# RELATIONSHIP BETWEEN SELF-ESTEEM, FEAR OF COVID-19 AND INSTAGRAM ADDICTION AMONG UNDERGRADUATES IN MALAYSIA

LEE JIA JIE

LOON LING LEE

THIO KAI QI

A RESEARCH PROJECT SUBMITTED IN

PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR

THE BACHELOR OF SOCIAL SCIENCE (HONS) PSYCHOLOGY

FACULTY OF ARTS AND SOCIAL SCIENCE

UNIVERSITI TUNKU ABDUL RAHMAN

JANUARY. 2022

# Relationship Between Self-Esteem, Fear of Covid-19 and Instagram Addiction Among Undergraduates in Malaysia

Lee Jia Jie, Loon Ling Lee, Thio Kai Qi

Universiti Tunku Abdul Rahman

This research project is submitted in partial fulfilment of the requirements for the Bachelor of Social Science (Hons) Psychology, Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman. Submitted in January 2022.

**ACKNOWLEDGEMENTS**

We would like to express our sincere gratitude to our Final Year Project (FYP) supervisors, Ms. Evelyn Toh Kheng Lin and Dr. Ooh Seow Ling. Although Ms. Evelyn had just been with us for the first half of our FYP journey, she showered us with her patience, understanding and unconditional support that we will never forget. With Dr. Ooh in the second half of journey, we would also like to thank for her invaluable advice and support. We believe we would not have such a fruitful experience without their guidance along the way.

Our family members and friends were supportive and helpful all the time too. They were always there for us to provide tremendous encouragement and emotional support despite the hardships. Moreover, we are extremely grateful to those who helped to disseminate our research study to collect more responses. We would like to extend our sincere thanks to every respondent for taking part in our research study.

Last but not least, special thanks to all lovely members for the effort and contribution. Kudos to everyone for putting this FYP together though it was challenging, especially during this online learning period. Our appreciation also goes out to Meta Company for WhatsApp where we exchange information rapidly, Google Company for Google Document where we see members active at 1am, and Microsoft Company for Microsoft Teams where we meet each other to work and have fun. Thank you all for making this happen!

LEE JIA JIE

LOON LING LEE

THIO KAI QI

**APPROVAL FORM**

This research paper attached hereto, entitled "Relationship Between Self-Esteem, Fear of COVID-19 and Instagram Addiction Among Undergraduates in Malaysia" prepared and submitted by Lee Jia Jie, Loon Ling Lee and Thio Kai Qi in partial fulfillment of the requirements for the Bachelor of Social Science (Hons) Psychology is hereby accepted.

_____ Date: _____

Supervisor: Dr. Ooh Seow Ling

## ABSTRACT

Instagram addiction has become an alarming issue worldwide, and Malaysia is no exception. Therefore, the present study examined the relationships between self-esteem, fear of COVID-19 and Instagram addiction among undergraduates in Malaysia. Three instruments were used to measure the respective constructs, including 10-Item Rosenberg Self-Esteem Scale, 7-Item Fear of COVID-19 Scale, and 6-Item The Instagram Addiction Scale. A cross-sectional survey design with quantitative methodology was employed. Purposive sampling method was also applied to recruit Malaysian undergraduates, aged between 18 to 24 years, who were also Instagram users with personal accounts. Hence, a total number of 183 Malaysian undergraduates ($M$ = 21.91 years; $SD$ = 1.00 years), wherein 74.9% of them were females ($n$ = 137), were involved in the present research by answering the online self-administered questionnaire. The results showed that there was no significant relationship between self-esteem and Instagram addiction. Self-esteem also did not significantly predict Instagram addiction. In contrast, a positive relationship was reported between fear of COVID-19 and Instagram addiction. Fear of COVID-19 also positively predicted Instagram addiction. Not only the present findings shed new light on the extant literature about Instagram addiction in the Malaysian context, but also provided empirical support to the policymakers in designing evidence-based programs related to Instagram addiction.

*Keywords:* Instagram addiction, self-esteem, fear of COVID-19, Malaysian undergraduates

**DECLARATION**

We declare that the material contained in this paper is the end result of our own work and that due acknowledgement has been given in the bibliography and references to ALL sources be they printed, electronic or personal.

Name: Lee Jia Jie

Student ID: 18AAB01872

Signature: 

Date: 28th March 2022

Name: Loon Ling Lee

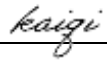
Student ID: 18AAB02166

Signature: 

Date: 28th March 2022

Name: Thio Kai Qi

Student ID: 18AAB03040

Signature: 

Date: 28th March 2022

**Table of Contents**

List of Tables

List of Figures

# List of Abbreviations

Abbreviations

| | | |
|---|---|---|
| 1. MCMC | - | Malaysian Communication and Multimedia Commission |
| 2. U&G | - | Uses and Gratifications |
| 3. COVID-19 | - | Coronavirus disease 2019 |
| 4. WHO | - | World Health Organization |
| 5. RSES | - | Rosenberg Self-Esteem Scale |
| 6. FCV-19S | - | Fear of COVID-19 Scale |
| 7. TIAS | - | The Instagram Addiction Scale |
| 8. MCO | - | Movement Control Order |
| 9. ERT | - | Emergency Remote Teaching |
| 10. SNSs | - | Social Networking Sites |
| 11. UTAR | - | Universiti Tunku Abdul Rahman |
| 12. SERC | - | Scientific and Ethical Review Committee |
| 13. PPMC | - | Pearson Product-Moment Correlation |
| 14. MLR | - | Multiple Linear Regression |
| 15. SPSS | - | Statistical Package for the Social Sciences |
| 16. SOPs | - | Standard Operating Procedures |
| 17. IAT | - | Implicit Association Test |

# Chapter 1

# Introduction

## Background of Study

In the era of information technology, the use of social media has been increasing rapidly over the years. According to the Malaysian Communication and Multimedia Commission (MCMC, 2020), social networking is the second main online activity in Malaysia, supported by the increasing percentage of Internet users from 85.6% in 2018 to 93.3% in 2020. As defined by Nazir et al. (2020), social media refers to a site that involves multiple platforms for the society to establish interaction, connect and share ideas as well as seek information. In parallel, Susan (2019) defined social media as a form of electronic communication that allows the users to engage in online communities to express personal messages, ideas, information, and other contents. No doubt that social media brings enormous conveniences to people's daily lives; however, excessive use of social media may lead to addiction (Arora et al., 2020; Chung et al., 2019; Kuss & Griffiths, 2017).

Nowadays, there are a variety of social media platforms available in Malaysia, to name a few, Instagram, Facebook, Twitter, Snapchat and so forth, whereby Instagram will be the focal point in the present study. With Instagram in focus, there are one billion active users around the globe monthly (Number of monthly active Instagram users, 2019), and more than 500 million active users enjoy Instagram every single day (Aslam, 2019). In Malaysia, Lim (2016) revealed the number of active users of Instagram has reached almost four million. MCMC (2020) further supported that the percentage of Instagram users in Malaysia has increased from 57% in 2018 to 63.1% in 2020. Besides that, a majority of the user population is within the age range from 18 to 29 years (Alhabash & Ma, 2017). Likewise, Susan (2019) depicted young adults aged between 18 to 24 years are more inclined to use Instagram. Of the user population, undergraduate students are associated with heavy Instagram use (Ponnusamy

et al., 2020). The Uses and Gratifications (U&G) Theory could serve as a point of reference for this situation. According to this theory, users are driven by the satisfaction of needs they gain from using certain social media platforms (Hossain, 2019). However, such gratification may encourage an intensive usage pattern, which in turn, leads to addiction (Foroughi et al., 2021). One of the gratifications of using Instagram is escapism (Lee et al., 2015). To illustrate, some undergraduate students, especially those with greater stress resulting from the transition from physical to online learning mode due to the coronavirus disease 2019 (COVID-19) pandemic, tend to engage in excessive Instagram use as a coping mechanism to escape from their real-life difficulties (Kircaburun & Griffiths, 2019; Rodríguez-Hidalgo et al., 2020). Additionally, Jiang (2021) also mentioned that undergraduate students use Instagram more often to learn, acquire and communicate the latest pandemic-related information; consequently, the increase in their time usage and frequency may put them at greater risk of developing Instagram addiction. Therefore, this clearly illustrates that Instagram addiction has become a critical concern among the undergraduate students in Malaysia.

According to Nazir et al. (2020), social media addiction can be observed in individuals who fail to control their social media usage to the extent of impeding their daily functioning. To picture, individuals with social media addiction often exhibit frustration, annoyance and puzzled emotions when they have no access to the Internet (Nazir et al., 2020). Similarly, Andreassen and Pallesen (2014) stated that these individuals tend to spend excessive time on social media due to an irresistible urge; consequently, it leads to impairments in the important areas of life. That said, Instagram addiction can be understood as an addictive use of Instagram by allocating too much time and concern due to an uncontrollable drive, which in turn, negatively impacts one’s daily functioning. Not to mention, the addiction model proposed by Griffiths (2005) could also be applied to explain

Instagram addiction in-depth. According to Griffiths (2005), all types of addiction, including social media addiction, share six common components, namely salience, mood modification, tolerance, withdrawal, conflict, and relapse. Salience refers to when the addictive activity is of utmost importance to the extent that it dominates one's thoughts, emotions and behaviors. Moreover, mood modification occurs when an individual gains a mood-lifting experience by engaging in the addictive activity. Tolerance refers to the condition where an increase in the amount of addictive activity is needed to attain the desired result. Furthermore, withdrawal can be observed in individuals who experience uncomfortable states, both psychological and physiological, once they quit the addictive activity. Conflict is a process where the addict struggles in interpersonal and intrapsychic conflicts. Last but not least, relapse refers to the revival or recurrence of addictive patterns after a certain period of abstinence. Thus, individuals who possess all these six characteristics are said to be addicted to Instagram.

To provide a brief overview of Instagram, it is a visual-oriented social media platform that allows its users to share photos and videos, interact with others by commenting and liking posts as well as following others' profiles (Foroughi et al., 2021; Kircaburun & Griffiths, 2018). As marketed by Instagram itself, this mobile application is designed for the sharing of personal life via photographs (Kim et al., 2017). Aside from photo and video posting such as Instagram Feed, Instagram has also introduced new features, including livestream, Instagram stories and Instagram TV, in recent years. Instagram stories feature allows users to share photos and videos taken throughout the day in an engaging slideshow layout, whereas Instagram TV is a feature for sharing videos that are up to 60 minutes. Hence, with its unique photo-based culture and in-built photo-enhancing features, Instagram easily stood out from the other text- based social media platforms, such as Twitter and Facebook (Lee et al., 2015). However, Mackson et al. (2019) raised the concern on the underlying unhealthy consequences of using Instagram excessively. This is supported by

Balakrishnan and Griffiths (2017), revealing the users' impulsive behavior of checking the number of likes and comments received for theirshared contents. Moreover, compulsive use of social media can contribute to mental healthissues such as anxiety, stress and depressive symptoms (Hou et al., 2019).

That said, numerous studies have been conducted to examine Instagram addiction alongside its potentially linked variables. Aside from the variables, such as shyness (Ponnusamy et al., 2020), loneliness (Ponnusamy et al., 2020), academic performance (Foroughi et al., 2021; Ponnusamy et al., 2020), depression (Foroughi et al., 2021), anxiety (Foroughi et al., 2021), daily Internet use (Kircaburun & Griffiths, 2018), personality (Kircaburun & Griffiths, 2018; Rahardjo & Mulyani, 2020) and fear of missing out (Rahardjo & Mulyani, 2020), self-esteem is also reported as a variable correlated with Instagram addiction (Andreassen et al., 2017; Aridiana & Tumanggor, 2020; Balta et al., 2020; Rahardjo & Mulyani, 2020). According to Rosenberg (1965), self-esteem is dependent on the way the individuals judge or perceive their personal abilities, in which negative self-evaluation will result in low self-esteem, whereas positive self-evaluation will lead to high self-esteem. This statement was supported by Smith and Claypool (2014), claiming that self-esteem refers to an individual's positive or negative evaluation of self. Since self-esteem is established during social interaction, social media has become another medium for people to elevate their self-esteem (Köse & Doğan, 2019). Putra (2018) also depicted that self-esteem is related to social media use because the users tend to make social comparisons on social media. According to Festinger's Social Comparison Theory (1954), social comparison is the predisposition of individuals to judge their environment, skill, and general identity by comparing with others. When individuals engage in upward social comparison by comparing themselves with superior others, they may experience negative self-assessment which, in turn, leads to greater social anxiety (Stein, 2015). On the contrary, those who compare

themselves with inferior others are said to engage in downward social comparison (Festinger, 1954). However, Verduyn et al. (2020) depicted that, due to the positively biased contents on social media, people are more prone to make upward social comparison and consequently, it harms the users' subjective well-being. In addition, the envy and inferiority feelings within oneself will drive the users to present more self-enhancing contents for others to view, thus forming a vicious envy cycle in the social media platforms (Verduyn et al., 2020). In contrast to Facebook, Instagram owns the availability of photo-enhancement filters to exaggerate one's positive impressions; as a result, its users tend to make social comparisons and eventually, affect their self-esteem (Lup et al., 2015). Moreover, the visual contents, such as photographs and personalized self-disclosure, are claimed to generate greater social presence as compared to text-based contents because these vivid cues shape concrete impression (Johnson & Knobloch-Westerwick, 2017). As a consequence, it encourages social comparison and further influences the Instagram users' self-esteem. Not only that, as defined by Ümmet (2015), self-esteem is one's appraisal of the gap between the self they perceive and the self they want; hence, some users tend to view Instagram as a platform to display their ideal self by applying enhancement filters. Consequently, these users will engage in compulsive Instagram use, which in turn, results in them developing Instagram addiction.

Apart from that, fear of COVID-19 is also revealed to be a variable associated with Instagram addiction (Kayis et al., 2021; Lin et al., 2020; Oducado et al., 2021; Peker et al., 2021; Servidio et al., 2021). Social media plays a key role, especially since 2019 when the entire world encountered an outbreak of the novel disease, known as COVID-19. González-Padilla and Tortolero-Blanco (2020) also provided support that COVID-19 is the first health crisis where social media is highly used for the purpose of ensuring the public to be safe and aware of the situation. According to the World Health Organization (WHO, 2020), as of August 2020, COVID-19 has infected 21.3 million individuals globally. As an effort to

minimize the spread of infection, several countries, including Malaysia, have declared national lockdown and other health and safety measures, such as social distancing and restricted physical contact (Shah et al., 2020). Aside from the physical impacts, individuals have also developed psychological fear of being infected, dying, losing loved ones and spreading the virus to others due to the high rates of transmission and mortality of COVID-19 (Ahorsu et al., 2020; Nguyen et al., 2020; Ornell et al., 2020; Seyed Hashemi et al., 2020). Fear can be understood as a functional reaction to threatening events (Kayis et al., 2021; Mertens et al., 2020). However, an overly high fear level is maladaptive and may lead to psychological distress (Hossain et al., 2020; Mertens et al., 2020; Rahman et al., 2020; Ren et al., 2020; Saravanan et al., 2020). As a result, people tend to resort to social media use, such as Instagram, as a coping strategy to alleviate their stress and anxiety (Duan et al., 2020; Fernandes et al., 2020; Seyed Hashemi et al., 2020). For instance, during the pandemic, people use social media more often to stay connected with others via online (Oducado et al., 2021). Ellis et al. (2020) also revealed that not only does social media help to meet young adults' need for social connectedness, but also to cope with the stressful pandemic. In addition, social media is commonly used to gain the latest medical advice and news about COVID-19 (Lin et al., 2020; Olapegba et al., 2020). This is supported by a past study, which involved university students from Malaysia, that social media use, including Instagram, greatly increased during the pandemic (Fernandes et al., 2020). However, Erubami et al. (2021) revealed that exposure to COVID-19 information on social media is positively related to increased fear of COVID-19. Siste et al. (2020) also depicted that excessive social media use may escalate anxiety and depression, at the same time, reinforce compulsive use, thus forming a dysfunctional coping mechanism. This was supported by Sundarasen et al. (2020) and Browning et al. (2021), illustrating a reciprocal cycle of using social media intensively, creating further psychological distress and reinforcing such a maladaptive coping strategy. In

short, although the behavior of using Instagram helps in reducing stress and anxiety (Király et al., 2020) and escaping from difficult thoughts (Gao et al., 2017), abusive usage may put these individuals at a higher risk of developing Instagram addiction (Blasi et al., 2019; Gao et al., 2020; Islam et al., 2020; Király et al., 2020; Priego-Parra, 2020).

In short, there exists the need to explore the relationship between self-esteem, fear of COVID-19 and Instagram addiction among undergraduate students in Malaysia.

**Problem Statement**

Instagram addiction has become an alarming concern worldwide, and Malaysia is no exception (Foroughi et al., 2021; Ponnusamy et al., 2020). According to Lim (2016), the number of active Instagram users has reached nearly four million in Malaysia. Among the user population, young adults make up the bigger portion (Kırcaburun & Griffiths, 2019; Ponnusamy et al., 2020). Moreover, Alhabash and Ma (2017) supported that 59% of Instagram users aged within the range from 18 to 29 years. A local study conducted by Hassim et al. (2020) also revealed that a majority of Malaysian undergraduate students are heavy users, whereby 57% of them spend four to six hours on Instagram per day, and another 9% spend six hours and above on Instagram per day. Such excessive use may result in dependency on social media, which in turn, leads to addiction (Arora et al., 2020; Chung et al., 2019; Kuss & Griffiths, 2017). Thus, it calls attention to conduct the present study on Instagram addiction among undergraduate students in Malaysia.

Besides, as compared to Instagram, other social media platforms, such as Facebook and Twitter, are more frequently studied due to their sustained popularity (Ponnusamy et al., 2020). To illustrate, the extant literature consists of past studies on Facebook addiction (Błachnio et al., 2016; Brailovskaia et al., 2019; Foroughi et al., 2019; Iranmanesh et al., 2019; Kanat-Maymon et al., 2018) and Twitter addiction (Arora et al., 2020; Dwyer & Fraser, 2016). However, little is known about Instagram addiction (Foroughi et al., 2021;

Kircaburun & Griffiths, 2019), especially in the Malaysian context. It is noteworthy that Instagram has been a fast-growing social media platform over years. To picture, MCMC (2020) revealed that the number of Malaysian Instagram users has increased from 57% in 2018 to 63.1% in 2020. Unfortunately, in comparison to YouTube, Twitter, Facebook, and Snapchat, it is found that Instagram is a social media platform that brings forth many negative impacts, including cyberbullying, fear of missing out, anxiety, depression, loneliness, negative body image and reduced sleep quality (Cramer & Inkster, 2017). This could be due to the notion of social comparison being more salient on Instagram as a result of its several technological features. Firstly, Instagram provides a wide range of easy-to-apply enhancement filters that increase the users' tendency to present idealized beauty (Yang et al., 2018); consequently, such a peer portrayal of beauty ideal facilitates social comparison and thus, impacts the viewers' psychological well-being (Chua & Chang, 2016). This was supported by Yang and Robinson (2018), who postulated that Instagram users tend to selectively show more positively biased content. Secondly, the common use of hashtags on Instagram further encourages social comparison by easing the users to receive greater exposure to those unrealistic beauty or lifestyle standards in one click (Lup et al., 2015). Thirdly, Instagram, as a photo-sharing platform, is full of visual content, which then enables the users to recall the information easier in comparison to text-based content (Noldy et al.,1990). As a result, these positively biased visual contents, such as body image and favorable lifestyle, may shape false senses of realities among the users (Hassim et al., 2020). As illustrated by Festinger's Social Comparison Theory (1954), when there are discrepancies between expectation and reality, anxiety and an emotional state of insufficiency will be developed and eventually, it will bring detrimental effects on the Instagram users' mental health. Therefore, this research gap should be bridged by contributing to the body of knowledge about Instagram addiction.

Moreover, despite the fact that self-esteem is a popular psychological construct to be studied in numerous research, there is little literature support for the relationship between self-esteem and Instagram addiction. In other words, most of the past literature focused on the addiction toward other social media platforms. Since different social media platforms offer unique features and structures to meet the diverse needs of users (Alhabash & Ma, 2017), research findings pertaining to other social media platforms may provide little generalization effect to explain Instagram addiction. Hence, Instagram, as a social media platform, deserves research attention to gain a better understanding about its addictiveness potential. Besides that, even though there are several past studies which examined the association between self-esteem and Instagram addiction (Aridiana & Tumanggor, 2020; Rahardjo & Mulyani, 2020), these studies are conducted among Indonesian teenagers. According to Polit and Beck (2010), study contexts and participants serve as key factors to be considered in the generalization of research findings. Hence, there is a need to study the relationship between self-esteem and Instagram addiction among undergraduate students in Malaysia.

To the authors' best knowledge, the correlation between fear of COVID-19 and Instagram addiction is yet to be investigated in the Malaysian context. To illustrate, there are prior studies conducted in other cultural contexts, including Mexico (Priego-Parra et al., 2020), Turkey (Kayis et al., 2021; Peker et al., 2021), Iran (Lin et al., 2020), Philippines (Oducado et al., 2020) and Italy (Servidio et al., 2021). Additionally, among the aforementioned literature, none of them studied its relationship with Instagram addiction. Instead, other variables, such as problematic Internet use (Peker et al., 2021), Internet addiction (Priego-Parra et al., 2020; Servidio et al., 2021), problematic social media use (Lin et al., 2020), smartphone addiction (Kayis et al., 2021) and Internet use (Oducado et al., 2020), are included. Not to mention, fear of COVID-19 is a relatively new construct because it was recently introduced by Ahorsu et al. (2020). That said, there is still a dearth of research

pertaining to the association between fear of COVID-19 and Instagram addiction. Furthermore, previous studies reported mixed results on the correlation. For instance, some past findings illustrated a positive relationship between social media use and fear of COVID-19 (Ahmad & Murad, 2020; Gao et al., 2020; Lin et al., 2020; Mertens et al., 2020). On the flip side, Oducado et al. (2021) found that social media use is inversely correlated with fear of COVID-19. In short, as supported by Fernandes et al. (2020) and Servidio et al. (2021), further investigations are required because the correlation remains unclear.

Taken together, the present study aims to investigate the relationship between self-esteem, fear of COVID-19 and Instagram addiction among undergraduate students in Malaysia.

**Significance of Study**

The present study will examine the relationships and predictive roles of self-esteem and fear of COVID-19 with Instagram addiction respectively. Hence, it will provide a greater theoretical understanding of the potential risk factors contributing to Instagram addiction among undergraduate students. It may also pave the way for future researchers to extend the existing literature by further exploring other potential risk factors that predict Instagram addiction among the undergraduate student population.

In addition, the present research contributes to the body of knowledge pertaining to Instagram addiction in the Malaysian context, which remains relatively under-researched as compared to addiction toward other social media platforms, such as Facebook addiction (Foroughi et al., 2021; Kircaburun & Griffiths, 2019; Ponnusamy et al., 2020). As aforementioned, Alhabash and Ma (2017) and Griffiths (2018) emphasized that different social media platforms have different structures, technological features, as well as gratifications and motives; hence, this study will shed light on the potential addictiveness of Instagram in particular.

Besides that, this study will also uncover the previously uninvestigated correlation between fear of COVID-19 and Instagram addiction, thus providing more insights into the impact of COVID-19 on social media use. This is significant in the sense that both Priego-Parra et al. (2020) and the United Nations (2021) pointed out the dearth of literature databases concerning how fear of COVID-19 may influence one's online behavior and mental health.

From the practical dimension, the present study will assist policymakers, educators and mental health professionals in designing addiction intervention and prevention strategies. This is because the predictive roles of self-esteem and fear of COVID-19 will be investigated respectively to identify the risk factors of Instagram addiction. That said, it aids the relevant authorities in developing evidence-based programs to curb the addiction issue among undergraduate students. Apart from that, this study will also offer research findings that serve as empirical evidence for policymakers and professionals to design effective health care initiatives. This can help in enhancing undergraduates' self-esteem and providing psychological support for undergraduates to overcome their distress and eventually, alleviating the risk of Instagram addiction among this population.

Lastly, the present study will also increase the awareness of risk factors contributing to Instagram addiction among undergraduate students. As a result of acquiring the knowledge derived from the present empirical findings, undergraduate students will be more conscious about the prevention of Instagram addiction. This was supported by Sedek (2021), revealing that individuals who learn relevant information will be more aware of the possible negative outcomes of excessive social media use and thus, putting conscious and deliberate effort into self-regulation to avoid getting addicted to Instagram.

**Research Objectives**

1. To examine the relationship between self-esteem and Instagram addiction.

2. To examine the relationship between fear of COVID-19 and Instagram addiction.

3. To examine the role of self-esteem in predicting Instagram addiction.

4. To examine the role of fear of COVID-19 in predicting Instagram addiction.

**Research Questions**

1. Is there a significant relationship between self-esteem and Instagram addiction among undergraduates in Malaysia?

2. Is there a significant relationship between fear of COVID-19 and Instagram addiction among undergraduates in Malaysia?

3. Does self-esteem significantly predict Instagram addiction among undergraduates in Malaysia?

4. Does fear of COVID-19 significantly predict Instagram addiction among undergraduates in Malaysia?

**Research Hypotheses**

***Research Question 1***

$H_{0a}$: There is no significant relationship between self-esteem and Instagram addiction among undergraduates in Malaysia.

$H_{1a}$: There is a significant relationship between self-esteem and Instagram addiction among undergraduates in Malaysia.

***Research Question 2***

$H_{0b}$: There is no significant relationship between fear of COVID-19 and Instagram addiction among undergraduates in Malaysia.

$H_{1b}$: There is a significant relationship between fear of COVID-19 and Instagram addiction among undergraduates in Malaysia.

***Research Question 3***

$H_{0c}$: Self-esteem does not significantly predict Instagram addiction among undergraduates in

Malaysia.

$H_{1c}$: Self-esteem significantly predicts Instagram addiction among undergraduates in Malaysia.

***Research Question 4***

$H_{0d}$: Fear of COVID-19 does not significantly predict Instagram addiction among undergraduates in Malaysia.

$H_{1d}$: Fear of COVID-19 significantly predicts Instagram addiction among undergraduates in Malaysia.

**Conceptual Definition**

***Self-Esteem***

According to Rosenberg (1965), self-esteem can be conceptualized as an individual's overall assessment of self-worth. In the present study, self-esteem implies a stable trait possessed by individuals, either in positive or negative manners, that guides thoughts and actions which reciprocally contribute to their self-appraisal (Hawi & Samaha, 2016; Yang et al., 2016).

***Fear of COVID-19***

The infectious disease, known as COVID-19, has emerged since 2019 and has led to the development of fear among individuals across the globe (Ahorsu et al., 2020). Fear of COVID-19 can be understood as an uncomfortable yet adaptive reaction to the current outbreak of COVID-19 due to its life-threatening events (Kayis et al., 2021: Mertens et al., 2020).

***Instagram Addiction***

According to Andreassen and Pallesen (2014), Instagram addiction can be defined as an individual's irresistible urge to spend excessive time and concern on Instagram, which in turn, leads to negative impairments in their important life aspects. Similarly, Huang (2020)

suggested that Instagram addiction can be described as a functional impairment, whereby an individual persistently and impulsively engages in Instagram use regardless of the physical and mental detriments (Huang, 2020).

## Operational Definition

### *Self-Esteem*

In the present study, the Rosenberg Self-Esteem Scale (RSES) will be administered to measure the participants' self-esteem level. This self-report scale is widely applied in numerous studies because it is brief, with a total of 10 items to assess one's global self-esteem. In this scale, both positive and negative attitudes about the self will be measured by rating each item on the five-point Likert scale, where the responses include (*strongly agree*), 2 (*agree*), 3 (*disagree*) and 4 (*strongly disagree*). The negative items of this scale are items 2, 5, 6, 8, and 9. Hence, the scores obtained from these negative items will be reversed before adding up with the rest of the item scores to compute the total score. A higher total score will indicate a higher self-esteem level.

### *Fear of COVID-19*

To assess the fear level of COVID-19, the Fear of COVID-19 Scale (FCV-19S), developed by Ahorsu et al. (2020), will be employed in this research. There are a total of seven items in this scale. Participants will indicate their level of agreement with each item using the five-point Likert scale, whereby the responses involve 1 (*strongly disagree*), 2 (*disagree*), 3 (*neutral*), 4 (*agree*) and 5 (*strongly agree*). Moreover, this unidimensional scale does not contain any negative items. Thus, the total score will be computed by summing all item scores, in which a higher total score will suggest a higher fear level of COVID-19.

### *Instagram Addiction*

In the present study, The Instagram Addiction Scale (TIAS), established by Sholeh and Rusdi (2019), will be used to measure the participants' level of Instagram addiction. A

total number of 12 items will be rated on a five-point Likert scale, whereby the responses include 1 (*strongly disagree*), 2 (*disagree*), 3 (*neither agree nor disagree*), 4 (*agree*) and 5 (*strongly ag*ree). To compute the total score, scores obtained from each item will be summed. Participants with a higher total score will be considered to have a higher level of Instagram addiction.

# Chapter 2

# Literature Review

## Self-Esteem

Self-esteem is defined as an individual's appraisal toward oneself, either in a positive or negative manner (Hawi & Samaha, 2016). It is considered as an evaluation of the broader self-concept, which is one's belief and knowledge regarding themselves (Vogel et al., 2014). Self-esteem is also believed to have both cognitive and affective components that could guide one's feelings, thoughts, and behaviors (Yang et al., 2016). Most researchers' explanations concerning self-esteem are focused on the individual's attitude toward oneself (Abdel-Khalek, 2016; Hawi & Samaha, 2016; J. Y. Park & E. Y. Park, 2019; Vogel et al., 2014). On the other hand, Bojanić et al. (2019) and Yang et al. (2016) suggested a modern view of self-esteem, in which self-esteem is believed to not only be one's respect toward themselves, but also the respect toward and from others. Yang et al. (2016) revealed that people gain higher self-esteem when they are socially accepted and believe others evaluate them positively. This idea is supported by Du et al. (2017), who proposed three levels of self-esteem. The first is the personal self-esteem that comprises one's self-worth of own unique attributes, while another two social levels of self-esteem cover the relational and collective aspects. They are defined as self-worth derived from social relationships with significant others, such as friends; and from larger social group memberships, such as racial groups, respectively (Du et al., 2017).

In addition, the literature provides insight into three forms of self-esteem. García et al. (2019) discussed two of them, namely trait self-esteem and state self-esteem; whereas Abdel-Khalek (2016) studied an additional form of self-esteem, namely self-evaluation. Trait self-esteem is an enduring characteristic which is relatively stable across time and circumstance while state self-esteem is less stable as it reflects the momentary experience which can be fluctuating over different time and context (García et al., 2019; Yang et al., 2016). The third

form, which is self-evaluation, represents how people form judgments about themselves (Abdel-Khalek, 2016). According to Jackman and MacPhee (2015), people evaluate themselves in global and domain-specific means, which then generate global and domain-specific self-esteem respectively. Global self-esteem refers to an individual's overall appraisal of various life domains, which is constituted by domain-specific self-esteem (J. Y. Park & E. Y. Park, 2019). On the other hand, domain-specific self-esteem emphasizes self-esteem related to particular life aspects such as academic, social, health and so forth, whereby the overall evaluation of these aspects form one's global self-esteem (J. Y. Park & E. Y. Park, 2019).

Aside from that, Abdel-Khalek (2016) suggested two distinct components of self-esteem, which are competence and worth. Competence can be understood as one's self-efficacy and ability to change their environment, such as making decisions to overcome difficulties (Abdel-Khalek, 2016). Stets and Burke (2014) explained that competence contributes to one's self-esteem because it heightens the sense of security toward their environment by viewing the world as predictable and alterable. According to Maslow's Hierarchy of Needs Theory (Maslow, 1943), most of the time, the security need should be fulfilled before the esteem need, showing support to the notion that competence serves as one of the components of self-esteem. As for the worth component, it is one's belief that one deserves respect, happiness, and love (Abdel-Khalek, 2016). Worth is studied in accordance with the modern view of self-esteem as postulated by Stets and Burke (2014). Stets and Burke (2014) reinforced that worth is developed through internalizing others' judgments. In simple words, an individual tends to perceive they are worth respect from others when they receive social approval. Stets and Burke (2014) also added the authenticity as one of the components of self-esteem that reflects how much a person truly understands themselves, and how much they strive to live up to their values. They also summarized the prerequisites to

achieve authenticity, which are to experience pleasant emotions along with the accomplishments, to rarely encounter obstacles when they live the way they desire, and to act consistently with their feelings and thoughts (Stets & Burke, 2014).

The level of self-esteem possessed by an individual can be placed anywhere along the continuum from negative to positive. Both positive or high and negative or low self-esteem play critical roles in human's physical, psychological and social well-being by directing their thoughts and behaviors. Nevertheless, they influence our life differently, in which positive self-esteem tends to generate favorable life outcomes whereas negative self-esteem acts in an opposite manner. Steiger et al. (2014) suggested that positive self-esteem protects one's health and social relationships, whereas negative self-esteem serves as a risk factor for mental illness and social problems. However, J. Y. Park and E. Y. Park (2019) revealed that such differences may not be manifested if individuals with negative self-esteem do not experience any unpleasant life circumstances. They suggest that this may be attributed to both categories of individuals, with either positive or negative self-esteem, exhibiting similar patterns of interpretation toward positive stimuli. Nevertheless, individuals with positive and negative self-esteem do elicit differences when they encounter negative life events. To illustrate, in the face of negative circumstances, individuals with positive self-esteem are able to filter excessive negative messages and bounce back quickly; on the flip side, individuals with negative self-esteem tend to ruminate unfavorable feedback from the environment (J. Y. Park & E. Y. Park, 2019). This was supported by Bojanić et al. (2019), who suggested that individuals with higher self-esteem have better coping skills.

García et al. (2019) depicted that, in universal nature, people tend to secure high self-esteem unless they are the victims of certain traumatic experiences. This phenomenon may stem from one's self-positivity bias, which aims to protect the individual against adverse impacts of negative self-evaluation, by allowing them to judge themselves more favorably

than third-party observers do (Zhang et al., 2013). Unfortunately, high self-esteem does not necessarily result in favorable outcomes. Bojanić et al. (2019) revealed that high self-esteem can be expressed in two ways, namely stable and unstable. Unstable high self-esteem is characterized by self-burdening, aggressiveness, and frequent activation of defense mechanisms (Bojanić et al., 2019). Individuals with unstable high self-esteem often portray a positive attitude toward self explicitly but hold a negative judgment about self at the unconscious level; hence, their defense mechanism is likely to be activated by reacting aggressively in the face of critiques that challenge their self-image (Bojanić et al., 2019). On the flip side, individuals with stable high self-esteem possess a consistent favorable view of self; thus, they are more likely to believe that they are capable to cope with it and less likely to aggressively defend themselves in the face of potential threats (Bojanić et al., 2019).

**Fear of COVID-19**

The novel disease of coronavirus, known as Coronavirus disease 2019 (COVID-19), is first identified in Wuhan, China in 2019, and has spread rapidly across 213 countries with over 7.7 million confirmed cases and more than 418,000 deaths globally (Lin et al., 2020). In Malaysia, COVID-19 is first detected in January 2020, and later led Malaysia to be the country with the highest increasing number of positive cases in Asia in early March 2020 (Sundarasen et al., 2020). COVID-19 is an infectious disease which is highly contagious via both direct and indirect contact. It can be spread directly via human-to-human transmission and indirectly through contaminated objects (Lotfi et al., 2020). For instance, the spread through respiratory droplets occurs when an individual sneezes, coughs or even talks. Aside from that, people can also be infected when their unwashed hands come into contact with their mucous membranes, such as eyes, mouth and nose.

To curb the rapid growth of COVID-19, the Malaysian government has implemented various national policies that limit outdoor activities, including border and travel controls,

Movement Control Order (MCO), emergency remote teaching (ERT) and social distancing (Sundarasen et al., 2020). Hence, citizens have no option but to shift their living focus indoors and engage in more sedentary behaviors (Lin et al., 2020). Siste et al. (2020) further illustrated that people's daily routines, including studying, working, religious activities, socializing and so forth, have also switched to online mode to minimize physical contact. As a consequence of the self-isolated situation, negative emotions may be triggered or even exacerbated. To support, past researchers report that anxiety and depression are related to the COVID-19 pandemic (Planchuelo-Gómez et al., 2020; van der Velden et al., 2020). Thus, it can be observed that the pandemic not only impacts people's lifestyles and social relationships which further creates social and economic burdens, but also induces fear among them (Sundarasen et al., 2020; Lin et al., 2020). As referenced by a number of researchers (Ahorsu et al., 2020; Ornell et al., 2020; Seyed Hashemi et al., 2020), many individuals develop fear toward COVID-19 due to the high transmission and mortality rates.

Kayis et al. (2021) explained that fear is a functional emotion that ensures humans' survival given that it is experienced at a moderate rate where fear promotes helpful actions. This was supported by Zhang and Zhou (2020) that fear appealing messages are more effective in encouraging compliance to health-related instructions. Emotions, including fear, have been described by Mahmud et al. (2020) as a complicated set of feelings capable of influencing one's thoughts and behaviors. The impact of emotions on thoughts and behaviors has been supported by several theories, such as James-Lange's Theory of Emotion, Schachter Singer's Two-Factor Theory and Lazarus's Theory, despite the consensus on whether behavioral responses occur after or simultaneously with emotions has yet to be reached (Mahmud et al., 2020). In particular, fear is viewed as an adaptive mechanism in the face of threats, whereby it protects an individual against unfavorable events or diseases, by increasing their willingness to abide by the health instructions (Wu et al., 2021). According to

Eder et al. (2021), fear significantly predicts health-securing behaviors. This notion was supported by Mariam et al. (2021) that pregnant women who experience greater levels of fear tend to have a higher willingness to follow preventive practices.

However, an intense level of fear may result in maladjusted behaviours (Lum & Tambyah, 2020). Gundogan (2021) and Wu et al. (2021) reinforced that acute fear of COVID-19 may create barriers in cognition and behavior when the maladaptive emotion leads to failure in accurately interpreting information from the environment; as a result, hindering one from carefully filtering information and rationally making decisions. To picture, in Iran, more than 1000 individuals suffered from alcohol poisoning, in which nearly 200 of them died from alcohol overconsumption because of a rumor claiming that COVID-19 could be cured by drinking alcohol (Lin et al., 2020). Moreover, fear of COVID-19, which is accompanied by profound stress, may also lead to suicidal behaviors. To illustrate, an infected Indian man reacted aggressively to everyone who approached him and eventually, he committed suicide due to an extreme fear and panic of transmitting the disease to his family members (Goyal et al., 2020).

Although the COVID-19 pandemic has become a global issue that impacts every single individual, Bahar Moni et al. (2021) revealed a disparity in the susceptibility to the fear of COVID-19 across different groups. When comparing between genders, females are found to be more prone to fear of COVID-19 due to their more sensitive personalities (Bahar Moni et al., 2021). Other than that, as suggested by Rodríguez-Hidalgo et al. (2020), undergraduates are viewed as a more vulnerable group due to deprivation of emotional support, which results from the travel restrictions and unfamiliarity toward ERT. Mahmud et al. (2020) also stated that the COVID-19 outbreak has created great uncertainties on undergraduates' future career plans, which in turn, further elevates their fear. Moreover, Browning et al. (2020) claimed that undergraduates are likely to be overwhelmed by

information related to COVID-19 as a result of their greater need and use of Internet and social media for academic tasks; consequently, they are at a higher risk of suffering from fear of COVID-19.

To relieve the fear of COVID-19, some individuals attempt to seek more health and medical information from online platforms, which in turn, may lead to inaccurate self-diagnosis and further heighten their fear and anxiety. Such a phenomenon is known as cyberchondria (Seyed Hashemi et al., 2020). Wu et al. (2021) explained that cyberchondria is a multidimensional construct characterized by intense online health information searching, negative affect, conflict with daily routine and reassurance seeking. Moreover, Oniszczenko (2021) depicted that cyberchondria directly contributes to fear of COVID-19 by overloading an individual with misleading information, causing them to misinterpret minor symptoms as if they were infected by diseases. Besides that, Varma et al. (2021) also claimed that individuals who often search for medical information online as a coping strategy to handle their uncomfortable emotions are at a greater risk of developing addiction toward such behavior. This was underpinned by Seyed Hashemi et al. (2020), who revealed the reciprocal relationship between cyberchondria and problematic internet use, whereby the increasing fear of COVID- 19 serves as both the antecedent and outcome of impulsive online searching.

**Instagram Addiction**

The term addiction has been predominantly linked to substance abuse, such as drugs and alcohol, before the mid-1990s until the emerging use of computers and Internet. This emergence draws the attention of researchers as it creates several social problems, such as deterioration of the users' physiological and psychological well-being (Zhao, 2021). Social media addiction, which is considered a behavioral addiction, receives greater societal concern over the years because it is believed to be more hazardous than alcohol and drug addictions (Tutgun-ünal, 2020). Addictive behavior has been described as an inability to control,

functional impairment and persistent engagement in the behavior irrespective of its negative impacts (Huang, 2020). It is suggested that the variables of addiction, problematic use, compulsive use, disordered use, and excessive social media use can be applied interchangeably due to their similar constructs; however, the variable of dependent use is an exception (Huang, 2020). To differentiate between addiction and dependency, Huang (2020) explained dependency as an indispensable behavior to achieve goals which does not necessarily result in negative impacts, such as impairment in daily lives which will undoubtedly occur to addiction. Not to mention, to draw a clear distinction between extreme enthusiasm and addiction, Griffiths (2019) indicated that an activity or behavior will be considered as an addiction if one experiences negative outcomes; otherwise, it will be labelled as extreme enthusiasm wherein no negative consequences are experienced.

Based on the idea of Aksoy (2018), there are two phases of addiction, which are the beginning stage, in which an individual engages in less than six months of social media use; and the continuity phase, in which the individual is involved in more than six months of social media engagement. In contrast to the two stages of drug addiction which are defined by the patients' symptoms (Gould, 2010), the social media addiction outlines its phases based on the users' purpose, in addition to the duration of social media use. Aksoy (2018) suggested that in the beginning phase, people use social media because they lack something, such as difficulty to develop friendships, fear to socialize and dissatisfaction with their own monotonous life. On the flip side, during the continuity phase, social media is used for advancement, such as maintaining social relationships, following up with new trends and events, as well as accomplishing personal tasks or duties (Aksoy, 2018).

The purpose of social media engagement also assists researchers to conceptualize primary and secondary addiction. Griffiths (2013) explained primary addiction as those who are addicted to the activity itself to the extent of gaining a sense of satisfaction and

contentment. On the other hand, secondary addiction can be observed from individuals who are addicted to the activity as a coping strategy for other underlying issues so as to reduce unfavorable emotions (Griffiths, 2013). As compared to primary addiction which resulted from genuine fondness of the activity, secondary addiction is believed to be less resistant to treatment because the individual will immediately quit the activity once their underlying problem is resolved; however, secondary addiction tends to generate more severe consequences (Griffiths, 2013). This notion is supported in social media secondary addiction, whereby social media addicts who seek to relieve negative moods, such as stress, anxiety, and jealousy, may further exacerbate these emotions and eventually worsen the symptoms of addiction (Masthi et al., 2017).

Apart from that, Griffiths (2019) proposed that behavioral addiction, including social media addiction, can be explained in terms of six core components, namely salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse whereby satisfaction of all six components is necessary to identify an activity or behavior as addiction. The conflict component represents the persistent involvement in short-term pleasure despite the adverse consequences, which will subsequently elevate the apparent need for the addicted activity as a coping mechanism (Griffiths, 2019). The unfavorable consequences can be categorized into two types: interpsychic conflict and intrapsychic conflict. Interpsychic conflict is often related to social relationships with children, friends, relatives, and colleagues, as well as working and academic performance (Griffiths, 2019). As for intrapsychic conflict, it occurs within one's self when the addict encounters the dilemma of wanting to cease the addictive activity yet fails to do so, thus experiencing a sense of loss of control (Griffiths, 2019). Both interpsychic and intrapsychic conflicts often accompany each other when a person is addicted to social media. To illustrate an example where both interpsychic and intrapsychic conflicts occur, Mazhar et al. (2020) and Tutgun-ünal (2020) revealed that addicted employees and

students tend to sacrifice their attention on work or study for social media, resulting in bad work or academic performance and poor social relationships.

Aside from that, salience is theorized to be the most evident component among addicts (Mazhar et al., 2020). Through salience, the behavioral addiction may be manifested by preoccupying one's behaviors, feelings and thoughts, such as an intense urge and significant deterioration of offline social connections (Griffiths, 2005). In line with Zhao (2021) who agreed that addicted users tend to use social media more frequently, Tutgun-ünal (2020) suggested that users who spend more than four hours daily on social media attain higher risk of addiction. Tutgun-ünal (2020) further emphasized that the social media usage duration of four to six hours elevates the likelihood of relapse, which is a phenomenon of recurring former patterns of compulsive engagement in the addicted activity despite a period of effortful controls (Griffiths, 2005).

There is also another component worth noting - withdrawal, which refers to the unpleasant effects either in psychological or physiological states that may happen when one stops the addicted activity. Griffiths (2005) suggested that, when social media addicts are abstinent from social media usage, they will experience physiological symptoms, such as loss of appetite, breathing difficulty, insomnia, headaches, and psychological symptoms, such as irritability, extreme moodiness, and delusion if severe. This can be observed in the diagnostic report of Paik et al. (2014), where a 25-year-old man not only displayed excessive aggressiveness toward his parents by attacking them with a knife, but also experienced uninterrupted persecutory delusions that he may be hurt by the electromagnetic waves when prohibited from using social media. The symptoms may not only manifest when one totally withdraws from using social media, but also when being interrupted. Upadhyaya (2018) stated that the addicted students may express extreme agitation and anger when they are disturbed during the use of Facebook.

In addition, mood modification, which was originally called euphoria, refers to the change in mood states followed by an addictive behavior (Griffiths, 2005). The reason why "euphoria" is replaced by "mood modification" is to create a bias-free concept that neither brings positive nor negative connotations (Griffiths, 2019). Griffiths (2005) claimed that different mood modifying intensity levels can be attained according to the activity chosen by an individual. This was underpinned by Tutgun-ünal (2020), who explained that the social media features, such as filters and enhancements, generate greater mood modifying effects. Hence, as Instagram is visual-focused, it may pose a higher risk of addiction to their users. The last component, tolerance, is described as symptoms whereby the favorable outcomes will result in an increased amount of addictive activities (Griffiths, 2005). The author discovered this component through an experiment among non-regular and addicted slot machine gamblers. The findings revealed that the mood modifying effects tend to decrease quicker among addicted gamblers after the game despite similar patterns of mood lifting during the activity between both groups of gamblers, suggesting that addicted gamblers may need to engage in the game more intensely than non-regular gamblers to achieve arousal peaks.

**Self-Esteem and Instagram Addiction**

As revised from past studies, most researchers revealed a negative relationship between self-esteem and social media addiction (Ardiana & Tumanggor, 2020; Hawi & Samaha, 2016; Treitel, 2020). Among them, only few researchers examined the association between self-esteem and Instagram addiction in particular (Treitel, 2020). The results are in line with other researchers who study social media addiction in general, in which people with lower self-esteem tend to spend more time on Instagram. This phenomenon is reinforced by the social compensation hypothesis, which emphasizes one's tendency to seek social approval online to increase their self-esteem when they experience failure in face-to-face interactions

(Hawi & Samaha, 2016). Aside from the underlying hypothesis, low self-esteem promotes intense social media use because people with low self-esteem tend to see virtual platforms as a safer place to express their true self due to the anonymity function (Ardiana & Tumanggor, 2020; Gadekar & Ang, 2020).

Jiang and Ngien (2020) also mentioned that people with lower self-esteem put more emphasis on extrinsic social approval to gain self-esteem. In this case, social media platforms, such as Instagram, are indisputably a good option for them to magnify their self-esteem as social approval is more salient and visible on social media via the numbers of likes and followers. Furthermore, in contrast to other social media platforms, Instagram does not include the "dislike" function; thus, it minimizes one's chances of receiving unfavorable comments (Jiang & Ngien, 2020). Zywica and Danowski (2008) also agreed that low self-esteem is often linked to self-protective behavior. Hence, people with lower self-esteem may prefer Instagram over other social media platforms since, as compared to other platforms with the "dislike" function, there is a lower risk of facing social rejection on Instagram.

Moreover, researchers also explained the reciprocal negative relationship between low self-esteem and social media addiction. Not only will low self-esteem encourage social media addiction, but also will social media addiction diminish one's self-esteem. In line with Moore and Craciun (2020) who suggested that constant checking of social media, where everyone's life story is reachable, will induce feelings of dissatisfaction and lower one's self-esteem, Hawi and Samaha (2016) also underpinned that social media addiction increases one's opportunity to experience social comparison in which they believe that popular influencers, who have huge number of followers and the power to influence others, are living a better life; consequently, it leads to a decline in self-esteem. Treitel (2020) also provided support to the tendency of addicted Instagram users to overemphasize the need for viewers' appraisal, thus escalating their pressure and reducing their self-esteem.

On the flip side, Trifiro (2018) argued that addiction to Instagram improves one's self-esteem because the users are allowed to portray themselves as favorable as possible on Instagram; hence, not only it increases their chances to gain social liking, but also boosts their self-esteem. However, this was rejected by Jiang and Ngien (2020), who believed the negative association between low self-esteem and Instagram addiction is attributed to the features provided by Instagram. To illustrate, as compared to Facebook and Twitter, there are more enhancement filters available on Instagram which allow its users to portray positively biased contents online; as a result, the comparison will be perpetuated and consequently reduce self-esteem (Moore & Craciun, 2020). Apart from that, in comparison with text-centered Facebook, Instagram places heavier emphasis on pictures and videos which present greater impressions, vividly showing how others' lives are and thus, increasing the negative feelings toward self (Jiang & Ngien, 2020).

**Fear of COVID-19 and Instagram Addiction**

People tend to alleviate their fear of COVID-19 through frequent engagement in reinforcing online activities such as video gaming, TV series watching, surfing the internet or using social media (Islam et al., 2020). This notion is consistent with the theory by Servidio et al. (2021), who proposed that stress may distort one's cognitive processes by increasing their involvement in certain online behaviors to the extent of regulating personal emotions, particularly during emergencies period, such as the COVID-19 pandemic. In light of the physical distancing policy, people are restrained from their regular coping mechanism, such as outdoor exercise and social activities; thus, they tend to view the aforementioned online activities as putative coping strategies. Ultimately, it may lead to severe problems, such as depression, and elevate the risk of addictive engagement in online activities (Király et al., 2020; Siste et al., 2020). Apart from that, Arora et al. (2020) highlighted those negative sentiments, such as anxiety and fear, will increase the individuals' vulnerability to addictive

use of social media, further reinforcing the correlation between fear of COVID-19 and Instagram addiction.

There are also other researchers who explain the association between fear of COVID-19 and social media addiction through the satisfaction of information need. Lin et al. (2020) revealed that 90% of users learned information concerning COVID-19 from the Internet, including virus transmission, the availability and effectiveness of medication and vaccine, COVID-19 regulation experiences in overseas countries, travel suggestion, the number of COVID-19 confirmed cases in certain areas, COVID-19 precaution measures and other details. This was also underpinned by Kayis et al. (2021), who mentioned that smartphones which make the Internet more accessible are perceived to be an essential tool for searching for information regarding the COVID-19 pandemic, and therefore heighten the threat of smartphone addiction. Particularly, as compared to the general population, students are more susceptible to social media addiction as most education institutions have introduced ERT via online platforms. Hence, students will experience longer screen time, which is a significant risk factor for social media addiction (Sundarasen et al., 2020; Browning et al., 2021).

On the flip side, it is argued that a higher level of problematic social media use will contribute to greater fear of COVID-19, as individuals with greater level of problematic social media use will attain more exposure to the COVID-19 information (Lin et al., 2020). In line with ideas by Lin et al. (2020), Sundarasen et al. (2020) suggested that the enormous flow of negative messages on social media may portray COVID-19 as an omnipresent phenomenon that can trigger anxiety. Sundarasen et al. (2020) also compared the levels of COVID-19 fear between medical students and other students and found that medical students are confronted with greater fear because they are well-informed on the details of the pandemic progress. However, this is incongruent with another researcher who discovers an inverse relationship between the use of the Internet and fear of COVID-19, wherein the more

frequent the students surf the Internet, the lower their fear (Oducado et al., 2021). They explain that nursing students utilize the Internet as their source of information to understand this novel disease, which then results in greater awareness, sense of control and lesser fear. They also emphasize a viewpoint neglected by Sundarasen et al. (2020), which is the students' attention to information integrity. The nursing students who pay greater concern to the validity of information gain a lower level of fear although they are frequently exposed to the Internet. This result is enhanced through observing the infodemic, where people are overloaded by unreliable online information about the COVID-19 pandemic, which subsequently contributes to fear and anxiety (Priego-Parra et al., 2020; Siste et al., 2020).

## Theoretical Framework

### *Uses and Gratifications (U&G) Theory*

The uses and gratifications (U&G) theory reflects how various social and psychological factors influence the preference of users to a particular social media or social networking platform (Whiting & Williams, 2013). This is viewed from a functionalist perspective which emphasizes that people are aware of their needs and are goal-directed (Hossain, 2019; Karimi et al., 2014). It serves to explain the causes of people choosing certain media over other alternatives so as to enhance the understanding of how people gain social and individual gratifications from their chosen media (Hossain, 2019). In simple words, it can be understood as the individuals are driven by specific needs to use social networking sites (SNSs). Consequently, the fulfilment of individuals' needs provides a strong incentive for the repetitive usage of the particular SNS, which may lead to addiction (Foroughi et al., 2021).

On the other hand, U&G theory is criticized for being too ambiguous in explaining how the motivations desired by the users sustain their use toward certain social media platforms (Huishan, 2018). Hence, Karimi et al. (2014) expanded the concept of

"gratifications" by making distinctions between gratification sought and gratification obtained. Gratification obtained refers to gratification that is truly experienced by the users through a particular medium; whereas gratification sought refers to gratification that is expected from a medium by the users before the actual attempt. In comparison with gratification sought, gratification obtained are able to predict media use better (Karimi et al., 2014). When the gratification obtained meets or exceeds the gratification expected by the users, recurrent use is likely to occur (Karimi et al., 2014).

Each and every media provides unique gratifications to the audience. For instance, five needs in relation to Pinterest are met through creative ideas, organization, entertainment, fashion and visual exploration; and six needs to Facebook are met through companionship, relationship formation and maintenance, entertainment, escapism, and social curiosity (Foroughi et al., 2021). Whilst, for Instagram, Foroughi et al. (2021) summarized the gratifications that users can gain are the satisfactions of their information, entertainment, social and recognition needs through the sharing of pictures and videos which reflect one's life events. Besides the aforementioned motives, Lee et al. (2015) added that some users seek the pleasure of escapism and peeking from Instagram. It is suggested that users may view Instagram as a coping mechanism in encountering real-life obstacles by engaging themselves in para-social relationships with celebrities. Additionally, unlike Facebook which restricts the exploration of an acquaintance's profile, Instagram stresses on free expression in which the users may peek at others' profiles without necessarily getting the owners' permission, which is meant for seeking like-minded friends or fulfilling their curiosity needs (Lee et al., 2015).

It was mentioned by Foroughi et al. (2021) that more frequent social media involvement is most likely contributed by escapism and social needs, while social media addiction is most likely predicted by entertainment and recognition needs. According to Maslow's Hierarchy of Needs Theory (Maslow, 1943), recognition is one of the pre-requisites

of self-esteem (Aruma & Hanachor, 2017). People will actively participate in activities which offer them recognition so that their self-esteem can be restored or maintained. In this case, it can be predicted that people who possess low self-esteem may use social media more to enhance their self-esteem. Furthermore, Lee et al. (2015) agreed that images are more preferable than texts for self-expression, which makes the visual-oriented Instagram become a new and empowering platform for self-presentation to fulfil one's recognition needs. When users satisfy their recognition needs, the obtained gratifications will then reinforce the use of Instagram. The idea was underpinned by Arora et al. (2020), who proposed that users who have more followers and receive mostly positive feedback are at an elevated risk of getting involved in addictive social media use. Hence, it is hypothesized that undergraduates who have low self-esteem may be more likely to become addicted to Instagram, because they want to gain recognition and improve their self-esteem through enhancing their self-impression online.

According to U&G theory, people would choose a social media platform that is able to fulfil their desires; while the gratifications obtained may reinforce such behavior until it eventually becomes a habit. As suggested by Foroughi et al. (2021) and Lee et al. (2015), people often use Instagram to meet their information and escapism needs. Fernandes et al. (2020) also provided support that escapism is correlated with social media addiction. Fernandes et al. (2020) revealed that there is a vivid increase in problematic internet use among adolescents who perceive surfing Internet as a form of avoidant coping to escape from unfavorable and stressful life events. Moreover, fear related to COVID-19 may cause one to be anxious about their safety and health, and subsequently trigger the information needs; as a consequence, they engage in more online behaviors to search for health information and news related to COVID-19 so as to reduce their fear (Seyed Hashemi et al., 2020). This was supported by Oducado et al. (2021), who believed the knowledge of COVID-19 is inversely

linked to fear. The distinctiveness of Instagram that delivers COVID-19 information in images or videos, which are better in sustaining users' attention and offering direct visual information, provides greater satisfaction to users who crave for the latest news during the pandemic (Foroughi et al., 2021). Hence, it is hypothesized that people who experience a higher level of fear toward COVID-19 may use Instagram more often and ultimately develop Instagram addiction.

**Conceptual Framework**

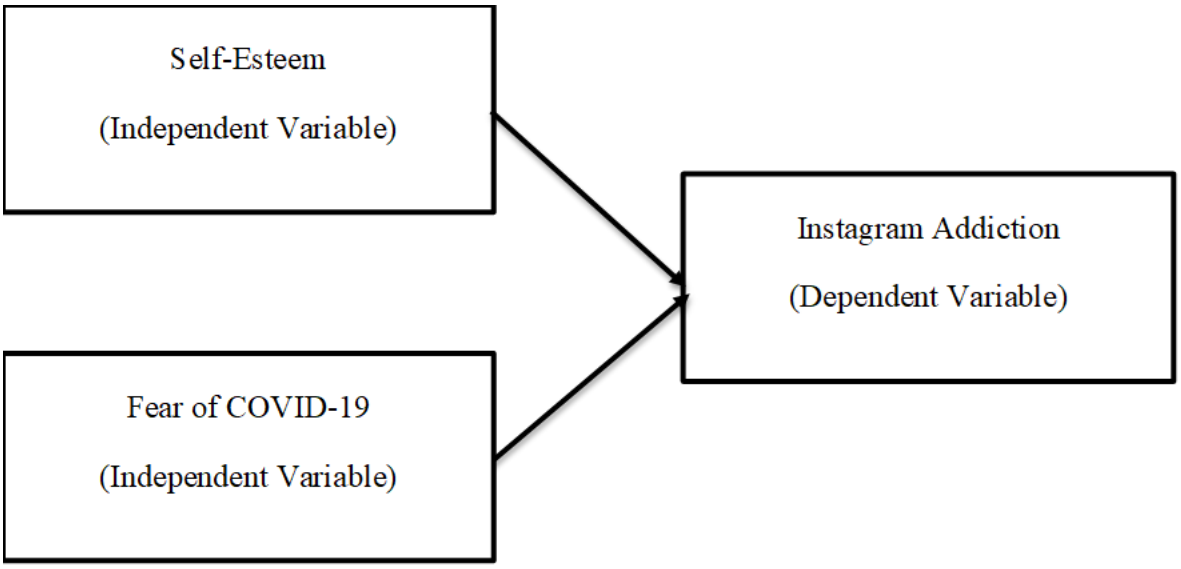



*Figure 1.* The conceptual framework of "Relationship between self-esteem, fear of COVID-19 and Instagram addiction among undergraduates in Malaysia".

# Chapter 3

# Methodology

## Research Design

This study utilised quantitative and correlational research design to investigate the association between self-esteem, fear of COVID-19 and Instagram addiction among undergraduate students in Malaysia. Quantitative methodology was employed because the present study aimed to collect data in the form of numerical values, and conduct statistical analysis to test the research hypotheses (Apuke, 2017). The primary data collected in the present research included data of self-esteem, fear of COVID-19 and Instagram addiction respectively among undergraduates in Malaysia. Cross-sectional design, whereby data was collected from the research sample at one point of time, was selected because it allowed the researchers to measure the correlation between multiple variables at a lower cost (Setia, 2016). Besides that, the survey method was adopted in this study because it aided the researchers to gather information from a large sample group at a single point of time (Ponto, 2015). Participants were given a self-report questionnaire which consisted of a demographic questionnaire and three psychometrically sound instruments.

## Sampling Procedures

### *Sampling Method*

Purposive sampling method, also known as judgement sampling, was applied to target the sample. This non-probability sampling technique was used as it was time-saving and focused on the population of interest, based on their characteristics, to contribute meaningful results that answered the research questions (Etikan et al., 2016). Participants were eligible to take part in the study if they met the inclusion criteria set by the researchers (see Data Collection Procedures).

Undergraduate students, who were young adults aged between 18 to 24 years, were targeted in the present study because this age group was more prone to Instagram addiction due to excessive use of the social media platform (Alhabash & Ma, 2017; Aparicio-Martínez et al., 2020; Kırcaburun & Griffiths, 2019). In addition, Instagram addiction was theorised to bring negative impacts to its users, including poor academic performance (Foroughi et al., 2021; Ponnusamy et al., 2020), social anxiety (Foroughi et al., 2021), depression (Foroughi et al., 2021), loneliness (Ponnusamy et al., 2020) and low psychological well-being (Korkmaz & Dilmaç, 2021). Unfortunately, of the user population, past researchers found that undergraduate students, who aged between 18 to 24 years, were heavy Instagram users (Ponnusamy et al., 2020; Susan, 2019). Hence, it drew attention to conduct the present research to study Instagram addiction among undergraduate students, who fall between the age range from 18 to 24 years, in Malaysia.

### *Location of Study*

An online self-report questionnaire was generated using Qualtrics, which was a web-based software that allowed users to create online surveys, and was disseminated on multiple social media platforms, including Instagram, Microsoft Teams, WhatsApp, and WeChat. The data collection was carried out among undergraduate students from Malaysia, which involved 13 states and three federal territories.

### *Ethical Clearance Approval*

Ethical clearance approval was obtained from Universiti Tunku Abdul Rahman (UTAR) Scientific and Ethical Review Committee (SERC) after the completion of the research proposal. The data collection procedures were initiated after gaining the ethical clearance approval from the relevant authority to ensure the present research was conducted in an ethical manner (Re: U/SERC/299/2021).

## Sample Size, Power and Precision

***Sample Size***

The sample size of the present study was computed using G*Power software version 3.1 (Faul et al., 2009). To test Research Hypotheses 1 and 2, Pearson Product-Moment Correlation (PPMC) was administered to investigate the relationship between self-esteem, fear of COVID-19 and Instagram addiction. According to Cohen (1992), a correlation coefficient of .30 was medium. Hence, Bujang and Baharum (2016) stated that to measure the magnitude of the relationship between two variables, the effect size and power input could be set at .30 and .80 respectively. After inserting every coefficient into G*Power software, including the margin of error of .05, a sample size of 84 was computed for the correlation analysis (see Appendix A).

To investigate Research Hypotheses 3 and 4, Multiple Linear Regression (MLR) was applied to explore the predictive roles of self-esteem and fear of COVID-19 in Instagram addiction. To determine the effect size, the correlation coefficients of the relationship between self-esteem and Instagram addiction from two past studies (Ardiana & Tumanggor, 2020; Rahardjo & Mulyani, 2020) were accordingly inserted into the formula proposed by Cohen (1988), where $f^2 = R^2/(1- R^2)$, followed by averaging these two effect size values. Hence, the effect size obtained was .37. Moreover, there were two predictors in the present study, which were self-esteem and fear of COVID-19. With the power input of .80 and the alpha error probability of .05, the sample size of 30 was computed for the regression analysis (see Appendix A).

Given that there were two statistical tests used in the present research, namely PPMC and MLR, the highest sample size calculated from G*Power, which was 84, was selected. To account for missing data and outliers, a total of 80% was added to the calculated sample size. In short, a total number of 150 undergraduates was targeted in the present study.

***Actual Sample Size***

A total number of 210 responses were collected during the data collection. However, incomplete responses, where the respondents missed out even one item in the online survey form, were removed from further analysis. After removing 22 incomplete responses and 5 outliers which were detected using Statistical Package for the Social Sciences (SPSS) software (IBM Corp., 2015), the final sample size of the present study involved 183 undergraduate students.

## Data Collection Procedures

### *Inclusion and Exclusion Criteria*

In the present research, there were four inclusion criteria to be met by the participants. Participants were eligible to take part in the present study if they met the following inclusion criteria: (i) Malaysian nationality, (ii) young adults aged between 18 to 24 years, (iii) currently pursuing undergraduate studies in Malaysia, and (iv) Instagram users with personal accounts. As for the exclusion criteria, participants who are currently pursuing undergraduate studies in countries other than Malaysia, currently involved in student exchange programs, and provide incomplete responses in the online questionnaire were excluded.

### *Procedures of Obtaining Consent*

Informed consent was obtained from participants in Part A of our questionnaire, which was the Consent Form for Research Participation and Personal Data Protection. This form contained information about the present study, including the purpose of this study, voluntary participation, potential risks, confidentiality concerns, contact information of the researchers, and participant inclusion criteria. Participants were being informed that participation is completely voluntary and thus, they are allowed to withdraw from the research at any time without having to give any explanation. Moreover, it was stated clearly that all information gathered will be kept anonymous and confidential. The data collected from the participants will be used for academic purposes only.

### *Description of Data Collection Procedures*

The online survey form was prepared using Qualtrics, and distributed on several social networking sites (SNSs), including Instagram, Microsoft Team, WhatsApp, and WeChat. To ease the data collection process, a hyperlink was generated so that the participants can access the online survey in one click via the hyperlink shared. To reach out to the undergraduate population, participants were also encouraged to disseminate the hyperlink to their peers. The data collection process lasted for four days, which was from 16 January 2022 to 20 January 2022. After removing outliers and incomplete data, the SPSS software was administered to conduct data analysis.

## Instruments

The self-administered survey form consisted of nine demographic questions, such as age, gender, ethnicity, current academic year and undergraduate programme; and three instruments, namely the 10-item Rosenberg Self-Esteem Scale, 7-item Fear of COVID-19 Scale and 6-item The Instagram Addiction Scale (see Appendix B).

### *10-Item Rosenberg Self-Esteem Scale (RSES)*

The Rosenberg Self-Esteem Scale was created by Rosenberg (1965) to assess one's global self-esteem, which entailed both positive (items 1, 3, 4, 7, and 10) and negative factors (items 2, 5, 6, 8, and 9). Hence, there were a total of ten items being rated on a four-point Likert scale, ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Some sample items were "On the whole, I am satisfied with myself", "At times I think I am no good at all" and "I feel I do not have much to be proud of". To compute the total score, all five items (items 2, 5, 6, 8, and 9) under the negative factor of self-esteem were being reverse scored, followed by adding up all item scores. Participants who scored within the range from 10 to 25 were considered to have a low level of self-esteem; whereas those who scored within the range from 26 to 40 were considered to have a high level of self-esteem. According to a local study

conducted by Subon et al. (2020), this scale showed good internal consistency of .77. Another study reported an acceptable reliability value of .87 (Rahardjo & Mulyani, 2020). Rosenberg (1965) also revealed that this scale achieved satisfactory criterion and convergent validity.

***7-Item Fear of COVID-19 Scale (FCV-19S)***

The Fear of COVID-19 Scale, established by Ahorsu et al. (2020), was administered to assess an individual's fear level of coronavirus disease 19, also known as COVID-19. There were a total of seven items, without any negatively worded items, being rated on a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Examples of items were "I am most afraid of coronavirus-19", "It makes me uncomfortable to think about coronavirus-19", "My hands become clammy when I think about coronavirus-19" and "I am afraid of losing my life because of coronavirus-19". The scores obtained from each item were being summed to obtain the total score, whereby a higher total score indicated greater fear of COVID-19. The concurrent validity of this scale was supported by Ahorsu et al. (2020). Moreover, this scale showed acceptable internal consistency and test-retest reliability, which were .82 and .72 respectively (Ahorsu et al., 2020). Another study conducted by Lin et al. (2020) also reported that this scale obtained satisfactory internal consistency of .89.

***6-Item The Instagram Addiction Scale (TIAS)***

The Instagram Addiction Scale, developed by Sholeh and Rusdi (2019), aimed to measure the extent of Instagram addiction based on six components proposed by Griffiths' addiction model (2005). There were two subscales in this scale, namely Instagram Feed Addiction, which examined the addictive behavior associated with Instagram feed, and Instagram Stories Addiction, which assessed the addictive behavior related to Instagram stories. Both served as main features on Instagram, in which Instagram feed allowed its users to post photos and videos on newsfeed page to gain likes and comments; whereas Instagram stories enabled its users to share their everyday moments in the forms of photos

and videos that will disappear 24 hours after they were posted (Sholeh & Rusdi, 2019). Each subscale consisted of six items, representing each addiction component introduced by Griffiths (2005). That said, the overall scale contained 12 items in total. Some examples of items in Instagram Feed Addiction were “I often think about what is happening on Instagram when I do not access it”, and “I post photos/videos on Instagram feed to attract others’ attention”. As for Instagram Stories Addiction, some items were “I feel there is an urge to continue checking Instagram stories continuously”, and “I watch Instagram stories too much that I neglect work/lectures/study time”. This scale employed a five-point Likert scale with the range from 1 (*strongly disagree*) to 5 (*strongly agree*). All item scores were being summed to compute the total score obtained. Hence, the total score was within the range from 12 to 60. A higher total score indicated a higher level of Instagram addiction. The internal consistency of Instagram Feed Addiction ranged from .65 to .92; whereas that of Instagram Stories Addiction ranged from .34 to .88, demonstrating satisfactory reliability (Sholeh & Rusdi, 2019). Furthermore, the convergent validity of the entire scale was supported by the significant correlation values with the comparative constructs, which were Instagram Addiction Scale (IAS), Social Media Engagement Scale (SMES), Instagram Behavior and Instagram Attitude (Sholeh & Rusdi, 2019).

# Chapter 4

# Results

## Descriptive Statistics

### *Demographic Characteristics*

Table 4.1 reported the demographic information of the research sample. The sample involved 183 respondents, who aged from 18 to 24 years and the mean age of the sample was 21.91 years (*SD* = 1.00). There were 137 females (74.90%) and 46 males (25.10%). Furthermore, the sample consisted of 89.10% of Chinese, 7.70% of Malay, 2.20% of Indian, and 1.10% of Punjabi. More than half (65%) of the respondents were third-year undergraduates, followed by second-year undergraduates (21.90%), fourth-year undergraduates (7.70%), first-year undergraduates (4.40%) and fifth-year undergraduates (1.10%). There were 38.80% of respondents from accounting, business, entrepreneurship, finance, management and taxation programme, 20.77% from social sciences programme, 10.38% from arts, design, fashion and creative industries programme, 6.01% from engineering and technology programme, 6.01% studying medicine, dentistry and pharmacy programme, 5.46% taking computing, information, communication and technology programme, 3.83% from mathematics, pure and applied sciences, and 8.74% studying other programmes. In addition, there were 36.10% of undergraduates currently studying at universities located in Perak, followed by 25.10% in Selangor, 12.00% in Malacca, 8.70% in Kuala Lumpur, 8.70% in Johor, 3.80% in Penang, and 5.20% from other states. Majority of them (49.18%) were currently studying at Universiti Tunku Abdul Rahman. The universities of which other respondents were from included Asia Pacific University of Technology and Innovation, Brickfields Asia College, FTMS College, HELP University, Institut Pendidikan Guru Kampus Gaya, Lam Wah Ee Nursing College, MAHSA University, Malaysia Institute of Art, Manipal University College Malaysia, Monash University, Multimedia University,

New Era University College, Reliance College, Southern University College, Sunway University, Swinburne University of Technology Sarawak, Taylor's University, Tunku Abdul Rahman University College, UCSI University, Universiti Selangor Bestari Jaya, Universiti Kebangsaan Malaysia, Universiti Pendidikan Sultan Idris, Universiti Putra Malaysia, Universiti Teknologi Malaysia, Universiti Teknologi MARA, Universiti Tun Hussein Onn, Universiti Utara Malaysia, Heriot-Watt University Malaysia, Universiti Malaya, University of Nottingham Malaysia, University of Reading Malaysia, Universiti Sains Malaysia and Xiamen University Malaysia.

**Table 4.1**

*Demographic Information of Research Sample (n = 183)*

| | *n* | *%* | *M* | *SD* | Min | Max |
|---|---|---|---|---|---|---|
| Gender | | | | | | |
| Male | 46 | 25.10 | | | | |
| Female | 137 | 74.90 | | | | |
| Age | | | 21.91 | 1.002 | 19 | 24 |
| 19 | 1 | .50 | | | | |
| 20 | 10 | 5.50 | | | | |
| 21 | 49 | 26.80 | | | | |
| 22 | 82 | 44.80 | | | | |
| 23 | 26 | 14.20 | | | | |
| 24 | 15 | 8.20 | | | | |
| Academic Year | | | | | | |

| | | |
|---|---|---|
| First Year | 8 | 4.40 |
| Second Year | 40 | 21.90 |
| Third Year | 119 | 65.00 |
| Fourth Year | 14 | 7.70 |
| Fifth Year | 2 | 1.10 |
| Programme Type | | |
| Accounting, Business, Entrepreneurship, Finance, Management and Taxation | 71 | 38.80 |
| Social Sciences | 38 | 20.77 |
| Arts, Design, Fashion and Creative Industries | 19 | 10.38 |
| Engineering and Technology | 11 | 6.01 |
| Medicine, Dentistry and Pharmacy | 11 | 6.01 |
| Computing, Information, Communication and Technology | 10 | 5.46 |
| Mathematics, Pure and Applied Sciences | 7 | 3.83 |
| Others | 16 | 8.74 |
| Location of University | | |
| Perak | 66 | 36.10 |
| Penang | 7 | 3.80 |

| | | |
|---|---|---|
| Selangor | 46 | 25.10 |
| Johor | 16 | 8.70 |
| Malacca | 22 | 12.00 |
| Kuala Lumpur | 16 | 8.70 |
| Others | 10 | 5.20 |

*Note.* *n* = number of cases; *%* = percentage; *M* = mean; *SD* = standard deviation; Min = minimum value; Max = maximum value

***Topic-Specific Characteristics***

Table 4.2 illustrated the frequency distribution of the respondents on topic-specific variables, including self-esteem, fear of COVID-19 and Instagram addiction. For the variable of self-esteem, the classification of scores was in accordance with the scale interpretation suggested by Rosernberg (1965), whereby respondents scored between 10 and 25 experienced low self-esteem level while those scored between 26 and 40 experienced high self-esteem level. For the variable of fear of COVID-19, since the authors did not specify the classification of scores, the cut-off point of 17.5 was applied based on the Receiver Operating Characteristic (ROC) curves constructed by Mohsen et al. (2021). The authors of the Instagram addiction variable did not state the classification of scores but suggested the use of percentile categorization to determine addiction levels. Hence, the median formula, (n + 1)/2, was applied to determine the cut-off point. By substituting 49 into the formula, the 25th number, which was 36, served as the cut-off point to classify the respondents into either low or high levels of Instagram addiction. As a result, 34.40% of respondents (*n* = 63) had low self-esteem whereas 65.60% of them (*n* = 120) had high self-esteem. Not only that, 31.10% of respondents (*n* = 57) experienced a low level of fear towards COVID-19 whereas 68.90% of them (*n* = 126) experienced a high level of fear towards COVID-19. In addition, there were 66.10% of respondents (*n* = 121) faced with a low level of Instagram addiction whereas

33.90% of them (*n* = 62) faced with a high level of Instagram addiction.

**Table 4.2**
*Frequency Distribution of Topic-Specific Characteristics (i.e., Self-Esteem, Fear of COVID-19 and Instagram Addiction) (n = 183)*

| | *n* | *%* | *M* | *SD* | Min | Max |
|---|---|---|---|---|---|---|
| Self-Esteem | | | 26.89 | 3.68 | 17 | 35 |
| Low (<26) | 63 | 34.40 | | | | |
| High (≥26) | 120 | 65.60 | | | | |
| Fear of COVID-19 | | | 19.99 | 5.42 | 8 | 35 |
| Low (<17.5) | 57 | 31.10 | | | | |
| High (≥17.5) | 126 | 68.90 | | | | |
| Instagram Addiction | | | 32.55 | 9.30 | 12 | 54 |
| Low (<37) | 121 | 66.10 | | | | |
| High (≥37) | 62 | 33.90 | | | | |

*Note.* *n* = number of cases; *%* = percentage; *M* = mean; *SD* = standard deviation; Min = minimum value; Max = maximum value

## Data Diagnostic and Missing Data

### *Frequency and Percentages of Missing Data*

There were a total number of 22 missing data (10.48%) being detected using SPSS software and removed from further analysis because the minimum sample size calculated using G*Power software, which was 84, was still achieved even after the data removal. Therefore, there were a total number of 188 data being processed in further analysis.

### *Criteria for Post Data-Collection Exclusion of Participants*

After scanning through the collected responses, all of them were found to fulfil the inclusion criteria set by the researchers (see section Inclusion and Exclusion Criteria). Hence, no response was excluded.

***Assumptions of Normality***

Normality tests were conducted for all variables, including self-esteem, fear of COVID-19 and Instagram addiction, in the present research. The tests included histogram, P-P plot, skewness and kurtosis, as well as Kolmogorov-Smirnov (K-S) Test.

**Histogram.** The histograms for all variables were normally distributed since all graphs looked nearly symmetrical if they were being cut in the middle (refer to Appendix C). Hence, it was suggested the normality derived from histogram was met by all variables.

**P-P Plot.** The normality based on P-P plots for all variables was satisfied because the majority of the observed scores fell closely or exactly on the diagonal line which represented the expected score (see Appendix D).

**Skewness and Kurtosis.** All variables did not violate normality assumption based on the skewness result because the values were within the acceptable range of ± 2 (Gravetter & Wallnau, 2014), which were .255, .040 and .166 for self-esteem, fear of COVID-19 and Instagram addiction respectively (see Table 4.3). Likewise, the normality assumption derived from the kurtosis result was not violated as well because the values of all variables fell within the acceptable range of ± 2 (Gravetter & Wallnau, 2014), which were .037, -.213 and -.138 for self-esteem, fear of COVID-19 and Instagram addiction respectively (see Table 4.3).

**Kolmogorov-Smirnov (K-S) Test.** As shown in Appendix E, the variables of self-esteem, $D$ (188) = .09, $p$ = .002 and fear of COVID-19, $D$ (188) = .08, $p$ = .003 had violated the normality assumption based on K-S test due to the significant results, indicating there was a difference between sample normality and population normality. On the other hand, the variable of Instagram addiction, $D$ (188) = .05, $p$ = .20 did not violate the normality

assumption based on K-S test because its non-significant result suggested that there was no difference between sample normality and population normality.

**Conclusion of Assumptions of Normality.** There were four out of five normality indicators, which were histogram, P-P plot, skewness and kurtosis, being satisfied by the variables of self-esteem and fear of COVID-19. As for the variable of Instagram addiction, all five indicators were satisfied. Since more than half of the normality indicators were fulfilled by all variables, the normality of data distribution was met.

**Table 4.3**
*Skewness and Kurtosis*

| | Skewness | Kurtosis |
|---|---|---|
| Self-Esteem | .255 | .037 |
| Fear of COVID-19 | .040 | -.213 |
| Instagram Addiction | .166 | -.138 |

### *Defining and Processing of Statistical Outliers*

The statistical outliers were detected based on the boxplot generated from the normality tests via SPSS software (see Appendix F). There were four outliers (Cases 40, 98, 123, and 208) being revealed in the variable of self-esteem, and another one outlier (Case 111) being detected in the variable of Instagram addiction. Conversely, no outlier was found in the variable of fear of COVID-19. In short, the total number of valid data involved in the statistical analysis was 183 after removing these five outliers.

### Assumptions of Multiple Linear Regression

According to Berry (1993), there were assumptions to be met for regression analysis to ensure the regression model can be generalized. Hence, in this research, four tests were conducted to check the assumptions of multicollinearity, independence of errors, multivariate outliers and influential cases, as well as normality and linearity of residuals and homoscedasticity.

**Test on Multicollinearity.** Multicollinearity is an issue where the correlations

between predictors are high, which in turn, brings substantial impact on the results. Tolerance and Variance Inflation Factor (VIF) were used to test multicollinearity among the predictors, which were self-esteem and fear of COVID-19. According to Hair et al. (2010) and Pallant (2010), the cut-off threshold for tolerance and VIF were ≤ .10 and ≥ 10 respectively to be considered as multicollinearity. Hence, as shown in Table 4.4, the multicollinearity assumption was violated for all predictors because the tolerance values were > .10 and the VIF values were < 10, indicating no multicollinearity had occurred.

**Test on Independence of Errors.** The assumption of independent errors should be met to indicate an independent correlation between residuals. Durbin Watson was used to test this assumption in the present study. According to Field (2009), values < 1 or > 3 would be considered as violating the assumption; on the other hand, values closer to 2 would suggest a congruence to the assumption. As shown in Table 4.5, it can be concluded that the assumption of independence of errors was not violated because the value obtained was 1.957.

**Test on Normality and Linearity of Residuals and Homoscedasticity.** As shown in Appendix G, the scatterplot portrayed an oval shape with residuals being distributed evenly and randomly. Thus, the assumption of normality and linearity of residuals and homoscedasticity were satisfied.

**Test on Multivariate Outliers and Influential Cases.** As shown in Appendix H, case numbers 2, 3, 22, 23, 25, 105, 113, 160, and 179 appeared to be potential outliers. To determine whether to exclude them, the residual statistics, which included Cook's Distance, Leverage, and Mahalanobis Distance, were used. Given that two out of three of the residual statistics were violated, the particular case would be removed. According to Cook and Weisberg (1982), cases with Cook's Distance > 1 were potential outliers; hence, no violation was resulted because all aforementioned cases acquired Cook's Distance of ≤ 1. Besides that, using the formula, where Leverage = (p+1)/n, the value of .02 was computed. According to

Hoaglin and Welsch (1978), cases with values > 2 times of Leverage's value were potential outliers. Since all cases obtained ≤ 2 times of Leverage's value, they were retained. Lastly, based on the rule of thumb for Mahalanobis Distance, the conservative cut-off point of a sample of 100 was > 15; as such, no violation was resulted. Therefore, all nine cases were not excluded from further analysis because they satisfied the benchmarks (see Appendix I).

Aside from these nine cases, there were another seven potential outliers (Cases 13, 69, 81, 130, 153, 159, and 199) being observed to have values > 2 times of Leverage's value (Hoaglin & Welsch, 1978). However, according to Steven (1984), cases with values > 3 times of Leverage's value were acceptable as well; thus, all cases, except case number 81, were not removed. Despite the violation in Leverage for case number 81, it was still being retained because it fulfilled the other two residual statistics, which were Cook's Distance and Mahalanobis Distance (see Appendix I).

In short, based on this test, no potential outliers were being removed because all cases satisfied at least two residual statistics. Hence, a total number of 183 data were used in further statistical analysis.

**Conclusion on Assumptions of Multiple Linear Regression.** There were no multicollinearity, dependence of errors, and removal of potential outliers. On the flip side, the normality and linearity of residuals and homoscedasticity were met. Therefore, it can be concluded that the assumption tests of Multiple Linear Regression were satisfactory.

**Table 4.4**
*Multicollinearity Test*

| | | Tolerance | VIF |
|---|---|---|---|
| 1 | (Constant) | | |
| | Self-Esteem | .978 | 1.022 |
| | Fear of COVID-19 | .978 | 1.022 |

Dependent Variable: Instagram Addiction

**Table 4.5**
*Independence of Errors Test*

| Model | Durbin-Watson |
|---|---|
| 1 | 1.957 |

*Note.* Dependent Variable = Instagram Addiction. Predictors = Self-Esteem, and Fear of COVID-19

***Data Transformation***

Among the three instruments used in this study, the Rosenberg Self-Esteem Scale (RSES) was the only instrument with negative items (items 2, 5, 6, 8, and 9). Hence, the scores obtained in these negative items were reversed based on the four-point Likert scale, ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). To illustrate, the response of 1 was reversed to 4; while the response of 2 was reversed to 3. After transforming these data, the researchers proceeded with computing the total score for further statistical analysis.

**Statistical Analyses**

In this research, there were four research hypotheses to be investigated. The results will be discussed based on each hypothesis accordingly.

***$H_{1a}$: There is a significant relationship between self-esteem and Instagram addiction among undergraduates in Malaysia.***

PPMC was conducted to test whether there was a significant relationship between self-esteem and Instagram addiction. The assumptions of this parametric test were met to ensure the data distribution was normal (see section Analyses of Data Distributions).

As shown in Table 4.6, the result demonstrated that there was no significant relationship between self-esteem and Instagram addiction, $r(181) = -.133$, $p = .072$. Therefore, $H_{1a}$ was rejected.

***$H_{1b}$: There is a significant relationship between fear of COVID-19 and Instagram addiction among undergraduates in Malaysia.***

PPMC was conducted to test if there is a significant relationship between fear of COVID-19 and Instagram addiction. The assumptions of this parametric test were met to

ensure the normality of data distribution (see section Analyses of Data Distributions).

As shown in Table 4.6, the result showed that there was a statistically significant relationship between fear of COVID-19 and Instagram addiction, $r(181) = .580$, $p < .001$. The correlation was positive, and according to Guildford (1973), it was a moderate correlation because the correlation coefficient, *r*, fell within the range from ± .4 to ± .7. Hence, $H_{1b}$ was supported.

**Table 4.6**

*Correlation Among Variables (n = 183)*

| Variables | 1 | 2 | 3 |
|---|---|---|---|
| 1. Self-Esteem | - | - | -.133 |
| 2. Fear of COVID-19 | - | - | .580** |
| 3. Instagram Addiction | -.133 | .580** | - |

*Note.* * $p < .05$; ** $p < .01$

***$H_{1c}$: Self-esteem significantly predicts Instagram addiction among undergraduates in Malaysia.***

The assumptions of MLR, including multicollinearity, independence of errors, multivariate errors, and influential cases, as well as normality and linearity of residuals and homoscedasticity, were checked to ensure the regression model fit the observed data (see section Analyses of Data Distributions).

MLR was conducted to test whether self-esteem significantly predicted Instagram addiction. As shown in Table 4.7, the regression model was statistically significant, $F(2, 180) = 46.112$, $p = < .001$ and accounted for 33.1% of the variance. By using the formula, where $f^2 = R^2 / (1 - R^2)$, the effect size of $f^2 = .51$ was found, indicating a large effect size (Cohen, 1988). However, it was found that self-esteem ($\beta = -.049$, $p = .424$) did not significantly predict Instagram addiction (see Table 4.8). Therefore, $H_{1c}$ was rejected.

***$H_{1d}$: Fear of COVID-19 significantly predicts Instagram addiction among undergraduates in Malaysia.***

The assumptions of MLR were checked to ensure the generalisation of the regression model (see section Analyses of Data Distributions).

MLR was used to examine if fear of COVID-19 significantly predicted Instagram addiction. As shown in Table 4.7, the regression model was statistically significant, $F(2, 180) = 46.112$, $p = < .001$. A total of 33.1% variances in Instagram addiction were explained by self-esteem and fear of COVID-19. The effect size of $f^2 = .51$ computed using the formula, where $f^2 = R^2 / (1 - R^2)$, was large (Cohen, 1988). Moreover, as shown in Table 4.8, fear of COVID-19 was also found to be a positive predictor to Instagram addiction ($\beta = .573$, $p < .001$). Thus, $H_{1d}$ was supported.

**Table 4.7**
*Regression Model Summary*

| | *df* | *F* | *p* | Adj. $R^2$ | $R^2$ |
|---|---|---|---|---|---|
| Regression | 2 | 46.112 | .000 | .331 | .339 |
| Residual | 180 | | | | |
| Total | 182 | | | | |

*Note.* Dependent Variable = Instagram Addiction. Predictors = Self-Esteem, and Fear of COVID-19

**Table 4.8**
*Coefficients Among Variables*

| | *t* | Std. β | Unstd. β | *p* |
|---|---|---|---|---|
| Self-Esteem | -.802 | -.049 | -.124 | .424 |
| Fear of COVID-19 | 9.348 | .573 | .984 | .000 |

*Note.* Dependent Variable = Instagram Addiction. Std. β = Standardized Beta. Unstd. B = Unstandardized Beta

# Chapter 5

## Discussion and Conclusion

This study examined the relationships between self-esteem, fear of COVID-19 and Instagram addiction among undergraduates in Malaysia. Moreover, the predictive roles of self-esteem and fear of COVID-19 on Instagram addiction were also investigated respectively. Based on the statistical analyses, $H_{1a}$ and $H_{1c}$ were rejected; whereas $H_{1b}$ and $H_{1d}$ were supported.

### Self-Esteem and Instagram Addiction

The $H_{1a}$, which hypothesised there is a significant relationship between self-esteem and Instagram addiction among undergraduates in Malaysia, was rejected. Similarly, the $H_{1c}$, which hypothesised that self-esteem significantly predicts Instagram addiction among undergraduates in Malaysia, was rejected.

The present findings were not in line with past studies that depicted self-esteem negatively predicts Instagram addiction (Balcı & Karaman, 2020; Eraslan-Capan, 2015; Moore & Craciun, 2020; Zurafa & Dewi, 2021). These researchers believed that individuals with low self-esteem are characterised by suspicions and insecurities, which then creates greater obstacles for them to establish social connection with others in the real world (Akkuş Çutuk, 2021). On the flip side, social media offers them an enchanting opportunity to express themselves and socialise with others anonymously; consequently, they become obsessed with this gratification and thus, increasing their risk of developing social media addiction (Akkuş Çutuk, 2021).

However, there were also past studies supporting the non-significant role of self-esteem in predicting Instagram addiction (Horzum & Ayas, 2013; Wahyuni & Maksum, 2019). A meta-analysis conducted by Fumero et al. (2018) also found a similar result by revealing that, as compared to other personal factors, self-esteem is not a strong predictor of

addiction. Saiphoo et al. (2020) provided the notion that the association between addictive use of social media and self-esteem is determined or mediated by the social media contents encountered. To illustrate, contents that prompt social comparison, whereby the users' self-esteem might be either enhanced or threatened by making comparison with others, are more likely to promote compulsive use of social media as compared to the neutral ones (Saiphoo et al., 2020). This was supported by Moore and Craciun (2020), who claimed that individuals tend to fall into the trap of social comparison when they learn others' life stories on Instagram, thereby diminishing their self-esteem; on the other hand, other neutral contents such as pandemic-related information do not prompt social comparison and thus, causing no impact on their self-esteem. Kocabıyık (2021) also emphasised that, during the pandemic, up to 90% of individuals obtain pandemic-related information, rather than other topics, on social media. Likewise, Buchanan et al. (2021) revealed that individuals tend to spend at least half an hour daily to seek information pertaining to COVID-19 on social media. In other words, social media users are more likely to seek pandemic-related information, which does not prompt social comparison that affects self-esteem, during the COVID-19 pandemic. Hence, it demonstrated the possible reason why the present study found a non-significant correlation between self-esteem and Instagram addiction.

The phenomenon can also be explained using U&G Theory, which highlighted that individuals tend to develop addiction to certain SNS or social media platforms due to the satisfactions of needs gained from their use from the use (Foroughi et al., 2021). The present study was conducted during the COVID-19 pandemic, where social need might appear to be more salient than recognition need to the young adults. This was supported by Pandya and Lodha (2021) that the movement restriction during the COVID-19 pandemic has posed barriers to social interaction, thereby aggravating the need for socialisation through social media. Foroughi et al. (2021) also revealed that young adults are in the pivotal stage of

relationship formation and maintenance to attain social support and the sense of belonging. As a result, the desire to strengthen social connection with others motivates them to spend more time and concern on Instagram, thus increasing their risk of developing Instagram addiction. This was pinpointed by the Erikson's Stages of Psychosocial Development (Erikson, 1963) that young adults, who were the respondents of the present study, incline to prioritise close relationship development to become functioning individuals. Therefore, it illustrated that the need for recognition might not be the primary gratification to seek from Instagram during the COVID-19 pandemic among Malaysian undergraduates, which was also similar to the present finding that there was no significant relationship between self-esteem and Instagram addiction.

Besides, Lannoy et al. (2020) claimed that individuals with higher implicit self-esteem, rather than explicit self-esteem, are more likely to develop addiction. This was also supported by Stieger and Burger (2010) who revealed that those with higher implicit self-esteem tend to be addicted to the Internet. Explicit self-esteem refers to the self-report self-esteem which reflects rational judgement; whereas implicit self-esteem refers to self-esteem which lies under the unconscious mind (Lannoy et al., 2020). Lannoy et al. (2020) explained that individuals who possess high implicit self-esteem are often overconfident about their ability in self-management and thus, more inclined to engage in risky behaviours. Nevertheless, the Rosenberg Self-Esteem Scale (RSES) used in the present study is commonly used by other researchers to measure explicit self-esteem only (Smeijers et al., 2017; Wegener et al., 2015). Since explicit and implicit self-esteem were not differentiated in this study, they might play as the confounding factors on the correlation between self-esteem and Instagram addiction, thereby contributing to the non-significant role of self-esteem in predicting Instagram addiction in the present study.

**Fear of COVID-19 and Instagram Addiction**

The $H_{1b}$, which hypothesised that there is a significant relationship between fear of COVID-19 and Instagram addiction among undergraduates in Malaysia, was supported. Moreover, the $H_{1d}$, which hypothesised that fear of COVID-19 significantly predicts Instagram addiction among undergraduates in Malaysia, was also supported.

The findings were consistent with several past studies (Fumero et al., 2018; Ting & Essaub, 2021; Yam et al., 2021). Yam et al. (2021) stated that the anxiety, worry and fear due to the COVID-19 might increase one's vulnerability of developing problematic handphone use. As supported by the meta-analysis conducted by Fumero et al. (2018), emotional factors are more associated with Internet addiction. To picture, during challenging times, individuals tend to experience a high level of impulsivity, which leads to the lack of control over behaviour and eventually, increases the likelihood of developing Internet addiction (Tang, 2018). Amidst the pandemic where social isolation occurs, handphone or Internet use is inevitable as they serve as the primary source of social support and information related to COVID-19 (Oducado et al., 2021). Yam et al. (2020) depicted that, during the lockdown period, most individuals begin to work from home or engage in ERT as an attempt to curb the COVID-19 infection; consequently, it results in greater amount of screen time, which leads to an increased risk of social media addiction. This was supported by Browning et al. (2021) and Sundarasen et al. (2020) that excessive screen time acts as a significant risk factor for social media addiction. Not to mention, individuals also have greater tendency to seek more information related to COVID-19 on social media to not only ensure their safety and health, but also get rid of their fear and anxiety by filling their knowledge gap (Kocabıyık, 2021). In line with Kocabıyık (2021), Oducado et al. (2021) suggested a negative linkage between COVID-19 knowledge and fear, implying one's strong desire to use social media to obtain more information related to COVID-19 as an attempt to reduce their anxiety. Meanwhile, social media also becomes the most accessible tool to obtain information related to COVID-

19 due to the physical restriction policy during the pandemic. This was supported by González-Padilla and Tortolero-Blanco (2020), who claimed that COVID-19 pandemic is the first ever health crisis with the highest social media usage as compared to other crises in the past. Therefore, there is a higher likelihood that individuals with greater fear of COVID-19 develop social media addiction, thus explaining the present findings that fear of COVID-19 significantly and positively predicted Instagram addiction.

The findings can also be discussed using the U&G Theory. This theory highlighted that individuals repeatedly utilise SNS to satisfy their needs and gratifications (Foroughi et al., 2021). When one experiences an overly high level of fear, they have a greater likelihood to engage in escapism by compulsively using social media to alleviate their negative sentiments, such as fear and anxiety (Lee et al., 2015). To picture, undergraduate students, who were the respondents in the present study, incline to use Instagram excessively as a coping approach to escape from their real-world difficulties resulting from the unexpected change of learning mode amid the COVID-19 pandemic (Kircaburun & Griffiths, 2019; Rodríguez-Hidalgo et al., 2020). Kırcaburun and Griffiths (2018) further elaborated on the process of escapism, wherein individuals get to mitigate their unpleasant thoughts when they gain a sense of involvement by interacting with other social media users, such as liking and commenting on their posts; consequently, it reinforces their excessive use and further increases their risk of developing addiction, thereby illustrating a vicious cycle. In addition, the enhancement filters, which are the technological features of visual-oriented Instagram, tend to elicit greater impact in relieving one's negative emotions, such as fear towards COVID-19 (Tutgun-ünal, 2020). In other words, Instagram offers higher satisfaction to its users, which then drives them to use Instagram compulsively. Consequently, such an abusive usage pattern of Instagram leads to the development of Instagram addiction among the undergraduate students (Blasi et al., 2019; Gao et al., 2020; Islam et al., 2020; Király et al.,

2020; Priego-Parra, 2020), which is similar to the present finding that fear of COVID-19 significantly predicted Instagram addiction.

Apart from that, the results were also in agreement with the Self-Medication Theory which emphasised that individuals tend to seek the mood modification outcomes of substance abuse, such as drug and alcohol, as well as other addictive activities, during times of distress given that they have limited access to adaptive coping mechanism (Ting & Essaub, 2021). This theory corroborated the ideas of Morales-Rodríguez (2021) and Servidio et al. (2021), who suggested that, during difficult times, such as the current COVID-19 pandemic, individuals' decision-making ability might be distorted due to psychological distress, thereby leading them to excessively engage in unhealthy online activities to alleviate their emotional disturbances. To support, numerous studies demonstrated a notable increase in addictive behaviours, such as watching dramas, using social media, playing online games and even online gambling, during the pandemic as an attempt to mitigate fear and anxiety (Hakansson et al., 2020; Lippi et al., 2020). Likewise, it was also found that the use of social media, including Instagram, increased remarkably by 70% as compared to pre-pandemic (Kocabıyık, 2021). Hence, consistent with the present study, fear of COVID-19 positively predicted Instagram addiction.

## Implications

### *Theoretical Implications*

The present study filled the research gap by focusing on Instagram, as a social media platform, to investigate its correlations with self-esteem and fear of COVID-19 respectively. This contribution is vital because the research insight into Instagram addiction remains unclear to date (Foroughi et al., 2021; Kircaburun & Griffiths, 2019). To illustrate, most of the past studies focused on other social media platforms instead, including Facebook addiction (Błachnio et al., 2016; Brailovskaia et al., 2019; Foroughi et al., 2019; Iranmanesh

et al., 2019; Kanat-Maymon et al., 2018) and Twitter addiction (Arora et al., 2020; Dwyer & Fraser, 2016). As explained by Alhabash and Ma (2017) and Griffiths (2018), different social media platforms involved different technological features, structures, as well as gratifications and motives, thereby demonstrating the importance of narrowing the research focus on Instagram to gain relevant research understanding. Apart from that, the present study also contributed to the extant literature in the Malaysian context as most of the previous studies were conducted in other cultural contexts, including Mexico (Priego-Parra et al., 2020), Turkey (Kayis et al., 2021; Peker et al., 2021), Iran (Lin et al., 2020), Philippines (Oducado et al., 2021) and Italy (Servidio et al., 2021). Not to mention, none of them focused on Instagram but other constructs, including problematic Internet use (Peker et al., 2021), Internet addiction (Priego-Parra et al., 2020; Servidio et al., 2021), problematic social media use (Lin et al., 2020), smartphone addiction (Kayis et al., 2021) and Internet use (Oducado et al., 2021). Hence, the present study shed new lights by uncovering the non-significant relationship between self-esteem and Instagram addiction, and the significant relationship between fear of COVID-19 and Instagram addiction in the Malaysian context.

Besides, to the authors' knowledge, the present research served as the pioneer in unveiling the positive role of fear of COVID-19 in predicting Instagram addiction. Fear of COVID-19 is considered a relatively novel construct introduced by Ahorse et al. (2020), wherein its correlation with Instagram addiction was unknown. Moreover, mixed results were reported in the existing literature concerning the relationship between general social media use and fear of COVID-19 (Ahmad & Murad, 2020; Gao et al., 2020; Lin et al., 2020; Mertens et al., 2020; Oducado et al., 2021), thereby indicating further investigations were in need (Fernandes et al., 2020; Servidio et al., 2021). That said, the present research enlarged the literature database by contributing new research insight into the significant correlation between fear of COVID-19 and Instagram addiction.

Aside from that, the present research also reported a surprising finding related to the non-significant predictive role of self-esteem on Instagram addiction, which was contrary to past findings (Balcı & Karaman, 2020; Eraslan-Capan, 2015; Moore & Craciun, 2020; Zurafa & Dewi, 2021). Since this study was carried out during the current health crisis of COVID-19, social need might be more salient than recognition need that contributed to the enhancement of self-esteem (Pandya & Lodha, 2021; Ponnusamy et al., 2020). In other words, contextual or environmental factors might play an influential role on individuals' motives of using Instagram. This was supported by Jiang (2021), who revealed an increase in Instagram usage among the undergraduate students during the COVID-19 pandemic to acquire and communicate the latest pandemic-related news. Similarly, a local study which involved undergraduate students also found that Instagram usage greatly increased during the COVID-19 pandemic (Fernandes et al., 2020). In short, the present study offered a new insight by demonstrating there might be other more influential factors than self-esteem in predicting Instagram addiction in different circumstances or situations to gain comprehensive understanding.

***Practical Implications***

The present research identified fear of COVID-19 as the risk factor contributing to Instagram addiction. Thus, this empirical finding aided university counsellors and other relevant authorities in targeting and supporting undergraduates who experience high levels of fear of COVID-19 because they are at a greater risk of developing Instagram addiction. This is important because several researchers pointed out the aversive consequences of Instagram addiction, including poor academic performance, social anxiety, depression, and loneliness (Foroughi et al., 2021; Ponnusamy et al., 2020). During times of distress such as the current pandemic, individuals are more likely to engage in addictive activities because they have limited access to adaptive coping strategies (Morales-Rodríguez, 2021; Servidio et al., 2021).

That said, tertiary educational institutions could pay more attention to this vulnerable group by providing them with proper resources to alleviate their negative sentiments, such as anxiety and fear towards COVID-19. For instance, university counsellors could offer more easily accessible counselling services for undergraduates, such as arranging both face-to-face and remote counselling sessions. Moreover, mental health programs, such as life skills training and mindfulness therapy, could be provided for undergraduates to acquire adaptive coping skills that are helpful to deal with their fear of COVID-19, thereby diminishing their risk of developing Instagram addiction.

Moreover, the present study also raised public concern and awareness of the importance of mental health because psychological distress, such as fear of COVID-19, was found to be the risk factor of Instagram addiction. Rather than engaging in excessive Instagram use which might result in Instagram addiction (Arora et al., 2020; Chung et al., 2019; Kuss & Griffiths, 2017), the policymakers and professionals could design outreach programs that educate the general population about the risk factor of Instagram addiction and proper ways to manage their fear of COVID-19 in a healthy and adaptive manner. For instance, according to the consensus guidance proposed by Király et al. (2020), coping strategies, such as meditation, listening to music, spending time with family, receiving an appropriate amount of pandemic-related updates from reliable sources and seeking mental health professional support, are helpful to reduce fear of COVID-19, which in turn, minimising the risk of Instagram addiction. In short, the present research offered empirical evidence for policymakers and relevant authorities to design evidence-based initiatives.

**Limitations of the Study**

The first limitation was the use of non-probability sampling techniques, which might result in poor generalisation of findings to the population. To be particular, purposive sampling method was employed in this study, where there were specific inclusion criteria to

be met by the respondents. In other words, the researchers are subjective and biased in selecting the research sample, thereby hampering the researchers from drawing inferences about the population (Etikan et al., 2016). As supported by Wisniowski et al. (2020), samples that are recruited using non-probability sampling techniques are less accurate at reflecting the characteristics of the larger group and thus, are less representative of the population. As a result, the generalizability of the present findings was subject to this limitation.

Furthermore, the present study adopted the online self-report questionnaire to collect data from respondents via social media; consequently, it might involve some response biases which in turn, affect the accuracy of the research findings. One of the response biases could be social desirability bias, whereby respondents tend to provide responses in a socially desirable manner, which in turn, results in biased data that impede the accuracy of results (Doduo & Winter, 2014; Rosenman et al., 2011). For instance, the twelfth item in the 6-Item The Instagram Addiction Scale (TIAS) required respondents to rate to what extent they watch Instagram stories too much that they neglect work, lectures, and study time. Hence, some respondents might provide inaccurate responses due to their perception that agreeing to this item indicates they are an irresponsible and weak person who fails to regulate themselves. Moreover, the authors of the Fear of COVID-19 Scale (FCV-19S) also claimed that this self-report scale is inadequate to measure fear, which is a subjective emotional experience, in an objective manner. As supported by LeDoux and Hofmann (2018), although self-reporting eases the data collection process, it might hamper the reliability in measuring the subjective emotional experiences, such as fear of COVID-19.

Besides, the present research was limited by the absence of including both implicit and explicit forms of self-esteem in examining the association with Instagram addiction. Lannoy et al. (2020) provided support to this notion that implicit, rather than explicit, self-esteem serves as the significant predictor of Internet addiction. Additionally, past study

conducted by Stieger and Burger (2010) found that individuals with Internet addiction reported low levels of implicit self-esteem, but high levels of self-esteem. However, the measurement of self-esteem employed in the present study, which was RSES, assesses the explicit form of self-esteem only, thereby impeding the accuracy of the observed results in representing the true correlation between self-esteem and Instagram addiction.

**Recommendations for Future Research**

Future researchers are recommended to adopt probability or random sampling techniques, where each sample in the population stands an equal chance to be selected in the study, to ensure the generalizability of the research findings to the target population (Acharya et al., 2013). For instance, the stratified sampling method could be employed by randomly selecting a constant number of undergraduates from each undergraduate program offered by the particular university. Hence, it allows the representation of all groups, or strata, in the target population. As supported by Sharma (2017), stratified sampling method provides the researchers with a representative sample that is able to reflect the characteristics of the population; thus, the research findings could be generalised to the population with higher confidence level.

Furthermore, it is recommended to include the measurements of both implicit and explicit self-esteem to obtain more valid research findings (Lannoy et al., 2020). For instance, the use of Implicit Association Test (IAT), along with RSES, could be adopted in future studies to investigate the correlation between self-esteem and Instagram addiction. Apart from that, another possible reason for the non-significant predictive role of self-esteem on Instagram addiction could be due to the types of social media contents encountered (Saiphoo et al., 2020). Hence, future researchers could explore this new research direction by involving this variable in the linkage between self-esteem and Instagram addiction.

Last but not least, since the present study was conducted during the COVID-19 pandemic, future researchers are warranted to replicate the study in different timelines to further explore how different contextual or environmental factors could influence the observed results. To picture, the Malaysian government had announced the transition from the COVID-19 pandemic to endemic phase from 1 April 2022 onwards, where Malaysians will return to near-normal life after almost two years of surviving in the pandemic (Mahalingam, 2022). That said, the endemic phase will involve some relaxed Standard Operating Procedures (SOPs), including increased capacity limit for social activities, interstate travels approval regardless of one's vaccination status, and reopening of international borders (Tan, 2022). As depicted by Wong and Alias (2021), the fear level towards COVID-19 varies across different pandemic periods. Since greater levels of social interaction will be allowed during the endemic phase, individuals may be less likely to rely on the compulsive use of social media to cope with their social needs, thereby reducing their risk of developing Instagram addiction (Foroughi et al., 2021; Siste et al., 2020). Therefore, future researchers are suggested to examine the association between fear of COVID-19 and Instagram addiction during the endemic phase to gain a more comprehensive understanding about the latent variables.

## References

Abdel-Khalek, A. M. (2016). Introduction to the psychology of self-esteem. *Self-esteem: Perspectives, influences, and improvement strategies*, 1-23. Nova Science Publishers.

Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: Why and how of it? *Indian Journal of Medical Specialities, 4*(2). https://doi.org/10.7713/ijms.2013.0032

Ahmad, A. R., & Murad, H. R. (2020). The impact of social media on panic during the COVID-19 pandemic in Iraqi Kurdistan: Online questionnaire study. *Journal of Medical Internet Research, 22*(5), Article e19556. https://doi.org/10.2196/19556

Ahorsu, D. K., Lin, C., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The fear of COVID-19 scale: Development and initial validation. *International Journal of Mental Health and Addiction*. https://doi.org/10.1007/s11469-020-00270-8

Akkuş Çutuk, Z. (2021). Investigating the relationship among social media addiction cognitive absorption and self-esteem. M*alaysian Online Journal of Educational Technology, 9*(2), 42-51. http://dx.doi.org/10.52380/mojet.2021.9.2.211

Aksoy, M. E. (2018). A qualitative study on the reasons for social media addiction. *European Journal of Educational Research, 7*(4), 861-865. https://doi.org/10.12973/eu-jer.7.4.861

Alhabash, S., & Ma, M. (2017). A tale of four platforms: Motivations and uses of Facebook, Twitter, Instagram, and Snapchat among college students? *Social Media + Society, 3*(1), 1-13. https://doi.org/10.1177/2056305117691544

Andreassen, C. S., & Pallesen, S. (2014). Social network site addiction: An overview. *Current Pharmaceutical Design, 20*(25), 4053-4061.

https://doi.org/10.2174/13816128113199990616

Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2017). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a largenational survey. *Addictive Behaviors, 64*, 287-293. https://doi.org/10.1016/j.addbeh.2016.03.006

Aparicio-Martínez, P., Ruiz-Rubio, M., Perea-Moreno, A., Martínez-Jiménez, M. P., Pagliari, C., Redel-Macías, M. D., & Vaquero-Abellán, M. (2020). Gender differencesin the addiction to social networks in the southern Spanish university students. *Telematics and Informatics, 46*, Article 101304. https://doi.org/10.1016/j.tele.2019.101304

Apuke, O. D. (2017). Quantitative research methods: A synopsis approach. *Kuwait Chapterof Arabian Journal of Business and Management Review, 6*(11), 40-47. https://doi.org/10.12816/0040336

Ardiana, R. T., & Tummanggor, R. O. (2020). Social media Instagram addiction and self-esteem in high-school students. *Advances in Social Science, Education and Humanities Research, 478*, 290-294. https://dx.doi.org/10.2991/assehr.k.201209.042

Arora, A., Chakraborty, P., & Bhatia, M. P. S. (2020). Problematic use of digital technologies and its impact on mental health during COVID-19 pandemic: Assessment using machine learning. *Emerging Technologies During the Era of COVID-19 Pandemic, 348*, 197-221. https://doi.org/10.1007/978-3-030-67716-9_13

Arora, A., Chakraborty, P., Bhatia, M. P., & Mittal, P. (2020). Role of emotion in excessive use of Twitter during COVID-19 imposed lockdown in India. *Journal of Technology in Behavioral Science, 6*(2), 370-377. https://doi.org/10.1007/s41347-020-00174-3

Aruma, E. O., & Hanachor, M. E. (2017). Abraham Maslow's hierarchy of needs and assessment of needs in community development. *International Journal of Development and Economic Sustainability, 5*(7), 15-27.

Aslam, S. (2019). *Instagram by the numbers: Stats, demographics & fun facts*. Omnicore. https://www.omnicoreagency.com/instagram-statistics/

Bahar Moni, A. S., Abdullah, S., Bin Abdullah, M. F. I. L., Kabir, M. S., Alif, S. M., Sultana, F., Salehin, M., Shariful Islam, S. M., Cross, W., & Aziz Rahman, M. (2021). Psychological distress, fear and coping among Malaysians during the COVID-19 pandemic. *PLoS ONE, 16*(9), Article e0257304. https://doi.org/10.1371/journal.pone.0257304

Balakrishnan, J., & Griffiths, M. D. (2017). An exploratory study of "selfitis" and the development of the selfitis behavior scale. *International Journal of Mental Healthand Addiction, 16*(3), 722-736. https://doi.org/10.1007/s11469-017-9844-x

Balcı, S., & Karaman, S. Y. (2020). Social media usage, self-presentation, narcissism, and self-esteem as predictors of Instagram addiction: An intercultural comparison. *Journal of Erciyes Communication, 7*(2), 1213-1239. https://doi.org/10.17680/erciyesiletisim.719895

Balta, S., Emirtekin, E., Kircaburun, K., & Griffiths, M. D. (2020). Neuroticism, trait fear of missing out, and phubbing: The mediating role of state fear of missing out and problematic Instagram use. *International Journal of Mental Health and Addiction, 18*(3), 628-639. https://doi.org/10.1007/s11469-018-9959-8

Berry, W. D. (1993). *Understanding regression assumptions*. SAGE Publications. https://dx.doi.org/10.4135/9781412986427

Błachnio, A., Przepiorka, A., & Pantic, I. (2016). Association between Facebook addiction, self-esteem and life satisfaction: A cross-sectional study. *Computers in Human Behavior, 55*, 701-705. https://doi.org/10.1016/j.chb.2015.10.026

Blasi, M. D., Giardina, A., Giordano, C., Coco, G. L., Tosto, C., Billieux, J., & Schimmenti, A. (2019). Problematic video game use as an emotional coping strategy: Evidence from a sample of MMORPG gamers. *Journal of Behavioral Addictions. 8*(1), 25-34. https://doi.org/10.1556/2006.8.2019.02.

Bojanić, Ž., Nedeljković, J., Šakan, D., Mitić, P. M., Milovanović, I., & Drid, P. (2019). Personality traits and self-esteem in combat and team sports. *Frontiers in Psychology, 10*, 1-7. https://doi.org/10.3389/fpsyg.2019.02280

Brailovskaia, J., Margraf, J., & Köllner, V. (2019). Addicted to Facebook? Relationship between Facebook addiction disorder, duration of Facebook use and narcissism in an inpatient sample. *Psychiatry Research, 273*, 52-57. https://doi.org/10.1016/j.psychres.2019.01.016

Browning, M. H. E. M., Larson, L. R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., Cloutier, S., Vu, T. M., Thomsen, J., Reigner, N., Metcalf, E. C., D'Antonio, A., Helbich, M., Bratman, G. N., & Alvarez, H. O. (2021). Psychological impacts from COVID-19 among university students: Risk factors across seven states in the United States. *PLoS ONE, 16*(1), Article e0245327. https://doi.org/10.1371/journal.pone.0245327

Bujang, M. A., & Baharum, N. (2016). Sample size guideline for correlation analysis. *World Journal of Social Science Research, 3*(1), 37-46. https://doi.org/10.22158/wjssr.v3n1p37

Chua, T. H. H., & Chang, L. (2016). Follow me and like my beautiful selfies: Singapore teenage girls' engagement in self-presentation and peer comparison on social media. *Computers in Human Behavior, 55*, 190-197. https://doi.org/10.1016/j.chb.2015.09.011

Chung, K. L., Morshidi, I., Yoong, L. C., & Thian, K. N. (2019). The role of the dark tetrad and impulsivity in social media addiction: Findings from Malaysia. *Personality and Individual Differences, 143*, 62-67. https://doi.org/10.1016/j.paid.2019.02.016

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Earlbaum.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159. https://doi.org/10.1037/0033-2909.112.1.155

Cook, R. D., & Weisberg, S. (1982). *Residuals and influence in regression*. Chapman and Hall.

Cramer, S., & Inkster, B. (2017). *Status of Mind: Social media and young people's mental health.* Royal Society for Public Health. https://www.rsph.org.uk/static/uploaded/d125b27c-0b62-41c5a2c0155a8887cd01.pdf

Dodou, D., & Winter, J. D. (2014). Social desirability is the same in offline, online, and paper surveys: A meta-analysis. *Computers in Human Behavior, 36*, 487-495. https://doi.org/10.1016/j.chb.2014.04.005

Du, H., King, R. B., & Chi, P. (2017). Self-esteem and subjective well-being revisited: The roles of personal, relational, and collective self-esteem. *PLoS ONE, 12*(8), Article e0183958. https://doi.org/10.1371/journal.pone.0183958

Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X., & Zhu, G. (2020). An

investigation of mental health status of children and adolescents in China during the outbreak of COVID-19. *Journal of Affective Disorders, 275,* 112-118. https://doi.org/10.1016/j.jad.2020.06.029

Dwyer, R., & Fraser, S. (2016). Addicting via hashtags. *Contemporary Drug Problems,43*(1), 79-97. https://doi.org/10.1177/0091450916637468

Eder, S. J., Steyrl, D., Stefanczyk, M. M., Pieniak, M., Martı´nez Molina, J., Pesˇout, O., Binter, J., Snnela, P., Scharnowski, F., & Nicholson, A. A. (2021). Predicting fear and perceived health during the COVID-19 pandemic using machine learning: A cross-national longitudinal study. *PLoS ONE 16*(3), Article e0247997. https://doi.org/10.1371/journal.pone.0247997

Ellis, W. E., Dumas, T. M., & Forbes, L. M. (2020). Physically isolated but socially connected: Psychological adjustment and stress among adolescents duringthe initial COVID-19 crisis. *Canadian Journal of Behavioural Science, 52*(3), 177-187. https://doi.org/10.1037/cbs0000215

Eraslan-Capan, B. (2015). Interpersonal sensitivity and problematic Facebook use in Turkish university students. *The Anthropologist, 21*(3), 395-403. https://doi.org/10.1080/09720073.2015.11891829

Erikson, E. (1963). *Childhood and society* (2nd ed.). Norton.

Erubami, J. A., Bebenimibo, P., & Ugwuoke, J. C. (2021). Social media use and COVID-19 risk perception among Nigerians: The roles of affects, gender and information sources. *Media Watch, 12*(2), 316-332.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling

and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1- 4. https://doi.org/10.11648/j.ajtas.20160501.11

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160. https://doi.org/10.3758/brm.41.4.1149

Fernandes, B., Biswas, U. M., Tan-Mansukhani, R., Vallejo, A., & Essau, E. A. (2020). The impact of COVID-19 lockdown on internet use and escapism in adolescents. *Revista de Psicología Clínica con Niños y Adolescentes, 7*(3), 59-65. https://doi.org/10.21134/rpcna.2020.mon.2056

Festinger, L. (1954). A theory of social comparison processes. *Human Relations,* 117-140.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Sage Publications.

Foroughi, B., Griffiths, M. D., Iranmanesh, M., & Salamzadeh, Y. (2021). Associations between Instagram addiction, academic performance, social anxiety, depression, and life satisfaction among university students. *International Journal of Mental Healthand Addiction,* 1-22. https://doi.org/10.1007/s11469-021-00510-5

Foroughi, B., Iranmanesh, M., Nikbin, D., & Hyun, S. S. (2019). Are depression and social anxiety the missing link between Facebook addiction and life satisfaction? The interactive effect of needs and self-regulation. *Telematics and Informatics, 43,* 1-11. https://doi.org/10.1016/j.tele.2019.101247

Fumero, A., Marrero, R. J., Voltes, D., & Peñate, W. (2018). Personal and social factors involved in internet addiction among adolescents: A meta-analysis. *Computers in Human Behavior, 86,* 387–400. https://doi.org/10.1016/j.chb.2018.05.005

Gadekar, R., & Ang, P. H. (2020). Is social media use socially enhancing or compensating? *Journal of Creative Communications, 15*(3), 269-288. https://doi.org/10.1177/0973258620943705

Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., Wang, Y., Fu, H., & Dai, J. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *PLoS ONE, 15*(4), Article e0231924. https://doi.org/10.1371/journal.pone.0231924

Gao, W., Liu, Z., & Li, J. (2017). How does social presence influence SNS addiction? A belongingness theory perspective. *Computers in Human Behavior, 77*, 347-355. https://doi.org/10.1016/j.chb.2017.09.002

García, J. A., y Olmos, F. C., Matheu, M. L., & Carreño, T. P. (2019). Self-esteem levels vs global scores on the Rosenberg self-esteem scale. *Heliyon, 5*(3), 1-17. https://doi.org/10.1016/j.heliyon.2019.e01378

Gerber, J. P., Wheeler, L., & Suls, J. (2018). A social comparison theory meta-analysis 60+ years on. *Psychological Bulletin, 144*(2), 177-197.

González-Padilla, D. A., & Tortolero-Blanco, L. (2020). Social media influence in the COVID-19 Pandemic. *International Brazilian Journal of Urology, 46*(1), 120-124. https://doi.org/10.1590/s1677-5538.ibju.2020.s121.

Gould, T. J. (2010). Addiction and cognition. *Addiction Science and Clinical Practice, 5*(2), 4-14.

Goyal, K., Chauhan, P., Chhikara, K., Gupta, P., & Singh, M. P. (2020). Fear of COVID 2019: First suicidal case in India! *Asian Journal of Psychiatry, 49,* Article 101989. https://doi.org/10.1016/j.ajp.2020.101989

Gravetter, F., & Wallnau, L. (2014). *Essentials of statistics for the behavioral sciences* (8th ed.). Wadsworth.

Griffiths, M. (2005). A 'components' model of addiction within a biopsychosocialframework. *Journal of Substance Use, 10*(4), 191-197. https://doi.org/10.1080/14659890500114359

Griffiths, M. D. (2013). Is "loss of control" always a consequence of addiction? *Frontiers in Psychiatry, 4*(36). https://doi.org/10.3389/fpsyt.2013.00036

Griffiths, M. D. (2018). Adolescent social networking: How do social media operators facilitate habitual use? *Education and Health, 36*(3), 66-69. https://doi.org/10.3389/fpsyg.2021.612007

Griffiths, M. D. (2019). The evolution of the "components model of addiction" and the need for a confirmatory approach in conceptualizing behavioral addictions. *Dusunen Adam The Journal of Psychiatry and Neurological Sciences, 32*, 179-184. https://doi.org/10.14744/DAJPNS.2019.00027

Gundogan, S. (2021). The mediator role of the fear of COVID-19 in the relationship between psychological resilience and life satisfaction. *Current Psychology*, 1-9. https://doi.org/10.1007/s12144-021-01525-w

Hair, J. F., Black, W. C., Black, B., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: Global edition* (7th ed.). Pearson Education.

Hakansson, A., Fernandez-Aranda, F., Menchon, J. M., Potenza, M. N., & Jimenez-Murcia, S. (2020). Gambling during the COVID-19 crisis - A cause for concern? *Journal of Addiction Medicine, 12*(4), e10-e12. https://doi.org/10.1097/ADM.0000000000000690.

Hassim, N., Hasmadi, M. H. N., & Sharipudin, M. N. S. (2020). Social media or social comparison? An analysis of Instagram use among Malaysian youth. *SEARCH: Journal of Media and Communication Research*, 33-45.

Hawi, N. S., & Samaha, M. (2016). The relations among social media addiction, self-esteem, and life satisfaction in university students. *Social Science Computer Review, 35*(5), 576-586. https://doi.org/10.1177/0894439316660340

Hoaglin, D. C., & Welsch, R. E. (1978). The hat matrix in regression and aNOVA. *The American Statistician, 32*(1), 17-22. https://doi.org/10.1080/00031305.1978.10479237

Horzum, M. B., & Ayas, T. (2013). Relation between depression, loneliness, self-esteem and internet addiction. *Education, 133*(3), 283-290.

Hossain, M. A. (2019). Effects of uses and gratifications on social media use: The Facebook case with multiple mediator analysis. *PSU Research Review, 3*(1), 16-28. https://doi.org/10.1108/PRR-07-2018-0023

Hossain, M. A., Jahid, M. I. K., Hossain, K. M. A., Walton, L. M., Uddin, Z., Haque, M. O., Kabir, M. F., Arafat, S. M. Y., Sakel, M., Faruqui, R., & Hossain, Z. (2020). Knowledge, attitudes, and fear of COVID-19 during the rapid rise period in Bangladesh. *PLoS ONE, 15*(9), Article e0239646. https://doi.org/10.1371/journal.pone.0239646

Hou, Y., Xiong, D., Jiang, T., Song, L., & Wang, Q. (2019). Social media addiction: Its impact, mediation, and intervention. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 13*(1). https://doi.org/10.5817/CP2019-1-4

Huang, C. (2020). A meta-analysis of the problematic social media use and mental health.

*International Journal of Social Psychiatry*, 1-22. https://doi.org/10.1177/0020764020978434

Huishan, G. (2018). *Linking loneliness and use of social media* [Master'sthesis]. https://core.ac.uk/download/pdf/158607337.pdf

IBM Corp. (2015). *IBM SPSS Statistics for Windows (Version 23.0)* [Computer software].

Iranmanesh, M., Foroughi, B., Nikbin, D., & Hyun, S. S. (2019). Shyness, self-esteem, and loneliness as causes of FA: The moderating effect of low self-control. *Current Psychology*. https://doi.org/10.1007/s12144-019-00465-w

Islam, M. S., Sujan, M. S. H., Tasnim, R., Ferdous, M. Z., Masud, J. H. B., Kundu, S., Mosaddek, A. S. M., Choudhuri, M. S. K., Kircaburun, K., & Griffiths, M. D. (2020). Problematic internet use among young and adult population in Bangladesh: Correlates with lifestyle and online activities during the COVID-19 pandemic. *Addictive Behaviors Reports, 12*, 1-8. https://doi.org/10.1016/j.abrep.2020.100311

Jackman, D. M., & MacPhee, D. (2015). Self-esteem and future orientation predict adolescents' risk engagement. *The Journal of Early Adolescence, 37*(3), 339-366. https://doi.org/10.1177/0272431615602756

Jiang, S., & Ngien, A. (2020). The effects of Instagram use, social comparison, and self-esteem on social anxiety: A survey study in Singapore. *Social Media + Society*, *6*(2), 1-10. https://doi.org/10.1177/2056305120912488

Jiang, Y. (2021). Problematic social media usage and anxiety among university students during the COVID-19 pandemic: The mediating role of psychological capital and the moderating role of academic burnout. *Frontiers in Psychology, 12*, 1-12.

https://doi.org/10.3389/fpsyg.2021.612007

Johnson, B. K., & Knobloch-Westerwick, S. (2017). When misery avoids company: Selective social comparisons to photographic online profiles. *Human CommunicationResearch, 43*(1), 54-75. https://doi.org/10.1111/hcre.12095

Kanat-Maymon, Y., Almog, L., Cohen, R., & Amichai-Hamburger, Y. (2018). Contingent self-worth and Facebook addiction. *Computers in Human Behavior, 88,* 227-235. https://doi.org/10.1016/j.chb.2018.07.011

Karimi, L., Khodabandelou, R., Ehsani, M., & Ahmad, M. (2014). Applying the uses and gratifications theory to compare higher education students' motivation for using social networking sites: Experiences from Iran, Malaysia, United Kingdom, and South Africa. *Contemporary Educational Technology, 5*(1), 53-72. https://doi.org/10.30935/cedtech/6115

Kayis, A. R., Satici, B., Deniz, M. E., Satici, S. A., & Griffiths, M. D. (2021). Fear of COVID-19, loneliness, smartphone addiction, and mental wellbeing among the Turkish general population: A serial mediation model. *Behaviour & Information Technology,* 1-13. https://doi.org/10.1080/0144929x.2021.1933181

Kim, D. H., Seely, N. K., & Jung, J. H. (2017). Do you prefer, Pinterest or Instagram? The role of image-sharing SNSs and self-monitoring in enhancing ad effectiveness. *Computers in Human Behavior, 70,* 535-543. https://doi.org/10.1016/j.chb.2017.01.022

Király, O., Potenza, M. N., Stein, D. J., King, D. L., Hodgins, D. C., Saunders, J. B., Griffiths, M. D., Gjoneska, B., Billieux, J., Brand, M., Abbott, M. W., Chamberlain, S. R., Corazza, O., Burkauskas, J., Sales, C. M., Montag, C., Lochner, C., Grünblatt,

E., Wegmann, E., . . . Demetrovics, Z. (2020). Preventing problematic internet use during the COVID-19 pandemic: Consensus guidance. *Comprehensive Psychiatry, 100*, 1-4. https://doi.org/10.1016/j.comppsych.2020.152180

Kircaburun, K., & Griffiths, M. D. (2018). Instagram addiction and the Big Five of personality: The mediating role of self-liking. *Journal of Behavioral Addictions, 7*(1), 158-170. https://doi.org/10.1556/2006.7.2018.15

Kırcaburun, K., & Griffiths, M. D. (2019). Problematic Instagram use: The role of perceived feeling of presence and escapism. *International Journal of Mental Health and Addiction, 17*(4), 909-921. https://doi.org/10.1007/s11469-018-9895-7

Kocabıyık, O. O. (2021). Social media usage experiences of young adults during the COVID 19 pandemic through social cognitive approach to uses and gratifications. *International Journal of Technology in Education and Science (IJTES), 5*(3), 447-462. https://doi.org/10.46328/ijtes.226

Korkmaz, H., & Dilmaç, B. (2021). Predictive relations between psychological well-being, Instagram addiction and values in university students. *Research on Education and Psychology, 5*(1), 71-82.

Köse, B. Ö., & Doğan, A. (2019). The relationship between social media addiction and self-esteem among Turkish University students. *Addicta: The Turkish Journal on Addictions, 6*(1), 175-190. https://doi.org/10.15805/addicta.2019.6.1.0036

Kuss, D., & Griffiths, M. (2017). Social networking sites and addiction: Ten lessons learned. *International Journal of Environmental Research and Public Health, 14*(3), 1-17. https://doi.org/10.3390/ijerph14030311

Lannoy, S., Chatard, A., Selimbegovic, L., Tello, N., Van der Linden, M., Heeren, A., & Billieux, J. (2020). Too good to be cautious: High implicit self-esteem predicts self-reported dangerous mobile phone use. *Computers in Human Behavior, 103,* 208–213. https://doi.org/10.1016/j.chb.2019.09.018

LeDoux, J. E., & Hofmann, S. G. (2018). The subjective experience of emotion: A fearful view. *Current Opinion in Behavioral Sciences, 19*, 67-72.

Lee, E., Lee, J., Moon, J. H., & Sung, Y. (2015). Pictures speak louder than words: Motivations for using Instagram. *Cyberpsychology, Behavior, and Social Networking, 18*(9), 552-556. https://doi.org/10.1089/cyber.2015.0157

Lim, M. (2016). *How many Instagram users in Malaysia?* ecInsider. http://www.ecinsider.my/2016/04/how-many-instagram-users-in-malaysia.html

Lin, C. Y., Broström, A., Griffiths, M. D., & Pakpour, A. H. (2020). Investigating mediated effects of fear of COVID-19 and COVID-19 misunderstanding in the association between problematic social media use, psychological distress, and insomnia. *Internet Interventions, 21*, 1-6. https://doi.org/10.1016/j.invent.2020.100345

Lippi, G., Henry, B. M., Bovo, C., & Sanchis-Gomar, F. (2020). Health risks and potential remedies during prolonged lockdowns for coronavirus disease 2019 (COVID-19). *Diagnosis*, *7*(2), 85–90. https://doi.org/10.1515/dx-2020-0041

Lotfi, M., Hamblin, M. R., & Rezaei, N. (2020). COVID-19: Transmission, prevention, and potential therapeutic opportunities. *Clinica Chimica Acta, 508,* 254-266. https://doi.org/10.1016/j.cca.2020.05.044

Lum, L., & Tambyah, P. A. (2020). Outbreak of COVID-19-An urgent need for good science

to silence our fears? *Singapore Medical Journal*, *61*(2), 55-57. https://doi.org/10.11622/smedj.2020018

Lup, K., Trub, L., & Rosenthal, L. (2015). Instagram #Instasad?: Exploring associations among Instagram use, depressive symptoms, negative social comparison, and strangers followed. *Cyberpsychology, Behavior, and Social Networking*, *18*(5), 247-252. https://doi.org/10.1089/cyber.2014.0560

Mackson, S. B., Brochu, P. M., & Schneider, B. A. (2019). Instagram: Friend or foe? The application's association with psychological well-being. *New Media & Society*, *21*(10), 2160-2182. https://doi.org/10.1177/1461444819840021

Macrynikola, N., Auad, E., Menjivar, J., & Miranda, R. (2021). Does social media use confer suicide risk? A systematic review of the evidence. *Computers in Human Behavior Reports*, *3*, 1-26. https://doi.org/10.1016/j.chbr.2021.100094

Mahalingam, S. (2022, February 11). COVID-19: Malaysia cautious about declaring possible move to endemic phase, says KJ. *The Star*. https://www.thestar.com.my/news/nation/2022/02/11/covid-19-malaysia-cautious-about-declaring-possible-move-to-endemic-phase-says-kj#close

Mahmud, M. S., Talukder, M. U., & Rahman, S. M. (2020). Does 'fear of COVID-19' trigger future career anxiety? An empirical investigation considering depression from COVID-19 as a mediator. *International Journal of Social Psychiatry*, *67*(1), 35-45. https://doi.org/10.1177/0020764020935488

Malaysian Communications and Multimedia Commission. (2020). *Internet Users Survey 2020*. https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/IUS-2020-Report.pdf

Mariam, T. G. M., Kassie, B. A., Asratie, M. H., & Abate, A. T. (2021). The effects of fear and knowledge of COVID-19 on preventive practice among pregnant women who attend antenatal care in northwest Ethiopia, 2020: Institution-based cross-sectional study. *International Journal of Women's Health, 13*, 95-100. https://doi.org/10.2147/IJWH.S286088

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*, 370-396.

Masthi, N. R. R., Pruthvi, S., & Mallekavu, P. (2017). A comparative study on social media addiction between public and private high school students of urban Bengaluru, India. *ASEAN Journal of Psychiatry,18*(2), 1-10.

Mazhar, N., Khan, T. B., Zafar, K., Warris, S. H., Nikhet, S., & Tahir, A. (2020). A study of components of behavioral addiction to social media use in current generation of Pakistani youth. *The Professional Medical Journal 27*(8), 1680-1685. https://doi.org/10.29309/TPMJ/2020.27.08.4494

Mertens, G., Gerritsen, L., Duijndam, S., Salemink, E., & Engelhard, I. M. (2020). Fear of the coronavirus (COVID-19): Predictors in an online study conducted in March 2020. *Journal of Anxiety Disorders, 74,* Article 102258. https://doi.org/10.1016/j.janxdis.2020.102258

Mohsen, F., Bakkar, B., Khadem Alsrouji, S., Abbas, E., Najjar, A., Marrawi, M., & Latifeh, Y. (2021b). Fear among Syrians: A proposed cutoff score and validation of the Arabic Fear of COVID-19 Scale- A National Survey. *Psychological Health Problems among Syrians*. https://doi.org/10.1101/2021.05.25.21257637

Moore, K., & Craciun, G. (2020). Fear of missing out and personality as predictors of social networking sites usage: The Instagram case. *Psychological Reports, 124*(4), 1761-

1787. https://doi.org/10.1177/0033294120936184

Morales-Rodríguez, F. M. (2021). Fear, stress, resilience and coping strategies during COVID-19 in Spanish university students. *Sustainability, 13*, 5824. https://doi.org/10.3390/su13115824

Nazir, F., Omar, N., Aripin, M. A., & Hisham, M. H. M. (2020). A case study of socialmedia addiction among Malaysians. *Solid State Technology, 63*(4), 1839-1851.

Noldy, N. E., Stelmack, R. M., & Campbell, K. B. (1990). Event-related potentials and recognition memory for pictures and words: The effects of intentional and incidental learning. *Psychophysiology, 27*, 417-428.

*Number of monthly active Instagram users from January 2013 to June 2018*. (2019). Statista. https://www.statista.com/statistics/253577/number-of-monthly-active-instagram-users/

Oducado, R. M., Tuppal, C., Estoque, H., Sadang, J., Superio, D., Real, D. V., Roa, M. N., Malaga, X., Quiros, J., Fajardo, M. T., & Dela Rosa, R. (2021). Internet use, eHealth literacy and fear of COVID-19 among nursing students in the Philippines. *International Journal of Educational Research and Innovation, 15*, 487-502. https://doi.org/10.46661/ijeri.5520

Olapegba, P. O., Iorfa, S. K., Kolawole, S. O., Oguntayo, R., Gandi, J. C., Ottu, I., & Ayandele, O. (2020). Survey data of COVID-19-related knowledge, risk perceptions and precautionary behavior among Nigerians. *Data in Brief, 30*, 1-6. https://doi.org/10.1016/j.dib.2020.105685

Oniszczenko, W. (2021). Anxious temperament and cyberchondria as mediated by fear of

COVID-19 infection: A cross-sectional study. *PLoS ONE, 16*(8), Article e0255750. https://doi.org/10.1371/journal.pone.0255750

Ornell, F., Schuch, J. B., Sordi, A. O., & Kessler, F. (2020). "Pandemic fear" and COVID-19: Mental health burden and strategies. *Brazilian Journal of Psychiatry, 42*(3), 232-235. https://doi.org/10.1590/1516-4446-2020-0008

Paik, A., Oh, D., & Kim, D. (2014). A case of withdrawal psychosis from internet addiction disorder. *Psychiatry Investigation, 11*(2), 207-209. https://doi.org/10.4306/pi.2014.11.2.207

Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4th ed.). Allen & Unwin.

Pandya, A., & Lodha, P. (2021). Social connectedness, excessive screen time during COVID-19 and mental health: A review of current evidence. *Frontiers in Human Dynamics, 3,* Article 68413. https://doi.org/10.3389/fhumd.2021.684137

Park, J. Y., & Park, E. Y. (2019). The Rasch analysis of Rosenberg self-esteem scale in individuals with intellectual disabilities. *Frontiers in Psychology, 10,* 1-10 https://doi.org/10.3389/fpsyg.2019.01992

Peker, A., Cengiz, S., & Yıldız, M. N. (2021). The mediation relationship between life satisfaction and subjective vitality fear of COVID-19 and problematic internet use. *Journal of Clinical Psychiatry, 24*(2), 199-206. https://doi.org/10.5505/kpd.2020.92259

Planchuelo-Gómez, Á., Odriozola-González, P., Irurtia, M. J., & de Luis-García, R. (2020). Longitudinal evaluation of the psychological impact of the COVID-19 crisis inSpain.

*Journal of Affective Disorders, 277*, 842-849. https://doi.org/10.1016/j.jad.2020.09.018

Polit, D. F., & Beck, C. T. (2010). Generalization in quantitative and qualitative research: Myths and strategies. *International Journal of Nursing Studies, 47*(11), 1451-1458. https://doi.org/10.1016/j.ijnurstu.2010.06.004

Ponnusamy, S., Iranmanesh, M., Foroughi, B., & Hyun, S. S. (2020). Drivers and outcomes of Instagram addiction: Psychological well-being as moderator. *Computers in Human Behavior, 107*, 1-11. https://doi.org/10.1016/j.chb.2020.106294

Ponto, J. (2015). Understanding and evaluating survey research. *Journal of the Advanced Practitioner in Oncology, 6*(2), 168-171. https://doi.org/10.6004/jadpro.2015.6.2.9

Priego-Parra, B. A., Triana-Romero, A., Pinto-Gálvez, S. M., Ramos, C. D., Salas-Nolasco, O., Reyes, M. M., Ramos-de-la-Medina, A., & Remes-Troche, J. M. (2020). Anxiety, depression, attitudes, and internet addiction during the initial phase of the 2019 coronavirus disease (COVID-19) epidemic: A cross-sectional study in México. *MedRxiv*. https://doi.org/10.1101/2020.05.10.20095844

Putra, J. (2018). Peran syukur sebagai moderator pengaruh perbandingan sosial terhadap self-esteem pada remaja pengguna media sosial. *Psikohumaniora: Jurnal Penelitian Psikologi, 3*(2), 197-210. http://dx.doi.org/10.21580/pjpp.v3i2.2650

Rahardjo, W., & Mulyani, I. (2020). Instagram addiction in teenagers: The role of type D personality, self-esteem, and fear of missing out. *Psikohumaniora: Jurnal Penelitian Psikologi, 5*(1), 29-44. https://doi.org/10.21580/pjpp.v5i1.4916

Rahman, M. A., Hoque, N., Alif, S. M., Salehin, M., Islam, S. M. S., Banik, B., Sharif, A.,

Nazim, N. B., Sultana, F., & Cross, W. (2020). Factors associated with psychological distress, fear and coping strategies during the COVID-19 pandemic in Australia. *Globalization and Health, 16*(1), 1-15. https://doi.org/10.1080/07481187.2020.1836071

Ren, S. Y., Gao, R. D., & Chen, Y. L., (2020). Fear can be more harmful than the severe acute respiratory syndrome coronavirus 2 in controlling the corona virus disease 2019 epidemic. *World Journal of Clinical Cases*, *8*(4), 652-657. https://doi.org/10.12998/wjcc.v8.i4.652

Rodríguez-Hidalgo, A. J., Pantaleón, Y., Dios, I., & Falla, D. (2020). Fear of COVID-19, stress, and anxiety in university undergraduate students: A predictive model for depression. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.591797

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.

Rosenman, R., Tennekoon, V., & Hill, L. G. (2011). Measuring bias in self-reported data. *International Journal of Behavioural and Healthcare Research, 2*(4), 320. https://doi.org/10.1504/ijbhr.2011.043414

Saiphoo, A. N., Dahoah Halevi, L., & Vahedi, Z. (2020). Social networking site use and self-esteem: A meta-analytic review. *Personality and Individual Differences, 153*, 109639. https://doi.org/10.1016/j.paid.2019.109639

Saravanan, C., Mahmoud, I., Elshami, W., & Taha, M. H. (2020). Knowledge, anxiety, fear, and psychological distress about COVID-19 among university students in the United Arab Emirates. *Frontiers in Psychiatry, 11*.https://doi.org/10.3389/fpsyt.2020.582189

Sedek, S. S. S. (2021). Innovative solutions for awareness campaign of social media

addiction and its consequences. *International Design Journal, 11*(2), 131-156.

Servidio, R., Bartolo, M. G., Palermiti, A. L., & Costabile, A. (2021). Fear of COVID-19, depression, anxiety, and their association with internet addiction disorder in a sample of Italian students. *Journal of Affective Disorders Reports, 4*, 1-7. https://doi.org/10.1016/j.jadr.2021.100097

Setia, M. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology, 61*(3), 261-264. https://doi.org/10.4103/0019-5154.182410

Seyed Hashemi, G. S., Hosseinnezhad, S., Dini, S., Griffiths, M. D., Lin, C. Y., & Pakpour, A. H. (2020). The mediating effect of the cyberchondria and anxiety sensitivity in the association between problematic internet use, metacognition beliefs, and fear of COVID-19 among Iranian online population. *Heliyon, 6*(10), 1-6. https://doi.org/10.1016/j.heliyon.2020.e05135

Shah, A. U., Safri, S. N., Thevadas, R., Noordin, N. K., Rahman, A. A., Sekawi, Z., Ideris,A., & Sultan, M. T. (2020). COVID-19 outbreak in Malaysia: Actions taken by the Malaysian government. *International Journal of Infectious Diseases, 97,* 108-116. https://doi.org/10.1016/j.ijid.2020.05.093

Sharma G. (2017). Pros and cons of different sampling techniques. *International Journal of Applied Research, 3*(7), 749-752.

Sholeh, A., & Rusdi, A. (2019). A new measurement of Instagram addiction: Psychometric properties of the Instagram addiction scale (TIAS). *CISAK*, 91-97.

Siste, K., Hanafi, E., Sen, L. T., Christian, H., Adrian, Siswidiani, L. P., Limawan, A. P., Murtani, B. J., & Suwartono, C. (2020). The impact of physical distancing and

associated factors towards internet addiction among adults in Indonesia during COVID-19 pandemic: A nationwide web-based study. *Frontiers in Psychiatry, 11*. https://doi.org/10.3389/fpsyt.2020.580977

Smeijers, D., Vrijsen, J. N., van Oostrom, I., Isaac, L., Speckens, A., Becker, E. S., & Rinck, M. (2017). Implicit and explicit self-esteem in remitted depressed patients. *Journal of Behavior Therapy and Experimental Psychiatry, 54*, 301–306. https://doi.org/10.1016/j.jbtep.2016.10.006

Smith, E. R., Mackie, D. M., & Claypool, H. M. (2014). *Social psychology: Fourth edition* (4th ed.). Psychology Press. https://doi.org/10.4324/9780203833698

Steiger, A. E., Allemand, M., Robins, R. W., & Fend, H. A. (2014). Low and decreasing self-esteem during adolescence predict adult depression two decades later. *Journal of Personality and Social Psychology, 106*(2), 325-338. https://doi.org/10.1037/a0035133

Stein, D. J. (2015). Social anxiety disorder and the psychobiology of self-consciousness. *Frontiers in Human Neuroscience, 9*(489), 1-4.

Stets, J. E., & Burke, P. J. (2014). Self-esteem and identities. *Sociological Perspectives,57*(4), 409-433. https://doi.org/10.1177/0731121414536141

Stevens, J. P. (1984). Outliers and influential data points in regression analysis. *Psychological Bulletin, 95*(2), 334–344. https://doi.org/10.1037/0033-2909.95.2.334

Stieger, S., & Burger, C. (2010). Implicit and explicit self-esteem in the context of internet addiction. *Cyberpsychology, Behavior, and Social Networking, 13*(6), 681–688. https://doi.org/10.1089/cyber.2009.0426

Subon, F., Unin, N., & Sulaiman, N. H. (2020). Self-esteem and academic achievement: The relationship and gender differences of Malaysian university undergraduates. *IAFOR Journal of Psychology & the Behavioral Sciences*, *6*(1), 43-54. https://doi.org/10.22492/ijpbs.6.1.03

Sundarasen, S., Chinna, K., Kamaludin, K., Nurunnabi, M., Baloch, G. M., Khoshaim, H. B., Hossain, S. F. A., & Sukayt, A. (2020). Psychological impact of COVID-19 and lockdown among university students in Malaysia: Implications and policy recommendations. *International Journal of Environmental Research and Public Health*, *17*(17), 1-13. https://doi.org/10.3390/ijerph17176206

Susan, W. (2019). *The relationship between social media use and depression in college students: A scoping review* [Master's thesis]. https://digitalcommons.library.tmc.edu/uthsph_dissertsopen/100

Tan, W. L. (2022, March 16). *Covid-19: Malaysia to transition to endemic phase from 1 April 2022.* Lexology. https://www.lexology.com/library/detail.aspx?g=bbeb3098-23dc-407d-8f93-d26bc604ea9a#:~:text=Questions%3F-,Covid%2D19%3A%20Malaysia%20to%20transition%20to%20endemic,phase%20from%201%20April%202022&text=On%208%20March%202022%2C%20the,borders%20from%201%20April%202022

Tang, C. (2018). Depression and impulsivity mediating the relationship between social anxiety and internet addiction. *International Journal of Psychology & Behavior Analysis, 4*(141). https://doi.org/10.15344/2455-3867/2018/141

Ting, C. H., & Essau, C. (2021). Addictive behaviours among university students in Malaysia during COVID-19 pandemic. *Addictive Behaviors Reports, 14*, 100375.

https://doi.org/10.1016/j.abrep.2021.100375

Treitel, Y. (2020). *The impact of Instagram usage and other social factors on self-esteem scores* [Doctoral dissertation]. ProQuest.

Trifiro, B. (2018). *Instagram use and its effect on well-being and self-esteem* [Doctoral dissertation]. https://digitalcommons.bryant.edu/cgi/viewcontent.cgi?article=1003&context=macomm

Tutgun-ünal, A. (2020). Social media addiction of new media and journalism students. *The Turkish Online Journal of Educational Technology, 19*(2), 1-12.

Ümmet, D. (2015). Self-esteem among college students: A study of satisfaction of basic psychological needs and some variables. *Procedia - Social and Behavioral Sciences, 174*, 1623-1629. https://doi.org/10.1016/j.sbspro.2015.01.813

United Nations. (2021). *Goal 3: Ensure healthy lives and promote well-being for all at all ages*. https://sdgs.un.org/goals/goal3

Upadhyaya, D. (2018). Is social media really addictive? Emerging dimensions of research. *IJRAR International Journal of Research and Analytical Reviews, 5*(4), 906-915.

Valkenburg, P. M., Koutamanis, M., & Vossen, H. G. M. (2017). The concurrent and longitudinal relationships between adolescents' use of social network sites and their social self-esteem. *Computers in Human Behavior, 76*, 35–41. https://doi.org/10.1016/j.chb.2017.07.008

van der Velden, P. G., Contino, C., Das, M., van Loon, P., & Bosmans, M. (2020). Anxiety and depression symptoms, and lack of emotional support among the general population before and during the COVID-19 pandemic. A prospective national study

on prevalence and risk factors. *Journal of Affective Disorders, 277,* 540-548. https://doi.org/10.1016/j.jad.2020.08.026

Varma, R., Das, S., & Singh, D. (2021). Cyberchondria amidst COVID-19 pandemic: Challenges and management strategies. *Frontiers in Psychiatry, 12,* 1-7. https://doi.org/10.3389/fpsyt.2021.618508

Verduyn, P., Gugushvili, N., Massar, K., Täht, K., & Kross, E. (2020). Social comparison on social networking sites. *Current Opinion in Psychology, 36,* 32-37. https://doi.org/10.1016/j.copsyc.2020.04.002

Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture, 3*(4), 206-222. https://doi.org/10.1037/ppm0000047

Wahyuni, E. N., & Maksum, A. (2019). Self-esteem and social media addiction among college students: Contribution gender as moderator. *The 1st International Conferences on Engineering, Technology and Social Science (ICONETOS),* 34-38.

Wegener, I., Geiser, F., Alfter, S., Mierke, J., Imbierowicz, K., Kleiman, A., … Conrad, R. (2015). Changes of explicitly and implicitly measured self-esteem in the treatment of major depression: Evidence for implicit self-esteem compensation. *Comprehensive Psychiatry, 58,* 57–67. https://doi.org/10.1016/j.comppsych.2014.12.0

Whiting, A., & Williams, D. (2013). Why people use social media: A uses and gratifications approach. *Qualitative Market Research, 16*(4), 362-369. https://doi.org/10.1108/QMR-06-2013-0041

Wiśniowski, A., Sakshaug, J. W., Perez Ruiz, D. A., & Blom, A. G. (2020). Integrating probability and nonprobability samples for survey inference. *Journal of Survey*

*Statistics and Methodology, 8*(1), 120-147. https://doi.org/10.1093/jssam/smz051

Wong, L. P., & Alias, H. (2021). Temporal changes in psychobehavioural responses during the early phase of the COVID-19 pandemic in Malaysia. *Journal of Behavioral Medicine, 44*(1), 18-28. https://doi.org/10.21203/rs.3.rs-24316/v1

World Health Organization. (2020). *Coronavirus disease (COVID-19) situation report - 209.* https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200816-covid-19-sitrep-209.pdf?sfvrsn=5dde1ca2_2

Wu, X., Nazari, N., & Griffiths, M. D. (2021). Using fear and anxiety related to COVID-19to predict cyberchondria: Cross-sectional survey study. *Journal of Medical Internet Research, 23*(6), 1-13. https://doi.org/10.2196/26285

Yam, F. C., Korkmaz, O., & Grifths, M. D. (2021). The association between fear of Covid-19 and smartphone addiction among individuals: The mediating and moderating role of cyberchondria severity. *Current Psychology*. https://doi.org/10.1007/s12144-021-02324-z

Yang, C. C., Holden, S. M., Carter, M. D., & Webb, J. J. (2018). Social media social comparison and identity distress at the college transition: A dual-path model. *Journal of Adolescence, 69*, 92-102. https://doi.org/10.1016/j.adolescence.2018.09.007

Yang, C., & Robinson, A. (2018). Not necessarily detrimental: Two social comparison orientations and their associations with social media use and college social adjustment. *Computers in Human Behavior, 84*, 49-57. https://doi.org/10.1016/j.chb.2018.02.020

Yang, J., Xu, X., Chen, Y., Shi, Z., & Han, S. (2016). Trait self-esteem and neural activities

related to self-evaluation and social feedback. *Scientific Reports, 6*(1), 1-10. https://doi/org/10.1038/srep20274

Zhang, H., Guan, L., Qi, M., & Yang, J. (2013). Self-esteem modulates the time course of self-positivity bias in explicit self-evaluation. *PLoS ONE, 8*(12), Article e81169. https://doi.org/10.1371/journal.pone.0081169

Zhang, X., & Zhou, S. (2020). Sharing health risk messages on social media: Effects of fear appeal message and image promotion. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 14*(2). https://doi.org/10.5817/CP2020-2-4

Zhao, L. (2021). The impact of social media use types and social media addiction on subjective well-being of college students: A comparative analysis of addicted andnon-addicted students. *Computers in Human Behavior Reports, 4*, 1-7. https://doi.org/10.1016/j.chbr.2021.100122

Zurafa, Z., & Dewi, F. I. R. (2021). Social-media addiction among late adolescents: Self-esteem and narcissism as predictor. *Advances in Social Science, Education and Humanities Research, 570*, 1444-1449. https://doi.org/10.2991/assehr.k.210805.227

Zywica, J., & Danowski, J. (2008). The faces of Facebookers: Investigating social enhancement and social compensation hypotheses; predicting Facebook™ and offline popularity from sociability and self-esteem and mapping the meanings of popularity with semantic networks. *Journal of Computer-Mediated Communication, 14*(1), 1-34. https://doi.org/10.1111/j.1083-6101.2008.01429.x

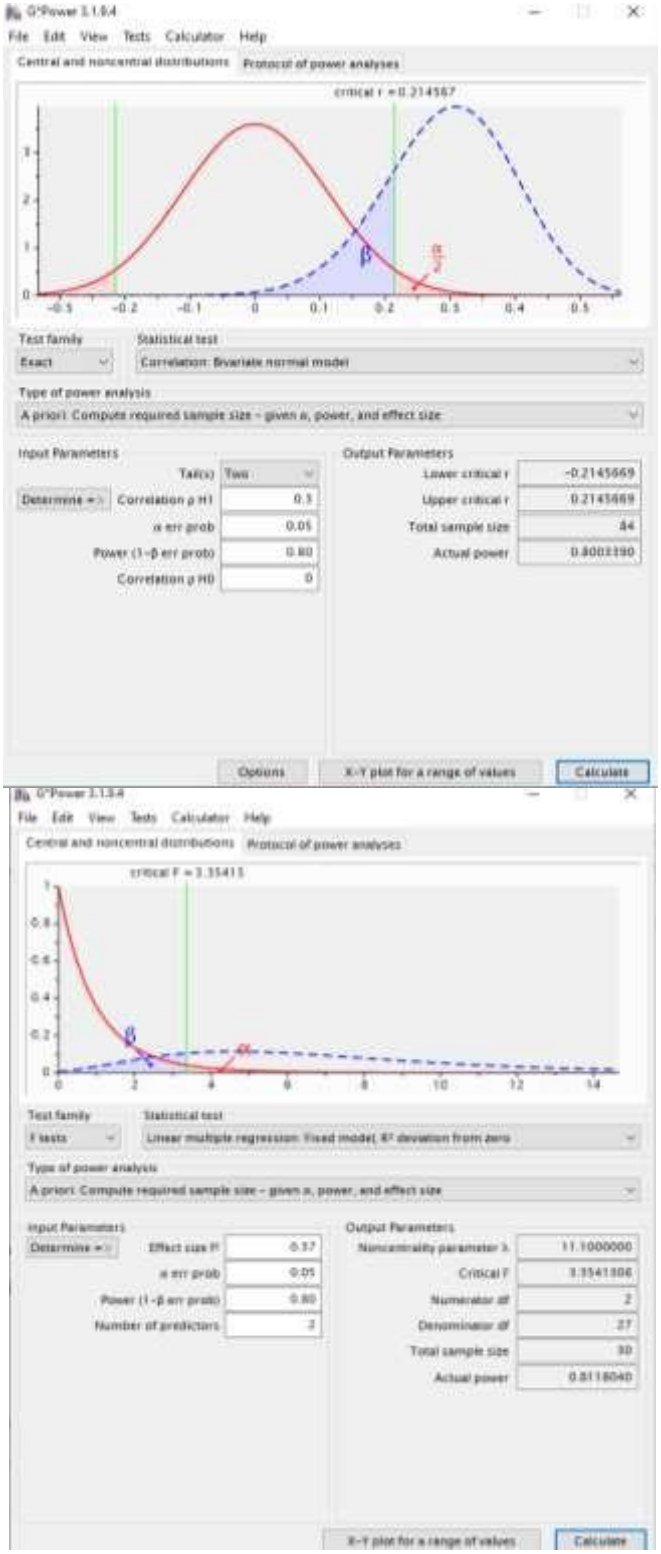
# Appendices

## Appendix A: Sample Size Calculation

$$f^2 = \frac{(-0.234)^2}{1 - (-0.234)^2} = 0.0579$$

$$f^2 = \frac{(-0.639)^2}{1 - (-0.639)^2} = 0.6901$$

$$f^2 = \frac{0.0579 + 0.6901}{2} = 0.374$$


G*Power 3.1.9.4
File Edit View Tests Calculator Help
Central and noncentral distributions
Protocol of power analyses
critical r = 0.214567
Test family
Exact
Statistical test
Correlation: Bivariate normal model
Type of power analysis
A priori: Compute required sample size – given α, power, and effect size
Input Parameters
Tail(s)
Two
Determine =>
Correlation ρ H1
0.3
α err prob
0.05
Power (1−β err prob)
0.80
Correlation ρ H0
0
Output Parameters
Lower critical r
-0.2145669
Upper critical r
0.2145669
Total sample size
84
Actual power
0.8003190
Options
X-Y plot for a range of values
Calculate
G*Power 3.1.9.4
File Edit View Tests Calculator Help
Central and noncentral distributions
Protocol of power analyses
critical F = 3.35413
Test family
F tests
Statistical test
Linear multiple regression: Fixed model, R² deviation from zero
Type of power analysis
A priori: Compute required sample size – given α, power, and effect size
Input Parameters
Determine =>
Effect size f²
0.17
α err prob
0.05
Power (1−β err prob)
0.80
Number of predictors
3
Output Parameters
Noncentrality parameter λ
11.1000000
Critical F
3.3541306
Numerator df
3
Denominator df
77
Total sample size
80
Actual power
0.8118040
X-Y plot for a range of values
Calculate

## Appendix B: Online Survey Form


**Part A (Consent Form)**

Department of Psychology and Counseling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman

Introduction

We are Year 3 Psychology students from the Faculty of Arts and Social Science (FAS) of Universiti Tunku Abdul Rahman (UTAR), Kampar, Malaysia. We would like to invite you to participate in the study entitled "**Relationship between Self-Esteem, Fear of COVID-19 and Instagram Addiction among Undergraduates in Malaysia.**" This study is conducted as a requirement for the subject UAPZ3023 (Final Year Project II).

Procedures and Confidentiality

The following questionnaire will require approximately 10-15 minutes to complete. All information provided will remain as private and confidential. The information given will only be reported as group data with no identifying information and only use for academic purpose.

Participation

All the information gathered will remain anonymous and confidential. Your information will not be disclosed to any unauthorized person and would be accessible only by group members. Participation in this study is voluntary, you are free to withdraw with consent and discontinue participation in anytime without prejudice. Your responses will be coded numerically in the research assignment for the research interpretation. Your cooperation would be greatly appreciated. Please feel free to contact the researchers via leejiajie23@1utar.my (Lee Jia Jie), loonlinglee100805@1utar.my (Loon Ling Lee) and kaiqi0904@1utar.my (Thio Kai Qi) should you have any inquires.

You are invited to participate in this study as long as you fulfil the following criteria:

**1, Malaysian**

**2. young adult aged between 18 to 24 years**

**3. currently pursuing undergraduate studies in Malaysia**

**4. Instagram user with a personal account**

By signing this form, I am stating that I am at least 18 years old and that I understand the above information and consent to participate in this study.

- ○ I consent to participate in this study.
- ○ I do not consent to participate in this study.

**Part B (Demographic Information)**

Age (e.g., 21):

Gender:

- ○ Male
- ○ Female
- ○ [ ] Others (please specify)

Ethnicity:

- ○ Malay
- ○ Chinese
- ○ Indian

○ [ ] Others (please specify)

Religion:

○ Islam
○ Buddhism
○ Christianity
○ Hinduism
○ [ ] Others (please specify)

Educational Institution (e.g., Universiti Tunku Abdul Rahman):

[ ]

Location of Educational Institution:

[ ]

Current Academic Year:

[ ]

Undergraduate Programme:

○ Accounting, Business, Entrepreneurship, Finance, Management and Taxation
○ Architect and Built Environment
○ Arts, Design, Fashion and Creative Industries

- ○ Computing, Information, Communication and Technology
- ○ Education and Humanities (Language, Literature, Philosophy, Liberty Arts)
- ○ Engineering and Technology
- ○ Law, Governance and Public Policy
- ○ Mathematics, Pure and Applied Sciences
- ○ Medicine, Dentistry and Pharmacy
- ○ Social Sciences (Economics, History, Politics, Psychology, Religious Studies)
- ○ Tourism, Hospitality, Culinary, Leisure and Event Management
- ○ Transportation and Logistics
- ○ [ ] Others (please specify)

Are you an Instagram user with personal account?

- ○ Yes
- ○ No

## Part C (Rosenberg Self-Esteem Scale)

**Part C: Rosenberg Self-Esteem Scale (RSES)**

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

| Strongly disagree | Disagree | Agree | Strongly agree |
|---|---|---|---|
| 1 | 2 | 3 | 4 |

| | Strongly disagree (1) | Disagree (2) | Agree (3) | Strongly agree (4) |
|---|---|---|---|---|
| 1. On the whole, I am satisfied with myself. | ○ | ○ | ○ | ○ |
| 2. At times I think I am no good at all. | ○ | ○ | ○ | ○ |

| | Strongly disagree (1) | Disagree (2) | Agree (3) | Strongly agree (4) |
|---|---|---|---|---|
| 3. I feel that I have a number of good qualities. | ○ | ○ | ○ | ○ |
| 4. I am able to do things as well as most other people. | ○ | ○ | ○ | ○ |
| 5. I feel I do not have much to be proud of. | ○ | ○ | ○ | ○ |
| 6. I certainly feel useless at times. | ○ | ○ | ○ | ○ |
| 7. I feel that I'm a person of worth, at least on an equal plane with others. | ○ | ○ | ○ | ○ |
| 8. I wish I could have more respect for myself. | ○ | ○ | ○ | ○ |
| 9. All in all, I am inclined to feel that I am a failure. | ○ | ○ | ○ | ○ |
| 10. I take a positive attitude toward myself. | ○ | ○ | ○ | ○ |

**Part D (Fear of COVID-19 Scale)**

**Part D: Fear of COVID-19 Scale (FCV-19S)**

Please respond to each item using the Likert scale to reflect how you feel, think and act toward COVID-19.

| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

| | Strongly disagree (1) | Disagree (2) | Neither agree nor disagree (3) | Agree (4) | Strongly agree (5) |
|---|---|---|---|---|---|
| 1. I am most afraid of coronavirus-19. | ○ | ○ | ○ | ○ | ○ |
| 2. It makes me uncomfortable to think about coronavirus-19. | ○ | ○ | ○ | ○ | ○ |
| 3. My hands become clammy when I think about coronavirus-19. | ○ | ○ | ○ | ○ | ○ |
| 4. I am afraid of losing my life because of coronavirus-19. | ○ | ○ | ○ | ○ | ○ |
| 5. When watching news and stories about coronavirus-19 on social media, I become nervous or anxious. | ○ | ○ | ○ | ○ | ○ |
| 6. I cannot sleep because I'm worrying about getting coronavirus-19. | ○ | ○ | ○ | ○ | ○ |
| 7. My heart races or palpitates when I think about getting coronavirus-19. | ○ | ○ | ○ | ○ | ○ |

**Part E: The Instagram Addiction Scale (TIAS)**

Please select a number from 1 (strongly disagree) to 5 (strongly agree) for each statement to measure the addiction in Instagram.

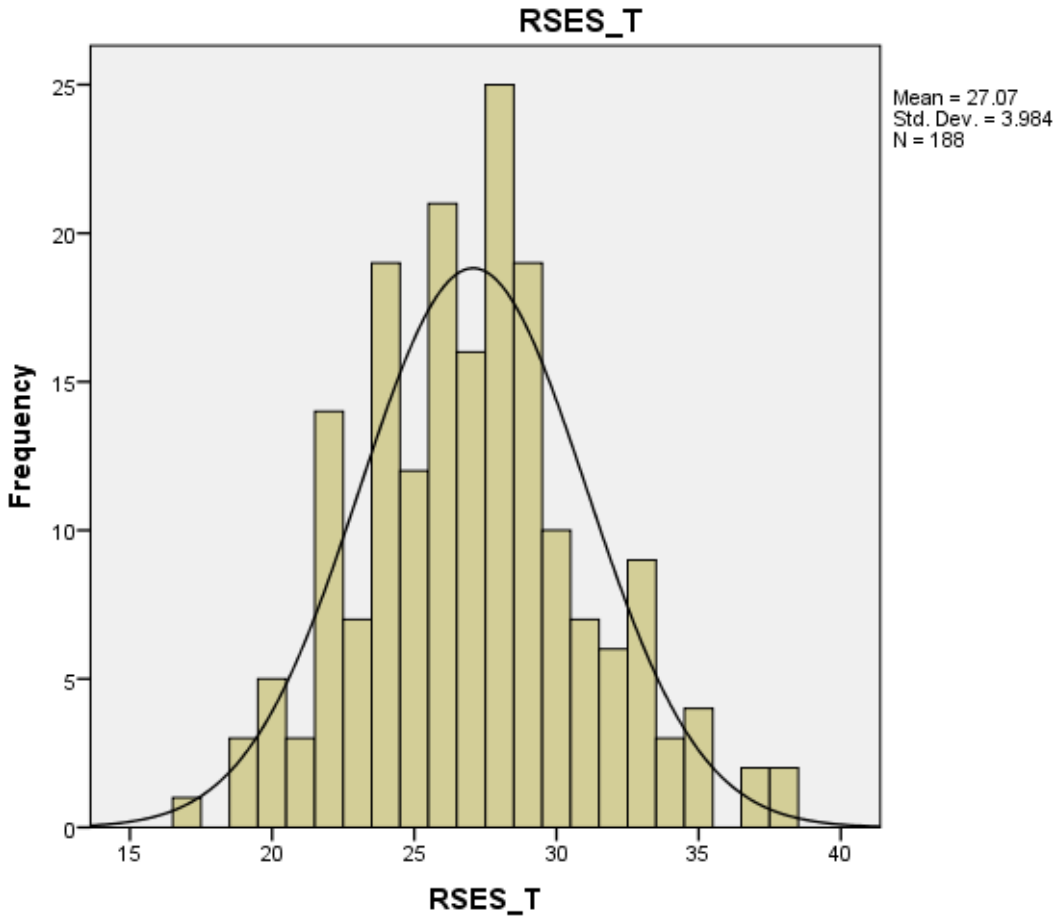
| Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

| | Strongly disagree (1) | Disagree (2) | Neither agree nor disagree (3) | Agree (4) | Strongly agree (5) |
|---|---|---|---|---|---|
| 1. I often think about what is happening on Instagram when I do not access it. | ○ | ○ | ○ | ○ | ○ |
| 2. I post photos/videos on Instagram feed to attract others' attention. | ○ | ○ | ○ | ○ | ○ |
| 3. I see the contents of Instagram feed posts to reduce feelings of guilt, anxiety, helplessness, or depression. | ○ | ○ | ○ | ○ | ○ |
| 4. I try to limit my time for Instagram (see the feed), but it does not work. | ○ | ○ | ○ | ○ | ○ |
| 5. I get easily irritated if I am prohibited from seeing the Instagram feed. | ○ | ○ | ○ | ○ | ○ |

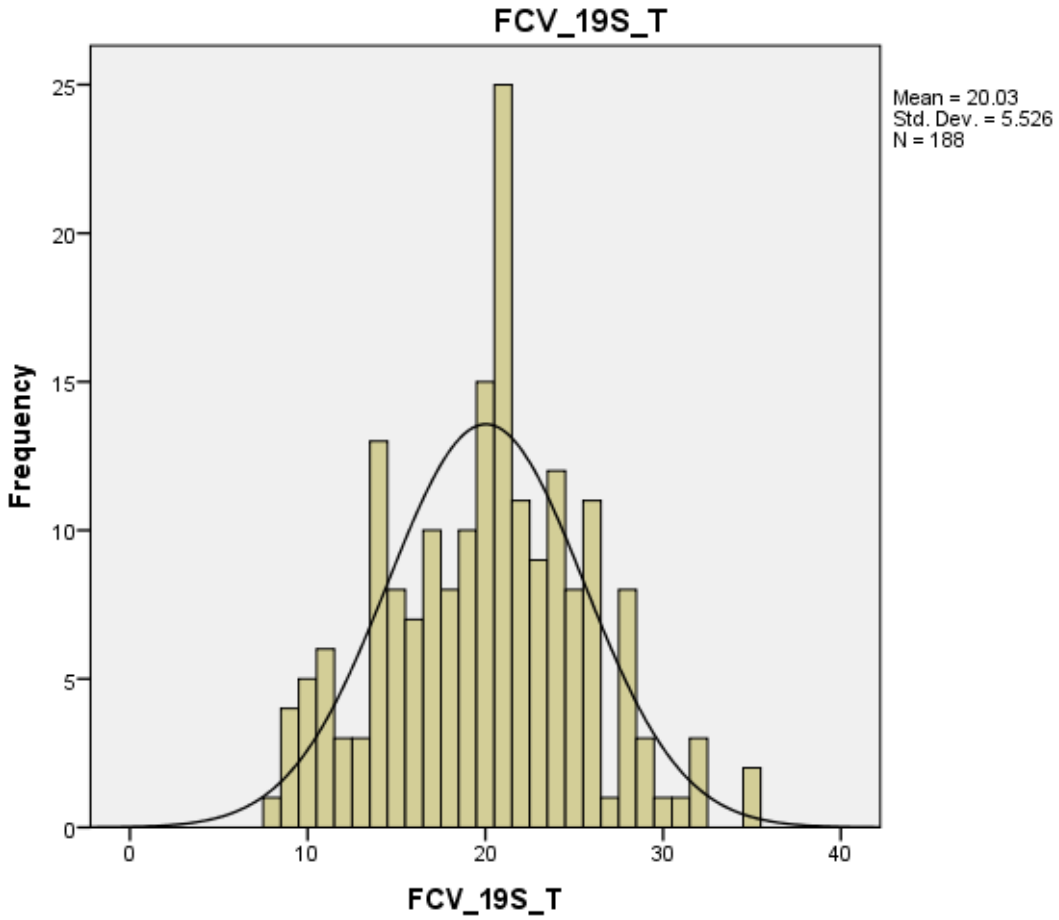
| | | | | | |
|---|---|---|---|---|---|
| 6. I find it hard to share time for hobbies, rest, or exercise because I spend my time checking Instagram feed. | ○ | ○ | ○ | ○ | ○ |
| 7. I think before sharing a photo on Instagram Stories whether to share it to public or close friends. | ○ | ○ | ○ | ○ | ○ |
| 8. I make Instagram stories about my activities to get others' attention. | ○ | ○ | ○ | ○ | ○ |
| 9. I check the content of Instagram stories to reduce feelings of guilt, anxiety, helplessness, or depression. | ○ | ○ | ○ | ○ | ○ |
| 10. I feel there is an urge to continue checking Instagram stories continuously. | ○ | ○ | ○ | ○ | ○ |
| 11. I get irritated easily if I am prohibited from watching Instagram stories. | ○ | ○ | ○ | ○ | ○ |
| 12. I watch Instagram stories too much that I neglect work/lectures/study time. | ○ | ○ | ○ | ○ | ○ |

## Appendix C: Histogram

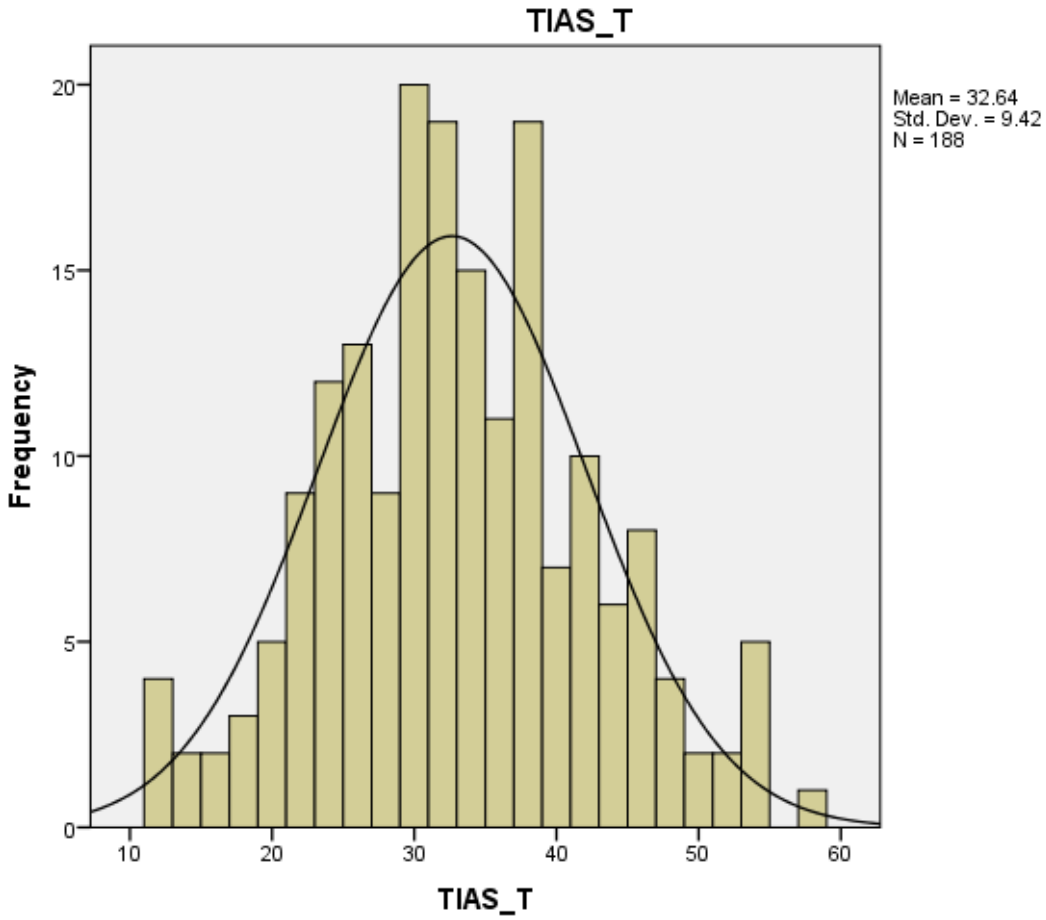
**Self-Esteem**



**Fear of COVID-19**

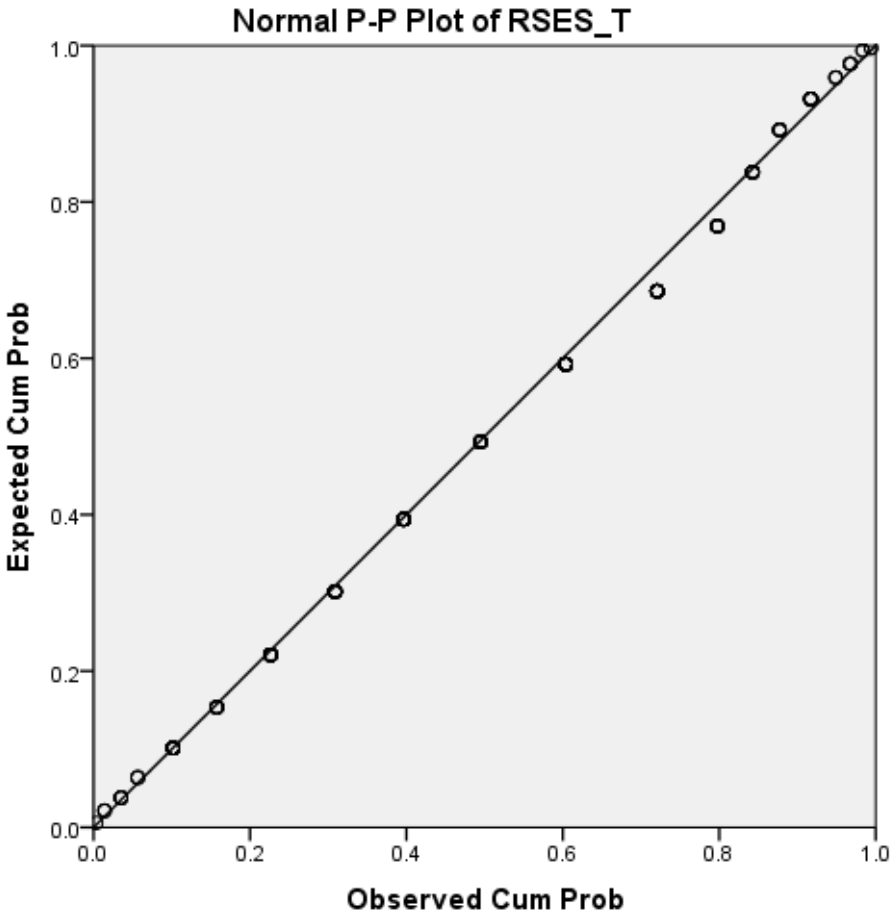


**Instagram Addiction**

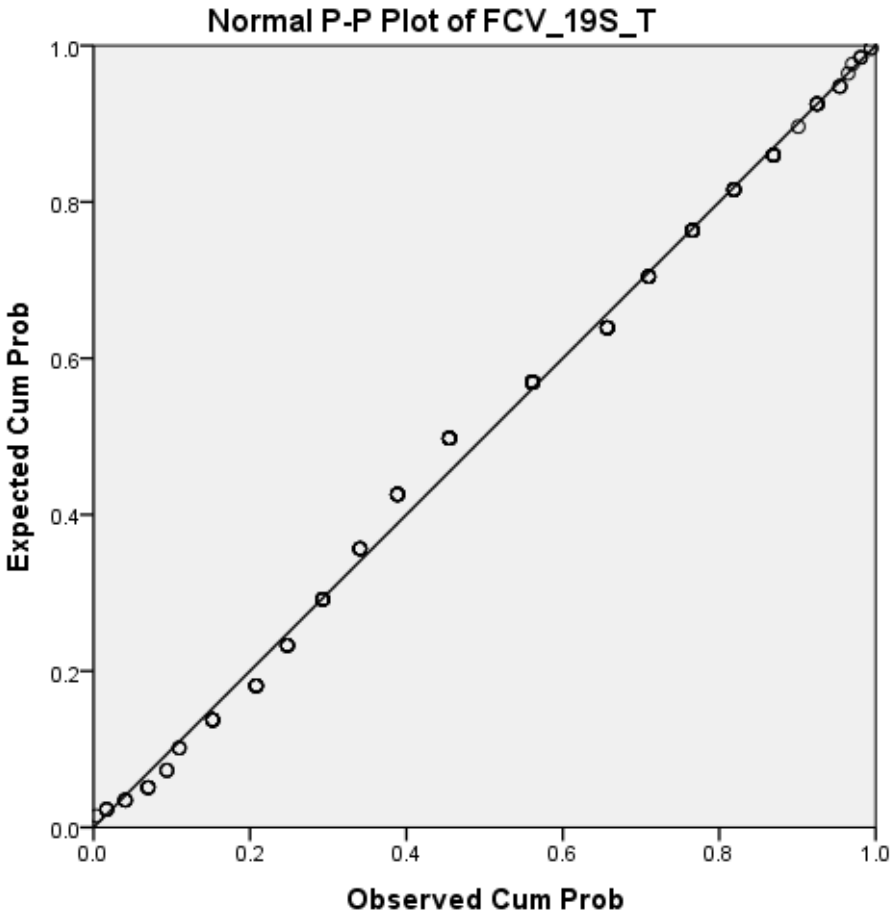


## Appendix D: P-P Plot

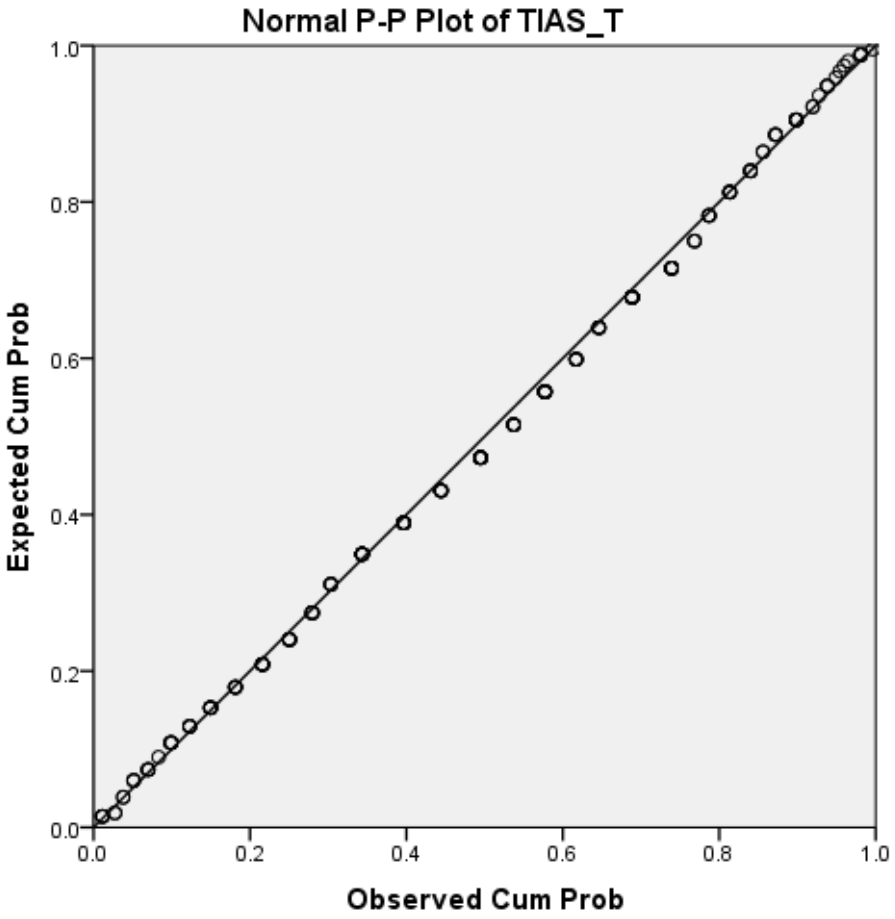
**Self-Esteem**



**Fear of COVID-19**



**Instagram Addiction**



## Appendix E: Kolmogorov-Smirnov (K-S) Test

**Tests of Normality**

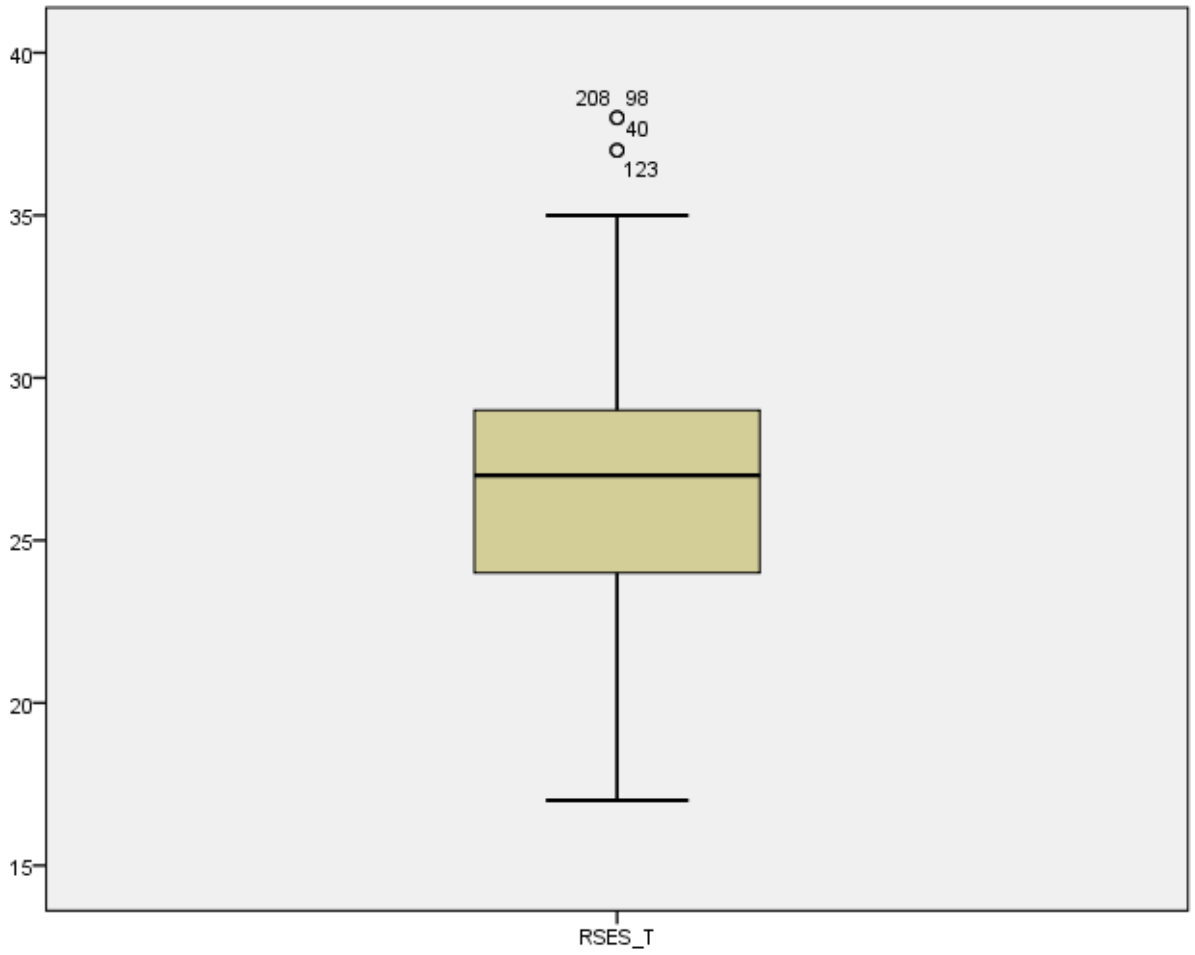
| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| RSES_T | .085 | 188 | .002 | .986 | 188 | .062 |
| FCV_19S_T | .083 | 188 | .003 | .987 | 188 | .078 |
| TIAS_T | .049 | 188 | .200* | .991 | 188 | .271 |

*. This is a lower bound of the true significance.

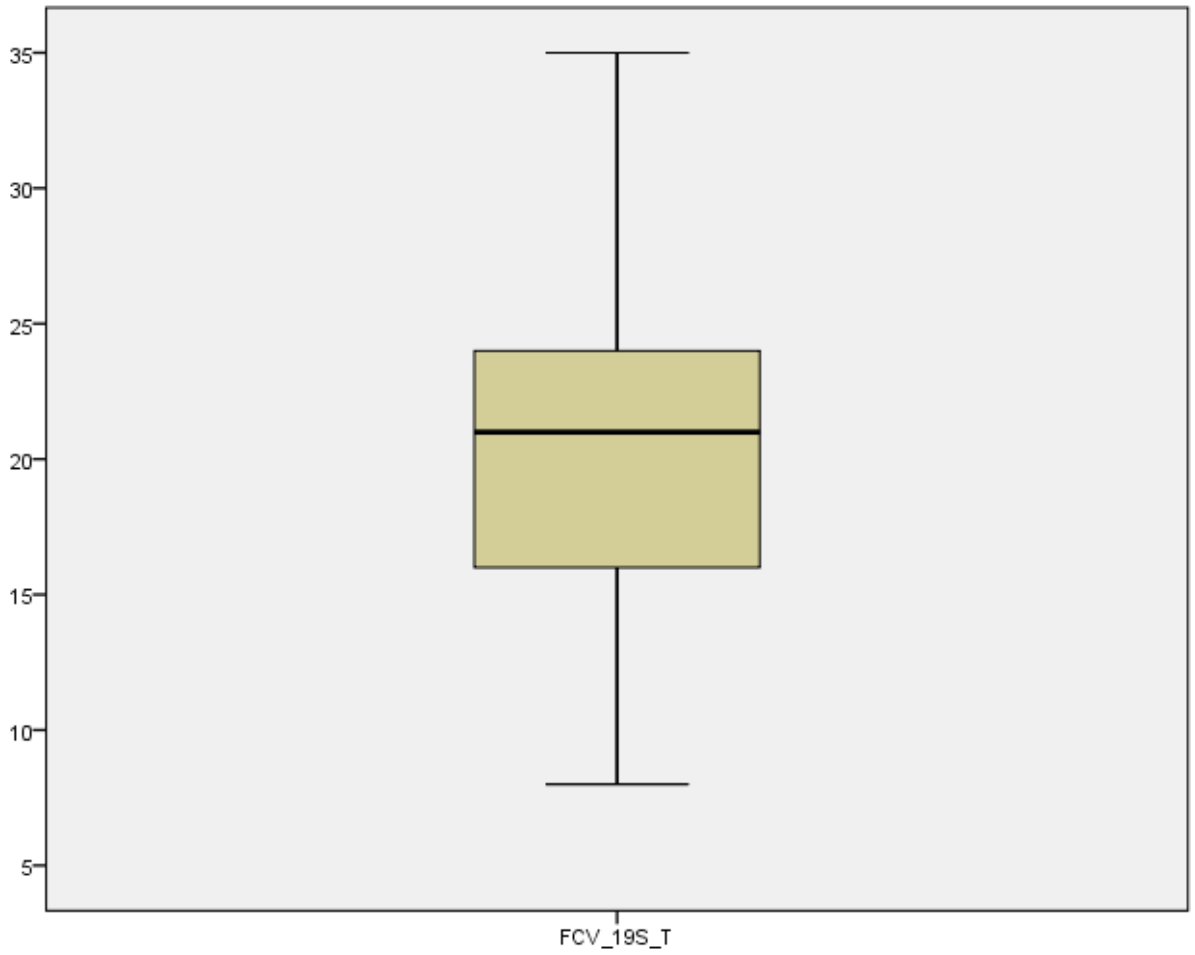
a. Lilliefors Significance Correction

## Appendix F: Boxplot

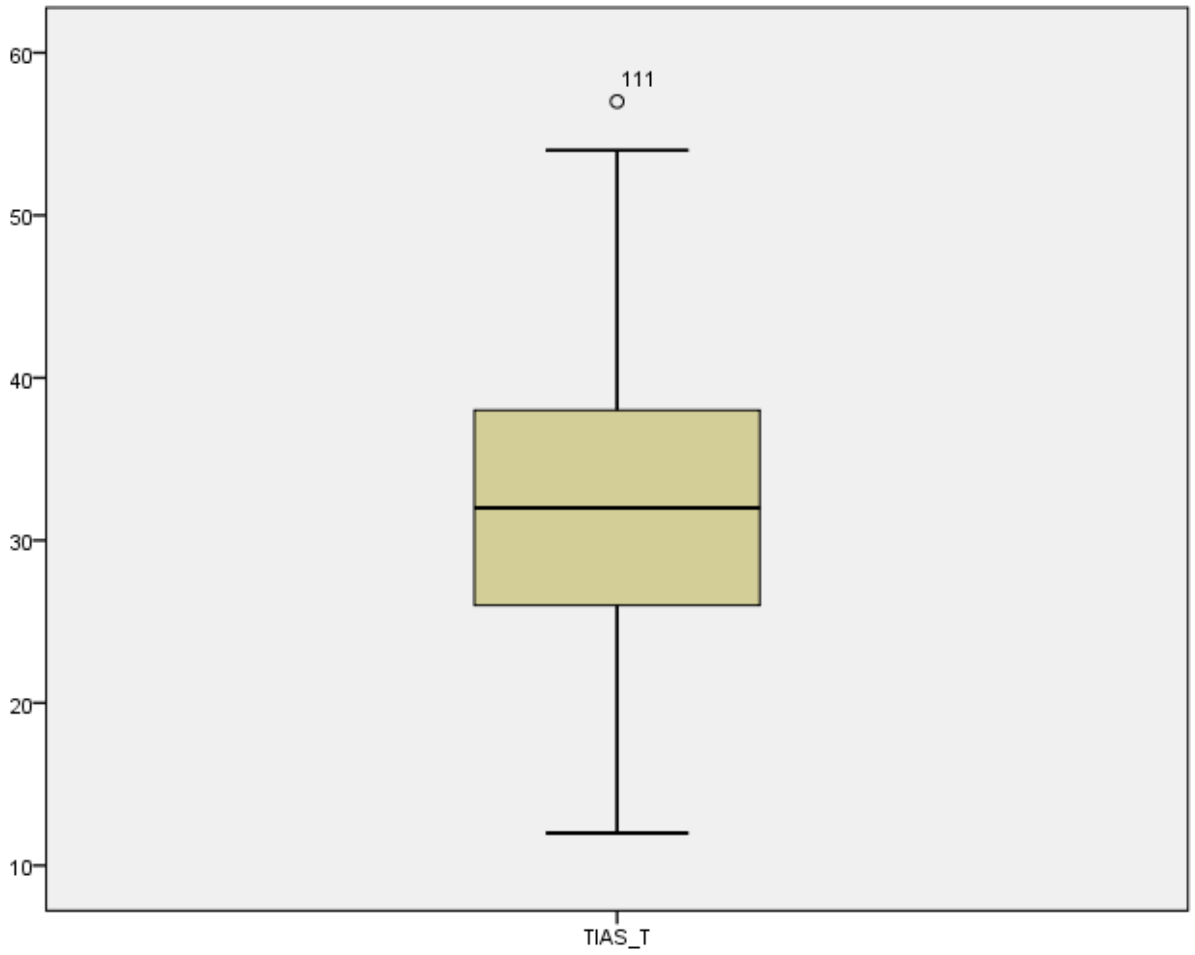
**Self-Esteem**



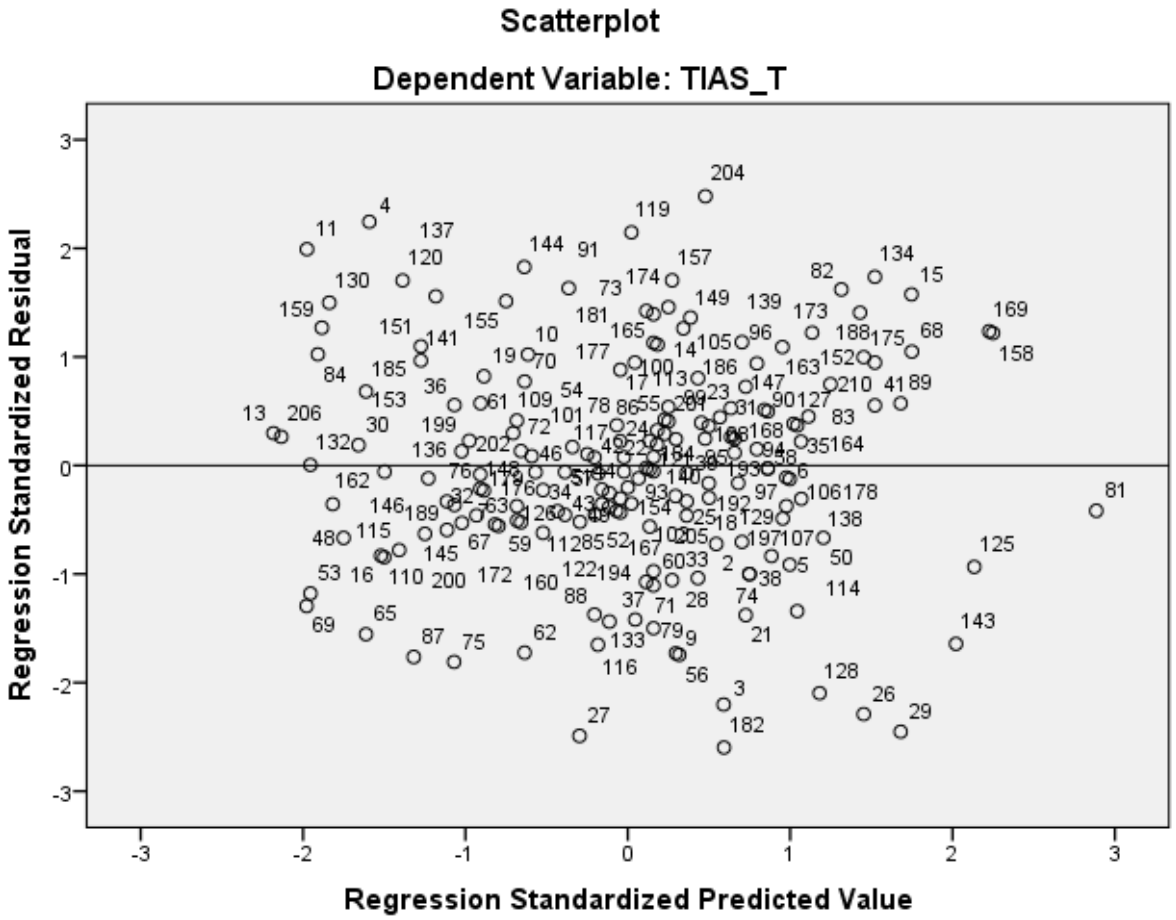
**Fear of COVID-19**



**Instagram Addiction**



**Appendix G: Scatterplot**



## Appendix H: Casewise Diagnostics

**Casewise Diagnostics[a]**

| Case Number | ID | Std. Residual | TIAS_T | Predicted Value | Residual |
|---|---|---|---|---|---|
| 2 | 3 | -2.202 | 19 | 35.75 | -16.748 |
| 3 | 4 | 2.244 | 41 | 23.93 | 17.067 |
| 22 | 26 | -2.290 | 23 | 40.42 | -17.418 |
| 23 | 27 | -2.490 | 12 | 30.94 | -18.943 |
| 25 | 29 | -2.452 | 23 | 41.65 | -18.650 |
| 105 | 119 | 2.147 | 49 | 32.67 | 16.327 |
| 113 | 128 | -2.097 | 23 | 38.95 | -15.948 |
| 160 | 182 | -2.598 | 16 | 35.76 | -19.759 |
| 179 | 204 | 2.480 | 54 | 35.14 | 18.863 |

a. Dependent Variable: TIAS_T

## Appendix I: Case Summaries Table

**Case Summaries[a]**

| | Case Number | Mahalanobis Distance | Cook's Distance | Centered Leverage Value |
|---|---|---|---|---|
| 1 | 2 | .32199 | .00128 | .00177 |
| 2 | 3 | .49893 | .01348 | .00274 |
| 3 | 4 | 4.31365 | .05193 | .02370 |
| 4 | 5 | 2.91122 | .00624 | .01600 |
| 5 | 6 | 2.91122 | .00012 | .01600 |
| 6 | 7 | .99283 | .00020 | .00546 |
| 7 | 9 | 1.76532 | .01559 | .00970 |
| 8 | 10 | .90433 | .00371 | .00497 |
| 9 | 11 | 4.41232 | .04172 | .02424 |
| 10 | 13 | 7.84064 | .00159 | .04308 |
| 11 | 14 | 3.51445 | .01383 | .01931 |
| 12 | 15 | 4.69425 | .02758 | .02579 |
| 13 | 16 | 5.28055 | .00850 | .02901 |
| 14 | 17 | 2.95529 | .00680 | .01624 |
| 15 | 18 | 2.58086 | .00060 | .01418 |
| 16 | 19 | .99283 | .00251 | .00546 |
| 17 | 21 | .56832 | .00553 | .00312 |
| 18 | 22 | 1.80334 | .00000 | .00991 |
| 19 | 23 | 1.78241 | .00081 | .00979 |
| 20 | 24 | .14652 | .00001 | .00081 |
| 21 | 25 | .14533 | .00023 | .00080 |
| 22 | 26 | 2.25029 | .03231 | .01236 |
| 23 | 27 | 1.93548 | .03438 | .01063 |
| 24 | 28 | .68274 | .00337 | .00375 |
| 25 | 29 | 2.84106 | .04407 | .01561 |
| 26 | 30 | 2.75760 | .00025 | .01515 |
| 27 | 31 | 1.37241 | .00110 | .00754 |
| 28 | 32 | .87717 | .00074 | .00482 |
| 29 | 33 | 1.11754 | .00441 | .00614 |
| 30 | 34 | .41034 | .00013 | .00225 |
| 31 | 35 | 1.45349 | .00022 | .00799 |
| 32 | 36 | .56612 | .00291 | .00311 |
| 33 | 37 | .26837 | .00473 | .00147 |
| 34 | 38 | .56612 | .00291 | .00311 |
| 35 | 39 | .14533 | .00001 | .00080 |
| 36 | 41 | 2.51645 | .00205 | .01383 |
| 37 | 42 | .09413 | .00001 | .00052 |

| | | | | |
|---|---|---|---|---|
| 38 | 43 | .10651 | .00010 | .00059 |
| 39 | 44 | .00102 | .00008 | .00001 |
| 40 | 46 | .55405 | .00002 | .00304 |
| 41 | 48 | 4.09947 | .00439 | .02252 |
| 42 | 49 | 2.74013 | .00066 | .01506 |
| 43 | 50 | 2.62022 | .00306 | .01440 |
| 44 | 51 | .11140 | .00001 | .00061 |
| 45 | 52 | .33843 | .00047 | .00186 |
| 46 | 53 | 5.38185 | .01743 | .02957 |
| 47 | 54 | .22359 | .00007 | .00123 |
| 48 | 55 | .62095 | .00050 | .00341 |
| 49 | 56 | .54302 | .00871 | .00298 |
| 50 | 57 | .19834 | .00046 | .00109 |
| 51 | 58 | 1.28609 | .00005 | .00707 |
| 52 | 59 | 1.35704 | .00121 | .00746 |
| 53 | 60 | .14652 | .00201 | .00081 |
| 54 | 61 | 2.86234 | .00126 | .01573 |
| 55 | 62 | 1.92897 | .01643 | .01060 |
| 56 | 63 | 1.10047 | .00122 | .00605 |
| 57 | 65 | 2.99382 | .01844 | .01645 |
| 58 | 66 | .33842 | .00012 | .00186 |
| 59 | 67 | 2.13914 | .00166 | .01175 |
| 60 | 68 | 396916 | .01057 | .02181 |
| 61 | 69 | 6.23142 | .02402 | .03424 |
| 62 | 70 | 1.92897 | .00332 | .01060 |
| 63 | 71 | .81646 | .00389 | .00449 |
| 64 | 72 | .19834 | .00001 | .00109 |
| 65 | 73 | 1.80334 | .01072 | .00991 |
| 66 | 74 | .56612 | .00291 | .00311 |
| 67 | 75 | 4.15878 | .03271 | .02285 |
| 68 | 76 | .85940 | .00002 | .00472 |
| 69 | 78 | 1.91103 | .00075 | .01050 |
| 70 | 79 | .14652 | .00476 | .00081 |
| 71 | 81 | 9.87525 | .00392 | .05426 |
| 72 | 82 | 5.80014 | .03527 | .03187 |
| 73 | 83 | 1.23763 | .00085 | .00680 |
| 74 | 84 | 4.13629 | .01043 | .02273 |
| 75 | 85 | .73392 | .00056 | .00403 |
| 76 | 86 | .03834 | .00020 | .00021 |
| 77 | 87 | 1.81687 | .01652 | .00998 |
| 78 | 88 | .11140 | .000386 | .00061 |
| 79 | 89 | 2.84106 | .00240 | .01561 |
| 80 | 90 | 2.06926 | .00152 | .01137 |

| | | | | |
|---|---|---|---|---|
| 81 | 91 | .13537 | .00559 | .00074 |
| 82 | 92 | .09413 | .00001 | .00052 |
| 83 | 93 | 2.09115 | .00008 | .01149 |
| 84 | 94 | 1.01531 | .00009 | .00558 |
| 85 | 95 | 1.89828 | .00033 | .01043 |
| 86 | 96 | 1.01531 | .00332 | .00558 |
| 87 | 97 | 1.37241 | .00000 | .00754 |
| 88 | 99 | .33487 | .00049 | .00184 |
| 89 | 100 | 4.69903 | .01374 | .02582 |
| 90 | 101 | 1.35704 | .00008 | .00746 |
| 91 | 103 | .05910 | .00024 | .00032 |
| 92 | 105 | .68274 | .00202 | .00375 |
| 93 | 106 | 1.05276 | .00267 | .00564 |
| 94 | 107 | 1.05276 | .00267 | .00578 |
| 95 | 108 | 1.19052 | .00025 | .00654 |
| 96 | 109 | 3.81739 | .00083 | .02097 |
| 97 | 110 | 2.30674 | .00448 | .01267 |
| 98 | 112 | .77786 | .00059 | .00427 |
| 99 | 113 | .62095 | .00087 | .00341 |
| 100 | 114 | 1.78821 | .00946 | .00983 |
| 101 | 115 | 2.71890 | .00430 | .01494 |
| 102 | 116 | 4.97926 | .03186 | .02736 |
| 103 | 117 | 2.08838 | .00006 | .01147 |
| 104 | 118 | .10651 | .00026 | .00059 |
| 105 | 119 | .05910 | .00900 | .00032 |
| 106 | 120 | 3.14047 | .02302 | .01726 |
| 107 | 121 | 1.76532 | .00031 | .00970 |
| 108 | 122 | .85360 | .00093 | .00469 |
| 109 | 124 | 3.92793 | .00196 | .02158 |
| 110 | 125 | 5.74600 | .01161 | .03157 |
| 111 | 126 | .93630 | .00093 | .00514 |
| 112 | 127 | 2.27412 | .00092 | .01250 |
| 113 | 128 | 2.04778 | .02534 | .01125 |
| 114 | 129 | 1.00097 | .00089 | .00550 |
| 115 | 130 | 8.93038 | .04570 | .04907 |
| 116 | 132 | 5.38185 | .00000 | .02857 |
| 117 | 133 | .70639 | .00656 | .00388 |
| 118 | 134 | 2.51645 | .02016 | .01383 |
| 119 | 136 | 2.46014 | .00011 | .01352 |
| 120 | 137 | 2.15801 | .01452 | .01186 |
| 121 | 138 | 3.93848 | .00090 | .02164 |
| 122 | 139 | .72170 | .00413 | .00397 |
| 123 | 140 | .96865 | .00029 | .00532 |

| | | | | |
|---|---|---|---|---|
| 124 | 141 | 5.49501 | .01193 | .03019 |
| 125 | 143 | 4.13559 | .02684 | .02272 |
| 126 | 144 | 1.40581 | .01508 | .00772 |
| 127 | 145 | 1.24278 | .00148 | .00683 |
| 128 | 146 | 3.52413 | .00012 | .01936 |
| 129 | 147 | 2.08901 | .00163 | .01148 |
| 130 | 148 | .85940 | .00016 | .00472 |
| 131 | 149 | .17328 | .00402 | .00095 |
| 132 | 150 | .03336 | .00001 | .00018 |
| 133 | 151 | 5.49501 | .01540 | .03019 |
| 134 | 152 | 2.25029 | .00612 | .01236 |
| 135 | 153 | 6.23021 | .00005 | .03423 |
| 136 | 154 | .14652 | .00001 | .00081 |
| 137 | 155 | .58123 | .00673 | .00319 |
| 138 | 156 | .40589 | .00000 | .00223 |
| 139 | 157 | 1.11754 | .01151 | .00614 |
| 140 | 158 | 5.13226 | .01787 | .03747 |
| 141 | 159 | 6.81959 | .02515 | .03747 |
| 142 | 160 | .41034 | .00101 | .00225 |
| 143 | 162 | 3.45946 | .00109 | .01901 |
| 144 | 163 | 4.63899 | .01407 | .02549 |
| 145 | 164 | 1.78821 | .00071 | .00983 |
| 146 | 165 | .14652 | .00270 | .00081 |
| 147 | 166 | .70639 | .00021 | .00388 |
| 148 | 167 | .40589 | .00083 | .00223 |
| 149 | 168 | 1.48205 | .00006 | .00814 |
| 150 | 169 | 4.95263 | .01777 | .02721 |
| 151 | 172 | 2.30026 | .00184 | .01264 |
| 152 | 173 | 1.35649 | .00661 | .00745 |
| 153 | 174 | .62095 | .00641 | .00341 |
| 154 | 175 | 2.51645 | .00601 | .01383 |
| 155 | 176 | 2.86234 | .00104 | .01573 |
| 156 | 177 | .33843 | .00192 | .00186 |
| 157 | 178 | 1.28609 | .00060 | .00707 |
| 158 | 179 | .35495 | .00001 | .00195 |
| 159 | 181 | .14652 | .00410 | .00081 |
| 160 | 182 | 7.22838 | .11148 | .03972 |
| 161 | 184 | .27556 | .00020 | .00151 |
| 162 | 185 | 2.99382 | .00354 | .01645 |
| 163 | 186 | .56832 | .00153 | .00312 |
| 164 | 187 | .03834 | .00007 | .00021 |
| 165 | 188 | 2.46395 | .01304 | .01354 |
| 166 | 189 | 1.24278 | .00046 | .00683 |

| | | | | |
|---|---|---|---|---|
| 167 | 192 | .74982 | .00009 | .00412 |
| 168 | 193 | 1.37241 | .00000 | .00754 |
| 169 | 194 | .14652 | .00259 | .00081 |
| 170 | 195 | .40589 | .00013 | .00223 |
| 171 | 196 | 1.28064 | .00030 | .00704 |
| 172 | 197 | .72170 | .00159 | .00397 |
| 173 | 198 | 1.38858 | .00059 | .00763 |
| 174 | 199 | 6.66141 | .00502 | .03660 |
| 175 | 200 | 1.85399 | .00213 | .01019 |
| 176 | 201 | .74982 | .00043 | .00412 |
| 177 | 202 | 3.49447 | .00045 | .01920 |
| 178 | 203 | .27556 | .00042 | .01920 |
| 179 | 204 | 1.79696 | .03243 | .00987 |
| 180 | 205 | .14533 | .00045 | .00080 |
| 181 | 206 | 5.61617 | .00091 | .03086 |
| 182 | 209 | 1.97848 | .00083 | .01087 |
| 183 | 210 | 1.92389 | .00309 | .01057 |
| Total N | | 183 | 183 | 183 |

a. Limited to first 200 cases.

# Appendix J: SPSS Output for Normality Assumption Testing

## Skewness and Kurtosis

**Statistics**

| | | RSES_T | FCV_19S_T | TIAS_T |
|---|---|---|---|---|
| N | Valid | 188 | 188 | 188 |
| | Missing | 0 | 0 | 0 |
| Mean | | 27.07 | 20.03 | 32.64 |
| Std. Error of Mean | | .291 | .403 | .687 |
| Median | | 27.00 | 21.00 | 32.00 |
| Mode | | 28 | 21 | 29[a] |
| Std. Deviation | | 3.984 | 5.526 | 9.420 |
| Variance | | 15.872 | 30.534 | 88.744 |
| Skewness | | .255 | .040 | .166 |
| Std. Error of Skewness | | .177 | .177 | .177 |
| Kurtosis | | .037 | -.213 | -.138 |
| Std. Error of Kurtosis | | .353 | .353 | .353 |
| Range | | 21 | 27 | 45 |
| Minimum | | 17 | 8 | 12 |
| Maximum | | 38 | 35 | 57 |
| Percentiles | 25 | 24.00 | 16.00 | 26.00 |
| | 50 | 27.00 | 21.00 | 32.00 |
| | 75 | 29.00 | 24.00 | 38.00 |

a. Multiple modes exist. The smallest value is shown

## Appendix K: SPSS Output for Assumption Testing of Multiple Linear Regression

### Multicollinearity

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Tolerance | VIF |
| 1 | (Constant) | 16.230 | 4.968 | | 3.267 | .001 | 6.427 | 26.034 | | |
| | RSES_T | -.124 | .155 | -.049 | -.802 | .424 | -.430 | .182 | .978 | 1.022 |
| | FCV_19S_T | .984 | .105 | .573 | 9.348 | .000 | .776 | 1.191 | .978 | 1.022 |

a. Dependent Variable: TIAS_T

### Independence of Errors

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .582[a] | .339 | .331 | 7.606 | 1.957 |

a. Predictors: (Constant), FCV_19S_T, RSES_T

b. Dependent Variable: TIAS_T

## Appendix L: Pearson Product-Moment Correlation

**Correlations**

| | | RSES_T | FCV_19S_T | TIAS_T |
|---|---|---|---|---|
| RSES_T | Pearson Correlation | 1 | -.147* | -.133 |
| | Sig. (2-tailed) | | .047 | .072 |
| | N | 183 | 183 | 183 |
| FCV_19S_T | Pearson Correlation | -.147* | 1 | .580** |
| | Sig. (2-tailed) | .047 | | .000 |
| | N | 183 | 183 | 183 |
| TIAS_T | Pearson Correlation | -.133 | .580** | 1 |
| | Sig. (2-tailed) | .072 | .000 | |
| | N | 183 | 183 | 183 |

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

## Appendix M: SPSS Output for Multiple Linear Regression

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .582[a] | .339 | .331 | 7.606 | 1.957 |

a. Predictors: (Constant), FCV_19S_T, RSES_T

b. Dependent Variable: TIAS_T

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 5335.510 | 2 | 2667.755 | 46.112 | .000[b] |
| | Residual | 10413.747 | 180 | 57.854 | | |
| | Total | 15749.257 | 182 | | | |

a. Dependent Variable: TIAS_T

b. Predictors: (Constant), FCV_19S_T, RSES_T

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Tolerance | VIF |
| 1 | (Constant) | 16.230 | 4.968 | | 3.267 | .001 | 6.427 | 26.034 | | |
| | RSES_T | -.124 | .155 | -.049 | -.802 | .424 | -.430 | .182 | .978 | 1.022 |
| | FCV_19S_T | .984 | .105 | .573 | 9.348 | .000 | .776 | 1.191 | .978 | 1.022 |

a. Dependent Variable: TIAS_T