



The Effect of Behavioral Activation Treatment on Symptoms of Depression, Anxiety, and General Health in Individuals with Depression

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Abstract

Background: Depression, a prevalent mental health disorder, often co-occurs with anxiety, significantly impairing individuals' overall well-being. Its high incidence underscores the need for effective interventions to alleviate symptoms and improve quality of life.

Objectives: The present study aimed to evaluate the effect of behavioral activation therapy in reducing depression and anxiety symptoms and enhancing general health among young adults diagnosed with depression.

Methods: A quasi-experimental field study was conducted, employing a pre-test, post-test, and two-month follow-up design with a control group. The target population included young adults aged 18 - 35 seeking psychological and counseling services in Ahvaz, Iran, in 2020. Using convenience sampling, 40 participants with a Beck Depression Inventory (BDI) score > 19, confirmed via clinical interviews, were selected. Participants were randomly assigned to an experimental group (n = 20) receiving eight 90-minute behavioral activation therapy sessions or a control group (n = 20) receiving no intervention. Data were collected using the BDI, Beck Anxiety Inventory (BAI), and Goldberg General Health Questionnaire (GHQ). Repeated measures analysis of variance (ANOVA) was used to analyze outcomes.

Results: The behavioral activation intervention significantly reduced depression and anxiety symptoms and improved general health in the experimental group compared to the control group ($P < 0.001$). These benefits persisted at the two-month follow-up, indicating sustained therapeutic effects.

Conclusions: Behavioral Activation is an effective intervention for alleviating depression and anxiety symptoms while enhancing general health in young adults with depression. These findings support its broader integration into clinical practice to improve patients' well-being comprehensively.

Keywords: Behavioral Activation, Depression, Anxiety, Mental Health, Psychotherapy

1. Background

Depression represents a pervasive and debilitating mental health disorder, particularly impactful among young adults (1). This demographic often experiences significant challenges, including academic and professional difficulties, impaired social functioning, and a diminished quality of life due to the pervasive symptoms of low mood, anhedonia, and cognitive

distortions (2). The burden of depression in this population is substantial, often leading to long-term disability and increased healthcare utilization. Moreover, the early onset of depressive episodes in young adulthood can profoundly shape an individual's developmental trajectory, impacting their educational attainment, career progression, and the formation of healthy interpersonal relationships (3). Addressing depression in this critical life stage is therefore

paramount for fostering resilient individuals and healthier communities.

Depression, as a core dependent variable in this study, is characterized by persistent sadness, loss of interest or pleasure in activities (anhedonia), changes in appetite or sleep, fatigue, feelings of worthlessness or guilt, difficulty concentrating, and recurrent thoughts of death or suicide (4). Globally, major depressive disorder affects millions, ranking among the leading causes of disability worldwide. Its debilitating nature extends beyond emotional distress, manifesting in significant functional impairments across various life domains, including work, education, and social interactions (5, 6). The profound impact of depression necessitates effective interventions that can not only alleviate symptoms but also restore functional capacity and improve overall well-being.

Anxiety, frequently co-occurring with depression, represents another critical dependent variable. Defined by excessive worry and fear, anxiety disorders often amplify the suffering experienced by individuals with depression (7). Symptoms such as restlessness, muscle tension, irritability, and panic attacks can further impede daily functioning and complicate the course of depressive illness (8). The synergistic effect of co-morbid anxiety and depression often leads to more severe symptoms, greater functional impairment, and a poorer prognosis than either disorder alone (9). Therefore, any effective intervention for depression must also address the pervasive influence of anxiety on the individual's mental and physical state.

Beyond specific symptomatology, the construct of general health encompasses an individual's holistic well-being, including physical, mental, and social dimensions. Depression and anxiety significantly erode general health, leading to decreased physical activity, poor sleep quality, unhealthy eating habits, and strained social relationships (10). This deterioration in general health is not merely a consequence of mental distress but also contributes to a vicious cycle, exacerbating psychological symptoms and reducing the individual's capacity for recovery (11). Interventions that promote improvements across these broader aspects of health are vital for sustainable recovery and enhanced quality of life.

Behavioral activation has emerged as a particularly promising therapeutic intervention for depression and related conditions. Rooted in behavioral theories of

depression, behavioral activation posits that a reduction in positively reinforced behaviors leads to a cycle of withdrawal and inactivity, exacerbating depressive symptoms (12). The core principle of behavioral activation involves systematically increasing engagement in activities that are either pleasurable or provide a sense of accomplishment, thereby disrupting this cycle and increasing opportunities for positive reinforcement (13). Research consistently supports behavioral activation's efficacy in reducing depressive symptoms, often demonstrating comparable effectiveness to other established psychotherapies (14, 15). Furthermore, its structured, action-oriented nature and relatively short duration make it a highly accessible and cost-effective treatment option (16).

Given the significant burden of depression and co-occurring anxiety among young adults, coupled with their adverse impact on general health, there is a clear necessity for effective and accessible interventions. While the efficacy of behavioral activation for depression is well-established, further research is warranted to comprehensively examine its effects on anxiety and broader general health outcomes within specific populations, such as young adults. This study aims to contribute to the existing body of evidence by rigorously investigating the effectiveness of behavioral activation treatment on symptoms of depression, anxiety, and general health in young adults diagnosed with depression, thereby informing clinical practice and improving patient outcomes in this region.

2. Objectives

The present study aimed to assess the efficacy of behavioral activation therapy in ameliorating symptoms of depression and anxiety, and concurrently improving the overall general health of young adults afflicted with a diagnosis of depression.

3. Methods

This study utilized a quasi-experimental, field-based design incorporating a pre-test, post-test, and a two-month follow-up assessment with an active control group. The statistical population comprised young adults aged 18 to 35 diagnosed with depression, who sought psychological and counseling services in Ahvaz, Iran, during the year 2020. A convenience sampling method was employed to recruit participants, from which 40 eligible individuals were selected. Eligibility

was determined through comprehensive clinical interviews conducted by a qualified psychologist and a score exceeding 19 on the Beck Depression Inventory (BDI). Participants meeting the inclusion criteria were then randomly assigned to either an experimental group ($n = 20$) or a control group ($n = 20$), ensuring comparability between the groups at baseline.

Inclusion criteria specifically mandated a primary diagnosis of major depressive disorder (mild to moderate severity) and a willingness to participate in the intervention. Exclusion criteria included a history of severe mental disorders (e.g., psychosis, bipolar disorder), active suicidal ideation requiring immediate intervention, current substance dependence, or concurrent engagement in other psychological treatments. All participants provided informed consent, and ethical approval was obtained from the relevant institutional review board, ensuring adherence to ethical guidelines for human research.

3.1. Instruments

3.1.1. Beck Depression Inventory-II

The Beck Depression Inventory-II (BDI-II) is a widely used 21-item self-report questionnaire designed to assess the severity of depressive symptoms. Each item is rated on a 4-point Likert scale ranging from 0 to 3, yielding a total score between 0 and 63. Higher scores indicate more severe depressive symptoms, with common interpretations including minimal (0 - 13), mild (14 - 19), moderate (20 - 28), and severe (29 - 63) depression (17). The BDI-II demonstrates strong psychometric properties, including high internal consistency and validity (18). In the current study, the Cronbach's alpha coefficient for the BDI-II was excellent, exceeding 0.90, indicating high reliability.

3.1.2. Beck Anxiety Inventory

The Beck Anxiety Inventory (BAI) is a 21-item self-report measure used to quantify the severity of anxiety symptoms experienced over the past week. Each item describes a common symptom of anxiety and is rated on a 4-point Likert scale from 0 (not at all) to 3 (severely). Total scores range from 0 to 63, with higher scores reflecting greater anxiety severity. Interpretive categories typically include minimal (0 - 7), mild (8 - 15), moderate (16 - 25), and severe (26 - 63) anxiety (19). The BAI has consistently shown strong reliability and

validity across diverse populations (20). For the present study, the internal consistency of the BAI was found to be very high, with a Cronbach's alpha of over 0.88.

3.1.3. Goldberg General Health Questionnaire-28

The Goldberg General Health Questionnaire-28 (GHQ-28) is a screening tool designed to detect common mental disorders in community and primary care settings. It comprises 28 items divided into four subscales: Somatic symptoms, anxiety/insomnia, social dysfunction, and severe depression. Items are typically scored on a 4-point Likert scale (e.g., 0 - 0 - 1 - 1 or 0 - 1 - 2 - 3), with higher scores indicating poorer psychological well-being. For research purposes, a common scoring method sums responses to yield a total score ranging from 0 to 28 (for 0 - 1 scoring) or 0 to 84 (for 0 - 3 scoring). A higher score indicates greater psychological distress and poorer general health (21). The GHQ-28 has consistently demonstrated robust reliability and validity across a wide array of diverse populations (22). In this study, the GHQ-28 demonstrated good internal consistency, with a Cronbach's alpha coefficient exceeding 0.80.

3.2. Intervention

The experimental group received eight 90-minute sessions of manualized behavioral activation therapy, delivered weekly by a trained clinical psychologist. The control group received no active intervention during the study period. A summary of the weekly session content is presented in Table 1.

3.3. Data Analysis

Data collected from all participants were analyzed using repeated measures analysis of variance (ANOVA). All statistical analyses were conducted using SPSS software (version 27.0), with the level of statistical significance set at $P < 0.05$.

4. Results

The participants' demographic profile demonstrated a largely homogenous sample of young adults. The experimental group had a mean age of 24.54 ± 5.28 years, with a majority (60%) possessing a university education (bachelor's degree or higher). The control group exhibited similar demographics, with a mean age of 25.11 ± 5.92 years and comparable educational

Table 1. Summary of Behavioral Activation Sessions

Sessions	Core Focus	Key Activities/Components
1	Introduction to BA and rationale	Psychoeducation on depression and the BA model; Activity monitoring; Identifying goals
2	Monitoring and identifying patterns	Review activity monitoring; Understanding the link between activity and mood; Identifying avoidance patterns
3	Values-based activity selection	Exploring personal values; Brainstorming activities aligned with values; Scheduling initial activities
4	Scheduling and skill building	Detailed activity scheduling; Overcoming barriers to activation; Problem-solving
5	Addressing avoidance and rumination	Strategies for reducing passive avoidance; Interrupting rumination and self-criticism
6	Reinforcement and problem-solving	Identifying and increasing natural rewards; Advanced problem-solving for challenges
7	Maintaining gains and relapse prevention	Reviewing progress; Developing a plan for continued activation; Identifying early warning signs
8	Consolidation and future planning	Summarizing learning; Discussing ongoing challenges and strategies; Encouraging self-reliance

attainment (65% with a bachelor's degree or higher). As detailed in Table 2, both groups showed comparable baseline levels of depression, anxiety, and general health, confirming effective randomization. Post-intervention, the experimental group experienced significant reductions in depression and anxiety symptoms and improved general health, maintaining these gains at the two-month follow-up, unlike the control group, which showed minimal change.

Prior to conducting the repeated measures ANOVA, the assumptions of normality, homogeneity of variances, and sphericity were assessed. Kolmogorov-Smirnov tests indicated that the data for all dependent variables were approximately normally distributed ($P > 0.05$). Levene's test confirmed the homogeneity of variances across groups for all variables at each time point ($P > 0.05$). Mauchly's test of sphericity was also evaluated for the within-subjects factor. Where sphericity was violated, Greenhouse-Geisser corrections were applied to adjust the degrees of freedom, ensuring the robustness of the statistical inferences.

The results of the repeated measures ANOVA are presented in Table 3, examining the effects of time, group, and their interaction on symptoms of depression, anxiety, and general health. A significant main effect of time was observed for all dependent variables, indicating overall changes in scores across the pre-test, post-test, and follow-up assessments. Crucially, a highly significant time \times group interaction effect was found for depression, anxiety, and general health ($P < 0.001$). This significant interaction confirms that the trajectory of change in these variables over time differed significantly between the experimental and control groups, unequivocally demonstrating the specific impact of the behavioral activation intervention. The effect sizes (partial η^2) indicated a large practical

significance for these interactions. Post-hoc analyses further elucidated that the experimental group exhibited significant improvements from pre-test to post-test, which were largely sustained at the two-month follow-up, while the control group showed no significant changes over time.

5. Discussion

The present study investigated the effectiveness of behavioral activation treatment in alleviating symptoms of depression and anxiety and enhancing general health among young adults with depression. The findings unequivocally demonstrated that participants in the experimental group experienced significant reductions in depression and anxiety scores, alongside marked improvements in general health, which were sustained at the two-month follow-up. These results are highly consistent with the primary objective of the research, confirming the therapeutic potential of behavioral activation within this specific population.

The observed efficacy of behavioral activation in reducing depressive symptoms aligns strongly with a substantial body of existing literature (14, 15). This outcome supports the core tenet of the behavioral activation model, which posits that depression often arises from a reduction in engaging with positively reinforcing activities, leading to a cycle of withdrawal and anhedonia. By systematically encouraging participants to increase their engagement in pleasurable and mastery-oriented behaviors, behavioral activation effectively disrupts this cycle (23). The structured, action-oriented nature of the intervention empowers individuals to gradually overcome inertia and re-establish a sense of purpose and enjoyment, directly counteracting the key features of clinical depression. This process helps individuals rebuild their

Table 2. Means and Standard Deviations of Depression, Anxiety, and General Health Scores Across Time Points ^a

Variables and Groups	Pre-test	Post-test	Follow-up
Symptoms of depression			
Experimental	28.50 ± 4.25	14.15 ± 3.10	15.30 ± 3.40
Control	29.10 ± 4.05	27.90 ± 4.15	28.55 ± 4.30
Anxiety			
Experimental	26.20 ± 3.80	12.80 ± 2.95	13.90 ± 3.15
Control	26.90 ± 3.65	25.80 ± 3.75	26.50 ± 3.90
General health			
Experimental	58.75 ± 6.10	35.20 ± 4.80	36.85 ± 5.05
Control	59.30 ± 5.95	58.50 ± 6.00	59.10 ± 6.20

^a Values are expressed as mean ± SD.

Table 3. Results of Repeated Measures Analysis of Variance for Depression, Anxiety, and General Health Scores

Sources and Variables	F	P-Value	η^2
Time			
Depression	65.80	0.001	0.634
Anxiety	58.15	0.001	0.605
General health	49.90	0.001	0.567
Group			
Depression	98.70	0.001	0.722
Anxiety	85.25	0.001	0.691
General health	75.30	0.001	0.665
Time×group			
Depression	115.45	0.001	0.752
Anxiety	102.10	0.001	0.729
General health	90.80	0.001	0.705

lives and increase their access to natural rewards, thereby leading to a sustained improvement in mood (15).

Furthermore, the significant reduction in anxiety symptoms observed in the experimental group is a critical finding, given the high comorbidity rates between depression and anxiety disorders. While behavioral activation primarily targets depressive behaviors, its mechanisms of action inherently address aspects of anxiety (24). As individuals become more active and engage in a wider range of experiences, they are likely to encounter situations they previously avoided due to anxiety (25). Successfully navigating these situations, even initially with some discomfort, can lead to a reduction in avoidance behaviors and an increase in self-efficacy, thereby decreasing anxiety levels.

The improvement in overall general health further underscores the comprehensive benefits of behavioral activation. By fostering increased physical activity, improved sleep patterns, and greater social engagement, behavioral activation contributes to a holistic enhancement of well-being that extends beyond mere symptom reduction, promoting a more adaptive and fulfilling lifestyle. These results echo findings from similar interventions in diverse contexts (26).

The clinical implications of these findings are substantial, particularly for mental health services in contexts like Ahvaz, Iran. Behavioral activation offers a cost-effective, relatively brief, and highly accessible therapeutic approach that can be effectively delivered to young adults struggling with depression and co-occurring anxiety. Its structured format makes it amenable to various clinical settings and can serve as a valuable frontline intervention. Theoretically, these

findings further reinforce the robustness of the behavioral model of depression, highlighting the crucial role of environmental reinforcement and behavioral contingencies in the onset and maintenance of depressive and anxious states.

Despite these significant findings, the study has certain limitations. Its quasi-experimental design, while practical for a field study, limits the absolute causal inferences compared to a fully randomized controlled trial. The reliance on self-report measures for data collection could introduce response bias. Additionally, the specific cultural context of Ahvaz, Iran, might limit the direct generalizability of these findings to other populations. Future research should consider larger, multi-center randomized controlled trials with longer follow-up periods to confirm these sustained effects and explore the mechanisms of change more deeply, perhaps incorporating qualitative data or physiological measures. Comparative studies with other established psychotherapies would also provide valuable insights into behavioral activation's relative efficacy.

5.1. Conclusions

In conclusion, this study provides compelling evidence for the efficacy of behavioral activation therapy as a robust intervention for young adults grappling with depression. The significant reductions observed in symptoms of both depression and anxiety, coupled with substantial improvements in overall general health, underscore behavioral activation's comprehensive therapeutic impact. These sustained benefits highlight its potential as a valuable, evidence-based approach in clinical practice, particularly within the context of mental health services in Iran. The findings advocate for the broader integration of behavioral activation to foster holistic well-being and enhance the quality of life for individuals affected by depression and its common comorbidities.

Footnotes

Authors' Contribution: Study concept and design, acquisition of data, analysis and interpretation of data, and statistical analysis: S. A.; Administrative, technical, and material support, study supervision: F. K. S. B.; Critical revision of the manuscript for important intellectual content: S. B. and M. J.

Conflict of Interests Statement: The authors declare no conflict of interests.

Data Availability: All data generated or analyzed during this study will be available from the corresponding author on reasonable request.

Ethical Approval: The present study was approved by the Ethics Committee of Islamic Azad University (IR.IAU.AHVAZ.REC.1399.009).

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