Original Article

THE EFFECTIVENESS OF PROBLEM SOLVING SKILLS IN DECREASING PTSD SYMPTOMS IN SUVIVORS OF BAM EARTHQUAKE

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ABSTRACT

Objective: To study and assess the effectiveness of problem solving program training in survivors of earthquake of Bam in Iran in 2003.

Methodology: A total of 160 habitants were matched and divided into two control and experimental groups. Both groups assessed and filled in the Mississippi PTSD and Coping Skill Questionnaires before and after the training program.

Results: The study revealed that the experimental group showed a significant shift from emotion-focused to problem-focused coping skills. In addition, the PTSD symptoms significantly decreased from pre-test to post-test for the experimental group.

Conclusion: It seems that the coping skill training, problem-focused problem solving, may be considered as a main factor for decreasing the psychological effects in disasters.

KEY WORDS: Problem-focused coping skills, PTSD, Earthquake.

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INTRODUCTION

On the morning of 26 December 2003 at 05:28 (local time) a major earthquake occurred in Bam area of Iran measuring-7. It was estimated that 30,000 people were killed and the same numbers were injured. Nearly 45,000 people became homeless which is expected to increase to 75,000 when those were evacuated, return to the area.[1,2] Similar earthquakes struck Armenia in 1988 (24,944 death), the Philippines in 1990 (1,600 death), Iran in 1990 (32,500 death), India in 1993 (9,475 death), Japan in 1995 (6,308 death), Russia in 1995 (1,989 death), Taiwan in 1999 (2,100 death), and Turkey in 1999 (20,000 death).[3,4]

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Studies showed that after each major disaster, approximately 10% of the affected individuals need specialized psychological treatment, 40% suffer from several problems in their daily life although and 50% seems to be capable of coping with the new conditions.[5] Earthquakes are related with high rate of psychopathology, especially with PTSD and depression.[6] Reports after Armenia earthquake in 1988 showed that the rates of PTSD were 87% and 73%, 1.5 and 4.5 years, respectively.[7,8] Kilic[4] reported that the rates of PTSD in Turkey earthquake in 1999 were 23% for those living close to epicenter and 14% for those living at 100km to the west. They found that PTSD was associated with fear during earthquake and loss of friends.

Several studies[9-11] found that those exposed to with death and destruction were more likely to experience severe psychological problems. Montazeri et al[12] showed that survivors of Bam earthquake in Iran suffered from high psychological distress. In order to mitigate severe psychological problems, survivors urgently need psychological intervention programs and health care.[4,9-12]

The effects of trauma disasters tend to widespread within a community that may have both advantages and disadvantages for survivors. The advantage is that most of the community members may share similar experiences that may facilitate their feelings and negative cognitions regarding the trauma. Moreover, the community members may provide a better social support for themselves that may be important in recovery from trauma. Studies focus of the concept of disaster in cultural settings and how the community members may recover and rehabilitate themselves from trauma.[13,14] Many people believe that expressing and disclosing intense emotion may help the survivors to adjust with the traumatic situation. This view is potentially improving the traumatic reactions.[15]

Studies have also showed that developing problem solving skills empower the resources of management crisis and mitigate it. In fact, crisis can be considered as opportunities to enrich the problem solving skills. Psychological debriefing has an important role in PTSD recovery. In World War I and II[15,16] debriefing was applied by commanders following a major battle as a main device for PTSD improvement. Cognitive behavior therapy (CBT) is also considered as an effective method to reduce the PTSD symptoms. CBT includes education about common PTSD reactions, relaxation training, imaginary exposure to the traumatic memory, cognitive restructuring, training problem-solving skills, and vivo exposure to avoided situations showed that significantly decrease the PTSD reactions and symptoms in patients.[15,17] A study by Paracha[19] found that coping strategies for volunteers and aid worker in a post-disaster situation enhanced their qualifications to help the survivors as well as a protective role in developing PTSD and depression in them.

This study was conducted to verify the effectiveness of problem solving skills in a group of trained survivor volunteers. The present study focuses on coping strategies instruction and relief efforts of the disaster consequences. The main aim of the present study was to educate individuals about stress reactions and ways of coping with them. Another objective of this study was to understand the survivors' psychological reactions and the extent and strength of PTSD. The main hypothesis was that problem-solving skills significantly decrease the psychological reactions of PTSD. In order to test the hypothesis results from the experimental group were compared with the control group.

METHODOLOGY

Subjects were enrolled from temporary residences and shelters (n = 1694). From them, 420 survivors were randomly selected for the study. Those having ages below 15 and above 60 and/or illiterate were excluded from the study. The survivors were assessed by both PTSD inventory and clinical interview. From them, 173 were identified as PTSD. Thirteen individuals did not take part in the study due to personal reasons. Thus, the sample was reduced to 160 survivors. Subjects were divided into two control and experimental groups (n = 40 each). The experimental group was offered 12 training sessions that aim to identify their problems and how better they can manage it (Table-I).

Instruments: Several instruments were used in the study including:

1. A Personal Detail Form was developed and subjects were asked to fill in to indicate their sex, age, grade and class, and marital status. Subjects were asked to complete the form as fully as possible.
2. Clinical structured interview: on the basis of DSM IV,[9] a clinical interview included PTSD criterion and symptoms was conducted.
3. Coping Skills Questionnaire: this scale is a short inventory and includes 19 items concerning different coping skills applied by people in crisis and harsh environment. The validity of the scale was 78%.[20]
4. All subjects were requested to fill in the Farsi version of Mississippi PTSD scale.[21] The scale is valid and has sufficient reliability.[22]
5. Problem Solving Training Program (PSTP). The program includes 12 sessions in a period of one month (three sessions per week, each 2 hours) (Table-I). In order to achieve

a good quality in training, subjects in the experimental group were divided into two separate classes (each 20). All sessions were carried out by therapist and co-therapist.

Both groups filled in the Mississippi scale and the Coping Skills Questionnaire before & after the Problem Solving Training Program (PSTP). The problem solving training program was conducted for the experimental group only. Data of two groups were compared by SPSS.

Data Analysis: Data analysis was done by using statistical package of SPSS 11.0. T-test and percent values of statements were calculated.

RESULTS

A total of 160 survivors were divided into two control and experimental groups. Table-II shows that 49 (30.6%) females and 111 (69.4%) males took part in the study. From them, 31 (20.4%) survivors were single, 116 (76.3%) were married and 5 (3.3%) were widow. The majority of them were in high school educational level (n = 135, 85%).

In order to test the hypotheses, survivors were requested to fill in the questionnaires in two phases. With respect to the coping skills, subjects were divided into either problem-focused or emotion-focused coping skill groups. As shown in Table-III for the experimental group, the mean scores of emotion-focused coping skills decreased in two phases (8.94 to 7.16) while, in problem-focused coping skills increased (11.34 to 16.3). For the control group, the mean scores of emotion-focused coping skills were similar (8.44 to 8) in two phases while, the mean scores of problem-focused coping skills showed a relative increase (10.66 to 13.12). With respect to emotion-focused coping skills, analyses by independent t-test were conducted and the results revealed significant differences between the two groups [$t = -4.67$, $p < 0.001$]. With respect to the problem-focused coping skills, similar analyses were conducted and the results showed significant differences between the two groups [$t = -2.36$, $p < 0.02$]. Findings showed that in the experimental group more survivors had problem-focused

Table-I: Problem solving training program

Sessions	*Content*
First	Completing the consent from, introducing group members to one another, explaining the program's aims and schedule, Presenting the effectiveness and benefits of the program, learning a major skills in life event, advantages of the program (simplicity, shortness, learning major abilities and skills, problem solving ability, ...)
Second	Presenting different coping styles, problem solving skills, reinforcing the subjects' motivation to be active in the program and tasks, debriefing their stressful situation,
Third	Debate on problem solving skills and choosing the more effective style, training the skills, categorizing each members' reactions, group discussion and support
Fourth	Recognizing the event, collecting the real information, reinforcing the skills, recognizing problem's details, resolving problems
Fifth	Reviewing the pervious sessions' aims, reinforcing the interpersonal relations, discussion on problems raised in the previous sessions, Control, evaluating the meeting
Sixth	Creating problem solving methods, controlling the intrusive thoughts, supporting the quantity of problem solving styles, reducing anxiety and emotions, reinforcing problem solving thought approach
Seventh	Rehearsal and reinforcing producing different problem solving, following up the previous sessions' aims, reinforcing interpersonal relations, answering members' questions
Eighth	Giving feedback to each member, instruction making decision skills, concerning on positive/negative consequences skills, reinforcing thoughtfully and management skills, evaluating the meeting
Ninth	Rehearsal and reinforcing the making decision method, reinforcing interpersonal relations, giving feedback to each member, evaluating cognitive faults
Tenth	Conducting and monitoring problem solving skills, presenting and discussion problem solving skills by each member, correcting the skills and discussion by group and trainer, encouraging each member to use the benefits of the method
Elevent	Evaluating the tasks and rehearsal problem solving skills, reinforcing confidence and tolerating frustrations, internalizing problem solving skills, evaluating members' activities
Twelfth	Evaluating members' activities, answering the questions, conclusion of training program, termination of the program and preparing the members for conducting individually problem solving skills.

Table-II: Basic demographic features in two groups

Variable		*Experimental gp*		*Control gp*		*Total*	
		N	%	*N*	%	*N*	%
Sex	Female	15	18.8	34	42.5	49	30.6
	Male	65	81.3	46	57.5	111	69.4
	Total	80	100	80	100	160	100
Marital status	Single	17	23.3	14	17.7	31	20.4
	Married	52	71.2	64	81	116	76.3
	Widow	4	5.5	1	1.3	5	3.3
	Total	73	100	79	100	152	100
Educational level	Primary	14	17.7	3	3.8	17	10.7
	High school	63	79.7	72	90.1	135	84.9
	University	2	2.5	5	6.3	7	4.4
	Total	79	100	80	100	159	100

coping skills in the post-test and less in emotion-focused coping skills comparing with the pre-test scores (Table-III).

As regards the severity of PTSD symptoms, in the pre-test phase the majority of survivors for the experimental group had either mild or medium symptoms (83.8%) and few had severe (2.5%) PTSD symptoms. In the post-test phase, most of them showed mild (65%) and none with severity PTSD symptoms (Table-IV). In order to test whether or not there were significant differences between the two groups on severity of PTSD symptoms, analyses by independent t-test were conducted and the results showed that there were significant differences between the groups [t = 7.9, P , 0.001]. For the experimental group, the mean scores of PTSD symptoms were decreased in post-phase while, this was not found for the control group (Table-III).

DISCUSSION

The main aim of the present study was to verify the effect of problem solving coping skills on the PTSD symptoms in earthquake survivors. Studies concerning problem-focused coping skills showed that psychological skills deficit may intense the psychological problems of

Table-III: Number, mean and standard deviation scores of subject on coping skills questionnaire (emotion/ problem focused) and PTSD symptoms in two groups.

Test		*Experimental group*			*Control group*		
		N	*M*	*SD*	*N*	*M*	*SD*
Emotion-focused	Pre-test	78	8.94	2.08	78	8.44	2.21
	Post-test	77	7.16	1.85	78	8	1.95
Problem-focused	Pre-test	78	11.34	2.44	78	10.66	3.69
	Post-test	77	16.3	4.77	77	13.12	5.09
PTSD Symptoms	Pre-test	78	64.03	18.5	78	64.3	21.1
	Post-test	77	57.8	14.9	78	96.4	33.6

disaster.[15,16,18,19] In contrast, developing problem solving skills may mitigate the psychological tensions and mobilize the personal resources to well adjust with the problems after disaster.[17,19]

The present study revealed that problem-focused training program reduced PTSD symptoms in the experimental group while this was not observed in the control group. It seems that survivors with problem-focused coping skills were able to prevent development PTSD symptoms. They may come to a better cognition and managing of the psychological consequences of disaster. In a similar vein, studies supported that cognitive approach may help survivors to reappraisal the situation and achieve to a better understanding of disaster's consequences. In addition, the coping skills training program changed survivors' attitudes in which they should concern more on the problem-focused style rather than emotion-focused. Similar to the previous studies, we found that the rate of psychological problems especially PTSD symptoms were higher. Survivors suffered from a wide range of psychological symptoms including depressed mood, distress, sleep problems and nightmare. Our findings support the previous research showing depression, tension and loss of social support.[4,9-11]

Table-IV: Comparing the frequencies of PTSD symptoms in two groups

Groups- test		*most mild*		*Mild*		*Medium*		*Severe*		*Most severe*	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
Experimental	Pre-test	11	13.8	33	41.3	34	42.5	2	2.5	0	0
	Post-test	10	12.5	52	65	18	22.5	0	0	0	0
Control	Pre-test	6	7.6	44	55.7	25	31.6	4	5.1	0	0
	Post-test	0	0	13	17.3	39	52	2	2.7	21	28

The most important findings of the present study was that the coping strategies and problem solving skills played a protective role in developing PTSD and other psychological problems. We found that survivors may have better feelings and experience positive changes in themselves and families. They were more likely to adjust to the situation and feel satisfaction with themselves. The instruction may be better to relieve them from tension and negative psychological reactions.

Findings from the present study suggest that further research should focus on longitudinal studies including a comprehensive understanding of trauma and socio-culture related factors. Social support system should also be considered as an effective and efficient resource toward relieving stress and psychological reactions. In order to minimize the psychological consequences, research should concern pervasive intervention programs for short and long periods post disaster. In addition, community help groups may be established prior to disasters, or may emerge during disasters. As regard cultural influence, attention should be paid to the cultural context of disaster and how the survivors may recover in those settings.[13,14,18] Based on findings related to similar research, community may provide to design new and original training programs on psychological issues for motivated caregivers and volunteers.

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