

## **Parent Training in Reduction of Attention-Deficit/Hyperactivity Disorder and Oppositional Defiant Disorder Symptoms in Children**

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Despite the vast literature supporting the efficacy of behavioral interventions for Attention-Deficit/Hyperactivity Disorder (ADHD), there is an extreme paucity of empirical support for these interventions in developing South Asian countries, such as Pakistan. The present study aimed to implement and evaluate a behavioral parent training program for children with ADHD in a Pakistani urban community. This represents the very first ADHD intervention study conducted in Pakistan. A total of 55, 4-12 year old children with ADHD and their parents were selected to participate for intervention. Pre- and post-treatment parent and teacher rating scales were collected to assess ADHD, Oppositional Defiant Disorder (ODD), and Conduct Disorder symptoms and associated impairment. Outcome measures included the Disruptive Behavior Rating Scale-Parent Form, Disruptive Behavior Rating Scale- Teacher Form, Home Situations Questionnaire, and School Situations Questionnaire (Barkley, 1997). Results showed significant difference on measures of ADHD/ODD symptoms and the number and severity of problem situations according to parent reports. However teacher's reports showed no significant findings for both ADHD and ODD. Reduction rates of symptoms on pre and post measures were noticeable for inattention, ODD, and for conduct disorder. The study provides some preliminary evidence supporting the effectiveness of Barkley's behavioral parenting program for Pakistani parents of ADHD children.

*Keywords:* ADHD, ODD, Conduct Disorders, Parent Training Program

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Human resources available for mental health care in most low-income and middle-income countries are very limited, and shortages are likely to persist. Populations with high rates of socioeconomic deprivation have the highest need for mental health care, but the lowest access to it (Belfer, 2008; Lancet Global Mental Health Group, 2007; World Health Organization, 2005). Scarcity of resources and available data is especially pronounced for children and adolescents with mental disorder which has serious implications for policy and practice of mental health, the most direct of which is that people who need care get none (Belfer, 2008; Patel et al., 2007; Razzouk et al., 2010; World Health Organization, 2005). A review of Patel et al., (2007), gives a global picture in terms of effectiveness trials with greater relevance for child mental health in low and middle income countries. It shows that little research has focused on interventions for developmental disabilities in childhood, such as mental retardation, autism, and ADHD. This review identifies only one large scale clinical trial from India showing the efficacy of a herbal preparation for management of behavioral and cognitive deficits in children with mental retardation, and a trial from Brazil showing that methylphenidate was effective for ADHD. They further identified, only five randomized controlled trials in Bangladesh, Bosnia, Herzegovina, Jamaica, and Turkey and, two non-randomized controlled trials in Cyprus, Serbia, and Mauritius reporting positive outcomes from those interventions which have relevance to improvements in maternal responsiveness, child psychophysiological functioning, cognitive development, problem solving, and self esteem, and reductions in parental distress and maternal depression (Patel et al., 2007).

There is a large unmet need in lower income countries like Pakistan, to develop evidence-based interventions which are feasible and sustainable. A descriptive study conducted at Agha Khan University Hospital by Syed, Hussein, and Yousafzai (2006) concluded that among a total of 290 new referrals made to the child and adolescent mental health clinics over three years, attention deficit-hyperactivity disorder (ADHD) was the most frequent diagnosis (25% of the cases). Another study conducted by Syed, Hussien, and Mahmud (2007) showed that using Strength and Difficulties Questionnaire (SDQ) the frequency of conduct problems was 42.3%, hyperactivity was 18.8%, and 37.8% on peer problems on the individual behavioral subsets scores. Such observations point to the need for the identification of evidence-based treatments to address the child mental health needs, particularly for externalizing problems and ADHD, in Pakistan. A thorough review of literature showed only one

feasibility study for a teacher training conducted at Agha Khan University which was to enhance teacher understanding regarding signs and symptoms of ADHD (Syed & Hussein, 2010). No study from Pakistan is found in published literature to find the feasibility of any home based or school based intervention for management of these children.

Stimulant medications are by far the treatment of first choice for ADHD. There is a widespread use and evidence supporting effectiveness of stimulant medication especially for treating core symptoms of ADHD. However, sometimes, medication is not considered to be a viable option due to many reasons. Factors such as family's willingness to put their child on medication, the side effects of medication, existence of certain co morbid conditions, like anxiety, academic failure, poor relationship with peers and siblings, are just a few reasons to decide for some treatment alternatives. Thus, behavior modification is thought to be the only non-pharmacological, evidence-based treatment strategy in western countries like America (Chronis, Jones, & Raggi, 2006). However, despite its roots in Western culture, behavioral parent training bears some similarities with the value systems which characterize eastern cultures, such as that of Pakistan. This is evident from the studies describing parental roles, which show that compared to Caucasian families, high levels of control are more frequently observed in families of Asian background (Chao, 1994; Stewart et al., 1999). A thorough review of studies from Asian cultures showed some empirical support for effectiveness and relevance of behavioral interventions for reducing ADHD and oppositional defiant disorder in cultures of Taiwan and India since these are programs more directive in nature improving parental supervision and hence more close to the Asian values of parenting (Basu & Deb, 1996; Huang, Chao, Tu, & Yang, 2003). However, reliance on extended families and an increased emphasis of society on obedience, discipline, and respect for elders, self control and difficulty in expressing feelings openly posed additional challenges when treating Asian parents in other studies (Crisante & Ng, 2003; Pinyuchon & Gray, 1997) and also has been experienced during the present study as well.

Lack of evidence for the effectiveness of such strategies and cultural and contextual relevance of such strategies points for the need to provide an evidence base in this area. Current study provides us preliminary evidence from this perspective. The primary objective of the present study was to look for the feasibility of a behavioral intervention program for children with ADHD and ODD in Pakistan.

It was hypothesized that after intervention a significant improvement will be observed for both core and associated features of ADHD.

## Method

### Sample

Present study is an effectiveness research reporting pre-post data for implementing a behavioral intervention program with Pakistani families. A sample consisting of 55 parents, of children diagnosed with ADHD was selected after assessment. Children with ADHD were recruited from the government hospital settings (including rehabilitation and psychiatric settings) around March 2008. For study timeline please see Figure 1. For this purpose, telephone, and person contacts were made to psychologists, and psychiatrists in the cities of Rawalpindi and Islamabad.

**Recruitment Procedure.** Sixty two children were referred from hospitals and all parents showed willingness for participation. The initial plan was to assign the participants to control and experimental conditions. However, since this study represents the first effectiveness trial of its kind in Pakistan, most of the practitioners and families had special requests for inclusion of their patients in the experimental group. This made random assignment difficult on practical bases. Hence, due to ethical considerations it was decided to provide intervention to all the children who were referred from hospitals. For the comparison purpose a non equivalent control group was recruited from school settings however the current article only presents the findings from the treated group. For 25 cases teacher's report was also incorporated.

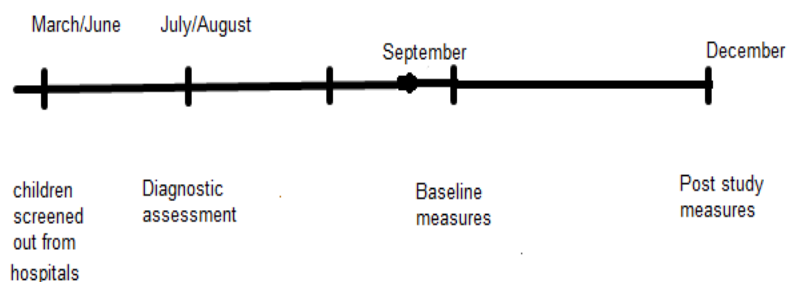


Figure 1. Study Timeline

**Assessment for symptoms of ADHD and associated disruptive behaviors.** All 62 children from hospital setting participated in a detailed assessment. Assessment was conducted by obtaining parents and teacher's reports on the Disruptive Behavior Disorders Rating scale (DBDRS; Barkley, 1997). Detailed history regarding birth and pregnancy, postnatal problems, developmental milestones, and medical history was also taken.

**Inclusion Criteria.** To be included, children were required to be less than 12 years; have no history of Traumatic Brain Injury or neurological disorders as per parents/caretakers reports. Caregivers were required to be literate (defined as the ability to read and write in the Urdu language), as illiterate mothers have difficulty in understanding the nature of the disorder and the importance of the behavior modification principles (Barkley, 1997). Final sample included 55 children for the treatment group. Out of the seven families excluded two children were having features of autism along with ADHD, one child was being treated for epilepsy, three were having intellectual disability and epilepsy; while one child was having severe speech and language deficits accompanying intellectual disability. Overall sequential participation of the subjects in different stages of the study is presented in Figure 2.

Assessed for eligibility ( $N = 62$ )
Did not meet the inclusion criteria ( $N = 7$ )
Participants enrolled in experimental group ( $N = 55$ )
Participants continuing after second session ( $N = 48$ )
Participants continuing after fourth session ( $N = 33$ )
Participants continuing after seventh session ( $N = 31$ )
Participants who completed the post measures ( $N = 31$ )

Figure 2: Participants' Chart

**Sample characteristics.** Table 1 shows sample characteristics of the 55 families that were recruited for study. Most families were from urban area of Rawalpindi and Islamabad. Most were bilinguals, speaking Urdu, with some other native language like Punjabi or Pushto.

Table 1

*Sample Characteristics (N=55)*

Demographic Characteristics	<i>f</i>	<i>%</i>
<b>Child's gender</b>		
Male	42	76.4
Female	13	23.6
<b>Familial Characteristics</b>		
Fathers' Education		
High School	15	27.8
Secondary School & College	25	46.3
Masters & technical /professional	14	93.3
Mothers' Education		
High School	23	41.8
Secondary School & College	20	36.4
Masters & technical / professional	12	21.8
Marital Status		
Parents living together	47	78.2
Separately	8	21.8
Familial Structure		
Nuclear	41	74.5
Extended	14	25.5
Mothers' work status		
Working	14	25.5
Not working	41	74.5
	<i>M</i>	<i>SD</i>
Fathers' age (years)	34.5	.707
Mothers' age (years)	35.3	4.5
Annual Income (Pakistani Rupees)	328000	186623
Child's age (years)	9.12	2.17

**Measures**

**Disruptive Behavior Disorders Rating Scales (DBDRS)-Parents and Teachers Versions.** The parent and teacher versions of the DBDRS (Barkley, 1997) contain DSM-IV symptoms of ADHD, ODD, and CD (on parent version only). Items 1-9 comprise the subscale of inattention, items 10-18 assess the hyperactivity, while items 19-26 are to assess ODD symptoms. CD symptoms are only rated on parent reported DBDRS. All items are rated on a 4-point Likert-type scale (1 = *not at all*, 2 = *just a little*, 3 = *pretty much*, 4 = *very much*). CD symptoms are rated on a dichotomous scale (1 = *no*, 2 = *yes*) of 15 items. ADHD and ODD symptoms rated as *pretty much* or

*very much*, and CD symptoms rated as *yes* were considered clinically significant. Keeping parent's report on DBDRS as a primary outcome measure ADHD and ODD symptoms were considered present if reported by the parents. For the items of CD the number of *yes* answers was counted. The cutoff score from the DSM-IV was considered for all subscales of DBDRS. Information about norms and psychometric properties of original DBDRS scale is available (DuPaul, Power, Anastopoulos, & Reid, 1998). Although the intervention is primarily focused on home setting however teacher's report is also taken to see if the intervention also brings change in classroom behavior. Furthermore, teacher's report was also taken because collaboration of teachers was required for the implementation of Daily School Behavior Report Card, which involves setting a reward system for children's classroom behavior from home.

**Home and School Situations Questionnaires.** The pervasiveness and impairment of the child's behavior problems within the home and school setting was examined by using the HSQ and SSQ (Barkley, 1997). The Home Situations Questionnaire (HSQ) requires parents to rate their child's behavior problem across 16 different home and public situations on a 9-point scale (1 = *mild* to 9 = *severe*). For example how child behaves in situations like while playing alone, getting dressed, while watching television etc. The School Situations Questionnaire (SSQ), similarly obtains teacher reports of problems in school situation on a 9-point scale (1 = *mild* to 9 = *severe*). Both of these scales are scored the same way to yield two separate scores. The first is the Number of Problem settings, calculated simply by counting the number of items answered Yes by the rater (endorsed as problematic by the rater), The mean severity score is calculated by summing the numbers circled beside the item and then dividing by the number of Yes answers. Normative information about both HSQ and SSQ is available (Altepeter & Breen, 1992; Du Paul & Barkley 1992).

Table 2

*Session Schedule of the Barkley's Parent Training Program, Defiant Children (1997) with Pakistani Parents*

1	<b>Review of information on ADHD.</b> An overview of the nature, developmental course, prognosis, and etiology of ADHD.
2	<b>Why children misbehave?</b> The causes of defiant behavior are discussed in terms of child characteristics, parent characteristics, situational consequences and parenting style, and stressful family events.

3	<b>Pay attention.</b> In this session, parents are trained in more effective ways of attending to child's behavior so as to enhance the value of their attention to their children.
4	<b>Attending to child compliance and independent play.</b> This session extends to the techniques developed in session 3 to instances when parents issue direct commands to children.
5	<b>Establishing a home token economy.</b> Parents are asked to set up a home token economy to provide external reinforcers for activities not intrinsically motivating, such as home chores.
6	<b>Implementing time out for non-compliance.</b> The home economy system is monitored. And parents are trained to use time out and response cost for noncompliance with rules or requests.
7	<b>Extending time out to additional non compliant behaviors.</b> In this session, no new material is taught to parents. Instead, any problems with previously implementing time-out are reviewed and corrected.
8	<b>Managing non-compliance in public places.</b> Parents are now taught to extrapolate their home management methods to troublesome public places, such as stores, church and restaurants.
9	<b>Improving child school behavior from home.</b> This session is designed to help parents to assist their children's teachers with the management of classroom behavior problems.

A planning committee was formed for the initial translation and adaptation of the intervention consisting of two faculty members, the supervisor of the study and a doctoral student of the National Institute of Psychology, Quaid-i-Azam University, Islamabad. These faculty members had experience of teaching developmental psychopathology to Master's level students and had postgraduate degrees in clinical psychology. Feedback from the program developer Barkley (1997), and other experts also aided with adaptation planning, as did extensive literature reviews and detailed examinations of studies that reported cultural adaptation procedures (e.g., Crisante & Ng, 2003; Forehand & Kotchick, 1996; Gorman & Balter, 1997; Ho et al., 1999; Huang et al., 2003; Kumpfer, Alvarado, Smith, & Bellamy, 2002; Lau, 2006; Leih-Mak, Lee, & Luk, 1984). Furthermore six parents were chosen to provide extensive feedback with regard to content of the intervention. The study was done in collaboration with Maryland ADHD Program, University of Maryland, United States. Extensive supervision was provided to the first author with regards to program implementation and evaluation.

Standardized guidelines regarding the cultural adaptation of interventions are not yet available in the scientific literature. Consequently, the translation guidelines for assessment materials (Guillemin, Bombardier, & Beaton, 1993) were also partially used for the adaptation of the treatment manual. These guidelines are primarily



intended for the adaptation of assessment tools and hence are only partially followed for the adaptation of treatment materials. Therefore, Lau's (2006) recommendations for the adaptation of parent training programs were also incorporated. These recommendations emphasize a two-pronged approach: (a) contextualize the content and (b) focus on engagement enhancement.

**Supporting Visual Educational Package.** Supporting visual educational package, including three DVD's and accompanying program manuals were used to give parents a better understanding of ADHD, associated noncompliant and defiant behaviors and systematic behavior management techniques to manage them. Since in Pakistan literacy rate is low, and most of the parents are at ease with the visual material, this effort was primarily keeping in view the generalizability of the package for less educated families. Due to monetary constraints it was not possible to develop a visual package on indigenous bases. Hence three DVDs were selected which could be most useful and relevant for Pakistani families in order to provide a comprehensive understanding of the basic behavior modification techniques, the nature of ADHD, its management. The Guilford Press DVDs by Barkley included, DVD - I "ADHD: What DO We Know?", DVD-II "ADHD: What Can We Do?", DVD-III, "Managing the Defiant Child: A Guide to Parent Training", (Barkley, 2006a, 2006b, 2006c), were translated into Urdu and the DVDs were dubbed for this purpose.

These DVDs were selected with the goal of helping to improve parents' understanding of ADHD and behavior management techniques, and to enhance their motivation for learning new parenting skills. The visual package was provided to parents to watch at home at the start of training. Portions of the package were also utilized during group sessions to provide real-life examples of the challenges families of children with ADHD often encounter.

In the adaptation process the first step involved a verbatim transcription of the DVDs in English. Proof reading and reevaluation of the transcription was conducted by the planning committee. Next, the English transcription was translated into Urdu. These translations were discussed by the committee members carefully and thoroughly reviewed again for cultural appropriateness and relevance. Necessary changes were made and the information not relevant to the indigenous needs of our population was omitted in the manner described previously. Each of the parents and practicing psychologists in our interest group was provided with a set of translated DVDs to watch along with the Urdu language manual, and asked to provide feedback on its relevance and usefulness.

### Study Design and Analyses

The present study is an effectiveness research with a pre-post design where change in the behavior of children was assessed before and after the intervention program.

Measures were taken within two weeks prior to implementation of intervention program. And then the change was assessed after last session. Paired sample *t*-test is used to see whether there is any change in the behavior of children, and an overall effectiveness of the program. Paired sample *t*-test was also used to see within subject variation. To find out the treatment success in terms of symptom reduction Mc Nemar's test was used for the rates of symptom reduction of ADHD core and associated features. By keeping DBDRS-Parent rating as primary outcome measure, the data was transformed into binary form for this purpose. Cases which were still within the clinical range on post-treatment measures were scored as '1', and for those which were no more in the clinical range were given the score '0'. "Treatment success" is defined at this stage in terms of symptom alleviation according to parent's and teacher's reports on DBDRS scale. Criteria for success is taken and cut offs are determined by following the DSM-IV-TR (American Psychiatric Association, 2000) diagnostic criteria for ADHD and associated features, as reported on DBDRS.

### Results

Table 3  
*Alpha coefficients and Skewness for the Study Outcome Measures (N=85)*

Variables	No. of Items	<i>M</i>	<i>SD</i>	<i>α</i>	Range		
					Potential	Actual	Skew
DBDRS-Parent Rating							
Hyperactivity	9	15.1	6.78	.82	1-9	1-9	.38
Inattention	9	14.9	6.10	.87	1-9	1-9	-.46
ODD	8	15.1	5.46	.81	1-8	1-8	.32
CD	15	1.49	2.47	.60	1-15	1-7	.97
DBDRS-Teacher Rating							
Hyperactivity	9	14.9	6.72	.86	1-9	1-9	-.26
Inattention	9	16.5	5.23	.79	1-9	1-9	-.34
ODD	8	11.3	5.50	.86	1-8	1-8	.23
HSQ	16	8.79	3.97	.79	1-16	1-16	.09
SSQ	12	4.86	2.44	.74	1-12	1-9	.18

*Note.* DBDRS= Disruptive Behaviors Parent Rating Scale, CD = Conduct Disorder, ODD = Oppositional Defiant Disorder, HSQ = Home Situation, Questionnaire, SSQ = School Situation Questionnaire

Table 3 shows higher consistency for all subscales for both parent and teacher versions of DBDRS and Chronbach's alpha coefficients for all subscales are within the satisfactory range. It further suggests the relevance of translated scales for Pakistani families both in terms of language use and constructs assessed by the tools.

### Treatment Outcomes

Table 4 shows the pre-post mean difference on measures of DBDRS-Parent and Teacher's reports and Home and School Situation Questionnaire.

Table 4

*Paired sample t-test (Complete Case Analyses) for Pretreatment and Post Treatment measures*

Measures	Pre-Treatment ( <i>n</i> = 31) <i>M</i> ( <i>SD</i> )	Post-Treatment ( <i>n</i> = 31) <i>M</i> ( <i>SD</i> )	<i>t</i>	Cohen's <i>d</i>
DBDRS- Parent's Report				
Inattention	6.48(1.74)	5.83(1.84)	3.32**	.37
Hyperactivity	5.64(4.93)	4.93(2.92)	3.32*	.34
ODD	4.77(3.16)	3.16(1.80)	8.04*	.51
Conduct Disorder	2.25(1.99)	1.65(1.81)	3.71**	.40
DBDRS- Teacher's Report				
Inattention	6.47(1.30)	6.17(1.44)	.90	.23
Hyperactivity	5.13(2.54)	4.80(2.84)	.85	.13
ODD	4.74(1.86)	4.2(1.99)	2.02	.27
HSQ				
Total no. of Problems	10.16(3.53)	6.38(2.75)	14.45*	1.07
Mean Severity	2.84(1.50)	1.60(1.00)	9.13**	.82
SSQ				
Total no. of Problems	5.48(2.2)	6.16(2.67)	3.95*	.33
Mean Severity	2.13(1.16)	1.82 (.89)	2.92*	.30

*Note.* DBDRS = Disruptive Behaviors Rating Scale, HSQ = Home Situation Questionnaire, ODD = Oppositional Defiant Disorder.

\**p* < .05, \*\**p* < .01

According to Table 4 difference in symptoms for pre and post treatment measures was observed to be statistically significant for symptoms of Inattention, ODD, and conduct disorder according to parent reports. Difference was also statistically significant for number of situations, and for the problem severity according to Home Situations Questionnaire. Non significant improvement was observed according to teacher's reports on DBDRS, however a decreasing trend can be observed for mean scores on hyperactivity and ODD. While on SSQ increased scores on number of problem behaviors were observed. Contrary to it symptoms mean severity has decreased according to teacher's reports. Furthermore, within group effect sizes were also been calculated. Large effect sizes were observed for HSQ total number of problem situations, while for the all other subscales effect sizes are in the range of small to moderate (Cohen, 1992). The average effect size calculated for the measures of parent report of DBDRS and HSQ was also taken, which is .54

Table 5

*Mc Nemar's Test for Frequencies and Number of Cases in Clinical Range on DBDRS-Parent Reports (N = 31)*

Variables	Pre-Treatment <i>n</i> (%)	Post-Treatment <i>n</i> (%)	<i>p</i>
DBDRS Parent Rating			
Inattention	23(74.2)	17(54.8)	.030
Hyperactivity	19(61.3)	17(54.8)	.630
ODD	26(83.9)	10(32.3)	.000
Conduct Disorder	13(41.9)	7(22.6)	.030

*Note.* ODD: Oppositional Defiant Disorder

Table 5 presents the findings of Mc Nemar's test for symptom reduction rates from pre to post measures. Using the DBDRS as a primary outcome measure, reduction rates of symptoms are noticeable and statistically significant for inattention, ODD, and conduct disorder. A thorough analysis of drop outs and completers along with predictors of premature termination is published elsewhere (Malik & Tariq, 2012).

**Adaptation Refinement.** This feasibility study has also given us an opportunity to adapt the behavioral intervention in cultural context of Pakistani families. These challenges and barriers observed and encountered during implementation also helped us to make the

content of this adapted program more relevant to Pakistani families. For example there was very limited awareness about mental illnesses among parents in general and lack of understanding about diagnostic terms like ADHD, ODD, etc. This had some implications for psycho-educational component of intervention. The supporting visual educational package, and more extended time for awareness of parents helped us to overcome this barrier to some extent. Stigma associated with mental disorders also added to the social pressure for mothers especially from extended family members. In a collectivistic culture of Pakistan the role of multiple caregivers adds to the challenge where involving other people in the therapy process (formally or informally) becomes even more important. It was observed that the parents tend to seek alternative treatments like herbal medicine and sometimes going to shrines and faith healers. Since religion carries a central place in Pakistan value system, if some families preferred to obtain alternative treatments, they were not challenged by the therapists until they asked for the advice in that regard. Also instead of addressing the issue more directly we tend to emphasize the scientific explanation of mental disorders in more detail so that families can have a better understanding of the nature of the problem and its scientific treatments.

Parents sometimes, had specific responses to behavioral treatment strategies, been introduced. During the parent training sessions, it was observed that in most families, praising the child is not considered favorable. As a result, parents often resist praising their children openly. Reinforcement is also difficult for parents due to an underlying belief that child's opinion is less important in comparison to the view point of elders in the family (Stewart et al., 1999). We addressed this issue through modeling and role playing positive parenting techniques (praise, reinforcement) with the parents. Many of them also had a belief that parents are superior and play a supervisory role for their children which is quite typical of Asian parenting (Chao, 1994). This viewpoint has serious implications for assignments like special play time. Again, role play was helpful in getting parents to experience how a non directive strategy like this would help them to improve their relationship. Parents also had difficulty grasping the token economy system during the time allotted in the *Defiant Children* (Barkley, 1997) manual. Hence, two individual sessions dedicated to the token economy were added for participants. Parents were also assigned homework that involved making three lists to facilitate the implementation of the token economy: (a) list the child's strengths and things they already do well; (b) list tasks and activities the child is struggling with; (c) list the child's likes and interests that may be used

as rewards. This helped them to identify the reinforcers and implement the program more effectively. Many parents held a general belief that physical punishment is the best way to manage behavior problems. Therefore, parents were more amenable to the use of physical punishment rather than time out. The therapist continually emphasized the importance of positive parenting and the effectiveness of positive parenting techniques. The above mentioned challenges are only a few among many observed during the process of implementation which helped us to refine the adapted program and to enhance parents engagement in the intervention process.

### Discussion

The current study provided a preliminary evaluation of effectiveness of an adapted version of Barkley's parent training program for Pakistani community by using a pre-post study design. It was hypothesized that participation in parent training program would result in a decrease in symptoms of ADHD and associated features according to parent and teacher reports. Results of the complete case analyses suggest a significant improvement in symptoms according to parent reports for ADHD and oppositional behaviors. This suggests the usefulness of culturally sensitive version of Barkley's Parent training for Pakistani families. The intervention also turned out to be effective for symptoms of inattention as well showing a statistically significant mean difference and a declining trend on post measures within treated group (Table 4). While using Mc Nemar's test for symptom reduction of core features of ADHD and associated features it is observed that the intervention worked for Hyperactivity, ODD and conduct disorder (Table 5). These findings are consonant with the studies of parent training effectiveness which shows that behavior modification does bring improvement in core and associated features of ADHD on immediate bases (Huang et al., 2003; Jones, Daley, Hutchings, Bywater, & Eames, 2007).

An additional step was taken to calculate the effect sizes for pre-post measures (see Table 4). The average effect size for pre post measures calculated through parent report of DBDRS and HSQ appears to be robust with reference to one of the recent systematic reviews for effectiveness of parent training suggests (Fabiano et al., 2008).

Although a higher dropout rate, does not allow us to interpret findings in term of true treatment success. However it should be noted that higher percentage for drop out is also consonant with many

studies of parent training in the existing literature. For example in a systematic review of studies examining premature termination from parent training, Forehand, Middlebrook, Rogers, and Steffe (1983) reported an overall dropout rate of 28%. While some researchers have reported a rate approaching 50% of parents (Prinz & Miller, 1994). Huang et al. (2003) using Barkley's parent training program with Taiwanese parents, and reported that 39% families dropped out from program and couldn't complete the total number of sessions.

### **Limitations**

While interpreting these findings a great degree of precaution is required, and future work should be designed while keeping in view some points which we couldn't incorporate in this very first trial of parent training with Pakistan families. Firstly, it is not a randomized controlled trial. Second, all outcome measures relied on self report measures from teachers and parents which may have reflected several potential bias, use of some observational measures can provide additional evidence for how the program works. The lack of availability of such observational measures with increased cultural sensitivity was also a major barrier for selection of such measures and some steps are needed to adapt such measures for Pakistani culture. Third, a high drop-out rate (24 out of 55 cases), also does not allow us to interpret findings in term of true treatment success.

### **Suggestions for Future Research**

It is recommended that future studies should be evaluating the effectiveness with an improved study design preferably with a randomized control group design. Challenges encountered during this study should also not be ignored while designing future studies. Increased referrals and requests from hospital setting, made us unable to plan a randomized controlled trial (RCT). RCTs enjoy a higher status along the evidentiary ladder for treatment effectiveness, and are much needed in Pakistani context. Future studies should be conducted with improved study designs providing researchers and clinicians a stronger evidence for effectiveness of psychosocial interventions. Parental psychopathology and distress, parenting styles and role of dysfunctional families are also needed to be explored in future works. Strong evidence exists in literature from developed countries, showing that such factors do play a role in treatment outcomes (Chronis,

Chacko, Fabiano, Wymbs, & Pelham, 2004). While designing and developing such programs these factors should be considered and some exploratory work is needed to understand the role of these potential variables for Pakistani families.

### **Implications**

This study provides some preliminary evidence supporting the effectiveness of Barkley's behavioral parenting program for Pakistani children with ADHD. The results of this study suggest the robustness of Barkley's program in reducing ADHD and ODD symptoms and impairment. Considering the very limited research on interventions for Pakistani children, the present study represents a stepping stone and an effort to identify evidence-based interventions for children with ADHD and other emotional and behavioral problems in Pakistan.

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