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Pathways to parental anxiety: effect of coping strategies for disruptive behaviors in children with attention deficit-hyperactivity disorder

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Abstract

Background: Disruptive behaviors are commonly found in children with attention deficit-hyperactivity disorder (ADHD) and affect the mental health of parents. However, a study of the direct and indirect effects between disruptive behaviors in children with ADHD and parental anxiety and coping strategies is apparently lacking.

Objective: To examine the direct and indirect relationship between disruptive behaviors in children with ADHD and parental anxiety and coping strategies as a mediator.

Method: A cross-sectional study was conducted at King Chulalongkorn Memorial Hospital, Thailand between March 2015 and January 2016. Participants comprised 200 parents whose children were diagnosed with ADHD by physicians. Participants completed questionnaires regarding sociodemographic characteristics including The Thai Hospital Anxiety and Depression Scale, The Swanson, Nolan and Pelham (SNAP-IV): parent form (Thai version), and The Coping Scale Questionnaire (Thai version).

Results: The direct path between disruptive behaviors and anxiety was significant ($b = 0.21$, $P = 0.002$). Moreover, a significant indirect path was found between disruptive behaviors and coping behavior with escape–avoidance ($\beta = 0.20$, $P = 0.005$), and an indirect path was found between escape–avoidance and anxiety ($b = 0.31$, $P < 0.001$).

Conclusions: Health care professionals should evaluate the use of coping strategies by parents of children with ADHD and encourage the parents to use a positive strategy for coping with the disruptive behaviors of their children.

Keywords: attention deficit disorder with hyperactivity; disruptive behavior; parental anxiety

Attention deficit-hyperactivity disorder (ADHD) is one of the most common neurodevelopmental disabilities, characterized by disruptive behaviors such as hyperactivity, inattention, impulse control, and behavioral disinhibition [1, 2]. Parents of children with neurodevelopmental disorders are at risk for parental stress and mental health problems [3–5]. Children with ADHD have lower adaptive function and interpersonal relationship problems with peers, siblings, and parents that

result in symptoms of anxiety or depression in parents [6–9]. Several factors that influence parental anxiety include parental education, financial stressors, socioeconomic status, social support, spousal support, and coping strategies used to face stressful situations [10, 11].

Coping strategies can be defined as the adaptation of an individual to stressful events or situations involving cognitive, emotional, and behavioral efforts intended to reduce stress and

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manage negative emotions [12]. There are 2 types of coping strategies: (1) adaptive coping methods including information seeking and (2) problem-solving and palliative-coping methods such as denial or escape-avoidance [13]. Palliative or poor coping strategies used by the mother or father of children with ADHD may lead to increased anxiety [14, 15].

Several studies show that disruptive behaviors in children with ADHD negatively impact parental mental health. However, a study of the direct and indirect relationship between disruptive behaviors in children with ADHD and parental anxiety by coping strategies as a mediator is apparently lacking. We hypothesized that disruptive behaviors in children with ADHD should directly affect parental anxiety, that coping strategies would mediate the association between disruptive behaviors in children with ADHD and parental anxiety, and that coping strategies with escape-avoidance are associated with increased parental anxiety.

Materials and methods

A cross-sectional study was conducted between February 2015 and January 2016 at King Chulalongkorn Memorial Hospital, a public general and tertiary referral teaching hospital with approximately 1,500 beds in Bangkok, Thailand. We selected 200 participants purposively based on inclusion and exclusion criteria. The inclusion criteria for the participants (who were parents or primary carers) were that parenting time with their child must be more than 12 h per day, their child was diagnosed with ADHD by a child psychiatrist, and their willingness to participate in our study. The exclusion criteria were children with ADHD and a comorbidity of autism, intellectual disabilities, and conduct disorder. This study was approved by the Ethics Committee and Institution Review Board of the Faculty of Medicine, Chulalongkorn University (approval No. 042/2015) following the principles of the Declaration of Helsinki and its contemporary amendments. All participants provided their written informed consent to participate in our study.

All participants responded to questions in self-rating questionnaires about their sociodemographic factors including sex, age, education, employment, financial difficulties or inadequate income, number of children and relationship to the child, and information about the child including its medical history. The Swanson, Nolan and Pelham (SNAP-IV): parent form (Thai Version) is composed of 24 items (each item score 0–3) related to disruptive behaviors of the child with ADHD, including inattentive, hyperactive-impulsive, and oppositional defiant subtypes. The SNAP-IV: parent form (Thai version) has shown good internal consistency with a Cronbach's α

coefficient of 0.93–0.96 [16]. The Thai Hospital Anxiety and Depression Scale (The Thai-HADS) is composed of 14 items (each item score 0–3) related to depressive symptoms and 7 items related to anxiety symptoms [17–19]. We used 7 items of the anxiety subscale to evaluate parental anxiety. A cutoff point of ≥ 11 on the anxiety subscale was interpreted as a clinical anxiety. The sensitivity of anxiety subscale of the Thai HADS was 100%, while the specificity was 86.0% for anxiety. The anxiety subscale also showed good internal consistencies with a Cronbach's α coefficient of 0.85. The Coping Scale Questionnaire [20, 21] was adapted from the coping strategies questionnaire into Thai [22] to evaluate parental coping strategies when dealing with a recent difficult situation. The questionnaire consists of 56 items in 3 dimensions of coping strategies regarding planful problem solving, seeking of social support, and escape-avoidance. Each item was scored on a 5-point Likert-like scale. The highest score in 1 of the 3 dimensions indicated the preferred coping style. The reliability of the Thai version of the coping scale had good internal consistency with a Cronbach's α coefficient of 0.90. To control information and recall bias regarding a child's disruptive behavior, parental anxiety, and parental coping strategies, participants responded to all questions using their experience within the previous month.

Statistical analysis

Categorical data were analyzed using descriptive statistics including frequency and percentages. The mean and standard deviation (SD) were used to describe these continuous variables. A bivariate analysis of the association between child disruptive behaviors, coping strategies, anxiety, and depression was conducted with a Pearson product-moment correlation coefficient using IBM SPSS Statistics for Windows (version 22.0). Structural equation modeling (SEM) path analysis was used to examine the direct and indirect effects of association within our hypothesized model. The maximum likelihood estimates of the model coefficients were obtained using AMOS (version 22.0). All acceptable models of fit included χ^2 goodness-of-fit tests with $P < 0.05$ indicating significance, comparative fit indices (CFI) ≥ 0.90 , and root-mean-square error of approximation (RMSEA) < 0.05 [23].

Results

The sociodemographic characteristics of the sample of 200 parents and their children are presented in **Table 1**. Most participants (84.0%) were women aged between 26 and 70 years

Table 1. Sociodemographic characteristics for parent and child (N = 200)

Parent	n (%)	Child	n (%)
Relationship to child		Sex	
Mother	168 (84.0)	Male	158 (79.0)
Age (mean: SD)	43.4: 7.76	Age (Mean: SD)	11.2: 2.8
Education		Education	
Primary school	8 (9.0)	Junior primary school	52 (26.0)
Secondary school	25 (12.5)	Senior primary school	63 (31.5)
College graduate	34 (17.0)	Junior high school	65 (32.5)
Bachelor's degree or higher	123 (61.5)	Senior high school	20 (10.0)
Employment		Taking psychostimulant medication for ADHD	185 (92.5)
Unemployed	10 (5.0)	Drug holiday from psychostimulant medication	120 (60.0)
Employee	86 (43.0)	Duration (years) of treatment (Median: IQR)	3.63: 4.5
Own business	66 (33.0)	Number of disruptive behaviors (Mean: SD); Range 1.23: 1.11; 0–3	
Government and state enterprise	38 (19.0)	Multiple symptoms of disruptive behaviors	
Adequate income	152 (76.6)	Inattention	79 (39.5)
Number of children (Mean: SD); Range 1.89: 0.81; 1–5		Hyperactivity–impulsivity	84 (42.0)
Anxiety	41 (20.5)	Oppositional defiant behaviors	84 (42.0)
Coping strategies (Mean: SD)			
Escape–avoidance 2.34: 0.57			
Seeking of social support	2.99: 0.81		
Planful problem solving	3.63: 0.51		

IQR, interquartile range; SD, standard deviation

(mean [SD] = 43.43 [7.76]). Most of the participating parents hold a bachelor's degree or higher, and most are employed. About three-quarters of the participants reported an adequate income. The participants had from 1 to 5 children. The prevalence of anxiety among parents of children with ADHD was 20.5%. A comparison of the most frequent coping strategies shows that the mean for the planful problem-solving strategy was higher than the mean for the seeking social support strategy and escape–avoidance strategy.

An examination of the demographic factors of children with ADHD shows that most were boys and that the average age of all children was 11 years. The education level of the children ranged from junior primary school to senior high school. Almost all children were taking psychostimulant medication and 60% were allowed drug holidays from medication by physicians. The recent disruptive behaviors of each child reported by parents using SNAP-IV ranged from 0 to 3 symptoms. The multiple dimensions of disruptive behaviors among children were found to be inattention, hyperactivity–impulsivity, and oppositional defiant behaviors (Table 1).

We found multicollinearity between each type of disruptive behaviors (inattention, hyperactivity–impulsivity, and oppositional defiant behaviors). All types of disruptive behaviors were positively correlated with parental anxiety. Inattention was positively correlated with the seeking of social support for coping, while hyperactivity–impulsivity and oppositional defiant behaviors were positively correlated with the escape–avoidance coping strategy (Table 2).

Before conducting a structural equation model with path analysis, the association between the sociodemographic variables and anxiety was explored—we found no significant association.

Structural equation model: path analysis: The results of association between child behavior and parental anxiety, and coping strategies as mediators in the pathways of these associations are shown in Figures 1 and 2.

Model 1 (Figure 1) indicates an acceptable model fit with a χ^2 test result of 0.05 ($P = 0.82$), a GFI of 0.99, a CFI of 0.99, and a RMSEA of 0.01. Although the overall test indicates a good fit, significant direct paths were not found between inattention and anxiety ($\beta = 0.09$, $P = 0.28$),

Table 2. Bivariate correlations between disruptive behaviors, coping strategies, and parental anxiety

	1	2	3	4	5	6	7
Inattention	1						
Hyperactivity–impulsivity	$r = 0.50$ $P < 0.001$	1					
Oppositional defiant	$r = 0.53$ $P < 0.001$	$r = 0.45$ $P < 0.001$	1				
Escape–avoidance	$r = 0.13$ $P = 0.07$	$r = 0.15$ $P = 0.037$	$r = 0.20$ $P = 0.005$	1			
Seeking social support	$r = 0.19$ $P = 0.007$	$r = 0.00$ $P = 0.996$	$r = 0.08$ $P = 0.242$	$r = 0.21$ $P = 0.002$	1		
Planful problem solving	$r = 0.08$ $P = 0.28$	$r = -0.06$ $P = 0.379$	$r = -0.004$ $P = 0.954$	$r = 0.01$ $P = 0.884$	$r = 0.41$ $P < 0.001$	1	
Anxiety	$r = 0.20$ $P = 0.004$	$r = 0.17$ $P = 0.015$	$r = 0.26$ $P < 0.001$	$r = 0.33$ $P < 0.001$	$r = 0.03$ $P = 0.644$	$r = 0.03$ $P = 0.717$	1

Figure 1. Coping strategies as mediators of inattention, hyperactivity–impulsivity, and oppositional defiant behaviors and anxiety ($\chi^2 = 0.05$, $P = 0.82$, GFI = 0.99, CFI = 0.99, RMSEA = 0.01). Paths with solid lines and numbers in bold are significant ($P < 0.05$). All path coefficients are standardized

hyperactivity–impulsivity and anxiety ($\beta = 0.02$, $P = 0.82$), and oppositional defiant behaviors and anxiety ($\beta = 0.15$, $P = 0.06$). The effects of multicollinearity between disruptive behaviors were determined as: inattention and hyperactivity–impulsivity ($\beta = 0.50$, $P < 0.001$), inattention and oppositional defiant behaviors ($\beta = 0.53$, $P < 0.001$), and hyperactivity–impulsivity and oppositional defiant behaviors ($\beta = 0.45$, $P < 0.001$). However, the indirect paths indicate that inattention significantly contributed to greater seeking of social support ($\beta = 0.19$, $P = 0.01$), and coping with escape–avoidance is related to an increasing anxiety level. We also found an indirect path for the coping strategies association:

coping with escape–avoidance leads to greater seeking of social support ($\beta = 0.20$, $P = 0.001$), and planful problem-solving coping relates to greater seeking of social support ($\beta = 0.39$, $P = 0.001$).

In model 2 (**Figure 2**), we combined inattention, hyperactivity–impulsivity, and oppositional defiant behaviors scores to disruptive behavior scores. This final model has an acceptable model fit with a χ^2 test result of 0.23 ($P = 0.88$), with GFI of 1.00, CFI of 1.00, and the RMSEA of 0.00. The direct path between disruptive behaviors and anxiety is significant ($\beta = 0.21$, $P = 0.002$). Moreover, significant indirect paths between disruptive behaviors and coping with

Figure 2. Final model of disruptive behaviors and coping strategies as mediators of anxiety ($\chi^2 = 0.23$, $P = 0.88$, CFI = 1.00, GFI = 1.00, RMSEA = 0.00). Paths with solid lines and numbers in bold are statistically significant ($P < 0.05$). Numbers in paths present the standardized regression coefficients

escape–avoidance ($\beta = 0.20$, $P = 0.005$) and indirect paths between escape–avoidance and anxiety ($\beta = 0.31$, $P < 0.001$) were found. Similarly, indirect paths between coping strategies were found for model 1. Specifically, coping with escape–avoidance relates to greater seeking of social support ($\beta = 0.20$, $P = 0.002$) and planful problem-solving coping relates to increased seeking for social support ($\beta = 0.41$, $P < 0.001$).

Discussion

The present study examined pathways to parental anxiety related to coping strategies for disruptive behaviors in children with ADHD using a structural equation model. The hypothesized model was based on the reviewed literature, which indicated disruptive behaviors directly influence parental anxiety. Our initial findings support this hypothesis and indicate that disruptive behaviors of a child with ADHD should have a direct effect on parental anxiety. Increased inattention, hyperactivity–impulsivity, and oppositional defiant behavior scores were associated with an increase in parental anxiety. Others have found that the severity of a child’s ADHD symptoms is associated with an increase in maternal and parental stress [6, 24]. We found that a child’s oppositional defiant traits have a stronger association with parental anxiety than a child’s ADHD symptoms. This finding is consistent with that of previous studies that found that oppositional defiant, aggressive, and externalizing behaviors have often been found to be a stronger predictor of parental stress, anxiety, and depression than a child’s ADHD symptoms [6, 25, 26]. This finding may have been influenced by the

effects of ADHD psychostimulant medication on the children with ADHD—the medication may have reduced their inattentive and hyperactivity–impulsivity symptoms. As a high proportion of children with ADHD have co-occurring disorders, inattention, hyperactivity–impulsivity, and oppositional defiant behavior scores were combined into a “disruptive behavior” score, which was directly associated with the parental anxiety.

Our second hypothesis is based on Lazarus and Folkman’s theoretical perspective on psychological stress and coping [12] that coping strategies mediate between stressful events and psychological outcomes. As predicted, escape–avoidance coping mediated the association between disruptive behaviors among children with ADHD and parental anxiety, while coping with seeking for social support and planful problem solving found no significant association with parental anxiety in our study.

Our findings are consistent with Lazarus and Folkman’s theory [12] that escape–avoidance is an attempt to regulate negative emotions or distress when an individual perceives stressors as essential and unsolvable; consequently, this may cause mental health problems. This may reflect the findings that our participants are strained in dealing with their child’s disruptive behaviors and use coping with escape–avoidance to reduce their stress. However, escape–avoidance has frequently been linked to the progression of anxiety level [15]. We also found significant correlations between coping with escape–avoidance and seeking of social support, and between coping with planful problem solving and seeking of social support. This suggests that parents with anxiety try to find other positive coping strategies to diminish their distress.

There were some limitations to our study. We used only a parent report of SNAP-IV that might overestimate child's disruptive behaviors. We used a cross-sectional study that may not detect changes of anxiety level over time. Further prospective studies should be considered, and other psychological symptoms of children with ADHD and their parents should be evaluated.

Conclusions

It may be helpful for health care professionals to evaluate the use of coping strategies of parents with children who have ADHD and to encourage them to use playful problem solving to cope with the stress. Helping parents connect with a support network or offering them participation in a parenting support group may be a positive strategy to help them cope with the disruptive behaviors of their child with ADHD.

Author contributions. NB contributed substantially to the conception and design of this study. NP and AU collected, analyzed, and interpreted the data. NB drafted the manuscript, and NP and AU critical revised it. All authors approved the final version of the manuscript submitted and take responsibility for statements made in the published article.

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Conflicts of interest statement. The authors have each completed and submitted an International Committee of Medical Journal Editors Uniform Disclosure Form for Potential Conflicts of Interest. Neither of the authors has any potential conflicts of interest to disclose.

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