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Study of Internet and Social Media Addiction in Indonesia during Covid-19

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ABSTRACT

Since February 2020, Indonesia was struck by the Covid-19 pandemic. This led to the imposition of Large-scale Social Restrictions. The government issued a policy of working from home, learning from home, and worshiping at home. To carry out their activities from home, people are becoming increasingly dependent on the internet. With the increasing use of the internet during this pandemic, we are conducting a study on whether there is a phenomenon of internet addiction and social media in Indonesia. A survey of 2309 respondents from 31 provinces in Indonesia using Kimberley Young's Internet Addiction Test (IAT) has been conducted. After the data cleaning process to remove redundant data, only data from 2206 respondents were analyzed further with the binary logistic regression method. 25% of respondents were indicated with Internet addiction. High school students and college students tend to have a 1.7% higher risk of addiction. The length of time accessing e-commerce web and social media also increases the risk of internet addiction. YouTube and Instagram are social media applications that tend to pose a risk of addiction to respondents. A critical analysis of the Internet Addiction Test from a Philosophy of Science perspective was conducted. Finally, we formulate recommendations on strategies the government and society could take in dealing with the problem of internet addiction.

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1. Introduction

Covid-19 has a major impact on Indonesian society. Until mid-November 2020, there have been 500,000 cases of Covid-19 in Indonesia with the number of deaths reaching 16,000 [1]. To deal with Covid-19, the government implemented a large-scale social restriction policy. People are instructed to work from home, study from home, and worship at home [2].

People increasingly depend on the internet to carry out their activities. According to APJII (*Indonesian Internet Service Providers Association*), the number of internet users in Indonesia as of the second quarter of 2020 has increased to 73.7 percent of the population or the equivalent of 196.7 million users [3]. Indonesia is currently ranked 4th in the world for the highest number of internet users [4]. It is feared that the increase in Internet use during the Covid-19 pandemic will cause symptoms of internet addiction and social media addiction. Therefore, we conducted a study on internet addiction and social media. We constructed an online survey using Kimberly Young's Internet Addiction Test [5].

The purpose of this study is to analyze whether there is a phenomenon of internet and social media addiction in Indonesia during this pandemic era. There are several studies [6][7][8] discussing the effects of the internet and social media addiction in Indonesia in recent years. But there has been no recent study measuring the impact of the internet and social media addiction in Indonesia during the Covid-19 pandemic. The contributions of this paper are:

1. conducting a comprehensive study of internet addiction and social media in Indonesia during the Covid-19 pandemic.
2. analyzing what factors are significant for internet and social media addiction in Indonesia.
3. inspecting internet addiction in terms of the philosophy of science.
4. providing advice to the government and society regarding the handling of internet addiction and social media.

This paper is structured as follows: Section 2 presents the related works; Section 3 provides background material on Internet Addiction. Section 4 describes our methodology. Section 5 explains the result and analysis. Section 6 offers discussion and recommendations related to our result. Section 7 concludes our study.

2. Related Works

There are several studies worldwide discussing the increasingly concerning effects of the internet and social media addiction in recent years. As one of the largest internet users globally, Indonesia also has the same problem. Hikmawati [6] has conducted a study related to the Gadget Addiction and Social Media phenomenon in Indonesia, based on a survey of 1312 respondents. This study used a questionnaire with questions referred to the Internet Addiction Test (IAT) method by Kimberly Young. However, the conversion rate of addiction did not follow the IAT technique, causing bias in the analysis. Pratama [7] conducted a study to measure social media's influence factors and gadget addiction on adolescents in Indonesia. Pratama organizes survey and data analysis by building Partial Least Square and Structural Equation Modeling. The discussion does not focus on the level of addiction as in Kimberly Young's IAT but looking for scientific evidence of what factors influence social media and gadget addiction. The discussion is very

focused on how the survey data is processed, thus information on the impact of addiction is not discussed in depth.

Siste [8] surveyed to measure the impact of physical distance and factors related to internet addiction among adults in Indonesia during the COVID-19 pandemic. The survey results show that a pandemic and a period of isolation at home causes an increase in the duration of internet access, which will worsen the health of internet addicts. However, Siste [8] used a different technique in conducting its survey and only targeted respondents over 21 years of age who were categorized as adults. There has been no recent study measuring the impact of internet addiction on students in Indonesia during the Covid-19 pandemic. Therefore, we devised an online survey and added a critical analysis from the perspective of science's philosophy related to Internet Addiction. Nugroho [9] surveyed 385 respondents using the Internet Addiction Test. The result shows that there is no relationship between gender and addiction level. However, the number of respondents was too small, and the regional coverage of the respondent was not explained. Comparison of previous research and its limitation are presented in Table 1**.**

Table 1 Comparison of The Research Related to IAT

Reference	Description	Limitation
[6]	Study of Gadget Addiction and Social Media phenomenon in Indonesia. Survey of 1312 respondents based on Internet Addiction Test (IAT)	The conversion rate of addiction did not follow the IAT manual
[7]	Study to measure social media's influence factors and gadget addiction on adolescents in Indonesia. Data analysis by building Partial Least Square and Structural Equation Modeling.	Not focus on the level of addiction as in Kimberly Young's IAT but finds scientific evidence of what factors influence social media and gadget addiction. Information on the impact of addiction is not discussed in depth
[8]	Impact of physical distance and factors related to internet addiction among adults in Indonesia during the COVID-19 pandemic	Only targeted respondents over 21 years of age
[9]	Study of Internet Addiction test in Indonesia with 385 respondents	The number of respondents was too small, and the regional coverage of the respondent was not explained

3. Internet Addiction

The term internet addiction became known in 1995 when New York psychiatrist Dr. Ivan Goldberg wrote a post about ***Internet Addiction Disorder*** on the Psycom bulletin board [10]. The post was actually made as a joke but sparked a discussion about the theme of internet addiction. In the same year, clinical psychology student Ms. Kimberly Young, discovered that her friend's husband seemed to have internet addiction and spent 40-60 hours in AOL chat rooms. At that time access to the internet cost $ 2.95/h. The man was not only experiencing financial difficulties, but his marriage ended in divorce after he met women in online chat rooms [11].

Ms. Young then conducted academic research on internet addiction and found that there were 600 cases of people who could not control their internet usage, which resulted in them experiencing relationship crisis, academic impairment, financial problems, and job loss. She then developed an *internet addiction test* (IAT) method to determine the severity of addiction which contained 20 questions. IAT has become the standard measurement of internet addiction levels and has been translated into Chinese, French, Italian, Turkish, Korean, and Bahasa Indonesia. Some of the symptoms that arise in people with internet addiction include preoccupation with the internet, lying about internet addiction, loss of

interest in other activities, using the internet as an escape, sleep deprivation, social isolation [12].

4. Methodology

4.1 Pre-Survey

From a literature study on internet addiction testing methods, we decided to use the Kimberly Young Internet Addiction Test. According to Billieux [13], internet addiction consists of three: internet gaming disorder, social media addiction, and online sexual addiction.

Since this survey is open and not aimed at specific ages and groups, we limit our research to internet addiction and social media addiction only. We devised a separate survey between internet addiction and social media addiction. Both surveys were carried out simultaneously. The survey was conducted anonymously, but participants were required to enter information on gender, age, education, occupation, and the province of residence.

We added some additional questions to find out what factors are significant to the internet and social media addiction. In the internet addiction survey, some additional questions were asked, namely the age of first having a gadget, the age of first accessing the internet, the age of first having a social media account, which sites are frequently accessed and the duration of access each day with choices are blogs, e-commerce, corporate websites, government agencies, social media, online communities, news portal, and other websites.

In the social media addiction survey, additional questions were asked: Duration of accessing social media accounts every day, the choices are Facebook, Instagram, WhatsApp, YouTube, Line, LinkedIn, Twitter, Telegram, TikTok, and other social media. Survey questions are made using Google Forms. Furthermore, a pre-survey was conducted with 200 respondents and tested with validity and reliability testing.

In the validity test, questions are categorized into four X variables (time, relationship, productivity, and thought), and one variable Y (addiction). These 4 categories follow the "Validity and Reliability Study of the Internet Addiction Test" research conducted by Keser et.al [14]. The validity test aims to check the reliability of the measuring instrument. In this study, the level of significance is smaller than 0.05 as shown in Figure 1, which means that these questions are valid and can be used to measure the Time variable.

Correlations

		X1_1	X1_2	X1_3	X1_4	TotalX1
X1_1	Pearson Correlation	1	,435**	,523**	,383**	,808**
	Sig. (2-tailed)		,000	,000	,000	,000
	N	200	200	200	200	200
X1_2	Pearson Correlation	,435**	1	,277**	,272**	,660**
	Sig. (2-tailed)	,000		,000	,000	,000
	N	200	200	200	200	200
X1_3	Pearson Correlation	,523**	,277**	1	,249**	,687**
	Sig. (2-tailed)	,000	,000		,000	,000
	N	200	200	200	200	200
X1_4	Pearson Correlation	,383**	,272**	,249**	1	,714**
	Sig. (2-tailed)	,000	,000	,000		,000
	N	200	200	200	200	200
TotalX1	Pearson Correlation	,808**	,660**	,687**	,714**	1
	Sig. (2-tailed)	,000	,000	,000	,000	
	N	200	200	200	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Y2_1	Y2_2	Y2_3	Y2_4	Y2_5	TotalY2
Y2_1	Pearson Correlation	1	,630**	,441**	,440**	,343**	,683**
	Sig. (2-tailed)		,000	,000	,000	,000	,000
	N	200	200	200	200	154	154
Y2_2	Pearson Correlation	,630**	1	,537**	,660**	,657**	,845**
	Sig. (2-tailed)	,000		,000	,000	,000	,000
	N	200	200	200	200	154	154
Y2_3	Pearson Correlation	,441**	,537**	1	,675**	,640**	,757**
	Sig. (2-tailed)	,000	,000		,000	,000	,000
	N	200	200	200	200	154	154
Y2_4	Pearson Correlation	,440**	,660**	,675**	1	1,000**	,881**
	Sig. (2-tailed)	,000	,000	,000		,000	,000
	N	200	200	200	200	154	154
Y2_5	Pearson Correlation	,343**	,657**	,640**	1,000**	1	,881**
	Sig. (2-tailed)	,000	,000	,000	,000		,000
	N	154	154	154	154	154	154
TotalY2	Pearson Correlation	,683**	,845**	,757**	,881**	,881**	1
	Sig. (2-tailed)	,000	,000	,000	,000	,000	
	N	154	154	154	154	154	154

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 1 Validity Test Result

Reliability is a measure that indicates that the measuring instrument used in research has reliability as a measuring tool, including measured through the consistency of measurement results from time to time if the measured phenomenon does not change [15].

To see the reliability coefficient, we used the reliability test by looking at Alpha-Cronbach [16]. The test results in Figure 2 suggest that r_{11} is 0.679 which means that the time variable is in the range $0.60 < r_{11} \leq 0.80$ with high reliability according to Guilford classification [17]. This means that the questionnaire is reliable. Validity and reliability tests were carried out using the IBM SPSS 20.0.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,679	,689	4

Inter-Item Correlation Matrix

	X1_1	X1_2	X1_3	X1_4
X1_1	1,000	,435	,523	,383
X1_2	,435	1,000	,277	,272
X1_3	,523	,277	1,000	,249
X1_4	,383	,272	,249	1,000

Figure 2 Result of Reliability Test

4.2 Survey

Survey distribution is carried out through several media such as WhatsApp, social media, and email. This survey was conducted openly, anonymously, and self-administrated, but limited to the timeframe 30th October 2020 - 4th November 2020. There were 2309 participants. All respondents conducted both internet addiction and social media surveys. Then data cleaning is performed to eliminate redundant data. After the cleaning process, an analysis of 2206 data was carried out.

4.3 Analysis

This study uses three analytical methods, namely *Descriptive Analysis* to obtain an overview of survey respondents, the *Binary Logistic Regression* method to see which variables are significant in influencing internet addiction and social media addiction and followed by *Cross Tabulation* to see the relationship between the two variables indicated to have an influence against addiction.

4.3.1 Descriptive statistics

Descriptive analysis [18] is carried out to get an overview of the respondents involved in this study. Out of 2206 respondents, 51.8% were male and 48.2% were female. The ages of the respondents ranged from 7-73 years, with the mean age is 28.04 years.

Respondents' education starts from elementary school to doctorate. Gender's percentage of the respondents and their education level are presented in Figure 3. The occupations of the respondents also varied, including housewives, students, college students, retirees, government employees, soldiers, police, traders, farmers, breeders, industrial workers, private employees, state-owned company employees, and not yet working.

Respondents came from 31 provinces in Indonesia and 6 participants from abroad. Of the 34 provinces in Indonesia, we have not received participants from the provinces of Maluku, North Kalimantan, and North Maluku.

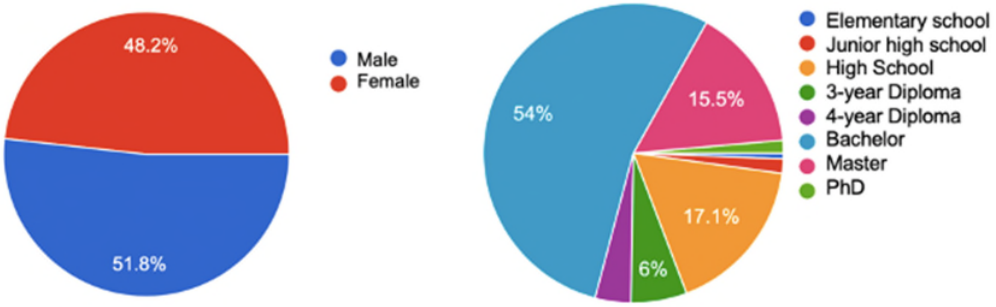

Figure 3 Respondents Gender's Percentage (left) and Education Level of Respondents (rights)

Total 65.91% of respondents had their first gadget in the age range of 10-20 years, with an average age of 12.3 years. 68.20% of respondents accessed the internet for the first time in the age range of 10-20 years, with an average age of 12.7 years. 69.80% of respondents had social media accounts for the first time in the age range of 10-20 years, with an average age of 13.1 years. The analysis tools we use are Microsoft Excel, SPSS, and Python.

4.3.2 Binary Logistic Regression

Binary logistic regression is a method used to describe the relationship of one or more independent variables to the dependent variable. The dependent variable used is categorized as discrete with two possibilities, namely success, and failure. Success events are usually denoted by Y = 1, while failure events are denoted by Y = 0 [19].

To carry out this analysis, we compare gender, access duration, and several new variables that were thought to have an influence on addiction. Then variables were categorized into two groups, as in Table 2.

Table 2 Binary logistic regression - data preprocessing

Binary Variable	Addiction (y)	Student Status	Working Status	Education Level
0	No Addiction (Normal)	Not a Student	Unemployed	Under Diploma
1	Addict (Mild, Moderate, Severe)	Student	Working	Diploma and above

5 Result

5.1 Internet and Social Media Addiction

Using the Internet Addiction Test Manual from Kimberly Young [20], it was found that 25.48% of participants experienced internet addiction at different levels, 20.26% in a mild level, 4.75% in a moderate level, and 0.45% in a severe level. For social media addiction, 20.08% of participants experienced addiction to social media, where 15.05% in mild level, 4.62% in a moderate level, and 0.41% in severe level. Details are presented in Figure 4

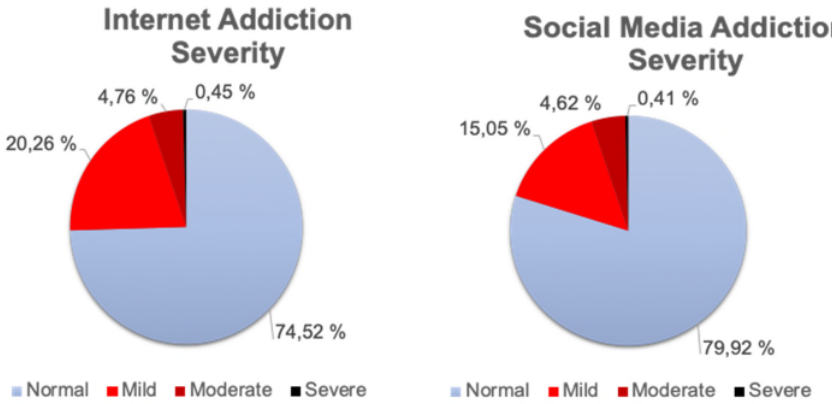

Figure 4 Internet and Social Media Addiction severity

5.2 Addiction Phenomenon

To determine what variables were related to internet and social media addiction, a logistic binary regression analysis was carried out using categorization as mentioned before. In this study, we use a significance level α of 0.05 [19].

From the various variables that exist, we build a model and look for which variables have a strong influence on the addiction level of the respondents. Using binary logistic regression, we compute the p-value. For internet addiction, from 15 variables that are being tested, there are 4 variables that have a significance level p <0.05, which means that these variables have correspondence with internet addiction as in Table 3.

These variables are (1) student status, (2) duration of accessing e-commerce sites per day, (3) duration of accessing company sites per day and (4) duration of accessing social media sites per day. Duration of accessing other sites per day also shows a significance level <0.05 but in this study, it was not taken into account since it may cover too many items inside. All of these four variables have a positive B value, except for the variable accessing the company's website per day has a negative value.

Table 3 Results of Binary Logistic Regression for Internet Addiction Survey

	B	S.E	Wald	df	Sig.	Exp(B)
Student Status	0.5444	0.153	12.560	1	0.001	1.722
Duration of accessing E-Commerce Site per Day	0.365	0.118	9.605	1	0.002	1.440
Duration of accessing Company Site Per Day	-0.322	0.156	4.247	1	0.039	0.725
Duration of accessing Social Media Site Per Day	0.425	0.076	31.414	1	0.001	1.529

For variables with a positive B value, means that the higher value of variables will increase a person's chances of experiencing addiction by the percentage value of Exp(B), and vice versa for variables with a negative B value.

We found that the duration of accessing company sites has a negative correlation with addiction, it means that the longer someone accesses the company's or school website, the lower the risk of internet addiction.

Table 4 Results of Binary Logistic Regression for Social Media Survey

	B	S.E	Wald	df	Sig.	Exp(B)
Student Status	0.638	0.184	12.102	1	0.001	1.893
Duration of accessing Instagram per Day	0.194	0.098	3.904	1	0.048	1.215
Duration of accessing Youtube Per Day	0.221	0.088	6.282	1	0.012	1.247

As in Table 4 for social media addiction, there are 3 variables with significance level <0.05, namely (1) student status, (2) duration of accessing Instagram, and (3) duration of accessing YouTube per day. All variables have a positive B value, meaning that the higher value of variables will increase a person's chances of experiencing addiction by the percentage value of Exp(B).

In addition, the duration of accessing e-commerce websites and social media is also very significant for the risk of addiction. From various social media, YouTube and Instagram have a high level of significance for addiction. This is aligned with the fact that these two platforms are popular among students. It was also found that widely used social media platforms, such as Facebook and WhatsApp, do not seem significant for addiction.

From these two regressions results, student status becomes interesting because it is a variable that corresponds to both internet addiction and social media addiction, while other variables such as gender, employment status, and education level have no strong relation with addiction level. To get better insight, cross-tabulation was carried out between student status and the level of addiction, with the result in Figure 5.

Figure 5 shows that in the group that had an addiction to the internet and social media (mild, moderate, and severe), the number of student respondents was higher than respondents who were not students.

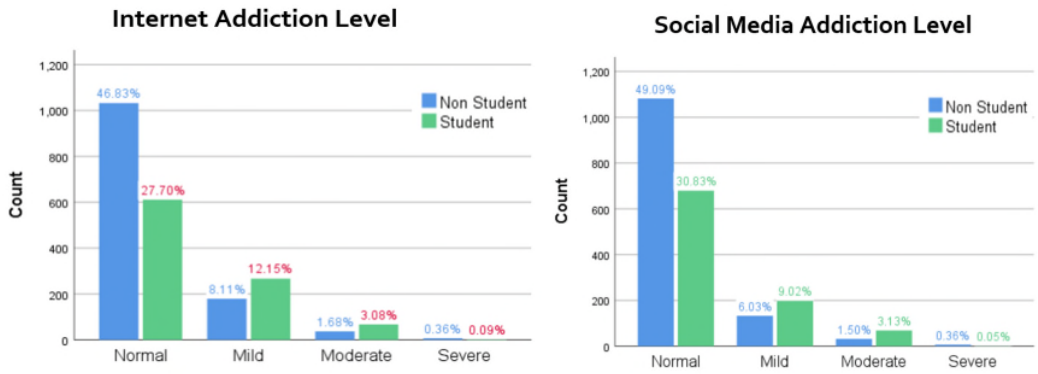

Figure 5 Students and Non-Students Internet and Social Media Addiction Comparison

5.1 Philosophy of Science

There has been some discussion that cast doubt on the validity of the Internet Addiction Test as a scientific method. For this reason, we try to examine this dubious opinion using the philosophy of science, especially from Karl Popper and Thomas Kuhn's approaches.

To distinguish science and pseudoscience, we follow the demarcation criteria from Karl Popper [21]. A system is called scientific only if it can be tested in the sense that it has the possibility of being falsified by experience. Pseudoscience is a term used to refer to a field that resembles science but not science.

Our study shows that the Internet Addiction Test (IAT) by Kimberly Young has been tested and can be falsified by experience. IAT fulfilled Karl's Popper demarcation problem.

Our study starts from pre-survey, validity, and reliability testing, followed by descriptive and correlative analysis and binary logistic regression. These processes were explained, can be tested and falsified.

The analysis process has also fulfilled the principles of Critical Rationalism, namely by combining a fundamentally empirical and rationalist view of

knowledge, followed by conducting critical testing in the observation process to develop scientific knowledge [22].

According to Thomas Kuhn's science does not progress via the accumulation of new knowledge but is revolutionary through paradigm shifts [23]. Thomas Kuhn divides the scientific revolution into several stages, pre-paradigm, normal science, and revolutionary. From our study, we conclude that Kimberly Young's IAT is still on the normal science stage. Although there have been some criticisms of Kimberly Young's internet addiction test, there is no new paradigm fully accepted yet to replace the IAT. The paradigm of internet addiction can be seen in Figure 6. The discussion of IAT criticism will be explored in the discussion section 6.4.

6 Discussion

6.1 Internet Addiction Center

To deal with the problem of internet addiction, the government should prepare a clinic or hospital specifically for internet addiction patients. The government needs to provide educational material about internet addiction. Several countries have taken steps to deal with internet addiction [24]. In 2006, the first inpatient center to treat Internet Addiction was opened in Beijing [25].

China was the first country to include internet addiction as a clinical disorder in 2008.

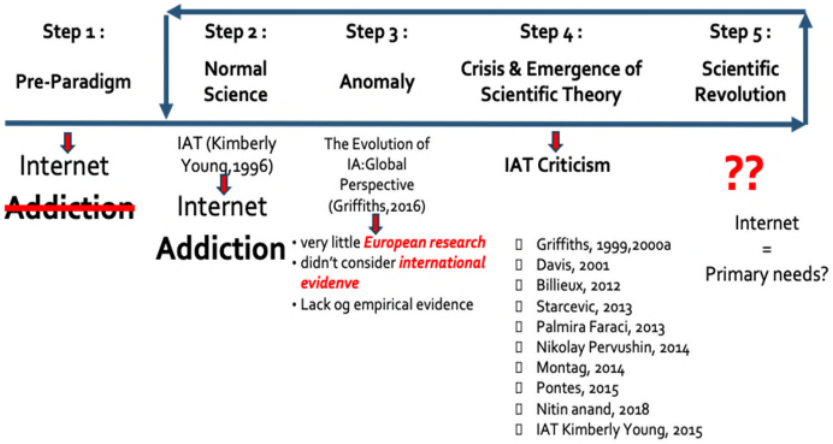

Figure 6 Internet Addiction Paradigm Based on Kuhn's Principles

The China government issued a number of policies to restrict internet access for students, including limiting the time to play games for 3 hours per day and requiring an ID card to play online games. China also has an Internet addiction center for the treatment of patients with Internet addiction. However, there were several cases of mistreatment in China.

South Korea built the world's first internet prevention center. At the "*Jump up Internet Rescue School*", teenagers who experience internet addiction receive treatment funded by the government. In 2007, South Korea had 140 internet addiction counseling centers and treatment programs at 100 hospitals. Some of the therapeutic methods given are music therapy and equine therapy. In 2011 the Korean government introduced a Shutdown law to prevent children under 16 from playing online games from 12 pm to 6 am [26]

The United States has had a hospital dealing with internet addiction in Pennsylvania since 2013. They use the concept of digital diet and digital nutrition so that patients can use technology in a healthy manner [27].

6.2 School from Home

Dealing with the COVID-19 pandemic, the Ministry of Education & Culture has issued a School from home (SFH) policy [28]. It has an impact on increasing internet usage in video conferencing using Zoom or Google Meet. Our study results show that students have high levels of internet and social addiction. however, further studies should be conducted to study whether there is an effect of SFH with an increased risk of student addiction.

But the Ministry of Education & Culture should prepare technical strategies anticipating the psychological effects of SFH. We advise teachers to provide socialization about the dangers of internet addiction in the classroom.

Currently, the Indonesian government has realized some difficulties of SFH and issued a joint decree of 4 ministries for the possibility of onsite learning in early 2021 [29].

6.3 Social Media Addiction

The analysis results show that the longer someone has access to social media increases the risk of internet addiction. Two social media platforms have a high significance for addiction, namely YouTube and Instagram. It is interesting to observe that Facebook, Twitter, Line, and WhatsApp do not have a high enough significance for internet addiction. However, TikTok almost has a high significance value for addiction, although it still does not meet the 0.05 limit.

Jaron Lanier in his book campaign to delete social media accounts. According to him, social media platforms change people's behavior [30]. The algorithms used by the social media platform are designed to make us addicted.

There needs to be a policy to restrict the use of social media by parents. The community can play a role by carrying out an educational movement about the dangers of social media addiction. The government can also issue regulations restricting the use of social media for students, or issuing laws regulating social media platforms to have a responsibility in preventing internet addiction.

6.4 Internet Addiction Test Criticism

More and more criticism for the IAT is being rolled out. Faraci [31]suggests additional research involving cross-cultural stability as a solution factor for Internet Addiction. Pervushin [32], distinguish the term internet addiction and internet-addictivity. Starcevic [33] suggested that internet addiction should be replaced by addiction to a specific online activity. Griffith [34] argues internet addiction term is not appropriate, because the internet is only a medium for other addictions, for example, game addiction. Billieux [13] argues that internet addiction should be divided into the spectrum of Internet gaming disorder (IGD), social media addiction, and online sexual addiction.

Montag [35] says Internet Gaming Disorder is not the same as Internet Addiction. Pontes [36] stated that there is no international consensus on the concept and diagnosis of the internet-related disorder. Davis [37] introduces the pathological Internet Use (PIU) method. Kardefelt-Winther [38] states that internet addiction is not an addiction, but a compensation strategy for other addictions.

7 Conclusion

As many as 25.82% of respondents were indicated having internet addiction. Students, the duration of accessing E-commerce, social media especially YouTube and Instagram significantly affect the risk of addiction. According to Popper's Falsification Criteria, Kimberley Young's IAT can be called a science, and is corroborated by statistics and research in several countries. However, the IAT has come under criticism from a new paradigm and is in crisis. We believe there will be a scientific revolution in the field of Internet Addiction.

We suggest the government to take serious steps to address the problem of internet and social media addiction. Our recommendations including drafting regulations on internet access and social media restrictions for students, regulations involving the social media and internet industry (ex. YouTube and Instagram) in the addiction prevention program, and establishment of a clinic facility special for Internet-addicted persons. Society can also be actively involved in providing campaigns and education on the dangers of the internet and social media addiction.

For further research study of game addiction or using another Internet addiction measurement method can be explored.

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