

What is Attention Deficit Hyperactivity Disorder (ADHD)? And How It Effects Parenting Lifestyle, Emotions, and Stress: A Systematic Review

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Abstract

Attention deficit hyperactivity disorder (ADHD) which is also known as hyperkinetic syndrome. It is the most common behavioral disorder in childhood and one of the key causes of learning disability in children. Children suffering from ADHD have normal or nearly normal intelligence. Main clinical feature includes a shorter attention span than other children in their group age. pharmacological and non-pharmacological therapies are available for the management of symptoms and to improve function but sometimes it will often fail to normalize symptoms of children suffering from ADHD. The interaction between parents and child with ADHD have great impact on parenting style and it always give negative outcomes. Parents of children suffering with ADHD also have stress to use several coping strategies to deal with ADHD symptoms impacting family life. The aim of this systematic review is to give brief introduction about ADHD and its impact on parents and caregivers daily lifestyle.

Keywords: Attention deficit hyperactivity disorder, copying, parenting lifestyle, caregivers.

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Introduction:

The term 'ADHD' is not a new issue¹⁻⁵. Attention, Deficit Hyperactivity Disorder name is new but same symptoms were observed, studied, and reported since the nineteenth century. The condition's names have been changed in time according to the technological developments in medicine⁶. The name was changed in time as explained in following paragraph. Early findings about inattentiveness were reported and published in 1798 by Sir Alexander Crichton's book which was called as "An inquiry into the nature and origin of mental derangement: Comprehending a concise system of the physiology and pathology of the human mind and a history of the passions and their effects" and was consisted of three books. Crichton reported inattentiveness but he did not mention about hyperactivity symptoms. Another evidence for the existence of hyperactivity is Dr. Heinrich Hoffmann's poem which was called as Fidgety Philip. The poem was written in 1845. Hoffmann described some symptoms of hyperactivity such as fidgeting, disobedience, over-activity, and parents' embarrassment because of inappropriate behaviors of his own son. Hoffmann also wrote "Johnny Look-in-the-air" which described inattentiveness symptoms^{3, 4, 6}. In 1902, children who are spiteful, cruel, disobedient, impulsive, inattentive, and hyperactive were defined as "morally defective" or having "defective moral control" by Dr. George F. Still^{2, 3, 4, 7, 8, 9}. Still reported that defective moral control is related with brain, people with the condition have average (normal) intelligence, the condition is genetic and mostly males have it. These facts are still recent⁴. Epidemic viral encephalitis caused brain damage in 1917. The symptoms of epidemic viral encephalitis were inattentiveness, impulsivity and short-term memory which were close to symptoms of Still's defective moral control^{3, 8}. Then, the name of the condition was changed as post-encephalitis in the 1920s, then minimal brain damage in the 1930s^{2, 8, 9}. The condition's connection with brain was proven once more with Kurt Goldstein's findings. Goldstein studied on soldiers who had head wounds in World War I. Goldstein realized that these soldiers were inattentive, disorganized, hyperactive, repeating same behaviors and easily distracted from environmental stimuli. These soldiers had similar symptoms with students with ADHD. In the late 1930s and the early 1940s Heinz Werner and Alfred Strauss emigrated from Germany to the United States and they worked together and replicated Goldstein's study. Werner and Strauss observed children. They have reported that some children have distractibility and hyperactivity symptoms. These symptoms were known as Strauss Syndrome in literature. Strauss Syndrome's symptoms were inattentiveness, distractibility, and hyperactivity. In the 1950s, William Cruickshank observed children who had cerebral palsy. The children were inattentive, hyperactive and had normal intelligence. Cruickshank named this condition as minimal brain injury. Minimal brain injury diagnosis was popular in the 1950s and 1960s⁴. People believed that hyperactivity and inattentiveness symptoms were caused by brain injury until the 1960s. This belief has changed with the new

diagnosis which was known as Minimal brain dysfunction (MBD) ^{2, 3, 8, 10}. American Psychiatric Association (APA) published a book which is known as Diagnostic and Statistical Manual of Mental Disorders (DSM). The condition was reported as hyperactivity in childhood in the first edition of DSM². Hyperkinetic reaction of childhood was used as a diagnosis for hyperactive children in the DSM-II. This name was popular in the 1960s and 1970s. Symptoms of hyperkinetic reaction of childhood were inattentiveness, impulsivity, and/or hyperactivity ^{3, 4}. After that APA reported the condition as attention deficit disorder (ADD) with and without hyperactivity in 1980 ^{3, 8, 9}. The name of the condition changed as attention deficit hyperactivity disorder (ADHD) by APA in 1987 and the condition was described in the Diagnostic and Statistical 12 Manual of Mental Disorders, third edition (DSM III) ^{9, 11}. Inattentive type ADHD, Impulsive-Hyperactive type ADHD and combined type ADHD categories added to definition of the condition in the DSM-IV which was published in 1994 ^{3, 12}. There are few differences between DSM-IV and DSM-V related with the diagnostic criteria of ADHD. These are, age of early diagnosis, comorbid diagnosis with autism spectrum disorder and the number of symptoms that are required for diagnosis of ADHD. 6 symptoms should be existed to be able to diagnose with ADHD in DSMIV and 5 symptoms are required according to APA's ¹³ Therefore, ADHD is classified by World Health Organization's (WHO) International Classification of Diseases (ICD). WHO categorized the condition with three different codes F90.2 (combined type ADHD), F90.1 (impulsive-hyperactive type ADHD) and F90.0 (inattentive type ADHD) are codes used to categorize ADHD ¹³.

PARENTING CHILDREN WITH ADHD:

It is generally accepted that parents who live with ADHD have a more challenging job raising children than those who don't live with this neurological disorder ¹⁴⁻¹⁷. Since there is a strong genetic link ^{14, 15} the symptoms of ADHD may be present in both the parents and children; and this genetic link can manifest in parents as deficiencies in parental control and emotional regulation. Johnston et al. ¹⁶ highlighted the link between parenting behavior and the development of ADHD symptoms in a child, confirming its relevance as a factor worthy of consideration. Parenting children with ADHD has a significant, and at times, negative impact on families. A major review conducted by Johnston and Mash ¹⁵ found parents of children with ADHD are more likely to experience marital disharmony, damaged parent child relationships and increased parental stress. Stress has also been linked to diminished parental self-efficacy and negative cognitive thought patterns. Furthermore, Johnston and Mash ¹⁵ reported a prevalence of negative impacts in cases where other comorbid problems exist, such as Oppositional Conduct Disorder (OCD), suggesting this occurs due to an increased severity of ADHD symptomatology. Parental stress appears to be linked to characteristics of the ADHD child, and the severity of the symptoms are linked to parental stress ¹⁷. These authors defined parenting stress as a distinct type of stress which manifests when parents do not meet their own expectations of parenting. There also appears to be a link between parenting and a child's negative social functioning. Certain parenting aspects, such as warm relationships and consistent boundaries, have been associated with better self-regulation and greater awareness of negative consequences for children with ADHD ¹⁸ Modesto-Lowe and colleagues suggested that these attributes support children as they adjust to adolescence and aid their maturity and independence. Given the recognition of the pivotal role of parenting on the social interaction with peers for children with ADHD ¹⁹, interventions aimed at improving parenting skills could have a direct, long-term impact. This is significant in view of the link between poor childhood social skills and long-term problems ¹⁹. For many parents this association with poor outcomes for children with ADHD as they mature into adolescence ²⁰ and adulthood ²¹ is of particular concern. As the lived experience of parents with ADHD children indicates, the many documented challenges create an environment where stress is commonplace and frequently exacerbated by child and parent interactions. These are examined in the following section.

PARENT STRESS

Given the impact on parents, it is not surprising that several studies over the last fifteen years have demonstrated increased stress in parents of children with ADHD compared with those of unaffected children ^{22, 14-16}. A meta-analysis using a quantitative approach, more inclusive than previous literature ¹⁷, endorsed the hypothesis that parents of children with ADHD experience more stress. Theule et al. ¹⁷ found both hyperactivity and inattention symptoms in children were predictors of parental stress. These authors suggested that while both hyperactivity and inattention are contributing factors, inattention symptoms have a less negative impact on family functioning. One definition of parental stress describes it as particular to parents with a perception or expectation of parenting that does not meet their resources for dealing with the lived experience ^{23, 17}. Mash and Johnston ²⁴ researched parents' perceptions, parental self-esteem, stress, and parental self-mastery, and found a strong correlation between parents' perceptions of anomalous behavior in their child and their own stress levels. The parents' description of the behavior was inversely related to their self-esteem. Additionally, Theule et al. argued that parents who experience high levels of stress are less likely to consistently implement interventions successfully¹⁷. Abidin ²⁵ researched the components of parental stress and broke it down into two main aspects: a)

the child aspect made up of child characteristics; and b) the parent aspect which is impacted by parents' reactions. Abidin argued that total parental stress is made up of a combination of both child and parent aspects. This theory led Abidin to develop the Parenting Stress Index (PSI) (1997), a measurement tool that is highly regarded as a reliable instrument for researchers²⁶ and is still used today²⁷ Using the PSI measure on both mothers and fathers, Theule et al.¹⁷ reported no difference in relation to overall child and parental stress, that is, both genders experience the same overall levels of stress in parenting a child with ADHD. Although there is a general imbalance in the representation of mothers versus fathers in the research, the difference is not considered sufficient to skew the findings and can be generalized to both genders¹⁷. While it is apparent that parents of children with ADHD experience more stress than parents of children without ADHD, a relationship has been found to exist between parental perceptions of the child's behavior and parental stress of living with ADHD. Homework appears to be a significant catalyst for parent-child stress and is reviewed in the following section.

HOMEWORK-RELATED STRESS

A common aspect of family life which causes parental stress is homework²⁷. Parents of children with ADHD report that homework is both onerous and presents increased challenges and stress. These parents also attest to lower self-efficacy when it comes to supporting their children compared to typically developing children²⁸. The educational value of homework attracts a great deal of attention in schools, households, and the media, with much of the commentary focused on whether the activity contributes to the academic achievement of a typical child. In a comprehensive synthesis of research from 1987 to 2003 conducted by Cooper, Robinson, and Patall²⁹ the authors validated the completion of homework as leading to improved overall academic achievement in primary and high school years. In high school, the benefits were considered to have significant impact on overall academic achievement. Unlike Hattie³⁰ who reported few benefits of homework in the primary years, Power et al.³¹ described additional advantages in assigning homework to primary school children. These authors argued that homework is helpful for teaching children useful study habits for when they get older, and cited parent involvement in their child's schooling as an important factor. Hattie³⁰ reported a moderate impact (effect of 0.51) for the benefit of parent involvement on overall academic outcomes. It is well established that children with ADHD have more problems with homework than typical children³²⁻³⁴. Researchers argue that many students with ADHD have the intellectual capacity to perform academically but are stymied by failure to complete homework, poor performance, missing deadlines for projects, and lack of timeliness in handing in work³⁵. Completing homework requires a combination of skills, including an ability to plan, prioritize, organize, and focus. Typical homework-related problems associated with children with ADHD include forgetting the necessary materials and instructions to complete tasks, disruptive behavior during homework, avoidance, inability to manage time, and not adhering to deadlines^{33, 36}. Children with ADHD also tend to lack skills in planning, time management and organization^{37, 36}. Finally, Resnick and Reitman argued that the various symptoms of ADHD are related to difficulties with academic functioning, which can have a significant impact on performing homework tasks.³⁸

PARENTING STYLE

Several studies demonstrate that styles of parenting can impact the parent-child relationship and outcomes. Modesto-Lowe et al.³⁹ described how researchers have attributed parenting styles to various results. They argued that "certain parenting characteristics such as warmth and sensitivity are linked to better self-regulation and less risky behaviors in children". In the authors' view, poor parenting and coping skills appear to exacerbate the behavior of children with ADHD. Modesto-Lowe et al.³⁹ Purported ADHD is often present in the parents and impacts on how families interact. They observed a link between parental ADHD, overly critical parenting, and less cohesive control. Put simply, this means that parents who themselves have deficiencies in self-discipline and impulse control, even without the impact of parental ADHD, find consistent parenting problematic. The relationship between young people's academic outcomes, the parenting style of adults who care for them, and these children's symptoms of ADHD have gained the attention of researchers in recent years. Jones, Rabinovitch, and Hubbard⁴⁰ interviewed college students and examined the style of parenting they had experienced in childhood and their adjustment to ADHD. The researchers' review of the literature on parenting styles and childhood ADHD revealed two types of parental involvement: supportive and controlling. They reported a controlling style more often resulted in parents adopting negative strategies in managing the behavior of their children with ADHD, including harsher instructions, more severe consequences, and stricter impositions^{41, 42}, which in turn, led to more severe symptoms such as inattention and hyperactivity⁴³. Conversely, a supportive style, demonstrated by parents' approval, interest and validation of age-appropriate choices seemed to be linked to outcomes that are more positive. Jones, et al.⁴⁰ argued that this supportive style of parenting nurtures self-esteem and resourcefulness in the child for academic activities. The concept of parenting styles is closely aligned with a study by Williams, Harries, and Williams⁴⁴ in which the authors examined how parents gained control over situations involving their children with ADHD – CT (combined type) and unmedicated at the

time of the study. Williams et al.⁴⁴ devised a theory of gaining control which identified the parents' response as either a cognitive pathway or an emotional pathway in relation to their child's behavior. They found that successful parents took a cognitive pathway rather than an emotional one, allowing them to be one step ahead of the child. Parents do not always react the same way, but if they have the skills and resources when confronted by challenging behavior, they can choose the cognitive pathway over the less effective emotional option. Situations perceived as a threat by parents may drive them to exert control and/or defend and justify their behavior, consequently eliciting an emotional reaction. The authors found parents who used the emotional pathway were often distressed about their relationship with their children. In contrast, the authors observed the cognitive pathway resulted in more favorable outcomes. The study identified three graduated cognitive stages. The first was a hopeful solution where the parent hoped the child would respond favorably – these parents had limited resources at their disposal. The second was sharing control, whereby parents shared relevant decision making with the child, including listening, and choosing suitable times to talk to their child. These parents tended to be mindful of the consequences they imposed. The third was an ability to optimize performance and where parents believed the child capable of achieving more than he generally did. Williams et al.⁴⁵ identified three paths to support performance optimization: a) the path of least resistance (POLR); b) extrinsic bridge; and c) intrinsic bridge – all these related to motivating the child. The authors claimed that motivational support from parents led to the child achieving more and that by providing parents with increased resources they will be more likely to choose a more successful cognitive pathway when motivating children. Williams et al.⁴⁴ also identified three types of resources: emotional, physical, and knowledgeable. Emotional resources refer to parents' strengths when dealing with challenges related to their child's behavior or traits. Physical resources relate to the energy levels of parents at the time of the challenging behavior, while knowledgeable resources relate to the information and facts parents have acquired to equip them to manage the behavior of their child. These parental resources are important in this study, as they suggest that parents with increased resources at their disposal have improved opportunities to choose a cognitive pathway, associated with the achievement of more successful outcomes⁴⁴. One outcome of the parent coaching in this study was expansion of emotional resources and increased knowledge resources for the parent participants. Similarly, Graham, Rodger, and Ziviani⁴⁵ highlighted the benefits of coaching for parents by providing new skills and insights into their child's behavior. A review by Modesto-Lowe et al.⁴⁶ examined all published research using the terms ADHD and parenting to establish what impact, if any, a particular parenting style had on the parent-child relationship. The authors reported a correlation between child ADHD, high levels of parental stress and dysfunctional parenting. Dysfunctional parenting is associated with inconsistency, harsh and excessive discipline leading to undesirable outcomes in children including aggression and delinquency^{47, 48}. The presence of parental psychopathology also has implications for how parents respond to symptoms of ADHD in their children. Modesto-Lowe et al.⁴⁶ concluded there was some evidence that poor parenting practices contribute to executive functioning deficits such as self-control. They went on to suggest this may contribute to further disruptive behavior and exacerbate ADHD symptomology.

PARENT COGNITIONS

Several studies demonstrate the important role of parent cognition in determining how parents manage ADHD-related behavior. The literature shows how parents' attributes to children's behavior can determine the functionality of parents' responses. The research shows that parents can become more upset by children's behavior if they attribute it to intentional behavior⁴⁹. In this study, parent cognition refers to the attention and awareness parents apply to the behavior of their children⁵⁰. Johnston and Mash¹⁵ also defined parent cognitions in this way and found that parental cognition can impact the behavior of the child. They described an important study, conducted by Hoover and Milich⁵¹ in which the participants were mothers who believed their boys' problem behavior was linked to sugar. They were led to believe that some boys were given sugar, and some were given a placebo, when in fact all boys were given a placebo. The mothers who believed their boys were given sugar were more critical and controlling in their interactions with the boys, substantiating the impact of their expectations of bad behavior following a sugar intake. It is important to identify the variables that influence a child's behavior and ADHD symptoms. The literature indicates that parents' views of their children's behavior can be significant. Johnston and Mash¹⁵ documented evidence from various studies that showed "child ADHD can influence parent behavior and adjustment". However, they also indicated that the opposite applies, that is, parents' behavior can influence the child's behavior and ADHD symptoms. Hoza et al. (2000) hypothesized a shift in parental cognition can change the behavior of both the parent and child. Kaiser et al.⁴⁹ discussed the relationship between parental acknowledgement of their child's behavior and intervention outcomes. They used the example of a parent who referred to their child's behavior as bad being more likely to use negative or strict parenting practices. Parents who associate behavior with a biological or neurological aspect are more likely to remain calm when their child misbehaves, suggesting that parents' cognitions affect how they perceive their child's behavior. They are more forgiving and open to intervention if they believe misbehavior is due to a disorder. The opposite also applies, in that they are less open to adopting interventions when they believe

misbehavior stems from a child's choice. Hoza, Johnston, Pillow, and Ascough⁵² highlighted this assertion, and observed fathers' views of their child's behavior as personal choice rather than ADHD symptoms was pertinent to the success of intervention. Certain cognitive disorders have been identified as predictors of treatment/intervention outcomes⁴⁹. The cognitive disorders may be depressive thinking or continually processing information in a systematically negative manner, as discussed by Beck⁵³. Kaiser et al.⁵⁰ suggest in their research that parents with negative cognitions tend to have more influence on their child's negative behavior, which in turn, can lead to a sense of hopelessness regarding improved behavior in the future. Accordingly, there is a requirement to focus on "inaccurate parent attributions or cognitions" in every session of behavioral parent training⁵⁰. One of the salient components of Barkley's training for parents who manage children with ADHD is to embrace and practice the concept of forgiveness. This includes letting go of anger, disappointment and resentment on the part of parents in relation to their children's behavior, and is closely linked to more recent research which demonstrates the altered cognitions of parents improve their children's behavior⁵⁰. Just as parents' cognition impacts the behavior of children with ADHD, changes in their attributions or explanations for problem behavior can result in different intervention outcomes. This idea is not new and was reported by Beck⁵³ who described a cognitive error as a pattern of consistently processing information by an individual as correlated to a negative view already held. In Kaiser et al.⁵⁰, developed an unpublished scale to measure parents' cognitive errors and suggested a decrease in cognitive errors through intervention may predict improved responses to treatments of children. In this instance Kaiser and his colleagues used the Homework Problem Checklist⁵⁴ to assess improvements. Moreover, Kaiser et al. reported the more parent cognitions changed in relation to their child's behavior during the intervention, the more positive the outcomes were.⁵⁰

PARENTAL SELF-EFFICACY

When asked to reflect on how effectively they interact and manage the behavior of their children, parents are measuring their self-efficacy⁵⁵. A review of the significance of parental cognitions on the outcomes of and engagement in behavioral parent training acknowledged that parental self-efficacy is extremely relevant⁵⁰. It is generally accepted that lower parental self-efficacy is evident in parents of children with ADHD than those of non-ADHD children. Furthermore, these parents self-report less effective parenting skills and perceive their influence over their children to be weaker⁵². Hoza et al.⁴⁹ explored parent cognition as a predictor of treatment for children with ADHD and found that it affects persistence, awareness of community support and greater parent responsiveness. These authors also found lower treatment outcomes were associated with low self-esteem in mothers and low parental efficacy as perceived by fathers. Much of the research has addressed the self-efficacy of mothers. Mash and Johnston assessed mothers' self-esteem and found social isolation was a major cause of maternal depression. A subsequent study by Johnston, Mah, and Regambal⁵⁶ found higher self-efficacy in mothers led to more positive outcomes about managing the symptoms of children with ADHD following behavioral treatment. Recently, Jiang et al.⁵⁵ endorsed the correlation between parents' self-efficacy and the prediction of treatment after examining the impact of the child's impairment and parents' self-efficacy on the acceptability and effectiveness of ADHD treatments. The results demonstrated that greater impairments, as reported by mothers, were positively correlated to the acceptability and effectiveness of treatment. Significantly, parental self-efficacy was positively correlated to mothers' predictions of treatment outcomes, that is, mothers rated the effectiveness of the behavioral strategies more positively where higher parental self-efficacy was apparent before the intervention. This is consistent with previous findings where mothers with higher parental self-efficacy have higher expectations of behavioral strategies working^{49, 56}. Recent findings on parental self-efficacy coupled with parents' need to feel empowered when using behavior strategies reinforce the importance of this study.

IMPACT ON THE WIDER FAMILY

Several studies have demonstrated the stress experienced by parents of children with ADHD^{17, 22}. More recently, it has been established that this stress continues into adolescence⁵⁷. A wider impact on these families has also emerged, one of these being lower quality sibling relationships⁵⁸ characterized by less warmth, less closeness, and more conflict^{59, 60}. The symptomology of ADHD in children presents challenges for parents that can lead to ineffective parenting and disruptive behaviors, evoking negative reactions among siblings and damaging sibling relationships¹⁵.

INTERVENTIONS FOR ADHD

Interventions and treatments continuously emerge as new knowledge expands about treating the symptoms of ADHD⁶¹. This new knowledge has not only informed the nature of ADHD, but also the benefits of refining various interventions and treatments. One application has resulted in the most recent diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders (APA, 2013) by changing the age at which symptoms appear from before seven years old to before 12 years old. Many studies have also reviewed the effects and

impacts of various types of interventions, including both pharmacological and non-pharmacological interventions. Much of the literature over the last 20 years has focused on the efficacy of pharmacological versus psychosocial treatment, however, several recent studies provide evidence of the most effective approach being a combination of pharmacological and non-pharmacological treatments ⁶¹⁻⁶³. Johnston and Park ⁶¹ undertook a comprehensive study reviewing published studies on all types of ADHD interventions, including pharmacological and non-pharmacological interventions. The authors considered pharmacological interventions alone, psychosocial treatments such as behavior and skills training alone, their combined effects, and emerging interventions such as cognitive-based training, dietary and other alternative interventions. Johnston and Park ⁶¹ described the field of pharmacological interventions as widely accepting of stimulants, namely methylphenidate (MPH) and amphetamine (AMP) compounds, as the prime treatment for ADHD. The authors explained that new developments in long-acting drugs and novel delivery methods have refined the benefits of these treatments for both adults and children. They discussed concerns about the side-effects of stimulants and claimed that some of these concerns have been alleviated by new knowledge. The authors cited the example of reduced impact on growth and weight for children after two years of ceasing medication: "...all but two of the studies demonstrated an accelerated growth rate 20 within two years after the discontinuation of medication, which often compensated for the height and weight deficits accrued during medication treatment". Johnston and Park ⁶¹ reported that some children do not respond to stimulants, so these young people were using a new type of "non-stimulant" drug. The indications were that these alternative drugs had some benefits about reducing symptoms of inattention and hyperactivity and could be used as a pharmacological intervention for those children who cannot endure the side effects of more typical medication. Johnston and Park ⁶¹ described psychosocial treatments as those not involving medication, and including a range of interventions such as behavioral parent training (BPT), classroom management strategies and others conducted in the school environment, as well as various skills training interventions aimed at child functioning when additional requirements to managing ADHD symptoms are needed ⁶³. There is significant evidence that these types of psychosocial interventions are effective in managing symptoms of ADHD ^{63,64}, but it is difficult to quantify the efficacy of these various interventions due to the different methodologies used. Nevertheless, the efficacy of treatments such as BPT and classroom management interventions is well established ⁶³. Over the last 20 years there has been much debate over the merits of pharmacological and psychosocial interventions ⁶²⁻⁶⁵. Johnston and Park concluded that both pharmacological and psychosocial interventions are effective standalone treatments for managing various symptoms but are most efficacious when combined in both home and school environments. They outlined evidence to support the view that long-term social problems can be prevented for children with ADHD as they mature into adults, suggesting fewer problems with substance abuse and antisocial behavior. However, in their review of ADHD treatments, Johnston, and Park ⁶¹ concluded that more effort is needed to clarify the requirements of families and individualize interventions to better match their values and preferences. The literature details theories and models put forward to explain ADHD and its comorbidities but two have been favored: Barkley's unifying theory of ADHD (1997) and the Dynamic Development Theory ⁶⁶. Barkley's unifying theory of ADHD (1997) offers the theory that there is a central deficit inhibiting behaviors, which impedes self-control, and goal directed behavior. The Dynamic Development Theory, which is attributable to ADHD Combined Type, offers the theory that there is a shorter and steeper delay of reinforcement presenting with ADHD, which leads to the requirement for more stimulation to activate dopamine in the brain ⁶⁶. Dopamine is the major neurotransmitter of the reward circuit in the brain and this theory indicates that children with ADHD may need more motivation to make an activity worth doing ⁶. Therefore, strategies which enhance self-control, goal directed behavior and extrinsic motivation have derived from these theories. Both theories are at the essence of psychosocial interventions. The next section reviews the most frequently researched psychosocial interventions.

COACHING PARENTS OF CHILDREN WITH ADHD

There is a dearth of research related to coaching parents and coaching parents of children with ADHD. Coaching around ADHD is a relatively new field so there is limited research on the subject, and none based in Australia. Existing studies focused on coaching college students with ADHD ⁶⁹ and showed the interventions were effective in helping students improve executive functioning and related skills ⁶⁸. Another study explored the benefits for adults living with ADHD, and recommended coaching as an effective tool for managing their cognitive and behavioral outcomes ⁷⁰. To date most research on parenting and ADHD has focused on behavior interventions for parents to use with their children, rather than a specific coaching intervention. Many are based on behavior therapy or cognitive behavioral therapy, as noted in the meta-analysis of Lindhiem, Higa, Trentacosta, Herschell, and Kolko ⁷¹, who asserted these theories formed the foundation of coaching. These authors reviewed the skills acquisition and skills utilization of the participants described in the 68 articles, in which evidence-based treatment was adopted for dealing with child behavior problems. Following their review, one recommendation was to develop "innovative interventions to enhance the acquisition and utilization of cognitive behavioral and parent management skills". In the context of this study, parent coaching was proven to

have the potential of such an “innovative intervention”. Few studies have considered parents’ perspectives from within coaching, but research conducted by Foster, Dunn, and Lawson ⁷² set out to understand the perceptions of coaching from mothers’ points of view. This approach was taken to bridge the knowledge gap on “the nature of the learning experience for parents”. The study involved ten one-hour one-to-one sessions with the same coach and was followed by a qualitative interview comprised of six open-ended questions. The concepts that emerged were indicative of the elements of coaching considered important by the mothers to facilitate a better understanding of themselves and their children. Foster et al. ⁷² divided the concepts into two sections: a) process of change (1 to 3) and b) the results of coaching (4 and 5). The concepts were: “(1) parent-coach relationship, (2) analysis, (3) reflection, (4) mindfulness, and (5) self-efficacy”. The results suggest the relationship between the parents and coach developed and changed due to analysis of the parents’ behavior and their reflection on the strategies that had been applied. Foster et al. ⁷² reported increased awareness and mindfulness served to raise the mothers’ self-efficacy. The literature also informs practitioners about the provision of effective coaching for parents ^{73,74}. Graham, Rodger, and Ziviani ⁴⁵ analyzed three parent-child dyads using case study methodology and reported that the benefits of coaching for parents included increased insights into child behavior, new skills gained from the expertise of the coach in combination with additional knowledge gained, and a greater sense of competence and empowerment in respect of the parent-child relationship. The study revealed parents’ self-learning and listening skills where their children were involved was enhanced, and the authors described a new awareness amongst parents of the impact of their emotional states on the behavior of the child, i.e., remaining calm in difficult situations will achieve the goal more effectively ⁴⁵. Graham et al. ⁴⁵ conducted their study in the context of an occupational therapy practice with coaching delivered in five phases as identified by Rush et al. (2003). The five phases were 1) Initiation or acceptance of coaching (the coach and coaches form a plan jointly which includes the coachee’s purpose of the coaching process); 2) Observation during and action following (the coach was present to observe 36 and gather data and the action involves the coachee practicing a new skill outside the coaching process); 3) Reflection and contemplation (the coach supports the coachee to continuously analysis the behavior and promotes ongoing new skills along with proficient existing skills); 4) Evaluation of the coaching process (the coach and coachee review how effective the coaching has been in meeting the purpose of the coaching process); and 5) Continuation of further coaching or resolution of coaching (this phase is a choice which is made after the evaluation has taken place). These five phases have also been cited as meaningful for the process of parent coaching ⁷². In conclusion, coaching within this occupational therapy context elicited positive findings regarding the achievements of children and their families, and is significant because it moves away from traditional child-focused interventions while retaining a family centered focus ⁷⁵. Parental interventions may be of more benefit than simply reducing ADHD symptoms. Tarver, Daley, and Sayal ⁷⁶ argued there was evidence of broader benefits where treatments contained a parental component, including improved parent-child relationships, which can positively affect a child’s behavior. The authors also described evidence of altered parental behavior, which may be linked to better academic and social results and even altered child neuropsychology. On balance, the evidence indicates that interventions targeting parents of children with ADHD may have a wide range of positive benefits. ⁷⁶

Conclusion

Studies related to parent-child interaction in families of children with ADHD directly effects parental functioning. Majority of these studies highlight on the interaction between mothers and their sons and indicates high level of childrearing stressors induced by the child ADHD symptoms. Normally parents of such children display high levels of over reactivity and tends to be more critical, less rewarding, and less responsive than parents of children without ADHD. Recent studies also indicates that the presence of psychiatric distress in parents of children suffering from ADHD occurs at frequent rate and it will make parent-child relationships more complicated. Prospective studies are needed to determine whether parenting behavioral training cause long-term improvements in parent behavior or ADHD-related outcomes. in sum parents can access useful treatments for their children, provide their children educational supports, and play a crucial role to prevent worsening of behavioral difficulties, which may lead to improvements during ADHD and related outcomes.

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