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Medicine

The Epidemiology of Pediatric Mental Disorders in Child Psychiatric Outpatient Clinic at Dr. Soetomo General Hospital Surabaya, Indonesia

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Abstract	Original Research Article

Background: Mental disorders in children need special interventions to ensure better quality of life. The epidemiology of pediatric mental disorders is needed to prepare sufficient facilities for their treatment. **Purpose:** The aim of this study is to describe the epidemiology of pediatric mental disorders in child psychiatric outpatient clinic at Dr. Soetomo General Hospital, Surabaya in the year 2019 and 2020. **Methods:** This study is a descriptive observational study that uses the medical records of pediatric patients with mental disorders at the child psychiatric outpatient clinic at Dr. Soetomo General Hospital between January 2019 and December 2020. The data was analyzed using descriptive statistics. **Results:** There were a total of 2773 patient visits to the child psychiatric outpatient clinic of Dr. Soetomo General Hospital, Surabaya between January 2019 and December 2020. Patient visits were 51.37% lower in 2020 compared to 2019. Autism (atypical and childhood autism) is the most frequent cases diagnosed in child psychiatric outpatient clinic of Dr. Soetomo General Hospital in 2019 and 2020. **Conclusions:** There is a decrease of patient visits in child psychiatric outpatient clinic at Dr. Soetomo General Hospital starting from the second quarter of 2020. Most cases diagnosed in both 2019 and 2020 were Atypical autism, ADHD with predominant inattentive presentation, and Childhood autism.
Keywords: Mental disorders, children, epidemiology, pediatric patients.

INTRODUCTION

Around 10 to 20% of children and adolescents are affected by mental disorders around the world (World Health Organization, 2020), with more than 50% cases happen before the age of 14 (Kessler *et al.*, 2007). Childhood and adolescence are the times when rapid physical and psychological changes happen, and is a sensitive period for some mental disorders' development (Rapee *et al.*, 2019). They are also the core high-risk period for first onset of mental disorders (Asselmann *et al.*, 2018). Furthermore, neurodevelopmental disorders like attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD) may also begin in childhood. These disorders persist throughout lifetime, alerting us for the need for a study on the prevalence of mental disorders in children and adolescents (Lee & Bahn, 2020). However, in the present, little is known about the epidemiology of mental disorder diagnoses among children and adolescent in Indonesia.

Mental disorders rank third in the leading causes of disability-adjusted life years (DALY) among children in the Western Pacific Region, (Baranne & Falissard, 2018), and ranked fifth in Indonesia (InfoDATIN, 2019). The rate of attempts of suicide among adolescents are also high in low income and middle income countries (Uddin *et al.*, 2019). However, in spite of these alarming statistics, cases of mental disorders in children and adolescent may still be underreported due to stigma and taboo which affect help seeking, reporting of mental health problems, and compliance to therapy (Estrada *et al.*, 2020). In addition, because of COVID-19 pandemic, children and adolescents have experienced extraordinary disruptions to their daily lives. It is predicted that these disruptions may be the risk for the development of mental

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disorders, such as depression, anxiety, and stress-related disorders (Racine *et al.*, 2020).

Mental disorders in children and adolescent should be diagnosed and treated adequately and routinely, because they can hinder the affected children/adolescents' mental development, therefore making transition to adulthood unsuccessful (Asselmann *et al.*, 2018). One study showed that most prior mental disorders resulted in increased risk for subsequent first suicide attempt in adolescents and young adults, in which the risk of first suicide attempt is higher among subjects with more mental disorders (Miché *et al.*, 2018). Childhood mental disorders, especially poorly treated ones, may also continue to present in affected child's young adulthood and adulthood. A Norwegian study revealed adolescents suffering from depression and anxiety disorders continued to have mental disorders in adulthood. Adolescent depression predicted the presence of anxiety in later life, more specifically social anxiety and phobic anxiety disorders. Adolescent anxiety also predicted the presence of depression in adulthood (Ranøyen *et al.*, 2018).

Adequate diagnosis and therapy of mental disorders in children and adolescent may provide better outcome and quality of life in adulthood. Another study showed that the presence of childhood mental disorder predicted worse sociodemographic (educational level, employment, financial situation), functional (relationship with family, peers, partner, physical health), and clinical (other newly diagnosed mental disorders, suicide attempts, help seeking due to psychological problems) outcomes 8 to 10 years after first diagnosis (Asselmann *et al.*, 2018).

The epidemiology of pediatric mental disorders is needed to prepare sufficient facilities for their treatment and furthermore, to ensure better quality of life of pediatric patients in the future. The aim of this study is to describe the epidemiology of pediatric mental disorders in child psychiatric outpatient clinic at

Dr. Soetomo General Hospital, Surabaya in the year 2019 and 2020.

METHODS

This research was a descriptive observational study done at the child psychiatric outpatient clinic at Dr. Soetomo General Hospital. The research data was taken from the medical records of patients in child psychiatric outpatient clinic at Dr. Soetomo General Hospital from January 2019 until December 2020. The variables examined in this study were the patients' diagnoses in the child psychiatric outpatient clinic at Dr. Soetomo General Hospital, Surabaya. The samples were all patients diagnosed with mental disorders in the age range 0-18 years who underwent treatment or therapy in child psychiatric outpatient clinic, Dr. Soetomo General Hospital, Surabaya. The data was analyzed using descriptive statistics.

RESULTS

There were a total of 2773 patient visits to the child psychiatric outpatient clinic of Dr. Soetomo General Hospital, Surabaya between January 2019 and December 2020, in which there were 1852 visits in 2019 and only 921 visits in 2020, 51.37% lower than the past year. The 10 most cases diagnosed in both 2019 and 2020 were Atypical autism (ICD 10 code F 84.1), Attention Deficit Hyperactivity Disorder (ADHD) with predominant inattentive presentation (F 90.0), Childhood autism (F 84.0), Other specified mental disorders due to brain damage and dysfunction and to physical disease (F 06.8), Mild mental retardation with significant impairment of behaviour requiring attention or treatment (F 70.1), Expressive language disorder (F 80.1), Other childhood emotional disorders (F 93.8), Mild mental retardation With the statement of no, or minimal, impairment of behaviour (F 70.0), ADHD with predominant hyperactive/impulsive presentation (F 90.1), and Unspecified communication disorder (F 80.9). The frequency of each diagnosis is stated in Table 1 and Figure 1.

Table 1: Diagnosis of the child psychiatric outpatient clinic of Dr. Soetomo General Hospital patients from January 2019-December 2020

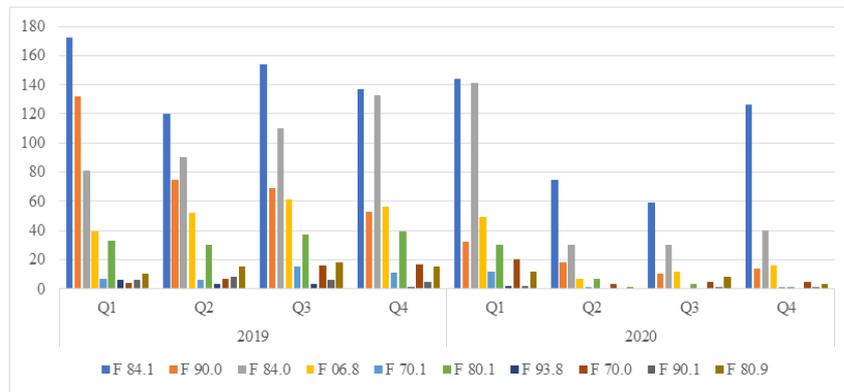| No	Diagnosis	2019				2020			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	F 84.1	172	120	154	137	144	75	59	126
2	F 90.0	132	75	69	53	32	18	10	14
3	F 84.0	81	90	110	133	141	30	30	40
4	F 06.8	39	52	61	56	49	7	12	16
5	F 70.1	7	6	15	11	12	1	0	1
6	F 80.1	33	30	37	39	30	7	3	1
7	F 93.8	6	3	3	1	2	0	0	0
8	F 70.0	4	7	16	17	20	3	5	5
9	F 90.1	6	8	6	5	2	0	1	1
10	F 80.9	10	15	18	15	12	1	8	3
Total		490	406	489	467	444	142	128	207

Figure 1: Diagnosis of the child psychiatric outpatient clinic of Dr. Soetomo General Hospital patients from January 2019-December 2020

Patient visits remained constant through 2019 until the first quarter (Q1) of 2020. From the second (Q2) until the third quarter (Q3) of 2020, there were around 80% decrease of patient visits from the past year. In the fourth quarter (Q4) of 2020, patient visits began to increase, but still less than patient visits in 2019.

The diagnosis of autism (atypical autism and childhood autism) is the most frequent cases diagnosed in child psychiatric outpatient clinic of Dr. Soetomo General Hospital in this range of time. In total, 35.59% of the cases in 2019-2020 were Atypical autism, and 23.62% were Childhood autism. ADHD with predominant inattentive presentation (F90.0) was the third most cases diagnosed, which represented 14.53% of visits. In contrast, ADHD with predominant hyperactive/impulsive presentation (F90.1) was only found in 1.05% of visits from 2019-2020. Other specified mental disorders due to brain damage and dysfunction and to physical disease is the fourth most frequent diagnosis, which accounted for 10.53% of the diagnoses. Language disorders which include Expressive language disorder (F80.1) and Unspecified communication disorder (F80.9) represented 6.49% and 2.95% of the cases, respectively. Mild mental retardation (F70.0 and F70.1) accounted for 4.7% of cases. The least frequent diagnosis was other childhood emotional disorders, which only accounted for 0.54% of all cases. The proportion of each diagnosis were stated in table 2. Autism is the most frequent diagnosis in both 2019 and 2020, with both Atypical and Childhood Autism had increased proportions in 2020 compared to 2019. There is a decrease proportion of ADHD with predominant inattentive presentation cases from 18% in 2019 to only 8% in 2020. The details regarding the proportion of each diagnosis can be seen in Figure 2.

Table 2: Frequency of cases diagnosed in child psychiatric outpatient clinic of Dr. Soetomo General Hospital patients in 2019 and 2020

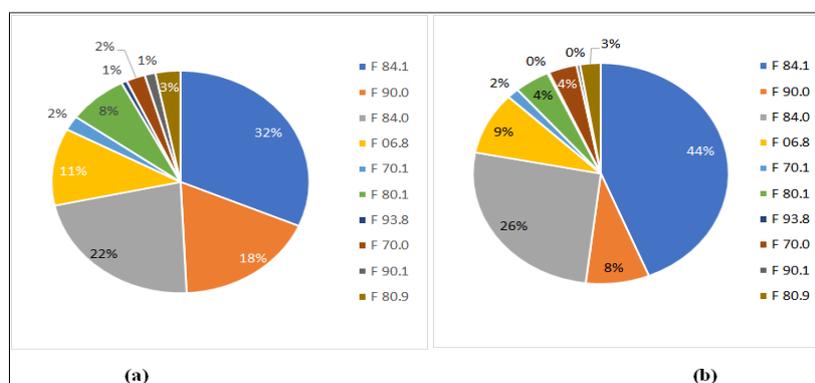| Diagnosis	2019	2020	Percentage	
			n	%
F 84.1	583	404	987	35.59
F 90.0	329	74	403	14.53
F 84.0	414	241	655	23.62
F 06.8	208	84	292	10.53
F 70.1	39	14	53	1.91
F 80.1	139	41	180	6.49
F 93.8	13	2	15	0.54
F 70.0	44	33	77	2.78
F 90.1	25	4	29	1.05
F 80.9	58	24	82	2.96
Total	1852	921		

Figure 2: Proportion of cases diagnosed in child psychiatric outpatient clinic of Dr. Soetomo General Hospital patients in (a) 2019 and (b) 2020

DISCUSSION

The most common diagnosis in both 2019 and 2020 was atypical autism, followed by childhood autism. Both of which are part of autism spectrum disorder (ASD). Attention Deficit Hyperactivity Disorder (ADHD) with predominant inattentive presentation was the third most diagnosis in both years, followed by other specified mental disorders due to brain damage and dysfunction and to physical disease. These findings were slightly different from a study in Korea, in which hyperkinetic disorder is the most common diagnosis. Depressive disorder is the second most common diagnosis, and also the most common diagnosis for female children. In our study, depressive disorders are not found among the top 10 most common diagnosis in our children outpatient psychiatric clinic. Anxiety disorder is a fairly common diagnosis for Korean children, affecting 3.36% of those below 19 years of age. In contrast, autism spectrum disorders are not nearly as common in Korea in comparison to in our study, being the 10th most common psychiatric disorders among Korean children (Lee & Bahn, 2020). Bipolar disorder, reaction to stress and adjustment disorders, tic disorders, and somatoform disorders are also among the top 10 most frequent psychiatric disorder in the Korean study. A study in Turkey supports the findings of the Korean study by Lee & Bahn, in which ADHD is also the most frequent psychiatric disorder diagnosis among children between 0 and 18 years of age (Altay *et al*., 2019).

We can also see from the results above that there is a 50% decrease in patient visits starting from the second quarter (April-June) of 2020, which means an increase in treatment dropout. A large proportion (28% up to 75%) of the treatments in child and adolescent psychiatric outpatient clinics ends in premature termination, or dropout (de Haan *et al.*, 2013). A study in Turkey also reported that dropout rates were 52% for child and adolescent patients getting treatment in psychiatry outpatient clinics (Örengül & Görmez, 2017). A study done in Korea yielded similar results with this study, which stated that the amount of children diagnosed with mental disorder decreased each year, from 23,412 patients on 2010 to 18,821 patients five years later (Lee & Bahn, 2020). Frequency of visits for ADHD patients in this study was decreasing from the second quartile of 2019. The study in Turkey also found that dropout rate in ADHD patients is significantly higher compared to patients with other diagnoses (Örengül & Görmez, 2017). Low parental socioeconomic status, patients who are taken into foster care, and patients who had problems with the law are significantly corelated with increasing rate of psychiatric treatment dropout in children and adolescent patients (Pelkonen *et al.*, 2000).

COVID-19 pandemic, which made its way to Indonesia on March 2nd, 2020 and its case has been increasing ever since, reaching 1,511,712 confirmed case and 40,858 deaths as of March 31st, 2021 (Satuan Tugas Penanganan COVID-19, 2021). The health ministry of Indonesia has released a statute about the obligation of social distancing (called *Pembatasan Sosial Berskala Besar* / PSBB) in order to combat COVID-19 infection. A study about the negative impact of social distancing for mental health reported negative psychological effects including frustration, post-traumatic stress symptoms, fear of getting infected by COVID-19, confusion, boredom, and anger (Brooks *et al*., 2020). The Indonesian Medical Association (*Ikatan Dokter Indonesia* / IDI) also recommends limitation of patient visits during the pandemic, and opt to use telemedicine whenever possible. This guideline is made for doctors to prevent the spread of COVID-19 even further (Ikatan Dokter Indonesia, 2020). These regulations made during pandemic may further decrease patient visits to outpatient clinics, including the child psychiatric outpatient clinic at Dr. Soetomo General Hospital, Surabaya.

Lower patient visits during COVID-19 pandemic may indicate inadequate treatment for the patients, which can induce symptoms relapse or worsening of mental condition. Therapy and treatment certainly increase the chance that psychiatric problems get resolved. When children drop out of psychiatric treatment, their disorders might persist or even worsen later in life (Dulmus & Wodarski, 1996; Reis & Brown, 1999) For example, children with untreated mental disorders are more likely to grow up as adults who rely on mental health services, which has negative consequences for themselves, their loved ones, and society (Kazdin & Wassell, 1998). Adolescents who have anxiety disorder which are inadequately treated are more likely to succumb to substance abuse and have lower academic achievement (Woodward & Fergusson, 2001). Adolescents with behavioural disorders who dropout of their treatment also are more likely to drop out of school, engage in crime, abuse drugs and alcohol and become unemployed (Lochman & Salekin, 2003; Moffitt *et al*., 2002).

To prevent the future bad consequences of treatment dropout, and to ensure continuity of psychiatric treatment during the pandemic, some psychiatric outpatient clinics across the globe have implemented telemedicine as a tool for physicians to examine patients and continuing the patients' treatment while keeping the risk of spreading the virus low. In the state of Massachusetts and California in the USA, both video and telephone visits are required be reimbursed by government insurance at a rate equivalent to an in person visit. This regulation greatly increased the availability of virtual visit for psychiatric patients. Virtual patient visits are done using one of the three methods: 1) live interactive video, 2) telephone conversation, or 3) online patient portal communication (Chen *et al*., 2020). In an outpatient psychiatric clinic in

the state of Northern California, USA, all in-person visits successfully changed into virtual appointments within 3 business days (from march 13th, 2020 until March 15th, 2020), with 73 virtual appointments occurred on its first day after full conversion. 92% (N=67) via videoconference and 8% (N=6) by phone. The patients gave an overall positive response for using telemedicine. A lot of patients felt relieved that their appointments were not cancelled due to the pandemic and they were eager or agreed to try telemedicine. Parents with children also felt safer because they did not have to risk bringing their children to the clinic, possibly exposing their children to the virus. A lot of doctors also felt the benefit of telemedicine. Several physicians appreciated that working from home alleviated concerns of child care. Working from home also saved time. Responses of the physicians were also positive overall (Yellowlees *et al.*, 2020).

The certain advantage of telemedicine during the COVID-19 pandemic is prevention of virus spread. Virtual care is especially beneficial for patients and caretakers who are immunocompromised or have other underlying health issues. Telemedicine also have other benefits, such as minimizes productivity and time loss due to commuting to healthcare centers, makes patients easier to schedule their appointment, increases patient's privacy by eliminating the need to travel physically to a mental health center (therefore reducing exposure to stigmatizing attitudes and beliefs from others), enhances family and home dynamic understanding, decrease rate of dropouts, and increases patient's sense of personal safety for those at risk for violence, crime, and behavioral dysregulation (Chen *et al.*, 2020). However, telemedicine also possesses its own set of challenges. Telemedicine may increase disruptions during sessions due to noises and technological glitches (freezing, delays, reconnecting need), can increase difficulty reading body languages and nonverbal communications, increases physician's effort required to establish rapport, and prevents physical examination needed to assess certain conditions (like movement disorders, medication-induced extrapyramidal symptoms or tremors, neurocognitive disorders) and mental status examination markers *(Chen et al.*, 2020).

Looking at the advantages stated above, we may conclude that telemedicine can increase (virtual) visit rates and decrease patient dropout rates. A study on 192 post-bariatric surgery patients in the USA showed that telemedicine could help overcome geographical barriers in order to provide good quality healthcare services to more remote regions (Wang *et al.*, 2019). A pre-pandemic meta-analysis about the effects of telemedicine for cognitive-behavioral treatments for anxiety disorders showed that the effects of telemedicine were equal in comparison to face-to-face therapist-delivered treatment across anxiety disorders. Telemedicine for cognitive-behavioral treatments is also significantly more effective compared

to control group (Reger & Gahm, 2008). Another meta-analysis in 2010 about effectiveness of telemedicine showed that effectiveness of telemedicine is varied across studies. Twenty one researches concluded that telemedicine works and has positive effects in therapeutic effects, increased efficiencies in the health services, and technical usability, nineteen reviews concluded that while telemedicine is promising, further researches are still needed before a firm conclusion can be drawn, while twenty two reviews concluded that the evidence for the effectiveness of telemedicine is still limited and inconsistent, particularly in the field of surgery, cardiology, and respirology (Ekeland *et al.*, 2010). Even though the effectiveness of telemedicine before pandemic era is variable, social distancing and lockdown provides more opportunity for telemedicine to become a more effective choice compared to face-to-face appointments.

Autism was the most frequent case found in both years. In Asia, the estimation of autism prevalence is largely varied among the countries, ranging from very low prevalence estimated in Iran, 2012 (0.063%) and Bangladesh, 2018 (0.076%), to low prevalence estimated in India, 2017 (0.153%), China, 2011 (0.177%), India, 2017 (0.219%), China, 2014 (0.275%), Nepal, 2018 (0.342%), and Israel, 2013 (0.480%). On the contrary, large autism prevalence were estimated in Bangladesh, 2009 (0.842%) and Sri Lanka, 2009 (1.07%), and very large prevalence were estimated in Lebanon, 2016 (1.53%), South Korea, 2011 (2.64%) (Chiarotti & Venerosi, 2020), and Shenzhen, China (2.62%) (Yang *et al.*, 2015). Unfortunately, there were still no data about the prevalence of typical and atypical autism in Surabaya and Indonesia because screening and surveillance of autism haven't been done, which causes a lack of official data on the number of children with autism in Indonesia (Indrihapsari *et al.*, 2020).

Atypical autism is different from childhood autism by the absence of repetitive behaviors or communication deficits and the failure to fulfill all sets of diagnostic criteria (Skalny et al., 2017). In this study, we found that atypical autism was more frequent compared to childhood (typical) autism. A study in UK found similar results, which shows the rate of childhood autism to be 3.5 per 10,000 children, in comparison to other autistic spectrum disorders (ASD), which were 4.8 per 10,000 children. This study also reported that while rates for typical childhood autism increased by 18% annually, a much larger increase (55% annually) was seen for 'other ASDs' (Powell *et al.*, 2001). In contrast, a population-based study in Denmark showed that atypical autism is nearly 3 times rarer than childhood autism (Lauritsen *et al.*, 2004).

In this study, the 10 most frequent diagnoses in child psychiatric outpatient clinic at Dr. Soetomo general Hospital were Atypical autism, ADHD with predominant inattentive presentation, Childhood autism,

Other specified mental disorders due to brain damage and dysfunction and to physical disease, Mild mental retardation with significant impairment of behaviour requiring attention or treatment, Expressive language disorder, Other childhood emotional disorders, Mild mental retardation With the statement of no, or minimal, impairment of behaviour, ADHD with predominant hyperactive/impulsive presentation, and Unspecified communication disorder. In a similar note, a US-based study about Changes in Outpatient Psychiatric Diagnosis from 1995-2000 showed a dramatic increase in the proportion of children diagnosed with both Autism and Bipolar disorders. An increase was also observed in ADHD, Anxiety, and Depression. A decrease was observed in diagnostic prevalence of Oppositional, Adjustment and Substance Abuse disorders (Harpaz-Rotem & Rosenheck, 2004). A study of 538 cases from pediatric psychiatric outpatient clinic visits in Turkey reported different findings. The most prevalent diagnoses were ADHD, generalized anxiety disorder, mental retardation, depression, Enuresis, specific learning disorder, social phobia, obsessive compulsive disorder, language disorder, and Generalized Developmental Disorder-Unclassified, consecutively. Autism spectrum disorder was not on the 10 most frequent diagnoses (Durukan *et al.*, 2011).

CONCLUSION

There is a decrease of patient visits in child psychiatric outpatient clinic at Dr. Soetomo General Hospital starting from the second quarter of 2020, which may be caused by social distancing regulations issued by the government in response to COVID-19 pandemic. Most cases diagnosed in both 2019 and 2020 were Atypical autism, ADHD with predominant inattentive presentation, and Childhood autism.

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