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Research Article

Comparison the Effectiveness of Cognitive-behavioral and Psycho-educational Interventions on Affective Control in Students with Love addiction

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Abstract

Aim: In recent years, cognitive-behavioral and psychoeducational interventions have been utilized in the treatment of love addiction (LA). Hence, the present study aimed to investigate the effectiveness of cognitive-behavioral and psycho-educational interventions on affective control of girl students with LA.

Methods: The present study was semi-experimental research conducted using a pretest-posttest design with the control group and a 3-month follow-up phase. The study population consisted of 414 undergraduate students of Guilan University in 2023-2024. From among 120 female undergraduate students with scores higher than 16 on the Love Addiction Questionnaire, 30 students were randomly selected and placed into two experimental groups (each with 10 participants) and one control group (with 10 participants). Both groups completed Peabody's Love Addiction Questionnaire (2005) and Williams' Affective Control Questionnaire (1997) as the pre-test. After ten sessions (two 45-minute sessions per week for five weeks) of cognitive-behavioral and psycho-educational interventions, the post-test was performed for the groups. The data were analyzed using descriptive statistical methods, including mean and standard deviation and inferential statistics including variance with repeated measures analysis through the SPSS- 26 software.

Results: The study participants included 30 single girls. The mean age of the participants in the experimental and control groups was 0.99 ±20.60, 1.49 ±22.00, 1.13 ±20.80, respectively. The results of the variance with repeated measures analysis indicated a significant difference in the mean scores of affective control from the pre-test to the post-test stage between the experimental group and the control group (P = 0.001). Specifically, in the experimental groups, the mean total score of affective control in the pre-test and post-test phases (cognitive-behavioral group) was equal to 151.70 and 118.10, 150.20 and 110.30 (psycho-educational group) respectively, while these values in the control group in the pre-test and post-test phases were 151.50 and 150.10, respectively. Also, in the experimental groups, the scores of four sub-scales of anger, depressed mood, anxiety, and positive affect revealed significant differences between the post-test stage and the pre-test stage (P =0.001). Therefore, the cognitive-behavioral and psycho-educational interventions was effective in improving the affective control of the student with LA. The results of Ben-Farooni's post hoc test indicated that there is no difference between the effectiveness of two cognitive-behavioral and psychological-educational interventions.

Conclusion: Based on the results of the present study, it can be concluded that cognitive-behavioral and psycho-educational interventions can be utilized to increasing the construct of affective control in individuals with LA. Both interventions have an equal effectiveness on enhancing the construct of affective control.

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1. Introduction

Love, a phenomenon intrinsic to human nature, has long been a fundamental component of our emotional landscape, dating back to ancient times. This innate inclination toward forming deep, affectionate bonds frequently manifests in a quasi-addictive manner, underscoring the potent and pervasive influence of love in human experience. The intensity and essential role of love, marked by overwhelming attraction and profound infatuation, provides a foundation for establishing sustained emotional connections. This association between the compelling allure of love and characteristics commonly observed in addictive behaviors is significant; indeed, in certain instances, individuals may exhibit a persistent, pathological fixation or develop affective dependencies—a pattern categorized among behavioral addictions without the involvement of substances (Sirvent-Ruiz et al., 2022).

Love addiction (LA) is categorized among behavioral addictions—a heterogeneous group of disorders where the focus of dependence is not a psychoactive substance but a behaviorally driven activity (Earp et al., 2017). LA is characterized by a maladaptive, pervasive, and excessive preoccupation with romantic partners, leading to impaired self-control and a subsequent decline in social, professional, and recreational activities (Redcay & Simonetti, 2018). The adverse consequences—such as dysfunction in daily life activities, heightened levels of distress, and its pervasive nature—distinguish this condition from the typical experience of 'falling in love (Sanches & Jhon, 2019). Key characteristics of LA include the preoccupation with thoughts, emotions, and behaviors directed toward the love object (salience); an increasing need to spend time with or think about the loved one (tolerance); reliance on thoughts of or time with the loved one to manage emotional distress (mood modification); difficulty in reducing time spent with the love object (relapse); psychological and physical withdrawal symptoms in the loved one's absence (withdrawal); and significant interference with daily activities, such as work or education, friendships, and personal interests (conflict) (Costa et al., 2021). Young adults who have experienced rejection in love and exhibit the highest levels of 'addiction' to another person often experience intense craving, impaired affective regulation, distressing emotions, social isolation, a disrupted sense of self-worth, and an increased likelihood of self-harm (Frascella et al., 2010).

LA increasingly takes control of an individual's life, elevating itself to the highest priority and diminishing the importance of other life domains. As LA progresses, it not only generates significant distress and suffering for the affected individual but also undermines critical aspects of functioning, including personal, social, occupational, and familial roles (Earp et al., 2017). LA can precipitate risky or harmful behaviors. Fisher (2016) posits that while romantic love is generally not regarded as toxic, it can sometimes be accompanied by intense passion and anxiety, leading individuals to believe, express, or engage in dangerous and inappropriate actions. LA can lead to a range of serious consequences, including financial difficulties, job loss, an inability to establish a family, physical health issues, and psychological disorders. In extreme cases, it may even contribute to criminal behaviors, such as sexual offenses and serial killings (Costa et al., 2021). LA appears to emerge within a cluster of symptoms characterized by impaired affective regulation and an increased vulnerability to both substance and behavioral addictions (Hormes, 2017).

Affective control refers to the use of cognitive control within emotional contexts. It encompasses the ability to inhibit affective information that conflicts with current goals, while simultaneously attending to and responding to goal-relevant environmental and internal cues (Schweizer et al., 2024). Affective control is understood through four dimensions: positive affect, anxiety, anger, and depressed mood. These dimensions enable individuals to regulate which emotions they experience, as well as when and how they express them (Minihan et al., 2024). Affective control does not entail preventing the onset of an emotional state; rather, it involves experiencing the emotion authentically without avoiding or suppressing it (Movahedzadeh et al., 2024). Previous research on romantic relationships has identified both positive and negative affect as independent predictors of the level of conflict and irritation within relationships. These findings suggest that individuals with higher levels of positive affect report less negative conflict and demonstrate a greater capacity to manage conflict effectively when it arises, whereas those with heightened negative affect tend to experience more frequent conflict and exhibit less effective coping strategies (Javanmard & Farshbaf, 2023). LA is characterized by emotional lability, particularly in response to the presence or absence of one's partner, along with pronounced difficulty in managing negative emotions such as depression, loneliness, guilt, shame, anxiety, and distress, which the individual finds challenging to regulate. Consequently, some researchers hypothesize that individuals suffering from LA may attempt to prevent or alleviate undesirable or intolerable emotions by seeking the constant presence of their partner as their primary, and sometimes sole, coping strategy, thereby reinforcing addictive behaviors (Gritti, 2018; Redcay & Simonetti, 2018; Salani et al., 2022). In the treatment of LA, alongside pharmacotherapy, various psychological interventions have been introduced. These treatments include Eye Movement Desensitization and Reprocessing (EMDR), psychodrama, Sex and Love Addicts Anonymous (SLAA), Cognitive-Behavioral Interventions (CBI), and Psycho-educational Interventions (PEI). Given that dysfunctional thoughts and beliefs are recognized as core psychological factors underlying LA, significantly contributing to its development and maintenance, cognitive-behavioral interventions can be effective in modifying these maladaptive beliefs and replacing them with functional alternatives. The pathological psychological features associated with LA underscore the potential role of automatic thoughts and cognitive distortions—such as overgeneralization, catastrophizing, and selective abstraction—in the persistence of this condition (Sanches & Jhon, 2019). Individuals with LA often have limited awareness and understanding of its symptoms, etiology, coping mechanisms, and available treatments, as well as the necessary skills for effectively managing their addiction. Thus, psycho-educational interventions can enhance individuals' awareness and understanding, offering a supportive environment in which they can safely identify and express their experiences. This environment helps normalize their experiences in the company of others and enables them to acquire essential, practical information about LA. Given that poor affective control may underlie LA, this research utilizes cognitive-behavioral and psycho-educational interventions to enhance affective regulation, comparing the effectiveness of these two approaches.

Cognitive-behavioral therapy (CBT) is a structured, time-limited, evidence-based psychological intervention effective for a broad range of emotional and behavioral disorders, including addictive behaviors (Sudhir, 2018). CBT is part of a family of

interventions aimed at identifying and modifying dysfunctional cognitions to alter negative emotions and behaviors. These interventions also encompass coping skills training and problem-solving therapy (Kiluk & Carroll, 2013). The psychopathological features associated with LA indicate that automatic thoughts and cognitive distortions—such as overgeneralization, catastrophizing, and arbitrary inference—may play a critical role in sustaining LA. These distortions could be successfully addressed through CBT (Sanches & Jhon, 2019). Findings from previous research have demonstrated the efficacy of exposure and response prevention (ERP), cognitive restructuring, and behavioral activation techniques in significantly decreasing both the frequency and intensity of compulsive behaviors, as well as modifying maladaptive cognitive patterns in individuals diagnosed with LA (Wyant, 2021). Recent studies on the efficacy of cognitive-behavioral interventions have yielded promising results, offering robust empirical support for the application of this therapeutic approach in clinical settings, particularly in addressing psychological challenges experienced by individuals diagnosed with LA. The findings of Alavi and Jabal Ameli's research indicate that cognitive-behavioral interventions and their specific components are effective in enhancing affective control. Based on the results of this study, cognitive-behavioral therapy is effective in managing the anger component among patients with multiple sclerosis (MS) (Alavi & Jabalameli, 2018). Research findings on the effectiveness of cognitive-behavioral interventions indicate that this approach positively impacts affective control, leading to overall improvements in affective regulation (Masoumian et al., 2021; Zachariah, 2023; Bisadi, 2023; Alahyari et al., 2021).

A psycho-educational intervention focusing on the distinction between healthy romantic relationships and pathological or dependent love may serve as a significant approach within psychological interventions for individuals with LA (Sussman et al., 2015). While psycho-educational interventions can be conducted individually, group-based approaches offer a conducive environment for intra-group dialogue, social learning, fostering support and cooperation, leveraging group reinforcement to encourage positive changes, and establishing a supportive network among participants. Cognitive-behavioral techniques, including problem-solving and role-playing, enhance the delivery of educational content by allowing individuals to practice and consolidate new information and skills within a safe and supportive environment (Griffin-Shelley, 2018). Recent studies suggest that psycho-educational interventions are effective in enhancing affective control among individuals with schizophrenia spectrum disorders. Their research indicated that psycho-educational intervention can enhance affective control in these individuals by improving cognitive reappraisal and reducing rumination (Lam et al., 2020). Research findings on the effectiveness of psycho-educational interventions suggest that these interventions positively impact affective control, leading to overall improvements in emotional regulation (Padmanabhan, 2022; Mohamed Ali & Saied Adam, 2022; Vagnini et al., 2023). Given the prevalence of LA in Iran and its adverse impacts on financial stability, employment, family formation, and its association with physical and psychological health issues, as well as the incidence of sexual crimes, there is a critical need for comprehensive psychological and educational interventions targeting individuals with LA in Iranian society. Furthermore, no studies have been conducted to assess the effectiveness of cognitive-behavioral and psycho-educational interventions, nor to compare the efficacy of these approaches. Given that dysfunctional cognitive processes are identified as primary underlying factors in LA,

cognitive-behavioral interventions are well-suited to target these maladaptive processes, facilitating their replacement with more adaptive and functional cognitive patterns. Since LA manifests in various forms, there is limited awareness and understanding of it among both the general public and therapists. Psycho-educational interventions can play a critical role in increasing awareness and knowledge regarding this condition. The research question of this study is: "Is there a significant difference in the effectiveness of cognitive-behavioral intervention compared to psycho-educational intervention in enhancing affective control?"

2. Objectives

The current study aimed to compare the effectiveness of cognitive-behavioral and psychoeducational interventions on affective control in students with learning difficulties.

3. Methods

3.1. Sample and Procedure

The present study employed a quasi-experimental design with a pre-test-post-test multigroup follow-up. The statistical population comprised 414 undergraduate students from Guilan University in the 2023-2024 academic year. Utilizing the Love Addiction Questionnaire by Peabody (2005), 30 female students who scored above 16 were purposefully selected from a pool of 120 students. These participants were then randomly assigned to two experimental groups and one control group: the Cognitive-Behavioral Intervention Group (n=10) following the work of Garcia et al. (2016), and Warren (2023), and the Psycho-Educational Intervention Group (n=10) based on research by Sarkhel et al. (2020) and Rosenberg and Feder (2014). The sample size was determined through a power analysis, aiming for a test power of 0.80, an effect size of 0.50, and a confidence level of 0.01. Given the study's design, which included three groups and three measurements, ten students were selected for each group, as per Cohen's table of sample sizes based on the F ratio.

Participants were included based on the diagnostic criteria for Love Addiction (LA), assessed through a clinical interview and the Love Addiction Questionnaire. Additional criteria required participants to be aged between 20 and 22 years, have obtained written consent for research participation, be single, enrolled as undergraduates, free from addiction, and without other psychological disorders or the use of psychiatric medications. Those displaying psychotic symptoms or substance abuse, or who missed more than two sessions, were excluded from the study.

To conduct the interventions, the researcher obtained consent from students with LA to participate in the study. A diagnostic interview based on psychological characteristics of LA was conducted prior to evaluation. After assessment, students were checked against the inclusion and exclusion criteria, and selected participants signed a consent form. The pre-test was administered using Peabody's Love Addiction Questionnaire (2005) and Williams' Affective Control Questionnaire (1997).

Following coordination with officials at the Counseling Center at Guilan University, arrangements for the intervention sessions were made in late April 2023. The schedule for the cognitive-behavioral and psycho-educational sessions was organized based on the students' availability. The interventions commenced in late April and concluded in early June, with the researcher facilitating the sessions. Each participant in the experimental groups attended ten

sessions, each lasting 45 minutes, held two days a week over five weeks. Meanwhile, the control group received regular treatment but did not partake in any interventions.

To encourage and motivate participants to complete the sessions, individual counseling was offered to address any personal issues as needed. Participants were reassured that they could reach out to the researcher for counseling after the intervention sessions ended. Following the completion of the intervention sessions, a post-test was conducted for all three groups. The effectiveness of the intervention was assessed through follow-ups conducted three months later. Throughout the study, consent was obtained from participants, who were assured of confidentiality and that they could withdraw from the research at any point during the testing process.

3.1.1. Cognitive-Behavioral Intervention (CBI) for students with LA

In this study, the Cognitive-Behavioral Intervention (CBI) is designed for students with Love Addiction (LA), following the research of Garcia et al. (2016) and the book by Warren (2023). The CBI consists of ten sessions, each lasting 45 minutes, conducted over five weeks. The therapeutic sessions were developed, customized, and implemented based on theoretical foundations.

3.1.2. Psycho-Educational Intervention (PEI) for Students with LA

The Psycho-Educational Intervention (PEI) is also tailored for students with LA, inspired by the research of Sarkhel et al. (2020) and Rosenberg and Feder (2014). Similar to the CBI, the PEI consists of ten 45-minute sessions over a five-week period. These therapeutic sessions were set up, customized, and implemented based on theoretical principles. The intervention protocols for both CBI and PEI are detailed in Table 1.

3.2. Research Tools

Peabody's Love Addiction Questionnaire (2005): This questionnaire comprises 32 statements that assess various aspects of love addiction. Each statement is measured on a 3-point scale (0 to 2), resulting in total scores that can range from 0 to 64, with higher scores indicating a greater risk of LA. In Iran, Qaemi (2009) studied the psychometric properties of this scale on students, finding a convergent validity of 0.87 and a reliability score of 0.83. Additionally, Nariman et al. (2019) reported an excellent Cronbach's alpha of 0.92 for the scale.

Williams' Affective Control Questionnaire (1997): This questionnaire consists of 42 statements divided into four subscales, each measuring different aspects of affective control. The subscales include anger (8 items), depressed mood (8 items), anxiety (13 items), and positive affect (13 items). Each item is rated on a 7-point Likert scale (1 to 7), ranging from strongly disagree to strongly agree. The test-retest reliability for the anger subscale is 0.73, for the depressed mood subscale 0.76, for the anxiety subscale it is 0.77 to 0.89, and for the positive affect subscale 0.66 to 0.84. Convergent and divergent validity are reported as 0.36 and 0.58, respectively (Mills, Dhillo, & Comninos, 2018). In Iran, Fathi et al. (2020) conducted a study using this scale with cancer patients to evaluate its psychometric properties, finding a reliability score of 0.83. The internal consistency of the questionnaire was reported in another study to be 0.78 for students, 0.81 for teachers, 0.88 for nurses, 0.90 for students, and 0.93 for professors (Gharadaghi & Amani, 2022).

Table 1. The CBI intervention protocol and PEI intervention protocol

Sessions	CBI protocol content
Session 1 and 2	Familiarization and introduction, introduction of group rules and definition of the concept of love addiction, stating expectations and goals in the educational process, discussion about romantic relationships and the individual's purpose in forming a romantic relationship, general familiarization and definition of affective control, initial assessment. Explanation of the ABC model, stating absolute beliefs and values, addressing why these beliefs are problematic, identifying thoughts and assumptions, assignment: identifying activating events (each day of the week, identify a specific situation or event that causes negative feelings or behaviors in you).
Session 3 and 4	Review of previous session's assignments, evaluation and challenging of thoughts (cognitive restructuring), introduction of four error-prone styles (negative automatic thoughts, negative core beliefs, cognitive triangle, logical error), training in self-monitoring techniques. Assignment: identify and record your automatic thoughts throughout the day. Review of previous session's assignments, discussion on information processing (recognition of automatic thoughts, identification of cognitive errors, cognitive restructuring), explanation of how love addiction is related to affective control.
Sessions 5 and 6	Activating the client (examine what each automatic thought means, why it bothers you, why it seems bad), focusing on specific automatic thoughts in specific situations followed by the creation of specific emotions, teaching emotion management techniques such as deep breathing and mindfulness. Identifying core beliefs (evaluating assumptions, coping strategies, client rules, etc.), explaining the connection between thoughts, emotions, and behaviors, teaching the thought journal technique (assignment: keep a journal to record your daily thoughts, feelings, and behaviors), teaching the "Five Whys" technique (ask yourself why five times to reach the deeper layers of your belief).
Session 7 and 8	Working on core beliefs and replacing them with more effective ones, evaluating worries and negative feelings, identifying and strengthening strengths (participating in artistic, sports, and social activities), enhancing self-control skills (practicing positive alternative behaviors). Assignment: make a list of strengths and practice daily to reinforce them. Review of previous session's assignments, discussion about self-talk (negative self-talk, positive self-talk, motivational self-talk, calming self-talk), discussion on communication skills (active listening, clear and precise expression, correct understanding and interpretation of messages) and assertiveness (setting boundaries, expressing needs and requests, conflict management). Teaching techniques such as mirror conversations and role-playing.
Sessions 9 and10	Practice and repetition, feedback and correction. Review of previous sessions and addressing individuals' concerns regarding the end of the intervention.
	PEI protocol content
Session 1 and 2	Introduction of members to each other, introduction of group rules, general discussion about love addiction, stating the goals and expectations of the group. Discussion about the signs and symptoms of love addiction, providing information on affective control, offering information on the underlying factors (variables) of love addiction, and raising awareness about each of these underlying variables.
Session 3 and 4	Discussion on how affective control is related to love addiction. Listening to individuals' opinions and perspectives on love addiction and discussing misconceptions.
Sessions 5 and 6	Increasing members' awareness about the thoughts, emotions, and behaviors related to love addiction, identifying and recognizing triggering situations, and the role of affective control in love addiction. Review of the previous session's content and instructing self-monitoring techniques through daily journaling, discussion about coping strategies (cognitive, behavioral, emotional, and social).
Session 7 and 8	Evaluating and receiving feedback from members about the activities and content of the sessions, teaching self-control skills (stop and think technique, deep breathing), reinforcing positive behaviors. Teaching problem-solving, discussing stress management and related techniques (relaxation techniques, cognitive techniques, time management, behavioral techniques, enhancing social support).
Sessions 9 and10	Discussion about self-compassion and teaching self-compassion techniques (self-kindness exercises and writing a letter to oneself), identifying and strengthening strengths. A comprehensive review of the sessions and addressing individuals' concerns regarding the end of the intervention.

3.3. Ethical Considerations

- The researcher introduced herself to the participants and provided thorough description about the experiment and what was going to happen.

- Informed consent was obtained from all participants.
- Participation in the research was purely voluntary.
- Dropping out of the research was permitted at any point.
- The privacy of the participants' information was completely preserved.
- The researcher, holding a valid specialized certification, was fully qualified to perform therapeutic interventions according to established protocols.

4. Results

The descriptive findings indicated that the mean and standard deviation of the ages of the participants in the cognitive-behavioral intervention, psychological-educational, and control groups were 20.60 ± 0.99, 22.00 ± 1.49, and 20.80 ± 1.13, respectively. The obtained F statistic from the comparison of the means of three groups in the age variable is 0.300, which is not statistically significant (sig = 0.743). Matching was conducted through variance with repeated measures analysis, and there was no significant difference between the groups ($P \geq 0.05$) .

Table 2. Mean and SD of affective control in two experimental and control groups

Variable	subscale	Phase	CBI		PEI		C	
			Mean	SD	Mean	SD	Mean	SD
Affective Control	Anger	Pre-test	35.50	6.16	33.90	4.88	34.10	9.09
		Post-test	22.30	5.35	17.40	4.42	33.70	8.32
		Follow up	21.60	5.18	17.30	4.94	33.60	8.01
	Depressed Mood	Pre-test	34.30	7.83	33.50	3.71	34.00	6.46
		Post-test	19.00	3.23	18.20	5.59	34.20	6.39
		Follow up	18.80	3.45	18.40	5.35	33.30	6.73
	Anxiety	Pre-test	49.60	4.47	50.30	5.53	50.10	7.07
		Post-test	33.50	8.88	28.30	8.75	50.50	9.26
		Follow up	34.50	9.60	28.20	7.99	49.80	8.44
	Positive Affect	Pre-test	32.30	3.97	32.50	3.43	33.30	3.19
		Post-test	43.30	6.60	46.40	2.87	31.70	3.88
		Follow up	42.90	6.55	45.50	3.50	31.60	3.94
	Total	Pre-test	151.70	16.66	150.20	10.46	151.50	18.97
		Post-test	118.10	20.46	110.30	15.68	150.10	18.75
		Follow up	117.80	21.71	109.40	14.90	148.30	17.01

Table 2 reports the mean and standard deviation of affective control, and its subscales in three groups: cognitive-behavioral intervention, psycho-educational, and control. The mean score of affective control and its subscales in the group of cognitive-behavioral intervention and psycho-educational intervention diminished after post-test. In the control group, no decline in affective control and its subscales was observed after the post-test. Before performing the statistical analysis, the normality of the data was first measured by the Shapiro-Wilk Test, with the results indicating that the significance level of affective control and its subscales being higher than the criterion value of 0.05. Homogeneity of variances was also assessed by the Leven Test where a probability value greater than 0.05 was obtained for affective control and its subscales scores. The first presupposition of the analysis of variance with repeated measures was the equality of the covariance matrix,

which was equal to the covariance matrix because of the non-significance of Box's M Test (P = 0.08, Box's M = 22.79). Mauchly's Sphericity Test was employed to validate a repeated measure analysis of variance (ANOVA). Thus, Mauchly's Sphericity Test was also observed (P = 0.102). Also, by performing the Leven Test, it was found that the assumption of the equality of variances was observed (P = 0.367).

Table 3. Results of Repeated Measures Analysis of Variance Test of Affective Control and Its Subscales

Variable	subscale	Variance resources		SS	DF	MS	F	P	Eta	OP
Affective Control	Anger	Within-group	Time	1601.66	1	1601.66	263.85	< 0.001	.90	1.00
			Group*time	743.68	2	371.71	61.23	< 0.001	.81	1.00
		Between-group	Group	1862.75	2	931.37	7.88	< 0.001	.36	.929
	Depressed Mood	Within-group	Time	1612.01	1	1612.01	228.41	< 0.001	.89	1.00
			Group*time	700.93	2	350.46	49.65	<0.001	.78	1.00
		Between-group	Group	2048.26	2	1024.13	12.05	< 0.001	.47	.990
	Anxiety	Within-group	Time	2343.75	1	2343.75	88.51	< 0.001	.76	1.00
			Group*time	1238.80	2	619.40	23.39	< 0.001	.63	1.00
		Between-group	Group	3437.15	2	1718.57	11.12	< 0.001	.45	.984
	Positive Affect	Within-group	Time	799.35	1	799.35	138.12	< 0.001	.83	1.00
			Group*time	621.90	2	310.95	53.73	< 0.001	.79	1.00
		Between-group	Group	1430.28	2	715.14	14.36	< 0.001	.51	.997
	Total	Within-group	Time	10062.15	1	10062.15	222.38	< 0.001	.89	1.00
			Group*time	3990.70	2	1995.35	44.10	< 0.001	.76	1.00
		Between-group	Group	11752.02	2	5876.01	6.90	< 0.001	.33	.892

In **Table 3,** the results of repeated measures analysis of variance test are reported to examine the differences between the research sample in three stages: pre-test, post-test, and follow-up. According to this table, the effect of measurement time on the mean scores of affective control and its subscales was significant (p <0.001). Also, the interaction between measurement time and group on the mean scores of affective control and its subscales was significant (p <0.001). In addition, the effect of the group was also significant on the mean scores of affective control and its subscales (p <0.001).

Figure 1 displays the effects of cognitive-behavioral intervention and psycho-educational intervention by groups and test stages. Since the interaction was significantly different between the intragroup factor of time of measurement and the intergroup factor of the group, so the simple intergroup effect concerning intragroup factor levels and pairwise comparison of time was investigated using Bonferroni post hoc test.

According to **Table 4,** based on the Bonferroni post hoc test, the results indicate that cognitive-behavioral and psycho-educational interventions have been effective on the total score and subscales of affective control (p <0.001). In other words, cognitive-behavioral

and psycho-educational interventions have been effective on improving affective control compared to the control group. Regarding the comparison of the effectiveness of cognitive-behavioral and psycho-educational interventions, it can be stated that there is no difference observed in the effectiveness of the two interventions on affective control.

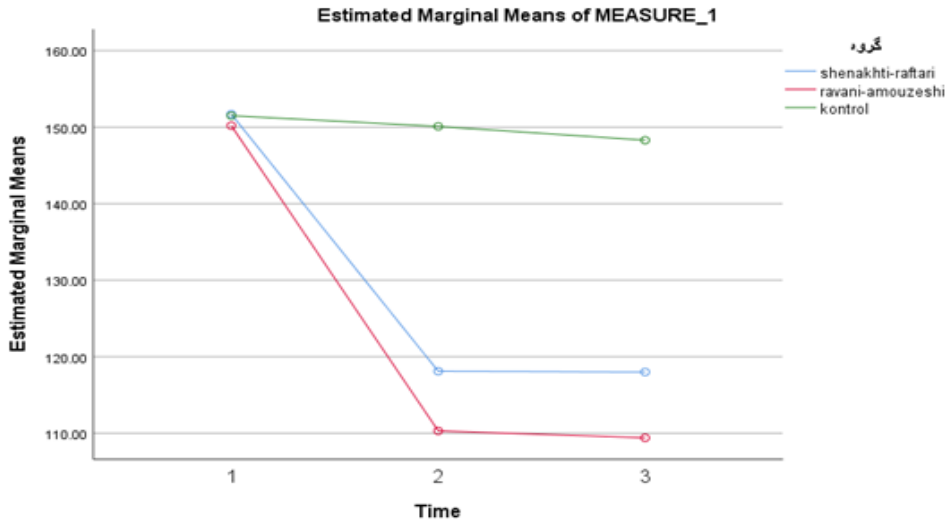


Figure 1. Effect of cognitive-behavioral intervention and psycho-educational intervention on affective control by groups and test stages

Table 4: Pairwise Comparisons of Three Groups of CBI, PEI, and C

Variable	Subscale	Group (i)	Group (j)	MD	Error	Sig
Affective Control	Anger	CBI	PEI	3.60	2.80	.63
		CBI	C	-7.33	2.80	.043
		PEI	CBI	-3.60	2.80	.63
		PEI	C	-10.93	2.80	.001
		C	CBI	7.33	2.80	.043
		C	PEI	10.93	2.80	.001
	Depressed Mood	CBI	PEI	.73	2.80	1.00
		CBI	C	-9.73	2.80	.001
		PEI	CBI	-.73	2.80	1.00
		PEI	C	10.46	2.80	.001
		C	CBI	9.73	2.80	.001
		C	PEI	10.46	2.80	.001
	Anxiety	CBI	PEI	3.60	2.80	.81
		CBI	C	-10.93	2.80	.001
		PEI	CBI	-3.60	2.80	.81
		PEI	C	-14.53	2.80	.001
		C	CBI	10.93	2.80	.001
		C	PEI	14.53	2.80	.001
	Positive Affect	CBI	PEI	-1.96	2.80	.87
		CBI	C	7.30	2.80	.001
		PEI	CBI	1.96	2.80	.87
		PEI	C	9.26	2.80	.001
		C	CBI	-7.30	2.80	.001
		C	PEI	-9.26	2.80	.001
	Total	CBI	PEI	5.96	2.80	1.00
		CBI	C	-20.70	2.80	.032
		PEI	CBI	-5.96	2.80	1.00
		PEI	C	-26.66	2.80	.001
		C	CBI	20.70	2.80	.032
		C	PEI	26.66	2.80	.001

Table 5. Pairwise Comparison of Three Times (pre-test, post-test, and follow-up)

Variable	Subscale	Stage		CBI		PEI		C	
				MD	Sig	MD	Sig	MD	Sig
Affective Control	Anger	Pre-test	Post-test	13.20	.001	16.50	.001	.40	1.00
			Follow up	13.90	.001	16.60	.001	.50	.89
		Post-test	Follow up	.70	.39	.10	1.00	.10	1.00
	Depressed Mood	Pre-test	Post-test	15.30	.001	15.30	.001	-.20	1.00
			Follow up	15.70	.001	15.10	.001	.70	.81
		Post-test	Follow up	.40	.11	-.20	1.00	.90	.51
	Anxiety	Pre-test	Post-test	16.10	.001	22.00	.001	-.40	1.00
			Follow up	15.10	.001	22.10	.001	.30	1.00
		Post-test	Follow up	-1.00	.41	.10	1.00	.70	.81
	Positive Affect	Pre-test	Post-test	-11.00	.001	-13.90	.001	1.60	.62
			Follow up	-10.60	.001	-13.00	.001	1.70	.42
		Post-test	Follow up	.40	1.00	.90	.36	.10	1.00
	Total	Pre-test	Post-test	33.60	.001	39.90	.001	1.40	.51
			Follow up	33.70	.001	40.80	.001	3.20	.34
		Post-test	Follow up	.10	1.00	.90	1.00	1.80	.62

According to Table 5 and based on the Bonferroni post hoc test, there was a significant difference between the mean scores of affective control and its subscales in pre-test and post-test ($p < 0.001$). There was also a significant difference between the mean scores of affective control and its subscales in the pre-test and follow-up stages ($p < 0.001$). However, there was no significant difference between the mean scores of affective control and its subscales in post-test and follow-up ($p > 0.001$).

Discussion

This study aimed to compare the effectiveness of cognitive-behavioral and psycho-educational interventions in enhancing affective control among students with Learning Disabilities (LD). The findings indicated that both types of interventions effectively improved affective control in these students, with the improvement sustained over a three-month follow-up period. Importantly, there was no significant difference in the effectiveness of the two interventions regarding affective control.

Numerous studies, including those by Lorenzo-Luaces et al. (2021); Shafiei et al. (2021); Ghorbani et al. (2020); and Girelli et al. (2024), consistently suggest that cognitive-behavioral interventions contribute to improvements in affective control.

Cognitive-behavioral interventions help individuals distinguish between healthy and unhealthy anger, equipping students with LD with strategies to manage unhealthy anger effectively (Hajilo & Shafiabadi, 2016). They also identify the thoughts, beliefs, and underlying meanings triggered during moments of anger and distress. Individuals with learning disabilities often face challenges in processing social information, which can lead to vindictive thought patterns and a deficiency in adaptive problem-solving skills. When experiencing physiological arousal, they are more prone to impulsive actions. Cognitive interventions enhance self-awareness, allowing these individuals to exercise greater

control over their behavior, language, and emotional responses, including anger. They learn that anger and aggression stem not only from external stimuli—such as others' words or taunts—but also from their own perceptions and interpretations, which can contribute to aggressive responses (Zachariah, 2023).

In addressing the alleviation of depressed mood and anxiety resulting from cognitive-behavioral interventions, it is important to note that this approach targets dysfunctional cognitive patterns. Depression and anxiety are often linked to unchecked negative beliefs, maladaptive thought patterns, and dysfunctional behaviors (Hazhir et al., 2012). Cognitive-behavioral interventions can effectively modify these negative beliefs and maladaptive behaviors in individuals with LD, leading to reductions in depressed mood and anxiety associated with cognitive restructuring.

Through cognitive-behavioral intervention, many cognitive distortions—such as catastrophizing and negative forecasting—can be effectively addressed (Aghaziarati et al., 2023). Techniques like cognitive restructuring help individuals identify and challenge negative and anger-inducing thoughts. This process empowers individuals to replace distorted and irrational thoughts with more positive and realistic perspectives. Moreover, coping skills training, as part of the intervention, equips individuals with strategies for effectively managing anger-provoking situations. For example, teaching problem-solving skills and effective communication can lead to reduced anger responses and improved emotional regulation.

Cognitive-behavioral interventions that incorporate relaxation techniques, such as deep breathing and meditation, can alleviate the physical and psychological stress associated with anxiety. Cognitive restructuring enables individuals to identify and replace negative thoughts with more rational alternatives, significantly reducing anxiety and improving the quality of life for those with LD.

Additionally, cognitive-behavioral interventions centered on cognitive restructuring help individuals challenge negative, self-destructive thought patterns contributing to depression, replacing them with more positive and empowering alternatives. Teaching coping skills—such as engaging in pleasurable activities and strategically planning events—can enhance mood and elevate energy levels in individuals with LD. Ultimately, cognitive-behavioral interventions foster positive emotional growth by reinforcing affirmative thought patterns and teaching constructive coping strategies. For instance, cultivating awareness of positive personal attributes and daily experiences can enhance outlooks and increase feelings of pleasure among individuals with LD.

Numerous studies, including those by Al-Alawi et al. (2022), Abazarnejad et al. (2019), and Zaharia et al. (2021) support these findings.

8. Limitations

Limitations of the present study included the restriction of the sample to female students, constraints in educational level and age range, and a small sample size. Gender differences may influence the manifestation of LA, even if their prevalence remains similar across genders. Further research is needed to deepen understanding of LA patterns as they relate to

gender and prevalence. While studies have not demonstrated a direct effect of age on LA, age may indirectly influence LA by affecting self-esteem.

9. Author Contributions

M. Gorji was responsible for leading the overall research process, data collection, writed, reviewed and approved the final version of the manuscript. M. Kafi was responsible for research plan design. A. Abolghasemi responsible for data analysis and reviewed the final version of the manuscript.

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11. Conflicts of Interest

The authors declare there is no conflict of interest in this article.

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