The Effectiveness of Acceptance and Commitment Therapy on Externalizing Symptoms in 7 to 12 Year-Old Children with Chronic Pain

Original Article

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Abstract:

Background: In recent years, the interest in relation to the identification of adaptive mechanisms through which people continue to improve their psychological well-being, despite the experience of chronic pain, has been observed. Acceptance is one of these positive psychological factors. We aimed to investigate the effect of Acceptance and Commitment Therapy for Children with Chronic Pain on externalizing symptoms in 7 to 12 year-old children.

Methods: The present study was based on quasi- experimental model According to the criteria of chronic pain; a number of children with chronic pain were selected by available sampling method from specialty and subspecialty pediatric hospitals of Tehran. Then, 20 children who according to their parents were prepared to participate in this study and met the inclusion criteria, were selected and were placed in the experimental and control group. The Child Behavior Checklist was administered in both groups at the pre-test, post-test, first and second follow-up.

Results: The results showed that the experimental group compared with the control group showed significant change in externalizing symptoms in multiple stages. These changes continued after the treatment, primary and secondary follow-up. Chi-square related to total score in experimental group was 26.21 (p=0.001) and chi-square related to total score in control group was18.55 (p=0.069).

Conclusions: Generally, it can be said that this protocol can be used in clinical fields, especially in the area of improving the externalizing symptoms of children.

Keywords: Acceptance and Commitment Therapy, Chronic Pain, Externalizing Symptoms

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Introduction:

Emotive regulation feature is an adaptive solution, especially when dealing with anger and distress. This feature leads to increased psychological well-being [1]. Emotive regulation is the process which individuals automatically or consciously reduce their emotions [2,3] and try to respond effectively to the demands of the environment with the influence on the occurrence, severity, duration, and expression of these emotions [3,4]. Although the current evidence suggests that emotive dysregulation is effective on the formation and persistence of emotional disorders, for example externalizing disorders (e.g, aggressive and offensive behavior) [5-7], growing evidence indicates that this concept has found wide application in the domains of pain and physical health. Preliminary findings have emphasized the important role of emotive regulation in painful reactions, especially from the angle of the problems associated with identifying and expressing emotions.

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The research of Van Middendorp et al.'s showed that in patients with chronic pain, who were faced with the problem of identifying and expressing emotions, severe emotion was associated with more severe pain. These findings indicated that interventions aimed at improving emotive regulation and psychological flexibility (in response to different emotional situations), might facilitate the chronic pain improvement [8].

On the other hand, because among the different ways of emotive regulation, acceptance is lower among individuals with externalizing symptoms [9] and the results of some studies indicate the impact of acceptance strategy on emotive regulation [10-12]; therefore, it can be concluded that interventions that are aimed at increasing acceptance and psychological flexibility have striking effects on externalizing symptoms in children with chronic pain.

Acceptance and commitment therapy (ACT) is an acceptance-based therapy that has empirical support for many physical and emotional problems, and research evidence for ACT of chronic pain shows an increasing trend [13].

ACT includes the non-judgmental awareness and acceptance of all experiences (positive and negative experiences), identification of valuable orientation of life, and efficient operation based on the goals that are consistent with these valuations .The target of ACT is clearly improving the performance and quality of life through the experience of thoughts, emotions and negative feelings of body with a more flexible manner. The process of ACT is a cycle of detecting cognitive fusion and avoidance, defusing and letting go (thus establishing new, more flexible functions for these events) and moving in a valued direction in a way that builds larger and larger patterns of effective behavior [14].

Various interventions have been conducted in relation to reducing the externalizing symptoms of children. For example, the research of Lochman et al.'s has demonstrated the effectiveness of cognitive behavior therapy (CBT: is a form of psychotherapy that change unhelpful thinking and behavior) strategies on externalizing symptoms [15].

Mindfulness therapy (mindfulness is the gentle effort to be continuously present with experience) is recognized as another effective intervention on externalizing symptoms. For example, the research of Bogels et al.'s showed that after mindfulness training, the children gained a better improvement in individual goals, internalizing problems, externalizing problems, attention problems and happiness. Moreover, they showed better performance in sustained attention tests and parents reported greater improvement in their children's goals, internalizing problems, externalizing problems, and their self-control [16].

Although there are various interventions in reducing children's externalizing symptoms, there is a research gap in the area of reducing externalizing symptoms in children with chronic pain, especially based on ACT. Thus, on one hand, the existing research gap in this area and on the other hand, because of the negative consequences of externalizing behavior [17], such as social and educational problems [18], the basic problem of the current study was whether Acceptance and Commitment Therapy for Children with Chronic Pain (CHACT) [19] (CHACT was similar to ACT, bat was designed to fit children) could improve the externalizing symptoms of 7 to 12 year-old children with chronic pain or not?

Methods:

The present study was based on quasi- experimental model. Among the patients referred to different clinics and departments of specialty and subspecialty pediatric hospitals in Tehran such as Mofid Children's Hospital, Children's Medical Center, Hazrat Ali Asghar Hospital and Bahrami Hospital (In these centers, different parts and clinics were used, such as: neurology, neuro-surgery, surgery, blood, rheumatology, orthopedics and physiotherapy), 20 children who met the inclusion criteria were entered into the study according to their parents' consent. Sampling method of this study was based on available sampling method.

Inclusion criteria for this study were as follows: (1) Being in the age range of 7 to 12 years old, (2) Engagement with education (because, children who are not in education employment, may have difficulty in understanding treatment and assignments); evaluation of educational status (success or failure), according to the school status, was done by the psychologist, (3) Obtaining the score of 13 to 29 (moderate disability) in Function Disability Inventory (FDI) (children who their score was less than 13, chronic pain did not have effect on their performance), (4) Having a history of developing chronic pain for 6 months or more and at least 3 months of the first medical treatment in relation to chronic pain and (5) The ability to attend meetings. After the selection of subjects based on inclusion criteria, they were placed in the experimental group (n=10) and control group (n=10).

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Then, CHACT was implemented on the experimental group. This protocol was designed based on the books of ACT, initial grete of ACT on children, ACT on adults with chronic pain, model of anxiety treatment in children, model of OCD treatment in children and consultation with Association for Contextual Behavioral Science (ACBS) (such as doctor Hayes, Wicksell , Murrell and Wilson). CHACT was based on six components related to ACT, such as acceptance, diffusion, and contact with the present moment, values, commitment action and self as context. More details about the protocol, such as templates and the content of the meetings were given in the previous paper [19].

Tools: The used tools in this study were as follows:

1) Demographic questionnaire:

The questions were about age, sex, education, chronic pain criteria (a history of developing chronic pain for 6 months or more, according to the approved physician and at least 3 months of the first medical treatment in relation to the chronic pain), taking or not taking pain medication, type and amount of pain medication (if used), and education and occupation of parents.

2) Child Behavior Checklist (CBCL)

CBCL assesses competencies (abilities), action or adaptive functioning and emotional- behavioral problems of 6-18 year-old children. This checklist which contained 13 questions and 113 items was answered by parents or a person who was responsible for the child and took care of him/her. The CBCL scales included competence and adaptive functioning scales, scales based on experience and scales based on DSM. The raw scores of problem CBCL scales were obtained by summing the scores of 0, 1 or 2 questions related to any scale. Minaee (2006) obtained good psychometric properties of CBCL [20]. In this study, we used the scales based on experience.

CBCL was used before and after the treatment and first follow-up (1.5 months after the treatment) and second follow-up (5 months after the treatment).

Method of data analysis: In this study besides descriptive statistics, because of the lack of the assumptions related to parametric tests, Friedman Test was used for examination of change in different time periods and Mann-Whitney Test was used for comparison of difference between the groups in the pre-test, post-test, first and second follow-up. SPSS19 was used for data analysis. Statistical analysis was performed in Shahed University. (IRCT No.: 2013112815577).

Results:

The results are presented in two sections of descriptive and analytical results:

A) Descriptive results:

The descriptive results of this study suggested that the mean age (SD) of the experimental and control group was 10.60 (1.7) and 10.20 (1.81), respectively, and the youngest children were 7 years old. The experimental group consisted of 4 girls and 6 boys and the control group consisted of 5 girls and 5 boys. In both groups, most patients were suffering from chronic pain caused by rheumatoid disease and the rest was suffering from pain in the chest, leg, kidney and so on. Many subjects in both groups were taking medication (11 person). In both groups, many parents were educated in guidance school.

Table1 presents the descriptive indicators of externalizing symptoms variable and its subscales. As can be seen, in the experimental group, external and aggressive behavior subscales have changed from pretest (M (SD)=6 (3.74) M (SD)=7.90, respectively) to posttest (M (SD)=2.70 (2) M (SD)=4.10 (2.80), respectively) and have remained relatively constant in the first and second follow-up. In the control group, externalizing behavior subscales remained relatively constant in all four time sections .Significant and non-significant statistical results of this status will be presented in the next section.

B) Analytical results:

Before addressing these results, it is worth mentioning that in both groups, based on parents' views, comparing the externalizing behavior variable in pre-test base on Mann-Whitney Test is not significant. (Offensive behavior, -1.013 (0.311); aggressive behavior, -0.228 (0.820); total score, -0.227 (0.820)). The analytical results of this study are presented in Tables 2 and 3. As shown in Table 2, in experimental groups, externalizing and aggressive behavior subscales are obtained significant changes at different time sections (chi-square for aggressive behavior = 23.28 (p=0.001), chi-square for externalize behavior (total)=26.21 (p=0.001)). Table 3 shows the meaningful comparison of variables between the control and experimental groups. As illustrated in this table, both groups generally show significant differences in relation to many variables. The most difference between the two groups was seen at this time: between pretest with posttest (z (total)=-2.28 (p=0.020)), between pretest with follow up 1 (z (total)=-2.19 (p=0.023)) and between pretest with follow up 2 (z (total)=-2.08 (p=0.021)). Thus, in

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general, we can say that the CHACT is able to improve the externalizing symptoms of 7 to 12 year-old children with chronic pain.

Table 1- Mean (SD) of the studied variables in experimental and control groups based on the responses of parents

Variable	Groups	Pretest	Posttest	Follow up 1	Follow up 2
Aggressive behavior	**Experimental**	6 (3.74)	2.70 (2)	2.80 (2.20)	2.60 (2.30)
	Control	6.10 (5.40)	5 (4.54)	5.10 (4.60)	4.30 (4.70)
Offense behavior	**Experimental**	1.90 (1.37)	1.40 (1.07)	1.50 (1.17)	1.43 (1.10)
	Control	1.50 (1.84)	1.10 (1.59)	1.30 (1.70)	1.22 (1.50)
Total (externalizing behavior)	**Experimental**	7.90 (4.84)	4.10 (2.80)	4.30 (3.09)	3.90 (2.80)
	Control	7.60 (6.27)	6.10 (5.23)	6.20 (5.26)	5.90 (5.03)

Table 2- Externalizing symptoms change and its subscales in the four time; pre-test, post-test, first and second follow-up

Groups	Variable	Chi - Square	df	P value
Experimental	**Aggressive behavior**	23.286	3	.001**
	Offense behavior	6.000	3	.112
	Total (externalizing behavior)	26.217	3	.001**
Control	**Aggressive behavior**	.360	3	.948
	Offense behavior	9.000	3	.054
	Total (externalizing behavior)	18.558	3	.069

***P<0.05 **P<0.01**

Table 3- Comparison of externalizing symptoms in experimental and control group

		Aggressive behavior		Offense behavior		Total (externalizing behavior)	
		Experimental g	Control g	Experiment	Control	Experiment	Control
Pretest & post test	**Mean (SD)**	3.30 (2.49)	1.10 (3.75)	0.50 (0.84)	0.40 (0.69)	3.80 (2.78)	1.50(4.30)
	Z (P value)	-2.148 (0.023)*		-0.140 (0.912)		-2.285 (0.020)*	
Pretest & follow up 1	**Mean (SD)**	3.20 (2.61)	1.00 (3.77)	0.40 (0.96)	0.38 (0.70)	3.60 (2.95)	1.40 (4.32)
	Z (P value)	-2.326 (0.019)*		-0.178 (0.812)		-2.196 (0.023)*	
Pretest & follow up 2	**Mean (SD)**	3.29 (2.49)	1.10 (3.70)	0.48 (0.88)	0.40 (0.67)	3.72 (2.82)	1.54 (4.20)
	Z (P value)	-2.200 (0.013)*		-0.130 (0.712)		-2.085 (0.021)*	
Posttest & follow up 1	**Mean (SD)**	-0.10 (0.56)	-0.13 (0.31)	-0.10 (0.31)	0.00 (0.00)	-0.20 (0.78)	-0.10 (0.31)
	Z (P value)	-0.054 (0.971)		-1.000 (0.739)		-0.108 (0.871)	
Posttest & follow up 2	**Mean (SD)**	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	Z (P value)	0.000 (1.000)		0.000 (1.000)		0.000 (1.000)	
Follow up 1 & 2	**Mean (SD)**	0.09 (0.56)	0.10 (0.31)	0.15 (0.28)	0.00 (0.00)	0.20 (0.70)	0.10 (0.31)
	Z (P value)	-0.054 (0.961)		-1.004 (0.639)		-0.128 (0.971)	

Discussion:

The purpose of this study was to investigate the effect of CHACT on externalizing symptoms of 7 to 12 year-old children with chronic pain. Overall, this research indicated that there were significant changes in externalizing symptoms among children who received CHACT compared to children who did not receive this treatment.

The results of previous research have shown that anger management, social problem solving and goal setting are the effective components in the treatment of children with externalizing symptoms and in this respect, the effectiveness of CBT for reducing the externalizing symptoms of children has been proven

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[15]. Thus, It can be concluded that in this study, the components of acceptance, cognitive fusion (according to its purpose in relation to the reduction in the true sense of inner experiences and also, attention to thoughts just as thought), valuing (determining objectives and values associated with them) and committed action (according to the goal that has in relation to skills, achieving values and the creation of larger patterns of effective and flexible behavior), are the most influential factors in reducing children's externalizing symptoms. As indicated, among the subscales of externalizing symptoms, offense behavior subscale showed no significant change in the experimental group comparing to the control group. It seems that one of the reasons is the role of different variables influencing the behavior of rule violations, for example the negative stereotypes of parents [21] and subsequently, more anger of parents towards these behavior [22], high levels of criticism [23] and observed conflicts in these families [21], parenting style and parental support [21], similar or different parenting styles of mother and father [25], low self-esteem of children with offensive behavior [26] and the importance of the school environment [27].

According to the research gaps related to the effect of ACT on externalizing symptoms in children with chronic pain, we can say that generally the present results which are consistent with the results of Lochman et al.'s and Bogels et al.'s respectively, have proved the efficacy of CBT and mindfulness on externalizing symptoms in children [15,16].

Regarding the impact of CHACT on externalizing symptoms of the children with chronic pain, it can be said that this protocol can be used in clinical fields, especially in the area of improving the externalizing symptoms of children. Although this study was conducted to determine the impact of CHACT on children with chronic pain regarding the limited sample size, it required multiple checks in terms of economic, social and cultural diversity in Iran. There is no doubt that if the conditions of comparing CHACT with other psychological treatment of chronic pain in children and also with the "placebo" were obtained, its role and impact would be more seriously evaluated.

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Conflict of interest: There was no conflict of interest.

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