Research Paper: Evaluation of Parent-Child Interaction Therapy on Anxiety Level in Pre-Elementary School Children: A Randomized Controlled Trial

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ABSTRACT

Objective: Anxiety is one of the most common disorders of childhood. The treatment Interaction therapy can be used for determining anxiety symptomsis . In line with this, the Parent-Child Interaction Therapy (PCIT) has been successful in America as well as in some other countries. However, the application of this approach was more limited in Asia. The present study aimed at evaluating the extent of the effect of PCIT approach on child's anxiety level according to mother's anxiety index.

Methods: This randomized controlled trial was conducted at Bijan Center for Substance Abuse Treatment in Tehran, Iran, from December 1, 2013 to November 1, 2014. It involved parents referred to two addiction clinics for methadone maintenance treatment in regions of 7 and 9 in Tehran. A sample of 72 mothers and children (aged between 19 and 41 years with an average age of 29.4 years) were selected by convenient sampling method. According to the assumed cutting point score in anxiety index (response rate=94%), the subjects were assigned to two groups, i.e., control and experimental. Based on the three levels of mother's anxiety, i.e., low, medium, and high levels (response rate=91%), the subjects were sub-divided into six groups. PCIT protocol was presented to experimental groups during the six weekly sessions. A pretest and a posttest (after 12 weeks of training) were administered to the participants. The analysis of data was done by two-way factorial variance analysis test (ANOVA), Scheffe Post-hoc test, and Chi-square using IBM SPSS Statistics Version 20 (IBM Corp., Armonk, NY, USA).

Results: The results showed that PCIT has been effective in reducing the anxiety among children whose mothers had low anxiety level (P<0.001) while it was not effective in reducing the anxiety symptoms in children whose mothers had medium and high anxiety levels (P>0.05). Confidence interval of scores of children's anxiety in the group of mothers with low anxiety was 95%, which was estimated to be 6.94(3.68-10.19) in experimental group and 12.91 (9.59-16.22) in control group.

Conclusion: Implications of these protocols are discussed with regard to their unique potential to address the clinical needs of young children with internalizing problems. However, further research into the evaluation of PCIT using a randomized controlled trial is recommendable.

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1. Introduction

In recent years, there has been a high reflection upon childhood disorders among experts and parents. The premature beginning of childhood disorders is associated with more resistant periods against treatment and weaker treatment results with the passage of time (Ramsawh, Weisberg, Dyck, Stout, & Keller, 2011; Luby, Si, Belden, Tandon, & Spitznagel, 2009). Anxiety disorders are among the most common psychological disorders in childhood and have high similarity with other psychological disorders with regard to their common underlying mechanisms, usually associated with pervasive problems in life (Beesdo, Knappe, & Pine, 2009; Rapee, Schniering, & Hudson, 2009). On the other hand, syndrome of anxiety is common among parent users, especially in early abstinence (Pirnia, Givi, Roshan, Pirnia, & Soleimani, 2016).

Anxiety is a common and undeniable phenomenon in human beings, which affects the performance (Ghahvechi-Hosseini, Fathi Ashtiani, & Satkin, 2015). According to estimations, anxiety disorders have affected 9% of pre-elementary school children (Wichstrom et al., 2011). The changing nature of these symptoms has led to an increased rate of these disorders with the passage of time. Twenty- five percent of adolescents suffer from anxiety disorder, and 10% of them complain about a temperamental disorder during the last year (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). Anxiety is seen to be a more prevalent disorder than depression in OCD patients (Alizadeh Goradel, Pouresmali, Mowlaie, & Sadeghi Movahed, 2016). Such anxiety disorder in pre-elementary school children can lead to depression and interactional disobedience disorders (Dougherty et al., 2013; Birmaher et al., 2009; Lavigne, LeBailly, Hopkins, Gouze, & Binns, 2009; Lavigne et al., 1996). Not treating anxiety and depression symptoms will cause family function disorder, increaseding school absenteeism, problem in educational performance, and disrupted social relation during adulthood (Hopkins, Lavigne, Gouze, LeBailly, & Bryant, 2013; Katz, Conway, Hammen, Brennan, & Najman, 2011). On the other hand, deep consideration of family background of children shows that anxiety symptoms exist in one of the family members, especially parents and often the mother in the family, in addition to the child. Family studies and genetics represent increased risk of susceptibility to anxiety in children of parents affected with anxiety and depression disorders (Beesdo et al., 2009).

Intergeneration transmission of risk factors may reflect genetic factors, especially anxiety and depression in parents, which has developed in form of nurturing factors and has revealed control and extreme ignorance of children and limited competition feeling among them and encourages anxious and avoidance behavior (Goodman & Gotlib, 1999, Wood, McLeod, Sigman, Hwang, & Chu, 2003). Research studies also support family tension of anxiety disorders (Beesdo et al., 2009; Rapee et al., 2009). Pre-elementary school children with anxiety disorders probably have mothers with anxiety disorders while no meaningful relationship was observed between children's anxiety disorders and fathers' anxiety disorders. Most of the studies rely on the role of parent-child interactions and child-rearing styles. Controlling social factors, such as limitation of entrance to kindergarten and exposure to challenging social conditions, help to solve child anxiety (McLeod, Wood, & Weisz, 2007; Van Der Bruggen, Stams, & Bögels, 2008). One of the important factors focused on treating of children is improving parent-child relationship. To this aim, levels of conflict between the parent and child have decreased and their interaction process and problem-solving skills have facilitated. A previous study has shown that positive interaction patterns such as active listening, eye contact, empathy, confirming and summarizing instead of criticizing and avoidance of cutting speech of others can be helpful in improving parent-child interaction (Stallard, 2005).

The Parent-Child Interaction Therapy (PCIT) was primarily developed by Sheila Eyberg in the early 1970s thatand is based on social learning theory and attachment theory. PCIT is an evidence-based treatment for young children with behavioral and emotional disorders that place emphasis on improving the quality of the parent-child relationship and changing parent-child interaction patterns (Brestan & Eyberg, 1998). Federal and State policymakers recognize PCIT as a successful and effective evidence-based practice. In the early 1990s, the UC Davis CAARE Center began providing PCIT services to children and families. The treatment is given to children aged between 2 and 8 years with destructive behavior background. This therapy was first developed and conducted with the aim of filling the treatment gap in children psychological hygiene services in different age groups (Gurwitch et al., 2015). PCIT has been successfully used in America and some other countries due to its cost-effective approach, but its application is limited in Asia (Chen & Fortson, 2015).

The theoretical foundation of this approach is based on the belief that since little children lack enough cognitive potentialities to change problematic behaviors, interaction therapy instead of direct involvement of children with problems focuses on changing of environmental

context and PCIT. Clinical experiments express that interaction therapy is concomitant with a significant improvement of children's destructive behaviors and parents' anxiety and leads to an increase in parents' confidence in their children's control of extreme behaviors (Abrahamse et al., 2012; Hood & Eyberg, 2003; Nixon, Sweeney, Erickson, & Touyz, 2003; Nixon, Sweeney, Erickson, & Touyz, 2004; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998). In two studies (Choate, Pincus, Eyberg, & Barlow, 2005), PCIT has been successfully used in decreasing separate anxiety symptoms. Moreover, in two other studies (Luby, Lenze, & Tillman, 2011; Lenze, Pautsch, & Luby, 2010), interaction therapy has been used with the aim of decreasing depression symptoms that contained hopeful results. A mental challenge that has attracted the minds of child psychotherapists for a while is the existence of double vision for specifying etiological aspects of anxiety disorders.

Both aspects of children's cognition and parent-child interaction specify anxiety symptoms in children to some extent. Cognitive psychotherapists take inefficient cognitions as reasons of respective symptoms while proponents of interaction approach target their criticism of cognitive treatments of pre-elementary school children on cognitive inabilities in benefiting from such treatments. This is because the inefficiency of medications is not clear about anxiety disorders (Wagner, 2003), and most parents avoid giving drugs to their children because of their side effects. Unfortunately, children with internalizing disorders are at a higher risk of exhibiting maladaptive emotional, social and behavioral difficulties that impede their ability to function productively within the social and academic settings at school.

The clinical evidences regarding the effectiveness of mother's psychological conditions on child's mood and cognitive structures in case of mutual interaction and the necessity of considering mother's mental potentiality in the process of treating anxiety in children needs to be considered. Also, the worth of understanding latent variables in planning efficient therapeutic processes should be taken into account. The aim of the present study was to examine the effectiveness of parent-child interactive treatment considering mothers' anxiety level. The findings of the present study can be effective in explaining the amount of effectiveness of child's treatment in a systematic framework and when affected by mother's psychological indices.

2. Methods

This randomized controlled trial was conducted at Bijan Center for Substance Abuse Treatment in Tehran, Iran, from December 1, 2013 to November 1, 2014. The population of this study included all of the children whose parents were users of Methadone. The inclusion criteria included at least one of their parents referred to addiction quitting clinics in Tehran. From the respective community, 80 mothers were selected based on the knowledge of past studies and by voluntary sampling. Interaction therapy and data collection were done in two addiction centers in regions 7 and 9 in Tehran.

From the parents referred to the Bijan Center for Substance Abuse Treatment for methadone maintenance treatment in region of 7 in Tehran, a sample of 80 mothers and children were selected by convenient sampling method, screening and obtaining highest scores according to the assumed cut-off point score in anxiety index. After the beginning of research process, eight participants were removed from the research because of various reasons. Seventy- two participants were sub-divided into two groups, experimental and control groups. Based on the three anxiety levels of low, medium and high, the participants were assigned to six groups.

For 12-weeks, the mother-child interaction therapy was given to the experimental group with the aim of decreasing parents' anxious behaviors, and the three control groups were placed in a waiting list. Exclusion and inclusion criteria of research were precisely controlled. Inclusion criteria for children were: 1) Being in the age group of 5 to 7 years, and 2) Fulfilling DSM-IV diagnostic criteria for anxiety disorder. The exclusion criteria for mothers and children were: 1) Having IQ defects, and 2) Taking psychotherapeutic medicines of an equal unit doze for more than three months.

The research data were collected using clinical interviews and self-reported questionnaires. All of the interviews were digitally recorded, and the words were copied and codified. The main body of collected data was based on paper and pencil method. Therefore, at the beginning of the study and in the form of a baseline, Spence child anxiety questionnaire in the form of parent format was used. With the passage of two weeks from the end of treatment process, all the children were evaluated for the second time in the form of a posttest with the abovementioned questionnaire. The data were analyzed by two-way factorial variance analysis test (ANOVA) and Scheffe Post-hoc test. The entire process was carried out based on the latest version of the Declaration of Helsinki (Human, 2001). In this study, with regard to assumption of Z=1.645, d=0.2, a=0.05 and also power of test 1-β=0.84, the sample size was calculated to be 72 subjects. In this study, clinical structured interview, demographic

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researcher-made questionnaire, Spence children's anxiety scale and Beck anxiety inventory were used.

Clinical Structured Interview for Disorders (SCID): It is a clinical interview used for distinguishing axis-one disorders based on DSM-IV. The inter-rater reliability coefficient was reported to be 0.60 (First, Spitzer, Gibbon, & Williams, 1995). The identification agreement of this instrument in the Persian language was useful for most of the special and general determinations with reliability of higher than 0.60. Copa coefficient for all of the current determinations and determination of lifetime were 0.52 and 0.55, respectively (Sharifi et al., 2009).

Demographic questionnaire: It is made by the researcher with the aim of applying and collecting individual information like age, education, marriage status, employment and the period of using drugs.

Spence Children's Anxiety Scale (SCAS): This scale was developed by Susan H. Spence in 1997 and is available in various languages. This scale is considered as one of the most effective instruments in evaluating different aspects of anxiety symptoms. It can evaluate the anxiety of pre-elementary school children. Parents' form of this scale has 38 statements in form of Likert scale of 0 (never) to 3 (always) with the highest score taken as 114. This questionnaire has acceptable internal reliability as 0.89 (Nauta et al., 2004). Furthermore, the reliability and validity of Japanese version of this measure were reported appropriately (Ishikawa, Sato, & Sasagawa, 2009). In Iran, previous studies (Mousavi, Moradi, Farzad, & Mahdavi, 2007) have shown that the SCAS has suitable psychometric properties among the Iranian primary school children and it is a clinically valuable tool in the assessment of childhood anxiety. The Cronbach's alpha in this study was calculated for the internal reliability of the scale, and the internal consistency of the total score was 0.84, which is consistent with the results reported by other investigators.

Beck anxiety inventory: Beck anxiety questionnaire is a self-reporting instrument for evaluating a range of anxiety symptoms and consist of 21 indices. Internal consistency for the BAI=(Cronbach's α=0.92) test-retest reliability (1 week) for the BAI=0.75 (Beck, Epstein, Brown, & Steer, 1988). The BAI was moderately correlated with the revised Hamilton Anxiety Rating Scale (0.51) and mildly correlated with the Hamilton Depression Rating Scale (0.25) (Beck et al., 1988). Investigation of psychometric features of respective questionnaire in Iranian community shows that the above questionnaire has high validity in comparative index of evalua-

tors (r=72%), test retest reliability (r=83%), and internal reliability with Cronbach's α of 92% (Kaviani & Mousavi, 2008).

3. Results

With regard to two independent variables of intervention therapy and parents' anxiety index, and dependent variable of child anxiety index with ordinal measure, parametric test of factorial variance analysis was applied (Reichardt, 2002). To this aim, essential assumptions of the respective test such as normal distribution, equality of variances and variance covariance matrix were investigated by Kolmogorov-Smirnov test, Leven test, and Box's M test, respectively. The necessary conditions for using two-way variance analysis were provided. For consequential investigations, Scheffe Post-hoc test was applied. The data were analyzed via IBM SPSS Statistics Version 20 (IBM Corp., Armonk, NY, USA). Our assumption was that lower levels of parent's anxiety had more positive effect on parent-child interaction therapy.

Demographic features of the participants

Table 1 shows the demographic status of the participants of the study; according to the results of the table, considering the most of the participants (experimental: 26, control: 21) had educational level of higher than Diploma. Regarding the age index, most of the participants belonged to older-than-25 years group (experimental: 20, control: 19). Distribution of participants in employment status index revealed that most of the participants were employed (experimental: 19, control: 25), and finally, most of the participants belonged to lower than 300 dollars monthly income (experimental: 23, control: 19). Data analysis using Chi-square test showed that the distribution of participants in case of demographic variables showed a significant difference in two indices including education level and monthly income (all Ps<0.01).

Table 2 represents the distribution of scores of children who participated in the study with respect to parent's anxiety levels. As it is evident, the highest variance between pretest and posttest scores of children belongs to mothers with low anxiety level in the experimental group.

In order to investigate the normality of distribution of the respective variable, Kolmogorov-Smirnov test was used. Respective statistics was equal to 0.716, which represented the normality of distribution. Before using the multivariable parametric variance analysis test to ensure respective assumptions, Box and Leven's test were utilized. The Box's test was not meaningful for any of the

Table 1. Demographic characteristics of the participants

Variable		Experiment	Control
Education level	Lower than diploma	10(28%)	15(42%)
	Higher than diploma	26(72%)	21(58%)
Age	18-25	16(44%)	17(47%)
	Older than 25	20(56%)	19(53%)
Employment status	Employed	19(53%)	25(69%)
	Unemployed	17(47%)	11(31%)
Monthly income	Less than 200 dollars	23(64%)	19(53%)
	More than 300 dollars	13(36%)	17(47%)

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Table 2. The mean and standard deviation of scores of child anxiety with regard to mother's anxiety

Experiment						Control					
Pretest Mean(SD)			Posttest Mean(SD)			Pretest Mean(SD)			Posttest Mean(SD)		
Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
12.71 (1.87)	13.13 (2.01)	14.37 (1.93)	6.94 (1.66)	11.27 (2.12)	10.75 (1.82)	13.01 (2.12)	12.94 (2.23)	13.79 (2.24)	12.91 (1.69)	12.61 (2.01)	13.19 (1.97)

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variables (P=1.01, F=5.11, M Box=7.24). Moreover, the results of Lambdai Vilkez showed that effects of group are significant on combined variables of anxiety of mother and child (Lambdai Vilkez=0.19, F=18.90, P<0.001). Therefore, using of variance analysis test was possible.

The results of Table 3 showed that there is a significant difference between child anxiety scores in combination with mother's low anxiety (F=5.74) in experimental group in comparison with control group (P<0.001). In order to determine different aspects of this difference, Scheffe Post-hoc test was utilized. According to Table 4, the highest scores of children belonging to mothers with low anxiety level (P<0.001) has been presented.

4. Discussion

The results showed that interaction therapy could positively affect those children's anxiety whose parents had been lowly anxious while this treatment had no signifi-

Table 3. The results of variance analysis

Group	Anxiety Levels	SS	df	MS	F	P
Experiment	High	711.15	5	142.23	2.64	0.08
	Medium	587.70	5	1175.54	2.97	0.07
	Low	623.10	5	124.62	5.74*	0.00
Control	High	339.75	5	67.95	2.27	0.89
	Medium	265.65	5	53.13	2.31	0.68
	Low	153.09	5	51.03	2.35	0.59

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Table 4. Results of Scheffe test

Variable	Group	Experiment		Control	
		(I-J)	P	(I-J)	P
High levels of anxiety	Experimental	-	-	2.64	0.08
	Control	2.64	0.08	-	-
Medium levels of anxiety	Experimental	-	-	2.97	0.06
	Control	2.97	0.06	-	-
Low levels of anxiety	Experimental	-	-	4.91*	0.01
	Control	4.91*	0.01	-	-

cant effect on those children's anxiety whose parents had been anxious in medium and high levels. This finding it is not in conflict with the current evidence base for PCIT. The effect of interaction therapy on anxiety symptoms has been determined by several studies in PubMed Database. In a study by Bjørseth and Vistrom (2016), children under the treatment of PCIT, compared to the children of control group, showed a significant reduction in behavioral problems after the treatment. Also, parents' parenting skills showed significant promotion compared to the control group. In a clinical trial, Webb, Thomas, McGregor, Avdagic and Zimmer-Gembeck (2016) examined the effectiveness of two kinds of Standard PCIT (S/PCIT), PCIT and motivation-enhanced PCIT (M/PCIT), on the amount of internalizing and externalizing problems in pre-school students. Their results showed that both treatments were found to be significantly effective in reducing behavioral problems. In addition, a significant difference was not seen between the effectiveness of these two treatments.

Consistent with the results of the present study, another study by McFarlane, Burrell, Duggan, and Tandon (2016) showed that lower level of anxiety in mothers was associated with more favorable influence of cognitive-behavioral therapy. Puliafico, Comer and Pincus (2012) used interaction approach in treating children's anxiety disorders, and its results were representative of efficacy of respective treatment. In another study, PCIT has been successful in improving externally risky behaviors of children with delayed growth (Ros, Hernandez, Graziano, & Bagner, 2016). This intervention had also been used for increasing the reliance on treatment process in Taipei families that contained hopeful results (Chen & Fortson, 2015). Moreover, there are some results in terms of efficacy of this treatment for depression disorder. Also, in the study by Lenze et al. (2010), interaction

therapy was successfully applied so as to decrease the depression symptoms of pre-elementary school children.

As stated before, there is a belief that a relationship exists between parents' beliefs and expectations with their children anxiety disorders. In other words, parents' beliefs and expectations are reflected in their child nurturing behaviors. In this line, PCIT was applied to a sample of abused children in the United States with the aim of increasing their children's nurturing behaviors that represented the efficacy of this intervention (Batzer, Berg, Godinet, & Stotzer, 2015).

Kortlander, Kendall and Panichelli-Mindel (1997) compared mothers having anxious children with mothers in the control group based on their expectations of their children in stressful conditions. Mothers of anxious children showed higher expectations, lower adaptive skills, and lower confidence in their management tasks. In this line, Shamir-Essakow, Ungerer and Rapee (2005) reported relation of anxiety symptoms of a sample of 104 pre-elementary school children that were selected based on high and low inhibitory behavioral index with mother anxiety and unsafe empathic style. There is a belief that high extent of parents' anxiety disorders is related to their over-control and negative behaviors (Bögels & Brechman-Toussaint, 2006).

For explaining the relative findings of this study, we can refer to two important issues. First, the "levels of the anxiety of parents and child" is a synthetic factor considered to have a close interactive relationship with each other that invites the intervention systems to consider this significant index, which plays a significant part in foundation of systemic approaches. Secondly, from a perspective beyond just a simple interaction, the extent of parent's anxiety index in a regular cycle adjusts and

facilitates child's anxiety levels. Conformity and congruence of behavioral problems between parent and child confirm this point. One thing that adds to the importance of findings of this study is the relationship between the extents of treatment response in child with different levels of parent's anxiety.

The findings of this study represented that children whose parent had low anxiety level had been significantly affected by the respective treatment while children whose parent had medium or high anxiety level did not experience significant changes going through the respective treatment. In confirming the study findings, the hypothesis that has attracted the attention of the writer of the article more than anything else is the defect in interaction and response system between the parent and child in highly anxious mothers. This condition evolved due to negative reinforcement approaches and is an index that is consequent with the treatment efficacy processes, which play a destructive role through interpersonal feedbacks. Since the child passes the growth process through an ethnomethodological realm, giving attention to mother's psychological factors in the process of treating symptoms of child is of high importance.

In line with macro education policy, the results of the present study indicate the need for a systemic and interactive look in reducing children's behavioral problems. In contrast with individual-centered therapeutic approaches, the findings of the present study seek the effective elements of treatment in the context of the family system. It is an approach that needs removing implementation limitations in spite of confirming the efficacy. In general, PCIT is well accepted among Iranian families and therapists, and the intervention was implemented in regular clinics in Iran without modifications to the core components of PCIT.

This study had several limitations. The most important limitations were as follows: 1) the cross-sectional nature of the study limits the overall conclusion and comprehensive forecast; and 2) use of a self-report assessment often creates a favorable social image and thus, self-reporting is associated with possible bias. It is recommended to obtain more reliable results. Hence, future researchers should conduct longitudinal studies on related issues so that the results can be compared with cross-sectional studies and the differences provide the contexts for gaining new knowledge in the research methodology. Furthermore, to do more precise evaluations, using the neuropsychological instruments besides the questionnaire is recommended.

Acknowledgments

Conflict of Interest

The author declared no conflicts of interest.

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