

Health Effect: Gadget Use and Addiction During Pandemic Covid-19 Session

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Abstract: Technology, such as a smartphone or other gadget, is the art or skill of solving a problem, improving an existing solution to a problem, reaching a goal, and performing a specific function. However, if used excessively, people will develop a gadget addiction and suffer negative health consequences. Therefore, this study is to identify mobile applications or social media most used and health affected while addicted to the gadget. The researcher conducted the quantitative analysis by collecting online questionnaires and analysing the data using the Best Worst Method (BWM). The number of respondents for the questionnaire is 104, which is 27 percent from the sampling of 384 respondents. Of 104 respondents, only 70 were accepted, while 34 respondents rejected due to invalid answers. The questionnaire was distributed online at random via social media platforms such as Facebook, WhatsApp, Twitter, Instagram, email, and face-to-face. Based on the finding, communication is the most used mobile application, followed by productivity, multimedia, games, online learning and e-learning. Meanwhile eye strain is most affects health followed by sleep routine/ insomnia, physical health, mental health and germs. In contrast, the least used mobile application is E-learning and germs for the least affected the health.

Keywords: Health effect, Gadget addiction, Pandemic Covid-19, Social media, Best worst method

1. Introduction

The word technology derives from the Greek word "techne," which implies the art or skill of solving a problem, improving an existing solution to a problem, achieving a goal, handling an applied input/output relation, or performing a specified function (Işman, 2012). Technology is a making, modifying, employing, and understanding of tools, machines, procedures, and methods put together

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(Ranjan *et al.*, 2010). The usage of technology is becoming more prevalent every day. Technology is essential to human survival and using social media. We employ various technologies to perform specific tasks in our lives, and technology is being applied in practically every part of our lives. Smartphones and tablets are two examples of technology that many people utilize.

As we all know, a smartphone and other gadgets, like a knife, has two sides. On the one hand, it delivers benefits and is necessary, but on the other hand, it also poses several risks (Ranjan *et al.*, 2010). It will harm the future generation if parents cannot handle it appropriately. According to Srinahyanti *et al.* (2019), gadget development is unavoidable. Still, parents must educate without taking away kids' ability to access digital information for the gadget to become a useful tool.

In the new global economy, these technologies and modern gadgets are not just popular amongst teenagers and young adults. Still, it is also a toy for children as early as age two and all generations. The most gadget used is the mobile phone, also known as the smartphone, because it is complete with various functions (Zickuhr, 2011). The dependence on these technologies increase has far-reaching consequences. Mobile phones or other gadgets have risks and hazards if used without control or over-used.

The year 2020 be remembered as the year in which the COVID-19 epidemic dramatically alters our daily lives and causes us to realign many parts of new standards. Many measures have been established under the Prevention and Control of Infectious Diseases Act 1988 (the Act) to prevent and restrict the spread of COVID-19, including the nationwide adoption of the Movement Control Order. Since 18 Mac 2020, the government has enacted rules under the Act to restrict movement and gatherings across the country, starting with the Movement Control Order (MCO), then the Conditional Movement Control Order (CMCO), and lastly, the Recovery Movement Control Order (RMCO) (Vivien & Ryan, 2021). Regarding pandemic covid-19 situations, the technology used is increasing because there are changes from traditional to modern ways, using gadgets such as e-learning.

Policymakers, teachers, parents, and students have been assessing the benefits of technology in education against the risks and repercussions for years. According to Staff (2021), some people state that technology in the classroom could promote cheating. Technology in education has grown critical, especially after the COVID-19 pandemic compelled higher education and public schools to switch to distant learning instead of face-to-face instruction. Not just education, even businesses also need to rely on technology to ensure their business can still sustain itself.

In Malaysia, social media addiction has become an important issue to be focused on since many studies show that social media has a correlational impact on the sleeping habit of humans (Nazir *et al.*, 2020). This issue cannot be underestimated since addiction may dominate their lives, disrupt social relationships, impair thinking, disturb the learning process, and impact emotional stability. In addition, addiction to technology is causing significant loss of productivity and problems in interpersonal relationships (Bhattacharyya, 2018). People who always depend on gadgets and technology might lose their confidence level because they do not know how to interact or communicate face-to-face and socialize (Rainie, 2018). Besides, these are inclined towards becoming addicted to smartphones and were exposed to health problems (Ithnain *et al.*, 2018).

Students' self-motivation, ability, and interest in studying may be harmed by excessive use of devices or children addicted to technology/gadgets such as tablets, laptops, computers, cell phones, video games, and so on. It is dangerous for a student to use technologies beyond their limits. Thus, this study determines the mobile applications most used when using the gadgets and to identify the health effect most affected with the use of gadgets using the Best Worst Method.

2. Literature Review

2.1 Definition Operation

(a) Applications or Social Media

Mobile applications or social media are software or sets of programmers that run on a mobile device and help users with specific tasks (Islam & Mazumder, 2010). Mobile applications are simple, user-friendly, low-cost, downloadable, and run on most mobile phones, including low-cost and entry-level phones (Srinahyanti *et al.*, 2019). Sarwar & Soomro (2013) stated that calling, messaging, browsing, chatting, social network communication, audio, video, games, and other mobile application functions have a wide range of applications. The evolution of media is frequently divided into two lineages: the broadcast and interactive phases (Bria, 2020).

(b) Health

A state of total physical, mental, and social well-being, not only the absence of disease or infirmity, has been described as health (Sartorius, 2006). As stated by Lerner (2019), health is the examination of the claim that balance is a feature of a universal definition of health is useful not only for health philosophy but also for any research on health from the human and other species' perspectives.

(c) Gadget

Gadgets are little electrical devices that can be carried about (Chutake *et al.*, 2020). There are benefits and drawbacks to using gadgets. Eyes strain, finger pain, backache, neck pain, and sleep disruptions have all been described as side effects of using a device on a regular. Merrin (2014) stated an etymological root in the French *gâchette*, which means catch-piece of a mechanism (a phrase used, for example, to describe elements of a firing mechanism) or *gagée*, which means little tool or instrument.

(d) Addiction

Addiction can be defined as craving or desire, inability to control, and persistence in engaging in the Act despite negative consequences (MentalHelp, 2020). As stated by Goodman (1990), addiction is a pattern of behaviour defined by recurrent failure to regulate the action (powerlessness) and continued conduct in the face of major negative consequences (unmanageability). Addiction is defined as the persistent repetition of a behaviour or activity despite the negative or unfavourable effects. It can be defined as a neurological dysfunction that leads to such behaviours (Ranjan *et al.*, 2010).

2.2 Applications or Social Media Platforms Most Used When Using the Gadgets

In today's world, technology and devices are unavoidable (Admin, 2020). Carrying a tiny computer (a smartphone) in one's pocket has become popular in recent years. Technology aids in the advancement of the human race by making routine tasks more efficient and repeatable (Chutake *et al.*, 2020). According to Zhou *et al.* (2019), technology-aided the information revolution.

Devices have strengthened to be so powerful and intelligent as a supercomputer in one's hands due to technological advancements (Zobel, 2016). Humans now have an unquenchable desire for instant access to information. When technology allows something to happen, it is natural for technology to become a standard. According to social media tools, organizations can now engage with the public in new ways. As stated by Kapoor *et al.* (2018), nonprofit organizations have taken notice of Twitter and Facebook, in particular as digital communication tools that enhance and replace traditional websites. There are various categories of gadget applications based on the application field following as tabulated is Table 1.

Table 1: Gadget application

Author	Application	Description
Islam & Mazumder (2010)	Communication or social networking	Social networking is the use of dedicated websites and applications to communicate informally with other users or to find people with similar interests to oneself (Monitis, 2017).
	Games	Games are a piece of software code intended to entertain or educate a person. Computer gaming is a large business nowadays, and there are millions of different games that people of all ages enjoy (Hope, 2020).
	Multimedia	Multi is an abbreviation for many or multiple. The terms media is referred to tools that are used to depict or do particular things, as well as a delivery channel and type of mass communication such as newspaper, magazine or television (Lawrence, 2016). Multimedia is the presentation of text, pictures, audio, and video with links and tools that allow users to navigate, engage, create, and communicate using a computer (Helen, 2020).
	Productivity	A mobile productivity app allows smartphones, tablets, and wearable devices to complete daily chores (Alyssa, 2015). These productivity apps make device users more efficient wherever they are by allowing them to access functions such as calendars, calculators, diaries, notepad/memo/word processors, spreadsheets, etc.
Moore <i>et al.</i> (2011)	E-learning apps	A mobile productivity app allows smartphones, tablets, and wearable devices to complete daily chores (Alyssa, 2015). These productivity apps make device users more efficient wherever they are by allowing them to access functions such as calendars, calculators, diaries, notepad/memo/word processors, spreadsheets, etc.
	Online learning	Developing technology-based education is known as e-learning development. According to Admin (2021), the word was coined to describe computer-assisted learning systems that enable students to learn on their own time and at their own pace. Shahzad <i>et al.</i> (2021) stated that e-learning encompasses a broader definition of technology-based learning that includes websites, learning portals, video conferencing, YouTube, mobile apps, and many other free blended learning websites. In addition, television, Microsoft Teams, google classroom, Edmodo, Kahoot, Quizlet and Prezi are other e-learning apps. Online learning refers to education over the Internet (Stern, 2018). According to Shahzad <i>et al.</i> (2021), the Internet established online learning to take advantage of technology and allow students to acquire degrees and attend school without being physically present in a classroom. Online learning is an asynchronous platform such as Zoom, Webex, and Google Meet.

2.3 Health Effects That are Most Affected Associated with the Use of Gadgets

Following are the criteria for the health effects associated with the use of gadgets: eyes strain, physical health, sleep routine/Insomnia, germs, and mental health.

(a) *Eyes Strain*

Overuse of gadgets can affect eyes health. As stated by Sadagopan *et al.* (2017), "smartphones, which are used to read and respond to emails, check the weather, read the news, and make status updates on Facebook, maybe creating eyesight difficulties". When a person squints to view smaller screens, their facial, neck, and shoulder muscles contract, their eyes strain, and their vision become blurred or strained (Resnick, 2019).

(b) *Physical Health*

Physical health is also a part of health effects that most associate with the use of the gadget. Adolescents' and adults' outdoor physical activity, such as sports, has been 'eliminated' by the influx of electronics, limiting their communication. Obesity is a condition that arises from a lack of physical activity, cardio, and exercise when on social media. Individuals addicted to social media prefer to sit for hours to explore the material they crave. According to Nazir *et al.* (2020), stated that "most social media users are obese as a result of long-term media use, as gadgets are difficult to give up". If people use social media frequently, they may have nerve problems.

(c) *Sleep Routine / Insomnia*

There are a lot of causes of insomnia, and the causes of blue light are also known as causes insomnia. According to Gary Heiting (2019), the section of the visible light spectrum with the most energy is blue light. It has a higher risk of causing eye damage than other visible light because of its high intensity. Sleep restoration has been linked to improved physical, cognitive, and psychological health in adults, adolescents, and children. Adequate sleep is a crucial element of student life, with poor sleep quality raising the risk of physical and mental illnesses. According to Nowreen & Ahad (2018), 34.4 per cent of people were discovered to be addicted to their smartphones, and 62.7 per cent were found to be poor sleepers. Most electronic media devices effectively expose a person to intense light, which can cause sleep disruption by delaying the circadian rhythm when it occurs after dark.

(d) *Germs*

Sometimes, people put their devices or gadgets everywhere and do not know whether they are hygienic or clean from germs/ bacteria. Smartphones have the potential to improve a human's healthcare. However, gadgets have the potential to harm them. According to Resnick (2019), the widget can transfer bacteria to the ears, noses, and hands by handling the device.

(e) *Mental Health*

Mental health is concerned with how we perceive ourselves, others, and our ability to handle life's demands. Mental illness refers to the wide range of mental health issues we can encounter under stressful situations. According to the World Health Organization, a mental disease is a state of well-being. Each individual fulfils their potential, can cope with everyday stressors, work successfully and fruitfully, and contribute to their community. According to Sarla (2019), anxiety, despair, tension, and low self-esteem are linked to excessive smartphone use, more common in females and young adults.

2.4 Conceptual Framework

Factors of gadget applications and health effects mentioned above, summaries in conceptual framework in Figure 1.

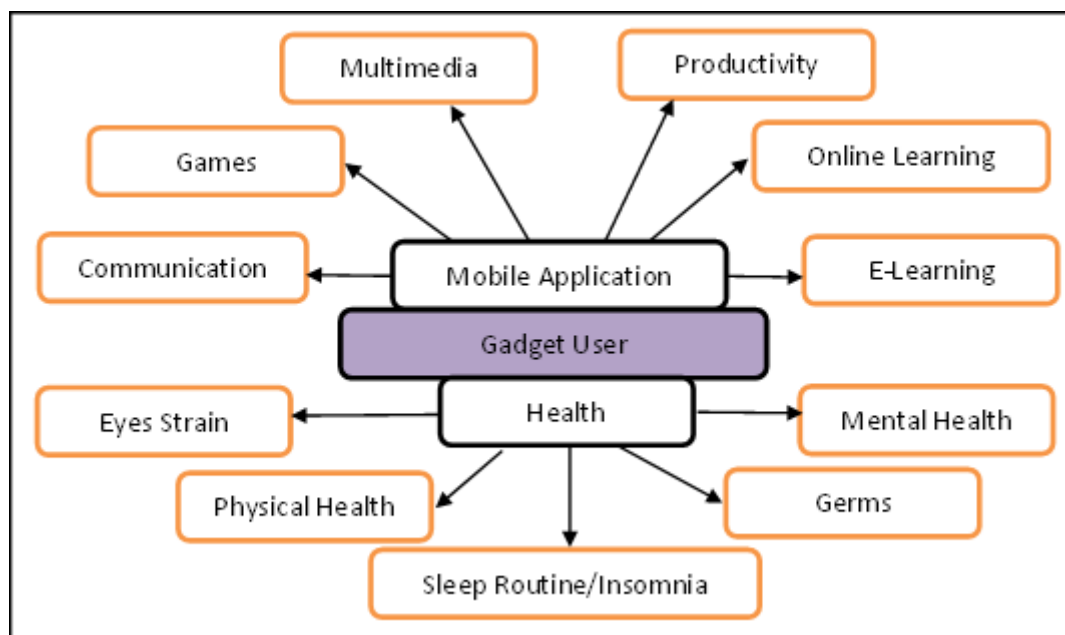


Figure 1: Conceptual framework

3. Research Methodology

The main methodology used in this research is the quantitative approach. The population of this study is familiar with using the gadget, and it is an unknown population. Thus, convenience sampling was used in this study. The data was collected, compiled and analyzed using Best Worst Method (BWM) to achieve the study's objective. This analysis method helps in organizing and analyzing non-numerical or unstructured data

We adopted one of the recently created MCDM technologies to evaluate gadget user options. BWM is similar to many other MCDM techniques, including a pairwise comparison of decisions elements (Rezaei, 2015). The main difference between BWM and other technologies is that not all comparisons are complete. Only the pairs with the best and worst alternatives previously selected are evaluated. Figure 3.0 shows the steps in Best Worst Method.

The online questionnaire was distributed using Google Form with the help of social media platforms such as WhatsApp's, Telegram, Facebook and Instagram. The online survey consists of three parts, divided into sections A, B, and C. Section A is about demography that the respondent's information which are gender, age, race, occupations and types of gadgets used. Section B is respondents select the most-used and the least-used apps or social media during the pandemic covid-19 session. Evaluate the other kinds of apps or social media to the most-used and the least-used using a 1–9 scale, ranging 1 = equal important to 9 = extremely important. Section C is respondents selecting the most- and least health effect most associate using the gadget. Evaluate the other types of health effects to the most-used and the least-used using a 1–9 scale, ranging from 1 = equal important to 9 = extremely important.

4. Results and Discussion

The questionnaire was distributed at random via social media platforms such as Facebook, WhatsApp, Twitter, Instagram, email, and face-to-face. The respondents completed 41 questionnaires online, while the remaining 63 questionnaires were conducted using Google Forms but guided by the researcher (face-to-face) as showed in Table 2.

Table 2: Questionnaire response rate

Questionnaire	Total
Sample size	384
Number of data collected	104
Valid questionnaire	70
Percentage of response rate	27%

Demographics encompass a wide range of socioeconomic data, such as a population's gender, age, ethnicity, income, employment status, homeownership, and even Internet access (French, 2014). Demographics generalise the people of specific geography based on a sample of people.

Table 3 shows the demographics analysis of the respondent that included gender, generation, races, occupation, level of education, wages, internet usage and area of residence. It shows that the number of genders is the same between males and females, 35 respondents (50%) respectively.

Table 3: Demographics analysis

	Elements	Frequency	Percentage (%)
Gender	Male	35	50
	Female	35	50
Generation	Gen Z	11	16
	Gen Y	42	60
	Gen X	17	24
	Baby Boomers	0	0
Race	Malay	56	80
	Chinese	6	9
	Indian	6	9
	Others	2	2
Occupation	Private Company Employee	40	57
	Government Employee	3	4
	Business owner	4	6
	Self-employed	7	10
	Others	16	23
Level of Education	Sekolah Rendah	3	4
	Sekolah Menengah	4	6
	SPM	24	34
	STPM	9	13
	Diploma	9	13
	Degree	20	29
	Others	1	1
Wages	B40 (B1)	52	74
	B40 (B2-B4)	11	16
	M40	5	7
	T20 (T1)	1	1
	T20 (T2)	1	1
Internet Usage	Mobile Internet	58	83
	Hotspot	2	3
Area of Residence	Broadband	10	14
	Developed Area	29	41
	Rural Area	41	59

Gen Y contributed to the highest participation with 42 (60%), and no respondents from baby boomers. Most of the respondent is Malay with 56 participants (80%), followed by Chinese and Indian with 6 participants (9%), and the others is from Iban and Dusun with two respondents (2%).

Most of the respondents work in private company employees, with 40 respondents (57%), followed by 16 respondents (23%) from others that included housewives and students, seven respondents (10%) from self-employed and four respondents (6%) of business owner. The majority of respondents' level of education is SPM with 24 respondents (34%) and the least from others, which is not a school with 1 of the respondents (1%).

The highest participation is from B40(B1) with 52 respondents (74%), and the least participation is from T20 with two respondents (2%). Most of the respondents use mobile Internet as internet usage with 58 participants (83%), and the least is using hotspot with two respondents (3%). The last is an area of residence with 29 participants (41%) from the developed area and 41 participants (59%) from the rural area.

In addition, Figure 2 show the results on an average of the most and the least used gadget activity. It shows that the communication activity is the most used with 0.3587, followed by productivity with 0.1568, Multimedia with 0.1509, online learning with 0.1308, games with 0.1088 and the least is E-learning with 0.088.

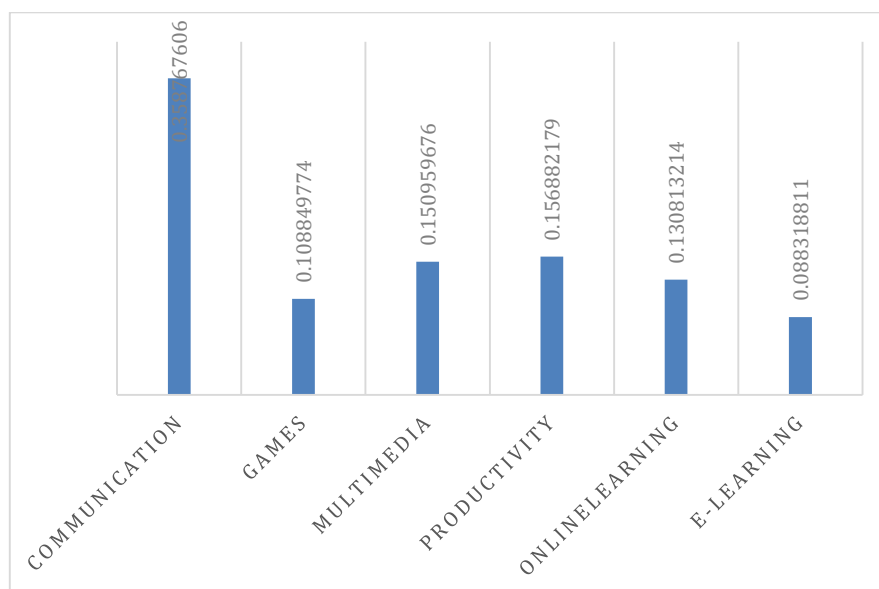


Figure 2: Average of the most and the least used gadget activity

Meanwhile Figure 3 shows the impact of gadget usage on one's health. It shows that eyes strain is the most affected on one's health with 0.3246, followed by sleep routine with 0.297, physical health with 0.1765, mental health with 0.1226 and the least effect on one's health is germs with 0.0789.

Last but not least, Table 4 and 5 show the comparison of the average for the gadget used and also the health effect. Communication is at the first ranking of the most used device with 0.3587, while eyes strain at the first ranking of health effect but with an average of 0.3246. Meanwhile, E-learning is the last rank of gadget used which is 6 with an average of 0.0883, while germs are also at the last level, which is 5 on the average 0.1226.

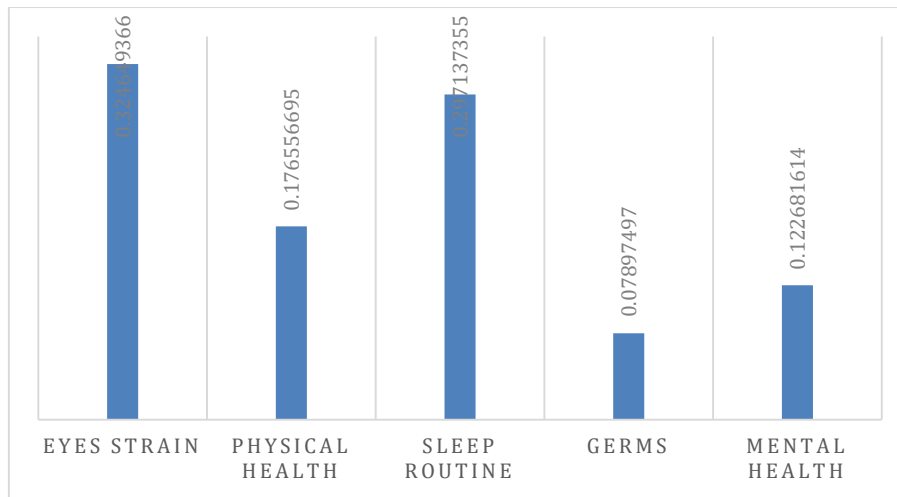


Figure 3: Average of the impact of gadget usage on one's health

Table 4: Average of gadget used

Gadget use	Average	Ranking
Communication	0.3587	1
Games	0.1088	4
Multimedia	0.1509	3
Productivity	0.1568	2
Online learning	0.1308	5
E-learning	0.0833	6

Table 5: Average of health effect

Health effect	Average	Ranking
Eyes strain	0.3426	1
Physical health	0.1765	3
Sleep routine / insomnia	0.2971	2
Germs	0.0789	5
Mental health	0.1226	4

The first objective of this study is to determine the mobile applications most used when using the gadgets using the Best Worst Method, and objective two is to identify the health effect that the most affected with the use of gadgets using the Worst Best Method.

According to the data analysis findings, mobile applications are used for communication, games, multimedia, productivity, online learning, and e-learning, among other activities. The researchers identified a communication activity and platform as popular choices for most respondents' gadget use.

Communication can help keep a long-distance relationship alive, whether it's with family, friends, or someone else entirely. Not only do Malaysians who had a quarantine during pandemic covid-19 continue to link with their neighbors, friends, and relatives through communication activities, but they also stay engaged with their communities at large. Despite this, these platforms can assist others who cannot provide for their necessities.

Meanwhile, the second goal is to determine which health effects are the most adversely affected by using the gadget by employing the Best Worst Method. Five health issues are involved, including

Eyestrain, physical health, sleep routine/insomnia, germs, and mental health. The health of the respondent's eyes is the most adversely affected by the healthy choice.

Eyes strain is after a long period of intense focus on an activity such as viewing a computer screen, reading a book, or driving a car, and the eyes may become tired or irritated (Silver, 2017). By making adjustments to the screen settings, users can protect their eyes. Reduce the brightness when at home, or enable automatic brightness settings to allow the phone to adjust based on the environment. Increase the text size to make it easier to read text messages.

5. Conclusion

In conclusion, based on the study's title, this study has successfully achieved objectives. According to the findings, researchers discovered that excessive use of technology could harm one's health. Everyone's health impact differed depending on what they used the gadget for and how long they spent on it.

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