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An Educational Study on Gadget Addiction and Mental Health among Gen Z

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Abstract

The acceleration of modern technology in the techno gadget era has led to the transformation of modern media highlighted by Generation Z. The aim of this study is to explore how gadget addiction influences the level of depression, anxiety, stress and sleep quality among the samples from the Ministry of Health Training Institution Sungai Buloh, Malaysia. Using the stratified sampling method, a total of 316 college students from various field are surveyed on the Smartphone Problematic Use Questionnaire, Depression Anxiety Stress Scale and Pittsburg Sleeping Quality Index. The Pearson correlation analysis and linear regression are adopted to find the relationship among the variables. Results show that gadget addiction is a predictor of depression, anxiety, stress and sleep disturbances. The findings of descriptive analysis show that the level of addiction, depression, anxiety and stress among the trainers is high. Positive correlations are found between the gadget addiction and levels of depression, anxiety, stress and sleep quality. Levels of depression, anxiety, stress and sleep quality among trainers are significant, with 13%, 10.7%, 12.5% and 3.4% experiencing symptoms of depression, anxiety, stress and sleeping disturbance respectively. Therefore, it is generally possible to know that the problem of gadget addiction can interfere with mental health of the users if the use of gadgets is not well controlled. The implications of this study are useful to academics and heavy gadget users and those who are hooked with their gadgets in their everyday life. Further studies in this area are needed to delve deeper into other issues related to each element of gadget addiction in order to reinforce the research framework which will in turn develop a standard guide for controlling gadget use in Malaysia.

Keywords

Sleep Disorders, Depression, Anxiety, Stress, Addiction

1. Introduction

A gadget is an important device and has become a necessity for human beings around the world. Tal and Torous (2017) said the rapid development of modern technology in the era of technological gadget has led to the revolution of modern media by the present generation Z (Gen Z). Previously, the use of gadget is very limited to professionals but nowadays, the use of these gadgets is not uncommon especially among Gen Z. More and more gadget users are able to own these devices because they are widely available and are commonly sold at affordable price. This study is generally aimed at identifying the extent of addiction affecting mental health (quality of sleep, depression, anxiety and stress) among Gen Z. In particular, the objectives of this study are to identify the level, relationship and contribution of quality of sleep, depression, anxiety and stress as well as gadget addiction among Gen Z users. The outcome of this study is expected to contribute to various parties especially teenagers and parents in identifying the elements that can lead to mental health and also serves as a guide in helping this group reduce their dependency on this gadget. All the sections in this study involve quantitative data collection.

2. Literature Review

2.1. Gadget and Gen Z

The literature review has documented that the use of a gadget can increase the community's social status because it symbolizes a high-tech society. Without a gadget, someone will be perceived as an outdated person. A research conducted by Turner (2015) states that users who use gadgets are the most effective explorer in digital information. This is because the convenient strategy in searching for information helps users improve their search and sharing information methods. The findings of Issa Omar Malecela (2016) showed that the level of ownership and the usage can help increase the use of the gadgets in a more sophisticated and dynamic manner. The use of electronic software such as smartphones, iPad, and tablet helps users perform various activities such as sharing of information, internet surfing, document writing and other activities (Khan et al., 2013). The study by Haque et al. (2016) states that with the availability of various applications on this technological device, it enables users to socialize, communicate, take pictures, record videos and some other sophisticated applications making it easy for users to perform an activity. According to Katz et al. (1973) in the theory of uses and gratification. Says that gadget users are active audience and they use the gadgets to meet specific needs. There is a need for gadgets to be transformed to various techno gadget features and thus providing different levels of satisfaction to its users. According to a topologist McQuail (1985) the uses and gratifications theory is a strategy to clarify the satisfaction obtained by gadget users while searching for information such as personal identity, social interaction and entertainment. The user satisfaction strategy is regarded as a method of using the gadget starting with setting the gadget's objectives.

Mohd Mothar et al. (2013) has stated that in the selection of a gadget, it provides an avenue for identifying the advantages and disadvantages of the gadget's usage, how it works in everyday life, how effective it is in searching, delivering and sharing of information and how users are able to control its usage. Thus, the use of gadget among Gen Z users is a strategy that helps this generation towards being high-tech savvy in the digital and techno gadget era.

The literature review shows that there is a disadvantage of gadget use among the Gen Z users. Elhai et al. (2017) revealed that Gen Z users spent 16 hours per day on average using a gadget. This implies the users cannot live without their electronic gadget. This is the feeling and resentment of gadget users whenever they have left their device at home or lose it. Many shortcomings need to be improved to achieve a more controlled level in use of the gadget.

Many Gen Z users are directly and indirectly involved in the effective and innovative use of these gadgets daily especially in their studies and daily lives. However, the dependency on the use of gadget without control is capable of contributing to problems in terms of social, academic and mental health. Thupayagale-Tshweneagae et al. (2014) state that people who are more frequent in using gadgets for the purpose of emotional support are likely inclined towards gadget addiction. Ranjan et al. (2013) state that gadget dependency is an unregulated behavioral problem and the inability of the user to use the gadget moderately. The extensive use may result in a stunted and non-functional daily life of the person. On the other hand, gadget addiction has the tendency to impel a person to be compulsive, characterized by an obsession to use the gadget. This distracts the ability of the person to live a normal life (Mat Sharif & Omar, 2013).

Babadi-Akashe et al. (2014) state that problem in gadget usage is characterized as an individual's nature and behaviour to regulate their dependence on the gadget and this nature raises the level of stress and creates problems in managing the individual's daily activities. According to VandenBos & American Psychological Association (2015), mental health is a fundamental field that describes emotional disturbance and disorientation that affects the functions of life. According to Gupta et al. (2013) a common symptom identified in the use of gadget is the inability to control the use of gadget, conceal the use of gadget and prolong use of the gadget on an ongoing basis without considering the effects of such behaviour. Mobile Phone dependency is a new emerging public health concern, due to the ill effects it predisposes on the younger generation. But, mobile phones can act as a boon also, when used effectively; hence adolescents need right motivation for the better usage of mobile phones (Dilip & Javalkar, 2018).

According to Zulkefly & Baharudin (2009), the use of gadgets among youth has experienced an increase from time to time causing symptoms of anxiety, depression and stress. Hassan et al. (2017) state that users who attempt to control and reduce the frequency of using the gadgets are found to suffer from mental problems. Gadget users who fail to control the excessive use of gadget suffer from symptoms such as restlessness, tiredness, feeling angry and extremely emotional especially gadget users who fail or unsuccessful in surfing the Internet

(Suki, 2013). The escalated number of social communication applications such as WhatsApp, Telegram, WeChat and social media applications such as Facebook, Instagram, Twitter as well as online games are the cause of serious gadget addiction among the users with significant increase in the number of current cases and also foreseeing the number will increase in the future (Teong & Ang, 2016: Ching et al., 2015: Al-Barashdi et al., 2015).

The approach used in these studies primarily focus on how the role of these gadgets affects the level of dependency and the functionality among the Gen Z. The similarity in the studies is the use of gadget and mental problems among Gen Z. In other words, the prevalent use of the gadget will heighten their dependency and addiction and thus affect their lifestyle. Although there are studies that provide explicit and implied content on the gadget dependency, less emphasis is given on the impact of gadget addiction on mental health problems among Gen Z.
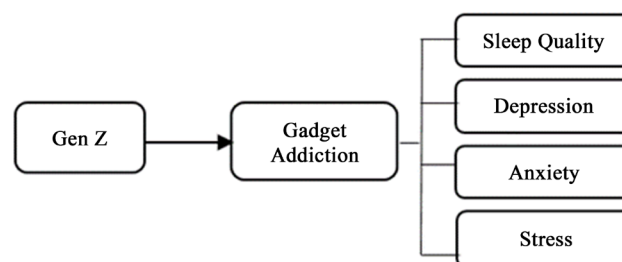
2.2. Conceptual Framework

This study uses a conceptual framework to assist researchers in conducting studies and to obtain information that is needed. This study adopts the concepts as shown in Figure 1. For this study, the independent variable is the gadget addiction. Mental health elements are the dependent variable. The main component of the conceptual framework is the Gen Z users from the Ministry of Health Training Institution, Sungai Buloh, Malaysia. The second component is the gadget addiction among the Gen Z users which are based on four elements, namely, quality of sleep, depression, anxiety and stress which are the third component of the conceptual framework.

Based on the opinions expressed by previous scholars, a conceptual framework for this research is developed as shown in Figure 1 which provides an insight on the purpose of the study to identify the influence of gadget addiction on mental health and the risks among the Gen Z users.

3. Methodology

The design of the study used cross-sectional survey method. This study is conducted by using a survey where data is collected using a set of questionnaires. The data is analyzed using the descriptive statistic in finding percentages, standard deviation and mean score. This study is conducted at the Ministry of Health

Figure 1. Conceptual framework gadget addiction and mental health among Gen Z.

Training Institution, (ILKKM), Malaysia. The study is targeted at all the trainees of the ILKKM, comprising of 325 trainees. A total of 316 people answered and returned the questionnaires. Stratified random sampling technique is used to analyze the data. As shown in Table 1, a total of 165 male trainees (52.2%) and 151 female trainees (47.8%) participated in this study. From the perspective of the programmes, the participants involved in this survey are; 111 from the Assistant Environmental Health Officer programme, 89 from the nursing programme, 36 from the Occupational therapy programme, 27 people from the Physiotherapy programme, 26 people from the Radiography and Radiotherapy program, 21 people from the Assistant public health programme while the remaining 6 people are the trainees of the Assistant Pharmaceutical officers programme.

The "Smartphone Use questionnaire" developed by Rush (2011) is adapted to identify the respondents addiction to the use of gadgets from eight aspects, i.e. no control, withdraw, interpersonal and relapse conflicts, lost judgement, sense of success, emotional relations, attraction and declining productivity. This instrument has been modified and contains 44 items in the form of Likert scale, while for the survey of healthy mind screenings the "Depression Anxiety Stress Scale" is used. The questionnaire contains three subscales, namely depression, anxiety and pressure. To measure the level of sleep disorders, the "Pittsburg Sleep Quality Index' survey is used. The questionnaire consists of 5 sections. Part A is based on respondents" demographics. This section aims to obtain information on the samples studied. Part B to part E is a survey related to the purpose of using gadgets, gadget addiction, mental filter and sleep disorders. The 7 point Likert scale which is a scale of seven points starting with "1 = very never", "2 = very rare", "3 = sometimes", "4 = frequent", "5 = Always" and "6 = very often" is used to identify the stage of use, addiction and filter healthy mind trainers. The mean value is referred from Plomp (2013), whereby 1.00 - 2.33 mean score is considered low, mean score 2.34 - 3.66 is average and mean score 3.67 - 5.00 is considered high. The data collected is analyzed using SPSS version 22 which

Table 1. Total number of research respondents and programme.

Sex	N	%
Male	165	52.2
Female	151	47.8
Programme	**N**	**%**
Assistant Environmental Health Officer	111	35.1
Nursing	88	28.2
Occupational therapy	36	11.4
Physiotherapy	27	8.5
Radiography and Radiotherapy	26	8.2
Assistant Public Health	21	6.6
Assistant Pharmaceutical Officers	6	1.9

involves descriptive analysis, correlation and regression.

4. Result and Finding

The analysis shows three main factors are needed to be discussed in this study namely 1) quality level of sleep, depression, anxiety, stress and gadget addiction, 2) sleep quality and its relationship, depression, anxiety and stress and gadget addiction among Gen Z and 3) factors contributing to depression, anxiety and stress and addiction of gadget among Gen Z.

4.1. Gadgets Owners

The analysis conducted (Table 2) has identified the number of gadgets owned by the respondents. As summarized in Table 2, the majority of the respondents (n = 189, 59.8%) own two types of gadget, followed by 75 people (23.7%) with three types of gadgets. 40 respondents (12.7%) have more than one type of gadget while 10 (3.2%) respondents and 2 (0.6%) respondents have 4 and 5 gadgets respectively.

4.2. Level of Gadget Addiction, Sleep Quality, Depression, Anxiety and Stress among Gen Z

The results of the study as shown in Table 3 indicate that only 3 respondents or 0.9 percent have low-addictive level score, while the majority of respondents are at a high-level addiction score with 99.1 per cent or 313 respondents.

Table 4 shows the quality of sleep. The respondents who obtain a score of less

Table 2. Number of gadgets owned by respondents.

Category	Frequency	Percentage
One type of Gadget	40	12.7
Two types of Gadgets	189	59.8
Three types of Gadgets	75	23.7
Four types of Gadgets	10	3.2
Five types of Gadgets	2	0.6

Table 3. Level of gadget addiction.

Score	Frequency	Percentage	Mean	S.D	Level
Score below 110	3	0.9			
Score above 110	313	99.1	165.86	23.31	High

Table 4. Level of sleep quality. Mean score for item: 1.00 - 2.33: Low, 2.34 - 3.67: Average, 3.68 - 5.00: High.

Score	F	%	Mean	S.D	Level
Score 5 and below	273	86.4			
Score 5 and above	42	13.3	2.95	1.41	Average

than level 5 are 273 or 86.4 percent, while 42 respondents or 13.3 percent are at level 5 and above. This indicates that most of the respondents are not facing sleep disorders because they have scored below 5.

Table 5 shows most of the respondents 170 (53.8%) are having severe depression, while 150 (47.5%) suffer severe stress. A total of 78 respondents (24.7%) experienced very severe depression, while 125 (39.6%) experienced very severe stress. Compared to the anxiety level, majority of the respondents experienced anxiety at a very severe level with 303 respondents (95.9%).

4.3. Relationship between Sleep Quality, Depression, Anxiety and Stress and Gadget Addiction

With reference to Table 6, correlation analysis shows that gadget addiction has a significant but very weak relationship with quality of sleep and the level of anxiety. Instead, addiction has been found to have a significant and positive correlation with levels of depression and anxiety level. Hence, this suggests there is a linear and positive relationship between quality of sleep, depression, anxiety and stress with gadget addiction. This shows that gadget addiction can lead to mental health problems as mentioned above.

The value of Pearson coefficient for the quality of sleep showed r = 0.185, p = 0.001 where the strength of the relationship is very weak. The anxiety levels

Table 5. Level of depression, anxiety and stress.

Variable	Normal	Light	Average	Severe	Very Severe	Mean	Std.Dev
Depression Score	0 - 5	6 - 7	8 - 10	11 - 14	15+		
Frequency	0	24	44	170	78	15.24	4.08
Percentage	0	7.6	13.9	53.8	24.7		
Anxiety Score	0 - 4	5 - 6	7 - 8	9 - 10	11+		
Frequency	0	0	5	6	303	16.50	3.62
Percentage	0	0	1.6	1.9	95.9		
Stress Score	0 - 7	8 - 9	10 - 13	14 - 17	18+		
Frequency	2	6	33	150	125	16.75	3.70
Percentage	0.6	1,9	10.4	47.5	39.6		

Table 6. Pearson analysis between sleep quality and gadget addiction among Gen Z.

Relationship	r	Sig.	
Relationship between sleep quality and gadget addiction	0.185	0.001	Very Low
Relationship between depression and gadget addiction	0.361	0.000	Low
Relationship between anxiety and gadget addiction	0.328	0.000	Low
Relationship between stress and gadget addiction	0.370	0.000	Low

**p < 0.01 [Correlation is significant at the 0.01 (2-tailed)]; Interpreting Correlation Coefficients: 0.00 - 0.29: Very Low, 0.30 - 0.49: Low 0.50 - 0.69: Average, 0.70 - 0.89: High, 0.90 - 1.00: Very High.

show the correlation value R = 0.328, p = 0.000 where the strength of the relationship is positively low. The relationship for the two variables; depression and stress levels recorded R = 0.361, p = 0.000 for depression and r = 0.370, p = 0.000 for stress. This relationship indicates that the null hypothesis is rejected. The findings show that the relationship between quality of sleep, depression, anxiety and stress with gadget addiction among Gen Z is significant.

4.4. Contribution of Gadget Addiction Variance on the Element of Sleep Quality

This study uses linear regression analysis and it involves more than one independent variable. The hypothesis of the study tested four factors and criteria and a predictor that is expected to influence the tendency to gadget addiction. Linear regression test will not be able to test all of the relationships in one statistical test so a separate regression test is used to test the hypothesis completely (Gefen et al., 2000). In the first regression analysis, the quality of sleep is a dependent variable while gadget addiction is the independent variable. The coefficient of determination (R^2) evaluates the proportion of the variance of a dependent variable against the mean score explained by an independent variable or predictor (Hair Jr et al., 2010). The higher the amount of R^2, thus the better the regression model fits the data. The result of linear regression analysis that identifies the relative contribution of gadget addiction to the quality of sleep is formulated in Table 7 and Table 8. The findings show that independent variables contributed significantly ($P < 0.05$) to the total variants in quality of sleep. The free variable is the gadget addiction level. This variable contributed 3.4 percent to the variants in quality of the respondents' sleep. Therefore, there is no significant contribution by the independent variable to the level of quality of sleep.

Based on the second test of regression, depression is a dependent variable while gadget addiction is the independent variable. Table 9 and Table 10 show the results of the regression test for the depression variables. The findings show that the gadget addiction level contributes significantly ($p < 0.05$) to the number

Table 7. Variance analysis of gadget addiction with element of sleep quality.

	Model	Sum of Squares	D.F	Mean Square	F	Sig.
1	Regression	21.494	1	21.494	11.122	0.001[b]
	Residual	606.794	314	1.932		
	Total	628.288	315			

Sig. at the 0.05 level; [a]Predictor: (Constant), Gadget Addiction; [b]Dependent Variable: Level of sleep quality.

Table 8. Linear regression analysis showing gadget addiction influencing sleep quality.

Variable	B	Std. Error	β	t	Sig.	R^2
Predictor	1.094	0.563		1.943	0.053	
Gadget addiction	0.011	0.003	0.185	3.335	0.001	0.034

R = 0.185[a]; R^2 = 0.0.34; Adjusted R^2 = 0.31; Standard Error = 1.390; Dependent Variable: Sleep Quality.

of variants in the level of depression. These two variables contributed 13.0 percent to the variant in the level of depression. Therefore, there are no significant contributions by the independent variables of the level of depression.

The third regression analysis is tested. Anxiety is a dependent variable while gadget addiction is the independent variable. Table 11 and Table 12 show the third regression variable. The test of the findings shows that gadget addiction had contributed significantly ($p < 0.05$) against the number of variants in predicting anxiety levels. The value of R^2 regression model for dependent variable level of anxiety is 102 (adjusted R^2), which means that 10.2% of the variance in the level of anxiety is explained by the regression model. This suggests that gadget addiction can contribute significantly to the extent of the respondents' anxiety.

The fourth regression analysis is conducted. Stress is the dependent variable while gadget addiction is the independent variable. Table 13 and Table 14 show

Table 9. Variance analysis of gadget addiction with element of depression.

	Model	Sum of Squares	D.F	Mean Square	F	Sig.
1	Regression	474.994	1	474.994	31.289	0.000[b]
	Residual	4766.727	314	15.181		
	Total	5241.722	315			

Sig. at the 0.05 level; [a]Predictor: (Constant), Gadget addiction; [b]Dependent Variable: Level of Depression.

Table 10. Linear regression analysis showing the influence of gadget addiction with the level of depression.

Variable	B	Std. Error	β	t	Sig.	R^2
Predictor	6.502	1.577		4.122	0.000	
Gadget Addiction	0.053	0.009	0.301	5.594	0.000	0.130

R = 0.361[a]; R^2 = 0.130; Adjusted R^2 = 0.122; Standard Error = 3.896; Dependent Variable: Depression.

Table 11. Variance analysis showing the influence of gadget addiction on the element of anxiety.

	Model	Sum of Squares	D.F	Mean Square	F	Sig.
1	Regression	358.844	1	358.844	29.982	0.000[b]
	Residual	3758.153	314	11.969		
	Total	4116.997	315			

Sig. at 0.05 level; [a]Predictor: (Constant), Gadget Addiction; [b]Dependent Variable: Level of Anxiety.

Table 12. Linear regression analysis showing the influence of gadget addiction with level of anxiety.

Variable	B	Std Error	β	t	Sig.	R^2
Predictor	8.902	1.401		6.356	0.000	
Gadget addiction	0.046	0.008	0.295	5.476	0.000	0.108

R = 0.328[a]; R^2 = 0.107; Adjusted R^2 = 0.102; Standard Error = 3.460; Dependent Variable: Level of Anxiety.

Table 13. Variance analysis showing the influence of gadget addiction with the element of stress.

	Model	Sum of Squares	D.F	Mean Square	F	Sig.
1	Regression	442.186	1	442.186	35.947	0.000[b]
	Residual	3862.560	314	12.301		
	Total	4304.747	315			

Sig. at 0.05 level; [a]Predictor: (Constant), Gadget Addiction; [b]Dependent Variable: Level of Stress

Table 14. Linear regression analysis showing the influence of gadget addiction with level of stress.

Variable	B	Std. Error	β	t	Sig.	R^2
Predictor	8.322	1.420		5.861	0.000	
Gadget Addiction	0.051	0.008	0.321	5.996	0.000	0.125

R = 0.370[a]; R^2 = 0.125; Adjusted R^2 = .0125; Standard Error = 3.507; Dependent Variable: Stress level.

the fourth variable for regression model. The results show that the gadget addiction level is important in predicting the level of stress against the use of gadget among Gen Z. The value of R^2 regression model for the dependent variable which is the stress level is 125, meaning that 12.5 percent of the variance in the stress level is explained by the regression model. This variable contributed 12.5 percent to a variant of the respondents' stress level. Therefore, there is no significant contribution by independent variable which is the level of stress.

The major and highest predictor of gadget addiction is the stress level (β = 0.321, t = 5.996, and P = 0.000) and it contributes 12.5 per cent (Table 14). This shows that for each unit which increases the stress score, the trainees' gadget addiction score is increased by 0.321 units. This means that the increase in the levels of gadget addiction among trainees is the main factor contributing 12.5 percent of the variant to the increase in stress in mental health disturbances. The second predictor is the level of depression (β = 0.301, t = 5.594, and P = 0.000) and this contributes to the increase in depression at 13.0 per cent. This means that when the depression level increases a unit (Table 10), gadget addiction level increases by 0.301 units. This finding clearly shows the increase in depression thus the gadget addiction level is also increased.

The following predictors recorded a value of β = 0.295, t = 5.476, and P = 0.000 and contribute to the increase in mental health disorder at 10.2 per cent (Table 12). This means that when the anxiety level increases a unit, gadget addiction level also increases by 0.295 units. The findings clearly show that with the increase in anxiety, the gadget addiction level is also increased. On the other hand, the fourth predictor which is the quality of sleep records a value of β = 0.185, t = 3.335, and P = 0.000 and the level of contribution to the quality of sleep disruption was 3.4 per cent (Table 8). This finding clearly shows the increase in the quality of sleep disruption; thus, the gadget addiction level is also increased. The balance of 60.4 per cent can be explained with the other variables

which are not accounted for in this model. The findings indicate that there may be some other factors affecting gadget addiction that is not highlighted in this study (Hair Jr et al., 2010; Pallant, 2009; Tabachnick & Fidell, 2007).

5. Discussion

Generation Z tends to adapt and easily understand the use of electronic devices, namely gadget. They are categorized as early adopters (Gupta et al., 2013). For them, a gadget is a compelling tool, a device which encompasses the whole of entertainment. It is not only a communication tool but it also increases their sense of autonomy, identity and even their credibility (Carbonell et al., 2018). The Gen Z gadget addiction level is an important issue because it is closely related to mental health as well as their overall welfare. Mental health is one of the indicators of productivity. The highly productive Gen Z is an important asset in the national development. The Gen Z is the country's backbone in terms of the economy as this generation will soon be in the work force and will contribute to the productivity of the country. Hence, the study of gadget addiction on mental health is an important perspective in assisting to formulate policies related to mental health in higher education institutions and globally for the implementation of the policy that is for the Gen Z. Thus, the study aims to know and identify the distribution of generations that are experiencing gadget addiction, thus contributing to psychological and mental disturbances among Gen Z in Malaysia, particularly those from training institution of Ministry of Health Malaysia, and thus estimating the percentage of users with gadget addiction and its impact on their mental health.

From a descriptive analysis conducted, more than half of the total respondents (51.6%) use gadgets to surf the internet. Rush (2011) and Elhai et al. (2016) used the same instrument and recorded a lower rating among the respondents as compared to this study. However, the findings of the study are consistent with the findings of the study of by Zulkefly & Baharudin (2009), which recorded over 50% respondents using the gadgets to surf the internet. The different findings of the studies are possibly due to the different environmental factors and the respondents' lifestyle who are involved in these studies. Even the trainees are also very obsessed in the use of these gadgets in entertainment and media at 50.6%. The study conducted by Bruner & Kumar (2007) indicates that undergraduates in Malaysia are the users of active social networking sites and it has become part of their daily activities. The findings of Mohd Mothar et al. (2013), found teenagers as die-hard users of gadgets in social networking sites where these addictions have disrupted their psychological well-being.

Based on the analysis of frequency, the level of gadget addiction among Gen Z shows 3 respondents are normal gadget users while 313 respondents are addicted to gadgets. Studies conducted by Salehan and Negahban (2013), Zaremohzzabieh et al. (2014), Teong & Ang (2016) and Carbonell et al. (2018) found the use of gadgets at normal level may provide positive benefits, but the use of gadget at

extreme and critical level is capable of disrupting the daily life of gadget users resulting in the decline of mental health, lack of focus in learning and affect socialization and academic performance.

Based on the analysis of the findings, it is found that the score for sleep quality of Gen Z is at a moderate level. The outcome of this study clarifies that proper distribution and planning facilitates the well-being of a healthy mind which has a lot of tasks to be completed and activities that need to be participated. The findings of this study are supported by the study of Mohammadbeigi et al. (2016) and Liu et al. (2017) which justifies that effective time management can eschew the trainees from forfeiting their sleeping time to play gadgets and thus can ensure the trainees get enough rest for the days to come. Preety et al. (2018) explains that gadget addiction can cause the trainees to sacrifice their sleep time and hence will bring to serious mental problems among Gen Z. The trainees should have the awareness of the importance of adequate and quality sleep. This is because adequate sleep can help the trainees to stay focused and energetic. It can also avoid stress and other psychological problems.

The findings from correlation analysis explain that there is a significant and positive relationship between gadget addiction and mental health among Gen Z. The findings indicate that high gadget addiction can contribute to mental health problems. This finding is in line with the study conducted Ranjan et al. (2013), Lepp et al. (2014) and Elhai et al. (2016). Gadget addiction has a positive relationship with depression, anxiety and stress. A study by Akilandeswari & Sujatha (2018) found gadget addiction level among medical students is at a low level. However, the study indicates that the symptoms of gadget addiction are increasing among the respondents. Elhai et al. (2017) found that the excessive use of gadgets would cause students to procrastinate resulting in their inability to complete their assignments in time. Therefore Babadi-Akashe et al. (2014) emphasize that the use of gadgets apart from learning purposes among the students is considered unethical.

The results of the analysis of the study also found that as a whole, there is a significant and positive relationship between gadget addiction not only with depression but also anxiety and stress. The results of regression analysis show that gadget addiction affects 3.4% of sleep quality, 13% of depression, 10.7% anxiety and 12.5% stress faced by the trainees. The study by Soni et al. (2017), state that the use of extreme gadget will have a negative impact on mental health where the higher the level of pathology, the lower the level of mental health among the users. A study by Carbonell et al. (2018), says that constructively speaking, users who use gadgets frequently usually experience a decline in their academic performance, disruption in social relationships, face financial problems and affect their physical health. A research by Kwon et al. (2013) and Ching et al. (2015), have expressed their concern that gadget usage will increase when users suffers from psychological disorders such as loneliness.

Previous studies have also found relationships between addiction and mental

health among Gen Z (Ozkan & Solmaz, 2015; Pundir et al., 2016; Vanitha & Ja-valkar, 2018). These past studies are consistent with the present study showing a significant difference in distribution between gadget addiction and mental health. However, the unadulterated effects of gadget addiction on mental health can only be identified when demographic, socioeconomic and environmental factors are able to be controlled. For example, a study made by Ozkan & Solmaz (2015) found that anxiety and depression affect the probability of getting stress. However, this relationship is absent when adjustments are made to other factors. Hence, the main contribution of this study is the estimation of the unadulterated effects of gadget addiction to mental health by using the econometric model.

Based on the findings of healthy mind screening, this study found the level of gadget addiction has a significant relationship in determining the level of mental health among Gen Z. The probability of getting mental health problems is high when the gadget addiction level keeps increasing. Apart from mental health, loneliness, technophobia and nomophobia also serve to determine the level of Gen Z mental health. Nevertheless, other variables are beyond the scope of this study.

6. Implication and Conclusion

The implication of this study can provide awareness and benefits to society especially for the Gen Z as the result of study contributes to the negative impact in their daily lives. The study by Carbonell et al. (2018) states that gadget dependencies will affect mental health such as depression, anxiety and stress among the users. In addition, parents and educators are able to identify users who suffer from gadget dependency resulting in impact of psychological problems contributing to the individual's academic and mental health disorders. In conclusion, gadget addiction has an impact on the users' academic, socialization and mental health. Gadget addiction among students not only distracts their academic performance, but also contributes to their physical, emotional and cognitive problems. Hence, efforts have been attempted to rationalize the smart and controlled use of the gadgets among Gen Z in order to enhance their time management, achieve good academic performance thus maintaining a more positive level of mental health. The implications of this study are useful to academics and heavy gadget users and those who are hooked with their gadgets in their everyday life. Further studies in this area are needed to delve deeper into other issues related to each element of gadget addiction in order to reinforce the research framework which will in turn develop a standard guide for controlling gadget use in Malaysia.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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