

# The Relationship between the Duration of Playing Gadget and Mental Emotional State of Elementary School Students

Arlinda Sari Wahyuni<sup>1</sup>, Ferdinan Benito Siahaan<sup>1</sup>, Mudia Arfa<sup>1</sup>, Ivana Alona<sup>1</sup>, Nerdy Nerdy<sup>2,3\*</sup>

<sup>1</sup>Department of Public Health and Community Medicine, Faculty of Medicine, Universitas Sumatera Utara, Padang Bulan, Medan Baru, Medan, Sumatera Utara 20155, Indonesia; <sup>2</sup>Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Sumatera Utara, Padang Bulan, Medan Baru, Medan, Sumatera Utara 20155, Indonesia; <sup>3</sup>Department of Pharmacy, Academy of Pharmacy Yayasan Tenaga Pembangunan Arjuna, Pintubosi, Laguboti, Toba Samosir, Sumatera Utara 22381, Indonesia

## Abstract

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**\*Correspondence:** Nerdy Nerdy, Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Universitas Sumatera Utara, Padang Bulan, Medan Baru, Medan, Sumatera Utara, 20155, Indonesia; Department of Pharmacy, Academy of Pharmacy Yayasan Tenaga Pembangunan Arjuna, Pintubosi, Laguboti, Toba Samosir, Sumatera Utara, 22381, Indonesia. E-mail: nerdy190690@gmail.com

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**BACKGROUND:** Technology has provided a type of facility in the world that currently makes the world like a virtual globe. One of the technologies currently used by humans is gadgets. Generally, children and adolescents nowadays often use gadget excessively. They use it excessively which may affect their social and emotional functions.

**AIM:** This study aims to determine the relationship between the duration of playing gadget and mental-emotional state of elementary school students.

**METHODS:** This study uses Strength and Difficulties Questionnaire (SDQ) which contains 25 questions that can be used for children aged 8 to 16 years. This research was conducted in August 2018 with fourth-grade students of Public Elementary School and Private Elementary School Medan as respondents. This study uses a cross-sectional study method with the chi-square test as a statistical hypothesis test. The number of respondents in this study was 103 students consist of 73 students of Public Elementary School and 30 students of Private Elementary School Medan.

**RESULTS:** The results of this study found a relationship between the duration of playing gadgets on mental-emotional at elementary school students with a probability value of 0.0001 ( $p < 0.05$ ) and the relationship between the frequency of using gadgets and mental-emotional with a probability value of 0.001 ( $p < 0.05$ ).

**CONCLUSIONS:** There is a significant relationship between mental emotional and the duration of playing gadgets and the frequency of using gadgets elementary school students.

## Introduction

Information and communication technology systems have provided a kind of facility in the world that currently makes the world like a small globe globally [1]. One of the current technologies used by humans is gadgets. A gadget is an object or item created specifically in this advanced era with the aim of helping everything become easier and more practical compared to previous technologies [2]. Generally, children and adolescents nowadays often use intense gadgets. They use it excessively which can affect their social and emotional function. The majority of children and adolescents have smartphones, laptops, game consoles, tablets, iPod

[3]. The use of electronic gadgets has greatly increased in the contemporary world, particularly among children, as a result of addiction [4].

Very early recognition gadget for children can have positive and negative impacts. These are influenced by several factors such as the frequency, duration, and supervision of parents. Using gadgets as a basic material for learning in children will have positive impacts such as increasing children's creativity and thinking. It can appear with parents and children, as well firm in providing time limits for children in playing gadget. Likewise the opposite, if the supervision of parents is lacking and there is no firm effort in providing time limits of playing gadget in children, can cause negative effects. The children

may develop to negative characters such as shy, lacking confident, lonely and stubborn [2].

The frequency or intensity of the children in using gadgets will affects their mental and emotional development. From a study conducted by the University of Western Australia, through a survey of 2,600 school students about the length of looking at the gadget screen, it was found that 45% of 8-year-old children and 80% of 16-year-old students spent more than two hours of playing gadget in a day [5].

There is no data about the correlation between mental and emotional condition with the duration and frequency of using gadgets among elementary school students in Medan, Indonesia which has been published yet. Thus, this study is seeking information whether mental and emotional condition is affected by the duration and frequency of using gadgets among elementary school students

## Methods

This study is an analytical study using a cross-sectional approach. This study uses a questionnaire Strength and Difficulties Questionnaire (SDQ) which contains questions that can be used for children aged 8-16 years. SDQ has 25 items on psychological attributes, divided into 5 scales: emotional symptoms, behavioural problems, hyperactivity/inattention, peer relations problems, and prosocial behaviours that are answered based on 3 choices: never, rarely, and often [6].

The study was conducted in August 2018 with students of Public Elementary Schools and Private Elementary School Medan grade 4 as respondents. The population that the researchers set in this study were fourth-grade elementary students.

We carried out a simple random sampling technique by using computer draw the samples. Our respondents were elementary school students from Public Elementary Schools and Private Elementary School in Medan who were included in the criteria. The collected data were analysed using computer statistical software by using the chi-square test ( $\chi^2$ ). The statistical level was determined as significant if the p-value is < 0.05.

## Results

In our study, we included 103 respondents consisting of 73 students (70.9%) from Public Elementary Schools and 30 students (29.1%) from Private Elementary Schools in Medan. Among the respondents 49.5% were boys, and 50.5 % were girls

and the age distribution was majorly at the age of 8-9 years (52%). Based on the most used gadget type by the respondents are smartphones (52.4%) and followed by tablets (33%) and laptops (9.7%) The frequency of using gadgets was mostly 1-3 days (51.5%), 6-7 days (30.1%), and 4-5 days (18.4%), respectively. Based on the duration of gadget usage in a week, 43% of respondents used gadgets < 5 hours a week, 34% of respondents 6-10 hours a week, and 21% of respondents > 10 hours a week. Based on mental-emotional categories, we obtained 35.9% was normal and borderline categories and 28.2% were abnormal.

**Table 1: Characteristics distribution of respondents, Characteristic Gadget, and mental-emotional category**

Characteristics of Respondents	n	%	
Gender	Male	51	49.5
	Female	52	50.5
Age	8-9 years old	54	52
	10-11 years old	49	48
School	Public Elementary Schools	73	70.9
	Private Elementary Schools	30	29.1
Gadget's type	Smartphone	54	52.4
	Tablet	34	33.0
	Laptop	10	9.7
	Etc	5	4.9
Number of Gadget Usage days in a week	1-3 day	53	51.5
	4-5 day	19	18.4
	6-7 day	31	30.1
Play Gadget Duration in a week	< 5 hour	45	43
	6-10 hour	36	34
	> 10 hour	22	21
Mental Emotional	Normal	37	35.9
	Borderline	37	35.9
	Abnormal	29	28.2

Based on SDQ criteria\*.

Based on the research, it was found that the emotional mental results of the normal category based on female sex were 59.5% and men 40.5%. Borderline categories based on female sex were 43.2%, and men were 56.8%. The abnormal category based on female sex is 51.7%, and males are 48.3%. The normal emotional and mental category was 48.6% and 51.3% at the age of 8-9 years and 10-11 years, respectively. The borderline category among children ages of 8-9 year was 56.7% and 10-11 years was 43.2%. The abnormal category in 8-9 years old was 51.7% and 10-11 years old was 48.2%.

**Table 2: Mental Emotional Distribution of Respondents**

Respondents based on Gender	Mental Emotional		
	Normal n (%)	Bordeline n (%)	Abnormal n (%)
Male	15 (40.5%)	21 (56.8%)	15 (51.7%)
Female	22 (59.5%)	16 (43.2%)	14 (48.3%)
Respondents based on Age	Normal n (%)	Borderline n (%)	Abnormal n (%)
8-9 years old	18 (48.6%)	21 (56.7%)	15 (51.7%)
10-11 years old	19 (51.3%)	16 (43.2%)	14 (48.2%)
Respondents based on School	Normal n (%)	Borderline n (%)	Abnormal n (%)
Public Elementary Schools	29 (78.4%)	22 (59.5%)	22 (75.9%)
Private Elementary Schools	8 (21.6%)	15 (40.5%)	7 (24.1%)

Based on elementary school type, it was found that most mental and emotional category of the public elementary school students was at the normal category (78.4%). Whereas in the private elementary school students, the mental and emotional category was mostly in borderline range (40.5%)

**Table 3: Mental Emotional Relationships with the Frequency of Using Gadgets and Number of Hours in a Week**

Number of Usage Gadgets days (/ week)	Mental Emotional		
	Normal n (%)	Borderline n (%)	Abnormal n (%)
1-3 days	27 (60)	6 (31.6)	4 (13)
4-5 days	18 (34)	8 (42.1)	11 (35.5)
6-7 days	8 (16)	5 (26.3)	16 (51.5)
Chi-Square			P = 0.001
Number of Gadget Usage Hours (/ week)	Mental Emotional		
	Normal n (%)	Borderline n (%)	Abnormal n (%)
< 5 hours	26 (70.3)	15 (40.5)	4 (13.8)
6-10 hours	8 (21.6)	19 (51.4)	9 (31)
> 10 hours	3 (8.1)	3 (8.1)	16 (55.2)
Chi-Square			P = 0.0001

Based on the research, the results of the normal mental, emotional category based on the frequency of gadget usage in the week were 1-3 days a week at 60%. Mental-emotional with borderline categories based on the frequency of gadget usage in the most weeks is 4-5 days a week as much as 42.1%. The emotional mentality is not normal category based on the frequency of use of gadgets in a week which is the most is 6-7 days as much as 51.5% with P value = 0.001, indicating that there is a significant relationship between mental, emotional and frequency of playing gadget. Emotional mentality in the normal category based on the number of hours of gadget usage in the most week is < 5 hours a week at 70.3%, the most borderline category is 6-10 hours a week 51.4%, the abnormal category based on the most hours of gadget usage in the week is > 10 hours a week of 55.2% (p-value = 0.0001).

SDQ has 25 items on psychological attributes, divided into 5 scales: emotional symptoms, behavioural problems, hyperactivity/inattention, peer relations problems, and prosocial behaviours that are answered based on 3 choices: never, rarely, and often [6].

**Table 4: Number of frequent answers by respondents**

SDQ Scale	Number of frequent answers by respondents
Emotional symptoms	140
Behavioural Problems	89
Hyperactivity/lack of attention	160
Peer relationship problems	185
Prosocial behaviour	291

From the results of the study it was found that the most "frequent" answers on the prosocial behaviour scale were 291 answers from which of the 5 questions on the prosocial behaviour scale, problem number 1 had the most "frequent" answers.

## Discussion

Based on the results of the study, the majority of the respondents were children of 8-9 years old. As many as 51.7% of respondents aged 8-9 years are

considered an abnormal mental, emotional category. According to Mildayani (2017), children aged 6-17 years are playing gadgets in the specified time, when the time is up they will ask for extra time. This is one sign of the effects of addiction. Children with their strength will hit, become aggressive, or cry [7]. Research conducted by Wiguna et al., in 161 children and adolescents showed that 54.81% had problems with relationships with peers and 42.2% had emotional problems [8].

The study showed that most of the respondents were female. However, as many as 51.7% of male respondents were categorised as abnormal. According to Jarot (2015), the influence of the gadget on the level of violence is mostly males, because it is more aggressive and the level of emotion has not been controlled. So that fellow men often quarrel [9].

Based on the research obtained based on the type of gadget that has the most is a smartphone. According to research by Okky Rachman (2015), elementary school children who have the most types of gadgets are mobile phones, the second most choice is laptops because they are larger so they are more likely to be satisfied to play games [10].

Based on the results of the study, the highest distribution of respondents for the number of days of use of gadgets in a week is 1-3 days a week. However, in this study mental, emotional abnormalities obtained the highest frequency is 6-7 days of use in a week, whereas, the most duration of gadget usage is < 5 hours a week. However, in this study, the abnormally emotional category obtained the highest number in duration more than 10 hours.

According to Sari and Mitsalia (2016), the use of gadgets is categorised as high intensity when using a gadget with a duration of more than 120 minutes/day and in one use is > 75 minutes. Also, a day can be many times (more than 3 times usage) the use of gadgets with a duration of 30-75 minutes will cause addiction in the use of gadgets. Furthermore, the use of medium intensity gadgets if using a gadget with a duration of more than 40-60 minutes/day and intensity of use in one use 2-3 times/day for each use [11].

Based on the research, it was found that the emotional mentality of respondents with an abnormal category was 28.2%. According to Sundus M (2015) about the effect of using gadgets on children that using too many gadgets causes depression in children at certain ages. This also causes mental health problems in children in childhood and adolescence. They may act depressed, or we can see the worst of these symptoms of depression within a few days [12].

Other studies conducted by Mingli et al., (2015) say that children who use gadgets for more than 2 hours per day have an increased risk of depression, and that risk increases with increasing

screen time [13]. Ferguson (2017) found a small positive relationship but significant use of the duration of playing gadget with feelings of depression and delinquency in children when playing gadgets for more than 6 hours per day [14].

Another major concern regarding excessive use of gadgets in the age of children is a negative action. A study in Malaysia conducted in 2011 found that children became very dependent on gadgets, they would have negative sentiments if they lost their gadgets, the majority will say that they will be angry, sad, and insecure [4]. The use of gadgets for too long duration can affect aggressive levels in children. Also, the child becomes insensitive to the environment around him. Children who are too cool with their gadgets result in forgetting to interact or communicate with people around and their families, and that will have a negative impact on children's social development [2]. Many studies have explored the relationship between gadget use and mental emotionality in children, and the results are clear, when using gadgets increase, so too the risk of mental-mental problems including depression, anxiety, ADHD, mood disorders, and suicide [15].

In conclusion, based on the results of the study, the conclusions obtained are there is a significant relationship between the duration of playing gadgets on mental-emotional elementary school students. Mental-emotional elementary school students also have a significant relationship to the frequency of gadget usage in a week. There is a significant relationship between the respondent's mental emotionality on the number of hours of gadget usage in a week.

The advice given to parents and teachers is to limit the use of gadgets to children where the duration of playing gadgets should be less than 40 minutes/day and frequency < 3 times/day and 1-3 days/week. For health workers and schools can make counselling efforts on excessive use of gadgets and conduct early detection using the SDQ questionnaire.

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