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Comparison of the effectiveness of compassionate mind-based therapy and dialectical behavior therapy on cognitive deficits, emotional processing defects and impulsivity of adolescent soldiers aged 18 to 20 years with high-risk behaviors

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ABSTRACT

Background and Aim: High-risk behaviors are behaviors that increase the likelihood of physical, psychological and social disastrous consequences for the individual. The aim of this study was to compare the effectiveness of compassionate mind therapy and dialectical behavior therapy on cognitive deficits, emotional processing defects and impulsivity of adolescent soldiers aged 18 to 20 years with high-risk behaviors. **Methods:** The method of the present study was quasi-experimental with a pretest-posttest design with a follow-up group. The statistical population of this study included all adolescent soldiers aged 18 to 20 years who referred to Valiasr Medical Center in Tehran in 2020. The sample selection process in the present study consisted of two stages: The first stage was done by purposeful sampling method of high-risk behaviors questionnaire to screen soldiers referred to Valiasr Medical Center in Tehran and among those who received a score higher than the screening method 50 people were selected based on the completion of the consent form for participation in the research as well as the inclusion and exclusion criteria of 45 people (15 people in the first experimental group, 15 people in the second experimental group and 15 people in the control) and specialized in 3 groups at random. To collect data, Iranian adolescents' risk questionnaires, cognitive deficits, Toronto Alexithymia scale, and Impulsivity Scale were used. **Results:** A pairwise comparison between the two treatment groups showed that cognitive deficits in the two treatment groups of compassion (I-J=7.20; P<0.01) and dialectical behavior therapy (I-J=8.66; P<0.01), Was significant from pre-test to post-test in contrast to control group (I-J=1.56; P<0.05); Also, the study of emotional processing deficits shows that only the dialectical behavior therapy group (I-J=12.73; P<0.01) was significant from pre-test to post-test. Also, the study of impulsivity in treatment groups shows that only compassion treatment was effective in reducing impulsivity (I-J=7.66; P<0.01). **Conclusion:** According to the findings of the present study, it seems that with compassionate practice and increasing positive emotions, a person's behavioral-intellectual treasury expands, which can it provided the basis for problem-solving and the reduction of conflicts between intrapersonal and interpersonal emotions, thereby reducing impulsivity and risky behaviors.

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Introduction

One of the destructive behaviors in adolescence, especially in soldiers, is risky behavior. Risky behaviors refer to behaviors that increase the possibility of damaging physical, psychological and social outcomes for a person. These behaviors are highly correlated in teenagers and with each other and follow a co-changing pattern. In late adolescence and early youth, due to their self-centeredness and lack of proper understanding of their behaviors, it is considered an important stage for the initiation of risky behaviors (Han et al., 2017). Risky behaviors include drug use, smoking, alcohol consumption, risky driving, unhealthy lifestyle, risky sexual behaviors that are common among school-aged children and adolescents (Jin, 2014).

Previous researches in other countries have identified and introduced many factors in the occurrence of high-risk behaviors. It should be noted that adolescence is a period in which various aspects of a person's mental health undergo changes. One of the main reasons is that most teenagers turn to risky behaviors, distorted cognitions and loss of self-confidence, lack of satisfaction with life, inability to accept themselves, and ultimately, the inability to express emotion or express too much emotion. (Baskin-Summers and Summers, 2003). Cognitive failure is considered to be mistakes or errors that a person commits in performing tasks that he is naturally capable of doing, in other words, it is a multi-dimensional structural cognitive failure. It includes errors in forming goals, errors in activating schemas, and errors in initiating actions (Wallace et al., 2004). Cognitive deficits include distraction, memory problems, inadvertent mistakes, and failure to remember names (Wallace, 2004). Cognitive impairment can lead to major problems due to interference with daily activities. Compensating these errors sometimes takes a lot of time. When these errors occur in the initiation of actions, they may result in serious injuries and even death (Dorn et al., 2010). Swanson and German (2006) showed that high levels of impaired cognitive impairment have a significant positive relationship with emotional processing defects. This means that the subjects with high cognitive impairment compared to the subjects with low cognitive impairment had a lower performance in the field of education and job. Tubman (2008) showed in a research that there is a positive and significant relationship between cognitive deficits and various components of high-risk behaviors such as drinking alcohol, drug use, dangerous driving accidents and high-risk sexual relations.

Since high-risk behaviors are related to emotion and many studies related to high-risk behaviors are focused on emotion and its expression. Studies have shown that emotionally capable people recognize their feelings, understand their implicit meanings, and express their emotional states to others more effectively (Oshari et al., 2015). Compared to people who do not have the ability to understand and express emotional states, these people are more successful in dealing with negative experiences and show better adaptation in relation to the environment and others (Golman, 1995). The inability to interpret and express emotions has been associated with a defect in emotion processing. The term emotional processing is defined as the ways of individual evaluation of stressful life events (Kirishi et al., 2015). These distortions lead the person's behaviors and other experiences to illness and disorder (Kirishi et al., 2015). It is believed that a defect in emotional processing is considered a dangerous factor for many mental disorders, because people with this deficiency are under the pressure of physical correlates of emotions that cannot be expressed. This failure prevents the regulation of emotions and makes the person's adaptation difficult (Osheri et al., 2015).

Among other factors that have a direct relationship with high-risk behaviors is impulsivity. Impulsive behaviors are sometimes called risky behaviors. They include a wide range of actions on which little thought has been done, in an immature form with immediate occurrence, without the ability to focus on a specific task, in the absence of a proper planning, and they have high risk and vulnerability. (Waxman, 2011). A review of the studies conducted on impulsivity shows that impulsive behaviors form the core of many mental disorders such as attention deficit/hyperactivity disorder, conduct disorder, impulse control disorder, substance abuse, bulimia, suicidal behavior, personality disorders, and risky behaviors. (Solati-Anaghizi et al, 2021; Karimkhani & Mirzakochak

Khoshnevi, 2020; Duran et al., 2006; Fossati et al., 2007; Ray et al., 2009).

One of the treatments whose effectiveness has not been investigated so far on cognitive deficits, emotional processing defects, and impulsivity of soldiers with high-risk behaviors is the treatment based on the compassionate mind. Compassion-focused therapy was originally developed to help individuals develop more accepting feelings toward themselves, as well as help them find a compassionate inner voice (Gilbert, 2014). This integrative therapy draws from neuroscience, social psychology, developmental, developmental, and Buddhism, as well as many other treatment models for mental health problems (Summers-Speakerman et al., 2018). Compassion-focused therapy is thought to enhance the ability to experience and tolerate calming emotions in the face of obstacles. As a result, it cultivates positive emotional states such as security, peace and contentment, and at the same time relieves negative emotional states; In this way, it enables people to regulate and face unpleasant or fearful emotions that are characteristic of the threat system, including anger, anxiety, shame, and guilt (Gilbert, 2014).

Another treatment that can be effective on cognitive deficits, emotional processing defects and impulsivity of soldiers with high-risk behaviors is Dialectical Behavior Therapy (DBT). Dialectical behavior therapy is a type of cognitive behavior therapy that was introduced and expanded in the late 1980s with the aim of helping to better treat borderline personality disorder (Bornovalva and Daughters, 2007). Dialectical behavior therapy is a cognitive behavioral therapy that, in addition to using skills (CBT) such as cognitive restructuring and management of maladaptive behavior events (such as impulsive aggression) through teaching emotional regulation skills, distress tolerance, and effective interpersonal relationships. (Mahlum, 2020). Therefore, the main body of DBT's focus is around learning, applying, and generalizing specific adaptive skills that are taught in this treatment method, and its ultimate goal is to help the patient break and overcome this vicious cycle (Bornovalva & Daughters, 2007). Research has shown that dialectical behavior therapy skills alone lead to reduced depression, hopelessness, and distress in victims of domestic abuse (Iverson et al., 2009); Mental health and well-being in family members of suicidal individuals and aggression, impulsivity, and psychological trauma in the correctional population are difficult (Rajalin et al., 2009). Babaei et al. (2012) showed that the teaching of emotion regulation skills based on dialectical behavior therapy to the subjects of the study resulted in a significant reduction of temptation scores in the scale of tempting beliefs. The grades during the ten sessions of the educational intervention had a significant decrease compared to the baseline grades. Therefore, according to the mentioned cases, the aim of this research was to compare the effectiveness of treatment based on the compassionate mind and dialectical behavior therapy on cognitive deficits, emotional processing defects, and impulsivity in 18-20 year old soldiers with high-risk behaviors.

Method

The method of the current research was a semi-experimental with a pre-test-post-test design with a follow-up group. The statistical population of this research included all young soldiers aged 18 to 20 who referred to Valiasr Medical Center in Tehran in 2020. The sample selection process in the present study included two stages: The first stage was carried out by targeted sampling of high-risk behaviors questionnaire in order to screen the soldiers referring to Valiasr Medical Center in Tehran. Among those who scored higher than 60%, 50 people were selected and randomly assigned to 3 groups (15 people in each group) based on the completion of the consent form to participate in the research and the entry and exit criteria. Entry criteria: 1- Soldier aged 18 to 20 referring to Valiasr Medical Center in Tehran. 2- Willingness to participate in the study; 3- Obtaining a high score in the high-risk behavior questionnaire of Iranian teenagers. 4- Not suffering from acute mental disorders such as bipolar disorder, schizophrenia, etc. Exclusion criteria: 1- Absence in more than one intervention session; 2- Taking part in other intervention programs at the same time; 3- Lack of desire to continue cooperation in the study.

Materials

1. Risk-taking questionnaire for Iranian teenagers (2011). This questionnaire was created by Zadeh Mohammad and Ahmadi in 2017 with the help of valid and popular tools in the field of teenagers such as ARQ (Galune et al., 2000) and YRBSS (Berner et al., 2004) questionnaires and considering the cultural and

social conditions of Iran. (Zadeh Mohammadi et al., 2011). This is the ability of 38 items to measure the vulnerability of adolescents against 7 categories of high-risk behaviors (violence, drug use, alcohol use, relationship and sexual behavior and orientation to the opposite sex). The questionnaire is answered in such a way that the respondents express their disagreement or disagreement with these items in a 5-option method from completely agree (=5) to completely disagree (=1). The range of scores is from 38 to 190, and the cut-off score of the questionnaire is above 50%, i.e. above 76. Cronbach's alpha of the standardized questionnaire in the research of Zadeh-Mohammadi et al. Cronbach's alpha was 0.74 for dangerous driving, 0.93 for smoking, 0.90 for drugs and psychotropic substances, 0.78 for violence, 0.90 for alcohol, 0.83 for friendship with the opposite sex, and 0.87 for sexual relationship and behavior. (Zadeh Mohammadi et al., 2011).

2. Broadbent et al.'s questionnaire of cognitive deficits (1982). This questionnaire was created in 1982 by Broadbent, Cooper, Fitzgerald and Parks. It has 24 items, and subjects respond to these items on a five-point scale (from "never" to "always") (Broadbent et al., 1982). This questionnaire has four components, which include distraction, memory problems, inadvertent mistakes, and failure to remember names. In Wallace's study, the Cronbach's alpha coefficient of this questionnaire was reported as 0.96 and its reliability coefficient as 0.51 (Wallace et al., 2006). Abolghasemi and Kiamarthi (2009) reported the Cronbach's alpha coefficient for the whole result as 0.84 and for the fragments of discoveries as 0.79, 0.64, 0.66 and 0.62.

3. Torronto Alexithymia Scale. This scale was developed by Taylor in 1986 and revised by Bagby, Taylor and Parker in 1994. The second revised version was the 20-item Toronto Aphasia Scale, which was considered an improvement on the original developers of the test (Bagby et al., 2003). Besharat (2007) also calculated the Cronbach's alpha coefficient for the whole ataxia questionnaire and three components of difficulty in describing feelings and thinking with external orientation as 0.85, 0.82, 0.75 and 0.72, respectively. It indicates good internal consistency of the scale. Mazaheri and Afshar (2010) calculated the reliability of this scale using Cronbach's alpha method in a sample of 80 students. Cronbach's alpha was 0.75 for the whole scale, 0.72 for difficulty in recognizing emotions, 0.72 for difficulty in describing emotions, and 0.53 for thinking with external orientation.

4. Impulsivity scale. This impulsivity scale was developed by Barratt in 1994. This scale has 30 items and the subjects answer these items in four degrees (never, sometimes, often, almost and always). In the 11th edition, Barat explains the impulsivity questionnaire based on the following three axes: 1- Self-motivation means acting without thinking, 2- Planning carefully or paying attention to details, and 3- Stability of adaptation, which means the ability of a person to foresee the future. This scale evaluates the three factors of cognitive impulsivity, motor impulsivity and unplannedness. This scale has 30 questions (Barat, 1994). The options are scored on a four-point Likert scale (rarely/never (score 1) and almost/always (score 4). This scale has ten negative questions that are scored in reverse. The reliability of the scale using Cronbach's alpha for the whole test is 0.83 and for the subscales of movement, attention and lack of planning, it is 0.74 and 0.73, respectively (Barat, 1994). In Iran, Akhtiari et al. reported an alpha coefficient of 0.78 for attention impulsivity, 0.63 for motor impulsivity, 0.47 for unplanned impulsivity, and 0.83 for the whole test (Akhtiari et al., 2008).

5. Behavior therapy based on dialectics. Dialectic-based behavioral therapy sessions based on the treatment plan of Bornovalva and Dauters (2007) were held in 10 90-minute sessions weekly for two and a half months.

Table 1. Content of dialectic-based behavioral therapy sessions

Session	Content
1	Initial acquaintance, stating the purpose of the training sessions, its duration, the number of sessions, conducting the pre-exam (filling in the questionnaires).
2	Overcoming the obstacles of healthy emotions and giving the skill of hoping that a person can know how emotions affect their thoughts and behaviors.
3	Reducing physical vulnerability to disturbing emotions and how people's thoughts and behaviors can affect their emotions.

4	Reducing cognitive vulnerability and understanding how thoughts affect feelings.
5	Increasing positive and pleasant emotions (such as happiness and joy) and overcoming negative emotions (such as anger, fear and sadness).
6	Conscious attention to emotions without judgment (learning to restrain conscious attention to emotions without judging them reduces the chance of intensification, causing trouble and annoying emotions).
7	Coping with emotions (facing emotions instead of avoiding them, which is one of the main goals of the dialectical behavior therapy approach).
8	Acting against strong emotional urges and why we need to understand how we feel.
9	Solving the problem (Before the disturbing emotions are activated, one must act to order the emotions. The process of solving the problem starts with behavior analysis, and basically, behavior analysis means following the series of events that lead to emotions. creates problems).
10	Receiving feedback from the group members about the principles taught, reviewing and summarizing the past materials and conducting the post-exam (completion of questionnaires).

6. Compassion-focused therapy. Compassion-focused treatment sessions based on Gilbert's (2014) treatment plan were held in 10 90-minute sessions weekly for two and a half months.

Table 2. Content of compassion-focused therapy sessions based on Gilbert's treatment plan

Session	Content
1	Getting to know each other, communicating, getting to know the general concept of self-compassion and empathy, and performing the pre-test (filling in questionnaires).
2	Stating the goals of the meeting, defining the group, practicing rhythmic calming breathing and expressing the characteristics of a group.
3	Empathy training, examining the way members deal with themselves (critical or compassionate style), defining self-criticism and the causes of its consequences, defining compassion, training to understand that people feel that they should follow things with an empathetic attitude.
4	Explaining self-compassion. Its characteristics and skills, how it affects a person's mental states, introducing three emotional regulation systems and how they interact to form and create more and more diverse emotions in relation to people's issues to increase care and attention to their health.
5	Teaching forgiveness. Teaching the concept of mindfulness, its logic and how to implement its exercises.
6	Introducing mental imagery and its logic, imagery training and its implementation in the group (image of color, location, and characteristics of a compassionate person)
7	Cultivating self-compassion and introducing the concepts: wisdom, ability, warmth and responsibility in creating compassion, teaching how to visualize self-compassion, teaching the development of valuable and sublime feelings in oneself in order to have a proper and efficient relationship with the environment
8	Focusing on self-compassion and identifying its different dimensions (attention, thinking, feeling, behavior, awareness).
9	Remembering the skills of compassion, the role of compassion in guiding thinking, the reactions of training thoughts and the behavior of a compassionate person in front of a critic
10	Receiving feedback from the group members about the principles taught, reviewing and summarizing the past materials and performing the post-test.

Implementation

In order to analyze the collected data, descriptive statistics methods including frequency table, graph, mean and standard deviation were used. Multivariate analysis of variance with repeated measurements was used to check the hypotheses. In addition, the analysis was done using SPSS version 23 software. It should be noted that the subjects were assured that participation in the study is

completely optional and they will be free to refuse to participate in the study and their names will not be recorded in the questionnaire, and their information will remain confidential. Then, the ethical consent form to participate in the research was presented to them to sign.

Results

The results of the analysis of demographic findings in 45 subjects indicate that the average age (and standard deviation) of people in the three groups of compassion therapy, dialectical behavior therapy, and evidence, respectively: 18/20 (8/93), 19/16 (9/97), 18/31 (8/18). Their minimum and maximum age was 18 to 20. More than 50% of the participants in the studied groups are from good to average from a socio-economic point of view, so it can be said that almost three groups are homogeneous.

Table 3. Mean and standard deviation of research variables based on different research groups and periods

Variable	Stage	CFT		DBT		Control	
		Mean	SD	Mean	SD	Mean	SD
Cognitive impairment	Pre-test	113/73	4/13	117/93	3/93	107/39	2/96
	Post-test	106/73	5/22	109/26	4/04	105/66	4/73
	Follow-up	98/13	8/65	97/86	7/03	105/00	4/81
Deficits in emotional processing	Pre-test	83/60	8/27	84/00	6/16	84/66	6/87
	Post-test	78/ 61	5/42	71/26	4/65	85/53	5/65
	Follow-up	76/06	5/81	68/66	6/82	83/46	9/26
impulsiveness	Pre-test	68/40	3/56	68/60	4/40	68/53	4/65
	Post-test	60/73	3/19	66/60	3/58	68/00	5/01
	Follow-up	60/00	2/10	65/46	2/44	68/13	4/10

As can be seen in Table 3, the mean and standard deviation of cognitive impairment, deficit in emotional processing, and impulsivity were reported in three groups. In order to check the assumptions, the repeated measurement of the assumptions and the relevant assumptions should be investigated. The distribution of the dependent variable in the groups should be approximately normal, and the Shapiro-Wilk test was used to check the normality of the data.

Table 4. Checking the normality of data distribution in the studied variables under the Shapiro-Wilk test

Variable	Pre-test		Post-test		Follow-up	
	Statistics	Sig.	Statistics	Sig.	Statistics	Sig.
Cognitive impairment	0/98	0/24	0/97	0/31	0/72	0/07
Deficits in emotional processing	0/66	0/23	0/97	0/58	0/96	0/13
impulsiveness	0/96	0/14	0/97	0/28	0/97	0/41

According to the information in Table 4, it was observed that the assumption of normality of research variables is accepted in all variables because the probability values are greater than 0.05. The variance of the difference between all combinations of groups (sphericity) should be the same. Mauchly's sphericity test is used to check this hypothesis.

Table 5. The results of Mauchly's sphericity test in research variables

Variable	Mauchly	Chi-square	df	P	Epsilon		
					Greenhouse-Gesser	HF	Lower bound

Cognitive impairment	0/89	4/36	2	0/11	0/90	0/99	0/500
Deficits in emotional processing	0/89	4/45	2	0/10	0/90	0/90	0/500
impulsiveness	0/86	5/82	2	0/06	0/88	0/86	0/500

The results of the sphericity test from Table 5 showed that the assumption of sphericity for all variables is higher than 5%, so the present assumption was also confirmed. For repeated measures analysis, the covariance between groups should be homogeneous. M-box test was used to check the hypothesis of homogeneity of covariances. The results of the M-box test showed that the condition of homogeneity of variances was met under the F statistic with a degree of freedom (12,8548/615). Levene's test is used to check the homogeneity of error variances of dependent variables in all groups. According to the findings, the probability value of this test for each of the variables is more than 0.05. Therefore, the assumption of homogeneity of variances is confirmed. In order to analyze the data, a combined repeated measurement design (between-group and within-group) was used between the two groups of compassion therapy and dialectical behavior therapy, the results of which are reported in Table 7.

Table 6. The results of multivariate analysis of variance to examine the within-group effects of variables

Test	Within-group effect	Value	F	Df hyp.	Df err.	P	Eta^2
Group test	Pillai's	0/97	13/03	6/00	82/00	0/001	0/48
	Wilk's Lambda	0/23	14/22	6/00	80/00	0/001	0/51
	Hotteling's trace	2/37	15/41	6/00	78/00	0/001	0/54
	Roy's largest root	1/89	25/92	3/00	41/00	0/001	0/65

According to the results of the multivariate analysis of variance, it can be said that there is a significant difference between the treatment groups, at least in terms of one of the variables (P<0.01). However, for a more detailed examination of the findings, the within-group effect of each variable is discussed.

Table 7. The results of the analysis of variance with repeated measurements on the research variables

Source	SS	Df	MS	F	P	Eta^2
Cognitive deficits	3731/12	2	1865/56	48/12	0/000	0/66
Group cognitive deficits	1210/11	4	302/53	13/64	0/000	0/39
Deficits in emotional processing	1522/88	2	762/94	17/83	0/000	0/28
Defects in emotional processing * group	967/31	4	241/83	5/65	0/000	0/21
impulsiveness	404/81	2	202/40	18/60	0/000	0/37
Impulsivity *group	325/45	4	81/36	7/48	0/000	0/26

According to the test results, it can be said that the significant effects include: Main cognitive deficits (partial η2=0.66; P<0.01; F=48.12); defects in emotional processing (partialη2 = 0.28; P<0.01; F=158.85); Impulsivity (partialη2 = 0.37; P<0.01; F=7.48); interaction effect with the group for cognitive impairment (partial = η2 = 0.39; P < 0.01; F = 13.64); emotional processing defects (partial η2=0.21; P<0.01; F=5.65); Impulsivity (partialη2=0.26; P<0.01; F=7.48). Therefore, it can be said that there is a significant difference between the scores of cognitive deficits, defects in emotional processing, and impulsivity in three stages (pre-test, post-test, follow-up) of evaluation. However, knowledge of the stability of the treatment requires a pairwise comparison, which is reported in Table 8.

Table 8. The results of Ben-Froni's post hoc test for pairwise comparison between groups of research variables

Variable	Group	I – J	Mean diff.	Std err.	Sig.
Cognitive impairment	CFT	Pre-test – Post-test	7/20	1/76	0/004
		Follow-up	15/60	2/14	0/000
		Pre-test – Post-test	-7/20	1/76	0/004
		Follow-up	8/60	2/48	0/011
	DBT	Pre-test – Post-test	8/66	1/22	0/000
		Follow-up	20/06	2/01	0/000
		Pre-test – Post-test	-81/66	1/22	0/000
		Follow-up	-11/40	1/83	0/000
	Control	Pre-test – Post-test	1/53	1/201	0/240
		Follow-up	-35/93	1/205	0/087
		Pre-test – Post-test	-1/53	1/201	0/240
		Follow-up	-37/46	0/959	1/000
Deficits in emotional processing	CFT	Pre-test – Post-test	5/00	2/37	0/162
		Follow-up	7/53	1/95	0/005
		Pre-test – Post-test	-5/00	2/37	0/162
		Follow-up	2/53	2/07	0/725
	DBT	Pre-test – Post-test	12/73	1/56	0/001
		Follow-up	15/33	2/60	0/001
		Pre-test – Post-test	-12/73	1/56	0/001
		Follow-up	2/60	1/79	0/508
	Control	Pre-test – Post-test	0/86	2/02	1/000
		Follow-up	1/20	3/33	1/000
		Pre-test – Post-test	0/86	2/02	1/000
		Follow-up	2/06	3/13	1/000
impulsiveness	CFT	Pre-test – Post-test	7/66	1/24	0/001
		Follow-up	8/40	1/01	0/001
		Pre-test – Post-test	-7/66	1/24	0/001
		Follow-up	0/73	0/86	1/000
	DBT	Pre-test – Post-test	2/06	1/54	0/609
		Follow-up	3/20	1/45	0/137
		Pre-test – Post-test	-2/06	1/54	0/609
		Follow-up	1/13	0/85	0/611
	Control	Pre-test – Post-test	-0/06	1/36	1/000
		Follow-up	0/40	0/98	1/000
		Pre-test – Post-test	0/06	1/36	1/000
		Follow-up	0/46	1/27	1/000

Examining the pairwise comparison between the two treatment groups in Table 8 shows that: Cognitive deficits in the two groups of compassion therapy (I-J = 7.20; P < 0.01) and

dialectical behavior therapy (I-J = 8.66; P < 0.01) from pre-test to post-test were significant in contrast to the control group. (I-J=1.56; P<0.05). Examining the emotional processing defect shows that only the dialectical behavior therapy group (I-J=12.73; P<0.01) was significant from the pre-test to the post-test. Also, the examination of impulsivity in treatment groups shows that only compassion therapy was effective in reducing impulsivity (I-J=7.66; P<0.01).

Conclusion

The purpose of this study was to compare the effectiveness of compassionate mind therapy and dialectical behavior therapy on cognitive deficits, emotional processing deficits, and impulsivity in 18-20 year old soldiers with high-risk behaviors. Based on the first finding of this research, it was determined that "treatment based on compassion and dialectical behavior therapy both have an effect on reducing the cognitive impairment of soldiers with high-risk behaviors, and there is no significant effect between the two treatments on reducing the cognitive impairment of soldiers with high-risk behaviors."

It can be stated that regarding the effectiveness of compassion-based therapy in reducing the cognitive deficits of soldiers with high-risk behaviors, this finding is in line with the researches of Shesh-Blouki and Harun Rashidi (2021), Barqi Irani et al. For example, in the study of Sheshbloki and Harun Rashid (2021), it was found that compassion therapy is associated with a reduction in emotional deficiencies and dysfunctional metacognitive beliefs. Other research also shows that compassion-based interventions reduce cognitive reactivity in people with suicidal behaviors (Bagiankole-Marzi et al., 2018). The findings also indicate that low cognitive performance is associated with high negative emotions and low positive emotions (Galvez-Sanchez et al., 2018). The explanation of such findings may be attributed to the fact that compassion therapy, targeting "shame and self-criticism", replaces kindness and compassion (positive emotions) with negative emotions (anger and shame). The reduction of negative emotions, which is associated with the increase of mental health and the expansion of positive emotions, triggers the phenomenon known in "positive-oriented psychology" as the "theory of the creation and expansion of positive emotions". Based on this approach, the expansion of positive emotions expands people's behavioral-cognitive treasury, which can be a precursor to reducing cognitive deficiencies (Lewis & Utley, 2015).

Also, regarding the effectiveness of dialectical behavior therapy on reducing cognitive deficits, it was found that this finding is also (implicitly) in line with the researches of Abu Tarabi Kashani et al. (2020) and Rezaei et al. (2019). Robison and Laczakowski (2015) also believe that dialectical behavior therapy is associated with improving self-control in substance dependent people. In their research, Amini and Shariatmadar (2018) have confirmed the effectiveness of dialectical behavior therapy in reducing some cognitive manipulations such as catastrophizing. The explanation of the present finding may be attributed to the issue that dialectical behavior therapy can reduce the amount of experience of negative emotions by increasing the psychological and emotional health of soldiers, which will result in the reduction of cognitive deficits. The findings also show that experiencing some unpleasant emotions such as depression can reduce the ability to focus and think and active memory performance in people (Rezaei et al., 2019). It can also be said that in some emotional problems such as depression, a part of the capacity of memory and attention may be involved with some mood-related events that can affect cognitive abilities. On the other hand, it can be said that the emphasis of dialectical behavior therapy on skills such as problem solving causes the person to face conflicts and, as a result, less psychological pressure. It provides the basis for increasing cognitive functions. Also, research findings have emphasized the problem-solving skills deficit in people with cognitive disabilities (Johnson et al., 2010). The review of the research background shows that although limited studies have investigated the effectiveness of compassion-based therapy and dialectical behavior therapy on reducing the cognitive impairment of soldiers with high-risk behaviors. However, the investigation shows that the present finding is implicitly aligned with the studies of Damavandian et al. (2021). By comparing compassion-based therapy and dialectical behavior therapy, Damavandian et al report that both treatments have the same effectiveness in reducing emotional self-regulation (Baigan et al., 2016). In the study of

Baghian Kolhamerzi et al. (2018), they confirmed the effectiveness of integrating dialectical behavior therapy based on the compassionate mind in reducing cognitive reactivity.

Based on another finding of this research, it was found that the effectiveness of dialectical behavior therapy in reducing emotional processing deficits was more than compassion therapy. This finding is consistent with the results of Baygan et al. (2016) and Rezaei et al. (2019). For example, Baygan et al. (2016) confirmed the effectiveness of this intervention on alexia by examining dialectical behavior therapy. In another study, Rezaei et al. showed in their research that dialectical behavior therapy had a significant effect on patients' emotional strategies (Rezaei et al., 2019). Akhwan and Sajjadian also confirmed the effectiveness and stability of this intervention in reducing the emotional instability of bipolar patients by testing dialectical therapy (Akhavan & Sajjadian, 2016).

Based on the last finding of this research, it was found that the effectiveness of compassion-based therapy on reducing impulsivity was higher than dialectical behavior therapy. The research of Saeedi et al. (2020) regarding the effectiveness of cognitive-behavioral therapy based on compassion showed that the intervention significantly reduced impulsivity in women. In another study, Rezaei et al. (2019) confirmed the effectiveness of compassion therapy in reducing the impulsivity of people with borderline personality disorder. In line with research, a study conducted on teenagers with aggressive behaviors showed that compassion therapy significantly reduced impulsivity in this group (Niasti et al., 2022), which is in line with foreign research (Duke, 2021). The effectiveness of compassion therapy in reducing impulsivity can be traced to the nature of compassion therapy. This means that providing therapeutic techniques in which, instead of suppressing negative emotions, disclosure (in the form of a compassionate letter) and acceptance of emotions with self-compassion is done, it prevents the suppression and accumulation of negative emotions and impulsive reactions. Research findings have also confirmed the role of suppression in impulsivity. Reports also indicate that people who use emotion suppression are more likely to engage in risky behaviors (Bayrami et al., 2014). It can also be said that with compassionate exercises and the increase of positive emotions, the person's behavioral-intellectual treasury expands, which can provide the basis for appropriate problem solving and reducing intra-personal and interpersonal conflicts, and as a result, reducing impulsivity.

The results of the analysis showed that both treatments were effective in reducing cognitive and emotional problems. Also, the comparison of the two treatments showed that there is no difference between the two treatments in reducing cognitive deficits, however, the dialectical treatment was more effective in reducing incomplete emotional processing, which was the opposite in relation to impulsivity, that is, the compassion treatment was more effective. The explanation of the findings also showed that the present findings may be directly through the increase of positive emotions or adaptive emotional regulation strategies, or may indirectly affect the research variables through the increase of psychological health.

Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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