DOCUMENT RESUME

ED 396 506 EC 304 888

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TITLE Follow-Up Study on the Adjustment of ADHD Adolescence.
PUB DATE 15 May 96
NOTE 19p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adolescents; Aggression; *Attention Deficit Disorders; Behavior Problems; *Cognitive Restructuring; Conflict; *Coping; Elementary Secondary Education; Family Problems; Followup Studies; *Hyperactivity; Intervention; *Outcomes of Treatment; Parent Attitudes; Parent Child Relationship; Peer Relationship; Program Effectiveness; *Student Adjustment; Student Attitudes; Student Development

ABSTRACT

A follow-up investigation evaluated the adolescent outcomes of 10 children with attention deficit hyperactivity disorder who had been treated 5 or more years earlier at a university school clinic with a multimodal treatment program called the Cognitive Academic Social Treatment program. The study hypothesized that adolescents and parents would have different beliefs about how the adolescent was functioning with respect to impulsiveness, inattentiveness, and hyperactivity. Ten of 65 surveys were returned and analyzed. Independent variables studied included: length and type of treatment, age treatment began, degree of aggression, socioeconomic status of family, and academic services. Dependent variables included family conflict, peer relationships, and school progress. Results indicated that parents reported their adolescents had significantly more conflict in their lives than adolescents themselves reported, suggesting that the strategies taught in the program for coping with problems had not been internalized. Results supported previous findings that multimodal intervention programs in childhood do not have significant positive effects in adolescence. Research on effects of continuous multimodal group therapy (from childhood through adolescence) is urged. (Contains 12 reference.) (DB)

Follow-up Study on the Adjustment of ADHD Adolescence

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May 15, 1996

Abstract

This study involved a follow-up investigation of 10 ADHD children who were treated five or more years earlier at a University school clinic. The purpose of the study was to determine predictor variables of adolescent outcome. Independent variables studied included: length and type of treatment, age treatment began, degree of aggression, socioeconomic status of family, and academic services. Dependent variables included family conflict, peer relationships and school progress.

One problem facing parents and teachers is the increasingly large number of young children who are acting "hyper", "inattentive", and "distracted" at home and in class. Many young children outgrow these behaviors. However, in the past fifteen years, it was found that more children (than in the past), between the ages of 6-10, were having difficulty with their social and cognitive skills. According to Kirby and Grimley (1986), children with attention problems can benefit from programs that teach cognitive strategies to help them control their impulses. Educational intervention is often accompanied by treatment with stimulant medication. Barkely (1991) reported that medication could help increase the amount of blood flow that passed to the frontal lobes in the brain, thereby improving the attention of these children and allowing them to process information at a slower pace. By developing multimodal programs (medication combined with therapy) some researchers believed that these "new strategies" can become internalized in the child, and can cause the child to be less impulsive.

In 1979, Dr. Edward Kirby, began a cognitive-behavioral program at Indiana State University for children who were engaged in impulsive and inattentive behaviors. Today, this program, known as the Cognive Academic Social Treatment program, or CAST has been staffed by University faculty and graduate students. CAST intended to teach children who have been identified with attention deficit hyperactivity disorder (ADHD) to focus on how they solved problems and not just the answer to the problem. The

program is multimodal; parents, teachers, physicians, graduate students and psychologists work together to help each child.

Parents of young ADHD children were understandable eager to know the probable outcome of their children's multimodal treatment. Thus, parent groups were also conducted at Indiana State University to help the parents generalize the skills that were practiced in the children's therapy group to their home and school environments. Unfortunately, few research studies provided support for the notion that the treatment during childhood would have lasting affects. Although parents from past groups provided anecdotal evidence about the effectiveness of CAST programs, the evidence reported long term effects were conflicting. Satterfield and his colleagues (1979, 1980) reported that childhood intervention combined with medication had positive long term gains in adolescence. However, Barkely (1991) stated that very little hard research evidence existed regarding the long term effects of similar intervention programs.

Weis, Kruger, Danielson, Elman (1964) evaluated 150 hyperactive children at a psychiatric hospital in Montreal, Canada. Sixty-six of the 150 children were eligible for the study because they met the following criteria: diagnosed before the age of twelve as hyperactive, displayed conduct problems in school, were of average intelligence, and did not have any symptoms of a mental illness.

Five years after the initial assessment, the children were placed in one of three groups. The first group received methylphenidate for four months and then received a placebo, the second group received chlorpromazine until two weeks of prior to the follow-up evaluation, and the third group received methylphenidate until two weeks prior

to the follow-up evaluation. Although the second and third group continued to take medication, they did not take medication on weekends or school vacations.

These researchers found that hyperactivity significantly decreased over five years in all three groups; however, there were no differences found in the degree of improvement of hyperactivity among the three groups. These results were disappointing because researchers expected to find a better outcome in children who received methylphenidate than those who received chlorpromazine or the placebo.

Despite the insignificant findings, Weis and his colleagues (1964) concluded that adolescents who received stimulant medications and had positive family support fared much better than the children who had negative family support. There was also no doubt that medication helped hyperactive children; however, as a sole treatment, its value was limited.

Another similar study was reported by Loney, Kramer, and Milich (1981) who followed-up 135 hyperactive children when they were adolescents. They investigated aggressive symptoms, hyperactivity, delinquency and achievement in their follow-up. The aim of their study was to identify predictors of initial clinical responses to ritilin and dexadrime.

Loney et.al (1981) found medication to be a factor in only three of the many outcome measures studied. Positive treatment effects were found only in reading, arithmetic, and a lower incidence of nonmedical drug use. Duration of treatment in this study and in many other studies had no predictive relationship to outcome measures (Weis, Minde, Werry, Douglas & Nemeth, 1971). It appeared that hyperactive children

did not outgrow their early problems and became indistinguishable from other adolescents and adults. However, they did not necessarily become criminals or psychotics (Weis et.al., 1971).

Yet, another study by Loney, Langhorne, Pateinite, Whaley-Klan, Broeker, & Hacker (1976) hypothesized that ecological variables, such as family and school environment and childhood aggression (identified at the referral) correlated with later adolescent aggression and delinquency (at the follow-up evaluation). It was also hypothesized that treatment variables, childhood achievement and hyperactivity, intercorrelated to contribute to adolescent achievement (Loney, Prinz, Minshalow, & Joad, 1978). However, only family variables (parenting style) were associated with aggression, hyperactivity, delinquent behavior and achievement. Aggression and hyperactivity were assumed to have different correlates at the referral and follow-up (see Table 1).

If these hypotheses were valid, then it would explain why drug treatment did not lead to improved adolescent behavior or reduced delinquency. Drug treatment affected childhood hyperactivity, but behavior outcome and subsequent delinquency were determined by childhood aggression and ecological antecedents which were not affected by drug treatment (Milich and Loney, in press). In other words, environmental changes were necessary to reduce aggression and adolescent delinquency. Drug treatment did not solely reduce problem behaviors because childhood hyperactivity was not the first link in a chain that led to adolescent delinquency.

Unlike these researchers, Feidham, Denhoff and Denhoff (1979) did one of the few studies that showed the positive outcomes for ADHD children in adolescence. They followed 81 hyperactive children into adolescence and then into adulthood and found that only 8% of the adolescents and 10% of the adults had serious problems. Their subjects received comprehensive treatment in a multidisciplinary setting and were from fairly stable middle class families.

Contrasting fairly sharply with the Feldman et.al findings, Barkely (1991) reported that "only 11% of ADHD children and adults were free of psychiatric diagnosis, functioned well, and had no significant symptoms of their disorder (p. 125)."

Even though the previously discussed researchers did not find drug therapy to be effective when it was used as a sole treatment, it did help ADHD children overcome some of their difficulties. It also appeared that drug treatment was the most common method that was used to reduce the symptoms of ADHD. However, Satterfield, Cantwell, & Satterfield (1979) followed-up 84 hyperactive children who received drug and behavioral therapy. They believed that if medication were combined with family and child-group therapy then successful long-term effects could be more probable.

In the Satterfield et.al (1979) study, the children's behavior was initially evaluated at home and at school, and then compared one year later to their academic performance and delinquent behavior. Teachers and parents completed a Connors Questionnaire before medication was initiated, during the time that the child took the medication, and after the medication was terminated. A psychologist, who was blind to the purpose of the study, rated the degree of psychosocial adjustment on the basis of the parents

answers. While interviewing the children, the psychologist made several conclusions. First, he determined that the children had exhibited some antisocial behavior. For example, 35 of them threatened or attempted to do great bodily harm, 22 had been suspended or expelled from school, and two had been in trouble with the police. Another commonality that the psychologist observed was that most of the children were not fidgety, inattentive, and hyperactive (even though that was what they were referred for). Thus, his interview with each child was markedly different from the school and home reports. Finally, this psychologist found that even though the childrens' IQ scores ranged from 80-103, they were one half to one grade level behind in achievement.

After one year of treatment (methylphenidate), the Conners Questionnaire was given to the parents and the teachers. The teachers found marked improvements in attention and hyperactivity, and the parents found the greatest changes in conduct and hyperactivity. Fifty-seven of the 84 children showed anti-social behavior before treatment and only 16 of the 57 continued anti-social behavior after treatment. However, ten of the 57 children who initially displayed antisocial behavior substituted new types of antisocial behavior for old problems.

Overall, improvement could not be accounted for solely on the basis of the children who displayed milder degrees of antisocial behaviors. Other changes observed by the teachers and parents observed were greater persistence and more attention at tasks, improved peer relations, and increased academic performance. The children reported feeling more successful and less impulsive in school, more confident, and were

getting along better with their peers. Therefore, as Satterfield et.al (1979) hypothesized medication combined with therapy was a successful treatment plan in many cases.

The findings of Satterfield and his colleagues (1979) suggested that many of the symptoms that ADHD children experienced diminished after treatment, but were these affects lasting? In 1980, Satterfield et.al re-evaluated 61 of the 84 children who initially participated in the earlier study. They found that 58 of the 61 children were still on medication. Another significant change that they found was that the children's anti-social behavior (at the end of the second evaluation) was less prevalent in all areas except alcohol consumption, drug abuse, trouble with the police and residential placement. The psychologist from the previous study reported that the children were less overactive, fidgety, and distractible, and that they had improved peer relations.

However, when the second year follow-up was compared to the first year follow-up, significant changes were not apparent. For example, academic gains, antisocial behavior and teacher and parent ratings were about the same at end of the second year as they were at the end of the first year. It therefore appeared that after an initial acceleration in academics and positive behavior that a leveling off seemed to occur. Since academic gains did not continue at the time of the second follow-up then it was possible that academic gains during the first year could have been due to increased concentration and test-taking ability, and not increased knowledge. Similar results were also found by Weis et.al (1971). They found when dosage was based on behavior improvement alone, academic as well as behavior improved.

In these two follow-up studies, Satterfield and his colleagues reported promising results compared to the other studies described above. It was unclear if these results would be the same if the children were re-evaluated five years later. There was thus a need to investigate the question of whether combined treatment has lasting life-long benefits (like the CAST program).

Because the studies reviewed offer conflicting evidence, there is a need to investigate the effects of combined therapy over an extended period of time, the present study sought to identify the current functioning of adolescents who received medication and therapy as children (through the CAST program).

If the CAST program helps children to slow down their thinking and to use effective strategies when solving problems, then these children will have less social and cognitive adjustment problems in adolescence.

The general problem that was investigated was whether multimodal treatment programs children attended have lasting effects into adolescence. The specific problem that was investigated regarded impulsiveness, inattentiveness and hyperactivity. In particular, are impulsiveness, inattentiveness and hyperactivity due to an internal lack of control or to an external influence? The present study hypothesized that adolescents and parents would have different beliefs about how the adolescent was functioning. Thus, this study is based on the premise that parents will report that their adolescents have more conflicts in their life than their adolescents actually report.

Methodology

Sample. The subjects in this study were children who were in the CAST program 5-10 years ago. The children, selected from the CAST files, met the DSM III R criteria for ADHD. Because only the children who met the DSM III R criteria for ADHD were placed in the CAST program, the findings of this study will be generalizable to other ADHD children.

Equipment and Materials. Each family who had a child in the CAST program at Indiana State University, was contacted by telephone to verify their address, and informed them that they would be receiving a questionnaire which would help a graduate project determine how well their children were now functioning as adolescents. The Conflict Behavior Questionnaire was then sent to 65 of these families. Two forms of twenty questions each were completed by the adolescent and one form with twenty questions was filled out by one or both of the adolescent's parent(s). A demographic information form was also sent to the families to control for extraneous variables, such as socioeconomic status and ethnicity.

Groups. There was one group in this study. The group consisted of adolescents who were in the CAST program and their parents.

Design. The design that was used in this study was in the form of a survey. Thus, there were not any specific tests administered.

Analysis of Data. A one way analysis of variance (ANOVA) was used to interpret the responses from the parent and adolescent version of the Conflict Behavior Questionnaire. Multiple correlations were also carried out to examine the relationships

between the parent and the adolescent responses. The alpha level of 0.05 was used in order to determine significance.

Results

The means of the three treatment groups are represented in Table 2. They show that treatment groups 1, 2, & 3 have means of 8.10, 6.50, and 3.40, respectively, and standard deviations of 6.08, 4.74, and 5.56. Table 2 also shows that the analysis of variance computed F-ratios that were significant at the 0.05 level. In Table 3, the correlations between the parents' responses on the questionnaire and the adolescents' responses on the questionnaire (with regard to mother and father) are shown. Using eight degrees of freedom, significant correlations were found between the parents response and the adolescents' response with regard to mother and father. The correlations shown in Table 2 are 0.6 and 0.5. In Figure 1, a visual representation of the means if presented on a bar graph.

Discussion, Conclusions, and Recommendations

This study investigated children who were in the CAST program five years ago. The mean of the conflict score was higher for the parents than it was for the adolescents which shows that the parents perceived their adolescents to have more conflict in their lives than did the adolescents. The correlations between the parents perceptions of conflict and the adolescents perception of conflict was congruent with the hypothesis. That is, the parents significantly reported (at the 0.05 level) that they perceived more conflict to exist than did their adolescent.

These results suggested that multimodal treatment in childhood did not reduce the amount of conflict the adolescents encountered as they grew-up. The degree of conflict that the parents and adolescents reported significantly differed, but the conflict still existed. Therefore, it appeared that the strategies that were taught in childhood (to cope with problems) were not internalized.

However, the return of surveys was extremely low. Only ten out of sixty-five surveys were returned. It may be possible that the sample of families who returned the surveys had more conflict than the "average" ADHD family. However, the results that were analyzed were significant for conflict at the 0.05 level.

In conclusion, the reason for expecting a difference in the way parents perceived their adolescents conflict and the way the adolescents perceived their conflict was that parents and adolescents views often are not the same. Adolescents often viewed themselves in a more positive light than did the rest of society. What society saw as disrupting, adolescents often saw as experimental.

Unfortunately, because of the results that were reported, we, are again forced to agree with Barkely (1991), who believed that multimodal intervention programs in childhood did not have significant positive affects in adolescence. The work by Satterfield et.al (1979; 1980) was convincing, but it appeared that as time passed, the strategies that the children learned would also pass.

Recommendations for future research involve finding out why intervention programs in childhood are not internalized and carried into adolescence. Possible explanations could be that the adolescents with ADHD were more at-risk for following

the "wrong crowd" or that they might have some type of a neurological imbalance. In conclusion, it would be interesting to see how continuous multimodal group therapy (from childhood through adolescents) affected the outcome of ADHD adolescents.

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Table 1

Factors influencing later aggression, hyperactivity, delinquencyand achievement

AT REFERRAL	AT FOLLOW-UP
ECOLOGICAL	AGGRESSIVE
CHILD AGGRESSION	HYPERACTIVE
	DELINQUENCY
FAMILIAL	
	ACHIEVEMENT
CHILD HYPERACTIVITY	
CHILD ACHIEVEMENT	
TREATMENT	

Table 2

Means and Standard Deviations of Parent and Adolescent Responses and F-ratio

Groups	Means	Standard Deviation
Parent	8.10	6.08
Child w/Mom	6.50	4.74
Child w/Dad	3.40	5.56

F-ratio	Significance
57.10	at 0.05

Table 3

Correlations between parents and adolescents responses

	Parent	Adolescent with mom	Adolescent with dad
Parent	1.00	**0.60**	0.48
Adolescent W/mom	**0.60**	1.00	**0.50**
Adolescent w/dad	0.48	**0.50**	1.00

Note: Significant correlations are in bold print.