




Effects of Parental-Group Intervention on Parents' Growth Mindset and Behaviors of Children with Attention Deficit Hyperactivity Disorder

Adidsuda Fuengfoo^{1,2}  Rawiwan Poonsawat² Sija Leelathanaporn²
Thanyaporn Mekrungharas^{1,2}

¹Rangsit University, Bangkok, Thailand

²Department of Pediatrics, Queen Sirikit National Institute of Child Health, Bangkok, Thailand

Address for correspondence Adidsuda Fuengfoo, MD, Queen Sirikit National Institute of Child Health, 420/8 Rajawithi Road, Ratchathewi, Bangkok 10400, Thailand (e-mail: dr_adidsuda@yahoo.com).

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Abstract

Attention deficit hyperactivity disorder (ADHD) is the most common developmental disorder among school-aged children. A multimodal treatment approach is the most effective approach for ADHD children. Parent intervention group activities help parents with ADHD children develop a good mindset toward their child and help develop skills to design appropriate parenting strategies. Our objective was to study the effect of growth mindset activities on reducing behavioral problems of ADHD children and factors associated with stress among parents of children with ADHD. A randomized controlled trial was conducted and parents of ADHD children aged 7 to 15 years were divided into the experimental and the control groups. The experimental group participated in mindset and communication intervention activities for 3 hours each, while the control group received only initial knowledge and guidance. Baseline data were collected in the beginning of the trial and at 2 and 6 months after starting the trial. Fifty parents with a mean age of 40.14 ± 8.28 years were divided into two groups. After 6 months, the mean mindset scores of the experimental group were statistically significantly higher than those of the control group (p -value = 0.014) and the impulsiveness score decreased by 2.46 ± 1.19 points (p -value = 0.05). The associated factors affecting parenting stress are their own mindset and their child's rebellious behavior. Parent intervention group activities help adjusting parents' mindsets and reduce impulsive behavior in children at 6 months of the trial. A child's rebellious behavior is the best predictor of parental stress, followed by the parents mindset.

Keywords

- ▶ ADHD
- ▶ growth mindset
- ▶ stress
- ▶ parent intervention group activities

Introduction

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder which is commonly found in child populations around the world. Centers for Disease Control and Prevention, United States, reported that the number of children aged between 4 and 17 years diagnosed with ADHD

increased from 7.8% in 2003 to 9.5% in 2007 to 11% in 2011¹. In 2012, the prevalence rate of ADHD in Thailand in 8 to 11 years of school-age children was 8.12%. Children² who are diagnosed with ADHD at the age prior to 12 years could cause parental depression and stress, which affect family relationship, problems in school, and increase child care expenses.^{3–6}

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Raising children with ADHD can be challenging. Parents who are unable to adjust themselves are more likely to experience stress and develop fixed mindset toward themselves and their child. Previous studies have indicated that parents of children with ADHD had significant parenting stress,^{7,8} and parenting stress⁹ may affect the parents-child relationship. Additionally, stressful parents¹⁰ of ADHD children are more likely to use an authoritarian parenting style and violent and inappropriate punishment, which declines academic performance.

Stress among parents of ADHD children includes following factors: (1) severity of ADHD symptoms: behavioral/emotional problems, management abilities, and physical conditions. A study found that behavioral problems of ADHD children have positive correlations to parenting stress.^{7,11} (2) Parents of ADHD children: (a) psychological and social support have inverse correlations to parenting stress.⁷ Parents with high social support tend to have lower stress. (3) Family relationship: healthy family relationship helps individuals cope with family problems and conflicts. Parents who use positive communication to deal with stressful situations are more likely to be more adaptive to stress. (4) Personalities: a person with a hardy personality is able to handle stress and pressure better because they are realistic, ambitious, risk-takers have high self-esteem, enjoy challenges, and learn to improve themselves from past events.

Parent management training (PMT) provides parents with techniques and skills to deal with their children's behaviors, decrease or eliminate a child's disruptive or inappropriate behaviors at home or school, and enhance positive communication, while reducing stress and parental conflicts. The training aims to enhance parents' knowledge and skills in parent-child interaction, parenting skills, coaching parents in applying such strategies as rewarding positive behavior, and responding to negative behavior by punishments.^{12,13} This is because ADHD children may exhibit behaviors that cause problems or impairments in various dimensions. Parents play an important role in caring for and dealing with problems that can be resulted from attention deficit disorder. Parents who fail to adapt to this stress tend to develop a negative mindset¹⁴ more than parents of normal children.

Mindset theory refers to beliefs or thinking processes that affect behaviors, perspectives, and attitudes.¹⁵ There are two basic mindsets that determine a person's personality: a person with a growth mindset believes that a fundamental quality of a person can be developed, and they see problems as opportunities for learning and development. A person with a fixed mindset assumes that a fundamental quality like skills, or abilities, is set, and nothing can be done to change it. They focus on their image and qualities like intelligence and view problems and obstacles¹⁵⁻¹⁷ as failures.

Parents of ADHD children with a fixed mindset tend to develop negative attitudes toward themselves and the child and might not be able to take care and adjust behaviors of ADHD children as good as they should be. A study about stress found that people with growth mindset are able to respond to stress better and improve their lives in many

aspects such as education, emotion, mental health, and adaptation.

According to past studies,⁹ researchers tried to find a correlation between stress and willingness to participate in group activities. However, the results of group activities focused only on children's behaviors, not parents. This study includes attitude adjustment of caregivers, parental stress, and factors affecting stress prediction in order to reduce stress and add positive factors to the qualitative framework.

Parents with a growth mindset have a positive attitude toward themselves and their children. They are able to deal with the stress and improve the quality of life of children and themselves including success in parenting ADHD children. The researcher applied this concept to behavioral management skills for ADHD and empowered parents by Do It Yourself Mindset Intervention workshops to develop appropriate parenting skills for ADHD children.

Objectives

1. To study parents' mindsets of ADHD children.
2. To study the effect of group activities to adjust parents' mindset, reduce parental stress, and behavioral problems of ADHD children.
3. To find factors related to parental stress.

Methods

A randomized controlled study was conducted in ADHD children and parents of ADHD children at the Center of Excellence in Child Development and Behavior, Queen Sirikit National Institute of Child Health (QSNICH), Thailand.

Sample Size Selection

Inclusion Criteria

1. Parents of ADHD children aged 7 to 15 years receiving services at the Center of Excellence in Child Development and Behavior, QSNICH, Thailand.
2. Parents of ADHD children who completed Swanson, Nolan, and Pelham (SNAP-IV) Rating Scale and the Child Care Stress Assessment form at the time of enrollment, 2 months and 6 months after joining the program or parents who chose to participate in 1 or 2 activities (1-day workshop) and attended a follow-up appointment after 2 and 6 months.

Exclusion Criteria

1. Parents of ADHD children with impaired cognitive abilities (nonverbal intelligence quotient [IQ] < 70) as assessed by the Test of Nonverbal Intelligence, Fourth Edition (TONI-IV).
2. Illiterate parents or parents who have been diagnosed with psychological disorders.

Withdrawal Criterion

Withdrawal criterion included parents of ADHD children who lost a 2 and 6-month follow-up or no participation in any activities.

Sample Size

The sample size is calculated with the formula $N(\text{gr}) = 2(Z_{0.05} + Z\beta)^2 p(1-p) / \Delta^2$.

N is the desired sample size, $Z_{0.05} = 1.65$,
 $Z\beta = 1.28$ (power of test = 90%).

There is no prior research done on parental stress of ADHD children after participating in parental group activities through mindset intervention approach. However, there was a study on the change in the stress level among parents of ADHD children after behavioral parent training (BPT) activities,^{9,18} which found that the stress level decreased by 58%, and 20% in those who did not participate in the activities. The calculation is shown as below:

$$p = p_1 + p_2/2, p_1 = 0.58, p_2 = 0.20 \Delta = |p_1 - p_2| = 0.38.$$

The total number of sample population was 56, divided to 28 people in each group.

Data Collection Methods

1. Research instruction was explained to the sample population.
2. Demographic data were collected by SNAP-IV Scale, parental stress scale, and mindset assessment.
3. Parents who have high stress levels were given initial advice and referred to a hospital near their homes for follow-up.
4. BPT activities were introduced to the participants.

The sample groups were divided into two groups: the experimental group and the control group. In the experimental group, parents attended BPT activities at least once. The activities training included two sessions: mindset intervention and communication skills (3 hours for each session). In the control group, parents who do not attend the training received a mindset assessment and standard consultation.

The training was divided into two sessions, conducted by ADHD experts with more than 10-year experience at the Center of Excellence in Child Development and Behavior, QSNICH.

1. Session 1: Growth mindset intervention (3 hours): Parents were encouraged to develop their mindset and apply their parenting skills. They were given 30 minutes to build a marshmallow tower, and then conceptual knowledge was provided and asked to give feedback for 2 hours and 30 minutes.
2. Session 2: Communication skills development (3 hours) aims to improve parenting skills. Parents were provided conceptual knowledge and encouraged to share their opinions and experience on communication skills such as how to be a good listener, give compliments/rewards, or punishments.
 - The assessments were done at 2 and 6 months after joining the trial using SNAP-IV scale, Parenting Stress Questionnaire, and mindset assessment. Individual

consultation and advice were given in case of no improvement in the child's condition, parental stress, or mindset development.

Research Tools

1. TONI-4, an individualized, nonlinguistic intelligence test for people aged 6 years to 89 years was used. The TONI-4 has two equivalent forms: Form A and Form B (60 items each). The tests usually take 15 to 20 minutes. The test takers can choose either form. The reliability coefficient of Form A was 0.89 and 0.83 for Form B. TONI 4 was used to remove ADHD children with intellectual disabilities (nonverbal IQ level less than 70) from the program.
2. Growth Mindset Assessment, Short Form (Thai version) has been derived from The Mindset Assessment Profile Tool, developed by Mindset Works, Inc. (www.mindsetworks.com) and was translated into two versions for parents and children.¹⁹

This 8-item questionnaire assesses various aspects of intelligence theory, learning goals, effort beliefs, and response to failure, drawing inspiration from Dweck's scale.⁹ For example, statements like "No matter how much intelligence you have, you can't change it", "I like my work best when it makes me think hard," and "When something is hard, it just makes me want to work more on it, not less."

Participants are required to rate each statement on a scale from 1 (strongly disagree) to 6 (strongly agree). Scores can range from 8 to 28, indicative of a fixed mindset, while scores between 29 and 48 reflect a growth mindset.

Following translation into Thai, the content validity was established through assessment by a linguist and two developmental behavioral pediatricians. The internal reliability of the assessment was tested on a sample of 30 subjects, resulting in Cronbach's alpha coefficient of 0.6.

This 5-minute assessment was given to parents at the beginning of the trial and repeated at 2 and 6 months during the trial.
3. SNAP-IV: parent form (Thai Version),²⁰ an ADHD screening assessment for parents and teachers. The assessment consists of 26 questions, a total of 26 items and four subscales included inattention (items 1–9), hyperactivity/impulsivity (items 10–18), and oppositional defiant disorder (ODD) (items 19–26). Cronbach's alpha of parent and teacher versions was 0.94 and 0.97, respectively. This 5-minute assessment was given to parents at the beginning of the trial and repeated at 2 and 6 months during the trial and was assessed in conjunction with medication.
4. Parenting Stress Questionnaire measures parenting stress when a child has a frequent and persistent pattern of anger, irritability, arguing, defiance, or vindictiveness toward others, the child may have ODD. It

consists of 10 questions, 3 points each. The content validity index was 0.89, using Cronbach's alpha coefficient. The reliability above 85% or a raw score of 25 is clinically significant parenting stress. This 10-minute assessment was given to parents at the beginning of the trial and repeated at 2 and 6 months during the trial.

Data Analysis

1. General data using descriptive statistics measuring frequency, percentage, mean, and standard deviation.
2. Chi-square test, independent *t*-test, pair *t*-test, and multiple regression analysis were used for factors analysis, where *p*-values less than 0.05 were statistically significant.

Study Results

The sample group of 50 children with ADHD participated in the study, 26 in the experimental group and 24 in the control group. The mean age of the children was 9.67 ± 2.06 , 40 (80%) males and 10 (20%) females. The mean score of intelligence level was 95.94 ± 10.21 score, assessed by TONI-IV, which was in a normal range. In total, 68% of children had siblings and 66% took medication regularly.

General Information of Parents with Attention Deficit Hyperactivity Disorder Children

The majority (80%) of caregivers were biological mothers, 74% of children were assisted. The mean age of the fathers was 42.06 ± 7.88 years. 24.5% graduated with a bachelor's degree. The mothers' mean age was 39.72 ± 6.62 years, 40% graduated with a bachelor's degree. 76% were married. 39% of the fathers owned a business, 30% were

employees, 56% had monthly incomes between 10,000 and 30,000 baht. Parents, education, income, culture, congenital disease, and moderate socioeconomic status of both groups had no statistically significant difference.

According to ►Table 1, 80% of ADHD children in the study were primary school boys with an average age of 9.67 ± 2.06 , who passed the TONI test with normal intelligence levels.

The majority of participants received consistent and regular medication; however, no significant differences were observed in the study outcomes ($p = 0.166$). The demographic characteristics of ADHD children in both groups had no statistical difference.

Assessment Results

Mindset Scores of Parents of Attention Deficit Hyperactivity Disorder Children

At baseline, parents of ADHD children in the experimental group had a growth mindset of 80.8 and 62.5% in the control group with no statistical difference (p -value = 0.151). After 2 and 6 months of the trial, the growth mindset of parents in the control group increased from 62.5 to 75%. In contrast, the growth mindset score in the experimental group decreased from 80.8 to 65.4% after 2 months and increased to 88.5% after 6 months. The mean mindset score of the experimental group was significantly higher than the control group (p -value = 0.038). After 2 and 6 months of the trial, the mean mindset score of the experimental group was higher than the control group with p -value = 0.944 and p -value = 0.014, respectively.

From baseline until month 6 of the trial, the average score of growth mindset of the experimental and the control groups increased. The score at 6 month was statistically significant (p -value = 0.042), which was a statistically significant change from the start of the study at 2 months (p -value = 0.05), as shown in ►Table 2.

Table 1 Demographic characteristics of ADHD children

	Total (<i>n</i> = 50)	Experimental group (<i>n</i> = 26)	Control group (<i>n</i> = 24)	<i>p</i> -Value
Age; mean \pm SD	9.67 ± 2.06	9.65 ± 2.10	9.69 ± 2.05	0.952
Gender; <i>n</i> (%)				0.571
Male	40 (80.0)	20 (76.9)	20 (83.3)	
Female	10 (20.0)	6 (23.1)	4 (16.7)	
TONI-IV; mean \pm SD	95.94 ± 10.21	97.08 ± 10.61	94.71 ± 9.84	0.418
Siblings, <i>n</i> (%)				0.410
No	16 (32.0)	8 (30.8)	8 (33.3)	
Yes	34 (68.0)	18 (69.2)	16 (66.7)	
Medication, <i>n</i> (%)				0.166
Consistently	33 (66.0)	14 (53.8)	19 (79.2)	
Inconsistently	14 (28.0)	10 (38.5)	4 (16.7)	
None	3 (6.0)	2 (7.7)	1 (4.2)	

Abbreviations: ADHD, attention deficit hyperactivity disorder; SD, standard deviation; TONI-IV, Test of Nonverbal Intelligence, Fourth Edition. Note: There is no statistically significant if p -value > 0.05.

Table 2 The differences in parents' mindset scores between the experimental and control groups at months 2 and 6 of the study

Change from baseline	Type of mindset	p-Value	Experimental group n (%)	Control group n (%)
Baseline n (%)	Growth mindset	0.151	21 (80.8)	15 (62.5)
	Fixed mindset		5 (19.2)	9 (37.5)
Mean ± SD	–	–	31.88 ± 4.06	29.79 ± 2.67
Mean difference ± SE ^a	–	–	–	–
p-Value ^a	–	–	–	–
2nd mo n (%)	Growth mindset	0.459	17 (65.4)	18 (75.0)
	Fixed mindset		9 (24.6)	6 (25.0)
Mean ± SD	–	–	31.46 ± 4.97	31.38 ± 3.56
Mean difference ± SE	–	–	0.42 ± 0.87	1.58 ± 0.77
p-Value	–	–	0.631	0.05 ^a
6th mo n (%)	Growth mindset	0.281	23 (88.5)	3 (11.5)
	Fixed mindset		18 (75.0)	6 (25.0)
Mean ± SD	–	–	33.42 ± 4.55	30.29 ± 4.08
Mean difference ± SE	–	–	1.54 ± 0.72	0.50 ± 0.67
p-Value	–	–	0.042 ^a	0.465

Abbreviations: SD, standard deviation; SE, standard error.

^aThere is no comparison available to calculate the mean difference ± SE and p-value at baseline.

Behaviors of Attention Deficit Hyperactivity Disorder Children

Behaviors of ADHD children at baseline were measured by SNAP-IV: parent form (Thai Version) shows a lack of concentration. The mean score was 15.12 ± 4.89 in the experimental group and 15.96 ± 4.97 in the control group, followed by agitation, impulsive, and resistance symptoms. The behavioral scores of children in both groups at baseline had no statistical difference.

Hyperactive and Impulsive Behavior

In the experimental group, the difference in behavioral score on hyperactive and impulsive behavior at 2 months of the trial was 12.62 ± 4.40 points, which decreased from the baseline score of 1.38 ± 0.83 points (p-value = 0.107), and at 6 months, the score was 11.54 ± 5.36 points, which was statistically significantly different from the baseline by 2.46 ± 1.19 points (p-value = 0.05).

In the control group, the score at 2 months of the trial was 11.38 ± 6.41 points, which decreased from the baseline score of 2.08 ± 1.13 points (p-value = 0.078), and at 6 months, the score was 10.67 ± 5.77 points, which was statistically significantly different from the baseline by 2.79 ± 1.01 points (p-value = 0.011) as shown in ► **Table 3**.

Attention-Deficit Hyperactivity Disorder

The score of inattentive and aggressiveness between the experimental and control groups at 2 month and 6 month had no statistical differences as shown in ► **Table 3**.

Parenting Stress Questionnaire Results

According to the parental stress assessment on child's behavior, parents in both groups were more stressed by child's externalizing symptoms (e.g. yelling, violent temper, and loud noises) rather than internalizing symptoms (e.g., distraction and inattentiveness).

Average parental stress in the experimental and control group was 34.50 ± 10.42 and 32.79 ± 9.99, respectively, indicating a high level of clinical significance (>25 points), but there was no statistical difference between both groups (p = 0.558).

Parental Stress from Child Behaviors

Experimental group: The score of stress from the behavioral characteristics of the children at 2 months after baseline was 34.73 ± 10.46 points, an increase of 0.23 ± 1.16 points from the beginning of the study (p-value = 0.845), and was 34.81 ± 10.17 points at 6-month, increased 0.30 ± 1.60 points from the baseline (p-value = 0.849).

Control group: The score of stress from the behavioral characteristics of the children at 2 months after baseline was 30.92 ± 10.25 points, a decrease of 1.87 ± 1.49 points from the beginning of the study (p-value = 0.223), and at 6 months after participating in the study was equal to 32.50 ± 9.66 points, a decrease of 0.29 ± 1.26 points from the start of the study (p-value = 0.820), as shown in ► **Table 4**.

Factors Analysis Related to Parental Stress at 6-Month of the Trial

The results of multiple regression statistical analysis showed that two independent variables child's behavior

Table 3 Changes in child behavior scores at baseline, 2 month, and 6 month of the study

	Experimental group (<i>n</i> = 26)	Control group (<i>n</i> = 24)	<i>p</i> -Value
Inattentiveness; mean ± SD			
Baseline	15.12 ± 4.89	15.96 ± 4.97	0.548
Follow-up 2nd mo	15.08 ± 5.14	14.46 ± 4.51	0.654
Follow-up 6th mo	13.27 ± 5.25	14.92 ± 5.11	0.267
Hyperactive/Impulsiveness; mean ± SD			
Baseline	14.00 ± 4.65	13.46 ± 7.19	0.755
Follow-up 2nd mo	12.62 ± 4.40	11.38 ± 6.41	0.433
Follow-up 6th mo	11.54 ± 5.36	10.67 ± 5.77	0.582
Aggressiveness; mean ± SD			
Baseline	9.85 ± 4.58	8.38 ± 4.58	0.262
Follow-up 2nd mo	9.81 ± 5.69	8.33 ± 6.06	0.380
Follow-up 6th mo	9.73 ± 6.82	7.75 ± 6.07	0.285
Total behavior scores			
Baseline	38.97 ± 4.70	37.80 ± 5.58	0.654
Follow-up 2nd mo	37.51 ± 5.07	34.17 ± 5.66	0.395
Follow-up 6th mo	34.54 ± 5.81	33.34 ± 5.65	0.261

Abbreviation: SD, standard deviation.

Note: Statistic significant if *p*-value ≤ 0.05.

and parents' mindset can predict parental stress, parental psychological distress, stress in parent-child relationship, and stress from child behavior. A child's rebellious behaviors and parents' mindset can influence parents by 65%. ODD has a positive correlation with overall parental stress (B2.492, adjust R² 0.645, *p*-value < 0.001). In contrast, there is a negative correlation between mindsets and overall parental stress (B1.502, adjust R² 0.645, *p*-value < 0.001).

By eliminating other confounding factors, child's behavior affects parental stress by 69% and mindset by 29%. This was similar to that of rebellious behavior as a predictor of parental distress (46%) and mindset (28%). Child's behavior affects parent-child relationship by 80% and mindset by 17% as shown in ► **Table 5**.

According to ► **Table 5**, the mindset score shows a negative effect on parental stress (with a standardized coefficient of -0.29). This implies that a decrease of 0.29 points in the

mindset score is associated with a corresponding increase of 1 point in parental stress. On the other hand, ODD demonstrates a positive effect on parental stress, with a standardized coefficient of 0.697. This suggests that an increase of 0.69 points in the ODD score corresponds to an increase of 1 point in parental stress.

Discussion

The researchers of this study performed a DIY mindset intervention activity, an integration of mindset intervention, communication skills, and behavioral modification¹⁸⁻²⁰ which empowered parents with a growth mindset that the existing quality can be developed by their own efforts, helped in perceiving obstacles as opportunities, and reduced impulsive behavior of ADHD children.

In the first 2 months of the study, overall parental stress was not reduced because parents compared new techniques

Table 4 Differences of parenting stress scores related to child behaviors after 2 and 6 months of the trial

	Baseline (mean ± SD)	Follow-up (mean ± SD)	2 mo (Mean difference ± SE)	<i>p</i> -Value	6 mo (Mean difference ± SE)	<i>p</i> -Value
Parental stress related to child behaviors						
Experimental group	34.50 ± 10.42	34.73 ± 10.46	0.23 ± 1.16	0.845	34.81 ± 10.17	0.30 ± 1.60
Control group	32.79 ± 9.99	30.92 ± 10.25	1.87 ± 1.49	0.223	32.50 ± 9.66	0.29 ± 1.26

Abbreviations: SD, standard deviation; SE, standard error.

Note: Statistic significant if *p*-value ≤ 0.05.

Table 5 Multiple regression analysis between independent variables and parental stress at 6 months of the trial

Model	Unstandardized B	Coefficients SE	Standardized coefficients beta	t	p-Value
Total score of parental stress R = 0.812, R ² = 0.659, Adj. R ² = 0.645, SE estimated = 13.809, F = 45.427, p-value < 0.001 ^a					
Constant	122.772	15.006		8.181	<0.001
Oppositional defiant behavior	2.492	0.311	0.697	8.014	<0.001
Mindset score	-1.502	0.441	-0.296	-3.407	0.001

Abbreviation: Adj., adjustment; SE, standard error.
Note: Statistic significant if p-value ≤ 0.05.

to how they dealt with stress in the past, causing feelings of guilt, anxiety, and fear of failing to apply the skills they have learned. However, parental stress reduced after 2 months. This reflects better perception and their ability to applying their knowledge to parenting skills.

After 6 months, the mindset score of the experimental group increased. Parents were able to modify their child's behavior appropriately and passed on this mindset to their children under their care.^{15,16} According to several studies,^{15,19} children with growth mindset were correlated with Ordinary National Education Test score and enjoyed learning more statistically significant than children with fixed mindset. An investigation on the effects of mindset development on seventh graders in New York found that a growth mindset motivated classroom learning^{15,21} and predicted children's academic achievement. Ninth graders who developed progressive mindsets had higher self-control and learning interest including learning skills and abilities.²⁰ This proved that behavioral problems of ADHD children with externalizing symptoms were improved after attending mindset intervention activities.^{15,21} However, teacher's perspectives toward these behaviors should be included in future studies to see the development in social skills, concentration, work with prudence, and responsibility for school assignments.

The assessment score of behavior problems of ADHD children was lower after a 6-month follow-up, and a mindset score of parents was higher. However, parental stress was higher due to responses to parenting stress questions, such as "Sometimes I feel like my kids don't like me and don't want to be close to me." These responses show parents' understanding toward their child's feelings and their perceptions toward themselves and their children. Moreover, the presence of a parents' growth mindset does not necessarily mean a decrease in happiness or a positive outlook. But it is a mindset that sees problems as opportunities for change and improvement. Even though the stress did not decrease, parents are more accepting and adaptive to deal with stress appropriately. In addition, parental depression may influence stress because stress can be overlapped^{15,21} with depression and genetics. In this study, parents had no depression or psychological disorders. However, the intervention during the study might cause sadness and or emotional instability. This study was conducted during the coronavirus disease 2019 (COVID-19) pandemic, when most children studied online and parents worked from home, so they were able to spend

time together. In some cases, they suffered from job loss and income loss during COVID-19 pandemic causing a higher rate of stress in terms of behavioral problems in ADHD children which appeared to be more problematic while taking online classes during COVID-19. The study of Abidin 1995 supported this study in terms that oppositional behavior, parent's mindset, children's age, and gender have no correlations to parental stress. Oppositional behavior is an externalizing symptom which is a stress predicting factor more than internalizing (e.g. inattention and irresponsibility) behavior problems. The severity of ADHD in children, rebellious behavior, and comorbidity affected parental stress.^{14,15} However, mindset development can reduce stress, positively affect academic success and psychosocial skills,^{18,21} and increase flexibility in childcare. Moreover, the activity helps identify independent variables that influence parental stress: child's stubborn behavior, parent-child distress, parent-child relationship, and overall stress. The child's rebellious behavior was an independent variable that positively correlated with parenting stress, while parents' mindset had an inverse relationship. Growth mindset positively correlated with problem coping skills and had a negative relationship^{17,22,23} with psychological distress. This improved family relationships and had positive impact on themselves and their child, resulting in proper care for ADHD children. Long-term data collection should be performed in conjunction with parental group activities for consistent motivation, as well as mindset intervention activities for teachers and children, and assess children's learning abilities. Parental group activities should incorporate mindset development that will help develop growth mindset, the ability to deal with oppositional behavior appropriately, reduce children's behavior problems significantly, and affect parents' perspectives on how to better manage stress and ADHD children efficiently.

The strength of this research is an integration of PMT, growth mindset intervention, and a DIY mindset intervention that identify factors associated with stress, decrease variables that is positively correlated, and support variables that is negatively correlated.

Most PMT parent group activities focus on positive communication principles, behavior modification, rewarding, and abstinence, which are important and necessary in taking care of ADHD children. To create a comprehensive approach, a combination of mindset adjustment for

caregivers will help ADHD children develop growth and positive mindset. In addition, caregivers will have better skills in managing stress and will be able to respond to child's rebellious behavior appropriately which will lead to a notable reduction in behavioral problems among ADHD children. For a more holistic and efficient care, group activities are recommended to be organized regularly, in conjunction with other standard treatments as a multimodal approach to achieve optimal long-term outcomes.

Conclusion

An integration of parent management and intervention training helps parents develop a progressive mindset that allows them to accept, adapt, and deal with behavioral problems of ADHD children. As a result, there is reduction in the number of children with impulsive behavior. Factors associated with parental stress were child's oppositional behavior followed by parents' mindset.

Conflict of Interest

None declared.

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