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Research Article

Behavioral Modification of Parents With the Barkley Method to Increase Resilience of Mothers of Children With Attention Deficit/Hyperactivity Disorder

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Background: Mothers of children with attention deficit/hyperactivity disorder are faced with more stress than mothers of healthy children and this extreme stress can affect their ability to train their children effectively. Psychologists believe that there is a moderating factor between stressful events and psychological disorders that cause stressful events to have different effects on individuals. A type of this moderating factor is resiliency.

Objectives: To determine the efficacy of behavioral modification with Barkley method on resilience of mothers of children with attention deficit/hyperactivity disorder (ADHD).

Patients and Methods: Twenty-four mothers of children diagnosed with ADHD were randomly enrolled in this study. The mothers were selected from the 22nd of Bahman hospital of Qazvin city. Mothers with a low score in resilience with children aged between four and twelve years were assigned to experimental and control groups. In this study, a questionnaire was used to measure resilience. The data were analyzed by covariance analysis.

Results: The behavioral modification of mothers with the Barkley method significantly enhanced their resiliency with children of ADHD in the experimental group compared to the control group.

Conclusions: The behavioral modification was found to be effective for the resilience of mothers of children with ADHD.

Keywords: Attention Deficit/Hyperactivity Disorder (ADHD); Resilience; Behavioral Modification

1. Background

Many families are involved with problems associated with having hyperactive children. According to various international statistics, about 3% to 7% of primary school children have symptoms of attention deficit disorder/hyperactivity (1). Children with developmental and behavioral characteristics effect parental behavior (2). Meanwhile, the mother as the most influential member of the family with close interaction with the children may be at risk of these influences (3). If the mothers of children with ADHD feel unworthy and incapacitated, and develop severe stress and have low self-esteem, this extreme stress can affect their ability to effectively train their children (3). Therefore, to improve maternal mental health and their parenting roles, resolving their psychological problems are necessary. Accordingly, psychologists believe that there are moderating factors between stressful events and psychological disorders that cause stressful events to have different effects on individuals. Resiliency is one of the moderator characters that has received special attention from psychologists (4). Resiliency is

the ability to overcome challenges of all kinds including trauma, tragedy, personal crises and life problems, and to bounce back stronger, wiser and more personally powerful (5). Although resilience is partly the result of personal characteristics and people's experience with the environment yet humans are not the victim of their own heredity and environment. People can be trained to increase their resilience capacity by learning certain skills. With suitable designed training programs, positive feelings and attitudes can be created for individuals. Also, the nature of group training itself can have a positive effect on reducing stress and increasing the level of social support as well as resiliency. This is because gathering of individuals in groups and interaction with people with similar problems can be effective as it reduces negative moods and allows individuals to share available resources (6, 7). Based on the fact that some features, such as increased confidence and ability to inhibit stress are components of resiliency, they are also beneficial for promoting resiliency (5). Therefore, identifying strategies that enable

these features to enhance resiliency in mothers of children with ADHD appear essential.

In this regard, Anastapolus et al. demonstrated that a training program for parents could enhance management skills of children and subsequently increase confidence and reduce stress of parents (8). The Barkley's method is a type of parental education, based on behavioral models, that has been used for this purpose. The structure of this program is very clear and precise like most behavioral programs that are used today and it is not simply a behavior-based integration. This is due to the influence of social learning theory on behavioral theories and therapists' experiences in implementing this method with some cognitive issues, especially at the beginning of the program (9).

2. Objectives

The aim of this study was to determine whether behavioral modification with the Barkley method could increase resiliency of mothers of children with ADHD.

3. Patients and Methods

The present research was an experimental study and the research design was based on pre-test and post-test with a control group. After nearly two months of completion of the training sessions, follow-up sessions for groups who attended the training sessions were carried out. The study population consisted of all mothers of children aged four to twelve years old with ADHD, who were admitted to 22nd of Bahman hospital of Qazvin city. Twenty-four mothers who scored low on the resiliency test with Connor-Davidson assay were selected and divided to two groups. The experimental group had 12 mothers and there was also another twelve mothers in the control group. The experimental group received 10 sessions of educational and behavioral modification programs based on Barkley's method. After the training sessions and tests, both the control group and the experimental group were evaluated for resilience using the Scale of Conner-Davidson in two stages (post-intervention and follow-up phase). Data were analyzed using analysis of covariance.

3.1. Resilience Inventory Conner-Davidson (2003)

Conner and Davidson developed a questionnaire on resiliency areas by review of the literature in 1991 - 1997. They believed that the scale of the questionnaire could distinguish resilient from non-resilient individuals in clinical and non-clinical groups and could be utilized in experimental and clinical situations. This questionnaire had 25 questions that were graded by the Likert scale between zero (completely false) and four (always true) (5). The mean of this scale was 52 so that scores higher than 52 indicated a higher resiliency. A score between 50 and 75 indicated average resiliency. Above 75 and below 50

indicated high resilience and low resilience, respectively. Mohammadi et al. (2006) performed an experimental research on the factors affecting resilience in individuals at risk for substance abuse. To determine a reliable method in Iran, they used the scale of Cronbach's alpha (6). The resulting coefficient was equal to 0.89. The validity correlations of each item with the total score of the categories were calculated. Correlation coefficients of each score were between 0.42 and 0.64. In the next step, the scale items were analyzed using its main components. Pre-item extractions based on correlation matrix and the indexes of the two items were calculated based on two criteria Kaiser-Mayer-Olkin (kmo) with the Bartlett's test. The amount of kmo was equal 0.87, and in Bartlett's test was equal 5556.28. Both indexes revealed sufficiency of the evidence for factor analysis.

3.2. Barkley Behavioral Modification

This program was developed by barkly in 1987 and consisted of ten sessions, which are held once a week and takes approximately two to three months.

3.2.1. Brief Berkeley Training Sessions of Parents With Behavioral Approaches

1. Orientation session held for the entire family.
2. Reviews of the general principles of behavior and the formation of inappropriate behavior with the behavioral approach.
3. Consideration of parental behavior on children's behavior.
4. Learning proper techniques for reducing deviant behavior in children.
5. Appropriate teaching methods for shaping children's behavior.
6. Using the principles for shaping behavior basis of operant conditioning.
7. Generalizing disciplinary practices to other situations with children.
8. Investigation of complaints and problems of parents.
9. Prevention of abnormal behavior in children.
10. Tracking and responding to potential questions of families.

4. Results

The results showed that the significance level of F was equal to 0.017 that is smaller than 0.05 alpha. This suggests a significant difference between the control and the experimental group after removing the effect of the pre-test. In other words, behavioral training with Barkley's method in parents had a significant effect of maternal resilience, which means an increase of resiliency in the experimental group. The degree of effect was equal to 0.307. This means that Barkley's behavioral training could explain 30% of the change in resiliency.

Table 1. The Results of Repeated Measurements to Increase Resiliency of Mothers

Variation Sources	Total Squares	Freedom Degree	Average Squares	F	Significant Level	Degree of Effect
Resilience Test	867.4842	2	433.2412	521.54	0.0001	858.0
Error	467.796	18	248.44	521.54	0.0001	858.0

Table 2. Descriptive Statistics for Resiliency Scores in Pre-Test, Post-Test and Follow-up

Variations	Values ^a
Pre-test	45.5 ± 6.059
Post-test	70.6 ± 6.484
Follow up	73.9 ± 8.774

^a Data are presented as mean ± SD.

Table 3. Significant Difference Between The Three Groups in Pre-Test, Post-Test and Follow-Up

Variable	Values ^a	Significant Level
Difference of pre-test with post-test	25.1 ± 3.318	0.0001
Difference of pre-test with follow up	28.4 ± 3.588	0.0001
Difference of post-test with follow up	3.3 ± 1.633	0.222

^a Data are presented as mean ± SD.

Results in Tables 1 and 2 indicate a significant increase in resilience (ANOVA test of less than 0.01 indicates significance; $P = 0.0001$, $F = 28.414$, and Wilk's lambda = 0.123 with the degree of effect being 0.858).

Thus, there was a significant difference between the three time periods. Regarding the difference between the mean of the three tests, pre-test, post-test and follow-up, Table 3 shows that in the experimental group parental education increased resilience.

5. Discussion

According to the present research findings, behavioral training of parents with Barkley's method enhanced resiliency of mothers of children with ADHD. Kalill et al. argued that individual's resiliency could be enhanced by reducing risk factors, increasing the capacity to adapt and cope with stress, and strengthening family's protective processes, confidence and self-sufficiency (9). Neal et al. studied the impact of immunization training and stress management on adolescent resiliency. They selected 15 adolescents who had lower levels of resiliency and held ten training sessions against stress. The results showed that after training, adolescent self-esteem, self-efficacy and self-confidence in the face of negative events were enhanced (11). On the other hand, Anastopoulos et al. showed that parent's education pro-

grams promoted child's management skills, increased confidence and reduced the parent's stress (8). Another study has shown the effectiveness of parent's behavioral training on improving efficiency and satisfaction, self-esteem and overall sense of parental competence, and reducing emotional and behavioral problems in children (11).

Also, in another study, the effectiveness of parent's behavioral training using positive parenting program on the mental health of mothers of children with ADHD was examined. The results revealed that the educational program reduced general mental health problems (depression, anxiety and social inadequacy) of mothers in the experimental group compared with the control group (3). When explaining the results of this study, it should be noted that the acquisition of knowledge and information about ADHD as well as skills to control children with ADHD led mothers to understand the characteristics of these children thus dealing with them less stressful. In other words, this program changed the mothers' expectations of their children's characteristics and moods, which ultimately led to reduced-maternal stress and subsequently increased confidence and self-efficacy when interacting with their children.

Accordingly, features such as an increase in self-confidence, ability of an individual to control and manage different situations and reduction of stress have beneficial effects on resiliency (5). Behavioral training with Berkeley's method for mothers of children with ADHD not only reduces the symptom of ADHD in their children but also promotes the mother's sense of competence and confidence in interacting with their child and augments their skill to manage their child (12, 13). The results of pre-test, post-test and follow-up, suggested that the use of behavioral training of parents with Berkeley's method had significant effects on resiliency of mothers of children with ADHD.

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Authors' Contributions

1- Study concept and design: Seyed Alireza Haji Seyed Javadi and Tahere Haji Seyed Javadi. 2- Acquisition of data: Tahere Haji Seyed Javadi. 3- Analysis and interpretation of data: Tahere Haji Seyed Javadi and Zahra Soltani Pari.

4- Drafting of the manuscript: Seyed Alireza Haji Seyed Javadi, Tahere Haji Seyed Javadi and Zahra Soltani Pari. 5- Critical revision of the manuscript for important intellectual content: Seyed Alireza Haji Seyed Javadi and Tahere Haji Seyed Javadi. 6- Statistical analysis: Tahere Haji Seyed Javadi and Zahra Soltani Pari. 7- Administrative, technical and material support: Seyed Alireza Haji Seyed Javadi and Tahere Haji Seyed Javadi. 8- Study supervision: Seyed Alireza Haji Seyed Javadi.

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