

# Effect of Cognitive Processing Therapy and Holographic Reprocessing on Reduction of Posttraumatic Cognitions in Students Exposed to Trauma

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**Objective:** This research was conducted to examine the effect of cognitive processing therapy and holographic reprocessing on the reduction of posttraumatic cognitions in students exposed to trauma.

**Method:** This was an experimental study with spread pretest-posttest randomized groups design. Statistical society of this research consisted of male freshman, junior and senior high school students of Uremia (N=10286). Utilizing Traumatic Events Screening Inventory, and SCL-90 R on 1000 randomly selected high school students, 129 students were recognized as having experienced traumatic events. Of the subjects, 60 were selected randomly. Then, clinical interview was conducted, and the selected sample was randomly assigned in to three groups of cognitive processing therapy, holographic reprocessing and control. These groups responded to Posttraumatic Cognitions Inventory in pretest and post test. Differences of pre-post test scores were analyzed using one way ANOVA and Scheffe test.

**Results:** The results demonstrated significant differences between the three groups in total score of the Posttraumatic Cognition Inventory. Difference was also observed in negative cognitions on self and self-blame dimensions. Furthermore, these two therapeutic methods were equally effective in the reduction of posttraumatic cognitions.

**Conclusion:** It appears that cognitive processing therapy and holographic reprocessing which had been originally developed and tested for sexually assaulted females, can also be applied for the victims of other traumatic events, particularly adolescents.

**Keywords:** Cognitive therapy, Holography, Post traumatic stress disorder

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Exposure to traumatic events is common, with estimated lifetime rates ranging from 26 to 92.2 percent in men, and 17.7 to 87.1 percent in women (1, 2, 3, 4). In the National Comorbidity Survey, 60.7% of American adults reported experiencing at least one traumatic event during their lifetime; of them, 8.2% of men and 20.4% of women developed posttraumatic stress disorder (PTSD) (5). More than half of children and adolescents in the United States, have experienced at least one traumatic event such as child abuse, sexual assault, domestic violence, community violence, bullying, serious accidents, fires, disasters, medical trauma, or the traumatic death of a loved one. Approximately a quarter of the exposed children developed significant symptoms, especially the symptoms of PTSD related to the experienced traumatic event (6).

Traumatized people are at an increased risk for other psychiatric and medical conditions. These negative effects are not restricted to childhood, but are also seen in adults. In adulthood, survivors of early childhood traumas are at the risk of PTSD as well as other

anxiety, affective, addictive, psychotic, and personality disorders (7); besides, they might be in danger of re-victimization (8). In the cognitive view, following a trauma, survivors typically adopt negative perceptions about the self and the world (9). It was proposed that these negative cognitions about trauma and/or its sequel may produce serious current threat, which is critical to persistent PTSD (10).

Although exposure to some stressful and traumatic events in children and adolescents is inevitable, identifying, diagnosing and offering early effective therapies can prevent them from the subsequent outcomes. Current studies have questioned the efficacy and safety of pharmacological interventions in the treatment of posttraumatic symptoms in adolescents, as they are in the developmental stage. Some years ago, the prominent approach in the treatment of traumatized children was cognitive behavioral therapy (CBT). The application of this method in the treatment of physically and sexually abused children and adolescents has attained strong evidences for supporting its effectiveness on the reduction of psychiatric symptoms (11). By studying groups of

patients with PTSD, Foa and Rauch reported that negative cognitions about self are reduced following prolonged exposure therapy (12). The application of CBT in the treatment of psychological symptoms related to other traumatic events has attained variable effect sizes. This problem caused researchers to follow the trauma-focused psychotherapies in the treatment of traumatized children and adolescents (11).

Cognitive processing therapy (CPT) and holographic reprocessing (HR) are two effective methods of trauma-related psychotherapies in the treatment of traumatized subjects. Cognitive-processing therapy (CPT), a therapeutic program developed by Resick and Schnicke et al. (1992), combines the exposure therapy and the cognitive restructuring/skill development. Historically, it had been tested in the populations of sexually assaulted females (13, 14). Researchers have shown the effectiveness of this intervention within the variety of traumatized populations, such as veterans (15), refugees (16), incarcerated adolescents (17), and motor vehicle victims (18). Holographic reprocessing (HR) is a cognitive-experiential psychotherapy based on Epstein's cognitive experiential self-theory of personality (CEST). HR uses the principles of this personality theory to access information about cognitive, emotional and behavioral tendencies that lead to the replication of situations, and replays of different aspects of the previous trauma and it also alters those patterns. HR is an integrative approach to psychotherapy, combining a variety of techniques such as cognitive-behavioral therapy, psychodynamic therapy and experiential therapy. In addition, HR uses the hologram as a model to reconstruct traumatic memories.

To date, only one controlled experimental research has studied the effectiveness of the holographic reprocessing therapy. In that research, Katz et al. (20) attained successful results with the application of this method to alert posttraumatic cognitions in the sexually assaulted women. This therapeutic method was not applied for the victims of other traumas and its effectiveness, compared to the evidence based therapies such as cognitive processing therapy, was not confirmed. Thus, considering the high occurrence of traumatic events and susceptibility of children and adolescents, it is important to introduce therapeutic methods for posttraumatic symptoms in children and adolescents. The aim of this study was to examine the effectiveness of these two therapeutic methods on the reduction of posttraumatic cognitions, and to compare these methods with a control group.

## Materials and Method

This was an experimental study with spread pretest-post test randomized groups design.

### Participants

Statistical society of this research consisted of male freshman, junior and senior high school students in city of Uremia in 2010-2011 school-year (N=10286).

One thousand students, approximately 10 percent of this statistical society, were randomly selected for screening traumatic events (current and previous injuries, hospitalizations, domestic violence, community violence, disasters, accidents, physical abuse) and psychological symptoms. Fifty five students refused to respond to the inventories, 129 of the subjects (13/63%) were exposed to at least one traumatic event based on Children Traumatic Events Screening Inventory and had a score of higher than 90 in the Symptom checklist-90 (SCL-90). Of the subjects, 60 were randomly selected. Then, clinical interview was conducted, and the selected sample was randomly assigned in to three groups of cognitive processing therapy, holographic reprocessing and control.

### Measures

*Traumatic Events Screening Inventory- Self report Form (TESI-SR)*: TESI is a 24 item scale developed by Ford et al. (2002) for the purpose of probing the history of exposure to traumatic events and distinguishing these events from other negative life experiences in Children and adolescents aged 6 – 18. The TESI inquires about a variety of traumatic events, including current and previous injuries, hospitalizations, domestic violence, community violence, disasters, accidents, physical, and sexual abuse. The issue of whether the child's reactions raised to the level of Criterion B of PTSD is evaluated in this inventory. It should be noted that in this research, items related to sexual abuse were omitted from the inventory by HARASAT office located in education department. TESI showed good correlation with other screening traumatic events inventories. The alpha coefficient of this inventory was reported to be 0/89(21). This coefficient was obtained to be 0/76 in the initial sample (n=946) of this research.

Structured Clinical Interview:

*The Structured Clinical Interview for DSM-IV (SCID)* is a well-established semi-structured interview for the use of establishing Axis I and II diagnoses which is consistent with the DSM-IV. This interview was used to diagnose disorders related to trauma, and to confirm diagnosis of SCL-90. Previous versions of the SCID have adequate reliability and validity for clinical and research purposes (22).

*Symptom Check-List 90-Revised (SCL90-R)*: The SCL90-R consists of 90 items which measures nine symptom domains and provides a global index of emotional distress and the Global Severity Index. This scale can be completed in approximately 15 minutes. The high scores correspond to greater severity of symptoms. Internal consistency of this scale ranges from 0/71 to 0/84 across all nine scales, and its test-retest reliability ranges from 0/67 to 0/91 (23). Internal consistency of this scale in Iranian sample ranged from 0/77 for psychos to 0/90 for depression (24). Cronbach's alpha of this scale in the current sample ranged from 0/69 for phobia to 0/86 for depression.

*Posttraumatic Cognitions Inventory (PTCI)*: The PTCI is a 36 item self-report measure which assesses trauma related thoughts and beliefs. Individuals rated the occurrence of thoughts and beliefs using a seven-point Likert scale. The measure loads on three factors of negative cognitions about self, negative cognitions about the world, and self-blame. The PTCI discriminated the traumatized individuals with and without PTSD more effectively compared to the world Assumptions Scale and the Personal Beliefs and Reactions Scale which do not include cognitions specific to the sequel of traumatic events (25). Alpha coefficients of the three subscales were reported to be 0/87 for the negative cognitions about self, 0/88 for the negative cognitions about the world, and 0/86 for self-blame (25). In the current study, for the total scale, these coefficients were 0/86, 0/67, 0/70 and 0/88 respectively for the three groups.

Data were collected after recognizing 129 subjects (13/63%) as being exposed to at least one traumatic event based on Children Traumatic Events Screening Inventory and had a score of higher than 90 in the Symptom Checklist-90(SCL-90). Sixty subjects were randomly selected; and clinical interview was conducted. Then, the selected sample was randomly assigned in to three equal groups of cognitive processing therapy (n=20), holographic reprocessing (n=20) and control group (n=20). At this stage, posttraumatic cognitions inventory was conducted as a pre test. Then, cognitive processing therapy and holographic reprocessing were performed as the therapeutic interventions on the experimental groups. It is important to note that because these therapeutic methods were not used for Iranian samples to date, the manuals of these methods were translated to Farsi. Next, based on the opinion of two psychotherapists about the effectiveness of these therapeutic methods on the posttraumatic symptoms and their correspondence with Iranian culture, they were applied in this research. Because the control group was attention only control group, Therefore, Six 30- minute sessions of group conversation about the six following issues were provided: adolescence period; education; communication with school staffs; counseling; learning and studying methods; and relationship between girls and boys . These interventions were conducted by one of the researchers of the current study. To examine the effectiveness of therapeutic intervention, differences of pre-post test scores were analyzed using one way ANOVA and Scheffe test. The details of each intervention are as follows:

*Cognitive processing therapy (CPT)*: According to manual developed by Resick et al. (26), this method comprised of 12 on e-hour therapy sessions. Basic issues of the sessions are as follows:

*First and second sessions*: After rapport was built with subjects, the necessary information about their current problems was provided to them, their symptoms were evaluated, and the structure of therapeutic sessions was determined. Existent disorders of the subjects were

explained to them based on the cognitive viewpoint and treatment was offered to them. At the end of the second session, subjects were instructed to write about the meaning of their traumatization experience, and how it affected their views of themselves, others and the world.

*Third and fourth sessions*: In these sessions, the meaning of traumatic events was established, and written exposure was applied based on what subjects had written at the impact statement. Furthermore, ABC method was used to address the relationship between subjects' thoughts and affections.

*Fifth and sixth sessions*: Subjects were helped to reappraise their beliefs about the experienced traumatic event. Cognitive restructuring techniques were introduced to them and they were questioned about their beliefs, using the list of challenging questions. Then, the subjects were asked to address their thoughts and beliefs by self monitoring orderly and challenged them by using the challenging questions.

*Seventh to Twelfth sessions*: Subjects' excessive and over-generalized beliefs about self were recognized, and they were helped to deal with them. Furthermore, subjects were helped to recognize, reappraise and review beliefs related to safety, trust, control, self esteem and intimacy. At the end of the twelfth session, the meaning of traumatic event was viewed again, and subjects were asked to write a new report about their traumatic event, and review the previously rewritten report. They also were helped to recognize how their beliefs have been altered. The concepts and skills that were introduced during the therapy were reviewed. Finally, subjects were asked to think about their achievement and reward themselves, as they have learned to cope with their experience of traumatic event.

*Holographic reprocessing (HR)*: According to manual developed by Katz (2005), this method was conducted in three stages (two step in each stage). In sum, therapy was offered in six sequential steps. Since the total therapeutic sessions consisted of nine 45 minute sessions, three sessions were allocated to each stage.

*First stage: safety*

Step 1) Establishing a therapeutic alliance: According to therapeutic manual, the following techniques were used to establish therapeutic alliance: 1) establish a good feeling; 2) Educate, normalize and "make the client right"; 3) Address resistance, transference and counter-transference.

Step 2) Ensuring a foundation of coping skills: At this step, the following coping skills were taught to the subjects: 1) Relaxation techniques (Signal breath, Cleansing breath, Relaxation sandwich, Counting exercise, and Personal biofeedback machine); 2) Detecting feelings (Body scan/Emotional scan, Deciphering messages); 3) Tolerating the experienced affects (by Mindful observation, deliberate distraction, five ways to express feelings); 4) Shifting feelings; 5) Building emotional resiliency (Maypole of support); 6)

Addressing such symptoms as nightmares, intrusive thoughts and panic; 7) creating a “feelings plan”

*Second stage: discovery*

Step 3) Engaging in experiential discovery: At this step, the subjects were helped to engage in experiential discovery by using the following techniques: 1) Connecting with the experience; 2) Identifying the feeling; 3) Free association with images, memories, or other feelings

Step 4) Mapping the experiential hologram: At this step, a simple image of a pot on a stove is offered to help the subjects organize and explain the components of the experiential hologram. In this analogy, each component is matched with an aspect of the image (the acquired motivation is matched with turning on the stove; the core violation is matched with the hot burner; the boiling contents inside the pot correspond to the personal truth including the associated feelings, assumptions, and beliefs that boil to the surface; the lid on the pot attempts to contain the boiling contents; the lid represents coping strategies; keeping the lid on tight to avoid the steam is the avoidance strategy; and keeping the lid on loosely to release the pressure of the steam is the compensation strategy; the steam that escapes from the pot corresponds to the residual negative emotions that linger in between cycles of the hologram).

*Third stage: reprocessing*

Step 5) Reprocessing the experiential hologram: The following techniques were used to reprocess experiential hologram:

- 1) Nine steps for Reprocessing (Contextualize scene, ask for permission, induce relaxation, approach the scene, set the stage, assess for level of distress, rescript the scene, complete and debrief);
- 2) Techniques to recontextualize a scene (Hindsight advantage, Age comparison);
- 3) Techniques to ensure emotional distance (Observer vantage point, Remaining current age, Changing attributes);
- 4) Goals for reprocessing

(Completing communication, releasing and integrating affect, gaining a new perception, increasing power and safety);

5) Reprocessing techniques (Imagery rescripting, fantasy, role-playing, story board, emotionally connected conversation, guided imagery).

Step 6) Establishing new patterns: At this step, subjects were briefed on the impact of reprocessing and its application in their future. They were also guided to develop the skills to set new goals, develop new self-concept and countering images.

**Results**

Sixty students who had experienced at least one traumatic event ,and had a score of higher than 90 in SCL-90 R were studied in three groups of cognitive processing therapy, holographic reprocessing and control ; each group consisted of 20 subjects (n= 20). Four subjects in the cognitive processing group, 2 in the holographic reprocessing group, and 5 in the control group did not complete the intervention programs, thus they were excluded from this study.

Demographic features of participants in the three groups are demonstrated in table 1. According to this table, the results of  $\chi^2$  test for the variables of educational field and educational level, and the one way ANOVA test for age variable demonstrated no significant difference between the groups in these variables.

Table 2 demonstrates the mean and standard deviation of pre- test and post- test scores in the three groups.

Table 3 showed the results of ANOVA for comparing the means of differences between pre-test and post-test scores in posttraumatic cognition inventory. As observed in this table, a significant difference exists between the three groups in the subscales of negative cognitions about self (F=6/70, p<0/003), self-blame (F=18/40, p<0/001) and the total scale (F= 8/66, p<0/001).

**Table 1. Demographic features of the participants and tests of significant difference among groups**

variable groups	n	educational field			Educational grade			Age		
		Field	Frequency(%)	$\chi^2$ (p)	Grade	Frequency(%)	$\chi^2$ (p)	mean	SD	F (p)
Cognitive processing therapy	16	first grade	9 (56/25)	6/68 (0/19)	first grade	9 (56/25)	4/60(0/33)	15/56	3/31	0/12 (0/89)
		human	3 (18/75)		second grade	4 (25)				
		experiential mathematic	3 (18/75) 1 (6/25)		third grade	3 (18/75)				
Holographic reprocessing therapy	18	first grade	10 (55/55)		first grade	10 (55/55)		15/38	1/14	
		human	2 (11/11)		second grade	4 (22/22)				
		experiential mathematic	4 (22/22) 2 (11/11)		third grade	4 (22/22)				
Control group	15	first grade	8 (53/33)		first grade	8 (53/33)		15/40	0/91	
		human	2 (13/33)		second grade	2 (13/33)				
		experiential mathematic	2 (13/33) 1 (6/66)		third grade	5 (33/33)				

**Table 2: Mean and standard deviations of pre test and post test scores in posttraumatic cognitions inventory**

Group Type of test		CPT group		HR group		Control group	
		M	SD	M	SD	M	SD
Pre test	Negative cognitions about self	69/06	23/65	61/61	25/05	58/66	7/24
	Negative cognitions about world	26/93	9/37	25/22	9/06	31/06	7/58
	Self-blame	20/25	4/97	2/05	8/19	16/80	10/59
	Total score	116/25	29/89	108/88	38/63	106/53	24/93
Post test	Negative cognitions about self	22/81	15/46	22/11	18/10	40/86	33/64
	Negative cognitions about world	21/87	9/66	17/50	12/64	27/93	10/84
	Self-blame	11/50	6/93	4/61	5/75	11/66	12/60
	Total score	58/18	24/10	44/22	12/32	80/46	50/31

**Table 3: ANOVA results to compare three groups**

p value	F	Means squares	df	Sum of squares	Source	Variables
0/003	6/70	3076/96	2	6153/93	Between groups	Negative cognitions about self
		458/86	46	21107/90	Within groups	
			48	27261/83	total	
0/29	1/25	87/92	2	175/84	Between groups	Negative cognitions about world
		70/13	46	3226/28	Within groups	
			48	3402/12	total	
0/001	18/40	671/75	2	1343/51	Between groups	Self-blame
		36/00	46	1679/17	Within groups	
			48	3022/69	total	
0/001	8/66	674./26	2	13480/53	Between groups	Total score
		777/47	46	35763/87	Within groups	
			48	49244/40	total	

**Table 4. Results of Scheffe test to compare the means of difference between pre test – post test scores in three groups based on F and significant level**

variables	groups	F	p value
Negative cognitions about self	CPT group× HR group	4/75	0/81
	CPT group× control group	26/45	0/005
	HR group× control group	21/70	0/02
	CPT group× HR group	-8/69	0/001
Self-blame	CPT group× control group	3/61	0/26
	HR group× control group	12/31	0/001
	CPT group× HR group	3/61	0/26
Total score of inventory	CPT group× control group	31/99	0/01
	HR group× control group	36/60	0/001
	CPT group× HR group	3/61	0/26

Furthermore, the results showed that the three groups did not differ significantly from one another with respect to negative cognitions about the world. According to table 4, the results of Scheffe test showed that in the components of negative cognitions about self and total score of this inventory, the two therapeutic groups (CPT and HR) did not differ significantly. However, a significant difference was observed between the two groups (CPT and HR) and the control group. In the component of self-blame, cognitive processing therapy group significantly differed from HR and control groups, but no significant difference was observed between cognitive processing and control groups.

**Discussion**

This research was conducted to examine the effectiveness of cognitive processing therapy and

holographic reprocessing on the reduction of posttraumatic cognitions in students exposed to trauma. The results of this study showed no significant difference between CPT and HR groups at the differences of pretest – post test scores, while these two groups differed significantly from the control group. Furthermore, these two therapeutic methods were equally effective on the reduction of posttraumatic negative cognitions , particularly negative cognition about self and self blame. These results are consistent with the results of Resick and Schnicke (13), Resick et al. (14), Monson et al. (15), Schulz et al.(16), Ahrens & Rexford (17), Galovski et al. (18), in relation to the effectiveness of cognitive processing therapy, and are also in accordance with the results of Katz et al. (20) in relation to the effectiveness of holographic reprocessing on the reduction of posttraumatic symptoms. Foa and colleagues have

emphasized the role of cognitions about self and the world in natural recovery from trauma, the development of posttraumatic disorders, and the CBT processes ameliorating these trauma symptoms (25); they correspond with the following ideas: the effects of these therapeutic methods on the negative cognitions can free the traumatized individual from other trauma symptoms. The effectiveness of these therapeutic methods on the reduction of negative cognitions can be attributed to the congruence of logic of these methods with the features of adolescence period. Each of these therapeutic methods was considered an integrative therapy with both the exposure therapy and psycho-social education and the cognitive techniques for the coping with dysfunctional cognitions. Furthermore, it can be noted that altering negative cognitions in adolescence period, where these cognitions are formed, is easier than other periods of life. Similarly, both CPT and HR are trauma-focused cognitive behavioral therapies; therefore, the effect of these methods on negative cognitions was expected.

On the subscales of posttraumatic cognitions inventory, the obtained results showed no significant difference between cognitive processing and holographic reprocessing groups on the negative cognitions about self, but these groups differed significantly from the control group on this variable; meaning that each of these methods were equally effective on the reduction of negative cognitions about self. This result is consistent with the results of Foa and Rauch research (12) on reduction of negative cognitions about self, following prolonged exposure therapy, and with the results of Katz et al. (20) study on the effectiveness of holographic reprocessing on the reduction of negative cognitions. Because cognitive processing therapy has targeted some essential components of self such as trust, safety, intimacy, control and respect, and holographic reprocessing is also based on intellectualizing the experiential self, it was expected that these therapeutic methods be effective for the negative cognitions about self more than controlled interventions. As the psychological identity and self are formed in the adolescence period, the experience of trauma can lead to development of maladaptive and irrational beliefs in adolescents. CPT addresses these negative beliefs by cognitive reconstruction and HR by mapping the experiential hologram. Therefore, receiving these therapies along with experiencing the safe environment of therapy can help modulate generalized and negative beliefs about self.

On the self-blame subscale, the obtained results showed that holographic reprocessing group differed from both cognitive processing and control groups. Furthermore, holographic reprocessing therapy was effective for self-blame more than cognitive processing therapy and control intervention. These results also showed that cognitive processing group does not differ significantly from control group in this variable. The results of this study are not consistent with the results of those studies supporting the effectiveness of

cognitive processing therapy on the symptoms of PTSD and comorbid disorders (13,14,15,16,17,18), while they are consistent with Katz's opinion (19) about holographic reprocessing therapy being effective for the reduction of trauma related symptoms more than other therapeutic methods, because it interactively uses the basic techniques of psychodynamic, cognitive-behavioral and experiential therapies. Similarly, after the experience of trauma, many people begin to blame their younger version of self for how they behaved at that time. HR can encounter a person with his/her own ego version by mapping experiential hologram; in this state, the person let go of the painful feeling about the younger version of self, and finally is free of the burden of self blame.

Moreover, the results of this research showed no significant difference between the three groups in the subscale of negative cognitions about the world, meaning that therapeutic methods were not effective for these cognitions. These results are not consistent with the results of Foa and Rauch (12), Resick and Schnicke (13), Resick et al. (14), Schulz et al. (16), Ahrens & Rexford (17), Galovski et al. (18) in respect to the effectiveness of cognitive processing therapy, and results of Katz et al. (20). Negative beliefs about the world were targeted in both CPT and HR, but the ineffectiveness of these methods for the cognitions can be due to the occurrence of some traumatic events such as crashing the airplane of Tehran-Uremia, and assassination of nucleus scientists shortly before conducting this research.

In conclusion, the results of this research revealed that cognitive processing therapy and holographic reprocessing, as the trauma related psychotherapies, were equally effective for the reduction of posttraumatic cognitions in trauma-exposed students. Thus, it appears that these therapeutic methods which had been originally developed and tested for sexually assaulted females can also be applied for the victims of other traumatic events (death of a parent, parental divorce, physical abuse etc) particularly during the adolescence period. Therefore, the results of the current study provide important evidence in the support of these two trauma-focused cognitive behavioral therapies for use in clinical setting. This research has some limitations. Firstly, because two months after conducting this research, high school examination time and summer holidays began, it was not possible to follow up the study. Secondly, these three therapeutic interventions were applied only by one researcher. Thirdly, no data were available on validity and reliability of Traumatic Events Screening Inventory, and Posttraumatic Cognitions Inventory for Iranians. Thus, it is recommended that in the future researches, follow up evaluations be conducted to study the constancy of the therapies and interventions applied by different specialists to increase the validity of these therapies. Furthermore, it is suggested that these methods be used for the victims of different traumas in all ages and in both genders.

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