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Reality of the internet and social media addiction in Indonesian students

Nasy'an Taufiq Al Ghifari [a,1,*], Akhmadi Surawijaya [a,2], Fitra Arifiansyah [a,3], Agus Komarudin [a,4], Denny Hidayat Tri Nugroho [a,5], Dimitri Mahayana [a,6]

[a] School of Electrical Engineering and Informatics, Bandung Institute of Technology 1-6 Jl. Ganesha No. 10, Bandung, 40132, Indonesia
[1] ghif.99@gmail.com; [2] 33219306@std.stei.itb.ac.id; [3] fitra@stei.itb.ac.id; [4] 33220005@std.stei.itb.ac.id;
[5] denny.nugroho@el.itera.ac.id; [6] dimitri@stei.itb.ac.id
* Corresponding Author

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ABSTRACT

The use of the Internet and social media today is inseparable from the life of modern society. This can lead to an addiction to the Internet and social media. This research aims to answer whether the phenomenon of Internet and social media addiction is a scientific reality or not in Indonesia, especially in Indonesian Students who are undergoing adaptation of the learning process from offline to online due to the Covid-19 pandemic situation. Data collection was conducted with a survey of 2002 respondents. Before the questionnaire was distributed, a validity test and reliability test with Alpha Cronbach's were conducted, and the results showed that all questions on the questionnaire were valid and reliable. Based on the survey results, 20.18% of respondents experienced mild addiction, 4.85% of respondents experienced moderate addiction, and 0.45% of respondents experienced severe addiction to Internets. While the survey results for social media addiction were 14.99% of respondents experienced mild addiction, 4.7% of respondents experienced moderate addiction, and 0.45% of respondents experienced severe addiction. Judging by the philosophy of science, Internet and Social Media Addiction are said to be science and not pseudoscience because it has fulfilled the characteristics of science that is logical, empirical, and can be falsified. There needs to be special attention from the Indonesians about the addiction to the Internet and social media so that this addiction can be anticipated and the inflicted symptoms can be minimized.

KEYWORDS
Addiction
Internet
Social Media
Philosophy of Science

1. Introduction

The use of the Internet and social media today is inseparable from the life of modern society. The increasing variety of gadgets produced by large companies with advanced applications in presenting various news media, social networks, lifestyle information, and hobbies online and offline is now attracting a lot of public attention [1]. Gadgets today are straightforward to find; almost in every community, people have gadgets [2]. According to APJII (Indonesian Internet Service Providers Association) data in 2020 (Q2) [3], the number of Internet users in Indonesia increased by approximately 73.7%. This result is an increase from the previous APJII survey in 2018, where Internet users have reached 171.17 million people, or about 64.8% of the population in Indonesia [4]. The increase was indirectly contributed by the Palapa Ring project in Indonesia and the Covid-19 pandemic situation this year, which caused people to stay at home and demand information and entertainment online [5]. The increase in Internet users in Indonesia was causing some communities to conduct Internet Addiction Disorder (IAD), also known as pathological Internet use [6]. The survey conducted by Siste [7] shows the relationship between the Covid-19 pandemic situation and the increasing use of the Internet and its psychological effects on its users.

On the other hand, behind the convenience offered by technology such as the Internet and social media, there is something impact that can be a detrimental and negative influence, one of which is addiction. This information was supported by survey results based on the Internet Addiction Test basically conducted by Kimberly Young [8]. Initially, the concept of addiction became a major debate over the

years. The concept is not easy to define but it depends on the activity performed [9]. Internet addiction, first introduced by Goldberg in 1995, described that there are the maladaptive of Internet usage which drives into clinical disorders experienced by the addictive user indicated by sort of symptoms [10].

Meanwhile, Beard defines Internet addiction as an excessive use of the Internet, which can affect the users' psychological condition and cause problems in their education, work, and other life aspects [11]. Block also classifies Internet addiction into four parts: excessive use, withdrawal symptoms, low tolerance, and negative repercussion. Several problems caused by the Internet addiction are poor diet, sleeping problems, stressed or depression, narcissism, relationship problems, etc. [12]. The majority of people spend at least 8 hours a day connecting to the Internet [4]. The Internet has become modern society's lifestyle, but Internet addiction has negative consequences for daily life [13]. The presence of Internet-connected gadgets can affect social interactions, both positive and negative influences [14]. A positive influence among them is the ease of communicating even remotely. While the negative influence among them is that it can make teenagers experience dysfunction, time of direct face-to-face interaction is reduced, the presence of Internet interferes with the quality of direct interaction, Internet make teenagers hyperpersonal, the Internet makes consumers and Internet make teenagers less sensitive to the environment [14]. In addition, Internet addiction can impact the development of children and adolescents, namely emotional and behavioral disorders [15].

Internet Addiction Test (IAT) provided by Kimberly Young was modified for retrieving social media addiction levels in Indonesia. As generally known, Young's IAT is the popular instrument to study Internet addiction problems, which was developed in 1996 based on DSM-IV criteria [16], [17]. Young's IAT contains twenty items that have performed the validity and reliability. Many researchers have also criticized whether to prove its evaluation process and adaptability in other related cases [18]-[20]. IAT instrument provided by Young has already been adopted and used in several countries and performed well validity and reliability, such as in South Korea, Arabic, France, Germany, Italia, India, Turkey, Vietnam, Croatia, and other countries well [21]-[30] even though it was also adapted in online gaming addiction test, mobile phone, and others.

Several studies worldwide discuss the effects of the Internet and social media addiction, which has become increasingly concerned in recent years. As one of the world's largest Internet users, Indonesia also has the same problem. Based on a survey of 1.312 respondents, Hikmawati [31] conducted research in Indonesia about gadget addiction and social media phenomena. The questionnaire used in this study mentioned the Internet Addiction Test (IAT) method proposed by Kimberly Young. However, the conversion rate of addiction did not follow the IAT technique, leading to biases in the analysis. Pratama [32] conducted a study to evaluate the factors influencing social media and gadget addiction in Indonesian adolescents. Pratama organizes investigations and data analysis by establishing Partial Least Squares and Structural Equation Models. The discussion does not focus on the degree of addiction like Kimberly Young's IAT but looks for scientific evidence on which factors affect social media and gadget addiction. The discussion was very focused on dealing with the survey data, so the information on the effects of addiction was not discussed in depth. Siste [7] surveyed to measure the impact of physical distance and factors related to Internet addiction among Indonesian adults during the Covid-19 pandemic. The survey results show that being in isolation during a pandemic and at home will lead to an increase in Internet access time, which will worsen the health of Internet addicts. However, Siste uses a different technique to conduct the survey, only for respondents classified as adults over the age of 21. No recent studies have measured the impact of Internet addiction on Indonesian students during the Covid-19 pandemic. Therefore, we designed an online survey and conducted a critical analysis from the perspective of science related to Internet addiction.

This research was conducted to answer whether the phenomenon of addiction to the Internet and social media is a scientific reality or not in Indonesia, especially in Indonesian Students who are undergoing adaptation of the learning process from offline to online due to the Covid-19 pandemic situation. In recent years, there have been several studies [7],[31], [32] discussing the impact of the

Internet and social media addiction in Indonesia. However, there is no recent study to measure the impact of the Internet and social media addiction on Indonesia Students during the Covid-19 pandemic. In addition, the majority of active users of social media are young age [33]. The research methodology used is a descriptive quantitative method by surveying 2.002 respondents to see the addiction to the Internet and social media in Indonesia. Besides, studies from the philosophy of science were conducted to reinforce addiction to the Internet, and social media is a scientific reality.

2. Literature Review

This section described the basic theories about Statistical Analysis and supporting theories used in research.

2.1. Chi-Square Test Method

The Chi-square test aims to find out the relationship between variables contained in the data. The type of data used in the chi-square test must be nominal or ordinal scale frequency data (qualitative data). The Chi-square test is not used for ratio or interval scale data (quantitative data). The chi-square test is part of a non-parametric statistical analysis. Therefore, the chi-square test for research data analysis does not require requirements to assume data normality. The chi-square formula can be seen in equation 1.

$$x^2 = \sum_{i=1}^{k} \frac{(f_o - f_e)^2}{f_e} \tag{1}$$

where f_o is the frequency of observation while f_e is the frequency of expectations.

In the decision-making for this chi-square test, we can look at two things, namely comparing the values of Asymp. Sig. with a critical limit of 0.05, or it can also be by comparing the value of chi-square calculate with the value of chi-square table at a significance of 5% [34].

1) Decision making based on significance value (Asymp. Sig)
- If the value of Asymp. Sig. (2-sided) < 0.05, meaning H_o is rejected and H_a is accepted.
- If the value of Asymp. Sig. (2-sided) > 0.05, meaning H_o is accepted and H_a is rejected.

2) Decision making based on the value of chi-square
- If the chi-square value calculates > chi-square table, it means H_o is rejected, and H_a is accepted.
- If chi square value calculates < chi square table, it means H_o is accepted, and H_a is rejected.

2.2. Ordinal Regression Analysis

Ordinal regression analysis is one of the statistical methods that describe the relationship between a response variable (Y) and more than one predictor variable (X), where the response variable is more than two categories, and the measurement scale is level [35]. Ordinal regression is used to model the relationship between ordinal response changers and explaining changes [36]. In the ordinal regression analysis, there are five options of link functions (see Table 1).

Table 1. Link Function in Ordinal Regression [37]

Link Functions	Functions
Logit	$\log\left(\frac{\pi}{1-\pi}\right)$
Complementary log-log	$\log(-\log(1-\pi))$
Negative log-log	$-\log(-\log(\pi))$
Probit	$\Phi^{-1}(\pi)$
Cauchit	$\tan(p(\pi-0.5))$

Its use depends on the distribution of data analyzed. Norusis explained that the logit function is used in most data distributions, complementary log-log are used for data that has a high-value tendency, negative log-log are used for data that has a low-value tendency, probit is used if latent modifiers normally spread, while cauchit are used if latent modifiers have extreme values [37].

3. Method

This research aims to measure the severity of addiction to the use of the Internet and social media in Indonesia, the relationship between Internet addiction and social media addiction, as well as the influence of gender, age category, professions, education levels, and domicile factors with the severity of addiction to the Internet and social media. The research started from the preparation of questionnaires, followed by data sampling for the validity and reliability tests of questionnaires, then testing the questionnaire's validity and reliability. If appropriate, it will be continued with the survey of respondents. After the data is collected, data cleaning is carried out, then calculated and classified as addiction to the Internet and social media. Then conduct correlation tests to find out the factors that influence addiction, then analyze the overall results and each specified category, and analyze results based on a philosophy of science. The research method carried out is presented in Figure 1.

3.1. Questionnaire Question Preparation

The questions are based on Kimberly Young's book on Internet addiction tests [17]. The questions are divided into two sections: the severity of Internet addiction and the severity of social media addiction which each consists of 20 questions. The questions below are distinguished only through replacing 'Internet' with 'social media', or vice versa.

- How often did you use the Internet or social media?
- How often did you abandon daily activity or homework?
- How often did you choose social media or the Internet then communicate with family or colleagues?
- How often did you build a new relationship with other users?
- How often did your friends or colleagues protest to you for spending much time in using social media or Internet?
- How often did social media or the Internet disturbt your school/works?
- How often did you productivity disturb you because of social media or Internet?
- How often did you check social media or the Internet before done your tasks?
- How often did you defensive or confidential when you access social media or Internet?
- How often did you think negatively when you access social media or Internet?
- How often did you refuse something when you access social media or Internet?
- How often did you think without social media or the Internet is boring?
- How often did you anger to your colleagues if they disturb you to access social media and Internet?
- How often did you sleepless because of social media or Internet?
- How often did you think about social media or the Internet when you did not use it?
- How often did you find yourself busy on social media or Internet?
- How often did you try to reduce your time in using social media or Internet?
- How often did you try to hide yourself silently in using social media or Internet?
- How often did you prefer to use social media or Internet then socialize with person?
- How often did you fill pressure or nervous without Internet or social media?

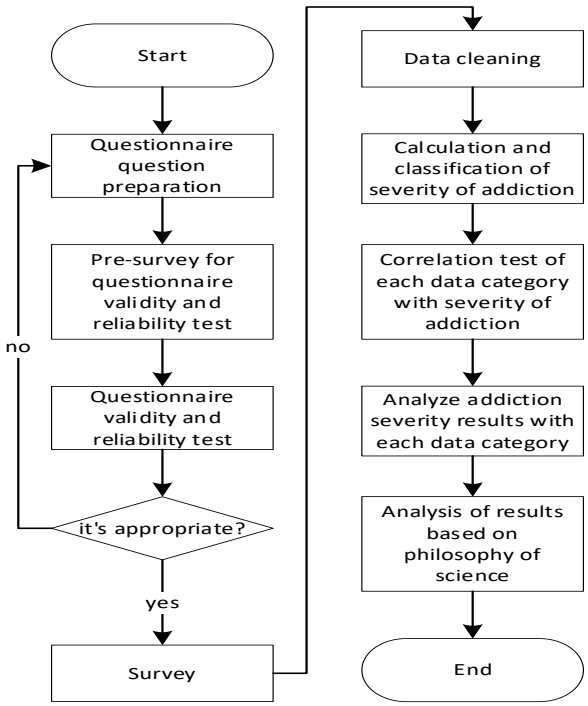

Fig. 1. Research Methods

These questions will have six answer options: Not Applicable, Rarely, Occasionally, Frequently, Often, and Always. These six answer options are based on Kimberly Young's survey. The six answer options will be converted to numeric numbers in processing survey result data, as seen in Table 2.

Table 2. Questionnaire Answer Options [17]

Answer Options	Value Conversion
Not Applicable	0
Rarely	1
Occasionally	2
Frequently	3
Often	4
Always	5

3.2. Pre-survey and Questionnaire Validity and Reliability Test

The questionnaire has been compiled, then pre-surveyed to a small sample of respondents for validity and reliability tests. Pre-survey was conducted once on October 30-31, 2020 with a total of 200 respondents (after data cleaning). The validity test stipulates the accuracy and precision of the measuring instrument in performing its functions, while the reliability test is the extent to which the measuring instrument is able to provide actual information from the questionnaire compiled. In this study the reliability test using Alpha Cronbach's method (Equation 2).

$$r_{11} = \left(\frac{n}{n-1}\right)\left(1 - \frac{\sum \sigma_t^2}{\sigma_t}\right) \quad (2)$$

where r_{11} denotes the reliability value sought, n is the number of question items tested, and σt is the variance value of each item.

3.3. Survey and Data Cleaning

After testing each question item's validity and reliability in the questionnaire, a survey was conducted on November 1-4, 2020, and produced 2309 raw data. Then data cleaning is done to eliminate redundant

data and inappropriate data (e.g. data with age above 65 years old or data that has erroneous entry). The data cleaning process resulted in 2002 data ready to be processed in the next step.

3.4. Calculation and Classification of the Internet and Social Media Addiction

Before calculating the addiction to the Internet and social media from suvey results that have gone through the data cleaning process, the answer to the survey result of string type needs to be converted first to numerical numbers in order to be done mathematical calculations (conversion of values presented in Table 3). The calculation of the addiction to the Internet and social media is done by summing up each survey answer on each respondent. The total score of such addictions has a value range from 0 to 100. Then, out of the total scores that have been obtained, the respondent can be classified the severity of his addiction according to the criteria of severity of addiction presented in Table 3.

Table 3. Conversion of Addiction Rate Value [17]

Severity Descriptor	Points	Description
None	0 - 30	Suggests presence of Internet addiction is unlikely.
Mild	31 – 49	The child is an average online and screen user. He or she may surf the Internet a bit too long at times but seems to control screen usage.
Moderate	50 – 79	The child seems to be experiencing occasional to frequent problems because of the Internet and screen use. Therapists should further have evaluated the full impact of technology on the child's life and the impact on the family.
Severe	80 - 100	Internet usage and screen time are causing significant problems in the child's life and, most likely, the family and school. The therapist should address the underlying problems and explore family dynamics, parental monitoring and screen use, and school issues.

4. Results and Discussion

This section will be presented the results obtained from the survey. In addition, there will also be an analysis of Internet and social media addiction based on the philosophy of science.

4.1. Research Results

From the survey of 2002 respondents, it was found that 20.18% of respondents experienced mild addiction, 4.85% of respondents experienced moderate addiction, and 0.45% of respondents experienced severe addiction to the Internet. While the survey results for social media addiction were 14.99% of respondents experienced mild addiction, 4.7% of respondents experienced moderate addiction, and 0.45% of respondents experienced severe addiction. The results can be seen in Figure 2.

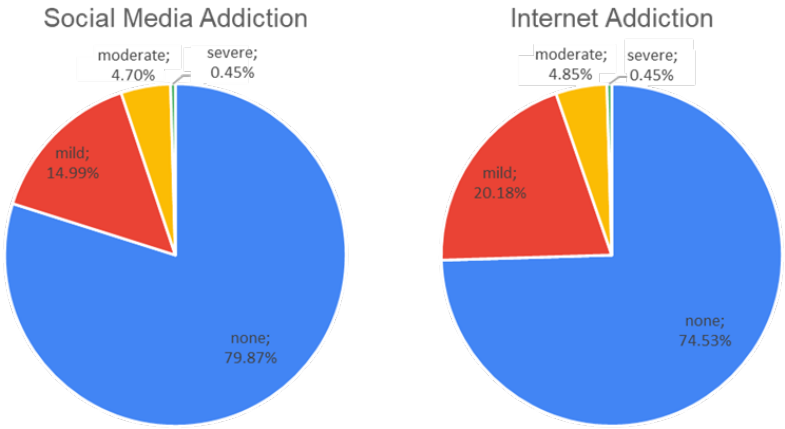

Fig. 2. Results Internet and Social Media addiction as a whole

4.2. Chi-Square Test

In addition to analyzing the results of the Internet and social media level of the overall data, the correlation between gender, age category, profession, education level, and domicile will be analyzed against Internet and social media addiction. Strata used in each category of gender, age category, profession, level of education, and domicile with the level of Internet and social media addiction, namely:

- Gender {male, female}
- Profession {Housewives, Student, Retirement, Civil Servants, Army, Police, Traders, Farmer, Breeder, Workers in Industry, Private employees, BUMN employees, BUMD employees, Other Jobs, Not yet/Not Working}
- Age {*remaja awal* (12-16 years old), *remaja akhir* (17-25 years old), *dewasa awal* (26-35 years old), *dewasa akhir* (36-45 years old), *lansia awal* (46-55 years old), and *lansia akhir* (56-65 years old)} [38]
- Education {SD, SMP, SMA, D3, D4, S1, S2, S3}
- Domicile {NAD, North Sumatra, West Sumatra, Riau, Riau Islands, Jambi, Bengkulu, South Sumatra, Bangka Belitung Islands, Lampung, Banten, DKI Jakarta, West Java, Central Java, East Java, DI Yogyakarta, Bali, NTB, NTT, West Kalimantan, South Kalimantan, Central Kalimantan, East Kalimantan, North Kalimantan, Gorontalo, West Sulawesi, South Sulawesi, Southeast Sulawesi, Central Sulawesi, North Sulawesi, Maluku, North Maluku, Papua, West Papua, Overseas}
- Addiction level {none, mild, moderate, severe}

1) Designing the proposed hypothesis

- variables such as age, gender, profession, education, and domicile have something to do with Internet addiction

  H_0 = no relationship between overall variables and Internet addiction

  H_a = there is a relationship between overall variables and Internet addiction

- variables such as age, gender, profession, education, and domicile have something to do with social media addiction

  H_0 = no relationship between overall variables and social media addiction

  H_a = there is a relationship between overall variables and social media addiction

Table 4. Chi-Square Test Results

Test Variable	Types of Addiction	P-value	Description
Gender	Internet	0.389	no relationship
Age	Internet	0.000	there is a relationship
Profession	Internet	0.000	there is a relationship
Education	Internet	0.001	there is a relationship
Domicile	Internet	0.880	no relationship
Gender	Social Media	0.232	no relationship
Age	Social Media	0.000	there is a relationship
Profession	Social Media	0.000	there is a relationship
Education	Social Media	0.290	no relationship
Domicile	Social Media	0.969	no relationship

From the chi-square test calculation results in Table 4 it can be concluded that the category of age, profession, and level of education has something to do with Internet addiction. Meanwhile, gender and domicile have nothing to do with Internet addiction. Then the profession and age categories have

something to do with social media addiction. Meanwhile, gender, education, and domicile have nothing to do with social media addiction.

4.3. Ordinal Regression Analysis

In this ordinal regression analysis, response variables or dependent variables, namely the frequency of Internet and social media addiction rates to determine the extent of the Internet and social media addiction, the study refers to Kimberly Young's book about the Internet addiction [17]. Can be seen in Table 3. The aspects chosen as predictor variables in this study are the age first had gadgets, age of first accessing the Internet, age first had a social media account, age category, profession, level of education, duration of access to blog or personal website daily, duration of access to e-commerce sites daily, duration of access to company website daily, duration of access to organization or government sites daily, duration of access to personal social media sites daily, duration of access to online community sites daily, duration of access to news website daily, duration of access to other sites on a daily, duration of facebook daily access, duration of instagram daily access, duration of whatsapp daily access, duration of youtube daily access, duration of line daily access, duration of linkedin daily access, duration of twitter daily access, duration of telegram daily access, duration of tiktok daily access, and duration of other social media daily access. Each of these variables is then coded in the form of a dummy variable with explanations as listed in Table 5.

Table 5. Predictor Variable Explanation

Variable	Classification	
X1	age first had gadgets	X1,2,3(1) = <10 years
X2	age of first accessing the Internet	X1,2,3(2) = 10-20 years
X3	age first had a social media account	X1,2,3(3) = 20-30 years X1,2,3(4) = 30-40 years X1,2,3(5) = 40-50 years X1,2,3(6) = >50 years
X4	age category	X4(1) = *lansia akhir* X4(2) = *lansia awal* X4(3) = *dewasa akhir* X4(4) = *dewasa awal* X4(5) = *remaja akhir* X4(6) = *remaja awal*
X5	profession	X5(1) = Not a Student X5(2) = Student
X6	level of education	X6(1) = S3 X6(2) = S2 X6(3) = S1 X6(4) = D4 X6(5) = D3 X6(6) = SMA X6(7) = SMP X6(8) = SD
X7	duration of access to blog or personal website daily	
X8	duration of access to ecommerce sites daily	
X9	duration of access to company website daily	
X10	duration of access to organization or government sites daily	
X11	duration of access to personal social media sites daily	X7-X24(1) = <3 hours
X12	duration of access to online community sites daily	X7-X24(2) = 3-5 hours
X13	duration of access to news website daily	X7-X24(3) = 6-8 hours
X14	duration of access to other sites on a daily	X7-X24(4) = 9-11 hours
X15	duration of facebook daily access	X7-X24(5) = >11 hours
X16	duration of instagram daily access	
X17	duration of whatsapp daily access	
X18	duration of youtube daily access	
X19	duration of line daily access	

Variable	Classification
X20	duration of LinkedIn daily access
X21	duration of Twitter daily access
X22	duration of telegram daily access
X23	duration of TikTok daily access
X24	duration of other social media daily access

1) Model Suitability Test

Ghozali says that parallel lines tests are used to test whether all categories have the same parameters or not [39]. Parallel lines test is also done to find out if the link function model used is appropriate or not. The link function model can be said to be appropriate if the significance value is greater than 0.05. From Tables 6 and 7, it can be seen that the significance values obtained are 0.063 and 0.051, respectively, greater than 0.05. This indicates that the selection of the logit function link model is appropriate.

The -2 log-likelihood value in this table is used to assess the model's suitability in ordinal regression. The model is said to be fit in case of a decrease in the value of -2 log-likelihood and a significance value that is less than the α value [39]. In Tables 6 and 7 it can be seen that the significance value is 0.000, which means it is less than the maximum level used (α=0.05). The value of -2 log-likelihood decreased by 293.325 and 230.748, respectively. Both results indicate that both models are fit. Next is to evaluate the magnitude of Pseudo R-Squared. This value is used to explain the amount of independent variables capable of explaining variable dependent. This value is similar to the coefficient of determination in regression. In Table 6 Cox and Snell's values are 13.6%, Nagelkerke values are 17.9%, and McFadden values are 10.3%. While in Table 7 Cox and Snell's values are 10.9%, Nagelkerke values are 15.2%, and McFadden values are 9.1%. So, when looking at the value of McFadden in Table 6 then 10.3% of factors that affect Internet addiction can be explained by the variation of independent variables that exist. The rest are influenced by other factors [40]. Model suitability can be tested as well using Pearson and Deviance. The resulting model is considered appropriate if at least one of the acquired significance values is greater than the α (0.05). From Tables 6 and 7, the significance value of deviance is greater than 0.05 which indicates that the model is appropriate. Thus, it can be concluded that both models built are good.

Table 6. Model Suitability Test (Internet)

Model Fitting Information	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	2430.960			
Final	2137.634	293.325	71	.000
Goodness-of-Fit		**Chi-Square**	**df**	**Sig.**
Pearson		5118.007	4468	.000
Deviance		1972.730	4468	1.000
Pseudo R-Squared				**Sig.**
Cox and Snell R2				.136
Nagelkerke R2				.179
McFadden R2				.103
Parallel Lines Test	**-2 Log Likelihood**	**Chi-Square**	**df**	**Sig.**
Null Hypothesis	2137.634			
General	.000b	2137.634	142	.063

Table 7. Model Suitability Test (Social Media)

Model Fitting Information	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	2413.024			
Final	2182.276	230.748	81	.000
Goodness-of-Fit		**Chi-Square**	**df**	**Sig.**
Pearson		6405.042	5205	.000
Deviance		2112.317	5205	1.000
Pseudo R-Squared				**Sig.**
Cox and Snell R2				.109

Model Fitting Information	-2 Log Likelihood	Chi-Square	df	Sig.
Nagelkerke R2				.152
McFadden R2				.091
Parallel Lines Test	**-2 Log Likelihood**	**Chi-Square**	**df**	**Sig.**
Null Hypothesis	2182.276			
General	.000b	2182.276	162	.051

2) Logit Ordinal Regression Estimation Results

The estimated results of logit ordinal regression models for Internet addiction are presented in Table 8. From the estimated results obtained, variables that significantly affect Internet addiction are variables X3, X6, X7, and X11. This means that the aspects that affect Internet addiction are the age of first having a social media account, level of education, duration of access to blog or personal website daily, and access to personal social media sites daily. From the results of this logit regression model, it can be seen that the coefficients owned by X3 and X6 variables are positive while the variable coefficients X7 and X11 are negative. These results show that the age aspect of first having a social media account and education level is an aspect that positively affects Internet addiction. In comparison, the duration of access to the blog or personal website daily and duration of access to personal social media sites daily is an aspect that negatively affects Internet addiction.

Table 8. Estimation Parameters (Internet)

Variable	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[Y = 1]	42.629	7586.212	.000	1	.996	-14826.074	14911.332
[Y = 2]	44.617	7586.212	.000	1	.995	-14824.086	14913.321
[Y = 3]	47.223	7586.212	.000	1	.995	-14821.480	14915.926
[X3 = 1]	16.335	1.620	101.713	1	.000	13.160	19.510
[X3 = 2]	16.315	1.229	176.100	1	.000	13.905	18.725
[X3 = 3]	15.830	1.196	175.275	1	.000	13.486	18.173
[X3 = 4]	15.491	1.163	177.341	1	.000	13.211	17.771
[X3 = 5]	15.469	1.100	197.725	1	.000	13.313	17.625
[X3 = 6]	15.734	.000	.	1	.	15.734	15.734
[X6 = 1]	18.408	1.179	243.783	1	.000	16.097	20.718
[X6 = 2]	19.830	.565	1233.126	1	.000	18.723	20.936
[X6 = 3]	19.241	.534	1296.242	1	.000	18.193	20.288
[X6 = 4]	19.625	.591	1102.564	1	.000	18.467	20.784
[X6 = 5]	19.629	.567	1198.475	1	.000	18.517	20.740
[X6 = 6]	19.447	.515	1424.970	1	.000	18.437	20.457
[X6 = 7]	19.511	.000	.	1	.	19.511	19.511
[X6 = 8]	0	.	.	0	.	.	.
[X7 = 1]	-3.014	1.422	4.494	1	.034	-5.801	-.228
[X7 = 2]	-2.967	1.410	4.429	1	.035	-5.731	-.204
[X7 = 3]	-3.244	1.425	5.185	1	.023	-6.037	-.452
[X7 = 4]	-3.010	1.407	4.576	1	.032	-5.767	-.252
[X7 = 5]	-3.019	1.661	3.303	1	.069	-6.276	.237
[X11 = 1]	-1.188	.567	4.387	1	.036	-2.299	-.076
[X11 = 2]	-1.409	.362	15.178	1	.000	-2.118	-.700
[X11 = 3]	-.650	.346	3.517	1	.061	-1.328	.029
[X11 = 4]	-.446	.351	1.611	1	.204	-1.135	.243
[X11 = 5]	-.236	.395	.357	1	.550	-1.011	.538

The estimated results of logit ordinal regression models for social media addiction are presented in Table 9. From the estimated results obtained, variables that significantly affect social media addiction are variables X3, X6, X20, X21, and X24. This means that the aspects that affect social media addiction are the age of first having a social media account, education level, LinkedIn daily access, duration of Twitter daily access, and duration of other social media daily access.

From the results of this logit regression model, it can be seen that the coefficients owned by variables X3, X6, and X20 are positive, while the variable coefficients X21 and X24 are negative. These results show that the age aspect of first having a social media account, level of education, and duration of LinkedIn daily access is an aspect that positively affects social media addiction. While the duration of Twitter daily access and duration of other social media daily access is an aspect that negatively affects social media addiction.

Table 9. Estimation Parameters (Social Media)

Variable	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[Y = 1]	45.668	8312.688	.000	1	.996	-16246.900	16338.237
[Y = 2]	47.346	8312.688	.000	1	.995	-16245.222	16339.915
[Y = 3]	49.911	8312.688	.000	1	.995	-16242.657	16342.480
[X3 = 1]	18.646	1.655	126.897	1	.000	15.402	21.890
[X3 = 2]	18.232	1.338	185.614	1	.000	15.609	20.855
[X3 = 3]	17.667	1.302	184.014	1	.000	15.114	20.219
[X3 = 4]	17.718	1.268	195.249	1	.000	15.233	20.204
[X3 = 5]	17.645	1.176	225.060	1	.000	15.340	19.950
[X3 = 6]	15.668	.000	.	1	.	15.668	15.668
[X6 = 1]	16.508	.985	281.134	1	.000	14.579	18.438
[X6 = 2]	17.221	.626	757.572	1	.000	15.995	18.448
[X6 = 3]	16.656	.591	794.466	1	.000	15.498	17.814
[X6 = 4]	16.676	.666	627.382	1	.000	15.371	17.980
[X6 = 5]	17.060	.625	746.283	1	.000	15.836	18.284
[X6 = 6]	16.826	.569	872.910	1	.000	15.710	17.942
[X6 = 7]	16.679	.000	.	1	.	16.679	16.679
[X6 = 8]	0	.	.	0	.	.	.
[X20 = 1]	2.716	1.332	4.156	1	.041	.105	5.328
[X20 = 2]	2.589	1.309	3.916	1	.048	.025	5.154
[X20 = 3]	2.626	1.352	3.775	1	.052	-.023	5.275
[X20 = 4]	3.414	1.407	5.890	1	.015	.657	6.171
[X20 = 5]	1.200	1.562	.590	1	.442	-1.861	4.261
[X21 = 1]	-2.083	.692	9.055	1	.003	-3.440	-.726
[X21 = 2]	-1.726	.680	6.446	1	.011	-3.058	-.394
[X21 = 3]	-1.991	.698	8.131	1	.004	-3.359	-.622
[X21 = 4]	-1.720	.728	5.583	1	.018	-3.146	-.293
[X21 = 5]	-.395	.845	.218	1	.641	-2.051	1.262
[X24 = 1]	-2.236	.935	5.725	1	.017	-4.068	-.404
[X24 = 2]	-2.197	.926	5.626	1	.018	-4.013	-.382
[X24 = 3]	-1.991	.941	4.476	1	.034	-3.836	-.147
[X24 = 4]	-1.806	.983	3.377	1	.066	-3.732	.120
[X24 = 5]	-1.593	1.096	2.115	1	.146	-3.740	.554

4.4. Descriptive Analysis

Figure 3 tells the age distribution of the first time a user has a social media account, first accesses the Internet, and first has his gadget. The results are quite impressive because the three facts presented in the picture show that the age of 10-20 years old is the first age a person begins to have a social media account, access the Internet, and have gadgets.

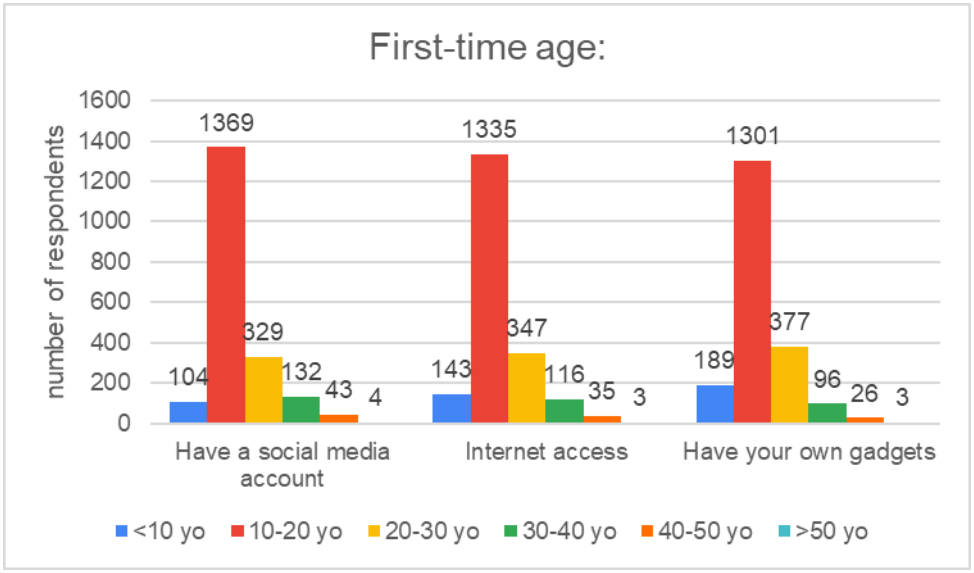

Fig. 3. First-time age questionnaire results

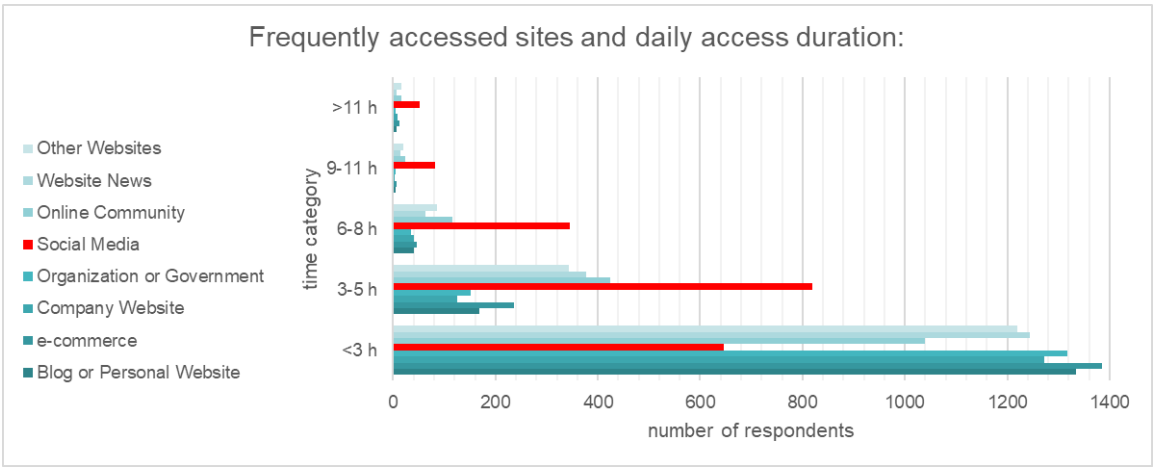

Fig. 4. Questionnaire results for daily access duration and what sites accessed

Figure 4 tells about what sites are most frequently accessed and how long it will take to access the site. The results are interesting because they are very dominant social media users shown on the red charts. The maximum duration of service per day is between 3-5 hours.

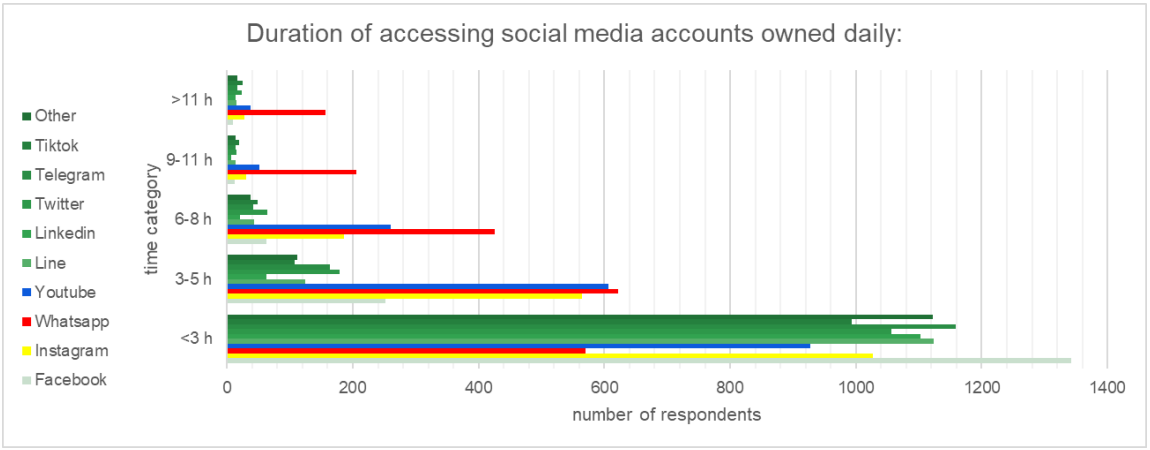

Fig. 5. Questionnaire results of social media access duration

Figure 5 tells about the duration of social media access owned by respondents. The result is that the Whatsapp app occupies the highest position for access more than equal to 3 hours, followed by Youtube and Instagram applications. The three images above show evidence that the length of gadget use is influenced by social media addiction. This is very clearly illustrated in Figure 4 where the majority accessed by respondents in their daily Internet is social media, with a long duration of access. In addition, Figure 5 gives another fact that social media is often used is Whatsapp, where the application is used to communicate or even become an online lecture platform during this pandemic. At the same time, the Youtube application can be used to support learning, where a lot of learning materials can be uploaded on this application.

4.5. Estimation of the Internet and Social Media Addiction among Indonesian Students

Based on the survey results, it can be estimated that the number of Indonesian students who are addicted to the Internet and social media using confidence interval method [31], with the number of students in Indonesia as many as 47.68 million people [41], the number of Indonesians who use the Internet amounts to 196.7 million people and active social media users of 160 million people [42]. So, the estimation of Indonesian students who are addicted to the Internet is 28.38% mild Internet addiction, 7.31% moderate Internet addiction, and 0.24% severe Internet addiction. Meanwhile, the estimated number of Indonesian students addicted to social media is 21.08% of social media addiction at a mild level, 7.55% moderate social media addiction, and 0.12% severe social media addiction. The estimated number of students addicted to the Internet is 17.13 million students, while the estimated number of students addicted to social media is 13.7 million students. It can also be said that the ratio of students in Indonesia for Internet addiction is 4:1 with mild level (among 4 students, one of addiction), moderate level ratio of 14:1, and severe level ratio of 416:1. While the comparison of students in Indonesia for social media addiction with mild levels of 5:1, moderate levels of 13:1, and severe levels of 833:1.

4.6. Study of the Internet and Social Media Addiction from Philosophy of Science

This section will explain the Internet and social media addiction according to the philosophy of science by Karl Popper and Thomas Kuhn. According to Karl Popper, a theory of science is said to be science if the theory can be tested and falsified [43]. This research question is "Does Internet and social media addiction in Indonesia a reality of science or pseudoscience?". To prove this question, we conducted a survey of 2002 respondents in Indonesia on the Internet Addiction Test (IAT) that has been created by Kimberly Young [17]. Then falsification with validity test, reliability test, hypothesis test, and ordinal regression test. Based on the test results, IAT is valid and reliable, and there is Internet addiction (0.45% severe, 4.85% moderate, and 20.18% mild) and social media addiction (0.45% severe, 4.70% moderate, and 14.99% mild) in Indonesia. From the testing and falsification above, Internet and social media addiction in Indonesia is a reality of science, and until now, the truth of the theory is the strongest (corborated) and temporarily accepted until there is evidence. When associated with Thomas Kuhn's scientific revolution theory, addiction to the Internet and social media is still in crisis phase. The normal science, in this case, is the theory of addiction in other cases, such as addiction to cigarettes, liquor, drugs, and technology [44], [45]. Furthermore, some anomalies occur in cases of addiction and cannot be solved with the usual addiction techniques. This is characterized by the number of cases that occur due to the Internet and social media. So, addiction is now said to be experiencing a crisis in the field of Internet and social media addiction. The main problem to solve is finding new theories and methods for measuring and overcoming Internet and social media addiction. It is hoped that all theories and methods about Internet and social media addiction can respond to the crisis that has resulted in revolutionary science [46].

4. Conclusion

From the survey of 2002 respondents, it was found that 20.18% of respondents experienced mild addiction, 4.85% of respondents experienced moderate addiction, and 0.45% of respondents experienced severe addiction to Internets. While the survey results for social media addiction were 14.99% of respondents experienced mild addiction, 4.7% of respondents experienced moderate addiction, and

0.45% of respondents experienced severe addiction. The estimated number of students addicted to the Internet is 17.13 million students, while the estimated number of students addicted to social media is 13.7 million students. In this study, a variable test was conducted covering 24 predictor variables (see Table 5). From the ordinal regression analysis, it can be concluded that the age aspect of first having a social media account and level of education is an aspect that positively affects Internet addiction. While the duration of access to the blog or personal website daily and duration of access to personal social media sites daily is an aspect that negatively affects Internet addiction. Then the age aspect of first having a social media account, level of education, and duration of LinkedIn daily access is an aspect that positively affects social media addiction. While the duration of Twitter daily access and duration of other social media daily access is an aspect that negatively affects social media addiction. Based on the things mentioned above, addiction to Internets and social media is said to be science and not pseudoscience because it has fulfilled the characteristics of science that is logical, empirical, and can be falsified. There needs to be special attention from the Indonesians about the addiction of interns and social media so that this addiction can be anticipated and the inflicted symptoms can be minimized.

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