ORIGINAL ARTICLE

The Effect of Screen Time on Mental Emotional Disorders in Elementary School-Age Children

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ABSTRACT

Emotional mental disorders refer to conditions in which children experience drastic emotional changes and instability that can affect their development and relationships with their environment. These disorders can be influenced by various factors, including high screen time. This study endeavors to examine the influence of screen time on emotional mental disorders among students in the sixth grade. The research utilized an analytical observational design with a cross-sectional approach. The sample consisted of 49 6th-grade students from SD Islam Sultan Agung 04 Semarang, selected using proportionate random sampling and meeting inclusion criteria (willingness to complete the questionnaire). The instruments used were the Strength and Difficulties Questionnaire (SDQ) and a Screen Time Questionnaire. Data analysis involved Chi-square and Fisher Exact tests. Regarding emotional mental disorder scores (difficulties), the majority of children (57.1%) fell within the normal category. For emotional mental disorder scores (strength), most children (98%) were categorized as normal. In terms of screen time scores, the highest category was high screen time, comprising 35 children (71.4%). The effect of screen time on emotional mental disorders in the difficulties domain yielded a p-value of 0.108 ($p > 0.05$), while for the strength domain, it was 1.00 ($p > 0.05$). In conclusion, the study found no significant effect of screen time on emotional mental disorders among the children studied.

Keywords: Screen Time, Emotional Mental Disorders, 6th Grade Elementary School Student

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INTRODUCTION

Emotional mental disorders, according to the American Psychological Association (APA), are psychological disorders characterized by excessive emotional reactions that are disproportionate to their causes[1]. Emotional disorders in children include various conditions, including anxiety, depression, and behavioral issues. These factors can greatly impact a child's emotional health, conduct, and social engagements. According to the National Institute of Mental Health (NIMH), around 10-15% of children experience emotional mental disorders[2]. The World Health Organization (WHO) states that about 1 in 5 children under the age of 16 experience emotional mental disorders[3]. Based on a survey conducted by APJII (Association of Indonesian Internet Service Providers) in 2023, out of a total of 8,510 respondents, 1,020 were adolescents aged 13-18 years old. On average, these adolescents reported using the internet for 1-5 hours per day. Excessive gadget use behavior leads to increased screen time.

Screen time denotes the duration spent using devices such as smartphones, television

computers, tablets, and laptops[4]. Therefore, this research aims to investigate the influence of screen time on emotional mental disorders in 6th grade elementary school children.

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MATERIAL AND METHODS

The type of research uses a cross-sectional approach This research employs a cross-sectional approach and was conducted at SD Islam Sultan Agung 04 Semarang in March 2024. In this research, screen time served as the independent variable. The dependent variable in this study is emotional mental disorder.

Screen time refers to the duration children spend daily using gadgets such as smartphones, tablets/ iPads, video games, and television, measured in minutes. It is assessed using a screen time questionnaire adapted from the American Pediatrics Association, divided into 7 time ranges: 05.00-08.00, 08.00-11.00, 11.00-14.00, 14.00-17.00, 17.00-20.00, 20.00-23.00, and 00.00-05.00. The questionnaire is completed over 3 days with assistance from parents. Screen time scores are interpreted into 2 categories: high screen time (>120 minutes/day), and low screen time (<120 minutes/day).

Emotional mental disorders encompass several diagnoses including Oppositional Defiant Disorder, Intermittent Explosive Disorder, Conduct Disorder, Sibling Rivalry, and Attention Deficit/Hyperactivity Disorder. The measurement of emotional and mental disorders utilizes the SDQ (Strengths and Difficulties Questionnaire), which includes 25 items across scales such as emotional symptoms, conduct issues, hyperactivity, and peer difficulties. There are three response options: "Yes", "Maybe", and "No" for interpretation. The scoring for the SDQ is divided into favorable and unfavorable categories, where favorable items are scored as 0 = No, 1 = Maybe, 2 = Yes, and unfavorable items are scored as 0 = Yes, 1 = Maybe, and 2 = No. Scores for emotional mental disorders are categorized into three groups: normal (0-13), borderline (14-16), and abnormal (17-40).

This study focuses on elementary school students as its target population. The accessible population for this study consists of sixth-grade students at SD Islam Sultan Agung 04 Semarang for the academic year 2023/2024.The sample in this study consists of research subjects who must meet inclusion and exclusion criteria. The criteria for inclusion and exclusion in this study are outlined as follows::

a) Inclusion Criteria

1. Their parents have provided informed consent, indicating permission for their child to participate as research subjects.
2. 6th students of SD Islam Sultan Agung 04 Semarang.
3. Willing and permitted to participate as respondents.

b) Exclusion Criteria

1. Incomplete questionnaires.
2. Absent during the research period.

The sample size is calculated using the Lemeshow formula as follows[5]:

$$n = \frac{Z^2 1-\alpha/2 \times P(1-P)}{d^2}$$

The sampling method used in this study is probability sampling, specifically proportionate random sampling, where every individual in the population has an equal opportunity to be chosen as research subjects[6]. This method ensures that each subject has an opportunity to be sampled proportionally according to their representation in the population[7].

Statistical Analysis

The analysis methods used in this study are univariate and bivariate analyses. Univariate analysis aims to describe the frequency distribution of screen time and the frequency distribution of children's emotional and mental disorders.

Bivariate analysis in this research utilizes Chi-square and Fisher's exact tests. These tests are conducted using IBM SPSS 25 software. Chi-square and Fisher's exact tests are utilized to ascertain the influence of screen time on emotional and mental disorders. The hypotheses are defined as H0= There is an effect of screen time on emotional and mental disorders in children (p-value ≤ 0.05), and H1= There is no effect of screen time on emotional and mental disorders in children (p-value > 0.05). These statistical tests help conclude whether screen time has a significant impact on children's emotional and mental health based on the calculated p-values.

RESULTS

This study was conducted from March 8, 2024, to March 12, 2024, at SD Islam Sultan Agung 04 Semarang. The respondents in this study were 6th grade students of SD Islam Sultan Agung, with the independent variable being screen time and

the dependent variable being children's emotional and mental disorders. The study included a total of 49 sixth-grade students from SD Islam Sultan Agung 04 Semarang who met the inclusion criteria for the research.

Table 1. Characteristics of Respondents

Variable		Frequency	Percentage (%)
Age	11	11	22.4
	12	35	71.4
	13	3	6.1
Gender	Male	25	51
	Female	24	49
Gadget ownership	Personal gadget	37	75.5
	Parental gadget	12	24.5

Based on Table 1, the bulk of respondents were in the 12-year-old age group, 35 people (71.4%). Regarding gender, the highest number of respondents were male students, 25 people (51%). In terms of gadget ownership, the data shows that most students use their own gadgets, 37 people (75.5%), compared to those who use parental gadgets.

The results of the Screen Time Questionnaire are categorized into low screen time and high screen time. The overview of respondents' screen time is presented in Table 3 below.

Table 2 . Screen Time Category based on Screen Time Questionnaire

Classification	Frequency	Percentage (%)
Low screen time	14	23,6
High screen time	35	71,4

Based on Table 2, the highest number of respondents are classified under high screen time, 35 people (71.4%), compared to those classified under low screen time, 14 people (23.6%).

The results of the Strength and Difficulties Questionnaire are categorized into normal, borderline, and abnormal. Emotional and mental domain difficulties among the respondents are presented in Table 3.

Table 3. Emotional Mental Disorders Category Domain Difficulties

Classification	Frequency	Percentage (%)
Normal	28	57,1
Borderline	8	16,3
Abnormal	13	26,5
Amount	49	100

According to Table 3, the majority of respondents are classified as normal, indicating no emotional and mental disorders, 28 people (57.1%). Followed by students classified as having abnormal emotional and mental disorders,13 people (26.5%), while those classified as borderline amount to 8 people (16.3%).

Emotional and mental domain difficulties among the respondents are presented in Table 4.

Table 4. Emotional Mental Disorders Category Domain Strength

Classification	Frequency	Percentage (%)
Normal	48	98
Borderline	0	0
Abnormal	1	2
Amount	49	100

Based on Table 4, the majority of respondents are classified in the normal category, 48 people (98%). Followed by the abnormal category, 1 people (2%). There were no respondents classified in the borderline category.

The impact of screen time on emotional and mental disorders among elementary school children was assessed using both the Chi-Square and Fisher Exact tests. These statistical methods were chosen to examine how screen time affects emotional and mental health issues. Data analysis was conducted using IBM SPSS Version 25 software.

Table 5. The effect of screen time on emotional and mental difficulties

Screen Time	Emotional Mental Disorders Difficulties
	p*
High Screen Time	0.108
Low Screen Time	

*Chi Square

Table 6. The effect of screen time on emotional and mental strength

Screen Time	Emotional Mental Disorders Strength
	p*
High Screen Time	1.00
Low Screen Time	

*Fisher Exact

The Chi-Square test showed p=0.108 (p>0.05),

and the Fisher's Exact test showed p=1.00 (p<0.05). Therefore, the hypothesis that there is an influence of screen time on emotional and mental disorders among elementary school children at SD Islam Sultan Agung 04 Semarang is rejected.

CONCLUSION

Based on the research conducted on 49 6th grade students at SD Islam Sultan Agung 04 Semarang regarding screen time and emotional mental disorders, the following conclusions can be drawn:

1. There is no significant correlation between emotional mental disorders and screen time among sixth-grade elementary school students.
2. Screen time among sixth-grade elementary school students resulted in 14 (23.6%) categorized as low screen time and 35 (71.4%) as high screen time.
3. There are 13 students (26.5%) experiencing emotional mental disorder difficulties in sixth-grade, with 8 (16.3%) categorized as borderline and 28 (57.1%) categorized as normal.
4. There is 1 student (2%) experiencing emotional mental disorder strengths in sixth-grade, with 0 (0%) categorized as borderline and 48 (98%) categorized as normal.

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Authors' contribution

Study design: Fidia Safa Ramadhani, Putri Rokhima Ayuningtyas, Ratnawati

Data gathering: Fidia Safa Ramadhani, Putri Rokhima Ayuningtyas, Ratnawati

Data analysis: Fidia Safa Ramadhani, Putri Rokhima Ayuningtyas, Ratnawati

Writing and submitting the manuscript: Fidia Safa, Putri Rokhima Ayuningtyas

Editing and approval of final draft: Putri Rokhima Ayuningtyas

Ethical clearance

All activities for this study were approved by the Ethical Committee No.17/I/2024 Komisi Bioetik of Faculty of Medicine, Universitas Islam Sultan Agung.

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Conflict of Interest

The authors confirm that there are no conflicts of interest related to this study.

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