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Evaluation of University of Buffalo's ADHD Summer Treatment Program developed by Dr. William Pelham, Jr., based on evidence-based treatments of ADHD

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I. Introduction

Attention Deficit Hyperactivity Disorder background

Attention Deficit Hyperactivity Disorder (ADHD) is the most common mental health problem of childhood, affecting 2-9% of the United States population. The condition presents more often in boys than in girls, and symptoms usually show before age 7. The diagnosis is usually not outgrown (ccf.buffalo.edu).

ADHD is characterized by developmentally inappropriate levels of inattention, impulsivity, or hyperactivity, as described by the Diagnostic and Statistical Manual of the American Psychiatric Association:

Inattention is characterized by a failure to give close attention, tendency to make careless mistakes, failure to listen when spoken to, failure to follow instructions, failure in finishing tasks, difficulty organizing tasks and activities, distaste for tasks that require a sustained effort, tendency to lose things, tendency to be easily distracted, and forgetfulness.

Hyperactivity is characterized by a tendency to fidget or squirm, tendency to leave one's seat in situations in which remaining seated is expected, feelings of restlessness, tendency to run or climb excessively, difficulty in engaging in leisure activities quietly, and talking excessively.

Impulsivity is characterized by a tendency to blurt out responses before questions are completed, difficulty waiting one's turn, and a tendency to interrupt or intrude on others.

To qualify for a diagnosis of ADHD, a patient must meet the DSM-IV TR criteria: The patient must present with six or more symptoms of either inattention or hyperactivity/impulsivity. Symptoms must have persisted for at least 6 months, create problems, and be inconsistent with the patient's developmental level. Some symptoms that cause impairment must have been present before age 7. Symptoms must be present in at least 2 different settings, and cause clinically significant impairment in functioning.

Three major ADHD subtypes have been identified and used in classification of the ADHD diagnosis: Combined ADHD presents with 6 symptoms from both inattention and hyperactivity/impulsivity, predominantly inattentive presents with 6 symptoms from inattention, and predominantly hyperactive/impulsive presents with 6 symptoms from both hyperactivity and impulsivity.

ADHD causes major impairments in functioning, which effects many aspects of the patient's life. Symptoms of ADHD might cause disturbances in relationships with parents, teachers, peers, and siblings, since a child with ADHD might be

characterized as annoying, intrusive, overbearing, and aggressive (Milich and Landau, 1982). Potential academic problems include comorbidity with learning disabilities an increased risk of failure/drop-out (DuPaul and Stoner, 2003).¹ A child with ADHD might suffer from low self-esteem. Symptoms of ADHD might cause problems for a patient's entire family, including marital problems between parents, alcohol abuse in the father, and depression in the mother (Johnston and Mash, 2001). ADHD is associated with an increased risk of substance or alcohol abuse, difficulty in job performance, and difficulty coping with stress ([ccf.buffalo.edu]).

The cause of ADHD remains unknown. Evidence points to causes being potentially biological, but any genetic markers still remain unknown (Castellanos and Swanson, 2002). It is clear that ADHD is not related to a person's diet ([ccf.buffalo.edu]).

ADHD often presents with a range of comorbid diagnoses, the most common of which are aggression disorders (Lahey, Miller, Gordon, and Riley, 1999).

General components of effective treatment

Due to nature of the diagnosis, widely accepted effective treatments of ADHD include early, intensive, long-term, and comprehensive components ([ccf.buffalo.edu]).

Treatments proven ineffective

Many treatments exist for ADHD that are widely advertised, despite a lack of scientific evidence in support of them, and often despite significant evidence against them. These treatments include one-to-one therapy, play therapy, cognitive therapy in a therapist's office, chiropractics, biofeedback, allergy treatments, dietary supplements, sensory integration training, balance training, and perceptual/motor training ([ccf.buffalo.edu]).

Summer Treatment Program overview

The summer treatment program (STP)² under scrutiny was developed and first implemented by Dr. William Pelham, Jr. at the State University of New York at Buffalo. It claims to be the only evidence-based therapeutic summer camp for treatment of ADHD. Today, numerous satellite sites exist all around country, including successful camps in New York and Chicago. The program serves children ages 6-12, and revolves around a strict token economy based on point system. Children with significant cognitive impairments are excluded from the STP. The STP treats individuals in home and school environments. No empirical evidence exists to support the program due to lack of parental consent to conduct research.

II. Assessment

Evidence-based assessment measures

A study done by Pelham, Fabiano, and Massetti (2005) concluded that ADHD symptom rating scales are reliable measures of ADHD. Major reliable scales include the Swanson, Nolan, and Pelham Rating Scale, Conners' Rating Scale, Disruptive Behavior Disorders rating scale, and Vanderbilt rating scale. Most ADHD symptom rating scales are available in parent and teacher versions.³

Broadband rating scale subscales were also found to have very good reliability and validity (Pelham, et al., 2005). Major assessments of this type include the Child Behavior Checklist and Teacher Report Form, Behavior Assessment System for Children, and Child Attention Problems Rating Scale.

Structured interviews have also been found to be reliable (Pelham, et al., 2005). Major structured interviews include the Diagnostic Interview for Children and Adolescents and Diagnostic Interview Schedule for Children. Semistructured interviews are less reliable than structured, and interviews meant for overall psychiatric assessment are less reliable than either of the two aforementioned (Pelham, et al., 2005).

Global and multidimensional impairment measures are reliable and valid (Pelham, et al., 2005). Common measures include the Child and Adolescent Functional Assessment Scale and Children's Global Assessment of Functioning.

Observational measures are reliable and valid in both analog and natural settings (Pelham, et al., 2005).⁴

Since assessment measures have been developed for ADHD that are easy, cheap, and efficient, it is clear why there has been a recent rise in how many people are diagnosed with the disorder.

Assessment for diagnosis of ADHD used for acceptance into STP

The STP staff uses the Impairment Rating Scale (IRS) (Fabiano, Pelham, Waschbusch, Gnagy, Lahey, Chronis, Onyango, Kipp, Lopez-Williams, and Burrows-MacLean, 2006) to diagnosis patients with ADHD and admit them into the STP. The goals of the IRS are brevity, ability to assess multiple areas of impairment, completion by informants in natural settings, and acceptable reliability and validity. The IRS was tested in 4 different samples: preschool and kindergarten children with ADHD and matched comparison children, school-age children with ADHD with medication and matched comparison children, kindergarten through grade 5 teacher ratings, and kindergarten through grade 6 parent and teacher ratings. The IRS proved to be reliable and valid, and highly accurate in identifying children with and without ADHD in multiple settings. It is an efficient assessment tool.

In the study investigating the IRS (Fabiano, et al., 2006), researchers downplayed the importance of some questionable results. Firstly, parent and teacher responses did not always overlap. Secondly, the study did not conclude anything about cross-cultural generalizability. Thirdly, the use of word "problem" in rating questions might inherently cause bias in the rater toward negative responses.

In order to compensate for effective components of assessment that are not present in the IRS, the STP also uses a variety of parental assessment forms, including the Pittsburgh Modified Connors Parent Rating Scale⁵, Parent DBD Rating

Scale ⁶, Narrative Description of Child ⁷, and Frequencies of Home Behavior Management Techniques ⁸. These forms account for diverse family backgrounds, as they include space to be filled out by total of 6 parents with questions specifying extent of relationship to child and biological relationship to child. They ask questions about home and school environments, questions about potential comorbidity, and questions about medications. Behavior ratings on the parental assessment forms are done when the child is not medicated.

The STP also uses teacher assessment forms, which account for diverse classroom environments, provide insight into therapies received at school, specify extent of the teacher's relationship to the child. Behavior ratings are again done by the teacher when the child is not medicated. Specific forms used for assessment include the Pittsburgh Modified Connors Teacher Rating Scale ⁹, Teacher DBD Rating Scale ¹⁰, Narrative Description of Child ¹¹, Academic and Behavioral Target Form ¹², and Classroom Management Techniques ¹³.

In conclusion, although individual tools are far from perfect, the STP appears to use a wide range of evidence-based assessment measures that combine to form a comprehensive, reliable, and valid package.

III. Evidence-based psychosocial treatments for ADHD

Benefits of psychosocial treatments

Psychosocial treatments are considered beneficial by behaviorists in the way that they focus on maintaining conditions, such as parenting skills, peer relationships, and academic success. Psychosocial treatments teach skills and yield long-term effects ([ccf.buffalo.edu]).

Behavioral parent training/Behavioral Child Management

Both behavioral parent training (BPT) and behavioral child management (BCM) are well-established forms of behavioral treatments. They demonstrate how a disorder is reflected in home behavior and parenting skills. A metaanalysis of 22 studies showed that both BPT and BCM are equivalent or better than placebo treatments (Pelham and Fabiano, 2001).

Behavioral classroom management

Behavioral classroom management (BCM) is based on contingency management procedures, such as reward programs, point systems, and use of time-out. A controlled experiment done by Pelham and Fabiano (2001) showed that patients undergoing BCM treatments showed significant improvement relative to the control group. The experiment used measures including teacher ratings of classroom behavior, teacher ratings of social skills, independent observations of classroom behavior, and daily work productivity. The experiment also included rigorous crossover studies.

Behavioral Peer Interventions

Behavioral Peer Interventions (BPI) include recreational activities, contingency management systems, and home rewards. The interventions teach sports skills and team management skills in an effort to teach broader social skills to children with ADHD. A metaanalysis of 22 studies showed BPI effects comparable to those produced by medication (Pelham and Fabiano, 2001). A different metaanalysis of 22 studies showed that patients undergoing BPI were 6-19 times more likely to meet behavioral goals than those not receiving BPI (Pelham, Burrows-MacLean, et al., 2005).

Behavioral program at the STP

The STP's behavioral program integrates all 3 aforementioned approaches.

The STP's parent training teaches the parents to help a child increase skills in the home and in the neighborhood and to improve family relationships. The parent learns to enforce house rules and structure, increase praise, give appropriate commands, give effective time outs, use contingency management, use token reinforcements, and implement a Home Daily Report Card (Arnold, 2002) ¹⁴. The frequency of sessions meeting with the therapist is faded gradually, but the parent continues to undergo continuous evaluations and modifications, and learns to plan for potential relapse by practicing situations before they occur.

School interventions address the child's classroom behavior, performance, and peer relationships. They attempt to teach the teacher to establish clear and meaningful classroom rules, praise appropriate behaviors, give appropriate commands, make accommodations and structure for the individual child, use individual and group contingency management, and give effective time outs. Teachers are trained individually by the therapist and instructed to implement the procedures learned in the classroom setting. The teacher is subject to evaluations and modifications by the therapist. The teacher plans for potential relapse. Through the use of a school-home DRC, the teacher learns to establish a connection with the child's parents. The teacher is also encouraged to integrate treatment with school-wide goals and protocol in an effort to implement school-wide programs.

Direct child intervention is primarily based on a strict point system. The child is taught academic competencies, recreational competencies such as sportsmanship, team membership, and game rules, and social/behavioral competencies, such as decreased aggression. Other methods used include the systematic teaching of social skills and social problem solving. The STP creates a safe environment in which all children with ADHD are able to develop a close friendship and build self-efficacy. The STP offers a more intensive approach for the child, plans for potential relapse, and integrates with parent and school treatments.

In conclusion, the psychosocial treatments used by the STP make effective use of comprehensive, evidence-based behavioral approaches for the treatment of ADHD by integrating a variety of components of BPT, BCM, and BPI.

IV. Incorporating medicine into behavioral treatments

Overview

Medication is the most common treatment for ADHD, with 2-2.5% of all elementary school students and 90% of children diagnosed with ADHD on medication at some point in time. Psychostimulants are the only FDA-approved treatments for ADHD. Methylphenidate (Ritalin) effects are seen in 30 minutes and remain in effect for 3-5 hours. Amphetamine compounds (Dexedrine, Adderall) effects are seen in 30 minutes and remain in effect for 4-8 hours. Pemoline (Cylert) effects are seen in 60 minutes and remain in effect for 8-10 hours. Newly-released long-acting methylphenidate (Concerta, Metadate-CD) can last up to 12 hours. No evidence exists to support a combination drug approach (ccf.buffalo.edu).

Medication benefits include improved classroom behavior and performance, improved peer relationships, and increased persistence in difficult tasks. Benefits extend to home and recreational settings and can be obtained with low to moderate doses. Positive effects are seen in patients with a wide range of ages. Medications can produce large and immediate results (ccf.buffalo.edu).

Problems associated with medication treatments include no proven long-term benefits. Improvements last only as long as medication is given. Adverse effects can be minimized with low doses, but may include loss of appetite, insomnia, irritability, nausea, dizziness, stomachaches, headaches, rapid heartbeat, elevated blood pressure, rashes, anxiety, drowsiness, and social withdrawal. There are many myths about medication's adverse effects that are not supported by scientific evidence, such as seizure activity, worsens motor tics and Tourette's Syndrome, suicidal/homicidal ideations, addiction (ccf.buffalo.edu).

Evidence-based comparisons: behavior modification vs. medicine vs. combined treatment

Two independent classroom studies (Pelham, Burrows-MacLean, Gnagy, Fabiano, and Coles, 2005; Fabiano, Pelham, Gnagy, Burrows-MacLean, and Coles, 2007) investigated the comparative efficacies of behavior modification, medicine, and combined treatments¹⁵. The sample groups were no behavior modification, low-intensity behavior modification, and high-intensity behavior modification. Behavioral treatment varied in 3-week blocks. Participants receiving medication were randomly assigned in a double-blind procedure with 3 levels of doses. The 2005 experiment studied the effects of transdermal methylphenidate and the 2007 experiment studied the effects of methylphenidate. Each class size was capped at 12 students and had a teacher and teacher's aide. Behavioral treatments included classroom rules based on a point system in which the low intensity students did not lose points for breaking rules, time outs in which the low intensity classroom did not include a contingent release component, social reinforcement, DRCs, recess awarded noncontingently, and individualized programs.

Classroom measures included seatwork completion, symptom ratings, effectiveness and stress ratings, impairment ratings, and side effects.

Outcomes from the experiment demonstrated that side effects from medication were insignificant, that behavior modification is superior to no behavior modification, that there exists an additional but nonsignificant benefit from high-intensity behavior modification, that medication is better than no medication, that single effects of alone treatments are equivalent, and that effects are greatest when treatments are combined.

The study was limited by its short duration. Long-term studies in the field are desperately needed. Although medication's biggest limit is that it only works in the short-term, the study does not lend support for behavior modification helping in the long-term. Also, all participants in the study were diagnosed with ADHD. It is possible that there would be more frustration and less success in an environment where the student feels singled out next to typical peers.

Approach taken at STP

At the STP, behavioral interventions are employed first. The STP staff believe that since not all ADHD children show positive responses to stimulant drugs, that there is a lack of evidence that drugs improve a long-term prognosis, and that medication comes with side effects, behavioral treatments should be used to address problems in functioning first. The STP has confidence in the idea, despite a lack of scientific evidence, that behavioral treatments predict long-term outcomes, and the STP incorporates booster treatments to maximize long-term effects. Behavioral treatments utilized by the STP are also accompanied by additional benefits, such as that they have no adverse side effects, that they reduce the dosage of medication needed, that they are relatively inexpensive, and that they are easily applied in a variety of settings.

The STP uses the Buffalo Treatment Algorithm¹⁶, which places power in the hands of parents, but stresses that a treatment approach that begins with behavioral interventions best meets goals.

In conclusion, the STP is effective in adhering to the behavioral value of allowing the patient's parents to ultimately determine the course of treatment, in stressing the positive aspects of behavioral interventions, and by accepting the evidence-based combined approach.

V. Conclusion

Although the University at Buffalo's STP claims to be the only evidence-based summer treatment program for ADHD, it cannot claim to be the only scientifically proven program due to lack of data analysis on the actual outcomes of the program. The lack of data is due only to parental opposition to conducting research on their children. In reality, huge amounts of data is collected on the children's behaviors all day while following the point system which is left unanalyzed. Hopefully, in the future, this data can be utilized to determine the actual efficacy of the STP.

Endnotes

1. In response, a 1991 ruling of the U.S. Department of Education stipulated that people with a diagnosis of ADHD are eligible to receive special educational services in school settings, and that appropriate educational services must be provided.
2. For more information on the STP, see ccf.buffalo.edu
3. While not scientifically proven, it seems intuitive that the teacher ratings should be taken more into account, as theirs

would include less personal bias and more knowledge of what is developmentally appropriate for the patient.

4. Again, while not scientifically proven, it seems intuitive that it would be best to use nonobtrusive measures, since they more efficient and deemed just as effective by the Pelham, et al., 2005 study.
5. The ambiguous wording in the rating scale, eg. "excitable," "is ignored" would intuitively avoid rater bias, since it does not necessarily put negative blame on the child.
6. Negative wording in the rating scale, eg. "cruel," "vindictive" might cause the parent to bias responses in defense of one's self or child.
7. More open-ended responses in the rating scale give insight into parent-child relationships.
8. Explains what effect parent might have on child's behavior.
9. Identical to Parents scale
10. Identical to Parents scale with questions that teacher most likely would not know the answer to, leading to questionable utility
11. Like parents', but formatted for teacher
12. Lists skills and functioning grade level
13. Explains what effect teacher might have on child's behavior
14. The Daily Report Card (DRC) pinpoints specific daily goals and measures them over the course of a day. Success is determined by the percent of time intervals over the course of the day that the child attains his goal. The parent and child select an area for improvement, determine how goals will be defined, decide on behaviors and criteria for success, establish a home-based reward system, and continue to monitor and modify the program. See Appendix A.
15. See Appendix B.
16. See Appendix C.

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