

Sleep Duration, Internet Use Duration and Anxiety on University Student during Covid-19 Pandemic

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Abstract

The Coronavirus has caused an extraordinary crisis in many fields so that many countries are struggling to get out of the crisis. In Asia, Indonesia ranks 9th above China which ranks 10th, but in Southeast Asia, Indonesia ranks first and has the potential to become the epicenter in Asia because of the number of Covid-19 cases that surpass China. To reduce the spread of the Corona virus, Indonesia implements of Large-Scale Social Restrictions (PSBB) in some of areas at each entrance (entry or exit of transportation, people, goods in lakes, water, or air) since March 31, 2020. The purpose of this study was to examine the relationship between sleep duration and anxiety and internet usage duration. with anxiety in 991 students during the Covid-19 pandemic in Indonesia. Data was collected through online questionnaires in 52 cities from 21 provinces in Indonesia. The results showed a relationship between sleep duration and anxiety and internet usage duration with anxiety.

Keywords

Sleep duration, internet use duration, anxiety, university student, Covid-19 pandemic.

Introduction

In this century, CoronaVirus has shocked the whole world. The name Corona is taken from the Latin word meaning crown, because its shape is like a nail that stands out like a crown and a corona of the sun. Then the United Nations announced that Covid-19 was the official name of the Coronavirus on Tuesday, February 11, 2020. The mention of Covid-19 is an acronym for the word "co" which is Coron, "vi" for the virus, "d" for disease, and "19" which come in 2019 and was first identified on December 31, 2019. The Corona SARS-CoV-2 virus known as COVID-19 was first detected in Wuhan City, Hubei Province, China in December 2019.

The Covid-19 virus spread massively and widely globally in many countries poses a serious threat, therefore WHO declared it a global pandemic on March 11, 2020. The Covid-19 pandemic made the whole world vigilant and even many countries were struggling against Covid-19 where the number of cases is increasing day by day. On July 25, 2020 at 07.00 WIB, there were 15,928,257 cases of Covid reported in Covid-19 in many countries and regions, resulting in 641,806 patients dying and 9,713,327 patients recovering, and 5,573,124 active cases or patients currently in care spread (worldometer.info 2020).

The United States occupies the first position in the world with 4,246,685 Covid-19 cases, of which 148,435 patients have died, and 2,027,265 patients have recovered, and 2,070,985 active cases. Meanwhile, China is in the 26th position of the world with 83,750 cases, which consists of 4,634 patients died, 78,873 patients recovered, and 243 active cases. Meanwhile, Indonesia's current position is above that of China, which is in position 24 with a total of 95,418 cases where 4,665 patients died, 53,945 patients recovered, and 36,808 active cases. The addition of new cases in Indonesia is quite high, reaching 1,761 cases a day. In the Asian sphere, Indonesia ranks 9th above China, which ranks 10th, and India becomes the Asia region with the most Covid-19 cases. India, the number of Covid-19 cases reached 1,337,022, of which 31,406 patients died, 850,107 patients recovered, and 455,509 active cases (worldometer.info 2020). If in Southeast Asia, Indonesia occupies the first position, which is then followed by the Philippines, Singapore, Malaysia and Thailand. The large number of Covid-19 cases in Indonesia has the potential to become an epicenter in Asia. The large number of covid-19 cases in Indonesia that surpassed China has the potential to make Indonesia an epicenter in Asia, although the United States is now the new epicenter of the spread of Covid-18, where previously China was the epicenter of the spread of Covid-19 disease.

Covid-19 pandemic has caused a lot of chaos in many countries, especially in the global socioeconomic field, especially since the introduction of quarantine (lockdown) in some countries or travel restrictions, quarantine, curfew, postponement or cancellation of events and the closure of schools and universities and a number of general and social facilities as an effort to prevent the spread of infection. In Indonesia, the Government did not make a decision to lockdown or quarantine, but instead set a "Public Health Emergency Status" on March 31, 2020 by implementation of Large-Scale Social Restrictions (PSBB) at the entrance (the entry or exit of transportation equipment, people, goods in lake, water, or air) regulated in Law article 59 paragraph 2. The regional government may also apply PPSB for a particular province or city proposed by the local government leader to the Minister of Health. Meanwhile, the government also bans *mudik* (annual exodus ahead of Idul Fitri). If there are travelers *mudik* after the government issued a ban on *mudik*, then the local government will repatriate travelers from the area.

General, anxiety is normal, but it would be bad if someone let it go especially in the condition of the pandemic Covid-19. In the research Azad et al. (2017) revealed that the problems of mental disorders experienced by developing countries are depression and anxiety with a prevalence of 10-44%. During the Covid-19 pandemic it also raised a number of psychological problems, such as widespread panic and increased anxiety in individuals (World Health Organization 2020a).

Ornel et al. (2020) also stated that during the epidemic Covid-19 caused anxiety, depression, difficulty, sleep disturbance, and suicide. This is supported by a number of studies. Research conducted by Lin (2020) states that the number of people infected by the Covid-19 virus is increasing rapidly worldwide causing concern and increasing public anxiety in many areas. When the Covid-19 outbreak was ongoing, a wave of fear and anxiety in the community had arisen. Following this wave of fears and fears, some communities appear to be developing new products of discrimination, namely mutual discrimination in Asian / Chinese society.

Wang et al. (2020) conducted a study of 1,210 respondents from 194 cities in China and showed 53.8% of respondents assessed the psychological impact of the Covid-19 pandemic under moderate or severe conditions, of which 16.5% reported symptoms of moderate depression to severe, 28.8% reported symptoms of moderate to severe anxiety, and 8.1% reported moderate to severe stress levels. Research Kwok et al. (2020) of 1715 respondents in Hong Kong showed a high perceived vulnerability (89%) and a high perceived severity (97%). Most respondents were worried about Covid-19 (97%), and their daily routine was disrupted (very little/very: 98%). Almost all respondents were aware of disease progression (99.5%). The most trusted sources of information were doctors (84%), followed by broadcasts (57%) and newspapers (54%), but they were not public sources of information (doctors: 5%; broadcasts: 36.34%; newspapers: 40%). Only 16% of respondents consider the official website to be reliable. Improved personal hygiene practices and avoidance of trips to China (> 77%) and considered effective (> 90%).

Other research was also conducted by Qiu, et al. (2020) of 52,730 respondents from 36 provinces, including Hong Kong, Macau and Taiwan. The results showed that 35% of respondents experienced distress, and women were far more vulnerable to stress and more likely to develop post-traumatic stress disorder. Li et al. (2020) conducted a study of 17,856 respondents and the results showed an increase in negative emotions, such as anxiety, depression and anger) and sensitivity to increased social risks and positive emotions, such as happiness and life satisfaction decreased. People care more about their health and family, while there is little to do with holidays and friends.

Li et al. (2020) conducted a study of 4,607 Chinese citizens aged between 17-90 years from 31 provinces in China showing that people's emotional reactions and behavior were slightly influenced by COVID-19. In addition, the public is actively involved in Covid-19 prevention behavior even though it is limited to other activities. In addition to research on community anxiety, there were also a number of studies on anxiety among health workers during the Covid-19 pandemic. Liu et al. (2020) conducted a study of 4,679 doctors and nurses from 348 hospitals in 31 provinces in China, the results showed the prevalence of psychological distress, anxiety symptoms, and depressive symptoms was 15.9% (95% CI 14.8- 16.9), 16.0% (95% CI 15.1-17.17), and 34.6% (95% CI 33.2-35.9). Those who are middle-aged, divorced or widowed, rarely or not live with family members, become nurses, work in high-risk departments, have experience of COVID-19 treatment or other infectious diseases, from hospitals designated for COVID-19 care, home non-communicable diseases, and high level hospitals have a higher risk of having at least one mental health problem. Medical staff with three mental health problems (23.2%) received less psychological assistance compared to those without problems (35.3%).

As a PSBB policy, some regional heads in Java, such as in DKI Jakarta and West Java, had already closes down schools, collage and public places also and apply distance learning methods or online at home in an effort to prevent the spread of Covid-19. The internet, then, has become a part of human life. AKAMAI (2020) reports that the change is causing 30% growth in internet traffic in March 2020, which is around 10x normal. Internet traffic growth over the past year is only in the last few weeks known from the globally distributed smart edge platform with more than 270,000 servers in 4,000 locations in 137 countries. The UNICEF survey (2020) reported more than 60 million students in Indonesia studying online during the COVID-19 pandemic. Indonesia ranked 4th in the use of the internet in 2020 which reached 171,260,000 users, with 8.560% growth (www.internetworldstats.com 2020). As consequence, excessive use of the internet also has a bad impact and lowers quality of life.

In China, several studies also show school students and college students have shown increased anxiety during the Covid-19 pandemic. Research conducted by Liu, Liu, and Zhong (2020) of 7,143 students in China to explore cognitive, psychological, and anxiety and depression levels to understand the psychological dynamics of students, apparently the results showed that 77.21% of respondents strongly agreed to reduce out and gather up. In addition, the level of anxiety and depression of students in China during the COVID-19 epidemic was higher than the level of national norms.

Another study conducted by Chao et al. (2020) showed that 0.9% of respondents experienced severe anxiety, 2.7% moderate anxiety, and 21.3% mild anxiety. The results of the correlation analysis showed that the economic effects, and effects on daily life, as well as delays in academic activities, were positively related to anxiety symptoms ($p < 0.001$). The condition of students is under pressure, and most experience higher levels of anxiety and depression during the Covid-19 pandemic than national levels.

Sleep plays an important role in maintaining one's health. During the Covid-19 Pandemic, many people had problems with the number of hours of sleep and the impact on sleep quality. Research conducted by Voisidis et al. (2020) regarding sleep difficulties during the Covid-19 pandemic of 2,427 Greeks showed that 37.7% of respondents were detected as having sleep problems, especially in women and people in urban areas rather than younger ages. In addition, respondent insomnia will increase if someone close to them has the virus or is not certain to contract the Covid-19 virus. In addition, higher levels of intolerance to uncertainty, concerns about COVID-19, loneliness, and symptoms of depression are more severe causes of insomnia. Siyu et al. (2020) conducted a study of 5393 respondents and showed that anxiety, depression and insomnia occurred at various levels among medical workers throughout China with 5.9%, 28% and 34.3 respectively % of the total sample group.

Other studies also conducted by Huang and Zhao (2020) on 603 volunteers and showed that 34% there was a prevalence of GAD (Generalized Anxiety Disorder), 18.1% symptoms of depression, and 18.1% of sleep quality. Zhu et al. (2020) conducted a study of 5062 health workers in which the results showed that women and those who had more than 10 years of work, accompanying chronic illness, a history of mental disorders, and family members or relatives who were confirmed or suspected to be susceptible to stress, depression and anxiety among health workers during the COVID-19 pandemic.

The study from Priego et al. (2020) of 561 respondents in Mexico showed that the majority of respondents (99.6%) were aware of the pandemic and considered SARS-COV2 as a real threat to their health. 82% ($n = 459$) considered themselves at risk of infection and developed COVID-19 during the following months. Most (98%) of respondents thought that social distance was very important to stop the spread of the virus. Most participants (97%) admitted that washing their hands often could stop the spread of infection. 181 (33%) respondents stated that fears and worries related to COVID-19 have disrupted their sleep quality.

Methods

This study aims is to examine the correlation between sleep duration and anxiety, and the correlation between internet use duration and anxiety. This quantitative research approach and cross-sectional study, using online questionnaire to university student in 21 provinces in Indonesia.

Anxiety in this study will be measured using an anxiety scale developed by Afandi (2007) which is a modification of the anxiety scale from Lipsig and Norman (1959), Greenberger Margono, Priyatna, and Padesky (2004) and from the anxiety symptoms mentioned by the National Health Committee (1998) with two physical and psychological aspects. This scale uses a 5-point Likert scale model which amounts to 36 items and has been tested to have an

Alpha reliability coefficient of 0.9429 and item-total correlation between 0.4105 to 0.7234. In addition, internet use asked with: How long do you use Gadget (mobile phone) on average per day? And sleep duration asked with: What are your average hours of sleep at night?

Result and Discussion

The study involved 991 respondents with age and gender as presented in table 1 below.

Table 1. Descriptive

Category	Sub Category	Amount
Ages	Xmin	15
	Xmax	45
	Mean	20.6
Sex	Male	298
	Female	683
	Total	991

Respondents came from 52 cities from 21 provinces in Indonesia and one (Sydney) city from Australia. The 21 province is West Java (644), DKI Jakarta (180), Banten (68), Riau (19), Central Java (16), East Java (14), Special Region of Yogyakarta (8), Riau Islands (5), Bangka Belitung (4), Jambi (4), Lampung (3), East Kalimantan (2), North Sumatera (2), Bali (2), North Sulawesi (2), Nangroe Aceh Darusalam (1), West Sumatera (1), Bengkulu (1), Lombok (1), South East Sulawesi (1), and North Maluku (1). The activity of respondents in accessing the Internet was dominated by the use of social media (table 2).

Table 2. Internet access activity during gadget use

Activity	Amount
1. Social Media	928
2. Youtube	765
3. Internet Browsing	751
4. Online Learning	492
5. Application for Entertainment	487
6. News about COVID-19	360
7. Game online	356
8. News beside COVID-19	302
9. Application for or Learning (Zenius, Ruang Guru)	162
10. Webinar	7
11. Netflix	7
12. Watching film	7
13. Others	15

Meanwhile, the widely used social media is WhatsApp, followed by Instagram, Twitter and Facebook (table 3). These results are somewhat contrary to the phenomena in the US and Italy, where an increase in the number of online gaming users during pandemic. In the U.S. there was an increase of 75% (Pantling 2020), while in Italy increase of 70% (Lepido and Rolander 2020). Steam, a leading gaming distributor, also reported more than 20 million concurrent active users, and live-streaming platforms *YouTube Gaming* and *Twitch* reported 10% increases in viewership (Stephen 2020). In this study, the number of users of online games ranked only 7th.

Table 3. Social media use

Social Media	Amount
1. WhatsApp	941
2. Instagram	888
3. Twitter	481
4. Facebook	217
5. Line	80
6. Youtube	19
7. Tiktok	14
8. Telegram	14
9. Others (Discord, Linkedin, Zoom, Quora, Snapchat, Spotify, Tinder)	15

Descriptively, we concluded that the average sleep duration of the respondents is 6.07 hours per night ($X_{\min} = 1$, $X_{\max} = 8$, $SD = 1.42$) which tend to insomnia because less than 6.5 hours (Morin and Espie 2004). Study in Australia, Stanton et al. (2020) found that from the 612 respondents had an average night sleep of 7.1 hours ($SD = 1.3$) during Covid-19.

Table 4. Sleep duration

Category	Sub Category	Amount	Percentage
Sleep Duration	Normal (6.5 hour or more)	708	71.5%
	Not normal (less than 6.5 hour)	283	28.5%
	Range	1-8 hour	
	Average	6.07 hour	
	SD	1.42	

28.5% of the participants had sleep duration of less than 6.5 hours per day. The result is better than the average of prevalence of insomnia in Greek and China (Voitsidis et al. 2020; Lai et al. 2019; Pappa et al. 2020; Qi et al. 2020; Zhang et al. 2020a; Zhang et al. 2020b). The average internet use duration of the respondents is 6.96 hours per day ($X_{\min} = 1$, $X_{\max} = 10$, $SD = 2.74$) which tend to addiction. Tao et al. (2010) states that the duration of internet addiction is at least 6 hours of use internet per day.

Table 5. Prevalence of insomnia during Covid-19 pandemic

Author(s)	Respondent	Country	Prevalence (%)
Voitsidis et al. (2020)	2,363	Greek	37.6%
Pappa et al. (2020)	33,062 healthcare workers	China	38.9%
Lai et al. (2019)	1,257 health care workers	Wuhan, China	34% (427)
Qi et al. (2020)	1,306 health care workers	China	45.5% (594)
Zhang et al. (2020a)	1,563 health care workers	China	36.1% (564)
Zhang et al. (2020b)	2,182 health care workers	China	33.9% (739)

Table 6. Internet use duration

Category	Sub Category	Amount	Percentage
Internet use duration	Normal (less than 6 hours)	440	44.4%
	Not normal (6 hours or more)	551	55.6%
	Range	1 – 10 hour	
	Average	6.96	
	SD	2.74	

The percentage of 44.4% also higher than in Hongkong (Cheung and Wong, 2011), China (Leung 2004; Lam et al. 2009), Korea (Whang, Lee and Chang 2003; Choi et al. 2009), Nepal (Bhandari et al. 2017), Greece (Siomos et al. 2008), and Turkey (Bener et al. 2019). But, lower than the study of Prabowo, Dewi and Nadia (2020) before Covid-19 (table 7).

Table 7. World-wide prevalence of internet addiction

Author(s)	Respondent	Country(s)	Internet Addiction (%)
Cheung & Wong (2011)	719 adolescents	Hong Kong	17.2%
Leung (2004)	699 millennials	China	37.9%
Lam et al. (2009)	1,618 (school students aged 13-18 years)	China	Moderate (10.2%) Severe (0.6%)
Whang, Lee & Chang (2003)	13,588 users	Korea	3.5%
Choi et al. (2009)	2,336 high school students	Korea	2.5%
Bhandari et al. (2017)	984 undergraduate students	Nepal	35.4%
Siomos et al. (2008)	2,200 adolescent students (12-18 years)	Greece	8%
Poli & Agrimi (2012)	2,533 school students aged 14 - 21 years	Italy	0.8%
Niemz, Griffiths, & Banyard (2005)	371 university students	England	18.3%
Kuss, Griffiths, & Binder (2013)	2,257 university students	England	3.2%
Kuss at al (2013)	3,105 adolescents	Netherland	3.7%
Černja, Vejmelka & Rajter (2019)	352 high school students, aged 15–20	Croatia	3.4%
Bener et al. (2019)	3,000 students (18 - 25 years)	Turkey	17.7%
Prabowo, Dewi & Nadia (2020)	259 millennials	Indonesia	72%

From the correlation, we found that there is a positive correlation between internet use duration and anxiety ($r=0.169$, $p<0.01$). This study supports several studies where found that internet addiction increases the risk of depression, anxiety and stress (Shadzi, Salehi, and Vardanjani 2020; J. Kuss et al. 2014). Mild levels of internet addiction with highly prevalent (62%) also correlated to anxiety and depression (Gao et al. 2020; Wang et al. 2020; Huang and Zhao 2020). In addition, addictive behavior such as video gaming, TV series watching, using social media, or surfing the internet are often used to reduce stress and anxiety. (Jacobs 2001; Khantzian 2013; Blasi et al. 2019). Garcia-Priego et al. (2020) found that younger age, sleep problems, internet addiction and depression were associated with anxiety.

We also found that there is a negative correlation between sleep duration and anxiety ($r=-0.153$, $p<0.01$). According Taylor et al. (2008), Jeong et al. (2016) and Siyu et al. (2020), there is an association between anxiety/stress and sleep disturbances and vice versa. WHO stated that new measures such as self-isolation and quarantine have affected usual activities, routines, and livelihoods of people that may lead to an increase in loneliness, anxiety, depression, insomnia, harmful alcohol, and drug use, and self-harm or suicidal behavior (World Health Organization 2020b). Similarly, lockdown, isolation, loss of job, financial burden, stress, depression, anxiety, phobia and lastly availability of plenty of leisure time all together put forward a fertile field on which behavioral addictions start growing relentlessly. Literature shows that usage of internet, particularly websites related to video gaming has been markedly increased in this period of lockdown. Among behavioral addictions, internet addiction (use of social media particularly) is top the list (Király et al. 2020).

Conclusion

There is a relationship between sleep duration and anxiety and internet use duration with anxiety on university student during Covid-19 pandemic in Indonesia. The prevalence of sleep duration is better than the prevalence of insomnia in Greece and China. And, the prevalence of internet use duration is higher than in Hongkong, China, Korea, Nepal, Greece, and Turkey before Covid-19 pandemic. We can learn from China that has a greater population than Indonesia, but has a smaller cumulative case number. Data of the World Health Organization (2020c) indicates that the cumulative case in China amounted to 88.122, while in Indonesia amounted to 108.376. China has done some stricter ways, such as efforts to prevent the spread of Covid-19 such as education and health information to the public about Corona Virus and the application of health protocols (such as maintaining physical distance, wearing masks, diligently washing hands with soap, using hand sanitizers, sunbathing in morning, consume healthy food and drinks as well as vitamins for endurance, exercise, etc.). Zhong et al. (2020) found that the majority of respondents (97.1%) had confidence that China could win the battle against COVID-19 and almost all participants (98.0%) wore masks. There are some types of interventions that have been performed in China, such as Progressive muscle relaxation for anxiety and fear (Xu et al. 2020), Mindfulness for anxiety & sleep problem (Zhong et al. 2000), Telehealth meditation for stress (Yanyu et al. 2020), Mental health online intervention (Li et al. 2020), and Cognitive Behavioral Therapy (CBT) telehealth intervention for depression, anxiety, and insomnia (Liu et al. 2020).

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Biography

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