

The Influence Self-esteem and Narcissism towards Instagram Addiction Among Emerging Adults

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ABSTRACT

Instagram is one of the most popular social media platform in Indonesia. Compared to other SNSs, Instagram has the worst effects on young people's mental health. Those with poor self-esteem use Instagram as a tool for self-improvement (taking photos and videos and compare it with other users), while narcissistic people use it for satisfaction (create false image to appear more appealing).

This study aims to explain the influence of self-esteem and narcissism towards Instagram addiction among emerging adults using I-PACE model, with non-probability sampling technique (snowball sampling). A total of 100 emerging adults aged 18-25 who actively use Instagram were recruited as respondents for this research.

The results of the hypothesis tests using multilinear regression analysis technique shows that there is an influence of self-esteem and narcissism on Instagram addiction with a significant value of (0.000). This shows that both self-esteem and narcissism has an influence on respondents' addiction to Instagram.

Keywords: Instagram addiction, self-esteem, narcissism, social media, communication.

ABSTRAKSI

Instagram adalah salah satu platform media sosial paling populer di Indonesia. Mereka yang memiliki self-esteem rendah menggunakan Instagram sebagai alat untuk mengunggah dan memilih konten sesuai keinginan mereka, sedangkan orang narsis menggunakannya untuk kepuasan (membuat citra palsu agar terlihat lebih menarik).

Penelitian ini bertujuan untuk menjelaskan pengaruh self-esteem dan narsisme terhadap adiksi Instagram di kalangan dewasa muda menggunakan model I-PACE dan non-probability sampling

(snowball sampling). Sebanyak 100 orang dewasa muda berusia 18-25 tahun yang aktif menggunakan Instagram direkrut sebagai responden penelitian ini.

Hasil uji hipotesis menunjukkan bahwa terdapat pengaruh harga diri dan narsisme terhadap adiksi Instagram dengan nilai signifikansi (0,000). Hal ini menunjukkan self-esteem dan narsisme memiliki pengaruh terhadap adiksi responden terhadap Instagram.

Keywords: Instagram addiction, self-esteem, narcissism, social media, communication.

INTRODUCTION

Background

Social media has been an inseparable part of Indonesian's life, especially emerging adults. Also the graphic report by We Are Social, a London-based creative media company shows that the number of Indonesian social media users has been increasing rapidly each year. The number has already reached 167 millions of users. Last year, there were 191 million users. Considering that there were 170 million users in 2021, this figure has climbed by 12.35%.

One of the advantages of social media is its accessibility, however, the easy access to social media leads to the uncontrolled time duration that users spent on social media (Akram, 2018). This uncontrollable usage may proceed to the development of addiction to social media (Akram, 2018). According to Zivnuska et al. (2019), social media addiction is an immoderate use of social media that can interfere with daily activities.



Figure 1.1.2: Hours Spent Daily on Social Media Worldwide (Source: We Are Social

A survey was conducted by We Are Social on how many average hours users' spent daily on social media. It was discovered that Indonesia ranked 10th on the list with an average of 3.2 hours per day (Katadata, 2022). This number exceeds the world average of 2.45 hours per day spent on social media (Katadata, 2022). Research by Andreassen (2015) suggests that the overuse of social media will cause symptoms that can be associated with addiction to drugs.

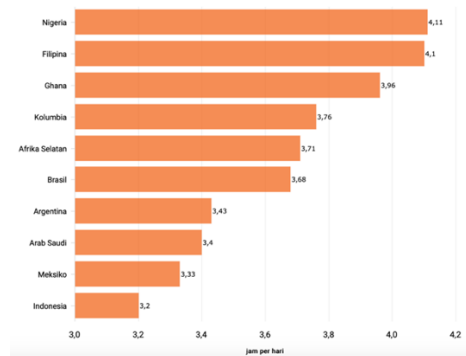


Figure 1.1.2: Hours Spent Daily on Social Media Worldwide (Source: We Are Social 2022)

There are several factors that affects addiction to social media, including self-esteem, an individual's overall positive evaluation towards themselves (Rosenberg, 1965). A survey was conducted by Pancarani, a student from UPNVJ with the title of social media influence towards emerging adults' self-esteem level in 2021.

The research consist of 110 people aged 18-21 years old in Indonesia. It was shown that 60% respondents has a dependency on social media, which greatly influenced by their low self-esteem. The reason is because the respondents think about other people’s opinion and wanting to please them, which was claimed by 80% of the respondents. As the respondents want to please people, they will seek validation through social media platforms.

The platform allows users to showcase their ‘successes’ to a large audience while gaining interaction counts such as likes and comments from other users (Akram, 2018).



Figure 1.1.3: Rank of Instagram Users Usage Number Worldwide (Source: Goodstats 2022)

Impressions will increase as visual-based content is more effective than the text-based one (Johnson & Knobloch Westerwick, 2016). About 90% of information communicated to the brain is visual, and the human brain processes visuals 60,000 times faster than text (Eisenberg, 2014). With its visual-based feature, Instagram will increase the social comparison and affect a person’s self-esteem (Shaohai, 2020).

Because of Instagram’s customized features, people now express themselves differently online, the viewers' emotional and psychological responses may be influenced by the idealized vision of beauty held by society (Chua & Chang, 2016). Therefore, users will more likely to go back to the same platform when they are successful in achieving their goals for their idealized vision (Chua & Chang, 2016).

Another factor that has been connected to Instagram addiction is narcissism (Sheldon et al., 2016). Narcissists use social networking sites, in accordance with their needs because they thrive in environments with brief interactions and highly controlled surroundings (Sheldon et al., 2016).

On social networking sites, users have total control over how they present themselves in accordance with their preferences (Sheldon et al., 2016). Thus, they are able to maximize their enjoyment and satisfaction while getting gratifications from it (Wainner, 2018). The ability to customize users’ homepage is one of the factors that determine the addiction to social networking sites (Wainner, 2018).

Researchers at the University of Swinburne, Australia involved 200 people as respondents about narcissism, selfie-posting, and Instagram addiction on 2016. They reached the conclusion that there is a link between narcissism and the amount of time users spent on Instagram. The head of research at Sejong University, Seung Ah Jin, also agreed with that conclusion. The tendency of narcissism is usually the basis that drives someone to often take selfies and use Instagram platform excessively (Jin, 2016).

Previous studies have shown that individuals with high narcissism level are more active and have bigger probability than their peers to post self-promotional content

on social media (Mehdizadeh, 2010, Ong et al., 2011).

According to Vazire et al. (2008), narcissists have a false belief that they are desirable to be validated. Therefore, they are more prone to exaggerate their own judgments of themselves and convey self-concepts that are somewhat modified on social media to gain validation from others (Moon et al., 2016).

This study has examined the influence of self-esteem and narcissism towards emerging adult's Instagram addiction. The dependent variable used on this study is Instagram platform because there aren't many researches and journals studying this platform. The sample of this study is emerging adults because they are the age group with the most social media users, as stated on the previous paragraph.

Research Problem

Whilst the fact that social media platforms provide its users with several advantages, there are also negative effects associated with the problematic social media use. One of them is the addictive effect (Müller et al., 2016).

Research by Andreassen (2015) suggests that the overuse of social media cause symptoms that can be associated with addiction to drugs. The addiction effect will also have a bigger impact on the mental health of people with poor self-esteem and narcissistic traits from the unhealthy dependency (Andreassen, 2015). In addition, Royal Society for Public Health (2017) claims that the social media with the worst effects on young people's mental health is Instagram.

Andreassen (2015) states that self-esteem is one of the factors that bring about Instagram addiction. people with low-self-esteem use Instagram to compare their postings on life progress with other users. Pantic et al. (2017) states that users with poor

self-esteem tend to feel better by using the features of the platform to choose contents which they would publish in hopes to gain interaction counts such as likes and comments. If those with poor self-esteem are successful in achieving their personal goals, they are more likely to return to the platform (Chua & Chang, 2016).

Another factor that causes addition towards Instagram is narcissism (Kircaburun, 2018). According to Vazire et al. (2008), narcissists use their presumptions that they are desirable to be validated in the online world. In comparison to face-to-face interactions, Instagram will provide a more useful environment to develop strategic interactions to create and maintain a well-chosen self-image. Instagram is a key tool for narcissists to achieve great control over how they present themselves (Casale & Banchi, 2020).

According to several studies (Alloway et al., 2014; Mehdizadeh, 2010; Pantic, 2014a; Rutledge, 2014), excessive use of visual social media platforms like Instagram may also be associated with greater narcissism in users. Self-promotion and self-marketing may build narcissism behavior through photographs, posts, and video clips (Pantic, et al., 2017). Thus, the development of prolonged activities online is easier to be developed on people with high narcissism level as they get gratifications and satisfactions during Instagram usage (Huang et. al., 2020).

The purpose of this study is to find out the influence of self-esteem and narcissism towards Instagram addiction. Therefore, this study questions, does self-esteem and narcissism influence emerging adults' Instagram addiction?

Research Objective

This study has examined the influence of self-esteem and narcissism on emerging adults' Instagram addiction

Research Significance

Academically, this study has guided the researcher about the influence of self-esteem and narcissism towards Instagram addiction. The results fixed the inconsistent findings of previous studies.

Practically, this study has provided empirical data on the influence of self-esteem and narcissism towards Instagram addiction.

Socially, this research increased people's awareness and concern about the effects of Instagram usage habit if it is not well-managed.

Theoretical Framework

The influence of self-esteem and narcissism towards Instagram addiction among emerging adults can be explained by the I-PACE model. The theoretical framework of I-PACE (Interaction of Person-Affect-Cognition-Execution) model proclaims that specific internet-use disorders are caused by a person's core characteristics (Brand et al., 2014). A person's core characteristics include personality and psychopathology. According to Brand et al. (2016), the I-PACE model explains the mechanisms of the emergence of an addictive use of specific Internet applications which can be elaborated further through the model below:

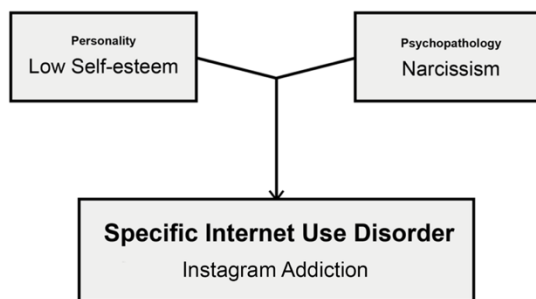


Figure 1.5: I-PACE Framework by Brand et al. (2014)

The I-PACE model was initially developed for internet-use disorders context, but the model has been expanded to other varieties of addictive behaviors, including the excessive use of social networking sites (Brand et al., 2019). The model has been shown to mediate the relationship between psychopathological symptoms (narcissism), personality (low self-esteem), and the addictive use of social-networking sites (Wegmann et al., 2019). Moreover, it encompasses that Instagram addiction is included as internet-use disorder.

Doinita (2015) states that self-esteem is viewed as a personality trait since it provides a range of self-perceptions, including the evaluation of one's own looks, beliefs, feelings, and behaviors. In addition, the developmentally early affect (such as pride or shame) regarding oneself may come on individual's own judgements on their selves (Doinita, 2015). According to Ayman (2020), people with low self-esteem use Instagram to improve their self-worth by posting and spending time taking videos and photographs. Moreover, the Instagram usage will make the users feel good about themselves and boost their self-esteem (Ayman, 2020). If those with poor self-esteem are successful in achieving their personal goals, they are more likely to return to the platform (Chua & Chang, 2016).

Narcissism is a personality disorder that is deemed to be psychopathological, and it is strongly associated with other mental health conditions. People with narcissistic personality disorder (NPD) frequently exhibit difficulties maintaining relationships and managing real-life situations (Mitra et al., 2023). According to Huang et al. (2020), narcissistic users are more likely to use Instagram as a platform to create a false self-image for the purpose to be more appealing. The way Instagram is set up will enable narcissistic users to show a visual representation in accordance with what they

desire, by accentuating some parts and hiding others (Apocada, 2017). Thus, the development of prolonged activities online is easier to be developed on people with high narcissism level as they get satisfactions during Instagram usage (Huang et. al., 2020).

According to Alhabash and Ma (2017), each social-networking sites (including Facebook, Tinder, and Instagram) has distinctive features. For Instagram, users can edit and share photos and videos, get comments and "likes" from other users, and follow other users' accounts. These features may lead to excessive use of the platform.

This excessive use is caused by the urge to share images and videos and thus subsequently checking notifications impulsively to monitor the number of comments and likes on the uploaded images and videos (Balakrishnan & Griffiths, 2017b). If users succeed in reaching their satisfying number of comments and likes then they are more inclined to return to the same platform and to do so would lead them to addiction (Wainner, 2018). The reduced negative self-evaluations will encourage addictive use of the platform and create habitualized behaviors in the later stages (Andreassen, 2015).

Furthermore, it is commonly acknowledged in clinical psychology that narcissism has its roots in weak self-esteem (Mehdizadeh, 2010). Researchers have also found that people with high levels of narcissism and low levels of self-esteem are more driven to keep up a positive online reputation (Mehdizadeh, 2010). The statements above supports the hypothesis that **both self-esteem and narcissism simultaneously influence Instagram addiction (H).**

The study by Casale and Banchi (2020) on the correlation between narcissism and problematic social media use analyzes and critically evaluates the quantitative

research that has already been done on the subject. The result implies that there might be significant differences between social media platforms and that narcissism may not have consistent effects across them. The findings of this comprehensive review also highlight the need for future studies to create hypotheses that fit different social media platforms, as there may be other variations in how people use SNSs depending on the kind of website that falls under the definition of "social networking" (Davenport et al., 2014).

The study conducted by Purnama et al. (2021) study on the relationship between social media addiction and self-esteem in Indonesia's rural areas examined the link between social media addiction and issues with teenage self-esteem. The survey was participated by 340 respondents.. The main finding of this study is that there is a strong correlation between social media addiction and low self-esteem. Social media dependence among teenagers is associated with lower self-esteem. According to this study, healthcare providers should develop an intervention that uses social media to boost adolescents' self-esteem.

A study was conducted by Cecilie et al. (2017) on the connection between narcissism, self-esteem, and social media addiction. The findings show that younger age, being a woman, being single, and having a low feeling of self-worth were all connected with addictive social media use. These elements together had a moderate overall impact but only a slight effect on social media addiction. After examining all other elements of the framework, low self-esteem had the largest influence on addictive social media use.

The study by Ardiana et al. (2020) concluded the findings which claims that there is a connection between the Instagram addiction of high school students in Jakarta and their poor self-esteem. Students who has high self-esteem, typically are more addicted

to Instagram. On the other hand, if a high school student's Instagram addiction is weak, it's likely that they also have low self-esteem.

The study by Moon et al. (2016) about the role of narcissism to promote oneself on Instagram examined the links between narcissism and Instagram self-promotion behavior. According to previous research (Fox & Rooney, 2015), selfies, self-uploaded photos, and frequent profile image updates are all characteristics of a person with high narcissistic traits. Furthermore, the findings indicates that more narcissistic individuals believed their Instagram profile photos to be physically more alluring. Which gives support to the hypothesis that more narcissistic individuals are self-conscious about their appearance (Vazire, Naumann, Rentfrow, & Gosling, 2008). It is suggested that narcissism and social media activity are associated by the fact that users with higher levels of narcissism also prefer to spend more time on Instagram (Mehdizadeh, 2010). It is significant that narcissism did not correspond with the total number of posted photographs. These results call for more research because they differ from the findings reported by Buffardi and Campbell (2008) while being consistent with Ong et al. (2011)'s study.

Based on the researches mentioned above, we can observe that there are contradictions between the research's findings. In addition, Additionally, the majority of study has only studied at two variables. This study is an enhancement over the previous one since it uses three variables—self-esteem, narcissism, and Instagram addiction—while concentrating just on one social media platform, Instagram.

Hypothesis

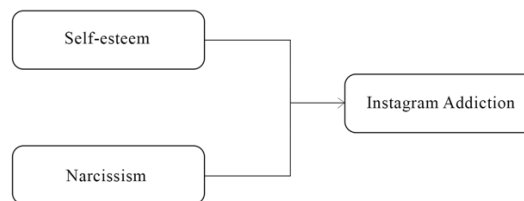


Figure 1.6: Hypothesis Diagram

H: there is a simultaneous influence of self-esteem and narcissism towards Instagram addiction.

RESEARCH METHODOLOGY

Research type

The research was done in explanatory. According to Zikmund et al. (2012), explanatory research type identify the cause-and-effect relationships. There are two independent variables, namely self-esteem and narcissism; and one dependent variable, Instagram addiction.

1.9.2 Population

Population is the aggregation of a selected sample (Baxter and Babbie, 2003). According to the research conducted by Handikasari in 2018, emerging adults aged 18-23 years old is the age group with the most social media users with the average age of 20 years old. Therefore, the sample of this study were emerging adults who actively use Instagram with the age range of 18-25 years old.

Sampling

Sampling technique

The sampling technique was done in non-probability sampling, because the current amount of people who got addicted to Instagram cannot be predicted by the researcher. In this research, emerging adults who are currently living in DKI Jakarta was chosen as the sample, as Jakarta is the most populated city in Indonesia, in addition as being the capital city with the most advanced technology compared to other cities.

The sampling was done through snowball sampling. According to Parker (2019), snowball is the sampling technique with the characteristics of networking and referral. The researcher start with a small number of initial contacts who fit into the research criteria and willing to participate, then the contacts recommend other potential participants.

1.9.3.2 Sample size

The research was participated by 100 emerging adults who are currently living in DKI Jakarta. According to Sekaran U. & Bougie R., (2016), the maximum sample size is 500 respondents for an appropriate research (Sekaran U. & Bougie R., 2016).

1.9.6 Data analysis Technique

For this study, the analysis was done in multi linear regression. There is one hypothesis: Self-esteem (X1) and narcissism (X2) simultaneously influence Instagram addiction (Y). According to Sujarweni (2015), multilinear regression method is used to determine and test the influence between two or more independent and dependent variables. This test aims to find out the influence of self-esteem towards Instagram addiction and narcissism towards Instagram addiction. according to Jiawei et al. (2012), the equation to determine one independent variable to one dependent variable is $Y = a + b X$ (straight line)

THE INFLUENCE OF SELF-ESTEEM AND NARCISSISM TOWARDS INSTAGRAM ADDICTION AMONG EMERGING ADULTS

Categorization of Self-esteem

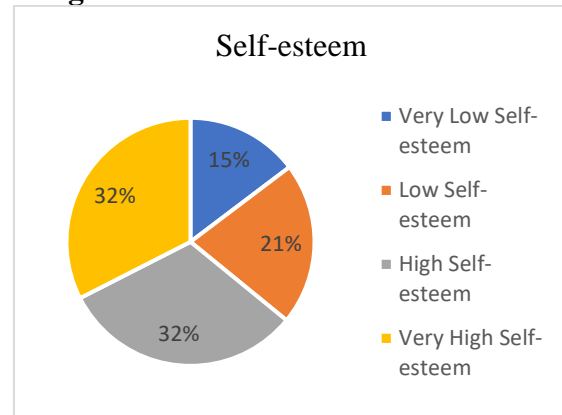


Diagram 3.4.3: Self-esteem Categorization

It can be concluded on the graphic based on the survey of respondents' self-esteem for this research, more than half of the respondents indicated that they have higher self-esteem (64%) based on the total score value of the answers from questionnaires.

Categorization of Narcissism

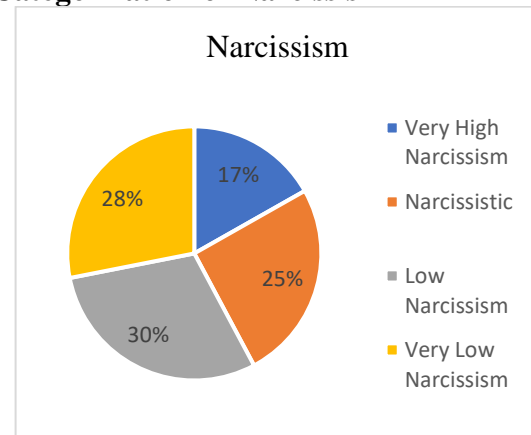


Diagram 3.5.4: Narcissism Categorization

Based on the descriptive data and the diagram above, it can be concluded that more than half of the respondents have a low narcissistic level (58%) based on the total score value of the answers from questionnaires.

Categorization of Instagram Addiction

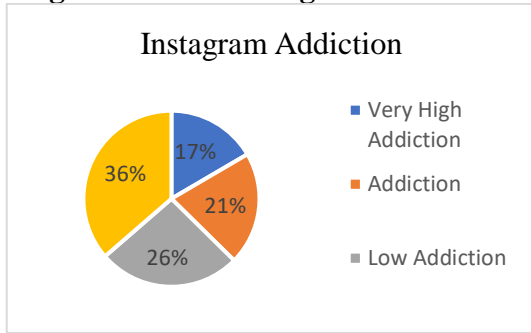


Diagram 3.6.3: Instagram Addiction Categorization

From the diagram above, it can be determined that more than half of the respondents are not addicted to Instagram (62%) based on the total score value of the answers from questionnaire.

THE INFLUENCE OF SELF-ESTEEM AND NARCISSISM TOWARDS INSTAGRAM ADDICTION AMONG EMERGING ADULTS

The hypothesis test for this chapter is explained, the variables used are self-esteem (X1), narcissism (X2), and Instagram addiction (Y). This study used SPSS (Statistical Product and Service Solution) software to test the hypothesis with multilinear linear regression.

Based on the calculations from data collections by the respondents, the F test is calculated to decide whether the independent variable (Self-esteem and Narcissism) has an influence on the dependent variable (Instagram Addiction).

The level of significance criteria for statistical test results for Hypothesis testing:

1. Sig. \leq 0.05 = regression test is significant; hypothesis is accepted
2. Sig. \geq 0.05 = regression test is not significant; hypothesis is rejected

The F test results can be seen in the following table:

| ANOVA ^a | | | | | | |
|--------------------|------------|----------------|----|-------------|--------|-------------------|
| Model | | Sum of Squares | df | Mean Square | F | Sig. |
| 1 | Regression | 4630.968 | 2 | 2315.484 | 94.014 | .000 ^b |
| | Residual | 2389.032 | 97 | 24.629 | | |
| | Total | 7020.000 | 99 | | | |

a. Dependent Variable: TOTAL_Y_INSTAGRAM_ADDICTION
b. Predictors: (Constant), TOTAL_X2_NARCISSISM, TOTAL_X1_SELF_ESTEEM

Table 4.2.1.3: F-test result of Self-esteem (X1) and Narcissism (X2)

Based on the regression of narcissism (X2) towards Instagram addiction (Y), it can be seen that the significant value is \leq 0.01 which indicates that the influence is significant. Therefore, the Hypothesis is accepted.

Discussion

Based on the F-test results, the independent variables, self-esteem and narcissism shows a significant influence towards Instagram addiction with test value of .000 (\leq 0.01). According to Ayman (2020), people with low self-esteem use Instagram to improve their self-worth by posting and spending time taking videos and photographs. Moreover, the Instagram usage will make the users feel good about themselves and boost their self-esteem (Ayman, 2020). If those with poor self-esteem are successful in achieving their personal goals, they are more likely to return to the platform (Chua & Chang, 2016). This argument supports the findings of this study that every time self-esteem is increasing, addiction to Instagram will increase by 0.742.

On the other hand, according to Huang et al. (2020), narcissistic users are more likely to use Instagram as a platform to create a fraud self-image for the purpose to be more appealing. The way Instagram is set up will enable narcissistic users to show a visual representation in accordance with what they desire, by accentuating some parts and hiding others (Apocada, 2017). Narcissistic users are more likely to use Instagram to create false self-images in order feel more appealing (Huang et al., 2020). Individuals with high

level of narcissism regularly find on Instagram the positive remarks and "Likes" pleasant (Casale & Fioravanti, 2018). Thus, the development of prolonged activities online is easier to be developed on people with high narcissism level as they get satisfactions during Instagram usage (Huang et. al., 2020). These arguments supports the findings that every time narcissism is increasing, the addiction to Instagram will also increase by 0.752.

Based on the I-PACE model for addictive behavior, excessive social media use can lead to the emergence of a deep emotional attachment to the virtual world due to the interaction of numerous mediating and regulating factors, which include constant attributes like person-related characteristics and mental states, throughout the long term (Brand, et al., 2016). A strong emotional attachment to the virtual world will develop as a result of excessive social media use (Brand et al., 2016). If this occurs, the person may develop a tendency to use social media excessively in a variety of settings as an impulse reaction (Brand et al., 2019).

As several studies indicate (e.g. Campbell, 2001), narcissism and self-esteem share some characteristics. Furthermore, it is commonly acknowledged in clinical psychology that narcissism has its roots in weak self-esteem (Mehdizadeh, 2010). Researchers have also found that people with high levels of narcissism and weak self-esteem are more driven to keep up a positive online reputation (Mehdizadeh, 2010). The statement above supports the hypothesis that both **self-esteem and narcissism simultaneously influence Instagram addiction (H).**

CONCLUSIONS & RECOMMENDATIONS

In this chapter, the conclusions are drawn based on the previous chapters, alongside with the recommendations that can

be beneficial for the parties that are involved and presented. This study is intended to find out if there is an influence of self-esteem and narcissism towards Instagram addiction. The hypothesis for this study is there is an influence of self-esteem and narcissism towards Instagram addiction. To test the hypothesis, data has been collected with the respondents of 100 emerging adults aged 18-25 years old by using multilinear regression analysis.

Conclusion

1. The result of this study shows that there is significant influence of self-esteem (X1) and narcissism (X2) on Instagram addiction. it can be seen from the multi linear regression tests of self-esteem and narcissism; it has significant value of 0.000 which is less than 0.01. Thus, it is concluded that the hypothesis can be accepted: self-esteem and narcissism have an influence on Instagram addiction.
2. This study indicates Instagram addiction can be explained by 65.3% (.653 adjusted R²) of the distribution of the influence of self-esteem and narcissism on Instagram addiction, the other 34.7% value is explained by the variables outside of this study.
3. Both of the coefficient value of self-esteem (0.363) and narcissism (0.470) is positive so it can be concluded that every time self-esteem and narcissism is increasing, the Instagram addiction will also increase.

Research Recommendation

1. Academic

The significance value result of the independent variables (self-esteem & narcissism) and dependent variable (Instagram addiction) is less than 0.01, which proves the influence

of self-esteem and narcissism towards Instagram addiction. The influence percentage is 65.3%, it is suggested that the rest 34,7% and the factors influencing Instagram addiction should be explored and expanded by other researchers for future study while using this research as a data source and reference. In addition, because the constant value (2.509) is 4 times larger than the R square of independent variables (0.653). This indicates that R square value could increase if they were another 4 added variables.

2. Practical

The findings of this research provide further knowledge for emerging adults who actively use Instagram on the influence of self-esteem and narcissism towards their probability to have addiction to the platform. However, the research sample should be broadened to other variables as well, such as the influence of Fear of Missing Out and Narcissism towards Instagram addiction, and other variables outside this study.

3. Social

Based on the findings from the study, test interventions such as motivational talks workshops, and coaching by targeting self-esteem and narcissism should be developed to reduce the addiction to Instagram. The design interventions have to promote a healthy self-esteem and a low narcissistic level that provide users with alternative strategies to cope with the negative emotions and social pressures. The level of narcissistic behavior on this research is less than 50%. However, the

respondents should take care of themselves so they don't develop narcissistic tendencies on social media, one of which is by adjusting the intensity of social media use, not sharing self-portraits too often or posting statuses or locations on social media.

Research Limitations

1. The age range of respondents for this study is emerging adults between 18-25 years old, which was mentioned in the research background, as social media users of 18-25 age group has the highest percentage. Other age groups (e.g., children, teenagers, adolescences, and elderly) aren't included as the sample.
2. The lack of experience author has in conducting research and producing academic papers may resulted in lack of depth and generality of discussions compared to the works of professional and experienced scholars.
3. There could be other additional factors that affect how narcissism, self-esteem, and Instagram addiction interact. This may be mediated or moderated by elements such as self-liking, fear of missing out (FoMO), and loneliness which are all mentioned on chapter two. The accuracy of the conclusions may be hindered if these factors are not taken into consideration when analyzing the data.

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