Comparison of the Effectiveness of Behavioral Activation and Its Combination with Mental Contrasting with Implementation Intentions on the Psychological Well-Being of Adolescent Girls with Depressed Mood

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Objective: The present study aimed to compare the effectiveness of behavioral activation and its combination with mental contrasting with implementation intentions on the psychological well-being of adolescent girls with depressed mood.

Materials and Methods: This quasi-experimental study employed a pretest–posttest–follow-up design with a control group. From among 300 questionnaires collected from lower secondary school girls in Karaj during the 2021–2022 academic year, 45 participants were randomly assigned to two experimental groups and one control group after screening and applying inclusion criteria. The first experimental group received a 10-session intervention of behavioral activation (each session lasting 90 minutes), while the second experimental group received a combined intervention of behavioral activation and mental contrasting with implementation intentions. The Beck Depression Inventory-II (BDI-II) was used for initial screening, and Ryff's Psychological Well-Being Scale was administered at the pretest, posttest, and three-month follow-up stages. Data were analyzed using repeated measures analysis of variance, along with the Shapiro–Wilk, Levene's, M. Box, and Mauchly's sphericity tests, as well as the Bonferroni post-hoc test. All analyses were conducted using SPSS version 24 at a significance level of $p < 0.01$. In the final analysis, data from 40 participants were included.

Findings: The mean differences in psychological well-being components between the two intervention groups (behavioral activation and its combination with mental contrasting with implementation intentions) and the control group were statistically significant. Both independent variables led to an increase in the mean scores of psychological well-being components. Additionally, a significant difference was observed between the effects of behavioral activation and the combined intervention on the components of self-acceptance ($p = .041$), autonomy ($p = .042$), and environmental mastery ($p = .029$). The combined intervention led to greater increases in these components compared to behavioral activation alone.

Conclusion: Although behavioral activation is an effective method for enhancing psychological well-being in adolescent girls with depressed mood, its combination with mental contrasting and implementation intentions yields more substantial outcomes. Given the results of this study and the psychological challenges experienced by this age group, the use of these interventions is recommended to improve the psychological well-being of adolescent girls with depressed mood.

Keywords: Behavioral activation, mental contrasting with implementation intentions, psychological well-being, adolescent girls, depression.

1. Introduction

Adolescence represents a critical period of psychological development, marked by substantial biological, cognitive, and emotional changes. During this stage, individuals become increasingly susceptible to psychological disturbances such as depression, which, if unaddressed, may disrupt academic functioning, social relationships, and long-term mental health outcomes. According to global estimates by the World Health Organization, depression remains one of the leading causes of illness and disability among adolescents worldwide, affecting more than 264 million people across all age groups, including youth populations in both developed and developing countries (World Health Organization, 2017). In the Iranian context, a meta-analysis reported a notable prevalence of depression among children and adolescents, underscoring the urgent need for effective and age-appropriate interventions (Mahmudi et al., 2021).

The concept of psychological well-being has gained traction as a multidimensional construct, encompassing emotional, psychological, and social aspects of functioning. Carol Ryff's eudaimonic model of psychological well-being emphasizes six core dimensions: autonomy, environmental mastery, personal growth, purpose in life, self-acceptance, and positive relations with others (Ryff, 2014). These components are essential for healthy psychological adjustment, especially during transitional periods such as adolescence. Psychological well-being is not only a desirable outcome in itself but also a protective factor against psychopathological outcomes such as depression and anxiety (Joshanloo, 2016).

In recent years, Behavioral Activation (BA) has emerged as an empirically supported intervention for addressing depression and enhancing psychological well-being. Rooted in behavioral theories of depression, BA posits that reduced engagement in rewarding activities and avoidance behaviors are key contributors to depressive symptoms. The treatment seeks to reverse these patterns by systematically increasing the individual's involvement in meaningful and enjoyable activities (Lejuez et al., 2011). Studies have demonstrated that BA is effective not only in treating clinical depression but also in improving broader psychological outcomes across age groups. A meta-analysis confirmed that BA significantly reduces depression and anxiety symptoms while enhancing overall activation levels (Stein et al., 2021). In adolescent populations, BA has also shown promise, with recent systematic reviews supporting its effectiveness in reducing depressive symptoms in youth (Tindall et al., 2024).

Research has further highlighted the importance of adapting BA protocols for adolescents, who face unique motivational and developmental challenges. For instance, McCauley and colleagues emphasized the utility of structured BA protocols in helping adolescents set goals, engage in pleasurable activities, and build behavioral momentum (McCauley et al., 2016). Similarly, Ghodrati and Vaziri Nekoo demonstrated the effectiveness of BA in improving psychological well-being and psychological flexibility in female Iranian students, suggesting that culturally adapted BA interventions can yield significant positive outcomes in non-Western contexts (Ghodrati & Vaziri Nekoo, 2019).

However, despite its effectiveness, BA alone may not sufficiently address cognitive and motivational barriers to goal pursuit, which are particularly salient during adolescence. This has led researchers to explore integrative approaches that combine BA with cognitive-motivational strategies. One such approach is the integration of Mental Contrasting with Implementation Intentions (MCII), a self-regulatory technique that combines future-oriented thinking with contingency-based action planning (Oettingen, 2012). Mental contrasting involves visualizing a desired future and identifying obstacles that could impede its attainment, thereby generating cognitive contrast that enhances motivation (Kappes & Oettingen, 2014). When paired with implementation intentions—structured "if–then" action plans—this method facilitates the translation of intentions into behavior, even in the face of competing demands or emotional distractions (Hallam et al., 2015).

The psychological and neural mechanisms underlying MCII have been well-documented. For example, Brodersen and Oettingen found that mental contrasting with positive reality effectively regulates anxiety and supports emotional regulation in stressful contexts (Brodersen & Oettingen, 2017). Similarly, Fritzsche et al. demonstrated that combining mental contrasting with implementation intentions significantly enhances goal pursuit and emotional well-being in adolescents, offering a promising complement to behavioral therapies (Fritzsche et al., 2016). In an experimental study, Sezer and colleagues reported that daily use of MCII reduced procrastination and strengthened goal motives, further attesting to its practical utility in adolescent behavior change (Sezer et al., 2025).

The integration of BA and MCII thus offers a synergistic framework for addressing both the behavioral deficits and

cognitive-motivational challenges commonly observed in adolescents with depressed mood. Tryon has argued that effective psychotherapy must incorporate goal-directed strategies to ensure sustained engagement and therapeutic success, particularly in youth (Tryon, 2018). In line with this perspective, studies have demonstrated that goal-setting activities enhance adolescent brain development and psychological outcomes by fostering self-regulation and personal agency (Scarborough et al., 2010). Such outcomes are closely linked to the broader construct of eudaimonic well-being, which reflects the realization of one's potential and meaningful life engagement (Wiese, 2017).

Moreover, the COVID-19 pandemic has exacerbated the mental health burden on adolescents, increasing the relevance of scalable and adaptable interventions. Ceri and Cicek found that stress and depressive symptoms were significantly elevated among adolescents during the pandemic, with marked disparities between healthcare and non-healthcare groups (Ceri & Cicek, 2021). This highlights the pressing need for accessible interventions that not only alleviate symptoms but also strengthen adolescents' capacity for adaptive functioning and psychological resilience.

Several pilot studies and clinical trials have demonstrated that even brief psychological interventions can yield measurable improvements in psychological well-being. For instance, Denneson et al. used health coaching techniques to enhance well-being in veterans with suicidal ideation, emphasizing goal clarity and self-monitoring as key components of therapeutic change (Denneson et al., 2019). Similarly, Scott et al. reported that a behavioral activation program significantly improved life engagement and psychological well-being in older adults, reinforcing the generalizability of BA across the lifespan (Scott et al., 2024).

Educational psychologists have also emphasized the role of metacognition and critical thinking in promoting psychological well-being. Guamanga and colleagues found that metacognitive strategies, such as self-reflection and emotion regulation, were positively associated with empathy and well-being, indicating their relevance in adolescent mental health education (Guamanga et al., 2025). Such findings align with the broader trend in mental health research emphasizing integrative and skills-based approaches to enhance resilience and life satisfaction.

The current study is grounded in this body of research and aims to compare the effectiveness of behavioral activation alone versus its combination with mental contrasting and implementation intentions (MCII) on psychological well-being in adolescent girls with subclinical depressive symptoms.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a quasi-experimental design with a pretest–posttest and three-month follow-up, including a control group, and was classified as applied research in terms of purpose. The independent variable consisted of two types of interventions: behavioral activation and a combination of behavioral activation with mental contrasting and implementation intentions, both administered to two experimental groups. The dependent variables were the components of Ryff's Psychological Well-Being Scale, including self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth.

The statistical population consisted of lower secondary school female students in Karaj during the 2021–2022 academic year. Inclusion criteria were: scoring below 20 on the Beck Depression Inventory-II (BDI-II); showing at least one of the two main symptoms of depression (depressed mood or loss of interest/pleasure) based on specific items in the questionnaire (Cuijpers et al., 2021); not receiving any other psychological intervention; absence of severe psychiatric disorders according to a specialist; no serious physical illness that could contribute to depression; no history of suicide attempts; no psychiatric medication use; and provision of informed written consent by both the students and their parents. Exclusion criteria included more than three absences from intervention sessions and failure to complete the questionnaires.

For sampling, among the four educational districts in Karaj, District 4 was randomly selected. Then, three all-girls lower secondary schools from this district were chosen randomly. In coordination with the school administrators, the first stage of the study—screening students using the BDI-II and a demographic questionnaire—was conducted online for 7th to 9th-grade students. The goal was to identify adolescent girls with depressed mood. A total of 1,650 students received the questionnaire link, and among the completed responses, 300 met the initial criteria, which included complete responses to both questionnaires and willingness to participate.

From this group, participants were selected who scored below 20 on the BDI-II and exhibited at least one of the two main depressive symptoms (scoring ≥1 on items 1, 4, or 12).

Other inclusion criteria were assessed through the demographic questionnaire. Based on the recommendation by VanVoorhis and Morgan (2007), who suggest a minimum of 15 participants per group for pilot studies, a final sample of 45 eligible participants was selected. After homogenizing participants by age and grade level, they were randomly assigned to three groups of 15 each (two experimental groups and one control group).

The interventions were conducted in 10 sessions of 90 minutes each. The first experimental group received the behavioral activation intervention based on the revised manual for brief behavioral activation treatment for depression (Lejuez et al., 2011), while the second group received a combined intervention of behavioral activation with mental contrasting and implementation intentions. The control group received no intervention. Due to restrictions from the COVID-19 pandemic, the questionnaires were administered online. The intervention was delivered through three in-person sessions and seven online sessions. For virtual delivery, the "Shad" platform was used, with three separate groups created. Educational content included text, audio, and video files, and each session included a 20-minute break and live discussion. Interaction with participants was facilitated through Q&A, form reviews, and homework assessments. During the study, three participants from the first experimental group and two from the second experimental group were excluded due to non-attendance or incomplete questionnaire responses. Ultimately, data from 40 participants were analyzed statistically. To ensure ethical considerations, the educational sessions were also held for the control group after data collection.

2.2. Measures

In the screening phase, a researcher-designed demographic questionnaire was used to collect information on grade level, GPA, history of psychological or physical illnesses, medication use, and other relevant variables. Another tool used in the screening phase was the Beck Depression Inventory-II (BDI-II). To collect data during the study, Ryff's Psychological Well-Being Scale was administered at three stages: pretest, posttest, and follow-up.

Beck Depression Inventory-II (BDI-II): The Beck Depression Inventory-II (BDI-II), developed by Beck, Steer, and Brown in 1996, is one of the most widely used self-report tools for assessing the severity of depression in adolescents and adults. It is a revised version of the original Beck Depression Inventory (BDI), updated to align with the diagnostic criteria for major depressive disorder in the DSM-IV (Beck et al., 1996). The BDI-II includes 21 items, each addressing a symptom of depression, such as depressed mood, guilt, and reduced energy. Respondents choose from four options per item (scored 0 to 3) to best describe their condition over the past two weeks. Total scores range from 0 to 63 and are interpreted as follows: 0–13 minimal depression, 14–19 mild depression, 20–28 moderate depression, and 29–63 severe depression (Steer et al., 1999). The BDI-II has demonstrated strong psychometric properties in various studies. In the original study, the tool showed high correlations with other depression measures and satisfactory convergent validity (Beck et al., 1996). In Iranian samples, several studies have confirmed its psychometric strength. For example, Toosi et al. (2017) reported a Cronbach's alpha of .83 in a study with 128 participants (Toosi et al., 2017). In another study, Hamidi (2015) reported a Cronbach's alpha of .93, indicating excellent internal consistency (Hamidi et al., 2015).

Ryff's Psychological Well-Being Scale (PWB): Ryff's Psychological Well-Being Scale (PWB), developed by Carol Ryff in 1989, is a self-report instrument designed to assess multiple dimensions of psychological well-being (Ryff, 1989). The scale is available in various versions, and the 18-item version is among the most commonly used short forms (Ryff & Keyes, 1995). This scale includes six key components of psychological well-being, each assessed with three items: self-acceptance (positive attitude toward oneself and one's past), positive relations with others (capacity for satisfying and intimate relationships), autonomy (independent decision-making and self-governance), environmental mastery (sense of control and competence in managing one's life), purpose in life (having meaningful life goals), and personal growth (continuous development and realization of one's potential) (Ryff & Keyes, 1995). The scale is scored on a 6-point Likert scale (from 1 = strongly disagree to 6 = strongly agree), with higher scores indicating greater well-being in each domain. Some items are reverse-scored and must be corrected during analysis (Ryff, 1989). Content and construct validity of the PWB scale have been supported by numerous studies. Its factorial structure has been validated using confirmatory factor analysis, demonstrating acceptable model fit (Abbott et al., 2010). In Iranian research, similar findings have affirmed the scale's validity, and factor analysis has shown that the six-dimensional structure is compatible with Iranian population data (Joshanloo, 2016). Reported Cronbach's alpha coefficients for the 18-item version typically range from .70

to .85, indicating good internal consistency (Diaz et al., 2006). Test-retest reliability over intervals ranging from four weeks to six months has been reported between .60 and .81, confirming the tool's stability (Van Dierendonck et al., 2008). In Iranian samples, Cronbach's alpha coefficients have ranged from .78 to .86, further supporting the questionnaire's reliability in this context (Bayani et al., 2008).

2.3. Intervention

Behavioral Activation Intervention: The behavioral activation intervention protocol included psychological concepts, skill training, and practical exercises based on the revised manual for Brief Behavioral Activation Treatment for Depression (Lejuez et al., 2011). This intervention was designed to reduce depressive symptoms and improve mental health by modifying daily behaviors and increasing engagement in pleasurable and meaningful activities. In this study, participants in the experimental group received ten 90-minute sessions of behavioral activation. In each session, participants were introduced to various concepts such as setting behavioral goals, identifying pleasurable activities, developing behavioral contracts, and evaluating personal progress. This intervention specifically focused on improving areas of life such as values and activities, identifying and overcoming behavioral obstacles, and enhancing persistence and self-management. Additionally, homework assignments were provided to encourage the practice of acquired skills in real-life settings, and participant progress was reviewed on a weekly basis. To enhance engagement and comprehension, diverse educational methods were used, including textual content, audio and video files, practical exercises, and group discussions. In the final sessions, emphasis was placed on consolidating positive changes and creating long-term plans to maintain therapeutic gains.

Combined Intervention of Behavioral Activation and Mental Contrasting with Implementation Intentions: In the second group, an intervention combining behavioral activation and mental contrasting with implementation intentions was conducted over ten 90-minute sessions. The steps of behavioral activation were followed, and in addition, mental contrasting with implementation intentions was implemented for the participants' selected goals and monitored during subsequent sessions.

The process of mental contrasting with implementation intentions includes four steps. First, for each behavioral goal

selected from the ranked list of activities in the activation program, participants received training in mental contrasting. In the first step, participants identified and articulated four positive aspects of achieving their goal (e.g., feeling proud, increased enjoyment in life, meeting new people, etc.). Then, they identified four negative aspects or potential obstacles that might hinder goal achievement (e.g., stress, lack of time, or insufficient knowledge). These positive and negative aspects were ranked in order of importance. Participants wrote the most important positive aspect of achieving the goal at the top of a sheet of paper and were instructed to vividly imagine it using mental imagery, and to note associated thoughts and images. After completing this section, they recorded the most significant negative obstacle in the center of the page and followed similar instructions to imagine and describe that obstacle vividly. In the third step, participants were asked to identify when and where the primary obstacle was most likely to occur. Finally, in the fourth step, they were required to determine an effective behavior to overcome the obstacle and develop an "if–then" plan, such as: "If obstacle A occurs, then I will perform behavior B." Participants wrote this plan on a small card to serve as a memory aid (Oettingen, 2000, 2012). After completing the mental contrasting with implementation intentions procedure for the selected goals, the behavioral activation steps continued.

2.4. Data Analysis

In the present study, both descriptive statistics (mean and standard deviation) and inferential statistics were employed. Given that the research included three stages—pretest, posttest, and follow-up—and all data were normally distributed, repeated measures analysis of variance (ANOVA) was used. Additional statistical tests included the Shapiro–Wilk test, Levene's test, M. Box's test, Mauchly's test of sphericity, and Bonferroni post-hoc test. Analyses were conducted using SPSS version 24 at a significance level of $p < 0.01$.

3. Findings and Results

In this study, 40 female students were assigned to three groups: behavioral activation (12 participants), combined behavioral activation/mental contrasting (13 participants), and control (15 participants). In the behavioral activation group, 4 participants were in the seventh grade, 5 in the eighth grade, and 3 in the ninth grade. In the group receiving the combined behavioral activation and mental contrasting

intervention, 3 participants were in the seventh grade, 5 in the eighth grade, and 5 in the ninth grade. In the control group, 5 participants were in the seventh grade, 6 in the eighth grade, and 4 in the ninth grade.

In the behavioral activation group, mothers' education levels were as follows: 5 participants' mothers had less than a high school diploma, 4 had a high school diploma, and 3 had education beyond high school. In the combined intervention group, 6 participants' mothers had less than a high school diploma, 6 had a high school diploma, and 1 had higher education. In the control group, 6 participants' mothers had less than a high school diploma, 7 had a high school diploma, and 2 had education beyond high school.

In the behavioral activation group, fathers' education levels were as follows: 4 participants' fathers had less than a high school diploma, 6 had a high school diploma, and 2 had higher education. In the combined intervention group, 5 participants' fathers had less than a high school diploma, 5 had a high school diploma, and 3 had education beyond high school. In the control group, 8 participants' fathers had less than a high school diploma, 5 had a high school diploma, and 2 had higher education.

Table 1 shows the means (standard deviations) and Shapiro–Wilk values (significance levels) of each psychological well-being component in the three research groups across the pretest, posttest, and follow-up phases.

Table 1

Mean (Standard Deviation) and Shapiro–Wilk Values (Significance Level) for Psychological Well-Being Components at Three Measurement Points

Index	Component	Group	Pretest M(SD)	Posttest M(SD)	Follow-up M(SD)
M (SD)	Self-Acceptance	Behavioral Activation	9.25 (2.60)	11.42 (2.57)	11.92 (2.57)
		Combined Intervention	8.38 (2.18)	14.69 (2.29)	14.54 (2.50)
		Control	8.27 (2.22)	8.07 (2.22)	8.80 (2.18)
	Positive Relations	Behavioral Activation	10.17 (2.33)	13.42 (2.19)	13.42 (2.75)
		Combined Intervention	11.31 (2.92)	14.92 (2.25)	15.15 (2.12)
		Control	10.20 (3.23)	9.67 (2.16)	10.20 (2.48)
	Autonomy	Behavioral Activation	8.92 (2.27)	11.25 (2.99)	12.17 (2.21)
		Combined Intervention	8.69 (2.93)	13.85 (2.19)	14.77 (2.28)
		Control	8.20 (2.73)	8.40 (2.10)	9.00 (2.33)
	Environmental Mastery	Behavioral Activation	9.75 (2.77)	11.58 (2.71)	12.00 (2.22)
		Combined Intervention	8.85 (2.27)	14.31 (2.39)	14.38 (2.79)
		Control	8.47 (2.85)	8.07 (2.15)	9.27 (2.05)
	Purpose in Life	Behavioral Activation	9.75 (2.67)	13.92 (2.57)	13.00 (2.26)
		Combined Intervention	10.38 (2.87)	14.69 (2.98)	14.54 (2.26)
		Control	9.60 (2.41)	10.07 (2.43)	9.67 (2.38)
	Personal Growth	Behavioral Activation	10.83 (2.33)	13.67 (2.96)	14.17 (3.07)
		Combined Intervention	10.92 (2.36)	15.31 (2.29)	14.85 (2.76)
		Control	10.87 (2.88)	9.60 (2.26)	10.53 (2.29)
Shapiro-Wilks' Statistics (p)	Self-Acceptance	Behavioral Activation	.925 (.328)	.887 (.106)	.956 (.722)
		Combined Intervention	.964 (.819)	.914 (.207)	.934 (.387)
		Control	.934 (.313)	.925 (.230)	.955 (.609)
	Positive Relations	Behavioral Activation	.917 (.259)	.856 (.044)	.954 (.701)
		Combined Intervention	.943 (.491)	.881 (.074)	.956 (.690)
		Control	.961 (.713)	.951 (.539)	.958 (.664)
	Autonomy	Behavioral Activation	.932 (.403)	.925 (.334)	.946 (.578)
		Combined Intervention	.910 (.183)	.955 (.670)	.944 (.505)
		Control	.912 (.145)	.902 (.101)	.960 (.696)
	Environmental Mastery	Behavioral Activation	.868 (.062)	.961 (.798)	.940 (.499)
		Combined Intervention	.938 (.431)	.964 (.816)	.946 (.537)
		Control	.905 (.115)	.895 (.079)	.955 (.603)
	Purpose in Life	Behavioral Activation	.932 (.406)	.931 (.391)	.937 (.455)
		Combined Intervention	.904 (.151)	.855 (.033)	.933 (.371)
		Control	.934 (.316)	.910 (.134)	.960 (.696)
	Personal Growth	Behavioral Activation	.912 (.225)	.930 (.382)	.915 (.247)
		Combined Intervention	.945 (.528)	.905 (.155)	.895 (.114)
		Control	.972 (.880)	.942 (.409)	.894 (.078)

Table 1 presents not only the means and standard deviations of psychological well-being components but also the Shapiro–Wilk values for each component across the three groups and three measurement phases. As shown in the

table, the Shapiro–Wilk values for the components of positive relations with others (p = .044) and purpose in life (p = .033) were statistically significant in the posttest phase for the behavioral activation group and the combined intervention group, respectively. Although these results indicate non-normal distribution of those components in the specified groups and phases, due to the robust nature of repeated measures ANOVA against violations of normality assumptions, this deviation is not expected to invalidate the analytical results.

Additionally, the results of Levene's test revealed that the differences in error variance of psychological well-being scores across groups and measurement phases were not statistically significant. Therefore, the assumption of homogeneity of error variances was met. Furthermore, the assumptions of homogeneity of covariance matrices of the dependent variables were assessed using M. Box's test, and the sphericity condition was evaluated using Mauchly's test. These results are presented in Table 2.

Table 2

Results of Assumptions Tests for Equality of Covariance Matrices and Sphericity

Component	M. Box	F	p	Mauchly's Index	χ^2	p
Self-Acceptance	8.10	0.59	.849	0.957	1.57	.457
Positive Relations	10.95	0.80	.649	0.986	0.52	.770
Autonomy	10.64	0.78	.672	0.994	0.23	.892
Environmental Mastery	19.48	1.43	.145	0.934	2.47	.290
Purpose in Life	10.07	0.74	.715	0.929	2.64	.267
Personal Growth	7.88	0.58	.862	0.914	3.23	.199

Table 2 shows that the M. Box statistic was not significant for any of the psychological well-being components. This indicates that the assumption of equality of covariance matrices for the dependent variables was met for each component. Additionally, Mauchly's test showed that the chi-square values for all psychological well-being components were not significant, confirming that the assumption of sphericity was also satisfied for all components.

Table 3

Results of Multivariate Analysis of Variance (MANOVA) Assessing the Effect of Independent Variables on Psychological Well-Being Components

Dependent Variable	Wilks' Lambda	F	df	p	η^2	Power
Self-Acceptance	0.459	8.57	4, 72	.001	0.323	.998
Positive Relations	0.729	3.08	4, 72	.021	0.146	.758
Autonomy	0.621	4.85	4, 72	.002	0.212	.945
Environmental Mastery	0.689	3.68	4, 72	.009	0.170	.861
Purpose in Life	0.765	2.58	4, 72	.044	0.125	.700
Personal Growth	0.640	4.88	4, 72	.003	0.203	.927

According to the results in Table 3, the effect of the independent variables on the psychological well-being components was significant for:

Self-Acceptance (Wilks' Lambda = 0.459, η^2 = 0.323, p = .001, F = 8.57),

Positive Relations (Wilks' Lambda = 0.729, η^2 = 0.146, p = .021, F = 3.08),

Autonomy (Wilks' Lambda = 0.621, η^2 = 0.212, p = .002, F = 4.85),

Environmental Mastery (Wilks' Lambda = 0.689, η^2 = 0.170, p = .009, F = 3.68),

Purpose in Life (Wilks' Lambda = 0.765, η^2 = 0.125, p = .044, F = 2.58),

Personal Growth (Wilks' Lambda = 0.640, η^2 = 0.203, p = .003, F = 4.88).

Table 4

Results of Repeated Measures ANOVA Comparing the Effects of Independent Variables on Psychological Well-Being Components

Component	Effect	SS	Error SS	F	p	η²
Self-Acceptance	Group	369.35	291.24	23.46	.001	0.559
	Time	192.78	193.05	36.95	.001	0.500
	Group × Time	175.40	328.19	9.89	.001	0.348
Positive Relations	Group	305.26	275.34	20.51	.001	0.526
	Time	110.95	226.97	18.09	.001	0.328
	Group × Time	90.60	435.68	3.85	.007	0.172
Autonomy	Group	322.91	285.68	20.91	.001	0.531
	Time	225.97	186.79	44.76	.001	0.547
	Group × Time	122.00	387.92	5.82	.001	0.239
Environmental Mastery	Group	332.03	182.77	33.61	.001	0.645
	Time	162.53	236.94	25.38	.001	0.407
	Group × Time	137.24	497.54	5.10	.001	0.216
Purpose in Life	Group	263.77	245.03	19.92	.001	0.518
	Time	122.97	255.44	17.81	.001	0.325
	Group × Time	89.20	473.09	3.49	.014	0.159
Personal Growth	Group	260.73	311.86	15.47	.001	0.455
	Time	105.61	267.46	14.61	.001	0.283
	Group × Time	134.95	430.59	5.80	.001	0.239

Table 4 indicates that, in addition to the main effects of group and time, the interaction effect of Group × Time was significant for all psychological well-being components:
Self-Acceptance (η² = 0.348, p = .001, F = 9.89),
Positive Relations (η² = 0.172, p = .007, F = 3.85),
Autonomy (η² = 0.239, p = .001, F = 5.82),
Environmental Mastery (η² = 0.216, p = .001, F = 5.10),
Purpose in Life (η² = 0.159, p = .014, F = 3.49),
Personal Growth (η² = 0.239, p = .001, F = 5.80).

Table 5 presents the Bonferroni test results comparing behavioral activation and its combination with mental contrasting with implementation intentions on psychological well-being components across the three groups and measurement stages.

Table 5

Results of Bonferroni Post-Hoc Test for Psychological Well-Being Components

Variable	A	B	Mean Difference	Standard Error	p-value
Self-Acceptance	Pretest	Posttest	-2.76	0.43	.001
	Pretest	Follow-up	-3.12	0.51	.001
	Posttest	Follow-up	-0.36	0.47	1.000
Positive Relations	Pretest	Posttest	-2.11	0.57	.002
	Pretest	Follow-up	-2.37	0.56	.001
	Posttest	Follow-up	-0.26	0.51	1.000
Autonomy	Pretest	Posttest	-2.56	0.53	.001
	Pretest	Follow-up	-3.38	0.51	.001
	Posttest	Follow-up	-0.81	0.50	.343
Environmental Mastery	Pretest	Posttest	-2.30	0.65	.003
	Pretest	Follow-up	-2.86	0.57	.001
	Posttest	Follow-up	-0.57	0.52	.860
Purpose in Life	Pretest	Posttest	-2.98	0.62	.001
	Pretest	Follow-up	-2.49	0.59	.001
	Posttest	Follow-up	0.49	0.49	.967
Personal Growth	Pretest	Posttest	-1.98	0.55	.003
	Pretest	Follow-up	-2.31	0.60	.001
	Posttest	Follow-up	-0.32	0.47	1.000
Self-Acceptance	Behavioral Activation	Activation/Mental Contrasting	-1.68	0.65	.041
	Behavioral Activation	Control	2.48	0.63	.001
	Activation/Mental Contrasting	Control	4.16	0.61	.001
Positive Relations	Behavioral Activation	Activation/Mental Contrasting	-1.46	0.63	.078
	Behavioral Activation	Control	2.31	0.61	.002
	Activation/Mental Contrasting	Control	3.77	0.60	.001
Autonomy	Behavioral Activation	Activation/Mental Contrasting	-1.66	0.64	.042
	Behavioral Activation	Control	2.24	0.62	.003
	Activation/Mental Contrasting	Control	3.90	0.61	.001
Environmental Mastery	Behavioral Activation	Activation/Mental Contrasting	-1.40	0.51	.029
	Behavioral Activation	Control	2.51	0.50	.001
	Activation/Mental Contrasting	Control	3.91	0.49	.001

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Purpose in Life	Behavioral Activation	Activation/Mental Contrasting	-0.98	0.60	.321
	Behavioral Activation	Control	2.44	0.58	.001
	Activation/Mental Contrasting	Control	3.43	0.56	.001
Personal Growth	Behavioral Activation	Activation/Mental Contrasting	-0.80	0.67	.716
	Behavioral Activation	Control	2.56	0.65	.001
	Activation/Mental Contrasting	Control	3.36	0.64	.001

The Bonferroni post-hoc test results for the time effect in Table 5 indicate that the mean differences in psychological well-being component scores between the pretest–posttest and pretest–follow-up phases are statistically significant. However, the mean differences between posttest and follow-up phases are not significant.

Additionally, the Bonferroni test results for group effects in Table 5 show that the mean differences in psychological well-being components between both the behavioral activation group and the combined behavioral activation/mental contrasting group compared to the control group are statistically significant. This means that implementing both independent variables led to an increase in the mean scores of psychological well-being components.

Table 5 further reveals that the differences between behavioral activation and the combined intervention are statistically significant for the components of self-acceptance (p = .041), autonomy (p = .042), and environmental mastery (p = .029). The combination of behavioral activation with mental contrasting resulted in greater increases in mean scores of these components than behavioral activation alone.

Accordingly, the findings of this study demonstrate that combining behavioral activation with mental contrasting is a more effective approach than behavioral activation alone in enhancing self-acceptance, autonomy, and environmental mastery among adolescent girls with depressed mood.

4. Discussion and Conclusion

The present study investigated the comparative effectiveness of Behavioral Activation (BA) and a combined intervention of BA with Mental Contrasting and Implementation Intentions (MCII) on enhancing psychological well-being among adolescent girls with subclinical depressive symptoms. The results demonstrated that both interventions significantly improved multiple components of psychological well-being—namely, self-acceptance, autonomy, environmental mastery, positive relations with others, purpose in life, and personal growth—compared to the control group. Notably, the combined BA+MCII intervention outperformed BA alone in increasing scores in self-acceptance, autonomy, and environmental mastery. These findings align with the central theoretical proposition that integrating motivational and cognitive-behavioral strategies can generate synergistic benefits, especially in emotionally vulnerable youth populations.

The significant improvement in psychological well-being in the BA group reinforces the findings of previous studies that have highlighted the efficacy of behavioral activation as a standalone intervention for adolescents with depressive symptoms. Tindall et al. (2024) reported that BA significantly reduced depressive symptoms in children and adolescents, emphasizing its utility as a structured and accessible intervention model. Similarly, Ghodrati and Vaziri Nekoo (2019) found that BA effectively improved both psychological well-being and psychological flexibility in female high school students in Iran, supporting the intervention's relevance in non-Western cultural contexts. The core mechanism in BA—encouraging engagement in pleasurable and value-based activities—is known to increase environmental reinforcement, which plays a key role in breaking the cycle of avoidance and inactivity that characterizes depression (Lejuez et al., 2011; Stein et al., 2021).

Moreover, the enhancement in psychological well-being through BA is not limited to mood symptoms. As Stein et al. (2021) noted, BA also positively affects activation levels and anxiety, further supporting its broad applicability. In the present study, improvements were particularly evident in domains such as positive relations and personal growth, which are indicative of the adolescent's re-engagement with life. These results corroborate findings by Scott et al. (2024), who demonstrated that a structured BA program increased life engagement and well-being in older adults. The consistency of these outcomes across different populations and age groups suggests the generalizability of BA as a transdiagnostic intervention that supports emotional and functional restoration.

While BA alone was effective, the results of this study revealed that integrating MCII further amplified gains in specific domains, particularly self-acceptance, autonomy, and environmental mastery. This finding reflects the motivational potency of MCII, which enables individuals to anticipate obstacles and formulate contingency plans,

thereby bridging the intention–behavior gap. According to Oettingen (2012), mental contrasting activates goal commitment when expectations are high and generates motivational arousal by contrasting the desired future with present obstacles. When coupled with implementation intentions—"if-then" plans specifying behavioral responses to anticipated challenges—goal pursuit becomes more automatic and less susceptible to emotional interference (Hallam et al., 2015; Kappes & Oettingen, 2014). This automaticity may explain why adolescents in the combined intervention group demonstrated stronger autonomy and mastery over their environments.

In support of this explanation, Fritzsche et al. (2016) found that adolescents who engaged in MCII exhibited enhanced emotional well-being and goal achievement. Sezer et al. (2025) further confirmed that daily mental contrasting with implementation intentions significantly reduced procrastination and promoted goal adherence, particularly in youth navigating daily behavioral challenges. Similarly, Brodersen and Oettingen (2017) showed that MCII reduces anxiety by enhancing individuals' sense of control over future-oriented tasks, which may contribute to the improvements in autonomy and self-acceptance observed in this study. These findings collectively suggest that MCII fosters self-regulation and self-efficacy—core elements of Ryff's model of psychological well-being (Ryff, 2014).

The additive effect of MCII over BA alone may also be understood within the framework of motivational and metacognitive development in adolescence. Guamanga et al. (2025) emphasized that metacognitive strategies such as reflection and planning are essential for developing psychological resilience and empathy. Adolescents who are encouraged to think critically about their goals and the obstacles they may face are more likely to internalize these goals and act upon them autonomously. The enhancement in environmental mastery observed in the combined intervention group reflects this process, where participants likely translated abstract goals into actionable behaviors that enhanced their ability to navigate real-life challenges. This aligns with Tryon's (2018) assertion that goal-based psychotherapy models are more effective in driving sustained behavioral change, particularly among adolescents.

Interestingly, the present study found that while both interventions improved purpose in life and positive relations with others, the differences between BA and BA+MCII in these components were not statistically significant. This might indicate that BA alone sufficiently promotes

engagement in socially and meaningfully rewarding activities, thus elevating these aspects of psychological well-being. The cognitive elements introduced by MCII may be more impactful in domains that require self-monitoring, internal control, and personal growth, such as autonomy and self-acceptance. Previous research by Sommer et al. (2019) in recovery education contexts found that goal-setting and personalized action planning enhanced internal aspects of well-being more than social components, which supports this interpretation.

Another plausible interpretation of the current findings pertains to adolescents' unique developmental needs. Adolescence is a period characterized by the pursuit of identity, autonomy, and competence. Interventions that address both behavioral deficits and cognitive regulation—such as the BA+MCII combination—may be particularly well-suited to this age group. The use of MCII could have helped participants navigate the motivational ambivalence often observed in adolescents with depressive symptoms. As Wiese (2017) emphasized, successful goal pursuit is directly linked to higher subjective well-being, especially when the individual perceives themselves as an agent of change. In this study, adolescents who used MCII may have experienced increased perceived control over their lives, thereby contributing to sustained improvements in their psychological well-being.

This study also adds to the growing body of research emphasizing the role of psychological interventions in treating subthreshold depression. Cuijpers et al. (2021) highlighted that subclinical depressive symptoms, if left unaddressed, can evolve into major depressive disorders. Therefore, early intervention using cost-effective, scalable approaches like BA and MCII is not only clinically significant but also aligned with public health goals (Nunes et al., 2016). In contexts where mental health resources are limited, such as many non-Western settings, combining these brief yet powerful strategies can provide adolescents with tools to manage emotions, set achievable goals, and foster psychological growth.

5. Limitations & Suggestions

Despite the promising findings, this study has several limitations. First, the sample size was relatively small and limited to adolescent girls from a specific urban region in Iran, which may affect the generalizability of the results to broader populations, including boys or youth from rural and culturally diverse settings. Second, the reliance on self-

report measures—while necessary due to the developmental stage of the participants—introduces potential bias, especially regarding socially desirable responses. Third, although the study included a follow-up assessment, the three-month period may not be sufficient to assess long-term sustainability of intervention effects. Finally, while the interventions were delivered in a hybrid (partly online) format to adapt to pandemic-related constraints, the variability in digital access and engagement may have influenced the consistency of outcomes across participants.

Future studies should consider using larger and more diverse samples that include different age groups, genders, and cultural backgrounds to increase external validity. Longitudinal designs with extended follow-up periods (e.g., six months or one year) would be valuable to examine the durability of intervention effects. Additionally, incorporating qualitative components such as interviews or reflective journals could yield deeper insights into the subjective experiences of participants and how they integrate learned strategies into daily life. Comparative studies assessing BA and MCII across clinical versus non-clinical adolescent populations would also help delineate the boundary conditions of their effectiveness. Finally, exploring neurocognitive or physiological markers alongside psychological outcomes could provide a more holistic understanding of the mechanisms underlying behavior change in adolescents.

Based on the findings, practitioners working with adolescents—particularly in school and community mental health settings—are encouraged to adopt integrated models that combine behavioral and cognitive-motivational strategies. Training school counselors and educators in BA and MCII protocols could enhance early intervention efforts and promote mental health literacy. Moreover, these approaches can be incorporated into psychoeducational curricula or peer support programs to foster resilience and psychological well-being at a population level. Ensuring that interventions are developmentally appropriate, culturally relevant, and accessible via hybrid formats can further enhance their scalability and impact in diverse educational and clinical settings.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contributed to this article.

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