



The Effect of the COVID-19 Pandemic Situation (Screen-Using) And The Students' Health BMI

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Abstract

The pandemic crisis caused by the Coronavirus (COVID-19) is currently the most pressing concern. As it is a disease that may readily spread among individuals forcing students to learn online rather than attending school. Online learning also contributes to changes in students' behavior, particularly screen-using behavior, which may result in a change in their body mass index (BMI). As a result, the primary objective of this study is to evaluate the relationship between students' screen-using behavior and changes in BMI. We conducted a cross-sectional review to evaluate the correlation between the two variables. The data was collected by randomly distributing the questionnaire to the participants, which included 27 questions on their general information, screen-using behavior, and BMI. There are 154 replies from Thai, bilingual, and international students. However, because several participants made mistakes in their responses, only 146 responses were used to analyze the results. We utilized Statistics Products and Service Solutions (SPSS) to evaluate the data after receiving and checking the responses. The results demonstrate that there is a correlation between the two variables.

Keywords: BMI, COVID-19, Online learning, Screen-using behavior, Students

Introduction

Coronavirus, also known as COVID-19, is a virus transmitted by the SAR-CoV-2 virus that causes an infectious disease (Coronavirus disease (COVID-19), n.d.). In 2019, it was discovered for the very first time in the Wuhan market, China (Bhargava, 2021). The disease has been spreading across the world ever since. On the 13th of January 2020, a report stated that the virus had been brought to Thailand for the first time by a Chinese visitor (COVID-19: WHO's Action in Countries, 2020). Following that, for several weeks, more cases of COVID-19 sickness were documented. The majority of infected patients have a mild respiratory illness, such as a sore throat, cough, and fever, and would recover on their own. However, in some groups of infected people, the symptoms, such as trouble breathing or shortness of

breath, can be fatal. Furthermore, the virus can easily spread in a variety of ways; for example, the virus can spread from an infected person's mouth or nose in microscopic liquid particles when they open their mouth (Coronavirus disease (COVID-19: How is it transmitted?, 2021). The number of affected patients rapidly increased until March 22, 2020. There were 188 new cases of COVID-19, prompting the government to institute a nationwide lockdown (Dechsupa, S., Assawakosri, S., Phakham, S., & Honsawek, S., 2020). The situation was proclaimed a national emergency, and all entertainment, restaurants, and schools were shuttered. Regardless, the government chose to postpone the start of the new school year by 6 weeks rather than utilizing online learning. After the lockdown, the situation appeared to have improved, as students were able to visit their

school on-site. However, the situation worsened in December 2020, when the number of COVID-19 patients increased dramatically. This time, the government announced that schools in high-risk areas, including Thai, bilingual, and international schools, had been mandated to provide online learning (Mala, 2021). The direct impact of this on the students was that online learning forces them to stay at home with a computer and sit in front of a computer all day. Furthermore, their physical activities, such as exercising and walking outside, have been restricted and replaced with other hobbies that can be done simply at home. Using a mobile phone or computer is often a part of those activities. As a result, their average screen time may rise. This may result in changes in their sleeping habits, food habits, and mental health, which all of these factors contribute to their weight and height.

To study the changes that weight and height have brought on the body mass index (BMI), which was developed by Adolphe Quetelet during the nineteenth century (NHS., n.d.). It is a weight classification system that uses height and weight to identify weight categories which include underweight, healthy weight, overweight, and obesity. During the 1970s, researchers observed that BMI looked to be a decent indicator for adiposity and overweight-related disorders, particularly based on data and reports from the Seven Countries Study (World Health Organization, 2022). For example, if a person's BMI value is over 30, it can be an indication that the person might be obese. To calculate the BMI, the person's weight in kilograms is divided by the square of the individual's height in meters (BMI, n.d.). Moreover, there is another research report that the more children spend time on the screen, the more increase in children's BMI (Mitchell et al., 2013). This research, therefore, is carried out to find the correlation between the screen utilization time and changes in BMI of both before and after the COVID-19 pandemic situation.

Methods

The 27-question questionnaire was designed to identify and investigate the correlation between students' screen-using behavior during the COVID-19 pandemic situation and their Body Mass Index (BMI). The questionnaire is divided into three sections, which are (1) general information, (2)

screen-use habit, and (3) body mass index. In the first part, the questions are about their personal information, such as their gender, age, and school. The following section is about screen-using behavior and how it might affect other activities. The questions in this section instruct participants to rate the score from one to five, with one indicating strongly disagree and five indicating strongly agree. Finally, the third section is about their BMI, which requires participants to enter their weight and height. Prior to launch, the questions received an index of item congruence (IOC) score greater than 0.5. Following that, the questionnaire was delivered to a volunteer group via several online platforms using google form. The volunteer group consists of 20 participants ranging from 7 graders to 12 graders, studying in Thai, bilingual, and international schools for the first pilot test. The acquired data was then subjected to a reliability test to determine the Cronbach Alpha value using a software called the Statistics Package for Social Sciences (SPSS). The score of 0.692 was achieved which is at an acceptable level. A total of 146 responses were collected.

Instrument

The 27-question questionnaire included the following questions:

Part 1: General information of participants

1. Please select your gender
2. Please select your age
3. Please select your educational level
4. Are you from a Thai or International school?
5. Are you studying in 100% online, hybrid learning or 100% offline?

Part 2: Variables

6. How many hours do you spend on the screen per day?
7. Do you think that the COVID-19 situation affects the time that you spend on screen compared to before? How?
8. How many hours do you spend on the screen in the morning per day?
9. How many hours do you spend on the screen in the afternoon per day?

10. How many hours do you spend on the screen in the evening per day?
11. How many hours do you sleep per night?
12. You often have your meal while using the screen.
13. While using the screen, you have other physical activities, except using the keyboard, such as walking or exercising.
14. While using the screen, you often eat snacks.
15. You feel bored of eating food or skipping your meal while spending your time on the screen.
16. You have brunch more often compared to before the COVID-19 pandemic.
17. While using the screen, does it make you drink more water than usual?
18. Using the screen while eating makes you intake more food than usual.
19. Your regular physical activities have been replaced by screen-using behavior.
20. Spending your time on the screen makes you feel more productive.
21. Spending your time on the screen makes you feel more inactive.
22. Using screen time before going to bed worsens your sleeping quality.
23. During the COVID-19 situation, you have more assignments that have to use the screen more than usual.
24. What was your height before the COVID-19 pandemic? (in centimeter)
25. What is your height during the COVID-19 pandemic? (in centimeter)
26. What was your weight before the COVID-19 pandemic? (in kilogram)
27. What is your weight during the COVID-19 pandemic? (in kilogram)

Results

Table 1: General information of participants

| Personal Information | Frequency | Valid Percent |
|----------------------|-----------|---------------|
| 1. Gender | | |
| Male | 66 | 45.20 |
| Female | 77 | 53.70 |
| Other | 3 | 2.10 |
| 2. Age (year) | | |
| 12 | 3 | 2.10 |
| 13 | 2 | 1.40 |
| 14 | 1 | 0.70 |
| 15 | 4 | 2.70 |

| | | |
|--|-----|-------|
| 16 | 45 | 30.80 |
| 17 | 80 | 54.80 |
| 18 | 9 | 6.20 |
| 19 | 2 | 1.40 |
| 3. Education level | | |
| Grade 7 | 3 | 2.10 |
| Grade 8 | 3 | 2.10 |
| Grade 9 | 1 | 0.70 |
| Grade10 | 12 | 8.20 |
| Grade 11 | 112 | 76.70 |
| Grade 12 | 15 | 10.30 |
| 4. Type of School | | |
| Thai school | 74 | 50.70 |
| Bilingual school | 10 | 6.80 |
| International school | 62 | 42.50 |
| 5. Type of study | | |
| Online 100% | 68 | 46.60 |
| Hybrid learning (online 50% and offline 50%) | 68 | 46.60 |
| Offline 100% | 10 | 6.80 |

Table 1 shows the general information of the 146 participants. The proportion of females is higher than both groups of male and others, with 53.7 percent being females, 45.2 percent being males, and 2.1 percent identified as others. The data also included information about the participants' backgrounds, which described their learning behavior, such as their educational level, type of school, and types of study.

Table 2: Descriptive Statistics (Average and Standard Deviation)

| | Mean | Standard Deviation | N |
|-----------------------|------|--------------------|-----|
| Screen-using behavior | 3.12 | 0.3962 | 146 |
| BMI change | 0.44 | 1.7691 | 146 |

Table 2 shows the mean of participants' screen-using behavior and BMI changes, which are 3.14 and 0.44, respectively. Both variables' standard deviations are 0.3962 and 1.7691, respectively.

Participants' weight and height during the pandemic were also collected to calculate the BMI.

Table 3: Student's correlation coefficient between the effect of screen-using behavior and BMI

| | | Screen-using behavior | BMI change |
|-----------------------|---------------------|-----------------------|------------|
| Screen-using behavior | Pearson correlation | 1 | .277 |
| | Sig. (2-tailed) | | <.001 |
| | N | 146 | 146 |
| BMI change | Pearson correlation | .277 | 1 |
| | Sig. (2-tailed) | <.001 | |
| | N | 146 | 146 |

Table 3 indicates that there is a correlation between participants' screen-using behavior and changes in BMI during the COVID-19 pandemic situation. The correlation was statistically significant ($p < 0.01$). With the correlation coefficient, $r = 0.277$.

Table 4: The difference between online learning and hybrid learning (online and offline)

| | Types of learning | N | Mean | Standard Deviation | t | p |
|-----------------------|-------------------|----|------|--------------------|-------|-------|
| Screen-using behavior | Online | 68 | 3.14 | 0.4028 | 0.687 | 0.493 |
| | Hybrid | 68 | 3.10 | 0.3876 | | |

Table 4 shows that there is no difference in screen-using behavior between both groups of participants, $t(68) = 0.687$, $p = 0.493$. who studied entirely online and those who studied hybrid learning (online and offline). Since it is possible to argue that the differences in the amount of online learning might affect the participants' screen using behavior and the results.

Conclusion

The main objective of this research is to investigate and analyze how students' BMI changes as a result of their screen-using behavior in Bangkok. We first hypothesized that there is a correlation between screen time and BMI. The results of this cross-sectional survey study project revealed that these factors have a slight positive correlation, indicating that our hypothesis is correct. The COVID-19 pandemic situation and online learning could be the essential factors contributing to the change in BMI as demonstrated by the positive correlation between them in this study. After we carefully examined the raw data, we also found that there are multiple reasons that could explain our results. Screen time was involved in many regular routines such as eating while using the screen. Additionally, many physical activities were replaced by screen time. However, the data may change in the future if the COVID-19 situation is resolved. A longitudinal study could be conducted to find the correlation between the data during and after the COVID-19 situation.

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