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Fathers with Childhood ADHD, Parenting, and their Young Children's Behavior: Offspring of the Pittsburgh ADHD Longitudinal Study (PALS)

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Abstract

Despite high heritability, no research has followed children with ADHD to parenthood to study their offspring and parenting behaviors. Given greater prevalence of ADHD in males and lack of research involving fathers, this study evaluated offspring of fathers with and without ADHD histories for ADHD and disruptive behavior and compared fathers' parenting behaviors. Male fathers (N=29) from the Pittsburgh ADHD Longitudinal Study (PALS) participated with their preschool-aged offspring. Fathers completed self-reported measures, and father-child dyads completed an interaction task. ADHD offspring had elevated ADHD symptoms and behavior dysregulation. All fathers displayed positive parenting. ADHD fathers reported lower supportive responses to their child's negative emotions than comparison fathers, yet rated their parenting as more efficacious. ADHD offspring were distinguishable as early as age 3; thus, earlier diagnosis and intervention may be feasible for this at-risk population. Future research should investigate the acceptability and efficacy of parent training for fathers with ADHD.

Keywords

ADHD; Parental ADHD; Fathers; Preschool; Parenting

Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is the most common childhood behavior disorder with an estimated worldwide prevalence of 5%¹. Individuals with ADHD often experience significant, lifelong impairment in academic achievement, employment, and social functioning^{2–5}. Moreover, impairments related to ADHD cause substantial financial burden, healthcare utilization, and familial stress, making early identification and intervention a priority^{4,6}.

Children as young as 4–6 years of age can reliably be diagnosed with ADHD, and most continue to meet full diagnostic criteria in middle childhood⁷. Moreover, preschoolers with ADHD have difficulties in behavioral, social, and academic functioning comparable to those of school-aged children with ADHD^{8,9}. Thus, it is important to fully characterize children at risk for ADHD at this young age and identify the factors that contribute to behavioral difficulties in early childhood. Despite an estimated heritability index of 0.88¹⁰, no research has prospectively followed children diagnosed with ADHD to parenthood to directly study their offspring's behavior and the parenting factors that may affect their children's behavior. Given the increased risk of developing ADHD, and bidirectional effects of ADHD symptoms on parenting and child behavior^{11,12}, offspring of parents with ADHD should be a target of increased research focus.

Interest in the role of fathers on child development and outcomes is increasing; yet, much of the literature on parenting children with ADHD has focused on mothers. For instance, mothers usually serve as the primary reporter of child symptoms and behavior^{13,14}. Even when father characteristics are ascertained in studies of children with ADHD, mothers are often the informants¹⁴. This characteristic of the literature leaves a substantial gap in knowledge about the offspring environment given the significantly higher rate at which males are diagnosed with ADHD even into adulthood⁴.

Problematic parenting – including inadequate supervision/monitoring, inconsistent discipline, low involvement, and negative parenting – has been linked to the expression of symptoms and impairment in childhood ADHD^{15–17}. Park and colleagues (2017) completed a meta-analysis of 32 studies evaluating parent ADHD symptoms and parenting behaviors. They found a preponderance of suboptimal parenting behaviors (harsh, lax, and less positive) among parents with more ADHD symptoms; however, only three studies focused specifically on fathers¹⁸. Given the central role of parenting in the treatment for ADHD in young children, it is important to consider the implications of ADHD on fathers' parenting behaviors^{10,19}.

The majority of studies examining ADHD in adulthood have relied on retrospective self-reports of individuals' ADHD symptoms instead of following individuals diagnosed in childhood longitudinally to adulthood. Importantly, self-report of ADHD symptoms and functioning often underestimates actual problems, even in adulthood^{20–22}. Likewise, when assessing parenting behaviors among adults with ADHD, self-reports may be inaccurate or inflated. Observed parenting behaviors are sometimes more predictive of child outcomes than is self-reported parenting behavior^{23,24}; thus, an objective assessment may be needed to fully assess the impact of ADHD on paternal parenting.

To fill these gaps in the literature, this exploratory study explicitly focused on the preschool-aged offspring and parenting behaviors of father participants in the Pittsburgh ADHD Longitudinal Study (PALS). Fathers were longtime participants who were originally research-diagnosed with ADHD in childhood and subsequently assessed longitudinally into adulthood. A demographically similar comparison group without childhood ADHD was also followed. We first aimed to compare the frequency of ADHD and disruptive behavior disorders (DBD) between offspring of fathers with and without childhood ADHD (Aim 1).

We hypothesized that the offspring of fathers with ADHD would have more ADHD symptoms and other DBDs than offspring of fathers without ADHD. Our second aim was to compare parenting behaviors of fathers with and without childhood ADHD. We used a multimethod approach—self-report and observer coded—to comprehensively describe paternal parenting behaviors. We hypothesized that, on average, fathers with childhood ADHD would more frequently utilize problematic discipline and less frequently utilize constructive discipline compared to fathers without ADHD. The current study represents an initial yet important effort to characterize offspring of fathers with research-quality diagnoses in childhood and parenting factors that may influence their children's functioning.

Method

Participants

The participants are from a longitudinal study of individuals with and without childhood ADHD (Pittsburgh ADHD Longitudinal Study: PALS). PALS participants with ADHD were diagnosed as children and, along with a demographically similar nonADHD comparison group, interviewed prospectively through adolescence and early adulthood. Assessments are ongoing. The diagnostic procedures used to identify participants for the PALS, and procedures for selecting the subsample of fathers and offspring for the current study, are described below. Additional details about the PALS are available elsewhere^{21,25–27}. The current study was approved by the institutional review board at the University of Pittsburgh. Fathers signed consent forms, and child participants provided assent before enrollment.

PALS ADHD group.—Participants with ADHD were diagnosed between 1987 and 1996 at a specialized university-based ADHD clinic. They participated in an 8-week summer treatment program (STP) for children with ADHD (Pelham, 1996) and were diagnosed with *DSM-III-R*²⁸ or *DSM-IV*²⁹ ADHD at a mean age of 9.4 ($SD = 2.27$, range = 5.0–16.92, 90% were ages 5–12). Exclusion criteria for follow-up included: a full-scale IQ score of less than 80; a history of seizures or other neurological problems; and/or a history of pervasive developmental disorder, schizophrenia, or other organic mental disorders such as substance-induced psychotic disorders.

PALS nonADHD group.—Participants without ADHD were recruited at the first follow-up of the probands as a nonADHD, demographically similar, comparison group for the PALS study. They were from the greater Pittsburgh area from several sources that overlapped with referral sources to the ADD Program including the STP (e.g., pediatric practices, local schools, hospital staff newsletter). Individuals who met *DSM-III-R* criteria for ADHD (presence of 8 or more symptoms reported by either the parent or the young adult), currently or historically, were excluded. Subthreshold ADHD symptoms and other psychiatric disorders were not excluded.

Subsample for the current study.—For the current study, male PALS participants with biological children ages 3–7 were recruited for participation (19 ADHD, 10 nonADHD). Fathers were excluded if they did not have contact with the biological child or if the child had been previously diagnosed with either an intellectual disability or autism spectrum

disorder. Recruitment is depicted in Figure 1. Due to the exploratory nature of the research, recruitment ended when the targeted number of participants was reached. There were no differences between the eligible participants enrolled and those not enrolled on race, marital status, or highest education. Those enrolled were more likely to have their child living in their home (86%) compared with those not enrolled (53%), $X^2=7.52(1)$, $p=0.01$. Among the PALS fathers with ADHD, there were no differences in severity of ADHD or ODD symptom for those enrolled compared to those not enrolled.

In the enrolled sample, no statistically significant differences between the fathers with childhood ADHD ($n=19$) and comparison fathers ($n=10$) were found on age ($M=32.9$; $SD=2.59$ and $M=33.7$; $SD=2.91$ respectively), ethnic or racial minority (30%), or marital status. However, 55% of the ADHD group fathers were married compared to 70% of nonADHD group fathers. As expected from the PALS³⁰, fathers with ADHD had a lower average education level than comparison fathers, who were more likely to have attended college ($t=4.92$, $p<0.001$).

Thirty offspring were recruited into this study; one pair of siblings completed the evaluation individually with the same father in the ADHD group. The sex (3:2 male to female) and ages of the ADHD group offspring versus comparison offspring did not significantly differ, although the ADHD group offspring tended to be younger ($M=5.0$; $SD=1.07$) than comparison offspring ($M=5.4$; $SD=0.68$, $t=1.043$, $p=0.31$, $[-1.00, 0.33]$, $d=0.45$).

Procedure

Self-report questionnaires completed in the home were collected electronically (Qualtrics survey software, Provo, UT). In the lab, the father participated in a diagnostic interview conducted by the first author (HMJ), a child and adolescent psychiatrist, and the father-child dyad completed an observed parent-child interaction task, the Disruptive Behavior Diagnostic Observation Schedule³¹, which was video-recorded for coding.

Measures

Offspring Diagnosis—The Disruptive Behavior Disorders Rating Scale (DBD)³² is a 45-item checklist measure of ADHD, Oppositional Defiant Disorder (ODD), and Conduct Disorder (CD) symptoms that was completed by the father; responses range from 0 (Not at All) to 3 (Very Much). Internal consistencies of the ADHD, ODD, and CD subscales for this sample (0.96, 0.93, and 0.73, respectively), as measured by Cronbach's alphas, were comparable to published reliabilities³².

The Impairment Rating Scale (IRS)³³ is a 7-item questionnaire completed by the father to assess the child's impairment. The IRS assesses six specific areas of impairment as well as overall impairment rated on a 7-point scale from 0 (no problem/definitely does not need treatment or special services) to 6 (extreme problem/definitely needs treatment or special services). The IRS has demonstrated acceptable to excellent temporal stability and a moderate to high degree of correlation with other validated parent-rated scales of impairment.

The Kiddie Schedule of Affective Disorders and Schizophrenia, Present and Lifetime (K-SADS-PL)³⁴ is a semi-structured diagnostic interview that was administered by the first author, with the fathers, to assess current and past *DSM 5* diagnoses³⁵. All participants were administered the 82-item base instrument and the 54-item diagnostic supplement for Behavior Disorders.

Offspring Observed Behavior—The Disruptive Behavior Diagnostic Observation Schedule (DB-DOS)³⁶ was used to objectively assess child behavior and paternal parenting. This study utilized the 20-minute parent-child context which has four tasks: Compliance-“Do”, Frustration, Compliance-“Don’t”, and Social Play, each designed to elicit clinically relevant behaviors in preschool-aged children. The first author (HMJ) was trained by a licensed clinical psychologist to administer the DB-DOS. Training included review of the DB-DOS manual, videotaped observations of the DB-DOS, and practice administrations. Child behaviors are coded in two domains: Problems in Anger Modulation and Problems in Behavioral Regulation. The DB-DOS assesses both quality and pervasiveness of observed behaviors to distinguish disruptive behavior symptoms from normative preschool misbehavior along a clinical continuum 0 (normative behavior), 1 (normative misbehavior), 2 (of concern), and 3 (atypical)³⁶. For analysis, Anger Modulation and Behavioral Regulation items were dichotomized as above or below the level of clinical concern. The coding was completed by an independent team of bachelor-level coders who were blind to each child’s clinical status. Initial reliability was established via 80% exact item-level agreement. Twenty percent of the contexts were randomly selected for double-coding to monitor ongoing interrater reliability (82%).

Paternal Perceived Parenting—The Parenting Sense of Competency scale (PSOC)³⁷ is a 17-item questionnaire used to assess the fathers’ satisfaction and self-efficacy regarding their parenting. The items on the PSOC scale are rated by the parent on a 6-point scale (1=Strongly Disagree, 6=Strongly Agree). Johnston and Marsh found that 16 of the 17 items loaded on two factors in a principal components analysis: 1) Satisfaction, including frustration, motivation, and anxiety; and 2) Efficacy, including competence, problem-solving ability, and capability in parenting, with internal consistencies of 0.75 and 0.76, respectively³⁹. The Cronbach’s alphas for these factors in our sample were 0.78 for Satisfaction and 0.62 for Efficacy.

The Coping with Children’s Negative Emotions Scale (CCNES)⁴⁰ was used to measure each father’s responses to his child’s negative emotions. Twelve hypothetical scenarios describing their child as upset, nervous, embarrassed, or angry are presented to the parent. For each scenario, the parent indicates whether they are very unlikely (1) to very likely (7) to respond with each of six reaction styles: Expressive Encouragement (EE), Emotion-Focused Reactions (EF), Problem-Focused Reactions (PF), Distress Reactions (DR), Punitive Reactions (PR), and Minimization Reactions (MR). The subscales are combined across scenarios to create composite scores for Supportive Reactions (EE, EF, PF) and Non-Supportive Reactions (DR, PR, MR)^{41,42}. These composite scores had excellent internal consistencies in our sample with a Cronbach’s alpha of 0.84 for Supportive Reactions and 0.91 for Non-Supportive Reactions.

Paternal Observed Parenting—The Parenting Clinical Observation Schedule (PCOS)⁴³ is an ordinal rating of the observed parent behavior from the DB-DOS from none (0) to high (3) in three domains: Responsive Involvement, Constructive Discipline, and Problematic Discipline. The PCOS has been shown to identify parenting behaviors with significant prognostic utility for predicting disruptive behavior disorders in children beyond what is predicted by parenting self-report measures⁴³. As was the case for the DB-DOS coding, the PCOS coding was completed by an independent team of trained coders who were blind to each father's clinical status. Twenty percent of the contexts were randomly selected for double-coding to monitor ongoing interrater reliability (94%).

Results

Offspring Diagnosis

To address Aim 1, we compared psychiatric diagnoses between offspring of fathers with and without childhood ADHD, including ADHD, ODD, CD, and Adjustment Disorder. A larger proportion of the ADHD group offspring met *DSM 5* criteria for ADHD, as determined by either diagnostic thresholds on the KSADS structured interview or parent report of 6 or more symptoms on the DBD plus impairment rated on the IRS. Forty percent of the ADHD group offspring ($n=8$) and 20% ($n=2$) of the nonADHD group offspring met criteria for ADHD. Thus, the odds of a child having ADHD if born to a father with childhood ADHD was 2.67 times greater than the odds of a child having ADHD if born to a father without childhood ADHD, but this difference was not statistically significant, $X^2=1.20(1)$, $p=0.27$. Another 20% ($n=4$) of the offspring of fathers with ADHD, and none of nonADHD group offspring, were subthreshold (4 or 5 symptoms) for ADHD.

When examined dimensionally, the mean number of ADHD symptoms was higher, in offspring of fathers with, compared to without, ADHD, with a trend towards significance ($M_{ADHD}=6.45$, $SD_{ADHD}=5.24$; $M_{NonADHD}=3.10$, $SD_{Non-ADHD}=4.12$) $t=1.91(28)$, $p=0.07$, $[-0.28, 6.98]$, (Figure 2). The effect size was large, $d=0.71$.

Only the offspring of fathers with ADHD met criteria for comorbid psychiatric disorders including ODD (25%, $n=5$), CD (10%, $n=2$), and Adjustment Disorder (5%, $n=1$). The mean symptom scores for ODD were significantly different between the groups, such that offspring of fathers with ADHD had more symptoms ($M_{ADHD}=2.25$, $SD_{ADHD}=2.57$; $M_{NonADHD}=0.30$, $SD_{Non-ADHD}=0.95$) $t=2.30(28)$, $p=0.03$, $[0.22, 3.69]$, $d=1.01$. Both groups of offspring were low on CD symptoms without a significant difference between the groups ($M_{ADHD}=0.70$, $SD_{ADHD}=1.17$; $M_{NonADHD}=0.10$, $SD_{Non-ADHD}=0.32$) $t=1.58(28)$, $p=0.13$, $[-0.18, 1.38]$, $d=0.70$.

Offspring Observed Behavior

The number of children rated as exhibiting clinically concerning anger modulation did not differ between groups (ADHD group offspring: 44%, $n=8$; comparison offspring: 30%, $n=3$), $X^2=0.56(1)$, $p=0.45$, odds ratio (OR)=1.87. However, ADHD group offspring were significantly more likely to have clinically concerning behavior regulation (67%, $n=12$) compared to children of fathers without ADHD (20%, $n=2$), $X^2=5.6(1)$, $p=0.02$, OR=8.00.

Given that offspring of ADHD fathers were both more likely to have ADHD symptoms and greater behavior dysregulation, we directly tested the overlap between reported and observed behaviors. The association between subthreshold or full symptoms of ADHD and clinically concerning behavior regulation was marginally significant ($X^2=3.59(1)$, $p=0.06$).

Paternal Perceived Parenting

To address Aim 2, we examined group differences in fathers' self-rated parenting on the PSOC. Satisfaction was high without significant or meaningful differences between the two groups ($M_{ADHD}=4.89$, $SD_{ADHD}=0.62$; $M_{NonADHD}=5.07$, $SD_{Non-ADHD}=0.96$), $t=-0.62(28)$, $p=0.54$, $[-0.77, 0.41]$, $d=0.22$. The group difference in self-reported *efficacy* of parenting, however, was marginally significant with a medium effect size: proband fathers reported greater efficacy ($M=4.79$, $SD=0.75$) than comparison fathers ($M=4.39$, $SD=0.38$), $t=1.93(28)$, $p=0.06$, $[-0.02, 0.82]$, $d=0.67$.

On the CCNES, fathers with ADHD rated themselves marginally less likely to respond to their child's negative emotions with a supportive reaction ($M=5.27$, $SD=0.65$) than fathers without ADHD ($M=5.72$, $SD=0.63$), $t=-1.80(28)$, $p=0.08$, $[-0.96, 0.06]$, $d=0.70$ (Table 1). All fathers reported low likelihood of responding to their child's negative emotions with non-supportive reactions ($M_{ADHD}=2.94$, $SD=0.71$; $M=2.70$, $SD=0.46$) $t=1.15(28)$, $p=0.26$, $[-0.19, 0.64]$, $d=0.41$. Summary statistics for each of the supportive and non-supportive CCNES subscales are provided in Table 1.

Paternal Observed Behavior

Finally, we compared ADHD and nonADHD fathers' observed parenting during the parent-child interaction task. There were no statistically significant group differences and little variability in scores. All fathers were rated moderate to high on constructive discipline ($M_{ADHD}=2.53$, $SD_{ADHD}=0.19$, $M_{NonADHD}=2.50$, $SD_{NonADHD}=0.00$), $t=0.62(28)$, $p=0.54$, $[-0.10, 0.15]$. There was almost no problematic discipline, ($M_{ADHD}=0.06$, $SD_{ADHD}=0.09$, $M_{NonADHD}=0.06$, $SD_{NonADHD}=0.18$), $t=0.13(28)$, $p=0.90$, $[-0.68, 0.28]$. There was somewhat more variability in responsive involvement (Table 2), ($M_{ADHD}=1.80$, $SD_{ADHD}=0.66$, $M_{NonADHD}=2.00$, $SD_{NonADHD}=0.45$), $t=0.94(28)$, $p=0.34$, $[-0.13, 0.14]$.

Discussion

In this novel, exploratory study, we found several trends suggesting that preschool-aged offspring of fathers with research-quality diagnoses of ADHD in childhood have increased risk for ADHD, ODD, and other disruptive behaviors. We did not find significantly more diagnosable ADHD among these young offspring (40% vs. 20%). However, when combined with cases subthreshold for the diagnosis, 60% of the ADHD group offspring had potentially clinically meaningful symptoms as compared to 20% of the non-ADHD group offspring. This difference was statistically significant. Offspring of fathers with ADHD had significantly more ODD symptoms than offspring of fathers without ADHD. Both groups of offspring had low CD symptoms without significant differences between the groups. Observer ratings of offspring behavior provided corroborating evidence that young children of fathers with childhood ADHD have greater difficulty with behavioral regulation. Overall,

all fathers engaged in positive parenting as rated by objective observers, with no significant differences between fathers with and without childhood ADHD. Similarly, all fathers reported high satisfaction with their own parenting. Interestingly, however, the ADHD group reported both greater efficacy in parenting and lower likelihood to respond to their child's negative emotions with a supportive reaction; both were marginally significant findings.

Offspring at familial risk for ADHD had greater ODD symptoms and observed difficulty with behavior regulation, which could be explained by shared genetic risk factors between these two highly comorbid disorders^{45,46}. Alternatively, poor behavior regulation and the development of ODD in the offspring of fathers with childhood ADHD could reflect impairments in early parenting when the neurobiological underpinnings of self-regulation develops among infants and toddlers^{47,48}. Fathers with ADHD struggle with behavior regulation themselves and may therefore have difficulty modeling positive behavior regulation for their preschool-aged children¹². This potential dyadic mechanism of the link between fathers' ADHD and their offspring's ODD and behavior dysregulation represents an area for future exploration.

Given that more offspring of fathers with ADHD had observed problematic behavior regulation than met full diagnostic criteria for ADHD, it is possible that the number of children diagnosed with ADHD will increase as the children age into structured educational environments where clinical symptom levels are most likely to be observed. Moreover, increasing inattention symptoms alongside stable hyperactivity-impulsivity symptoms, typical for preschoolers, may nudge several children in the current sample over the diagnostic threshold in the coming years, exacerbating this group difference⁴⁴. All children who were subthreshold for ADHD (4 or 5 symptoms) were offspring of fathers with ADHD and under 5 years of age; therefore, even more offspring may meet diagnostic criteria at age 5 or older. In any case, these preliminary data show a clear pattern of increased risk for ADHD symptoms and DBDs more generally among children of fathers with childhood ADHD. The cross-sectional design does not allow for assessment of stability of children's ADHD and DBD diagnoses. Therefore, future longitudinal studies will critically add to these findings by evaluating the predictive validity of preschool-aged diagnoses in offspring at risk for ADHD.

Despite significantly greater clinically concerning behavior regulation among offspring of fathers with ADHD, all observed interactions of fathers with their children were rated as largely positive without group differences. Therefore, the behavior dysregulation of these young children at familial risk for ADHD may reflect the biological underpinnings of ADHD. Alternatively, the observed positive parenting behaviors may in part reflect demand characteristics of the lab-based interaction task and may not generalize to the home environment in which parenting and discipline typically occur. This explanation is potentially supported by the differences between the two groups on self-reported parenting behaviors such that ADHD fathers reported a lower likelihood to respond with a supportive reaction to their child's negative emotions. Yet, these results suggest that fathers with childhood ADHD are able to engage in parenting behaviors that optimize the behavior of their children. This finding implies that fathers with ADHD may be equally capable of learning and implementing the positive parenting skills targeted in behavioral parenting

interventions as fathers without ADHD. Indeed, parent management training is well established as efficacious in improving behaviors in children as young as 4, making it a first-line treatment for preschool-aged children^{49,50}. However, a review of the literature found that mothers are the primary participants in parenting interventions for children with ADHD, and only 13% of studies reported on father outcomes⁵¹. Fabiano and colleagues (2009) conducted the first fathers-only study of parenting management training for children with ADHD by randomizing fathers to either standard parent management training or a program that includes sports skills training. Fathers in the alternative training program had greater attendance and participation, and they reported higher satisfaction⁵². Additional research is needed to determine whether alternative therapy designs may appeal to fathers and improve engagement in parent training.

Interestingly, fathers with childhood ADHD rated themselves as *more* efficacious parents than fathers without ADHD and just as satisfied with their parenting, despite demonstrating equally positive parenting behaviors as rated by objective observers; thus, it is possible that fathers with ADHD may even view parent management training as unnecessary and be less likely to participate. There is strong evidence that individuals with ADHD are prone to positive bias, rating their symptoms and functioning as more adaptive than do other informants^{22,53}. This bias may be represented in the fathers' high ratings of parenting efficacy. If so, it has potential implications for enrollment and participation in parent management training, the treatment of choice for preschool-aged children with ADHD and other DBDs. More specifically, fathers who may benefit most from parent management training (those with children with ADHD) may be less motivated to engage given their self-enhancing views of their parenting skills. Future research should examine whether ADHD interferes with the acceptability or effectiveness of parent management training among fathers.

The parenting responsibilities associated with traditional gender roles may also contribute to the more positive parenting efficacy perceived by fathers with ADHD. For instance, mothers often take on the role of primary caregiver, including routine parenting responsibilities that may involve more challenging parent-child interactions (e.g., meals, bedtime, errands), whereas fathers may be involved in responsibilities that tend to require less frequent discipline⁵⁴. Such a separation of parenting roles may protect fathers' ADHD symptoms from impairing their parenting efficacy. This potential process could be pronounced when fathers with ADHD take on parenting tasks that explicitly capitalize on their strengths, such as play activities, accentuating their perceived parenting efficacy. Moreover, parents affected by ADHD disproportionately live in separate households and their children spend more time with their mothers⁵⁵, which may accentuate mothers' roles as primary caregivers and fathers' perceived parenting efficacy.

The findings from this preliminary study should be considered in light of its limitations including the small sample size, which may have masked effects due to low power. We emphasize effect sizes to highlight the most robust findings, but several *p*-values were slightly above .05. These results may become statistically significant in a larger sample. Additionally, these fathers are participants in a longitudinal study of ADHD that was ascertained through research clinic-based diagnosis. Therefore, it is unclear whether or not

the findings would translate to populations of individuals diagnosed with ADHD in adulthood or to populations of adults with ADHD ascertained outside of the clinic referral process. Additionally, this sample was selected based on childhood diagnosis of ADHD as opposed to current ADHD symptoms. This stratification is reasonable given that the sample was comprehensively diagnosed in childhood and adults with childhood ADHD continue to have impairment into adulthood and underreport their own symptoms of ADHD^{5,21,56}. However, it is possible that fathers who have highly persistent ADHD symptoms would have greater impairment in their parenting behaviors. Due to the sample size, we were unable to evaluate the impact of fathers' symptom severity on parenting or child behaviors.

Future research should investigate the feasibility and utility of screening for ADHD even earlier in childhood, prior to the preschool years, as well as the stability of the diagnosis into middle childhood. Identification of reliable early indicators of ADHD is critical to develop and test interventions that effectively prevent and reduce ADHD symptoms and that improve functioning.

Findings from this preliminary study suggest that children of fathers with childhood ADHD are already at greater risk for ADHD symptoms and disruptive and dysregulated behaviors by the preschool years. An increasing focus by parents, clinicians, and policymakers on early intervention for a range of developmental disabilities underscores the importance of identifying young children at risk for ADHD in order to implement effective early interventions. In light of ADHD fathers' positive observed parenting behaviors and high self-ratings of parenting efficacy, future research should investigate the extent to which fathers engage in and benefit from parent management interventions to help improve the behavior of their children with ADHD.

Summary

Greater ADHD symptoms and disruptive behaviors were evident even amongst the youngest offspring of fathers with ADHD compared to offspring of fathers without ADHD. This finding suggests that children at risk for ADHD may be identified as early as age 3, and potentially in the first couple of years of life before skills necessary for academic success are learned. If reliable indicators of risk for developing ADHD can be identified by this age, or even earlier before skills necessary for academic success are learned, then early intervention may be efficacious in decreasing the life-long impairments associated with ADHD. Parent training is known to be effective for ADHD symptoms in childhood, but most of the research to date has included mothers only. Less is known about fathers' parenting behaviors or response to parent training. This study found that fathers with childhood ADHD reported lower likelihood of supportive responses to their child's negative emotions than comparison fathers, yet rated their parenting as more efficacious. Fathers with childhood ADHD may benefit from parent training, particularly as their children age and their behavior has the potential to become more disruptive. Future research should investigate the acceptability and efficacy of parent training for fathers with ADHD.

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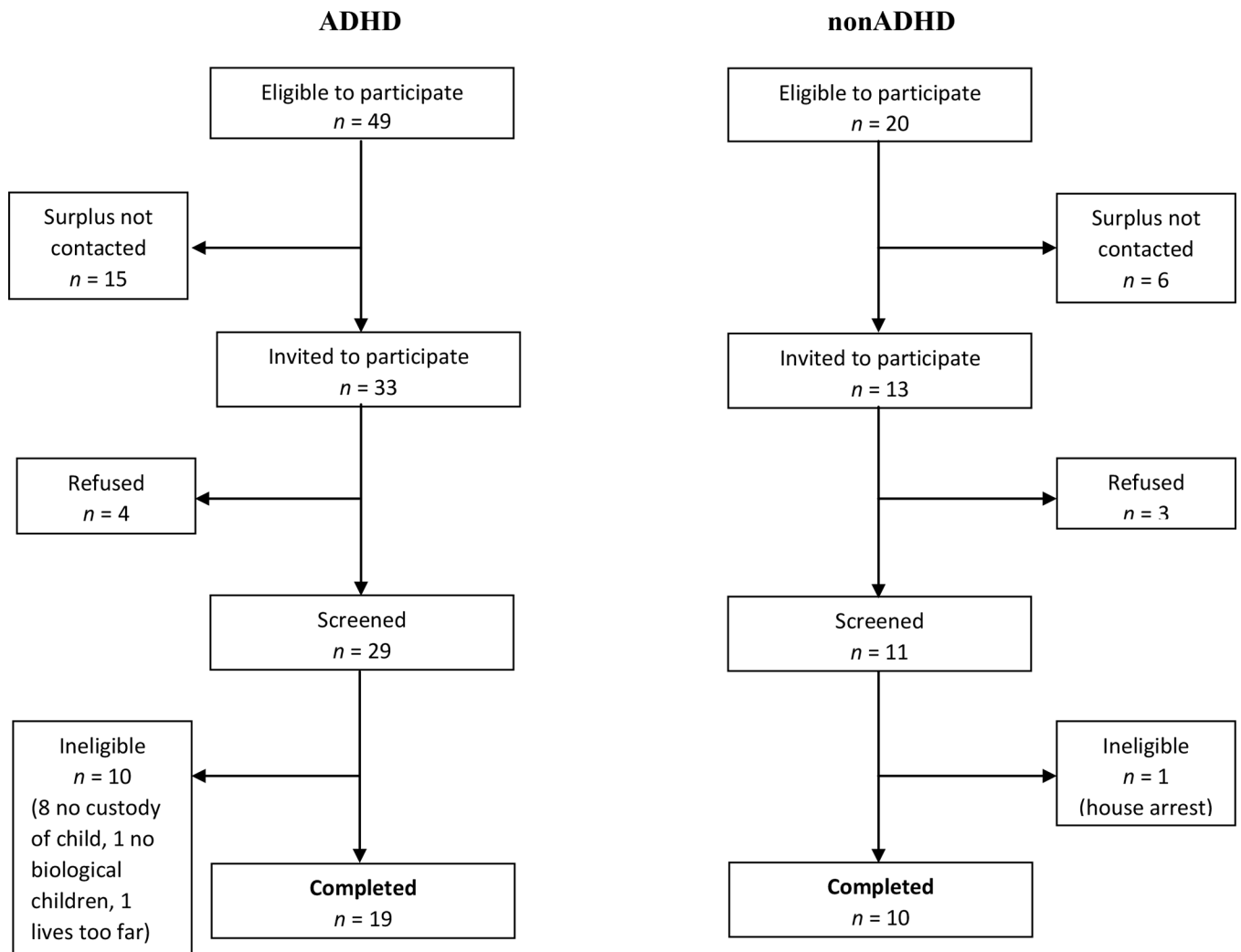


Figure 1.
Participant flow throughout the study.

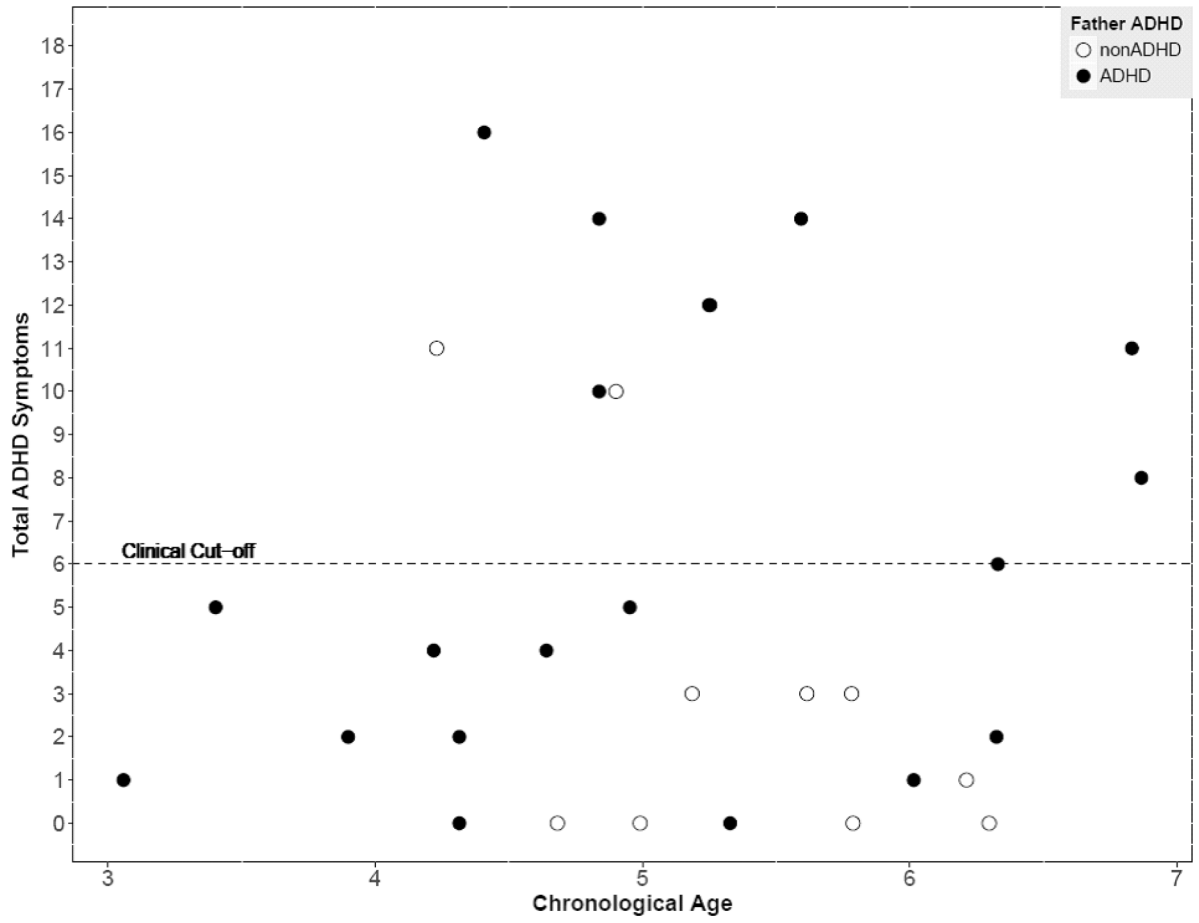


Figure 2.
Child ADHD symptom count by age.

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Table 1:

Father Responses to Coping with Children's Negative Emotion Scale (CCNES) Subscales by ADHD Group

Subscale	ADHD (N = 20)		nonADHD (N = 10)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Supportive Reactions				
Expressive Encouragement	4.69	.84	5.18	.85
Emotion-Focused Reaction	5.53	.76	5.94	.64
Problem-Focused Reaction	5.58	.69	6.03	.73
Non-Supportive Reactions				
Punitive Reaction	2.65	.87	2.35	.60
Minimization Reaction	3.55	.88	3.26	.65
Distress Reaction	2.63	.85	2.48	.72

Note: CCNES subscales are on a 7-point Likert scale (1 = very unlikely; 7 = very likely).

None of the ADHD group comparisons attained statistical significance at $p < .05$.

Table 2:

Observer Ratings of Father Parenting Behaviors on the Responsive Involvement Subscale of the Parenting Clinical Observation Schedule (PCOS)

Item	ADHD (N = 18)		nonADHD (N = 10)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Scaffolding	2.28	.67	2.70	.48
Response to Positive Behaviors	1.67	.97	2.00	1.05
Warm Affection	1.28	1.13	.70	.95
Positive Engagement	2.33	.77	2.70	.48
Labeling	.89	.83	1.00	.82
Intensity of Positive Affect	2.11	.83	2.40	.52
Pervasiveness of Positive Affect	2.06	.94	2.50	.71

Note: Fathers' parenting behaviors on the PCOS Responsive Involvement items were coded on an ordinal scale ranging from 0 (none) to 3 (high).

None of the ADHD group comparisons attained statistical significance at $p < .05$.