis et al., 2014)** in a meta-analysis of CBT for children.

According to **Compton et al. (2004) and Hardway et al. (2015), involving** the care provider(s) in the therapeutic process while simultaneously employing contingency management may also improve outcomes. It has been shown that when a caregiver is present during therapy sessions, the child or teenager is more likely to open up to the therapist.

3.0 Research methodology

3.1 Objective of the study: To find out the prevalence of depression and to check the effect of CBT on the degree of depression in teenagers.

3.2 Hypothesis:
1. There will be a significant reduction in the degree of depression in teenagers after CBT.
2. There will be a significant reduction in the degree of depression in male teenagers after CBT.
3. There will be a significant reduction in the degree of depression in female teenagers after CBT.

3.3 Samples and Sampling Techniques
The random method selected 120 teenagers, including 60 male and 60 female teenagers studying in classes 11 and 12 (16 to 18 years old) in the schools located in Dehradun. A total of 20 teenagers were excluded due to medical and preexisting psychological treatment. A total of 10 male and 10 female teenagers were allocated to the waiting list, and 40 male and 40 female teenagers were given CBT. A total of 4 groups were formed, including 20 teenagers from each group, to provide group-based CBT. A total of 37 male and 35 female teenagers have completed the CBT therapy.

3.4 Plan of CBT: A total of 15 sessions of CBT were provided. After each session, a 5-day break was observed. For this time break, specific tasks were given. Which includes journaling and noting their own emotions and reactions as per current situations **(Tables 1 and 2).**

3.5 Assessment and Statistical Analysis: The Beck Depression Inventory **(A. T. Beck, Steer, and Brown, 1996)** is used for the assessment of the degree of depression, and a t-test is used for statistical analysis.

Table:1 Overview of Cognitive behavioral therapy for depression

S.N.	Action
01	Mutually agreed on problem definition by therapist and client
02	Goal setting
03	Explaining and familiarizing client with five area model of CBT
04	Improving awareness and understanding on one's cognitive activity and behavior
05	Modification of thoughts and behavior - using principles of Socratic dialogue, guided discovery, and behavioral experiments/exposure exercise
06	Application and consolidation of new skills and strategies in therapy sessions and homework sessions to generalize it across situations
07	Relapse prevention
08	End of therapy

Table: 2 Session Structure of Cognitive Behavioral Therapy

S.N.	Component	Time (Minutes)
01	Beginning of session: Mood check; Agenda setting; reviewing homework	15-20
02	a) Discussion of agenda / problem b) Description of occurrence of specific problem. c) Elicitation and confirmation of elements of the cognitive model. d) Collaborative discussion regarding how to approach a problem. e) Rationale for the introduction of intervention. f) Assessment of efficacy of intervention. g) Summary by patient. h) Collaborative action plan in writing. i) Planning and discussion of a homework and how to approach it.	80-90
03	Feedback by therapist	10-20

4.0 Results and discussion

4.1 Analysis of data obtained for the management of depression in teenagers by using CBT:

From table 3, the initial mean depression score of male teenagers was 44.46 (extremely severe), which was reduced by 13.41% after 3 sessions of CBT. After 6 sessions of CBT, a total reduction of 34.77% was observed. After the 9th and 12th sessions of CBT, 54.68% and 64.91% reductions were observed, respectively. And finally, after 15 sessions of CBT, an overall 66.26% reduction was observed in the depression scores of male teenagers. The initial depression score, which was in the category of extremely severe, changed to mild mood disturbance after 15 sessions of CBT.

When depression scores of female teenagers were analyzed, it was found that the initial mean depression score of female teenagers was 46.6, which was reduced by 16.31% after 3 sessions of CBT, 36.70% after the 6th session, and after the 9th and 12th sessions of CBT, 54.94% and 61.37% reductions were observed, respectively. And finally, after 15 sessions of CBT, a reduction of 65.67% was observed in the depression scores of female teenagers. Thus, after 15 sessions of CBT, the depression scores of female teenagers changed from extremely severe to borderline clinical depression.

Initially, the score for depression for all teenagers was recorded at 45.53, indicating an extremely severe level of depression. Following three sessions, the value decreased by 14.91%. Following six sessions, the depression score exhibited a reduction of 35.78%. Following nine sessions, the depression score exhibited a reduction of 54.80%. Following 15 sessions, the depression score was reduced by 65.98%. Thus, after 15 sessions of CBT, the depression score of teenagers changed from extremely severe to mild mood disturbance **(Figure 1 and table 2)**.

Figure 1: Percentage reduction in depression scores of teenagers after CBT

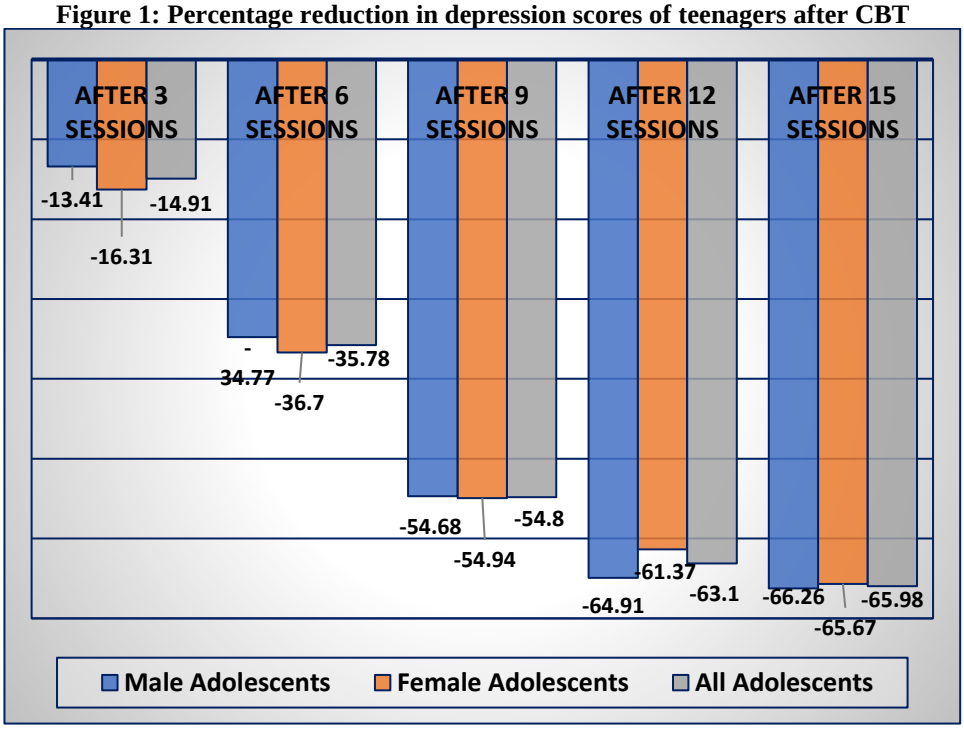


Table: 3 Depression Scores per CBT sessions

	Depression Pre-Data			Post CBT Scores of Depressions (Mean) & (% Reduction)				
	N	Mean Score	SD	After 3 Sessions	After 6 Sessions	After 9 Sessions	After 12 Sessions	After 15 Sessions
Male	37	44.46	8.9926	38.5 (-13.41)	29 (-34.77)	20.15 (-54.68)	15.6 (-64.91)	15 (-66.26)
Category of Depression level		Extremely severe		Severe	Moderate		Mild	
Female	35	46.6	4.8276	39 (-16.31)	29.5 (-36.70)	21 (-54.94)	18 (-61.37)	16 (-65.67)
Category of Depression level		Extremely severe		Severe	Moderate		Borderline clinical	
Total	72	45.53	6.9101	38.74 (-14.91)	29.24 (-35.78)	20.58 (-54.80)	16.8 (-63.10)	15.49 (-65.98)
Category of Depression level		Extremely severe		Severe	Moderate		Borderline clinical	Mild

4.2 Statistical analysis of Depression scores of teenagers obtained after different sessions of CBT

4.2.1 When data was analyzed to find a significant difference in the reduction of depression scores in teenagers through CBT, the following observations were made:

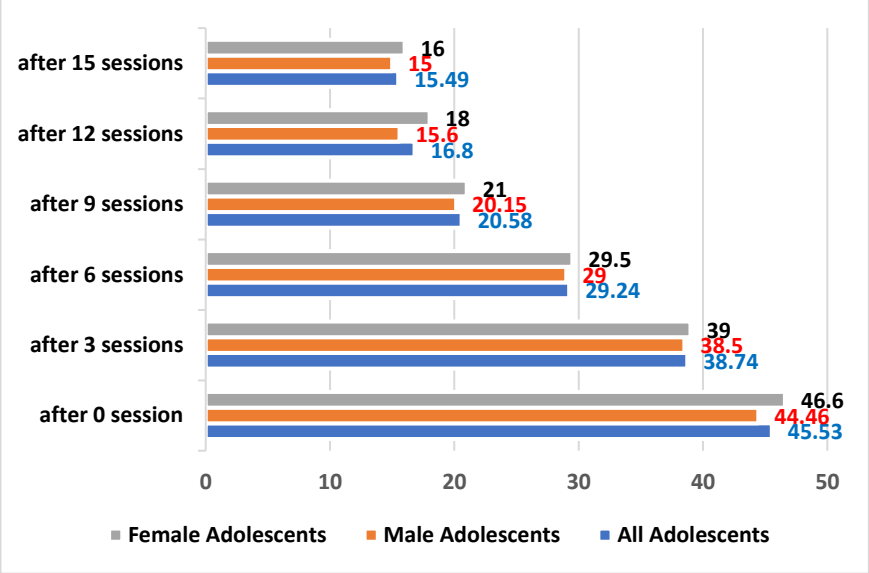
For the zero-to-3rd session of CBT, the calculated t-value was 6.1135. For the 3rd to 6th session, the calculated t-value was 9.7394; for the 6th to 9th session, the calculated t-value was 9.9605; and for the 9th to 12th session, the calculated t-value was 4.6338. All the t-values were found to be significant at the 95% confidence level. For the 12th to 15th sessions, the t-value was 1.6575, which is not significant at the 95% confidence level. It means that up to 15 sessions of CBT are found effective for the management of depression among teenagers **(Table 4).**

Table 4: t-values for Depression Scores of Teenagers After CBT Sessions

CBT Sessions	Mean (N =72)	SD	t-Value*	
After 0 Session	45.53	6.9101	6.1135**	
After 3 Session	38.74	6.2023	P .0001	9.7394**
After 6 Session	29.24	5.4805	9.9605**	P .0001
After 9 Session	20.58	4.9386	P .0001	4.6338**
After 12 Session	16.80	4.2279	1.6575***	P .0001
After 15 Session	15.49	3.8653	P .0689	

*.05 level of significance
** significant
*** not significant

Figure 2: Depression scores of teenagers after different sessions of CBT



4.2.2 When data was analyzed to find a significant difference in the reduction of depression scores in male teenagers through CBT therapy, the following observations were made:

For the zero to 3rd session of CBT, the calculated t-value was 3.0100; for the 3rd to 6th session, the calculated t-value was 5.2448; for the 6th to 9th session, the calculated t-value was 5.2293; for the 9th to 12th session, the calculated t-value was 2.8926; and all these t-values are significant at the 95% confidence level of significance. For the 12th to 15th sessions, the t-value was found to be 0.4174, which is not significant as per the table values. It means that for up to 15 sessions, CBT is effective for the management of depression among male teenagers **(Table 5).**

Table 5: t-values for Depression Scores of Male Teenagers After CBT Sessions

CBT Sessions	Mean (N =37)	SD	t-Value*	
After 0 Session	44.46	8.9926	3.0100**	
After 3 Session	38.5	8.0124	P .0036	5.2448**
After 6 Session	29	7.5627	5.2293**	P .0001
After 9 Session	20.15	6.9842	P .0001	2.8926**
After 12 Session	15.6	6.5397	0.4174***	P .0051
After 15 Session	15	5.8031	P .6776	

*.05 level of significance
** significant
*** not significant

4.2.3 When data was analyzed to find a significant difference in the reduction of depression scores in female teenagers through CBT, the following observations were made:

For the zero to 3rd session of CBT, the calculated t-value was found to be 6.977; for the 3rd to 6th session, the calculated t-value was found to be 9.7122; for the 6th to 9th session, the calculated t-value was found to be 9.4904; and for the 9th to 12th session, the calculated t-value was found to be 3.9027. All these t-values were found to be significant at the 95% confidence level. For the 12th to 15th sessions, the t-value was found to be 3.4752, which is significant as per table values. But after 15 sessions, the calculated t-value was not found to be significant. It means that for up to 15 sessions, CBT is effective for the management of depression among female teenagers **(Table 6).**

Table 6: t-values for Depression Scores of Female Teenagers After CBT Sessions

CBT Session Interval	Mean (N =35)	SD	t-Value*	
After 0 Session	46.6	4.8276	6.9777**	
After 3 Session	39	4.2679	P .0001	9.7122**
After 6 Session	29.5	3.9080	9.4904**	P .0001
After 9 Session	21	3.5782	P .0001	3.9027**
After 12 Session	18	2.8067	3.4752**	P .0002
After 15 Session	16	1.9274	P .0009	

*.05 level of significance ** significant

5.0 Discussion:

The hypothesis 1.0, which expected a significant reduction in the degree of depression in teenagers after CBT, is accepted. A significant reduction is observed in the depression scores of teenagers after 15 sessions of CBT. **Oud, M., et al. (2019),** in their research, found a similar impact of CBT on the depression level of teenagers. **The hypothesis 2.0,** expecting a significant reduction in the degree of depression in male teenagers after CBT, is accepted. A significant reduction is observed in the depression scores of male teenagers after 15 sessions of CBT. **Oud, M., et al. (2019),** in their research, found a similar impact of CBT on the depression level of teenagers. **The hypothesis 3.0,** expecting a significant reduction in the degree of depression in female teenagers after CBT, is accepted. A significant reduction is observed in the depression scores of female teenagers after 15 sessions of CBT. **Gautam M. (2020),** in his research, found a similar impact of CBT on the depression level of teenagers.

6.0 Conclusion:

The study found that there is a significant reduction in depression levels in teenagers after 15 sessions of CBT. The results were consistent across various studies, with similar findings in male and female teenagers. Overall, CBT was found effective in teenagers' depression management.

7.0 Summary

The study's objectives were to examine depression levels among teens enrolled in Dehradun schools and analyze the effectiveness of cognitive behavioral therapy. T. Aeron Beck's psychological depression questionnaire was utilized for the investigation. In the study (pre-posttest), 80 teens in total were chosen, and CBT was utilized to manage depression levels. To identify a significant difference, the t-test was used. The results of the study showed that after 15 sessions of CBT, teens' depression levels reduced significantly.

8.0 Educational Implications

It is the responsibility of both government and private schools to sort out the cases of depression among teenagers and provide them with proper counseling. Therefore, to fulfill depression-related concerns and improve the mental health of teenagers, there is a need for remedial measures. By monitoring the level of depression, CBT can be included in the educational environment.

9.0 Limitations

The study is restricted to eighty teenagers enrolled in Dehradun's private and public schools. Depression is the subject of the study; numerous other factors that could have an impact on mental health were overlooked.

10. Suggestions

To make the study more thorough, it might be done in other places and with a larger population. It would have been possible to test the depression of college and middle school students in a comparable manner. It is possible to test and compare the depression of teenagers studying different subjects, such as the social and scientific sciences. In regard to depression, a variety of factors can be examined, including workload, work habits, age, interests, adjustment, and self-concept

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12. Conflict of Interest: The authors have declared that no competing interest exists.

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