



THE EFFECT OF GADJET ON ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) IN PRESCHOOL CHILDREN: LITERATUR REVIEW

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ABSTRACT

Background: Attention Deficit Hyperactivity Disorder (ADHD) is a psychiatric disorder that often occurs in children and can persist into adolescence. This condition is characterized by inability to focus attention (inattention), hyperactivity and impulsivity. The cause of ADHD is still unclear, but it is suspected that the use of gadgets contributes to the occurrence of ADHD in preschool children. **Objective:** this research aim to analyze the effect of the use of gadgets on preschool children with ADHD. **Methods:** the chosen research methodology is literature review. All the data has matched the inclusion criteria and collected from online platforms such as PubMed, Scient Direct, and Google Scholar was published in 2019 - 2023. **Results:** of the 10 journals reviewed, it was stated that the use of gadgets had an effect on the occurrence of ADHD, 2 journals said that children with ADHD would have learning difficulties. Preschoolers with ADHD have a habit of playing gadgets for more than the recommended duration of one hour/day. **Conclusion:** the use of gadgets in preschool children affects the ADHD
Keyword: Gadgets, ADHD, Preschool Children

INTRODUCTION

The golden period is the first period of five years in a child's life, is often called the window opportunity or critical period. The golden period of child growth that occurs once in human life. At this time the child's brain will develop very rapidly, most of the network of brain cells functions as a controller for every human activity and quality. Children will respond quickly and quickly learn new things by exploring the surrounding environment. This period is a conducive period in developing various kinds of abilities, intelligence, talents, physical, cognitive, language, social, emotional and spiritual abilities. The early age range is also very decisive in the formation of good character attitudes, behavior and personality of a child in the future. In fact, many parents do not understand the importance of early

stimulation in the development of preschool children. In addition, parents do not realize that the parenting style that is applied to children every day can affect the child's further development. Ironically, many parents deliberately give and let their children play gadgets (age 3-6 years) that should not be suitable for using gadgets with the reason that children sit quietly and not fuss. Increasing the number of gadget users will increase the number of gadget addiction. Gadget addiction will increase the prevalence of the risk of attention deficit disorder and hyperactivity because gadget addiction affects excessive release of the hormone dopamine, causing a decrease in the maturity of the Pre-Frontal Cortex (PFC) (Setianingsih, 2018)

American Academy of Pediatrics (AAP) guidelines, the recommended gadget



play for children over the age of 2 is less than one hour per day. World Health Organization (WHO) guidelines recommend no gadget exposure for children aged less than 2 years and no more than 1 hour of screen time for children aged 2-4 years. There is increasing concern about the link between gadgets and mental illness in children. (Vaidyanathan et al., 2021)

Attention Deficit and Hyperactivity Disorder (ADHD) is a mental disorder condition characterized by three main symptoms, including inattention (difficulty in concentrating), hyperactivity, and impulsivity that can last persistently or permanently. Currently the cause of ADHD is still not clearly known. However, there are several factors that are thought to increase the risk of developing ADHD, including genetic, neurological, neurotransmitter, psychosocial, environmental (cigarette and alcohol consumption during pregnancy), brain trauma, sugar consumption patterns and additives. Birth factors such as low birth weight, premature birth, delivery using the section caesarea method can also increase the risk of a child experiencing GPPH or exacerbate symptoms in children (et al., 2022).

The prevalence of attention deficit hyperactivity disorder (ADHD) in pre-school children ranges from 3-10%. The 4th edition of the Diagnostic and Statistical Manual of Mental Disorder reports a prevalence of ADHD of 2-7% among pre-school-aged children. The American Psychiatric Association estimates that 3-7 out of 100 school children suffer from ADHD (Ministry of Health RI, 2011). Other studies state that the prevalence of ADHD in children around the world ranges from 4-7%. (Trisanti et al., 2020).

METHOD

The research design and method used in this study is a literature review, which is carried out by exploring, observing, analyzing, and identifying several references that are relevant to the research topic. The articles analyzed were articles obtained from the results of accessing several databases such as ScienceDirect, PubMed, and Google Scholar by entering the keywords "Gadget", "ADHD", and "Preschool Children". The selected articles are ten articles with years of publication between 2019-2023. After searching for several references, the researcher obtained ten scientific articles that met the research inclusion criteria.

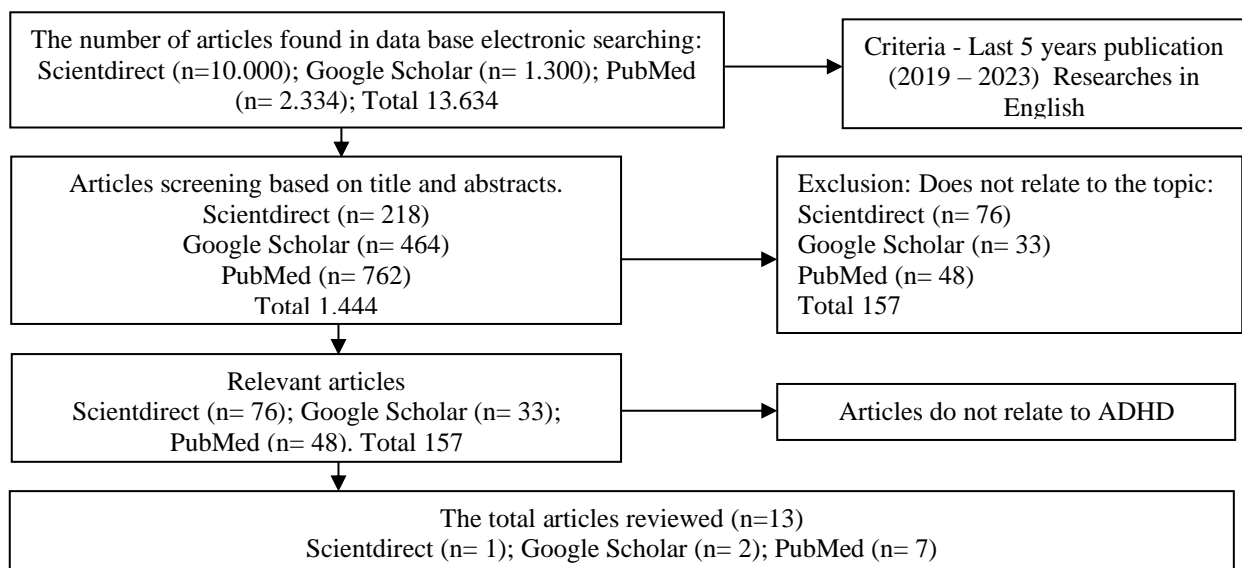


Figure 1. PRISMA Flowchart



RESULTS

Based on scientific articles that have been collected from PubMed, google scholar and scientific direct, three journals say that playing gadgets that exceed the maximum limit will cause gadget addiction for children besides that this can trigger the risk of ADHD. Two journals explained that gadget addiction will reduce motivation and learning achievement at school. Two journals say that there is no significant relationship between playing gadgets and the occurrence of ADHD. This is because the type of viewing will also affect the triggering factor for ADHD. Physical exercise can increase the attention of children with ADHD.

In a study (Vaidyanathan et al., 2021) the total screen time of preschoolers with ADHD was more than the recommended standard in 80.4% of children, with a median of 140.00 minutes (range: 20–500 minutes). The most used modality was television (98.2%), followed by mobile phones (87.3%), tablets (17.9%) and laptops (10.7%). The severity of ADHD ($R=0.29$, $P=0.02$) and the level of parental stress ($R=0.29$, $P=0.03$) were positively correlated with increased screen time exposure in children. Preschoolers with ADHD have screen exposure above the recommended duration of one hour/day. Structured parent training programs for children with preschool ADHD and providing developmentally appropriate interventions are critical in limiting exposure to screen time and also for managing parental stress. World Health Organization (WHO) guidelines recommend no screen exposure for children younger than 2 years and no more than 1 hour of screen time for children aged 2-4. There is increasing concern about the link between screen exposure and mental illness in children. Digital media impact varies depending on device type, content and level of interactive interface, solitary engagement, background exposure, maximum continuous exposure at any one time, and cumulative exposure per day. The interactions of these

variables are diverse and complex, and therefore require intensive research.

DISCUSSION

Children under preschool age are more likely to use the internet/gadgets to watch videos. Gadgets provide stimulation through the visual and auditory senses which can cause a child's mental instability and lack of attention to other things. The intensity of using gadgets in children depends on parental supervision because children are not yet able to control themselves. The negative impact of using gadgets for children is being lazy to move and do activities, less socializing, difficulty concentrating, exposure to electromagnetic radiation, more emotional, difficulty communicating, addiction, phantom vibration syndrome, decreased frontal lobe maturity. Murtaza's research (2017) found that excessive length of time using gadgets would increase behavioral disturbances in children. In this study, the duration of time for using gadgets appropriately kept children from the risk of ADHD. The more often children use gadgets, the higher the risk of children experiencing attention deficit disorder and hyperactivity. This shows that the efficient use of gadgets in preschool-age children will be very beneficial for the growth and development of children.

CONCLUSIONS

The use of gadgets without good time control will cause problems such as deviant behavior problems in childhood, in this case attention hyperactivity disorder. Families are advised to pay more attention to the use of gadgets for children at home by setting time limits for playing gadgets for children, diverting children's attention by doing interesting things such as inviting children to play outside the home, inviting children to do more activities (sports, playing music) and socialize with their peers. This research can be used as additional information in providing better promotive and preventive measures to reduce gadget addiction in



preschool-aged children and prevent the risk of ADHD, especially in preschool children.

No	Journal Identity	Title Journal	Author	Method	Summary of results
	Shuai et al. Globalization and Health	Influences of digital media use on children and adolescents with ADHD during COVID19 pandemic	Lan Shuai, Shan He, Hong Zheng , Zhouye Wang, Meihui Qiu, Weiping Xia, Xuan Cao, Lu Lu1 and Jinsong Zhang	Cross sectional	ADHD children with problematic digital media use (PDMU) will suffer more severe core symptoms, negative emotions, executive function (EF) deficits, impaired family environment, stress from life events, and motivation to learn lower. Compared in ADHD children without PDMU
	Plos One	Screen-time is associated with inattention problems in preschoolers: Results from the CHILD birth cohort study	Sukhpreet K. Tamana, Victor Ezeugwu, Joyce Chikuma, Diana L. Lefebvre, Meghan B. Azad, Theo J. Moraes, Padmaja Subbarao, Allan B. Becker, Stuart E. Turvey, Malcolm R. Sears, Bruce D. Dick, Valerie Carson, Carmen Rasmussen, CHILD study Investigators, Jacqueline Pei, Piush J. Mandhane	Cohort study	Increased screen time in preschool years is associated with worse attention problems.
	Original Article	Screen Time exposure in Preschool Children with aDHD: a Cross-Sectional exploratory Study from South india	Sivapriya Vaidyanathan, Harshini Manohar, Venkatesh Chandrasekaran, Preeti Kandasamy	Cross-Sectional exploratory Study	Preschoolers with ADHD have screen exposure above the recommended duration of one hour/day. Structured parent training programs for children with preschool ADHD and providing developmentally appropriate interventions are critical in limiting screen time exposure
	European Child & Adolescent Psychiatry	Risk and protective factors related to children's symptoms of emotional difficulties and hyperactivity/inattention during the COVID-19-related lockdown in France: results from a community sample	Flore Moulin, Tarik El-Aarbaoui, Joel José Herranz Bustamante, Mégane Héron, Murielle Mary-Krause, Alexandra Rouquette, Cédric Galéra, Maria Melchior	a longitudinal survey of a cohort	Children's emotional and behavioral difficulties are related to parents' mental health and socioeconomic difficulties. In the unprecedented situation of the COVID-19 epidemic, parents and professionals involved in caring for children must pay special attention to their mental health needs.
	Attygalle et al. Neurologi BMC	Migraine, attention deficit hyperactivity disorder and screen time in children attending a Sri Lankan tertiary care facility: are they associated?	Udena Ruwindu Attygalle, Gemunu Hewawitharana and Champa Jayalakshmi Wijesinghe	a comparative cross-sectional study	About 5% of children with migraines are clinically diagnosed with ADHD, compared with 3.5% of those without migraines. Children with migraines are more likely to display hyperactive/impulsive features and are inattentive than those without migraines. Although no association was found between clinically diagnosed ADHD and time spent watching television or gadgets, migraines were associated with longer daily screen use (Levelink et al., 2021). Screening for ADHD in children diagnosed with migraine may be helpful. More studies are needed to understand the possible benefits of reducing screen time in children with migraines
	Journal of Attention Disorder	The Longitudinal Relationship Between Screen Time, Sleep and a Diagnosis of Attention-	Birgit Levelink , Marjolein van der Vlegel , Monique Mommers, Jessica Gubbels, Edward Dompeling, Frans J.M. Feron, Dorothea M.C.B.	Cross sectional	the externalizing symptom score CBCL/2-3 increased by 0.03 with hourly television viewing (95% CI 0.002-0.05) and increased by 0.02 per hour of sleep deprivation (95% CI -0.03--0 , 01). It can be concluded that neither television



No	Journal Identity	Title Journal	Author	Method	Summary of results
		Deficit/Hyperactivity Disorder in Childhood	van Zeben-van der Aa, Petra Hurks, and Carel Thijs		viewing nor sleeping time is associated with ADHD
	Infant behaviour development	Screen Time in 36-month-olds at Increased Likelihood for ASD and ADHD	Monique Moore Hill, MA, Devon Gangi, PhD, Meghan Miller, PhD, Sabrina Mohamed Rafi, BS, Sally Ozonoff, PhD	a cross-sectional analysis	The study found that children aged 36 months with increased ADHD symptoms spent significantly more time looking at gadgets.
	Psychiatry Research	Effects of physical exercise on attention deficit and other major symptoms in children with ADHD: A meta-analysis	Wenxin Sun a , Mingxuan Yu a , Xiaojing Zhou	Literature searches for randomized controlled trials (RCTs).	A total of 15 RCTs with 734 subjects were included. Meta-analyses show that physical exercise can improve attention in ADHD children
	Original Article Series	Gaming Addiction in Children and Adolescents with Attention-Deficit Hyperactivity Disorder and Disruptive Behavior Disorders	Lavkush Verma, Vivek Agarwal , Amit Arya , Pawan Kumar Gupta , Pooja Mahour	a cross-sectional, observational study conducted at the child and adolescent psychiatry outpatient department (OPD) of a tertiary care hospital	Children with gaming addiction score significantly higher across all CBCL (Child Behavior Checklist) domains compared to those without GA (gaming addiction). The GAS (Game Addiction Scale) score has a significant positive correlation with the domains of aggressive behavior, social problems, rule breaking, and CBCL attention problems
	Original Article Series	Effect of Electronic Gadgets on the Behaviour, Academic Performance and Overall Health of School Going Children- A Descriptive Study	Amitha M Hegde , Prachi Suman , Muhammad Unais , Cynthia Jeyakumar	Descriptive Study	After analyzing descriptive data, it was found that 69% of students like to use gadgets at night before going to bed where 59% of children complain of frequent headaches in the morning accompanied by difficulty seeing the blackboard from the back bench. 53% of children had difficulty concentrating during class or at home while studying, thus reporting a decrease in overall grades.

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