



THE CORRELATION BETWEEN THE SMARTPHONE ADDICTION AND EATING BEHAVIOUR OF ADOLESCENTS IN LAMPUNG PROVINCE

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ABSTRACT

Adolescents are those of the Generation Z who are now between 11-26 years old. Adolescents is also called the generation of Internet, who are those who have been familiar with and introduced to the technology and connected to the Internet ever since they were born. In result, Internet has a big impact to the life development and the character building of adolescents. The objective of the study was to discover the correlation between the smartphone addiction and eating behaviour of adolescents in Lampung Province. This is a quantitative analytic study with an observational research design and cross-sectional approach. This research was conducted between September – October 2021 in Lampung Province. The most respondent age was > 17 years or 66.8 % and female was 366 respondent or 73.2%. The respondent who had smartphone addiction level of moderate and severe was 251 respondents or 50.2 %. The eating behaviour of less healthy was 251 respondents or 50.2 % and health eating behaviour was 249 respondents or 49.8%. There was no significant correlation between the adolescent age group and eating behavior (p-value = 0.543). There was a significant correlation between adolescent sex and eating behavior (p-value = 0.001). There was a significant relationship between smartphone addiction and eating behavior in adolescents (p-value = 0.0005). Need further research of the correlation between smartphone addiction with eating behaviour and health.

Keywords: adolescents; healthy eating behavior; smartphone addiction

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INTRODUCTION

Adolescents are those of the Generation Z who are now between 11-26 years old. Adolescents is also called the generation of Internet, who are those who have been familiar with and introduced to the technology and connected to the Internet ever since they were born. In result, Internet has a big impact to the life development and the character building of adolescents. The overuse of smartphone may cause some other behaviour, psychological and health problems. As the next generation of Indonesia, we need to take care of the quality of the good health of adolescents. According to the Indonesian Law Number 36 of 2009 on Health, adolescents are considered healthy when they meet the requirements of health condition, either physically, mentally, spiritually, and socially that will enable them to live a productive life socially and economically.

There are a lot of risks and health problems that threaten adolescents nowadays, so that there needs to be some efforts to increase the health capacity of adolescents in order to bring about the highest degree of public health in the future. One of the health problems of adolescents is the lack of balanced nutritional needs. Indonesia is currently having the triple burden of malnutrition, namely stunting (52,6%), wasting (16,8%), and obesity (29,5%), according to the result of Indonesia Basic Health Research 2018. Female adolescents in Indonesia are also mostly facing the problem of chronic energy deficiency and anaemia. Objective the Study to discover the correlation between the smartphone addiction and eating behaviour of adolescents in Lampung Province.

METHODS

This is a quantitative analytic study with an observational research design and cross-sectional approach. This study was conducted to describe the independent and dependent variables and to find out the statistical correlation between one variable and another, particularly to study the correlation between the smartphone addiction and eating behaviour of adolescents in Lampung Province. This research was conducted between September – October 2021 in Lampung Province. The study population were adolescents aged 10-24 years old in Lampung Province. According to the results of the Central Bureau of Statistics (BPS) census, in 2019 there were 2,134,655 adolescents aged 10-24 years old in Lampung Province.

Meanwhile, the measurement of the research sample was conducted by using Isaac and Michael's formula with a degree of error of 5%, with the samples of 386 people. There are inclusion and exclusion criteria that must be included in this study. Inclusion criteria: adolescents aged 10-24 years old, not yet married, owning a smartphone, willing to be respondent and has been living for 6 months in the location of the study. Exclusion criteria: unwilling to be respondent and adolescents that has died, moved out, or no longer lived in the village where the study was conducted. The sample technique of this study is incidental sampling, where the respondent coincidentally meets the researcher and is considered suitable as data source.

The type of data used in this study is primary data. The primary data obtained in this study are all of the variables being studied. The process of data collection is conducting by distributing Google Form questionnaires. Questionnaire was used to obtain the primary data about the age, gender, smartphone addiction, and eating behaviour of the respondents. The data on smartphone addiction is collected by using the SAS (Smartphone Addiction Scale) questionnaire, which was adapted from Kwon, et al (2013) and translated by Rahmadyan (2017). The instrument consists of 33 questions, while the Pearson correlation reliability test has been carried out and the Cronbach's Alpha reliability coefficient is 0.947. Meanwhile, the eating behaviour was measured by using 11 questions that are adapted from Prasiwi (2007).

RESULTS

Based on the table 1 shows that the most respondent age was > 17 years or 66.8 % and female was 366 respondent or 73.2%. The respondent who had smartphone addiction level of moderate and severe was 251 respondents or 50.2 %. The eating behaviour of less healthy was 251 respondents or 50.2 % and health eating behaviour was 249 respondents or 54.4%.

Table 1.
 Characteristic of respondent

Category of respondent	f	%
Age		
< 15 years	18	3.6
15 – 17 years	148	29.6
> 17 years	334	66.8
Gender		
Female	366	73.2
Male	134	26.8
Level of smartphone addiction		
Severe	230	46.0
Moderate	21	4.2
Mild	249	49.8
Eating behaviour		
Less healthy	245	49.0
Healthy	255	51.0

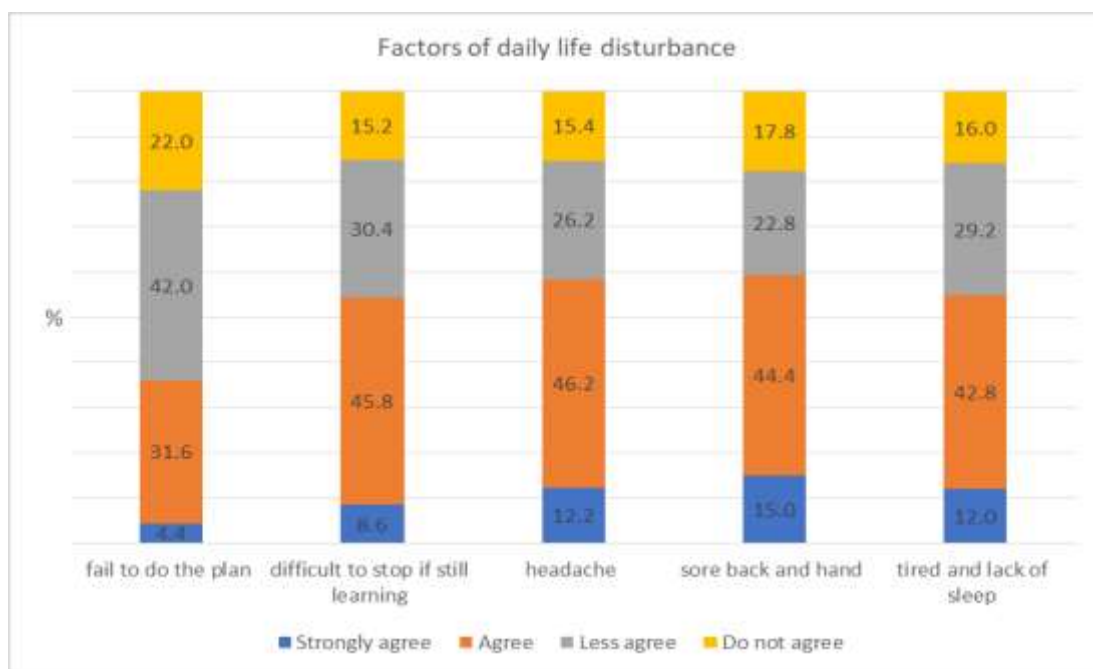


Chart 1. The factors of daily life disturbance

Based on the chart 1. shows that the most daily life disturbance of smartphone addiction among respondents were sore back and hand 59.4 % and tired, headache 58.4 %, lack of sleep 54.8 % and difficult to stop if still learning 54.4 %.

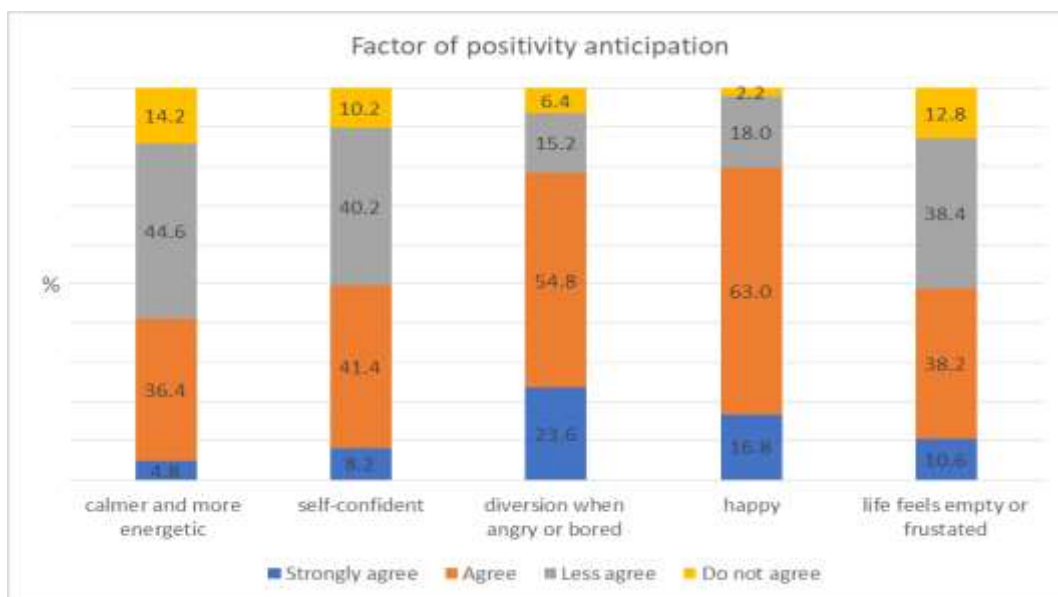


Chart 2. Factor of positive anticipation

Based on the chart 2. shows that the most factor of positive anticipation for using smartphone longer among respondents were happy 79.8 % and diversion when angry and bored 78.4 %, self-confident 49.6 % life feels empty and frustrated 48.6 %.

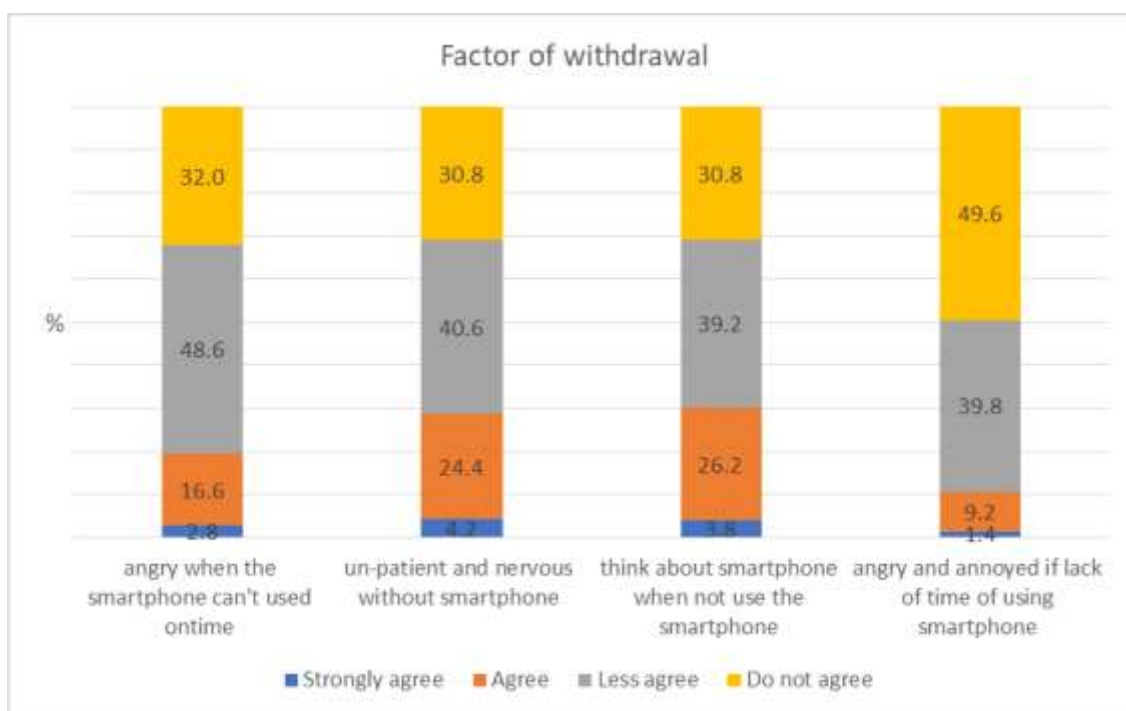


Chart 3. Factors withdrawal

Based on the chart 3. shows that the most factor of withdrawal of smartphone addiction among respondents were think about smartphone when not use the smartphone 30 % and un-patient, nervous without smartphone 28.6 % and will be angry when the smartphone can't use on time 19.4 %.

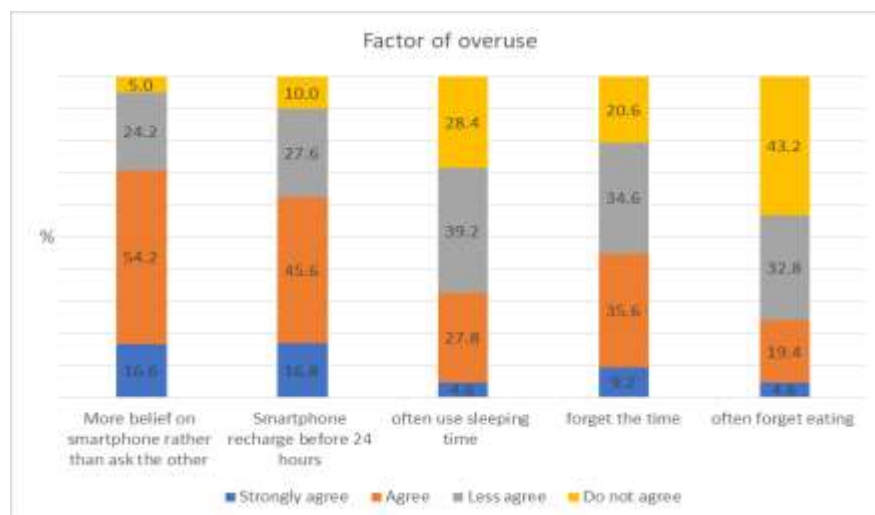


Chart 4. Factor of overuse of smartphone

Based on the chart 4. shows that the most factor of overuse of smartphone among respondents mentioned that 70.8 % because of more believe on smartphone rather ask the other, follow by 62.4 % of smartphone recharge before 24 hours, 44.8 % forget the time when using the smartphone and 32.4 % of them often forget the time and 23.9 % forget eating time.

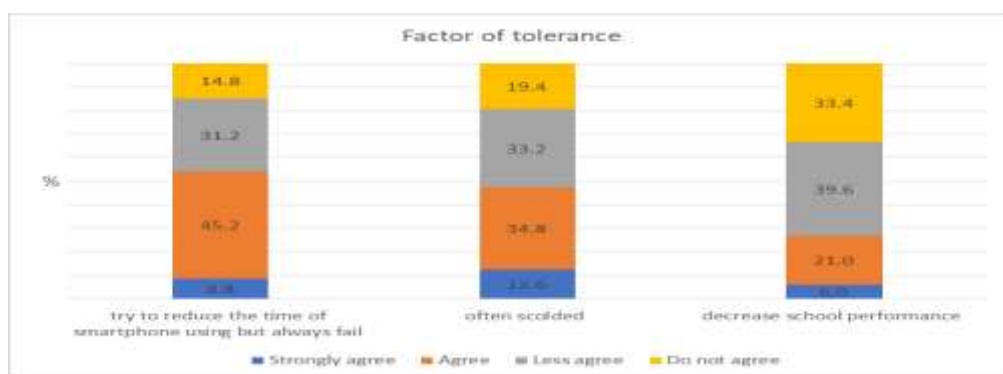


Chart 5. Factor of tolerance of over-use smartphone

Based on the chart 5. shows that the most factor of tolerance of over-use smartphone among respondents mentioned that 54 % was try to reduce the time of smartphone use but always fail, 47.4 % often scolded and 27 % decrease school performance.

Table 2.
 Distribution of Breakfast (n=500)

Category of respondent	f	%
Frequency of breakfast of one week:		
Never or 1 – 3 times	162	32.4
4 – 6 times	338	67.6
Breakfast at home:		
No	143	28.6
Yes	357	71.4

Based on the table 2. shows that the number of respondents who had breakfast 4 – 6 times per week was 338 or 67.6 % and never had breakfast was 162 or 32.4 %. The respondents who had breakfast at home was 357 or 71.4 % and did not take breakfast was 143 or 28.6 %.

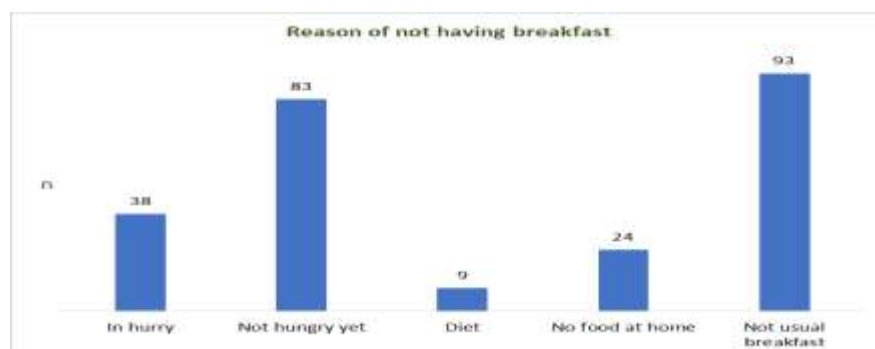


Chart 6. Reason of not having breakfast

Table 3.
 Consumption of snack

Category of respondent	f	%
Frequency of snack per day:		
More than 3 times	160	32,0
1 – 3 times	311	62,2
Never	29	5,8

Based on the chart 6. shows that among 162 respondents who had taken a breakfast less than 4 times a week, 93 respondents not usual take breakfast, 83 respondents not hungry and 24 respondents said that no food at home.

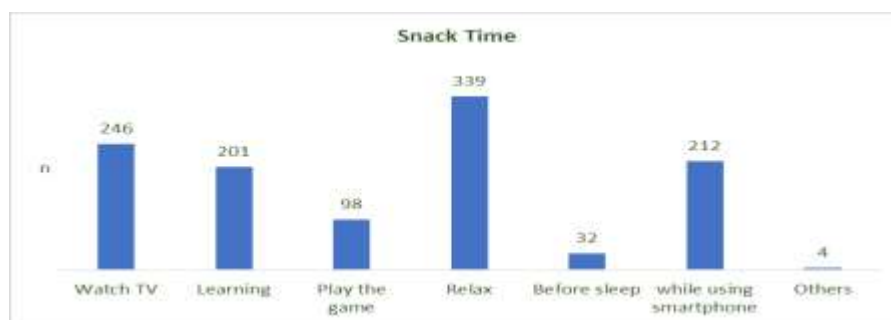


Chart 7. Time of consumption of snack

Based on the chart 7 show that among 473 respondents who consumed snack, was 339 respondents took snack when relax, 246 respondents took snack while watching tv, 201 respondents took snack while using smartphone and 212 respondents took snack while learning.

Univariate Analysis

The univariate analysis is conducted to describe the characteristics of each research variable. For the continuous data, the mean, median, and standard deviation values will be used, as well as testing the normality of the data distribution. Meanwhile, for the categorical data, frequency distribution and percentage will be used instead. Later on, the results of the univariate analysis will be presented in form of table and graph.

Bivariate Analysis

The bivariate analysis is conducted on two variables that are allegedly related or correlated. In this case, bivariate analysis is used to determine the correlation between the independent and the dependent variable. To find out the correlation between the categorical independent variables and the dependent variable, bivariate analysis is conducted statistically by using the Chi Square test. Meanwhile, to determine the correlation between the numerical independent variable and the dependent variable, bivariate analysis is conducted statistically by using the Simple Logistics Regression test.

This study uses a 95% degree of significance with a value of $\alpha = 0.05$. If the analysis result obtains $P\text{-value} \leq \alpha$, H_0 will be rejected, which means there is a correlation. On the other hand, if the $P\text{-value} > \alpha$, then H_0 will not be rejected, which means

Moreover, the Prevalence Ratio (PR) will be measured. The PR value is used to determine the degree of correlation between the independent and the dependent variable. If the result of $PR < 1$, the independent variable being analysed is a protection factor against the dependent variable. If the result of $PR = 1$, the independent variable being analysed has no correlation with the dependent variable. If the PR result > 1 , the independent variable being analysed is a risk factor for the dependent variable. Therefore, the greater the PR value, the greater the effect on the dependent variable. The result of the bivariate analysis will be presented in form of cross-tabulation.

Table 4.
 Bivariate analysis

Category of respondent	Eating behaviour						p-value & OR (95% CI)
	Less healthy		Healthy		Total		
	f	%	f	%	f	%	
Age of adolescents:							0,543
> 17 years	159	47,6	175	52,4	334	100	PR 1 = 1,343 (0,521 – 3,726)
15 – 17 years	78	52,7	70	47,3	148	100	PR 2 = 1,136 (0,437 – 2,949)
<15 years	8	44,4	10	55,6	18	100	
Gender:							0,001
Female	197	53,8	169	46,2	366	100	PR 2 = 0,479 (0,318 – 0,72)
Male	48	35,8	86	64,2	134	100	
Smartphone addiction:							0,0005
Severe addiction	137	59,6	93	40,4	230	100	PR 1 = 1,724 (0,705 – 4,212)
Moderate addiction	11	52,4	10	47,6	21	100	PR 2 = 2,308 (1,6 – 3,33)
Mild addiction	97	39	152	61	249	100	

Based on the table 7 above shows that 47.6 % of respondents > 17 years had less healthy behaviour of eating, 52,7 % of respondent 15 – 17 years had less healthy eating and 44,4 % of respondents < 15 years had less healthy eating. The result of statistical analysis had p-value 0,543 means no significant correlation between group of age of adolescents with behaviour of eating.

53,8 % of female adolescent had less healthy eating and 35,8 % of male adolescent had less healthy eating. The result of statistical analysis had p-value 0,001 means there was significantly correlation between group of age of adolescents and behaviour of eating. The result of statistical analysis also had value of prevalence rate 0.479, means that female adolescent had risk 0,479 time on behaviour of less healthy eating compared to male adolescent.

59,6 % of adolescent which severe smartphone addiction had less healthy food consumption follow by 52,4 % of adolescent which moderate smartphone addiction had less healthy eating and 39 % of adolescent which mild smartphone addiction had less healthy eating. The result of statistical analysis had p-value 0,0005 means there was significantly correlation between smartphone addiction and behaviour of eating. The result of statistical analysis that adolescent which moderate smartphone addiction also had risk 1,724 times on behaviour of less healthy eating compared to adolescent which mild smartphone addiction; while adolescent which severe smartphone addiction had risk 2,308 times on behaviour of less healthy which mild smartphone addiction.

DISCUSSION

The smartphone addiction of adolescents

Addiction is an activity that is carried out repeatedly and may have negative impacts on its abusers. Addiction does not only refer to drug or substance abuse, but also refers to gambling, smartphones, internet, and games (Kwon, et al, 2013). Smartphone addiction is a type of behavioural addictions that is related to the problem with impulse control. Self-withdrawal, tolerance, impaired adaptive function, coercion and pathological disorders, lack of control, and problems stemming from smartphone use, and interference with other activities are some symptoms of smartphone addiction (Kwon, et al., 2013). According to the American Academy of Paediatrics (AAP), a good screen time is 2 hours/day for children and adolescents. However, in reality adolescents from 11-18 years old can spend 7.5-9 hours screen-time per day, as suggested by the data from Pew Research Centre.

Signs, symptoms, and characteristics of the smartphone addiction

Smartphone addiction is included in the group of behavioural addiction. The American Psychiatric Association (2013), WHO (2008), and the American Society for Addiction Medicine (2010) have acknowledged the existence of behavioural addiction to varying degrees with different clinical criteria but are still similar to one another (Rosenberg & Feder, 2014).

According to Mark Griffiths (2005) in Rosenberg & Feder (2014), is based on the consensus of other studies, there are six main components of the behavioural addiction that are listed as follows:

1. Salience occurs when the activity has become the most important activity in a person's life and tends to dominate their thinking, feelings, and behaviour.
2. Mood modification refers to the emotional effect of the behaviour on the individual that often serves as a coping strategy and is reported to evoke "busyness" or numbness or paradoxically as a sedative to individual "escapism" behaviour.
3. Tolerance is the process whereby increasing number of activities are required to achieve the former mood-modifying effect, often means someone engaging in a greater period of time to do activities and spent behaving and there is an escalation of the intensity of the desire, recklessness, destructive, and ego-dystonic nature of the behaviour.
4. Withdrawal symptoms are the states of unpleasant feeling and/or physical effects such as tremor, moodiness, and irritability that occur when someone is unable to engage in activities.
5. Conflict refers to the conflict between a person and those around them (interpersonal conflict), conflict with other activities (work, social life, hobbies, and interests), or from withe the individual themselves (intra-psychic conflict and/or subjective feelings of losing control) that are concerned with spending too much time engaging in the addictive behaviours.

6. Relapse is the tendency for repeated reversions to former patterns of excessive engagements in the activity to recur, and for even the most extreme patterns typical of the height of excessive engagement in the activity to be restored after period of control.

According to Kwon, et, al., (2013), there are several criteria of the smartphone addiction, namely:

1. *Daily life disturbance*, is a disturbance in daily activities when someone finds it difficult to carry out daily activities without using a smartphone, such as not being able to the work that has been planned, difficulty concentrating in classroom, as well as suffering from light-headedness, blurred vision, pain in the wrist or back of the neck, and sleep disturbance. In addition, the person will have difficulty to concentrate while engaging in any activity or work.
2. *Positive anticipation*, occurs if a person feels excited every time, they use their smartphone and if they consider that their smartphone is a stress reliever, as well as feels emptiness when they are away from their smartphone.
3. *Withdrawal*, is a condition when a person feels impatient, restless, and intolerable when they do not use their smartphone.
4. *Cyberspace oriented relationship*, occurs to a person who are always surround themselves with the Internet in order to be able to make friends, thus leaving the actual, real-world relationship behind.
5. *Overuse*, the excessive and uncontrolled use of smartphone may make a person addicted. The excessive use may cause the person to prefer to seek help via smartphone only. The excessive use also refers to behaviour where the person is always ready themselves to recharge the smartphone and feeling the urge to keep using their smartphone.
6. *Tolerance*, is a condition where a person is always unable to control their use of smartphone. Therefore, someone with the smartphone addiction may experience failure in controlling their use of smartphone.

Factors that Affect the Smartphone Addiction

1. *Internal factor*, is actor is the factor that describe the characteristics of a person and mostly influence the person as it drives them personally.
2. *Situational factor*, occurs if a person feels comfortable when they use a smartphone either individually or collectively; consist of consists of several aspects of the individual's psychological state while using smartphone.
3. *External factor*, is the influence of the media on the exposure of smartphone and the various provided features; influenced by some aspects of increased media exposure on smartphone that may cause the emergence of impulsive behaviour to purchase smartphone.
4. *Social factor*, consists of several aspects of individual needs in social interaction and carried out by the media (smartphone) may form the new pattern of interaction.

The impacts of the smartphone addiction

Smartphone addiction may impact the person who engage in it, both physically and psychologically. According to the American Academy of Child and Adolescent Psychiatry, the prolonged use of smartphone may have some negative impacts on adolescents, such as: sleep disturbance, low performance in school, read less book, spend less time with family members and friends, spend less time to engage in physical or outdoor activities, weight problem, moodiness, the problem of self-image and body-image, fear of missing out and less time to learn new ways to rest and relax.

Measuring the smartphone addiction

Measuring the smartphone addiction is conducted via questionnaire. One of the questionnaires that can be used is the Smartphone Addiction Scale (SAS). The first SAS measuring instrument used by Kwon et al. (2013) consists of 48 items that are divided into seven subscales. The reliability of each item and each subscale is 0.967. Furthermore, Kwon, et, al., (2013) adapt the questionnaire by removing several invalid items and eliminating several indicators that are considered not valid. In the end there are 33 items with six indicators, namely daily life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse, and tolerance that have passed and have been determined as valid with reliability score of 0.911.

Eating behaviour of adolescents

1. Behaviour according to Skinner (1938) is someone's response or reaction to an external stimulus.
2. Furthermore, in terms of health, behaviour is a person's response to a stimulus or object related to the state of being healthy or sick, disease, and health-affecting factors such as the environment, food, drink, and health service. (Notoatmodjo, 2014).
3. Eating behaviour is a set of knowledge, attitude, and practice that include the food consumption and healthy lifestyle.
4. According to Lund and Burk (1969), food intake is driven by motivation such as need, stimulus, and desire which are determined by various cognitive processes including perception, memory, thinking process, and decision to act.
5. Meanwhile, according to Suhardjo (1989), eating behaviour is a set of habit and behaviour related to food and activities of eating, including manner, eating frequency, eating pattern, acceptance of food, the food selection.
6. In addition, adolescents tend to engage in a lot of activities that affect the amount of energy their body requires.
7. Adolescents often feel hungry and do not really pay attention on what type of food they eat as long as it is fulfilling.
8. During adolescence, the growth and development of their body takes place slowly and will eventually stop before 18 years old. However, it does not mean that the nutritional factors for adolescents do not require much attention anymore.
9. The energetic nature of adolescents causes the increase of their physical activity as well as their energy requirement (Irianto, 2014).

According to Irianto (2014), the following are some characteristics of the eating behaviour of adolescents:

Female adolescents usually have an unhealthy eating pattern, a desire to drastically lose weight, even eating disorder. It is because adolescents have a negative body image by comparing themselves to their idols, such as artists, models, and celebrities who tend to have thin, tall, and slender bodies. The "snacking" habits on foods that are low in nutrition (lack of calories, protein, vitamins, and minerals) such as snacks, crackers, and chips. The habit of eating fast food with imbalance nutrients or excessive energy like pasta and fried chicken as well as too much consumption of soft drinks. The lack of drinking water and eating breakfast in the morning.

Eating behaviour can be classified into the healthy and unhealthy eating behaviour (Carol, 2005). The following are some healthy eating behaviours that can be found among adolescents and adults: eat whenever feeling hungry and stop eating when feeling enough, not after feeling too full, eat several types of food, eat in a big meal three times a day plus one snack small or more, instead of skip meals and change them with more snacks, eat every type

of food to meet the nutritional requirements, to be not afraid of worried to eat fatty food nor to add high-fat food such as peanut butter, butter, or cheese cream into your diet, do not overcalculate the calory and fat intake, eat not only every time you feel angry, sad, bored, lonely, happy, or basically any emotion and not to be on a diet.

Several factors that may affect the eating behaviour of adolescents
Individual characteristics, based on gender, there are some differences of energy requirement between the male and female adolescents. Male adolescents usually do more physical activities so they need more energy as well, while the activities of female adolescents need to be adjusted with their period when they need more protein and iron the most (Irianto, 2014). The metabolism for some adolescents is faster, while some teenagers may experience slow metabolism, which depends on the speed of the hormonal activity of adolescents. Faster growth may affect the physical activity of adolescents as well as the nutritional intake requirement (Irianto, 2014).

1. **Eating Pattern**, is similar to that of the adults. An increased appetite during adolescence should be met with a well-nourished and well-balanced diet. Adolescents who grow up well in their own home environment will be able learn to choose their food wisely. Furthermore, they will have eventually a good eating habit (Irianto, 2014). According to the Regulation of The Ministry of Health Number 41 of 2014, the definition of a balance diet is the daily diet that consists of the appropriate amounts and types of nutrients according to the requirement of the body, by taking into account the principles of food diversity, physical activity, healthy lifestyle, and regular monitor of normal body weight in order to prevent nutritional problems.
2. **Physical activity**, including every kind of body activity such as sports is an effort to balance between the requirement and intake of nutrients, particularly as the main source of energy in their body. In addition, physical activity may also facilitate the metabolic system in the body, including the metabolism of nutrients. Therefore, physical activity plays a significant role to balance the nutrients requirement and nutrients intake of the body.
3. **The role of parents**, especially on children diet, can be translated into a household practice to provide the food and healthcare and other sources for the survival, growth, and development of the children.

CONCLUSIONS

The highest number of respondents was female (73.2%) and > 17 years old (66.8%); Level of smartphone addiction (moderate and severe) was 52.4%; Less health of eating behaviour was 50.2 %; The results of smartphone addiction analysis, it was found that 59.4% of adolescents often experience with headaches, sore back and hand; The results of the analysis of adolescent eating behavior, 67.6% had breakfast 4-7 times per week; 71.4% of adolescents eat breakfast at home, 56% of adolescents eat complete meals. There was no significant correlation between the adolescent age group and eating behavior (p-value = 0.543); There was a significant correlation between adolescent sex and eating behavior (p-value = 0.001). There was a significant relationship between smartphone addiction and eating behavior in adolescents (p-value = 0.0005).

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