The Population of Children with High Risk of ADHD and The Mother's Sociodemographic Profile in Surabaya

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ABSTRACT

Objective: Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder with several symptoms in the form of inattention, hyperactivity, and impulsivity. There are no official data regarding the prevalence of ADHD in Indonesia, and data in regards to ADHD prevalences are limited to several studies. This study aims to give perspective on the prevalence of children's ADHD risk in Surabaya. *Methods:* This study was conducted at three elementary schools in Surabaya. All students between grades 3 to 6 were invited as participants in this study, with the forms being filled out by their mother. The risk of ADHD is measured with SPPAHI. Additionally, we also collected the mothers' sociodemographic data. *Result:* Among the 358 mothers, there were 54 mothers (15,1%) who had children with ADHD symptoms, as evidenced by a questionnaire score on the Hyperactive and Impulsive Child Behavior Assessment Scale (SPPAHI) >30. *Conclusions:* Further research and examination are required to properly diagnose ADHD in children.

Keywords: ADHD; mother; children; Indonesia

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder with several symptoms in the form of inattention, hyperactivity, and impulsivity that appear since childhood and are not related to the age or developmental process of the individual [1]. ADHD manifests as inattention and hyperactivity-impulsivity and primarily appears in children under the age of 12 [2]. Recent research also found a relationship between ADHD and dopamine receptors D1 to D5 [3,4]. ADHD has a significant effect on a person's life, especially during the early years when most of them have a stunted development, struggle to connect with others, inability to make friends, learning problems, and poor performance at school [5]. It is important to properly diagnose and detect the disorder before it further impacts the children in the future.

Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) estimates that the prevalence of ADHD in children is 5%. Data from the Centers for Disease Control and Prevention (CDC) in 2016 stated that the prevalence of ADHD in children aged 2-17 years in the United States was 9.4%, or 10% (approximately 2.4 million children) in the 6-11 years age group. However, there are no official data regarding the prevalence of ADHD in Indonesia, and data in regards to ADHD prevalence are limited to several studies regarding the relationship between ADHD and other corresponding factors in parents, such as quality of life and depression.

This study aims to give perspective about ADHD prevalences in Surabaya, particularly in the Kapasan subdistrict.

MATERIALS AND METHODS

Study design and population

This study was conducted at three elementary schools (SD) in Surabaya, namely SD Simokerto VI, SD Kapasan III, and SD Kapasan V. All students between grades 3 to 6 were invited as participants in this study, with additional inclusion criteria where the children must be aged 9-12, and the forms must be filled by their mothers. However, due to the nature of the screening tool and the age of children being too young, this study will instead use the data provided by the children's mothers. This study was approved by the Medicinal Faculty Ethics Committee of Airlangga University.

Data collection

Parents' demographic data such as age, occupation, education level, marital status, and health status were collected from the participants. Health status was measured by whether the participants were currently undergoing medications or not. The children's data includes gender and age.

Assessment of ADHD risk

Skala Penilaian Perilaku Anak Hiperaktif Indonesia (SPPAHI) or Hyperactive and Impulsive Child Behavior Assessment Scale was used as an instrument to assess the risk of ADHD in children. Previously, SPPAHI was used as a screening tool to assess the prevalence of ADHD risks in various other studies in Indonesia[6-8]. This instrument consists of 35 questions with a scale of 1 (never at all) to 4 (always or very often) and uses a score of 0-3 for the answer to each question with a score range of 0-105. SPPAHI can be filled by doctors, parents, or teachers. Since this study will be filled by parents, the cutoff score for SPPAHI is determined at 30, where children whose score is above 30 are considered at risk of ADHD. Children whose score is under or exactly 30 are not considered at risk of ADHD. The sensitivity and specificity of parent-submitted SPPAHI are 61.3% and 76.8% respectively[9].

RESULTS

This research was carried out in October 2023. From the three elementaryschools previously mentioned, a total population of 590 children was obtained. A total of 466 questionnaires were filled out and returned to the researchers, of which 358 mothers met the inclusion criteria, and the rest were deemed ineligible because theywere not willing to take part in the research, the questionnaires were filled in by fathers, siblings or other guardians of students, the children were over 12 years old, or the SPPAHI questionnaire was not filled completely.

Among the 358 mothers, 54 mothers had children with ADHD symptoms, as evidenced by a questionnaire score on the Hyperactive and Impulsive Child Behavior Assessment Scale (SPPAHI)>30. The demographical data of mothers and children are presented in Table 1 and Table 2, respectively.

TABLE 1: Sociodemographic Profile of Respondents.

Variables	Frequency	Percentage
Participants	**358**	**100%**
Age		
<30	21	5.86%
30-39	166	46.36%
40-49	151	42.17%
>50	20	5.58%
Occupation		
Housewife	252	70.39%
Employee	59	16.48%
Civil servant	2	0.55%
Self-employed	27	7.54%
Others	18	5.02%
Completed Education		
No formal education	5	1.39%
Elementary school	65	18.15%
Middle school	73	20.39%
High school	178	49.72%
University	34	9.49%
Unknown	4	1.2%
Marital Status		
Married	300	85.2%
Divorced	37	8.9%
Unknown	21	5.9%
Health		
Healthy	340	95.0%
Sick	14	3.9%
Unknown	4	1.1%

In this study, the sociodemographic characteristics of respondents were divided based on age, occupation, education level, marital status, and general health. FromTable 1, it is found that the distribution of mothers' ages is mostly between 30-39 and 40-49, with 166 (46,36%) and 151 mothers (42,17%) respectively. The most common occupation was a housewife (252 mothers, 70,39%) with 178 mothers (49,72%) having formal high school education.

300 mothers (85,2%) are still married, while 37 mothers (8,9%) have divorced. A total of 340 mothers (95,3%) reported being in good health or not taking medication on the questionnaire, and 14 mothers (3,7%) were taking medications. However, these medications consist of flu and pain relievers. No mother has reported taking medications for psychiatric or other chronic diseases.

TABLE 2: Children's Profile.

Variables	Frequency	Percentage
Participants	**358**	**100%**
Gender		
Male	181	50.55%
Female	177	49.45%
Age		
9	50	14.8%
10	130	35.4%
11	141	39.8%
12	37	10.0%
Risk of ADHD		
No risk	304	84.9%
At risk	54	15.1%

From Table 2, it is found that the children's gender is spread evenly, with males being slightly more (181 children, 50,55%) than females (177 children, 49,45%). It was also found that there were 141 (39,8%) children aged 11, with only 37 (10%) children aged 12.

Between 358 children, 54 (15,1%) were found with risk of ADHD, as evidenced by the SPPAHI score of >30. Below is a table regarding the profile of children's ADHD and the sociodemographic data of their mothers (Tables 3 and 4).

TABLE 3: Sociodemographic Profile of Mothers of Children with ADHD Risks.

Variables	Frequency	Percentage
Participants	**358**	**100%**
Age		
<30	3	5.6%
30-39	24	44.4%
40-49	23	42.6%
>50	4	7.4%
Occupation		
Housewife	38	70.4%
Employee	10	18.5%
Civil servant	1	1.9%
Self-employed	5	9.2%
Completed Education		
No formal education	2	3.7%
Elementary school	12	22.2%
Middle school	12	22.2%
High school	21	38.9%
University	6	11.1%
Unknown	1	1.9%
Marital Status		
Married	43	79.6%
Divorced	4	7.4%
Unknown	7	13.0%
Health		
Healthy	48	88.9%
Sick	2	3.7%
Unknown	4	7.4%

TABLE 4: Profile of Children With Risks of ADHD.

Variables	Frequency	Percentage
Participants	**54**	**100%**
Gender		
Male	28	51.9%
Female	26	48.1%
Age		
9	5	9.3%
10	23	35.4%
11	22	39.8%
12	4	10.0%
Presentation		
Inattention	50	92.6%
Hyperactivity-Impulsivity	2	3.7%
Combination	2	3.7%

From the sociodemographic table, the majority of the mothers of children with ADHD risk having no occupation, or being a housewife (38, 70,4%). Most of these mothers also have a high school education with 21 mothers (38,9%), followed by middle school and primary school, both at 12 mothers (22,2%). From Table 4, we found that from 54 children with risks of ADHD, 28 (51,9%) of them are male and 26 (48,1%) of them are female. It was also found that the majority of the children with ADHD risk are displaying symptoms of inattention, with 50 children (92,6%) displaying these symptoms.

DISCUSSION
This study aimed to provide a perspective on the spread of ADHD in a small area, particularly in the subdistrict of one of Indonesia's most populated cities. From this study, it was found that the prevalence of ADHD risk sits at 15,1%. This number is higher than the estimates in other countries, such as the one provided by DSM-5 (5%) and the survey conducted by CDC in the United States (9,4%). However, the results found in this bears resemblance to other studies conducted in Indonesia, particularly in the city of Surabaya.

According to research conducted on children aged 9-12 years by Setyanisa, Setiawati, and Irwanto in 2022 at five elementary schools in Surabaya, it was found that the prevalence of ADHD was 55 out of 449 children, or 12.2%6. There is another study with similar results conducted at SD Balongsari Surabaya by Setiawati et al in 2023, which found that 19 out of 126 children (15.9%) were at risk of ADHD7. In 2019, research conducted by Sasono, Irwanto, and Setiawati found that among the 114 students who were willing to be research subjects, 22 students (19.3%) had risk factors for ADHD8. These similarities might be due to different locations of the study, whereas different regions have different cultures and methods of raising children.

In regards to the mother sociodemographic data, the results found in this study were similar to other studies conducted in Indonesia, where mothers of elementary school children are mostly within the range of 30 – 49 years6,10. This result might be caused by the culture in Indonesia, where it is only considered acceptable to have a child after marriage, with additional estimates that marriage commonly occurs between the ages of 25 to 35. For education level, results in this study found that high school was the most common, with 21 mothers (38,9%). It appears that this was caused due to the decision made by the government of Indonesia to enact 12 years of education. However, a study conducted by Oguzoncul et al. in Turkey found that the majority of mothers with ADHD children's education level was lower when compared to other mothers, where 48.9% (45 mothers) had an elementary school education level or below, 32.6% (30 mothers) had an elementary school education level or below. secondary school (SMP/SMA), and 18.5% (17 mothers) took further education. Another research with a different result was conducted by de Lorient et al. in Surabaya, where the majority of mothers had high school education and advanced level education, with 17 mothers having high school education, 14 mothers studying at university, 3 mothers had studied middle school education, and 2 mothers did not attend school or had elementary school education. The research shows that the majority of mothers have a high level of education, which may be due to differences in primary school location choices. In this study, it was found that ADHD symptoms were found most often in children aged 10 to 11 years, with a total of 23 children aged 10 years and 22 children aged 11 years. In other age groups, 5 children were 9 years old, and 4 children were 12 years old. The results in this study were quite similar to the theory where ADHD symptoms in children will most appear closer to 12 years. However, in this study, there were not many respondents in grade 6. In research conducted in 2015 by Mirzaagashi et al, it was found that of 112 children, around 32 children (28,57%) with ADHD were aged 1211. The difference in age distribution in this study is most likely due to the choice of inclusion criteria between grades 3 to 6, where the majority of symptoms appeared in children of grades 4 to 5, whereas it appears that in the study by Mirzaagashi et al, there were no special criteria regarding the child's grade.

The most frequent presentation of ADHD symptoms in this study was inattention with a total of 50 children, while hyperactivity and combined inattention-hyperactivity were 2 children each. It is important to note that SPPAHI appears to favor inattention more than hyperactivity, with there being 19 items regarding inattention and 13 measuring hyperactivity. However, as this study did not analyze the validity of the SPPAHI, and merely used the data regarding item correlation, sensitivity, and specificity during its conception, it is unknown whether this can be attributed to the uneven spread of the symptoms.

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DECLARATION OF INTEREST

The authors declared no potential conflicts of interest regarding the research, authorship, and publication of this article.

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