

Relationship between Parenting Stress and Risk of Attention Deficit Hyperactivity Disorder (ADHD) in Elementary School Children

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Abstract

Background: Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder during child development with three symptoms which are comprised of inattention, hyperactivity, and impulsiveness that may persist into adulthood. This condition can be a stressor for parents in performing parenting and may lead into a state of parenting stress. **Objective:** To analyze the relationship between parenting stress and the risk of developing Attention Deficit Hyperactivity Disorder (ADHD) in elementary school children. **Methods:** This research was conducted in Surabaya from November 2020 to January 2021 with respondents consisting of parents of elementary school children who have ADHD risk and agreed to participate in this study with a total of 55 samples selected using a purposive sampling technique. The research design was cross-sectional using demographic questionnaire, Abbreviated Conners Rating Scale (ACRS), and Parenting Stress Index-Short Form (PSI-SF) which were filled out by respondents through an online form. The data were processed and analyzed using One-Sample Chi-Square analysis test program with a p-value <0.05, considered statistically significant. **Results:** The majority of parents experienced moderate parenting stress levels (58.2%). There was a significant relationship between each level of parenting stress and the risk of ADHD in children ($p < 0.001$). **Conclusions:** There is a significant relationship between parenting stress and the risk of ADHD in children.

Keywords: Attention Deficit Hyperactivity Disorder, Parenting Stress, Children, Elementary School

Introduction

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder in which a developmental disorder occurs causing emotional and behavioral disorders. The three main symptoms of ADHD which are inattention, hyperactivity, and impulsiveness, typically appear in children before the age of 12 years old and can persist until the child reaches adulthood. The symptoms exhibited in ADHD can result in performance problems in social, educational, or work aspects. The

prevalence of ADHD is estimated to range from 3 to 7% in the US with manifestations of ADHD symptoms at least occurring in two different situations, such as at school and home¹.

Parents who have children with ADHD tend to feel anxious, fearful, and more irritable, so they are at greater risk of falling into parenting stress^{2,3}. Parenting stress conditions that arise will result in an inadequate skill of parenting to a child with ADHD. Parents will tend to use negative parenting approach, more control towards

child behaviour, and give a lot of punishment due to inappropriate behavior from their children. If this is not resolved, it can result in the worsening of child condition and deterioration of relationship between parent and child^{2,4}. Such situations are further dampened with the current conditions, which is the Corona Virus Disease 2019 (COVID 19) pandemic, that requires children to study at home remotely through online learning. This condition will make children feel bored and also affect stressors which will cause parenting stress on parents because they have to oversee learning activities as well as double the role of being a teacher for their children while at home. Parents who have to do work from home (WFH) will be burdened by bigger thoughts and energies which will lead to the risk of anxiety and depression, that subsequently will have an impact on parenting stress^{5,6}.

Method

This research is an observational analytic study with a cross-sectional design. The population of students aged 9 to 12 years old came from five elementary schools in Surabaya, namely Semolowaru I/261, Semolowaru IV/614, Keputih 245, Kertajaya, and Baratajaya. The sample of this study consisted of 55 students from the five schools at the 4th, 5th, and 6th grades with a purposive sampling method that was determined by the inclusion and exclusion criteria of the researcher. All required data was taken through a questionnaire which was filled in by the parents of students through an online platform from November 2020 to January 2021. Ethical clearance is obtained from the Faculty of Medicine, Universitas Airlangga (Ref: 284/EC/KEPK/FKUA/2020).

The demographic questionnaire contains data of students, which are age and gender, as well as data of parents, which are age, gender, education, occupation, and income. The Abbreviated Conners Rating Scale (ACRS) questionnaire for early detection of ADHD risk in children listed in the Stimulation, Detection, and Early Intervention of Child Growth and Development (SDIDTK) book consists of 10 questions. A score that is more than equal to 13 means that the child has a high risk of ADHD⁷. The Parenting Stress Index-Short Form (PSI-SF) questionnaire measuring the level of parenting stress in parents consists of 36 questions that have been translated into Indonesian and have been tested for validity and reliability^{8,9}. The results of the total scores obtained will be categorized into low, moderate, and high levels. The data were processed and analyzed with the aid of an analysis test program with univariate analysis techniques and bivariate analysis techniques with the One-Sample Chi-Square test which was considered significant if the p-value was <0.05.

Results

Characteristics of Children and Parents

The characteristics of the child and the parents are presented in table 1 below. The composition of sex in children is dominated by the male which is 56.4% and age is dominated by the age of 10 which is 32.7%. Most parents are between 31 until 40 years old (60%) with the most recent education in senior high school (70.9%). The occupation is dominated by housewives (47.3%) and the majority income is between 0 to 1.500.000 Rupiah (50.9%).

Table 1. Characteristics Socio-Demographic of Children and Parents

Children	Category	Frequency (n)	Percentage (%)
Gender	Boys	31	56.4
	Girls	24	43.6
Age	9 Years Old	4	7.3
	10 Years Old	18	32.7
	11 Years Old	17	30.9
	12 Years Old	16	29.1

Cont... Table 1. Characteristics Socio-Demographic of Children and Parents

Parents	Category	Frequency (n)	Percentage (%)
Education	Junior High School	7	12.7
	Senior High School	39	70.9
	Associate Degree	1	1.8
	Bachelor Degree	8	14.5
Age	21-30 Years Old	3	5.5
	31-40 Years Old	33	60
	41-50 Years Old	17	30.9
	51-60 Years Old	2	3.6
Occupation	Housewife	26	47.3
	Entrepreneur	10	18.2
	Private	7	12.7
	Laborer	4	7.2
	Government Employees	3	5.5
	Others	5	9
Income	0 – 1.500.000 Rupiah	28	50.9
	1.500.001 – 2.500.000 Rupiah	12	21.8
	2.500.001 – 3.500.000 Rupiah	8	14.5
	More than 3.500.000 Rupiah	7	12.7

Prevalence The Risk of ADHD in Children

Early detection of ADHD using the ACRS questionnaire was performed with a cut-off score of 13. There are 55 children (12.2%) who score more than or equal to 13 and can be classified as at high risk of experiencing ADHD, from the total sample in this study which is 449 children. The data are presented in table 2 below.

Table 2. Prevalence The Risk of ADHD in Children

	Category	Frequency (n)	Percentage (%)
Risk of ADHD	Yes	55	12.2
	No	394	87.8
Total Sample		449	100

Parenting Stress and Risk of ADHD in Children

Measuring the level of parenting stress using the PSI-SF questionnaire was divided into three categories which are low, moderate, and high. Stress levels of

parents with children at risk for ADHD are dominated at moderate levels (58.2%) and only 5.5% of parents experience low levels of parenting stress. The data are presented in table 3 below.

Table 3. Overview of Parenting Stress and Risk of ADHD in Children

	Category	Frequency (n)	Percentage (%)
Level of Parenting Stress	Low	3	5.5
	Moderate	32	58.2
	High	20	36.4
Total Sample		55	100

In this study, the relationship between each category was tested on parenting stress on the risk of ADHD in children. It was found that there was a significant relationship between each level of parenting stress and the risk of ADHD in children ($p < 0.001$). The data are presented in table 4 below.

Table 4. Relationship Between Parenting Stress and Risk of ADHD in Children

		Level of Parenting Stress						Total
		Low	P	Moderate	P	High	P	
Risk of ADHD	Yes	3	0.000*	32	0.000*	20	0.000*	55
		5.5 %		58.2 %		36.4 %		100%
	No	113		259		22		394
		28.7 %		65.7 %		5.6 %		100 %

*significant level $p < 0.05$

Discussion

The sample at high risk for ADHD had more male sex frequencies than female (Table 1). Previous research in Bali also showed the same result, where the frequency of male sex with ADHD was more than in girls with a ratio of 2:1^{10,11}. This is consistent with the evidence that boys have ADHD more often because they show more challenging and aggressive traits than girls¹¹. The age range in this study was between 9 and 12 years according to the Diagnostic and Statistical Manual of Mental Disorders 5 (DSM) - 5 which provides explanation that

some of the symptoms of ADHD in these individuals appear before turning 12 years¹. The results obtained were that the highest ages were 10 years and followed by 11 years, 12 years, and 9 years (Table 1). Another study by Novriana (2013), also obtained results that were not much different, in which more children with ADHD were found in the 11-13 years age range¹². ADHD can persist into adulthood in several situations and this can have serious consequences, such as failure to complete school, depression, problems with social relationships, substance abuse, violation, accidental injury, and failure

to do a job. All of that can happen if ADHD conditions are not detected as early as possible and are not treated properly^{1,13}. The higher the age of the child, the greater the risk of ADHD, coupled with the consistently high prevalence of ADHD, which shows the importance of early detection in children so that this ADHD condition does not get worse and can be treated early.

The parenting stress description in this study shows that most of the parents are included in the moderate level of stress, followed by high and low categories (Table 3). This is consistent with the previous meta-analysis conducted by Theule (2013) which elucidates that parents with ADHD children will experience high levels of parenting stress¹⁴. This occurs because parents have inadequate knowledge of their child's condition so that in carrying out parenting there will be a feeling of discomfort and anxiety if the results obtained are not in line with the wishes of the parents as caregivers¹⁴. The condition of the COVID-19 pandemic that is currently occurring when this research was conducted, where the school learning process and a lot of work done online at home can add to the burden on the mind and affect stressors in parents⁶. So that this condition also accelerates the parenting stress condition where there is a relatively high level of parenting stress.

The results of the bivariate analysis test to determine the relationship between variables tested in this study using the One-Sample Chi-Square test technique obtained p-value = 0.000 ($p < 0.001$). So, it can be concluded that there is a significant relationship between parenting stress and ADHD in children (Table 4). These results are consistent with previous research conducted by Perez *et al.* (2018) in which the results showed association between parenting stress in parents and the condition of children with ADHD¹⁵. Another study, Setiawati *et al.* (2018), which discusses the level of parental anxiety about children with ADHD also showed a significant relationship³.

The existence of a relationship at low parenting stress levels can be seen from the data showing that only a few parents of children with ADHD risk have

low parenting stress levels and the rest tend to be at moderate and high levels. This is in line with the theory that the symptoms of children with ADHD will affect the psychopathological conditions of the parents as caregivers, where there are higher levels of stress^{2,16}. At high parenting stress levels, there was also a significant relationship and strengthened with the percentage at high parenting stress levels found in parents with children at risk for ADHD than parents who did not have children at risk for ADHD. This condition will make parents have difficulty in teaching and children will receive less attention, so that cognitive stimulation in children will be reduced and this makes the risk of ADHD even higher^{11,17}.

The three symptoms of ADHD consist of inattention, impulsivity, and hyperactivity. Inattention is a symptom of decreased attention to something characterized by the child being unable to hold their attention both while learning and playing for a long time. Impulsiveness is a symptom of ADHD shown by a child who often imposes their will or likes to interrupt other people's conversations. Hyperactivity itself can be shown by the behavior of children who are unable to stay still in certain situations for a long time and are easily influenced by environmental conditions. The three symptoms are shown in children with ADHD if allowed to persist into adulthood and of course, will be detrimental to both themselves and the environment around them¹. These three symptoms can arise or get worse due to many influencing factors like genetic and environmental factors. Environmental factors can come from exposure to heavy metals, chemicals, and psychosocial conditions¹⁸. The discussion in this study is to focus on the psychosocial conditions around the child that one of which is due to inappropriate environmental conditions such as parenting stress on parents while caring for children.

The mechanism of parenting stress with the risk of ADHD in children can be explained because stress conditions in parents will affect the neurotransmitters dopamine and norepinephrine in children, where there will be a decrease in dopamine and norepinephrine

which cause symptoms of decreased attention or inattention and impulsivity¹⁹. If the stress condition of the parents is not resolved immediately, then the children will indirectly be affected by stress from their parents when doing inappropriate parenting. This stress condition can inhibit action potential inhibition on pre-synaptic neurons so that the production of dopamine and norepinephrine will be produced in large quantities and cause symptoms of hyperactivity in these children¹⁹. Parents who have children with ADHD experience confusion and misunderstanding about the conditions that occur in their child, resulting in anxiety which can be a stressor while doing parenting³. This will indirectly affect the way of caring for children, where parents who ignore their child's condition will make the child grow more impulsive and act according to their wishes without thinking about the impact that arises afterward²⁰.

Parents who do not have children at risk for ADHD show a tendency towards low to moderate parenting stress levels with the predominance remaining at moderate parenting stress levels. This is of interest because it should be expected that parents without children who are at risk for ADHD tend to have low levels of parenting stress. It should be noted that the urgency at this time is the influence of the COVID-19 pandemic condition, wherein previous research by Hiraoka (2020), it was found that there was a significant relationship between parenting stress and the school learning process during COVID 19. This happens because parents as caregivers need adjustments both in their daily work and in the school learning system for children where parents will be more involved in accompanying children and this condition can add stressors to parents while caring for their children^{6,21,22}.

Conclusion

There is a significant relationship between parenting stress and the risk of ADHD in children ($p < 0.001$). The majority of parents with children at high risk for ADHD experience moderate to high levels of parenting stress. Parenting stress levels are more likely to be experienced by parents who have children at high risk of ADHD than

parents who do not have children at high risk of ADHD. More research is needed about the condition of ADHD in children so that the level of parenting stress on parents can be minimized.

Future research is expected to be focussed on to other risks which are thought to also affect the risk of ADHD in children so that these conditions could be identified and managed early.

Conflict of Interest: There is no conflict of interest.

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Ethical Clearance: This study had been approved by Ethical Commission of Health Research Faculty of Medicine Universitas Airlangga (Ref: 284/EC/KEPK/FKUA/2020).

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