EFFECTIVENESS OF BEHAVIOURAL ACTIVATION THERAPY FOR DEPRESSION IN SCHOOL GOING ADOLESCENTS

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Abstract

Introduction: Present-day adolescents experience depression due to a variety of environmental causes and show negative effects on social, physical, psychological, and cognitive features. This study aims to evaluate the effectiveness of behavioural activation (BA) therapy on depression in adolescents. **Methods:** This study was carried out on school-going adolescents after obtaining informed voluntary consent. 150 adolescents (15-19 years) with mild and moderate depression based on Beck's Depression Inventory-II (BDI-II) were randomly assigned to control and experimental groups, equally. Pre-test scores on somatic, affective, cognitive, and total were taken. The experimental group was given BA therapy in batches, for 3 months consisting of mood elevation, problem-solving, social skill development, and healthy behaviour, while control was given routine care. Post-test was done using BDI-II for both groups. Salivary cortisol was measured for both groups in the pre-test and post-test. Data were analysed by Kruskal Wallis one-way ANOVA. **Results:** In somatic, affective, cognitive, and total scores of BDI-II, the pre-test showed homogenous data in both groups ($p > 0.05$). In the post-test significant difference was observed in somatic, cognitive, and total ($P = 0.002$, 0.005 and < 0.001, respectively). From the pre-test to the post-test, the control did not show significance ($P > 0.05$), while the experimental group showed significance ($P = 0.005$, 0.009, 0.003 and < 0.001, respectively). Salivary cortisol showed an increase in control in the post-test compared to the experimental ($P < 0.001$). **Conclusion:** The BA therapy is beneficial in reducing depression among adolescents.

Keywords: Adolescence, Behavioural Activation Therapy, Depression. Salivary Cortisol.

1. INTRODUCTION

The adolescent period is very challenging, and require massive decisions on academic and extracurricular activities for an adventurous and stable life. This is influenced by financial, social, environmental and also the biological changes. It is extremely important to explore the opportunities available during the adolescent period to shape the life. If the available systems are not utilised positively, it may lead to depression. Globally, it is estimated that 1 in 7 adolescents of 10 to 19 years, experience mental health problems.

This is generally unrecognised and uncontrolled .The Centre for Disease Control and Prevention (CDC) reported that 1 in 7 adolescents of 12 to 17 years, had major depressive episodes, and 1 in 3 had feelings of sadness or hopelessness. More than 264 million people suffer from depression.

Worldwide statistics reported that in the year 2020, more than 200 million people suffered from depression and it was a leading cause of disability. According to Substance Abuse and Mental Health Services Association, adolescents have the highest rate of major depressive episodes.

Depressive disorders are among the most common mental health problems affecting around 50 million people in India and a major contributor to the disability adjusted life year (DALY). The prevalence of depression is higher in school going adolescents. A cross sectional study was conducted recently to assess the prevalence of depression and risk factors among urban school going adolescents of 11 to 19 years. The data was collected using the Patient Health Questionnaire-9.

The results of the study showed that more than half of the children had mild depression and close to 1 % had severe depression. The depression level was higher in female, late adolescents and those who were studying in higher grade (Bharati et al, 2022). The National Crime Records Bureau (NCRB) reported that more than 1.5 million suicides in the country in 2021, and this is increasing every year.

It is human nature that unhappiness is a part of life and the adolescents are no exception to that. However, clinical depression is more intense and lasts longer than sadness or grief. It seriously limits a person's ability to effectively carryout daily activities. Symptoms of depression include loss of interest, rejected feeling, loss appetite, disturbed sleep, fatigue, loss of hope and more seriously suicidal thoughts. Depression leads to inactiveness and particularly in school going adolescents, it will cause major damages. It is highly essential to activate them and give positive energy.

Behavioural activation (BA) is one of the ways to remove all negative thinkings and feelings. It is a practical and evidence-based treatment for depression. BA for depression has been found to be very effective for many depressive disorders. BA increases positive reinforcement of individuals and decreases negative behaviour patterns that cause depression. Reducing negative behaviours by rewarding improves a person's positive reinforcement.

BA is based on scheduling and completing meaningful rewarding activities with a clear purpose that can change the mood and elevate positive attitude. It is efficient, easy to practice and useful for all ages, especially in adolescents to reduce the level of depression.

A randomized controlled trial to assess the effectiveness of BA therapy for subthreshold depression among late adolescents was carried out using Beck's Depression Inventory. It was identified that BA significantly decreased the depression in the experimental arm compared to the conventional arm (Takagaki et al, 2018).

The aim of the present study is to evaluate the effectiveness of BA in school going adolescents, and to find a relation with salivary cortisol level.

2. MATERIALS AND METHOD

2.1. Participants: The participants for the study were taken from Muthraiyar Higher Secondary school (Puducherry, India). The study was approved by Saveetha Medical College Hospital Institutional Ethics Committee. Permission was also obtained from authorities of the school to conduct the study after explaining the importance of the problem.

All the guidelines of the Indian Council of Medical Research were followed. 150 adolescents (15 to 19 years) with mild and moderate depression based on Beck's Depression Inventory-II (BDI-II) were randomly assigned to control and experimental groups, equally. The inclusion criteria were school going adolescents (15 to 19 years) after obtaining informed voluntary consent.

The exclusion criteria were those who were undergoing remedial measures for psychological problems. Sample size was estimated for 4 score difference in depression in the mean or median of post-test of control and experimental groups, with 7 score as standard deviation, 90 % power and 5 % significance level. Adding 10 % as dropout, the sample size was rounded to 75 for each group.

2.2. Methodology: For the control and experimental groups, pre-test scores of somatic, affective, cognitive and total were taken along with socio-demographic variables. The experimental group was given behavioural activation (BA) therapy in batches, for 3 months consisting of mood elevation, problem-solving, social skill development, and healthy behaviour, while control was given routine care. The BA consisted of three sessions. Session 1, was on resolving intrinsic issues with self-observation, explanation of depression model, psycho-education for depression, motivation to articulate the problems, and healthy relationships and behaviours. Session 2, consisted of eye contact, systemic breathing, interpersonal relationships, removing negative thoughts, fist relaxation, and rewards for changing to an adaptive behaviour. The session 3, consisted of discussion to improve healthy behaviour with friend and relatives. Post-test was done using BDI-II for both groups.

2.3. Salivary cortisol: The saliva of the participants were collected at the pre-test and post-test from the control and experimental groups by standard procedure. Salivary cortisol was measured by

2.4. Statistical analysis: The data was represented as median and percentiles, and analysed by Kruskal Wallis one-way ANOVA on ranks with Tukey's multiple comparison test. A probability of 0.05 and less was considered statistically significant. SigmaPlot 14.5 version (Systat Software Inc. San Jose, USA) was used for sample size calculation, statistical analysis and for graph plotting.

3. RESULTS

The median and percentiles of somatic, affective, cognitive and total score of Beck's Depression Inventory are given in Table 1. The median of somatic score in control pre-test, control post-test, experimental pre-test and experimental post-test were 10, 10, 11 and 9, respectively. The median of affective score in control pre-test, control post-test, experimental pre-test and experimental post-test were 5, 5, 5 and 4, respectively. The median of cognitive score in control pre-test, control post-test, experimental pre-test and experimental post-test were 7, 7, 7 and 6, respectively.

The median of total score in control pre-test, control post-test, experimental pre-test and experimental post-test were 22, 22, 24 and 18, respectively. It was found to be statistically significant by Kruskal Wallis one way ANOVA on ranks (P < 0.001). Within group comparison of control pre-test with control post-test did not show significance (P = 0.989).

Within group comparison of experimental pre-test with experimental post-test showed significance (P = 0.005). Between group comparison of control and experimental in pre-test did not show significance (P = 1.0). Between group comparison of control and experimental in post-test showed significance (P = 0.002). There was no change in the control pre-test to post-test, while in experimental one score decrease was seen in the pre-test to post-test. This shows that the intervention is beneficial in reducing the somatic depression.

Table 1: Comparative analysis of control and experimental groups on Beck's depression inventory and the sub-categories.

S.No.	Category	Groups	Median	Percentiles	Statistics
1	Somatic	Con-Pre	10	9 – 13	Given in Figure 1
		Con-Post	10	9 – 13	
		Exp-Pre	11	9 – 13	
		Exp-Post	9	7 – 11	
2	Affective	Con-Pre	5	4 – 6	Given in Figure 2
		Con-Post	5	4 – 6	
		Exp-Pre	5	4 – 7	
		Exp-Post	4	3 – 6	
3	Cognitive	Con-Pre	7	6 – 10	Given in Figure 3
		Con-Post	7	6 – 10	
		Exp-Pre	7	6 – 10	
		Exp-Post	6	5 – 8	
4	Total	Con-Pre	22	20 – 26	Given in Figure 4
		Con-Post	22	20 – 26	
		Exp-Pre	24	18 – 28	
		Exp-Post	18	16 – 21	
Con = Control; Exp = Experimental Pre = Pre-test; Post = Post-test n = 75 each The percentiles are 25th and 75th percentile					

The median of salivary cortisol in control pre-test, control post-test, experimental pre-test and experimental post-test were 7, 7.8, 6.7 and 6.7*, respectively. There is a statistical difference from the control group pre-test (P<0.001) (Table 2).

Table 2: Comparison of control and experimental groups on salivary cortisol (ng/mL).

Groups	Median	Percentile	Statistics
Control Pre-test	7	5.7 – 8.4	H = 14.471 P = 0.002
Control Post-test	7.8	6.3 – 8.3	
Experimental Pre-test	6.7	5.3 – 8.2	
Experimental Post-test	6.7*	5.9 – 7.7	
n = 75 each The percentiles are 25th and 75th *Significantly different from control post-test (P < 0.001).			

4. DISCUSSION

Depression is one of the most common psychiatric problems (Ref---). In a randomized controlled trial web-based BA was given for depression. Data were grouped and analysed on an intention-to-treat basis with a mixed model. The results revealed superiority of the BA (Weinitschke et al, 2023).

Somatic component of BDI-II includes Loss of energy, Irritability, Difficulties of concentration, Tiredness or fatigue, lose, agitation, changes in sleeping habits, changes in appetite and loss of sexual interest. In this study the median and percentiles of somatic score of Beck's Depression Inventory is represented in Figure.1

Affective component of BDI-II includes sadness, pessimism, loss of pleasure, suicidal thoughts and loss of interest. How it changes and maintains. In this study the median and percentiles of affective score of Beck's Depression Inventory is represented in Figure.1
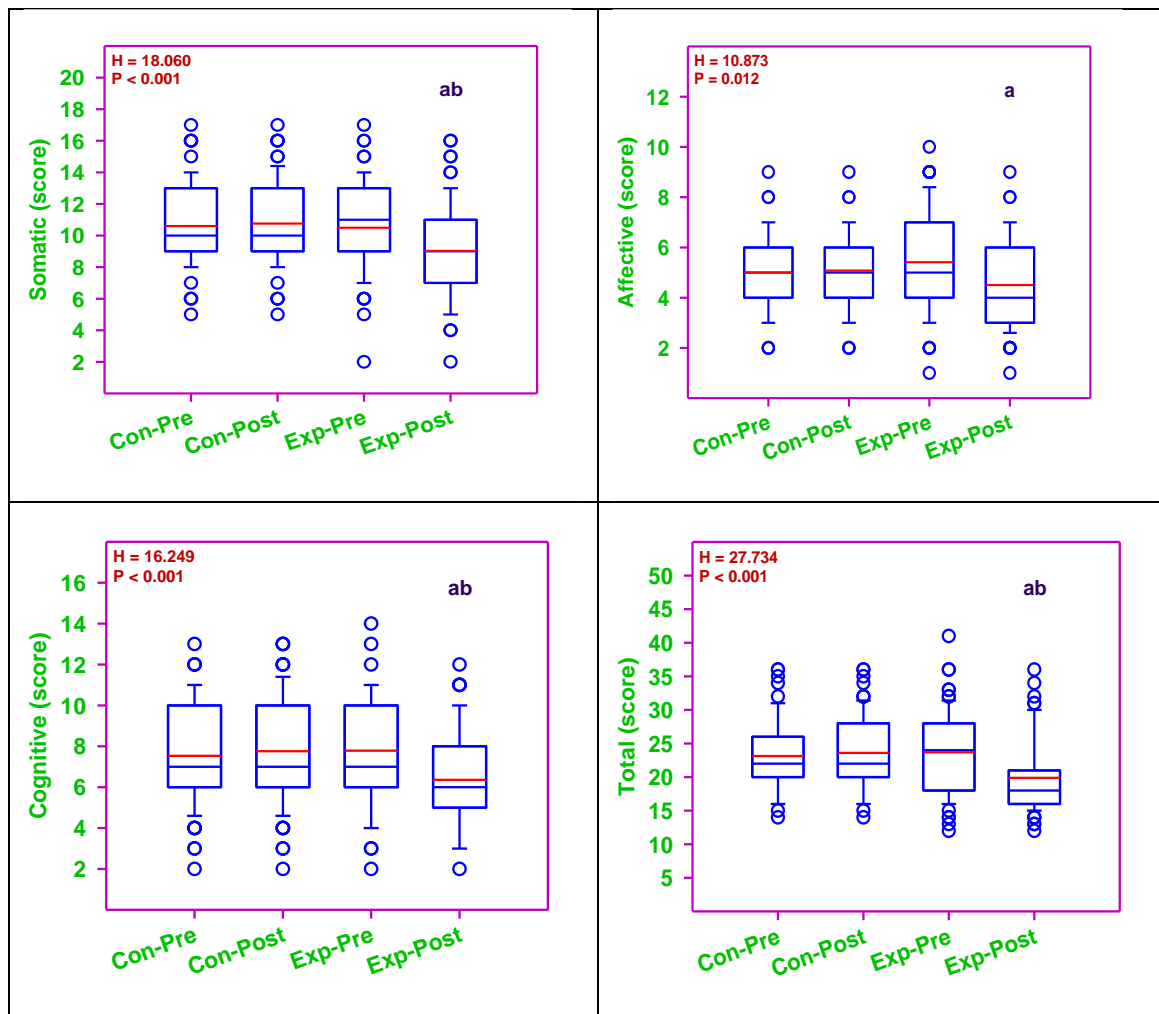
Figure 1: Comparison of control (Con) and experimental (Exp) groups, pre-test (Pre) and post-test (Post) on somatic, affective, cognitive and total scores of Beck's Depression Inventory.

The middle red line is the mean.

n = 75 each

The data was analysed by Kruskal Wallis one-way ANOVA with Tukey's multiple comparison test.

[a]Significantly different from the respective pre-test (within group comparison).

[b]Significantly different from the respective control (between group comparison)

Cognitive component of BDI-II includes indecision, failure, devaluation, feeling of guilt, feeling of punishment, disconformity with one self and self-criticism. In this study the median and percentiles of affective score of Beck's Depression Inventory is represented in Figure.1

Beck Depression Inventory (BDI) scores of 328 adolescents referred to a depression clinic were factor analysed to test the discriminant validity of each factor. Three of the four factors (Negative Self Attitude. Performance Difficulty, and Somatic Symptoms) discriminated depressed adolescents from those with a behaviour disorder or no diagnosis; the Negative Self Attitude and Performance Difficulty factors also

discriminated depressed from anxious adolescents. The fourth factor, Physical Worry, failed to discriminate diagnostic groups. Diagnostic efficiency statistics are reported for both the BDI and for items comprising the 13-item BDI Short Form. Results indicate the BDI is a valid screening tool for adolescent depression in a clinical setting, regardless of the presence of comorbid conditions. (Bennett DS et al,)

In the present study in the control group, no change was observed in total depression score, while in the experimental group 4 score decrease was observed. This shows that BA is very effective in controlling the depression level.

In a randomised study, internet based cognitive behavioural therapy and physical exercise were given to depressed individuals. Analysis of salivary cortisol level showed that the diurnal cortisol was maintained with reduced level at awakening (Rahman et al, 2018). In the present study, while the salivary cortisol increased in the control group, the experimental group showed a maintained level.

5. CONCLUSION

The present study showed significant reduction in social, affective, cognitive and total scores of depression level, with a maintained level of salivary cortisol with BA therapy.

Conflict of interest

There is no conflict of interest.

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