THE RELATIONSHIP BETWEEN NEUROTICISM, SELF-COMPASSION AND PHONE ADDICTION AMONG UNDERGRADUATE STUDENTS IN MALAYSIA.

CHONG RUI HONG

A RESEARCH PROJECT SUBMITTED IN

PARTIAL FULFILMENT OF THE REQUIREMENTS FOR

THE BACHELOR OF SOCIAL SCIENCE (HONS) GUIDANCE AND COUNSELLING

FACULTY OF ARTS AND SOCIAL SCIENCE

UNIVERSITI TUNKU ABDUL RAHMAN

APRIL 2025

Copyright Statement

This Project Paper is submitted in partial fulfilment of the requirements for the degree of Bachelor of Social Science (Honours) Guidance and Counselling at Universiti Tunku Abdul Rahman (UTAR). This Project Paper represents the work of the author, except where due acknowledgement has been made in the text. No part of this Project Paper may be reproduced, stored, or transmitted in any form or by any means, whether electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the author or UTAR, in accordance with UTAR's Intellectual Property Policy.

ACKNOWLEDGEMENT

By completing this research, I encountered various obstacles and experienced stress throughout the journey. Fortunately, I received support from many people and learned a lot from this experience. Without their support, I would not have been able to complete this research. I would now like to express my deepest gratitude to everyone who contributed to this study.

Firstly, I am sincerely grateful to my supervisor, Mr. Ho Khee Hoong, for his guidance and valuable feedback throughout the research process. His support, patience, and expertise were crucial in helping me complete this study.

Moreover, I would like to thank my friends and family. My friends provided assistance and advice that contributed to the success of the research. Although my family did not directly assist with the research, their understanding and care helped me stay positive and manage stress, giving me the strength to complete this study.

Lastly, I truly appreciate all the participants who took the time to complete the survey. Their contributions were essential in generating the results for this study. Their time and effort are deeply appreciated.

CHONG RUI HONG

APPROVAL FORM

The research paper attached here, entitled "The Relationship Between Neuroticism, Self-Compassion and Phone Addiction among Undergraduate Students in Malaysia" written and submitted by Chong Rui Hong in partial fulfilment of the requirement for the Bachelor of Social Science (Hons) Guidance and Counselling is hereby accepted.

_____ Date: _____

Supervisor

(Mr. Ho Khee Hoong)

Abstract

Phone addiction has emerged as a prevalent concern in the digital age, particularly among university students. The purpose of this study is to examine the relationship between phone addiction, neuroticism and self-compassion among undergraduate students in Malaysia. Therefore, the present study examined the relationship of self-compassion, neuroticism, and phone addiction among undergraduate students in Malaysia, as well as tested whether neuroticism and self-compassion predict phone addiction. This study is a correlational design using a cross-sectional research design and purposive sampling to recruit participants online through the survey method. This study applied three instruments to assess self-compassion, neuroticism and phone addiction, which were the Self-Compassion Scale-Short Form, Big Five Inventory-Neuroticism, and Smartphone Addiction Scale-Short Version. The survey was distributed online to 110 undergraduate participants in Malaysia between 18 to 25 years old. The result showed that there were significant relationships between self-compassion, neuroticism, and phone addiction among undergraduates in Malaysia. Moreover, the result showed that self-compassion has a negative relationship with phone addiction and was able to predict phone addiction, but neuroticism was unable to predict phone addiction among undergraduates in Malaysia. In summary, self-compassion can be further examined as an intervention toward undergraduate students with phone addiction.

Keywords: phone addiction, self-compassion, neuroticism, undergraduate students, Malaysia

Subject Area: RC554-569.5 Personality disorders. Behavior problems including sexual problems, drug abuse, suicide, child abuse.

DECLARATION

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

Name : Chong Rui Hong

Student ID : 22AAB02222

Signature :

Date : 26th April 2025

Table of Contents

Chapter 1: Introduction 1

Background of the Study 1

Problem Statement 4

Significance of Study 7

Theoretical Significance 7

Practical Significance 9

Research Objectives 10

Research Question 10

Research Hypotheses 11

Conceptual Definitions 11

Phone Addiction 11

Self-Compassion 11

Neuroticism 12

Operational Definitions 12

Phone Addiction 12

Self-Compassion 13

Neuroticism 13

Chapter 2: Literature review 14

Phone Addiction 14

Neuroticism 16

Self-Compassion 17

Phone Addiction and Neuroticism....19
Phone Addiction and Self-Compassion....20
Neuroticism and Self-Compassion....21
Theoretical Framework....23
Conceptual Framework....24
Chapter 3: Methodology....26
Research Design....26
Sampling Procedures....28
Sampling Method....28
Participants....28
Location of Study....29
Ethical Clearance Approval....29
Sample Size, Power, and Precision....29
Data Collection Procedures....30
Inclusion and Exclusion Criteria....30
Procedures for Obtaining Consent....31
Data Collection Procedures....31
Instruments....33
10-Item Smartphone Addiction Scale-Short Version (SAS-SV)....33
12-Item Self-Compassion Scale-Short Form (SCS-SF)....34
8-Item Big Five Inventory-Neuroticism (BFI(N))....34

Chapter 4: Result 36
Descriptive statistics 36
Demographic Characteristics 36
Topic-Specific Characteristics 37
Sampling sufficiency 38
Missing Data and Data Diagnostics 39
Frequency and Percentages of Missing Data 39
Methods for Addressing Missing Data 39
Criteria for Post Data-Collection Exclusion of Participants 39
Criteria for Imputation of Missing Data 40
Defining and Processing of Statistical Outliers 40
Data Transformation 40
Analyses of Data Distributions 40
Data Analysis 41
Chapter 5: Discussion and Conclusion 48
Discussion 48
Phone Addiction and Neuroticism 48
Phone Addiction and Self-Compassion 49
Neuroticism and Self-Compassion 50
Predictors of Phone Addiction 51
Implication of the Study 53

Theoretical Implications 53

Practical Implications 54

Limitation of the Study 55

Recommendations for Research in the Future 56

References 58

List of Tables 80

List of Figures 81

Appendices 82

Appendix B: G*Power Analysis 82

Appendix C: Boxplots 85

Appendix D: Casewise Diagnostics 86

Appendix E: Action Plan 89

Appendix F: Turnitin 90

Chapter 1: Introduction

Background of the Study

Phone addiction is characterised by overuse and dependence on mobile phones, which can lead to significant mental distress when access to devices is restricted (Chóliz, 2012). Phone addiction has become a growing concern due to its impact on daily functioning, including challenges in usage management and its potential to disrupt relationships and academic performance. (Chóliz, 2012). According to Kiran et al. (2019), mobile phones play a significant role in facilitating social interaction through social media (Kiran et al., 2019), yet their overuse among university students has become a growing concern. Similarly, emerging evidence suggests that excessive mobile phone use may contribute to challenges such as difficulty concentrating, academic setbacks, and heightened psychological distress (Çağan et al., 2014). Phone addiction will lead to many negative consequences that impact the mental health and academic success of university students if they are not able to control their usage. Recently, there have been many counselling cases related to phone addiction across society, and counsellors can provide a therapeutic approach for clients with phone addiction. Therefore, phone addiction will be crucial to study in the guidance and counselling field to enhance the current situation faced by university students.

A systematic review reported that 26.99% of individuals globally experience phone addiction (Meng et al., 2022). Based on Raza (2023), research shows Southeast Asia has the highest phone addiction, but Europe has the lowest. Moreover, Olson et al. (2022) suggested that Germany and France have the lowest phone addiction compared with 24 other countries. In contrast, studies in Taiwan (Republic of China) reported university students are stressed in their academic life so they will use mobile phones to escape from the potential stress of academics (Kuang-Tsan & Fu-Yuan, 2017). These findings highlight cultural and contextual factors that might influence phone addiction. The major impact of phone addiction is

COVID-19, students started to depend on mobile phones and digital devices for social interaction, learning and shopping ("44 smartphone addiction," 2024). It has shown that 37.4% of the study sample of university students were addicted to phone addiction due to the influence of the COVID-19 pandemic (Albursan et al., 2022).

According to Olson et al. (2022), there is an increase in mobile phone addiction in the world, it reported that China, Saudi Arabia and Malaysia have the highest phone addiction among the 24 countries. Malaysian university students' usage of mobile phones was mainly chatting and browsing information, followed by connecting with social networking sites (Munusamy & Ghazali, 2020). Munusamy & Ghazali (2020) highlight the importance of understanding phone addiction's contributing factors, as addressing these through improved interpersonal relationship-building techniques and self-control training may reduce its prevalence among students. Meanwhile, authority parties such as government and policymakers also play an important role in planning programs for young technology users to have growth with technology's advantage (Munusamy & Ghazali, 2020). In Malaysia, 46.9% of students are reported to be addicted to mobile phones (Ching et al., 2015). It also shows that 70% of Malaysian students use mobile phones for more than four hours per day, and it might be due to nomophobia which is a fear of missing out on information. Chan et al. (2020) highlights that university students have a moderate level of phone addiction and further discuss the importance of awareness programmes for students. Given the high prevalence of phone addiction in Malaysia based on various sources, mental health professionals should advocate for preventative and recovery strategies for coping with phone addiction.

Phone addiction is a growing concern, particularly among university students, as excessive use often leads to neglecting important aspects of life such as eating, sleeping, and academic responsibilities (Zhang & Zeng, 2024). They might use their phones to text, watch videos, engage on social media, or play games which can result in ignoring daily tasks that

are important to them (Zeerak et al., 2024). Friends and family will be triggered by the excessive phone usage behaviour of the person which leads to quarrels and poor relationships with others as well (Albursan et al., 2022). The behaviour of the phone addiction individuals might tend to ignore the responsibility in their lives and cause many negative consequences to their daily lives. The phone addiction individuals will procrastinate with academics which causes them to have poor results and negative emotions (Zhang & Zeng, 2024). On the other hand, students with academic stress might use phones more frequently if they face much stress at school to escape from their emotions (Zhang & Zeng, 2024). Therefore, better coping strategies should be incorporated for students if they are having negative emotions instead of just using phones to escape from academic stress.

According to Chung (2018), certain personality traits, such as neuroticism, play a role in causing addictive behaviours like phone addiction. An individual with high neuroticism will tend to see life circumstances as more negative and easily feel emotional (Li et al., 2024). For instance, this will lead them to feel easily stressed when they have many assignments or encounter stressful events, they will tend to escape from them because they want to relieve stress. Also, students who are unable to control their stress due to neuroticism personality traits will find it easier to overuse their phones as a negative way to escape from reality (Li et al., 2024). Based on Marciano et al. (2022), the coping style and cognition control of neuroticism traits will increase the chances of internet addiction. Hence, neuroticism traits will be a risk factor for phone addiction for university undergraduate students.

Next, individuals with high self-compassion will be less likely to engage in phone addiction as they will be more compassionate toward themselves when facing negative experiences (Yang, X. et al., 2023). Phone addiction is considered maladaptive behaviour, so an individual with self-compassion will tend to reduce the behaviour and maintain positive

emotions (Yang, X. et al., 2023). By fostering self-compassion, students will have better chances to reduce phone addiction and maintain their well-being. According to Porzoor & Hajipour (2023), self-compassion has a significant negative relationship with phone addiction. Hence, self-compassion will be an approach to challenge students' possibilities to escape stressful events by phone usage and replace it with positive coping strategies.

Studies examining the relationship between phone addiction, neuroticism, and self-compassion can provide valuable insights to inform counselling practices. Both counsellors and students will benefit from understanding how neuroticism and self-compassion work which affects the phone addiction toward undergraduate students in Malaysia. As phone addiction is quite a significant issue among Malaysian undergraduate students, investigating the relationship between the independent variables and phone addiction will help to predict the possibilities and control the situation. Hence, this research can help to have better counselling strategies that lead students to have a healthy use of technology, enhance academics and improve emotions.

Problem Statement

Phone addiction has increased a lot nowadays, the highest demographic group that has phone addiction are adolescents and young adults. Which said undergraduate students also fall in this range (Olson et al., 2022). Based on Felipe (2016), higher education institutions contribute to the prevalence of phone overuse among students. Felipe (2016) reported that overusing phones will lead students to have poor interpersonal relationships and bad experiences at the university. They tend to use the phone to escape from difficult conversations and work physically. When someone else is using their phone, other people will feel devalued and disrespected, which will make them less inclined to connect with others (Felipe, 2016). Also, phone addiction will lead to many different impacts on diverse areas such as academics, psychology, behaviour and lives (Liu et al., 2024). Students use

phones a lot because they can be used in searching for information and forming social relationships online whenever they want, and as well if not controlled will distract them from doing important things (Saha & Saha, 2018). Therefore, phone addiction will lead to bad consequences which impact undergraduate students' lives. Although phone addiction is widespread among undergraduate students, there is limited research on how psychological traits such as neuroticism and self-compassion contribute to this addiction, and how these factors may influence students' academic and social outcomes.

Despite the benefits of phones for communication and academic purposes, excessive use among undergraduate students is a significant issue. According to Felipe (2016), reducing phone addiction can have positive effects on students' interpersonal relationships and academic performance. By unplugging from their phones students will be more focused on the present which helps them to connect with their interpersonal relationships and have an enriching university experience (Felipe, 2016). However, the issue remains that many students fail to exercise self-control, leading to over-reliance on their phones, which can negatively affect their academic focus, social connections, and overall well-being (Liu et al., 2024). Despite the growing awareness of the negative effects of excessive phone usage, there is limited research on how undergraduate students can effectively balance phone usage to prevent negative impacts on their academic and social lives. Understanding the psychological factors such as neuroticism and self-compassion that influence students' ability to maintain healthy phone usage could provide valuable insights into intervention strategies.

Meanwhile, the COVID-19 pandemic from 2020 until 2022 has influenced society not only economically but also psychologically and a dependency on electronic devices (Wang & Ma, 2024). Although the COVID-19 pandemic has already ended, there is still a huge influence on society due to the huge changes. An increasing number of people have become dependent on phone usage for socializing, shopping, and engaging in leisure activities, often

replacing physical interactions and activities, which may contribute to phone addiction (Zhang, 2023). Also, there have been shown heightened feelings of anxiety and stress due to COVID-19 which is the neuroticism trait linked with phone addiction (Zhan et al., 2021, Yang, Z. et al., 2023). Besides, the rise of AI has caused people to depend more on it to learn and understand things instead of having face-to-face discussions and asking questions with friends or lecturers. This will affect their connection with others and lead the students to feel less connected with others in the university. Digital dependencies as a coping mechanism might lead to a cycle which leads to increased phone addiction with higher neuroticism levels (Alaa Zuhir Al-Rawashda et al., 2024; Achangwa et al., 2022). All in all, the changes due to the impact of COVID-19 and AI have affected the current university students on phone addiction and neuroticism.

Moreover, phone addiction will be mediated by self-compassion, as self-compassion is a way to a healthy solution and mindset when dealing with different things (Yang, X. et al., 2023). Self-compassion can be used to determine the therapeutic way to cope with phone addiction issues among undergraduate students and can estimate the possibilities of phone addiction for undergraduate students in Malaysia. However, cultural differences might appear with the difference in norms of defining self-compassion based on the country (Kotera et al., 2024). So, Malaysia might have a different meaning to perceive self-compassion when comparing studies with other countries. Also, there is a lack of studies on the relationship between phone addiction and self-compassion among the population and area of study. Only a few studies are in Malaysia which focus on undergraduate students. So, it is important to fill the gap that studies the relationship between phone addiction and self-compassion of undergraduate students in Malaysia.

Furthermore, most of the research focuses on adolescent populations, while some studies have examined the connection between neuroticism and self-compassion (Wang &

Wu, 2024). Few studies explicitly look at the relationship between neuroticism and self-compassion in Malaysian undergraduate students, a group that can experience particular social and educational challenges. Felipe et al. (2024) claim that those who had a difficult upbringing are more likely to be neurotic and less self-compassionate, but their research does not examine the direct relationship between these two traits. Thus, examining the relationship between neuroticism and self-compassion in the context of Malaysian undergraduates is crucial, as these psychological traits may significantly influence phone addiction, academic performance, and social well-being, which are pressing issues for this demographic.

In a nutshell, there is a lack of studies that investigate the relationship between phone addiction, neuroticism and self-compassion among Malaysia's undergraduate students. It is crucial to make others have awareness of phone addiction issues that are happening in society currently and see how the relationship between neuroticism and self-compassion will affect the tendency of phone addiction. It will also help shed light on providing new opinions and techniques on mental health issues or phone addiction issues. Also, this study will help to provide new insight to the society and the locals to see the current issues that are happening. Thus, the study's purpose is to examine the relationship of phone addiction, neuroticism and self-compassion among undergraduate students in Malaysia.

Significance of Study

Theoretical Significance

The Stress-Vulnerability Model applied in this study provides valuable information on the combination of phone addiction, neuroticism and self-compassion. Currently, phone addiction issues have become normal in our society as most of us have phones nowadays and the COVID-19 pandemic has changed society to become more phone dependent to do daily tasks such as online transactions, shopping and communicating. Especially in university, students need to have phones to socialise with others, pay money, take photos and so on. Yet,

there were limited research studies regarding the relationship of phone addiction, neuroticism and self-compassion among undergraduate students in Malaysia. Most resources are related to phone addiction and mental health issues among adolescents. So, this study will discover the relationship by focusing on the direct relationship between phone addiction, neuroticism and self-compassion in students. Also, there is a need to study the relationship between neuroticism and self-compassion. Individuals with higher self-compassion will have lower neuroticism because they will mindfully treat themselves when meeting challenges (Wang & Wu, 2024). Thus, the empirical findings from this study will contribute significant theoretical and practical knowledge.

Likewise, this study examines the unique combination of neuroticism, self-compassion and phone addiction, aiming to deliver a new perspective on the existing literature. The Stress-Vulnerability Model is applied to explain the relationship of phone addiction, neuroticism and self-compassion. To clarify mental illness, Joseph Zubin and Bonnie Spring established the Stress-Vulnerability Model in 1977. This model explains the causes of mental illness vulnerabilities are affected by both environmental stressors and biological predispositions (Zubin & Bonnie, 1977). The theory is related to the variables as students with high vulnerability such as neurotic traits will experience a heightened impact from stressful events, which may lead to phone addiction. Meanwhile, self-compassion acts as a protective factor, moderating vulnerability with healthier coping behaviours (Ormel & Neeleman, 2000). Accordingly, I will seek the theory through insight provided by the research based on the vulnerability of self-compassion and neuroticism toward phone addiction.

The present study can contribute by providing empirical support in the field of guidance and counselling. It will provide new knowledge about phone addiction, neuroticism and self-compassion toward Malaysia’s undergraduate students in the rising AI era and post-

COVID-19 endemic period. Also, understanding the theoretical framework can provide new insight into the influence of neuroticism and self-compassion on phone addiction. Additionally, researchers, counsellors, and psychologists can use this research to analyse or better understand undergraduate students in Malaysia. Since there is a lack of research on the correlation between these variables in Malaysia. Thus, this study will equip mental health professionals to know the issues happening among undergraduate students and incorporate effective interventions to manage phone addiction issues.

Practical Significance

Firstly, counsellors and mental health practitioners will be stakeholders in this study. They will have valuable insights to look through the correlation between phone addiction, neuroticism and self-compassion. It will let them understand the majority of Malaysia's undergraduate students are currently having and the cause or even able to formulate interventions for individuals with mental health issues. They can also apply suitable treatment toward the population of undergraduate students' clients when they encounter them (Worsley et al., 2022). Also, predict the possible cause and effect of the client's mental illness after having new insight from this study. Hence, this study is able to let counsellors and mental health practitioners to shed light on understanding the mental situation of clients.

Secondly, university administrators are the second stakeholder. This study focuses on students in the university. So, by understanding the impacts of phone addiction, neuroticism and self-compassion, university administrators can formulate activities, workshops or some new rules for the students to encourage and support undergraduate students' mental health concerns. The university administrators will be able to create a supportive and healthy atmosphere in the university environment which lead students to use positive coping strategies and reduce phone dependency when encountering stressful situations ("Mental

Health and," n.d.). Hence, university administrators can provide additional help for students to deal with mental health issues based on the insight from this study.

Lastly, students will be the third stakeholder. Many Malaysians do not express their feelings when they encounter stressful situations and also after the influence of the COVID-19 Pandemic. Often, students will search for information online instead of seeking professional help. So, this study will help the student to have awareness of the phone addiction issue among themselves or others which they can help themselves or their friends around them. Students can adopt healthier coping strategies when they encounter stressful events instead of excessive use of phones after knowing that self-compassion plays a role as a protective factor (Hernández-Torrano et al., 2020). Ultimately, this study will shed light for students to have better coping strategies and self-compassion toward themselves when encountering stress.

Research Objectives

This study's objective is to examine the relationships between phone addiction, neuroticism, and self-compassion among undergraduate students in Malaysia. There are four objectives formulated to examine the relationships between the variables. Which are:

1. To examine the positive relationship between phone addiction and neuroticism.
2. To examine the negative relationship between phone addiction and self-compassion.
3. To examine the negative relationship between neuroticism and self-compassion.
4. To examine whether self-compassion and neuroticism predict phone addiction.

Research Question

1. Is there a positive relationship between phone addiction and neuroticism?
2. Is there a negative relationship between phone addiction and self-compassion?
3. Is there a negative relationship between neuroticism and self-compassion?
4. Does self-compassion and neuroticism predict phone addiction?

a. Does self-compassion predict phone addiction?

b. Does neuroticism predict phone addiction?

Research Hypotheses

H_1: There is a positive relationship between phone addiction and neuroticism.

H_2: There is a negative relationship between phone addiction and self-compassion.

H_3: There is a negative relationship between neuroticism and self-compassion.

H_4: Self-compassion and neuroticism predict phone addiction.

H_{4a}: Self-compassion predicts phone addiction.

H_{4b}: Neuroticism predicts phone addiction.

Conceptual Definitions

Phone Addiction

Phone addiction refers to the excessive use of mobile phones in situations where it is inappropriate or disruptive, rather than using it during designated free time or for specific purposes (De-Sola Gutiérrez et al., 2016). Individuals with phone addiction may use their phones at any time, in any place, and often in the presence of others, leading to social or personal disruptions (Yang, L. et al., 2023). For example, the individual will use the mobile phone when using the restroom or use it while driving. Also, they might excessively use phones to play video games, listen to music, watch videos, do online shopping and so on (De-Sola Gutiérrez et al., 2016; Nikolic et al., 2023; Yang, L. et al., 2023). Individuals with phone addiction will feel uncomfortable or irritated if they are unable to use their phone which is a withdrawal symptom with mobile phones (Eide et al., 2018).

Self-Compassion

Self-compassion means treating oneself with kind behaviour and less judgment (Neff, 2016). Based on Elices et al. (2017), self-compassion is a form of sympathy that shows concern toward oneself when suffering and is followed by tolerating one's own flaws.

Individuals will treat themselves with gentle, supportive and understanding attitudes. As well as offer warmth and unconditional acceptance of self when making mistakes or failures. They will be mindful of their feelings and comfort themselves if facing distress. For instance, they will be kind to themselves when facing personal inadequacies and accept the fact that it is okay to be imperfect (Neff, 2016).

Neuroticism

Neuroticism is often categorised as the personality traits that have negative affective or emotional states such as sadness, anxiety, anger and hostility. Individuals with neuroticism will have stronger responses when encountering adverse stimuli such as stress, change, loss and frustration (Sharma, 2020) Additionally, they not only frequently experience negative emotions and responses, but they will perceive themselves as having no ability to cope with the experience (Cassiello-Robbins et al., 2020). Besides, it also includes negative emotions of fear and irritability. They will perceive the world as a dangerous and threatening place that has a negative view of the world instead of a positive one (Barlow et al., 2014).

Operational Definitions

Phone Addiction

Phone addiction is operationally defined as compulsive smartphone use that interferes with daily life. It is measured using the Smartphone Addiction Scale-Short Version (SAS-SV), which consists of 10 items rated on a six-point Likert scale (Wong et al., 2023). It is from 1 (strongly disagree) to 6 (strongly agree). There are no reverse items within this test and SAS-SV is used to measure the level of addiction toward smartphones such as compulsive use and symptoms of phone addiction. The higher score of SAS-SV means a higher level of smartphone addiction (Kwon et al., 2013).

Self-Compassion

The operational definition of self-compassion is the degree to which people are kind and empathetic to themselves when they are going through a tough moment. It is measured using the Self-Compassion Scale-Short Form (SCS-SF), which consists of 12 items on a five-point Likert scale ranging from 1 which is “almost never” to 5 which is “almost always”. This test is used to measure the self-compassion level by assessing the way individuals treat themselves during difficult times and so on. SCS-SF contains six reverse items which are items 1, 4, 8, 9, 11, and 12. The lower score of SCS-SF indicates a lower level of self-compassion (Raes et al., 2011).

Neuroticism

Neuroticism is operationally defined as an individual's tendency toward emotional instability, anxiety, and negative emotional states. It is measured using the Big Five Inventory-Neuroticism (BFI (N)), which consists of 8 items, each on a five-point Likert scale from 1 to 5. First, disagree strongly; second, disagree a little; third, neither agree nor disagree; fourth, agree a little; and fifth, agree strongly. It is used to measure the level of neuroticism traits of individuals such as emotional instability and so on. BFI (N) include three reverse items which are items 2, 5, and 7. The higher score of BFI (N) means the higher score of neuroticism level (Chidambar Subramanian et al., 2024; John & Srivastava, 1999).

Chapter 2: Literature review

Phone Addiction

Phone addiction is a problematic smartphone use which negatively affects a person's daily life (Kil et al., 2021). A systematic review study has shown that university students are at a vulnerable stage which relates to stress in life and the constant need for connectivity which makes it easier to become phone addicted (Azad et al., 2015; Mohd Amin et al., 2024). Phone addiction not only affects the students' mental health, academic performance and social interaction (Ithnain et al., 2018). It also impacts individuals' physical health such as sleep disruption, vision issues, poor body posture and weight gain (Mei et al., 2023; Abed et al., 2018; Ratan et al., 2021; Alotaibi et al., 2022). Additionally, studies showed that phone addiction is linked with low self-esteem, loneliness and poor interpersonal relationships (Huang et al., 2020; Lin et al., 2021; Sönmez et al., 2021).

The prevalence of phone addiction among university students has become an increasing concern in recent years, driven by the widespread availability of mobile phones and the extensive use of mobile applications, which have seamlessly integrated into students' daily routines (Kil et al., 2021). The findings showed that 60.7% which is considered a large percentage of university students compulsively use mobile phones, the highest purpose of students using phones is due to social networking and communication followed by academic usage (Nasser et al., 2020). Notably, WhatsApp is the most frequently used application among university students followed by Instagram and Facebook, which serve as platforms for communication and sharing daily moments. Factors such as peer pressure and conformity to social norms among the younger generation have been identified as potential contributors to phone addiction (Nasser et al., 2020). Hence, these insights highlight the common nature of phone addiction and the social patterns that sustain it within university settings.

Research has shown that phone addiction is more prevalent among women younger than 21 years old with large family sizes than men owing to women being more susceptible to emotional imbalance (Alotaibi et al., 2022; Arpaci & Kocadag Unver, 2020). However, other studies indicate that men have excessive use of phones attributable to regulating their stress and revealed that gender does not affect phone addiction scores (Eum et al., 2021; Yoon et al., 2021; Ivanova et al., 2020). Based on the Attachment theory developed by John Bowlby, people will seek substitutes to attach to avoid crowds or a harmful emotional environment (Wu & Chou, 2023). So, they will attach to mobile phones to prevent stressors such as social bullying, stress, discrimination, and emotional disorders (Eisenberg et al., 2019). On the other hand, the earliest reliable and widely recognised instrument used to assess phone addiction was the Mobile Phone Addiction Index (MPAI), invented by Louis Leung (Leung, 2008; Cheng et al., 2024). Thus, these findings highlight the complex nature of phone addiction, including gender and attachment behaviours, and emphasise the role of early tools such as MPAI in research.

In conclusion, phone addiction among university students is a growing concern with wide-ranging effects on mental, physical, and social well-being (Ithnain et al., 2018). The prevalence of phone addiction is influenced by factors such as stress, the need for constant connectivity, and social pressures within university settings (Nasser et al., 2020). While gender differences have been observed in some studies, with women being more susceptible to emotional imbalance and men using phones to regulate stress, attachment theory provides valuable insight into how individuals may turn to mobile phones as substitutes for emotional attachment (Alotaibi et al., 2022; Wu & Chou, 2023). This highlights the complex nature of phone addiction, driven by both individual and social factors. Moreover, instruments like the Mobile Phone Addiction Index (MPAI) are crucial in assessing and understanding phone addiction, advancing research in this critical area (Leung, 2008).

Neuroticism

Neuroticism is a personality trait with a higher tendency toward negative thoughts or emotions, which will experience higher stress and unstable emotions (Friedman, 2019; Bellingtier et al., 2023). It also revealed associations with depression, substance abuse, intense anxiety, PTSD and panic disorders (Friedman, 2019; Ikizer et al., 2022; Mousavi et al., 2023). Conversely, individuals with asthma, skin issues, urinary issues or ulcers tend to exhibit higher levels of neuroticism (Friedman, 2019). When neuroticism is paired with higher conscientiousness, it can result in healthy neuroticism, as individuals will make better adjustments to their behaviour (Graham et al., 2020). However, when neuroticism is combined with low conscientiousness, it results in unhealthy neuroticism, characterised by increased risk-taking, social conflict and engagement in unhealthy behaviour (Friedman, 2019).

According to Kou et al. (2012), the prevalence of neurotic disorder among Chinese undergraduate students is 25.6%. Neurotic disorders exhibit emotional experiences and stress reactivity like the traits of neuroticism, including negative emotions, mood swings, self-criticism, and heightened vulnerability to stress. (Kou et al., 2012; Lahey et al., 2009). While neuroticism is a personality trait rather than a clinical diagnosis, its shared features with neurotic disorders suggest that the prevalence of neuroticism is likely not low among the undergraduate student population. Based on Lahey et al. (2009), personality, intellectual and mental disorders correlated with neuroticism by upwards of 20% and showed females have slightly higher neuroticism compared with males.

According to the Big Five Model, there are five trait dimensions, and neuroticism is one of them (Babcock & Wilson, 2020). A higher neuroticism level indicates greater emotional instability, susceptibility to stress, maladjustment and a tendency to experience negative emotions such as anxiety, sadness, or anger (Ayub, 2015). On the other hand, lower

neuroticism indicates greater emotional stability and resilience in the face of adversity (Md. Mahfuzur Rahman Khan, 2021). Moreover, a well-known instrument used to assess neuroticism levels is the Eysenck Personality Questionnaire - Neuroticism (EPQR-N), comprising 24 binary yes-or-no questions (Van Der Walt et al., 2023; Teng & Liu, 2013).

In a nutshell, neuroticism will lead to mental and health-related issues if one does not have a higher conscientiousness, as this trait is characterised by emotional instability, susceptibility to stress, and a tendency to experience negative emotions such as anxiety and anger (Graham et al., 2020; Friedman, 2019). Research links neuroticism to mental health challenges, including depression, PTSD, and physical conditions like asthma and ulcers (Friedman, 2019). Among Chinese undergraduates, neuroticism is prevalent and associated with heightened stress reactivity and self-criticism (Kou et al., 2012). Tools like the Eysenck Personality Questionnaire - Neuroticism (EPQ R-N) provide reliable measures, highlighting the importance of understanding this trait in predicting mental and physical well-being (Van Der Walt et al., 2023).

Self-Compassion

Self-compassion does not imply that one is superior to others; instead, it refers to the capacity to be kind and understanding to oneself during difficult times (Neff, 2023). Self-compassion often links with a healthy lifestyle like engaging in physical activity and having positive emotions (Zhang et al., 2023; Neff, 2009). Also, self-compassion can predict resilience and is related to higher levels of adaptive coping (Inwood & Ferrari, 2018; Ewert et al., 2021). Based on Muris & Otgaar (2020), self-compassionate individuals can recognise and feel their suffering as well as tolerate and act to alleviate suffering compared with individuals with uncompassionate self-responding. Besides, mental health issues often incorporate self-compassion as a protective factor, and it is increasingly recognised as an intervention for mental health challenges (Wilson et al., 2019).

The prevalence of higher self-compassion is greater among students aged 23 or younger, as well as those from urban and rural areas compared to suburban regions (Kohli et al., 2022). Based on Salafi et al. (2023), 60% of students have moderate self-compassion and the study showed a significant correlation between age and self-compassion. The correlation between age and self-compassion can be explained by self-compassion levels tend to increase as individuals grow older (Homan, 2016). A study conducted in Malaysia found that 71.2% of university students demonstrated moderate self-compassion while 16.2% exhibited high self-compassion (Xin & Wan Jaafar, 2024).

Despite that, there are no significant gender differences in self-compassion from the studies (Salafi et al., 2023; Honsel, 2019). The Social Mentality Theory by Paul Gilbert explains that self-compassion arises from the natural roles of giving and receiving care in mammals, which help create feelings of safety and support (Neff, 2023; Gilbert, 2005). Additionally, the Self-Compassion Scale, which comprises 26 questions and has been used extensively, is the first tool for self-compassion (López et al., 2015). These insights highlight the significance of understanding self-compassion's roots and utilising reliable tools for its measurement.

In summary, self-compassion is a core quality characterised by treating oneself with kindness in difficult times, promoting resilience, adaptive coping, and mental health (Neff, 2023). Research shows that self-compassion supports a healthy lifestyle, positive emotions, and mental health (Zhang et al., 2023). Among university students, self-compassion levels are generally moderate, with a higher prevalence observed in students from urban areas (Kohli et al., 2022). Although self-compassion increases with age, studies reveal no significant gender differences in this trait (Salafi et al., 2023). The Social Mentality Theory suggests self-compassion stems from caregiving roles, and the Self-Compassion Scale effectively assesses it, highlighting its importance for student well-being (Neff, 2023; López et al., 2015).

Phone Addiction and Neuroticism

Lei et al. (2020) revealed that phone addiction is related to the group of students with neuroticism traits, among medical undergraduate students in Malaysia. Next, a study among university students from China showed phone addiction being influenced by neuroticism while masked by the self-emotional assessment, which refers to the process of evaluating and being aware of one's own emotions (Chen et al., 2022). Based on Choi et al. (2014), Korean college students showed that the group of students with high phone addiction levels and high internet addiction levels will have a greater score on neuroticism compared with the group of students with low phone addiction and internet addiction levels.

A study found that students with neuroticism traits are more prone to have phone addiction since the individuals will depend on their phones to get emotional and social reassurance as well as validation in their relationships (Lei et al., 2020; Kim et al., 2015). According to Yan et al. (2024), individuals with higher neuroticism exhibit stronger negative emotional responses, inadequate coping strategies, and a tendency to perceive situations as uncontrollable, resorting to unhealthy coping mechanisms like phone addiction in stressful situations. In brief, students utilise phones to relieve stress, tension, and negative emotions to escape stressful situations (Li et al., 2021).

According to Lei et al. (2020), neuroticism and phone addiction have a weak but positive association. At the same time, college students with higher neuroticism rates have a positive relationship with phone addiction (Yan et al., 2024). Moreover, there was a positive relationship between phone addiction and neuroticism among students in the China college (Chen et al., 2022). According to Choi et al. (2014), students with low levels of phone addiction are related to a social desirability trait which could lead to suppressing the problematic traits like neuroticism that are linked to phone addiction.

Most of the studies showed a positive relationship between phone addiction and neuroticism (Yan et al., 2024; Gao et al., 2022; Horwood & Anglim, 2018). Yan et al. (2024) showed a positive relationship between phone addiction and neuroticism among undergraduate nursing students in China. Similarly, a meta-analysis study showed that neuroticism has a positive association with problematic mobile phone usage across the studies (Gao et al., 2022). Likewise, results indicate that problematic mobile phone use positively correlates with neuroticism (Horwood & Anglim, 2018). Meanwhile, Zhong et al. (2024) a study on phone addiction, particularly addiction to social networking sites found that neuroticism moderated the relationship between frustration and addiction, with the interaction showing a significant negative effect on social networking site addiction under specific conditions like attachment avoidance. Furthermore, another study showed no relationship between phone addiction and neuroticism (Bianchi & Phillips, 2005). Hence, there are different correlation results of phone addiction and neuroticism across the research but most of the findings emphasise that there is a positive relationship between phone addiction and neuroticism which aligns with the hypotheses set for this study.

Phone Addiction and Self-Compassion

Self-compassion has been consistently identified as a protective factor against phone addiction. According to Liu et al. (2020), adolescents with higher self-compassion levels could buffer the impact of peer victimization on phone addiction. Similarly, Liu et al. (2020) also reported a significant negative relationship between self-compassion and phone addiction, as individuals with higher self-compassion tend to use healthier emotional regulation techniques. Katircioğlu (2023) highlighted that self-compassion mediates the relationship between social anxiety and phone addiction, with low self-compassion leading to poor emotion regulation and increased reliance on phones. Furthermore, self-compassion reduces the effect of low perceived social support on phone addiction among college students

with depressive symptoms and noted that students with high self-compassion are less affected by their levels of perceived social support (Yang, X. et al., 2023). Yang, X. et al. (2023) showed no significant relationship between self-compassion and phone addiction.

By fostering adaptive behaviours, self-compassion moderates phone addiction. Sirois et al. (2015) explained that individuals with high self-compassion are more likely to adopt positive coping strategies, such as addressing challenges directly and building resilience, rather than using phones to escape reality. Conversely, Katircioğlu (2023) emphasised that those with low self-compassion often struggle with emotional regulation, increasing their reliance on phones as a maladaptive coping mechanism. Most studies highlight the negative correlation between self-compassion and phone addiction (Sirois et al. 2015; Katircioğlu, 2023; Liu et al., 2020; Yang, X. et al., 2023). Similarly, self-compassion has a weak correlation but negatively predicts phone addiction among university students (Terzioğlu et al., 2023). Moreover, Wei (2024) provided evidence that negative self-compassion has a significant positive correlation with phone addiction. Hence, most of the findings emphasise that there is a negative relationship between phone addiction and self-compassion which aligns with the hypotheses set for this study.

Neuroticism and Self-Compassion

According to Geiger et al. (2018), certain aspects of self-compassion measured by the Self-Compassion Scale, overlap with neuroticism and potentially lead to repetition in their constructs such as isolation, self-criticism and over-identification with negative thoughts. However, their differences are that self-compassion is malleable and influenced by environmental factors whereas neuroticism is genetically rooted and relatively stable (Geiger et al., 2018). Next, individuals with high neuroticism will find it easier to overreact to jokes or negative events which results in negative feedback from others and rumination (Wang & Wu, 2024). Since the dorsomedial prefrontal cortex (dmPFC), ventromedial prefrontal cortex

(vmPFC), and medial prefrontal cortex (mPFC), along with the connectivity between the amygdala and dmPFC are all involved in regulating negative emotions, neuroticism levels are significantly negatively correlated with their activity (Yang et al., 2020). Meanwhile, Wang & Wu (2024) suggested that self-compassion has a negative correlation with neuroticism and plays a moderating role. In other words, self-compassion influences cognitive processing and emotional regulation, leading neurotic individuals to reduce negative thoughts and use effective strategies to cope with their adverse situations (Yip & Tong, 2020). Thus, neuroticism levels can be moderated by self-compassion, particularly when individuals with high neuroticism struggle to regulate their emotions due to the biological basis of the trait.

Most of the findings result showed that self-compassion and neuroticism have a negative significant relationship (Pfattheicher et al., 2017; Wang & Wu, 2024; López et al., 2015; Thurackal et al., 2016; Stauffer, 2015). In accordance with Pfattheicher et al. (2017), self-compassion improves emotional regulation and suggests that insufficient self-compassion is associated with neuroticism features, explaining the significant moderate negative association between the two. In addition, the results demonstrated that self-compassion has an intervention function in moderating the influence of neuroticism on psychological outcomes, with the stronger self-compassion, the lower the predictive effect of neuroticism on depression (Wang & Wu, 2024). Similarly, a strong negative relationship between neuroticism and self-compassion has been shown due to self-compassion being a protective and resilience factor toward neuroticism (López et al., 2015). Meanwhile, Thurackal et al. (2016) showed that neuroticism is a significant negative predictor of self-compassion in two sample studies which implied that self-compassionate seminarians (bachelor program of Philosophy or Theology) and non-seminarians could experience lower levels of neuroticism. Plus, a study using an experimental design revealed a strong negative link between neuroticism and self-compassion, indicating that people with high neuroticism

will have far lower levels of self-compassion (Stauffer, 2015). There is a need to have more studies about the correlation between self-compassion and neuroticism due to the lack of research studies. Hence, all the findings showed that there is a negative relationship between self-compassion and neuroticism which aligns with the hypotheses of this study.

Theoretical Framework

Figure 2.1. *The study's theoretical framework, "The relationship between neuroticism, self-compassion and phone addiction among undergraduate students in Malaysia.".*

The Stress-Vulnerability Model, also called the Diathesis-Stress Model, is a well-known hypothesis that describes how biological and environmental factors can shape individuals' behavioural and emotional responses, created by Bonnie Spring and Joseph Zubin (Zubin & Spring, 1977). Moreover, vulnerability, stress, and protective factors are the three main elements that interact to cause maladaptive responses (Schiele et al., 2020; Demke, 2022; Goh & Agius, 2010). It has been pointed out that if the stress can be managed effectively it will lead to an improvement of the maladaptive response caused by stress and vulnerability that arise from biological and environmental factors (Moore et al., 2012). Conversely, the likelihood of a maladaptive response will be decreased if the person with a high level of vulnerability remains in a low-stress setting (Wadsworth, 2016).

The three main ideas that make up the Stress-Vulnerability Model are stress, vulnerability, and protective factors (Schiele et al., 2020; Goh & Agius, 2010; Demke, 2022). Firstly, Goh & Agius (2010) suggested stress is an emotion and reaction brought on by life events. For instance, stress often arises from personal stress, job-related stress, life events, conflict in relationships, and lack of purpose in life. Secondly, vulnerability consists of two

components which are inborn and acquired (Zubin & Spring, 1977). Following that, inborn means genes that have an internal influence on the individual. Influences such as illnesses, traumas, peer interactions, family-related experiences, or any other life events that could promote or prevent the development of a maladaptive response are the cause of the acquired component (Zubin & Spring, 1977). Thirdly, protective factors play a role in reducing an individual's biological vulnerability and stress (Demke, 2022). The protective factors can be many things such as medication, positive coping skills, a structured routine, a low-stress lifestyle, and a supportive environment. Meanwhile, the protective factor leads the individual who encounters stress or vulnerability to be able to decrease their tendency to have maladaptive responses as well as decrease their stress level (Pruessner et al., 2011).

Conceptual Framework

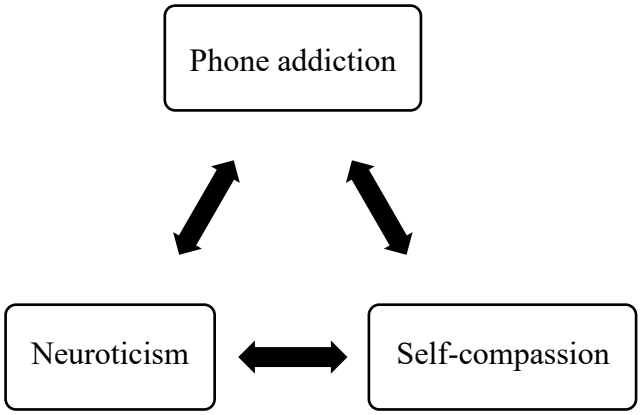


Figure 2.2. *The conceptual framework of the study's research objectives, "The relationship between neuroticism, self-compassion and phone addiction among undergraduate students in Malaysia.".*

The figure above illustrates the conceptual framework of this study. The key variables are neuroticism, self-compassion, and phone addiction. As illustrated in Figure 2.2, the main goal of this research is to discover how the variables relate to one another and whether neuroticism and phone addiction are negative predictors of self-compassion. Phone addiction is a maladaptive response, while neuroticism plays a role as vulnerability, and self-

compassion plays a protective factor in the Stress-Vulnerability Model (Schiele et al., 2020; Goh & Agius, 2010; Demke, 2022). When an individual has a higher neuroticism level when encountering stress, they will have a higher level of phone addiction since neuroticism traits are more likely to engage in negative coping strategies. Meanwhile, a person with a higher self-compassion who encounters stressful situations will have lower phone addiction due to the person having much self-kindness toward themselves and will regulate their emotion positively.

Chapter 3: Methodology

Research Design

This study examined the connection between neuroticism, self-compassion, and phone addiction using a quantitative research approach (Bloomfield & Fisher, 2019). The collection and analysis of numerical data, alongside the investigation of the causal relationship between each variable, define quantitative research (Bayley, 2013). It is possible to expand the findings from the quantitative study to the general population (Polit & Beck, 2010). Quantitative research has the detached observer, meaning the researcher has limited interaction with the participants (Arghode, 2012). Besides, it is submitted for statistical analysis for summary and interpretation (Kotronoulas et al., 2023). Given the structured nature and suitability of quantitative research for identifying patterns and relationships, this approach is ideal for addressing the objectives of this study.

Also, correlational research was implemented to examine the statistical relationship between or among two or more variables (Curtis et al., 2016). By exerting correlational research, this study focused on examining the relationship between phone addiction, self-compassion and neuroticism. This will predict the relationship between these three variables and can lead to further study across society (Khidhir, 2021). Thus, correlational research is a suitable approach for this study due to it provides a statistical understanding of the relationships between the variables and lays the foundation for future studies and interventions to deal with these associated challenges.

The research design of the cross-sectional study was selected which focuses on who will be observed, or certain information collected by the researcher during a single point in time or a short period (“NCI Dictionary of,” n.d.). There are advantages and disadvantages of using cross-sectional study (Pandis, 2014). The advantages are it is easy and quick to conduct, is less expensive and allows us to examine the relationship between many exposures

and outcomes. Despite this, the disadvantages are less suitable to examine pathology and probable with selection bias, information bias and confounding variables (Pandis, 2014). To decrease the disadvantage of the cross-sectional study, the inclusion and exclusion criteria were included as well as making sure of the rationale in choosing participants (Taris et al., 2021). According to Setia (2016), a cross-sectional research design focuses on a particular population's behaviour or characteristics at a single point in time. Hence, cross-sectional research is suitable for this study since it is time-efficient and can test the correlation between the variables of young adult university students in Malaysia.

A survey approach was implemented to conduct this study, the questionnaire was provided in Google Forms. Survey research design obtains a description of a particular group of individuals at a particular time (Ponto, 2015). The results of the survey describe the variables that are being studied (Zimba & Gasparyan, 2023). For this study, close-ended questions and rating-scale questions were employed in the survey, which included demographic questions and instrument questions (Keough & Tanabe, 2011). Google Forms is suitable for this study as it does not restrict the number of questions formulated and can turn them into anonymous responses. For instance, to ensure anonymity, respondents' email addresses and personal information such as name and phone number, were not collected.

Self-reported measures were chosen for this study. The respondents must answer the survey questions based on their emotions and behaviours (Kerr et al., 2021). Since the study uses Likert-scale questionnaires, respondents will indicate the extent to which each item describes them or how much they agree with a given statement. Self-reported measures are time-saving and cheap (O'Neill et al., 2025). Additionally, they enable researchers to gather information that only the respondents themselves can report, such as personal feelings and behaviours. However, a potential drawback is the risk of dishonest or biased responses (Schell et al., 2021; Palczyńska & Rynko, 2021). To address this, the researcher will identify

and remove outliers and unengaged responses to ensure the validity of the results. Therefore, self-reported measures are deemed suitable for this study.

Sampling Procedures

Sampling Method

Non-probability sampling was chosen to find the respondents, which means utilising a subjective method to recruit the participants from a population (Rahman, 2023). The purposive sampling technique is selected from non-probability sampling, which focuses on individuals with specific characteristics to answer the research questions (Andrade, 2020). Purposive sampling was chosen as it increases the likelihood of selecting participants who meet the study's specific criteria, ensuring an effective and targeted recruitment process. This sampling method is time-efficient for recruiting respondents as it focuses on a specific target group (Sibona & Walczak, 2012). On the other hand, purposive sampling has limited generalisability; to address this, the sampled group should be interpreted cautiously when applied to other populations (Andrade, 2020). To overcome this disadvantage, students from various universities in Malaysia will be recruited to enhance sample diversity, and the results will be compared with previous studies to assess consistency and validity. Hence, considering the disadvantages and advantages of purposive sampling, this sampling method is suitable for this study.

Participants

The targeted participants for this study were Malaysian undergraduates who are 18 to 25 years old and enrolled in Malaysian universities. According to Chen et al. (2016), university undergraduate students are the typical group of phone users. Ursu et al. (2021) mentioned that university students are within the age range of 18 to 25. Al-Menayes (2015) suggested that phone addiction reduces the academic performance of undergraduate students.

Hence, university students aged 18 to 25 are suitable for this study to examine the relationship between phone addiction, self-compassion and neuroticism level.

Location of Study

Malaysia's universities were encompassed in the location of study, and the students from Malaysia's universities were the respondents for this research. Google Forms was used to create the survey questions. Besides, social media such as Instagram, Facebook, Xiaohongshu, Dcard, Microsoft Teams, WhatsApp, and WeChat were used to find participants from Malaysian universities. Many university students are using these social media, which have a greater chance to gain participants from online applications. Moreover, an online public profile page was created with posts related to this study's topic to attract Malaysian university students and share the Google Form on the profile page.

Ethical Clearance Approval

The ethical clearance approval had been submitted by the researcher to this study's supervisor (Mr Ho Khee Hoong). Then, the ethical clearance was approved by the UTAR Scientific and Ethical Review Committee by the head of the department of psychology and counselling (Mr Tay Kok Wai) and the dean of the faculty of arts and social science (Dr Lee Lai Meng). Therefore, the researcher gained approval to conduct this research on 26th December 2024 (Re: U/SERC/78-422/2024, refer to Appendix A). The pilot test started on 15th February 2025 and ended on 20th February 2025. The actual study was conducted on 20th February 2025 and ended on 2nd March 2025.

Sample Size, Power, and Precision

For the present study, a total sample size of 110 was needed. In accordance with the calculation below, the greatest number of samples is 73. Salkind (2012) states that to prevent missing data and the response rate, the number of samples should be increased by 40% to

50%. The researcher made a 50% increase in the sample size. As a result, 109.5 = 110 is the ultimate sample size that the researcher must gather.

The sample size for this study was determined using the G*Power 3.1.9.7 edition. As stated by Brydges (2019), the power level is set at 80%, and the significance level is set at 5% to allow for a 0.05 margin error.

According to G*Power 3.1.9.7, the Pearson Correlation Test calculates H_1, H_2, and H_3. The effect size of the association between neuroticism and phone addiction is r =.287 (Yan et al., 2024). Based on Terzioğlu et al. (2022), the effect size of the relationship between phone addiction and self-compassion is r = -.308. Moreover, the effect size of the correlation between neuroticism and self-compassion is r = -.734 (Fiselier, 2017). G*Power suggested a total sample size of 73, 63, and 10 based on the effect size supplied by the previous study. Thus, the three pairings' relationship's actual power is .80, .80, and .84 (Appendix B).

Based on G*Power 3.1.9.7, Multiple Linear Regression computes H_4, which examines phone addiction and neuroticism as a negative predictor of self-compassion. According to Correll (2020), the researcher can utilise the medium effect size, which is f^2 = .15. Hence, the G*Power indicates a total size of 43, whereas the actual power is .80 (Appendix B).

Data Collection Procedures

Inclusion and Exclusion Criteria

Foremost, the inclusion criteria were (1) students aged between 18 to 25, (2) Malaysian university students, and (3) having mobile phones and access to the internet. On the other hand, the exclusion criteria were (1) non-undergraduate students, (2) exchange students or international students, (3) students under 18 or over 25 years old. Thus, the inclusion and exclusion criteria were used to ensure the participants fell within the research population.

Procedures for Obtaining Consent

The informed consent form was included in the first part of the Google Form survey. It included informing the respondent of privacy and confidentiality, the objective of this study, the inclusion and exclusion criteria, and the usage of the data formulated. In compliance with the Personal Data Protection Act 2010, all information collected from participants remained anonymous and confidential. The participants were voluntarily to participate in this research without being forced and had the right to withdraw from the study at any time. If participants encountered problems while doing the self-report survey, they could email the researcher for assistance. Hence, the data collected from this research was used only for academic purposes.

Data Collection Procedures

The data collection procedure was a Google Forms self-report questionnaire contained questions from chosen instruments, and some demographic information was developed. The first page of the Google Forms was the informed consent for the participants and sought their consent toward this study. After gaining ethical approval, the survey was distributed online through social media applications such as Instagram, Facebook, Xiaohongshu, Dcard, WhatsApp, and WeChat. After the respondents agreed and provided consent to join this study, demographic information such as age and gender were included in the survey, which respondents needed to fill in. Then, they answered the instrument's questions. After the data collection was completed, the data generated was moved into Excel and arranged. Lastly, JASP was used to analyse the data and summarise the results.

After the approval of the ethical clearance and survey, the pilot study was conducted and continued with the actual study. The pilot study enabled the researcher to measure the internal consistency of all instruments. Based on Table 3.1, SCS-SF showed low reliability below .70, which is .56, so 5 items needed to be removed from SCS-SF to maintain the

internal reliability. SAS-SV and BFI-N showed acceptable internal reliability that Cronbach's alpha is more than .70. Based on Table 3.2, after low-reliable items were dropped in the pilot study, SCS-SF showed acceptable reliability, which is .73. Hence, the five items (2, 5, 6, 7, 10) from SCS-SF were not used in the actual study to maintain the internal reliability of the instrument.

According to the research study, a total of 114 respondents were collected. However, due to the unengaged response and outliers, only 110 respondents were used for this study. Following that, the target sample size (n=110) was achieved. Based on Table 3.1, the reliability test showed acceptable reliability of the three instruments from the actual study.

Table 3.1

Reliability of Instruments in Pilot Study (n=30) and Actual Study (n=110)

Instrument	Pilot Study (Cronbach's alpha)	Actual Study (Cronbach's alpha)
SAS-SV	.77	.82
SCS-SF	.56*	.75
BFI-N	.80	.71

Note. SAS-SV= Smartphone Addiction Scale-Short Version, SCS-SF= Self-Compassion Scale-Short Form, BFI-N= Big Five Inventory-Neuroticism; *The reliability of SCS-SF with all the items is below the acceptable standard Cronbach alpha .7.

Table 3.2

Reliability of SCS-SF in Pilot Study (n=30) after Items Dropped

Instrument	Pilot Study (Cronbach's alpha)
SCS-SF (12 items)	.56
SCS-SF (7 items)*	.73

Note. SCS-SF= Self-Compassion Scale-Short Form; *Items 2, 5, 6, 7, 10 were removed from the SCS-SF.

Instruments

A total of three instruments were implemented in this survey which were the Smartphone Addiction Scale-Short Version (Kwon et al., 2013), the Self-Compassion Scale-Short Form (Raes et al., 2011) and the Big Five Inventory-Neuroticism (John & Srivastava, 1999).

10-Item Smartphone Addiction Scale-Short Version (SAS-SV)

Smartphone Addiction Scale-Short Version (SAS-SV) was created by Min Kwon and her colleagues to distinguish the risk and behaviour of smartphone addiction (Kwon et al. 2013). SAS-SV consists of 10 items on a six-point Likert scale, ranging from 1 (strongly

disagree) to 6 (strongly agree). The lowest score for this instrument is 10 and the highest is 60. The higher the score indicates the higher the smartphone addiction. The cut-off point for males is 31 while for females is 33. Having a general usage of mobile phones is considered a score of 26 in SAS-SV. It is a self-reporting test which includes six elements that are positive anticipation, daily-life disturbance, cyberspace-oriented relationship, withdrawal, tolerance and overuse. No reverse items are found in this instrument. Furthermore, it has an internal consistency alpha coefficient of .939, which is suitable to use for this research study (Wong et al., 2023).

12-Item Self-Compassion Scale-Short Form (SCS-SF)

The Self-Compassion Scale-Short Form (SCS-SF) was developed by Filip Raes and his colleagues to measure the ability of self-compassion (Raes et al., 2011). SCS-SF consists of 12 items on a five-point Likert scale, ranging from "1 = Almost never" to "5 = Almost always" including reverse items 1, 4, 8, 9, 11, and 12. An example for this test item is "I try to see my failings as part of the human condition". The items from SCS-SF are categorised into six components which are self-kindness, common humanity, mindfulness, self-judgment, isolation and over-identification. The higher the score indicates the higher the self-compassion level. The range of the total score of SCS-SF is from a minimum of 12 to a maximum of 60 scores. The internal consistency alpha coefficient was .86 which is considered a valid and reliable instrument (Raes et al., 2011).

8-Item Big Five Inventory-Neuroticism (BFI(N))

The Big Five Inventory-Neuroticism (BFI(N)) arises from the Big Five Inventory which was developed by Robert McCrae and Paul Costa to distinguish the emotional instability of an individual (John & Srivastava, 1999). Big Five Inventory measures five dimensions which are extraversion, agreeableness, conscientiousness, openness and neuroticism. However, in this study, only neuroticism subscales are included. BFI-N consists

of 8 items, each on a five-point Likert scale, ranging from “1 = Disagree a lot” to “5 = Agree a lot” including reverse items 2, 5, and 7. To illustrate, two items from this test are “Get nervous easily” and “Is relaxed, handles stress well”. The minimum score for BFI-N is 8 and the maximum is 40. The internal consistency alpha coefficient of .85 is shown in BFI-N which is a valid and reliable instrument (Chidambar Subramanian et al., 2024).

Chapter 4: Result

Descriptive statistics

Demographic Characteristics

Table 4.1 shows the demographic data for this study. A total of 110 undergraduate students from Malaysian universities participated in the study. Respondents were between 18 and 25 years old (M=21.882, SD=1.47). There were 1.81% of 18 years old (n=2), 4.54% were 19 years old (n=5), 10% were 20 years old (n=11), 16.36% were 21 years old (n=18), 39.09% were 22 years old (n=43), 15.45% were 23 years old (n=17), 8.18% were 24 years old (n=9), 4.45% were 25 years old (n=5). The gender distribution was 40.9% male (n=45) and 59.09% female (n=65).

Table 4.1

Demographic Characteristics of Participants (n=110)

	n	*%*	*M*	*SD*	*Min*	*Max*
Age			21.882	1.470	18.000	25.000
18	2	1.81				
19	5	4.54				
20	11	10.00				
21	18	16.36				
22	43	39.09				
23	17	15.45				
24	9	8.18				
25	5	4.45				
Gender						
Male	45	40.90				
Female	65	59.09				

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

Topic-Specific Characteristics

Table 4.2 shows descriptive statistics and the total values from the three instruments used to measure three study variables. The three variables were neuroticism (*M*=25.136; *SD*=4.889), self-compassion (*M*=19.891; *SD*=4.444) and phone addiction (*M*=35.473; *SD*=8.655). The kurtosis and skewness of the data normality for all three variables are normal due to the instruments are within ±2.000. Following that, the *p*-values of Shapiro-Wilk for neuroticism ($W = 0.978$, $p = 0.069$), self-compassion ($W = 0.984$, $p = 0.221$), and phone addiction ($W = 0.985$, $p = 0.27$) are more than .05, therefore, the normality null-hypotheses

failed to be rejected. This means that the data of neuroticism, self-compassion and phone addiction appeared to be normal. Overall, the data can be analysed using parametric methods since they were normal.

Table 4.2

Descriptive Statistics of Topic-Specific Variables (i.e. Neuroticism, Self-Compassion, and Phone Addiction)

	Neuroticism	Self-Compassion	Phone Addiction
Valid	110	110	110
Missing	0	0	0
Mode	24.000[a]	21.000[a]	34.000[a]
Median	25.000	20.000	35.000
Mean	25.136	19.891	35.473
Std. Deviation	4.889	4.444	8.655
Skewness	-0.226	0.258	-0.154
Std. Error of Skewness	0.230	0.230	0.230
Kurtosis	-0.354	-0.173	-0.309
Std. Error of Kurtosis	0.457	0.457	0.457
Shapiro-Wilk	0.978	0.984	0.985
P-value of Shapiro-Wilk	0.069	0.221	0.270
Range	22.000	22.000	38.000
Minimum	15.000	10.000	15.000
Maximum	37.000	32.000	53.000

Note. [a] The mode is computed assuming that variables are discreet.

Sampling sufficiency

According to G*Power, the highest number suggested is 73. The researcher collected 114 data from the participants. The researcher excluded 1 respondent with unengaged responses and 3 outliers. Thus, 110 respondents will be used in the data analysis. Following that, no significant univariate outlier was identified, and the skewness and kurtosis z-scores were not significant since the z-scores didn’t exceed ±3.29. All the data are valid to measure the level of phone addiction, level of neuroticism, and level of self-compassion among

Malaysian university undergraduate students. Hence, evidence suggests sample data meet the underlying assumption of normality.

Missing Data and Data Diagnostics

Frequency and Percentages of Missing Data

Since Google Forms is set up by default to require all questions to be answered before submitting their response, there were no missing data within this study. However, there was one unengaged response, which is case 85. Case 85 had a standard deviation lower than 0.4, which was considered an unengaged response, and it was removed from the study. Next, the number of valid samples (n=110) reached the sample size (n=110) suggested by G*Power and an additional 50% of participants were added to adjust for missing data before data diagnostic analysis.

Methods for Addressing Missing Data

By using the formula =COUNTBLANK(B2:AG2), the researcher is enabled to check and detect the missing data. This formula was being employed on every responder, which included the instrument questions and demographic questions. Moreover, Google Forms was set as compulsory to answer every question. Thus, there is no missing data from the respondents.

Criteria for Post Data-Collection Exclusion of Participants

All the participants were between 18 and 25 years old. Moreover, all the participants agree to participate with consent of disclosure of personal data for the research purpose. So, no cases were excluded from this study.

On the other hand, the following exclusion criteria included the unengaged response. The formula =STDEV.P(D2:AG2) was used to find the unengaged responses. If the standard deviation of the data is lower than 0.4, it is considered an unengaged response. After applying the formula, one unengaged response was identified and removed from the study. Case 85

had a standard deviation of 0.18, the participant responded “3” on all items in SCS-SF and SAS-SV. Thus, case 85 was excluded from this study to ensure validity.

Criteria for Imputation of Missing Data

The median values of the items or questions will be imputed if there are missing data available in the responses. Following that, median values are applied to ordinal data, while the mode will only be applied to nominal data. Since there was no missing data in this study, no imputation was needed.

Defining and Processing of Statistical Outliers

The researcher used boxplots in descriptive statistics to analyse the outliers from each instrument by using JASP. A total of three outliers were found in SAS-SV (Appendix C). The three outliers were then removed from this study which were cases 38, 48, and 109.

Data Transformation

Three instruments were being used in the survey which were Big Five Inventory-Neuroticism has 8 items with a 5-point Likert scale that range from 1 to 5, Self-Compassion Scale-Short Form has 7 items with a 5-point Likert scale that range from 1 to 5, and Smartphone Addiction Scale-Short Version has 10 items with a 6-point Likert scale that range from 1 to 6. The BFI-N and SCS-SF have reversed items. So, the researcher used the formula =IF(D2=1,5,IF(D2=2,4,IF(D2=3,3,IF(D2=4,2,IF(D2=5,1,""))))) to transform the reversed item into ascending order. Other than that, to compute the total scores of each scale, the formula =SUM(D2:K2) were used in Microsoft Excel.

Analyses of Data Distributions

Based on this study, the normality tests used were boxplot, Shapiro-Wilk, skewness and kurtosis. The outliers found in the boxplot were deleted from this study. According to Table 4.2, the skewness was within ±2.000 for neuroticism, self-compassion and phone addiction. To illustrate, the skewness of neuroticism is -0.226, self-compassion is 0.258, and

phone addiction is -0.154. Hence, the three variables' skewness were normally distributed. Moreover, Table 4.2 shows the kurtosis of neuroticism, self-compassion and phone addiction was within ±2.000. For instance, the kurtosis of neuroticism is -0.354, self-compassion is -0.173, and phone addiction is -0.309. As a result, the kurtosis of each variable was normally distributed. Most of the variables in this study were negatively skewed, excluding self-compassion.

According to Table 4.2, the result of Shapiro-Wilk on the three variables were normally distributed due to the Shapiro-Wilk test *p*-value being more than .05. To illustrate, the Shapiro-Wilk of neuroticism is 0.978 (*p*-value=0.069), self-compassion is 0.984 (*p*-value=0.221), and phone addiction is 0.985 (*p*-value=0.27). Hence, all the variables were normally distributed and could be used for parametric tests.

Data Analysis

H_1: There is a positive relationship between phone addiction and neuroticism.

There are two assumptions in using Pearson Product-Moment Correlation (PPMC):

1. The scores for phone addiction and neuroticism are normally distributed.
2. The case represents a random sample from the population.

Pearson Product-Moment Correlation (PPMC) was performed to investigate if there was a statistically significant relationship between phone addiction and neuroticism. The alpha level of the test is .05 and is a one-tailed test. Table 4.3 shows the result of r (108) = .236, p = .007. The null hypothesis was rejected. The direction of the correlation was positive, which means the higher the phone addiction, the higher the neuroticism and vice versa. Using Guilford's rule of thumb, the effect size was low. The *p*-value of the Shapiro-Wilk test for phone addiction and neuroticism was .4, which means that the data was normally distributed.

Table 4.3

Pearson's Correlations (n=110)

Variable		Phone Addiction		Neuroticism
1. Phone Addiction	Pearson's r	—		
	p-value	—		
2. Neuroticism	Pearson's r	0.236	**	—
	p-value	0.007		—

Note. All tests one-tailed, for positive correlation.

* $p < .05$, ** $p < .01$, *** $p < .001$, one-tailed

Table 4.4

Shapiro-Wilk Test for Bivariate Normality

			Shapiro-Wilk	*p*
Phone Addiction	-	Neuroticism	0.987	0.400

H_2: There is a negative relationship between phone addiction and self-compassion.

There are two assumptions in using Pearson Product-Moment Correlation (PPMC):

1. The scores for phone addiction and self-compassion are normally distributed.
2. The case represents a random sample from the population.

Pearson Product-Moment Correlation (PPMC) was performed to investigate if there was a statistically significant relationship between phone addiction and self-compassion. The alpha level of the test is .05 and is a one-tailed test. Table 4.5 shows the result of r (108) = -.441, $p < .001$. The null hypothesis was rejected. The direction of the correlation was negative, which means the higher the phone addiction, the lower the self-compassion and vice versa. Using Guilford's rule of thumb, the effect size was moderate. The *p*-value of the Shapiro-Wilk test for phone addiction and self-compassion was .594, which means that the data was normally distributed.

Table 4.5

Pearson's Correlations (n=110)

Variable		Phone Addiction	Self-Compassion
1. Phone Addiction	Pearson's *r*	—	
	p-value	—	
2. Self-Compassion	Pearson's *r*	-0.441***	—
	p-value	< .001	—

Note. All tests one-tailed, for negative correlation.

* $p < .05$, ** $p < .01$, *** $p < .001$, one-tailed

Table 4.6

Shapiro-Wilk Test for Bivariate Normality

			Shapiro-Wilk	*p*
Phone Addiction	-	Self-Compassion	0.989	0.594

H_3: There is a negative relationship between neuroticism and self-compassion.

There are two assumptions in using Pearson Product-Moment Correlation (PPMC):

1. The scores for neuroticism and self-compassion are normally distributed.
2. The case represents a random sample from the population.

Pearson Product-Moment Correlation (PPMC) was performed to investigate if there was a statistically significant relationship between neuroticism and self-compassion. The alpha level of the test is .05 and is a one-tailed test. Table 4.7 shows the result of r (108) = -.628, $p < .001$. The null hypothesis was rejected. The direction of the correlation was negative, which means the higher the neuroticism, the lower the self-compassion and vice versa. Using Guilford's rule of thumb, the effect size was moderate. The *p*-value of the Shapiro-Wilk test for neuroticism and self-compassion was .106, which means that the data was normally distributed.

Table 4.7

Pearson's Correlations (n=110)

Variable		Neuroticism	Self-Compassion
1. Neuroticism	Pearson's *r*	—	
	p-value	—	
2. Self-Compassion	Pearson's *r*	-0.628 ***	—
	p-value	< .001	—

Note. All tests one-tailed, for negative correlation.

* $p < .05$, ** $p < .01$, *** $p < .001$, one-tailed

Table 4.8

Shapiro-Wilk Test for Bivariate Normality

			Shapiro-Wilk	*p*
Neuroticism	-	Self-Compassion	0.982	0.106

H_4: Self-compassion and neuroticism predict phone addiction.

$H_{4a:}$ Self-compassion predicts phone addiction.

$H_{4b:}$ Neuroticism predicts phone addiction.

A multiple linear regression predicts the university students' phone addiction based on the neuroticism and self-compassion shown in Table 4.9. Assumptions to use this Multiple Linear Regression are as followed:

1. Linear relationship between phone addiction, neuroticism and self-compassion.
2. Multivariate normality with no significant outliers.
3. There should be no or little multicollinearity.
4. There should be independence of observation.
5. Homoscedasticity.

6. The two independent variables (neuroticism, self-compassion) are in the category of ordinal.
7. Phone addiction is in the interval.

Multiple Linear Regression (MLR) was used to test how well the independent variables: neuroticism and self-compassion predict the dependent variable, phone addiction. The alpha level of the test is .05, and it is a two-tailed test. Table 4.8 below revealed the results of MLR, it showed that the results were statistically significant F (2, 82) = 8.939, p < .001. Therefore, null hypothesis was rejected.

Table 4.9

Multiple Linear Regression Model Summary (n-85)

									Durbin-Watson	
Model	R	R^2	Adjusted R^2	R^2 Change	F Change	df 1	df 2	p	Statistic	p
H_1	0.423	0.179	0.159	0.179	8.939	2	82	< .001	2.138	0.509

Note. H_1 includes BFI-N_Total, SCS-SF_Total

Table 4.10

Multiple Linear Regression Model (n-85)

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	1406.623	2	703.311	8.939	< .001
	Residual	6451.424	82	78.676		
	Total	7858.047	84			

Note. H_1 includes BFI-N_Total, SCS-SF_Total

Note. The intercept model is omitted, as no meaningful information can be shown.

Note. Outcome Variable = Phone Addiction. Predictors = Neuroticism and Self-Compassion

According to Table 4.11, the identified equation to understand this relationship was *Phone addiction* = - 0.141 (*Neuroticism*) - 0.978 (*Self compassion*) + 58.367. This means that the value of phone addiction for individual cases can be calculated using the formula as mentioned. It was found that Self-Compassion (β = -0.469, $p < .001$) significantly predicted phone addiction. However, it was found that Neuroticism (β = -0.076, $p = .563$) did not significantly predict phone addiction. According to Table 4.9, the value of adjusted *R* squared was 0.159. This indicates that 15.9% of the variance in phone addiction was explained by neuroticism and self-compassion.

Table 4.11

Multiple Linear Regression Coefficient

Model		Unstandardized	Standard Error	Standardized	t	p	Collinearity Statistics	
							Tolerance	VIF
H_0	(Intercept)	35.894	1.049		34.215	< .001		
H_1	(Intercept)	58.367	10.391		5.617	< .001		
	Neuroticism	-0.141	0.242	-0.076	-0.581	0.563	0.578	1.730
	Self-Compassion	-0.978	0.275	-0.469	-3.562	< .001	0.578	1.730

After calculating with the formula $f^2 = \frac{R^2}{1-R^2} = \frac{0.179}{1-0.179}$ = 0.218, the researcher got the effect size of 0.218, indicating that it was a medium effect size according to Cohen's effect size. Overall, self-compassion significantly predicts phone addiction, but neuroticism does not significantly predict phone addiction.

Moreover, the assumptions of MLR were observed, based on casewise diagnostic (Appendix D), it showed that there were no multivariate outliers in the data because 99.9% of them fall between -3.29 to +3.29, which means there were no standardized residuals that are lesser than -3.29 nor greater than 3.29. Moreover, there were 25 cases with Cook's distance greater than 1. Therefore, the 25 cases were deleted to ensure the data had achieved multivariate normality. Table 4.9 above shows that the Durbin-Watson was 2.138. As the value is between 1.5 and 2.5, it indicates that the assumption of autocorrelation was not violated. Also, according to Table 4.11 above, all the collinearity tolerance was more than 0.1 and VIF was not more than 5.0. Therefore, it indicates that the data has no multicollinearity.

Chapter 5: Discussion and Conclusion

Discussion

The current study examined the relationship between self-compassion, neuroticism, and phone addiction. Moreover, this study examined whether self-compassion and neuroticism can predict phone addiction.

Phone Addiction and Neuroticism

Hypothesis 1 of the present study hypothesised that there is a positive relationship between phone addiction and neuroticism. The result shown by the Pearson Product-Moment Correlation is supported by H_1. However, there was a low correlation between phone addiction and neuroticism. Past studies have supported the results of this study, which indicate a positive relationship between phone addiction and neuroticism (Lei et al., 2020; Yan et al., 2024; Chen et al., 2022; Gao et al., 2022; Horwood & Anglim, 2018).

Lei et al. (2020) found that phone addiction and neuroticism had a positive relationship among medical undergraduate students in Malaysia. This can be explained with students with neuroticism have a higher risk of having phone addiction, as they can get emotional and social reassurance by using the phone (Lei et al., 2020; Kim et al., 2015).

According to Yan et al. (2024), a positive relationship between phone addiction and neuroticism is shown among the undergraduate nursing students in China. Students who have higher neuroticism will have stronger negative emotional responses, use inadequate coping strategies and see situations as uncontrollable, resulting in them having phone addiction in stressful situations (Yan et al., 2024).

Next, Chen et al. (2022) showed that higher neuroticism experience anxiety and depression, so the use of mobile phones, such as entertainment and social media, will lead neuroticism individuals to meet their psychological needs. A rational use of a mobile phone

will help neurotic individuals express their emotions and solve their problems instead of leading to self-isolation and health impacts.

Based on Eichenberg et al. (2024), phone addiction is associated with higher neuroticism levels and is correlated with neuroticism. A positive correlation between phone addiction and neuroticism was found, which was explained with neuroticism tends to involve avoidance techniques toward emotional regulation (Gao et al., 2022).

In conclusion, the findings from the present study further add to the literature by establishing the positive relationship between neuroticism and phone addiction. This can be justified by the university students with higher neuroticism need to regulate their emotions in daily life, so they tend to use the quickest way. Which is using the phone as a method to release their overly stimulated emotions, and the behaviour of using the phone to cope with their emotions, which in turn becomes more addictive to the phone. The choice of using smartphones to regulate their emotions slowly becomes ingrained and conditioned, forming an instant gratification behaviour (Ambat, 2025).

Phone Addiction and Self-Compassion

Hypothesis 2 of the present study hypothesised that there is a negative relationship between phone addiction and self-compassion. The result shown by the Pearson Product-Moment Correlation was consistent with H_2, there was a moderate correlation between phone addiction and self-compassion. The result was consistent with the past studies, where phone addiction and self-compassion have a significant negative relationship (Katircioğlu, 2023; Liu et al., 2020; Yang, X. et al., 2023; Terzioğlu et al., 2023).

Sirois et al. (2015) mentioned that self-compassion negatively links with maladaptive coping styles. Therefore, it explained that phone addiction is a maladaptive coping mechanism, and students with higher phone addiction have lower self-compassion. Next,

self-compassion has a negative relationship with phone addiction, as individuals with self-compassion who encounter negative emotions will seek approaches that are healthier for them (Katircioğlu, 2023). Self-compassionate individuals see excessive use of the phone as an unhealthy way to cope with their emotions in the long run.

Moreover, Liu et al. (2020) shared that self-compassionate individuals are resilient and more optimistic about their negative experiences in life. Also, they seek coping strategies rather than a temporary escape from their reality to their virtual world on their phone. The optimistic view of high self-compassion individuals resists phone addiction when facing negative life events due to they can handle their emotions and thoughts (Liu et al., 2020). According to Yang, C. et al. (2023), higher self-compassion students, although having less perceived social support, still have the strength within themselves to view positively and adjust themselves to prevent phone addiction.

Based on Terzioğlu et al. (2023), a weak negative relationship was found between phone addiction and self-compassion. The mindfulness stance of self-compassion often has a positive influence on individuals to have a balanced view of their circumstances, so they will have less risk of phone addiction. Hence, this study justified that phone addiction and self-compassion have a negative relationship among university undergraduate students. Students with higher self-compassion can observe their situation with emotional stability, reducing the tendency to escape into the virtual world for relief.

Neuroticism and Self-Compassion

Hypothesis 3 of the present study hypothesised that there is a negative relationship between neuroticism and self-compassion. The result shown by the Pearson Product-Moment Correlation was consistent with H_3, there was a moderate correlation between neuroticism and self-compassion. The past studies were consistent with the result, where the neuroticism

and self-compassion have a negative relationship (Pfattheicher et al., 2017; Wang & Wu, 2024; López et al., 2015; Thurackal et al., 2016; Stauffer, 2015).

According to Pfattheicher et al. (2017), neurotic individuals seek maladaptive coping for negative events while self-compassionate individuals seek adaptive coping for negative events. Therefore, higher self-compassion is associated with lower neuroticism levels. Then, Wang & Wu (2024) mentioned that by promoting self-compassion to individuals with high neuroticism are beneficial to decrease the neuroticism level. Thus, self-compassion can decrease neuroticism levels by actively seeking positive coping.

The result is justified with lower self-compassion having more rumination and self-criticism, which is aligned with higher neuroticism (López et al., 2015). Neuroticism has a lower self-compassion level compared with normal individuals. Neuroticism is negatively correlated with self-compassion; high neuroticism makes it challenging to have self-compassion (Thurackal et al., 2016). Neuroticism individuals have traits that are opposite to self-compassion; they are self-conscious and have more negative emotions. Low self-compassion is equal to self-criticism, which is self-judging and ruminating on their mistakes. Next, students with higher self-compassion have lower neuroticism, and the past study mentioned that training can improve the self-compassion level (Stauffer, 2015). Thus, self-compassion correlated with neuroticism and determined the level of each other.

Predictors of Phone Addiction

Hypothesis 4 of the present study hypothesised that phone addiction is significantly predicted by self-compassion and neuroticism. The result shown by the Multiple Linear Regression was inconsistent with H_4. Neuroticism did not significantly predict phone addiction, while self-compassion was able to predict it. Past studies supported this result, showing that self-compassion predicts phone addiction, while neuroticism does not.

H_{4a} of the present study showed the result of self-compassion predicting phone addiction and is justified by past studies (Qiu et al., 2025; Mohtarami Zavardeh et al., 2024). Mohtarami Zavardeh et al. (2024) showed that self-compassion predicts phone addiction in university students. Self-compassion individuals are mindful and use positive coping instead of escaping their negative experiences. According to Wei (2024), self-compassion negatively predicts social media use of college students. Self-compassion students have positive emotions, engage in more positive behaviours, and have more social interaction instead of phone use. Qiu et al. (2025) mentioned that self-compassionate individuals emphasise long-term personal goals and engage healthily in their surroundings, so they are less tempted by phones. Therefore, self-compassion predicts phone addiction; the lower the self-compassion, the higher the phone addiction and vice versa.

H_{4b} of the present study showed that the result of neuroticism was not able to predict phone addiction and is justified by past studies (Bianchi & Phillips, 2005; Phillips, 2018). According to Phillips (2018), neuroticism cannot predict phone addiction since low neuroticism individuals use the phone to maintain a healthy relationship, while high neuroticism individuals use the phone to manage their emotions, so both have a chance to have phone addiction, but for different reasons. Based on Bianchi & Phillips (2005), neuroticism cannot predict phone addiction due to neuroticism is not strongly associated with phone addiction but is strongly associated with other addictions such as substance abuse. Moreover, the result can be explained due to the sample size being too small in this study, and the demographics are different from other research studies. Smaller sample size causes the result to be different, and age range differences influence the study result as well. Also, this study is conducted in Malaysia, which has a different cultural background from the questionnaires used and other research studies, so there are cultural differences and different

understandings of the items of the questionnaires provided. Therefore, the result showed no significant prediction of neuroticism to phone addiction.

Implication of the Study

Theoretical Implications

The Stress-Vulnerability Model was applied for this present study to explain the phone addiction regarding self-compassion and neuroticism among undergraduate students (Quaedflieg & Smeets, 2020). In this model, phone addiction is viewed as the outcome, while neuroticism serves as the vulnerability factor, and self-compassion acts as a protective factor from the outcome. The statistically significant negative relationship of self-compassion and phone addiction justified the theory was aligned with this study, as the result showed that self-compassion negatively predicts phone addiction. When meeting with stress, the students with higher self-compassion deal with the stress with healthier coping strategies and have better emotional regulation, which reduces their risk of phone addiction.

However, the current study results showed that neuroticism cannot predict phone addiction. This indicates the stress-vulnerability model has limited ability to explain the neuroticism prediction of phone addiction. Moreover, relying on stress to explain this study's variables excludes other causes of phone addiction. Besides, stress-vulnerability models are commonly used for explaining mental health illnesses rather than behavioural addiction (Quaedflieg & Smeets, 2020). So, using this theory in behavioural addiction was not suitable. Also, this theory is a unidirectional explanation which phone addiction cannot explain neuroticism and self-compassion. Therefore, this theory was not comprehensive enough to explain this study and was unable to prove that neuroticism can positively predict phone addiction. It is recommended that other theories or integrated theories be used in future to explain phone addiction.

Practical Implications

Counsellors and mental health practitioners have a new insight into this study. The study result showed that self-compassion is negatively correlated and predicts phone addiction, so enhancing self-compassion among phone addiction undergraduate clients will lead to a higher chance of decreasing phone addiction. To increase self-compassion as an implementation in counselling, the therapist can provide techniques from different theories, such as Acceptance and Commitment Therapy and Compassion-Focused Therapy (Wakelin et al., 2022). This can help to maintain the healthy mental status of individuals with phone addiction. The findings and results from this study can help the counsellors and mental health practitioners to have a better view of the current trends among undergraduate students in Malaysia. Therefore, it lets them have awareness of the issues and helps their clients to improve their performance in life.

Secondly, the university administrators and students benefit from this study, as the new information gained from this study applies to the current university and the students. This study revealed the phone addiction issue that arises nowadays, which causes a lot of effects among students. The university administrators can implement strategies to decrease phone addiction among students, such as providing a learning space without Wi-Fi, so they can decrease phone usage in school while studying. Also, the university administrators can provide training for students to improve their self-compassion, as well as to know the importance of applying healthy coping strategies when meeting problems in life. Moreover, students gained the knowledge and were able to identify the symptoms of phone addiction. Therefore, they can use the knowledge from this study on themselves, others and even on the new generations.

Limitation of the Study

The sample size of this study is too small, as there were only 110 participants. Small sample size can lead to the results being different from those of past studies and even lead to inaccurate results. Then, the researcher should include more demographic information about the participants so that the researcher can make sure the participants are not overly represented from specific demographics and make sure there are no biases from confounding variables. Besides, a larger population can be considered for this study, the researcher focused on undergraduate students. So, this study's result can only be applied to a specific population, which is Malaysian undergraduate students and cannot be applied to a larger population group in Malaysia. This also caused difficulties in finding past literature and suitable instruments.

Other than that, the method of self-reported instruments and cross-sectional research design causes common method bias in the study (Chen et al., 2022). Some participants simply answer the survey just to complete the survey. Also, they can get tired of long sentences, especially with difficult words to understand. The instruments have quite long sentences and some difficult terms, which increase the time and effort for participants to understand and read. Although there were fewer questions for the survey in this study, long sentences and difficult terms can create stress and be time-consuming for participants to answer.

Lastly, the present study did not include data on participants' daily phone usage patterns, which could have provided deeper insights into the relationship between personality traits and phone addiction. Since the study found that neuroticism did not significantly predict phone addiction, this trait may not have been a suitable predictor within the context of the present study. Neuroticism provided limited explanatory value for understanding phone addiction among undergraduate students. Additionally, the study faced challenges in

identifying a well-established theoretical framework suited for behavioural addiction, as much of the existing research focuses on clinical mental health disorders rather than technology-related behaviours.

Recommendations for Research in the Future

Firstly, increase the participants for the study to reduce bias and enhance reliability in the study's results (White, 2023). A larger and diverse population should be considered, such as adults and young adults in Malaysia. Demographic information should be included in the survey form, such as race, year of study, programme, university and so on. More comprehensive demographic information gained can help to analyse the results with a less biased view (Stauffer, 2015). The researcher can analyse if there are any possible confounding variables based on the demographic information collected.

To decrease the common method bias from the self-reported instrument, the researcher can include some questions that have a few trap questions within the instrument to identify whether the participants read the question and select the answer seriously. Then, the researcher can choose to do a longitudinal design to make sure they can examine the results over time, which decreases the bias and ensures validity (Stauffer, 2015). The researcher should choose the instruments that have easier-to-understand sentences and shorter sentences. Then, translate it into languages that are commonly used in the country, such as translating the instruments into Chinese and Malay. So, the participants can understand the instruments better without making errors and feeling frustrated by the questionnaire.

Lastly, include the self-report from smartphone tracking apps in the online survey (Qiu et al., 2025). This will help to enhance the accuracy of the data and gain more information about the phone addiction level from the participants. Following that, introduce a different psychological variable in future studies, such as self-esteem, depression, and social

connectedness (Chen et al., 2022). Replace the neuroticism with another psychological variable, so that it can be much easier to find past studies as well as the applicable theoretical framework.

References

44 smartphone addiction statistics for 2024 [infographic]. SlickText. (2024). https://www.slicktext.com/blog/2019/10/smartphone-addiction-statistics/

Abed, S. N., Abd, R. K., Dawood, I., Abdul, N., & Jamal, R. (2018). Health problems of mobile phone addiction for sample of students and their health awareness at institute technical of kut. *Journal of Pharmaceutical Sciences and Research, 10*(2), 412–415. https://www.researchgate.net/publication/328051571

Achangwa, C., Ryu, H. S., Lee, J. K., & Jang, J. D. (2022). Adverse effects of smartphone addiction among university students in South Korea: A systematic review. *Healthcare, 11*(1), 1-19. https://doi.org/10.3390/healthcare11010014

Albursan, I. S., Al. Qudah, M. F., Al-Barashdi, H. S., Bakhiet, S. F., Darandari, E., Al-Asqah, S. S., Hammad, H. I., Al-Khadher, M. M., Qara, S., Al-Mutairy, S. H., & Albursan, H. I. (2022). Smartphone addiction among university students in light of the COVID-19 pandemic: Prevalence, relationship to academic procrastination, quality of life, gender and educational stage. *International Journal of Environmental Research and Public Health, 19*(16), 1-15. https://doi.org/10.3390/ijerph191610439

Al-Menayes, J. J. (2015). Dimensions of social media addiction among university students in Kuwait. *Psychology and Behavioral Sciences, 4*(1), 23-28. https://doi.org/10.11648/j.pbs.20150401.14

Alotaibi, M., Fox, M., Coman, R., Ratan, Z., & Hosseinzadeh, H. (2022). Smartphone addiction prevalence and its association on academic performance, physical health, and mental well-being among university students in Umm Al-Qura University (UQU), Saudi Arabia. *International Journal of Environmental Research and Public Health, 19*(6), 1-17. https://doi.org/10.3390/ijerph19063710

Ambat, J. K. (2025). *Excessive use of digital devices: A qualitative study on perceived causes and impact*. [Master thesis, Bournemouth University]. BURO. https://eprints.bournemouth.ac.uk/40768/1/AMBAT%2C%20Janhavi%20Krishnadas_M.Res_2024.pdf

Andrade, C. (2020). The inconvenient truth about convenience and purposive samples. *Indian Journal of Psychological Medicine*, *43*(1), 86–88. https://doi.org/10.1177/0253717620977000

Arghode, V. (2012). Qualitative and quantitative research: Paradigmatic differences. *Global Education Journal*, *2*(4), 155-163. https://www.scribd.com/document/612043429/Arghode-2012-GEJ

Arpaci, I., & Kocadag Unver, T. (2020). Moderating role of gender in the relationship between Big Five personality traits and smartphone addiction. *Psychiatric Quarterly*, *91*(2), 577–585. https://doi.org/10.1007/s11126-020-09718-5

Ayub, N. (2015). Predicting suicide ideation through intrapersonal and interpersonal factors: The interplay of Big-Five personality traits and social support. *Personality and Mental Health*, *9*(4), 308–318. https://doi.org/10.1002/pmh.1301

Azad, M. C., Fraser, K., Rumana, N., Abdullah, A. F., Shahana, N., Hanly, P. J., & Turin, T. C. (2015). Sleep disturbances among medical students: A global perspective. *Journal of Clinical Sleep Medicine*, *11*(1), 69–74. https://doi.org/10.5664/jcsm.4370

Babcock, S. E., & Wilson, C. A. (2020). Big Five Model of Personality. In *The Wiley Encyclopedia of Personality and Individual Differences* (pp. 55–60). Wiley. https://doi.org/10.1002/9781119547174.ch186

Bayley, R. (2013). The quantitative paradigm. In *The handbook of language variation and change* (pp. 83–107). Wiley. https://doi.org/10.1002/9781118335598.ch4

Bellingtier, J. A., Mund, M., & Wrzus, C. (2023). The role of extraversion and neuroticism for experiencing stress during the third wave of the COVID-19 pandemic. *Current Psychology*, *42*(14), 12202–12212. https://doi.org/10.1007/s12144-021-02600-y

Bianchi, A., & Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. *CyberPsychology & Behavior*, *8*(1), 39–51. https://doi.org/10.1089/cpb.2005.8.39

Bloomfield, J., & Fisher, M. (2019). Quantitative research design. *Journal of the Australasian Rehabilitation Nurses' Association*, *22*(2), 27–30. https://doi.org/10.33235/jarna.22.2.27-30

Brydges, C. R. (2019). Effect size guidelines, sample size calculations, and statistical power in gerontology. *Innovation in Aging*, *3*(4). https://doi.org/10.1093/geroni/igz036

Çağan, Ö., Ünsal, A., & Çelik, N. (2014). Evaluation of college students' the level of addiction to cellular phone and investigation on the relationsship between the addiction and the level of depression. *Procedia - Social and Behavioral Sciences*, *114*(1), 831–839. https://doi.org/10.1016/j.sbspro.2013.12.793

Cassiello-Robbins, C., Wilner, J. G., & Sauer-Zavala, S. (2020). Neuroticism. In *Encyclopedia of Personality and Individual Differences* (pp. 3222–3227). Springer International Publishing. https://doi.org/10.1007/978-3-319-24612-3_1256

Chan, Y. F., Aziz, N. A., Muzlia, S., Mustafa, S., Cheong, T. H., Fook, C. Y., Abdul Aziz, N., Narasuman, S., & Han, C. T. (2020). Journal of critical reviews mobile addiction, attitude and purpose of use among university students in a public university in Malaysia. *Article in Journal of Critical Reviews*, *7*(19), 4860- 4867. https://www.researchgate.net/publication/353073033

Chen, L., Yan, Z., Tang, W., Yang, F., Xie, X., & He, J. (2016). Mobile phone addiction levels and negative emotions among Chinese young adults: The mediating role of

interpersonal problems. *Computers in Human Behavior*, *55*, 856–866. https://doi.org/10.1016/j.chb.2015.10.030

Chen, W., Wang, X., Sun, S., Liu, Q., & Guo, Z. (2022). The relationship between neuroticism and mobile phone use among college students in love: The masking effect of self-emotional assessment. *Frontiers in Psychology*, *13*(1). 1-11. https://doi.org/10.3389/fpsyg.2022.942520

Cheng, J., Peng, C., Rong, F., Wang, Y., Tan, Y., & Yu, Y. (2024). Mobile phone addiction and suicide behaviors among Chinese adolescents: The mediation of poor sleep quality. *Journal of Behavioral Addictions*, *13*(1), 88–101. https://doi.org/10.1556/2006.2023.00078

Chidambar Subramanian, B., Shafini Bakar, R., Che Rahimi, A., & Mohd Yasin, M. A. (2024). Neuroticism, coping styles and psychological distress among frontliners during COVID-19 pandemic in Kelantan, Malaysia. *Environment and Social Psychology*, *9*(8), 1-15. https://doi.org/10.59429/esp.v9i8.2947

Ching, S. M., Yee, A., Ramachandran, V., Sazlly Lim, S. M., Wan Sulaiman, W. A., Foo, Y. L., & Hoo, F. kee. (2015). Validation of a Malay version of the smartphone addiction scale among medical students in Malaysia. *PLOS ONE*, *10*(10), 1-11. https://doi.org/10.1371/journal.pone.0139337

Choi, S. W., Mok, J. Y., Kim, D. J., Choi, J. S., Lee, J. W., Ahn, H. J., Choi, E. J., & Song, W. Y. (2014). Latent class analysis on internet and smartphone addiction in college students. *Neuropsychiatric Disease and Treatment*, *11*. 817-828. https://doi.org/10.2147/NDT.S59293

Chóliz, M. (2012). Mobile-phone addiction in adolescence: The test of mobile phone dependence (TMD). *Prog Health Sci*, *2*(1), 33-44. https://www.researchgate.net/publication/284690452

Chung, T. (2018). Psychology of addictive behaviors. *Psychology of Addictive Behaviors, 32*(7), 697-698. https://doi.org/10.1037/adb0000429

Correll, J., Mellinger, C., McClelland, G. H., & Judd, C. M. (2020). Avoid Cohen's 'small', 'medium', and 'large' for power analysis. *Trends in Cognitive Sciences, 24*(3), 200–207. https://doi.org/10.1016/j.tics.2019.12.009

Curtis, E. A., Comiskey, C., & Dempsey, O. (2016). Importance and use of correlational research. *Nurse Researcher, 23*(6), 20–25. https://doi.org/10.7748/nr.2016.e1382

Demke, E. (2022). The vulnerability-stress-model-holding up the construct of the faulty individual in the light of challenges to the medical model of mental distress. *Frontiers in Sociology, 7*(1), 1-8. https://doi.org/10.3389/fsoc.2022.833987

De-Sola Gutiérrez, J., Rodríguez de Fonseca, F., & Rubio, G. (2016). Cell-phone addiction: a review. *Frontiers in Psychiatry*, *7*, 1-15. https://doi.org/10.3389/fpsyt.2016.00175

Eichenberg, C., Schneider, R., & Rumpl, H. (2024). Social media addiction: Associations with attachment style, mental distress, and personality. *BMC Psychiatry*, *24*(1), 1-14. https://doi.org/10.1186/s12888-024-05709-z

Eide, T. A., Aarestad, S. H., Andreassen, C. S., Bilder, R. M., & Pallesen, S. (2018). Smartphone restriction and its effect on subjective withdrawal related scores. *Frontiers in Psychology*, *9*(1), 1-11. https://doi.org/10.3389/fpsyg.2018.01444

Eisenberg, M. E., Gower, A. L., McMorris, B. J., Rider, G. N., & Coleman, E. (2019). Emotional distress, bullying victimization, and protective factors among transgender and gender diverse adolescents in city, suburban, town, and rural locations. *The Journal of Rural Health, 35*(2), 270–281. https://doi.org/10.1111/jrh.12311

Elices, M., Carmona, C., Pascual, J. C., Feliu-Soler, A., Martin-Blanco, A., & Soler, J. (2017). Compassion and self-compassion: Construct and measurement. *Mindfulness & Compassion, 2*(1), 34-40. https://doi.org/10.1016/j.mincom.2016.11.003

Eum, K. Y., Kim, H. S., Kim, S. J., Kim, E. M., & Jin, M. H. (2021). Mediating effect of depression on the relationship between stress and smartphone addiction in married men, moderating effect of age. *Journal of Convergence for Information Technology*, *11*(8), 129–136. https://doi.org/10.22156/CS4SMB.2021.11.08.129

Ewert, C., Vater, A., & Schröder-Abé, M. (2021). Self-compassion and coping: A meta-analysis. *Mindfulness*, *12*(5), 1063–1077. https://doi.org/10.1007/s12671-020-01563-8

Felipe, J. P. (2016). Understanding how intentionally unplugging from cell phones shapes interpersonal relationships and the undergraduate college experience. [Master's thesis, University of San Francisco]. Gleeson Library. https://repository.usfca.edu/thes/187

Fiselier, S. (2017). *Investigating the relationships between neuroticism, self-compassion and coping styles* [Bachelor's thesis, University of Twente]. University of Twente Student Theses. https://essay.utwente.nl/72494/1/Fiselier_BA_Faculty-of-behavioural-sciences.pdf

Friedman, H. S. (2019). Neuroticism and health as individuals age. *Personality Disorders: Theory, Research, and Treatment*, *10*(1), 25–32. https://doi.org/10.1037/per0000274

Gao, L., Zhai, S., Xie, H., Liu, Q., Niu, G., & Zhou, Z. (2022). Big five personality traits and problematic mobile phone use: A meta-analytic review. *Current Psychology*, *41*(5), 3093–3110. https://doi.org/10.1007/s12144-020-00817-x

Geiger, M., Pfattheicher, S., Hartung, J., Weiss, S., Schindler, S., & Wilhelm, O. (2018). Self–compassion as a facet of neuroticism? A reply to the comments of Neff, TóTh–KiráLy, and Colosimo (2018). *European Journal of Personality*, *32*(4), 393–404. https://doi.org/10.1002/per.2168

Gilbert, P. (Ed.). (2005). *Compassion*. Routledge. https://doi.org/10.4324/9780203003459

Goh, C., & Agius, M. (2010). The stress-vulnerability model how does stress impact on mental illness at the level of the brain and what are the consequences? *European Psychiatry*, *22*(2), 198-202. https://www.psychiatria-danubina.com/UserDocsImages/pdf/dnb_vol22_no2/dnb_vol22_no2_198.pdf

Graham, E. K., Weston, S. J., Turiano, N. A., Aschwanden, D., Booth, T., Harrison, F., James, B. D., Lewis, N. A., Makkar, S. R., Mueller, S., Wisniewski, K. M., Yoneda, T., Zhaoyang, R., Spiro, A., Willis, S., Schaie, K. W., Sliwinski, M., Lipton, R. A., Katz, M. J., … Mroczek, D. K. (2020). Is healthy neuroticism associated with health behaviors? A coordinated integrative data analysis. *Collabra: Psychology*, *6*(1). 1-18. https://doi.org/10.1525/collabra.266

Hernández-Torrano, D., Ibrayeva, L., Sparks, J., Lim, N., Clementi, A., Almukhambetova, A., Nurtayev, Y., & Muratkyzy, A. (2020). Mental health and well-being of university students: A bibliometric mapping of the literature. *Frontiers in Psychology*, *11*, 1-16. https://doi.org/10.3389/fpsyg.2020.01226

Homan, K. J. (2016). Self-compassion and psychological well-being in older adults. *Journal of Adult Development*, *23*(2), 111–119. https://doi.org/10.1007/s10804-016-9227-8

Honsel, H. (2019). *The role of gender in relation to self-compassion and accompanying health behaviours*. [Bachelor thesis, University of Twente]. University of Twente Student Theses. https://essay.utwente.nl/78217/

Horwood, S., & Anglim, J. (2018). Personality and problematic smartphone use: A facet-level analysis using the Five Factor Model and HEXACO frameworks. *Computers in Human Behavior*, *85*(1), 349–359. https://doi.org/10.1016/j.chb.2018.04.013

Huang, Y., Jung, H., & Lim, C. (2020). Effects of smartphone addiction on radiology students' interpersonal satisfaction. *Medico-Legal Update, 20*(1), 1971-1975.

https://www.semanticscholar.org/paper/Effects-of-Smartphone-Addiction-on-Radiology-Huang-Jung/bbe13e2b30887eadb162651d760ee32b06d7644c

Ikizer, G., Kowal, M., Aldemir, İ. D., Jeftić, A., Memisoglu-Sanli, A., Najmussaqib, A., Lacko, D., Eichel, K., Turk, F., Chrona, S., Ahmed, O., Rasmussen, J., Kumaga, R., Uddin, M. K., Reynoso-Alcántara, V., Pankowski, D., & Coll-Martín, T. (2022). Big Five traits predict stress and loneliness during the COVID-19 pandemic: Evidence for the role of neuroticism. *Personality and Individual Differences, 190,* 1-5. https://doi.org/10.1016/j.paid.2022.111531

Inwood, E., & Ferrari, M. (2018). Mechanisms of change in the relationship between self-compassion, emotion regulation, and mental health: A systematic review. *Applied Psychology: Health and Well-Being*, *10*(2), 215–235. https://doi.org/10.1111/aphw.12127

İskender, M., & Akin, A. (2011). Self-compassion and internet addiction. *TOJET: The Turkish Online Journal of Educational Technology 10*(3), 215–221. https://eric.ed.gov/?id=EJ944970

Ivanova, A., Gorbaniuk, O., Błachnio, A., Przepiórka, A., Mraka, N., Polishchuk, V., & Gorbaniuk, J. (2020). Mobile phone addiction, phubbing, and depression among men and women: A moderated mediation analysis. *Psychiatric Quarterly, 91*(3), 655–668. https://doi.org/10.1007/s11126-020-09723-8

Jain, F. A., Gutierrez-Ramirez, P., Zea, M., Okereke, O. I., Orden, K. A. Van, Pedrelli, P., Vranceanu, A. M., Dueck, K., Pederson, A., & Gomez, L. A. R. (2024). Early childhood adversity predicts risk of family caregiver suicidal ideation: Roles of neuroticism and self-compassion. *Research Square*, 1-9. https://doi.org/10.21203/rs.3.rs-4803419/v1

John, O. P., & Srivastava, S. (1999). The big-five trait taxonomy: History, measurement, and theoretical perspectives. (2nd ed.). *New York: Guilford Press*. https://jenni.uchicago.edu/econ-psych-traits/John_Srivastava_1995_big5.pdf

Katircioğlu, H. T. (2023). *The role of self-compassion in the relationship between social anxiety and smartphone addiction*. [Master thesis, Izmir University of Economics]. GCRIS. https://hdl.handle.net/20.500.14365/5107

Keough, V. A., & Tanabe, P. (2011). Survey research: An effective design for conducting nursing research. *Journal of Nursing Regulation*, *1*(4), 37–44. https://doi.org/10.1016/S2155-8256(15)30315-X

Kerr, M. L., Fanning, K. A., Huynh, T., Botto, I., & Kim, C. N. (2021). Parents' self-reported psychological impacts of COVID-19: Associations with parental burnout, child behavior, and income. *Journal of Pediatric Psychology*, *46*(10), 1162–1171. https://doi.org/10.1093/jpepsy/jsab089

Khidhir, R. J. (2021). A correlation study of the effectiveness of teaching practice between taught programs and personal in-built performance talents. *Journal of English Language Teaching and Applied Linguistics*, *3*(3), 41–50. https://doi.org/10.32996/jeltal.2021.3.3.6

Kil, N., Kim, J., McDaniel, J. T., Kim, J., & Kensinger, K. (2021). Examining associations between smartphone use, smartphone addiction, and mental health outcomes: A cross-sectional study of college students. *Health Promotion Perspectives*, *11*(1), 36–44. https://doi.org/10.34172/hpp.2021.06

Kim, J. H., Seo, M., & David, P. (2015). Alleviating depression only to become problematic mobile phone users: Can face-to-face communication be the antidote? *Computers in Human Behavior*, *51*, 440–447. https://doi.org/10.1016/j.chb.2015.05.030

Kiran, S., Sanjana, J., & Reddy, N. (2019). Mobile phone addiction: Symptoms, impacts and causes - a review. *International Conference on Trends in Industrial & Value Engineering, Business and Social Innovation*, 81-86. https://www.researchgate.net/publication/330521664

Kohli, H., Wampole, D., Kohli, A., Peng, C., & Polyakova, D. (2022). Association between self-compassion and demographics of university students adjusted by gratitude. *International Journal of Progressive Education*, *18*(6), 15–28. https://doi.org/10.29329/ijpe.2022.477.2

Kotera, Y., Martínez-Rives, N. L., Aledeh, M., Colman, R., Veasey, C., Harrington, T., Komori, N., Ozaki, A., Griner, D., Ali, Y., & Taylor, E. C. (2024). Cross-cultural psychology and compassion. *Encyclopedia*, *4*(4), 1509–1519. https://doi.org/10.3390/encyclopedia4040098

Kotronoulas, G., Miguel, S., Dowling, M., Fernández-Ortega, P., Colomer-Lahiguera, S., Bağçivan, G., Pape, E., Drury, A., Semple, C., Dieperink, K. B., & Papadopoulou, C. (2023). An overview of the fundamentals of data management, analysis, and interpretation in quantitative research. *Seminars in Oncology Nursing*, *39*(2), 1-9. https://doi.org/10.1016/j.soncn.2023.151398

Kou, C., Meng, X., Xie, B., Chen, Y., Yu, Q., Shi, J., Yu, Y., D'Arcy, C., & Huang, Y. (2012). The prevalence and correlates of neurotic disorders among undergraduates at a mainland Chinese university. *Social Psychiatry and Psychiatric Epidemiology*, *47*(12), 2011–2018. https://doi.org/10.1007/s00127-012-0500-2

Kuang-Tsan, C., & Fu-Yuan, H. (2017). Study on relationship among university students' life stress, smart mobile phone addiction, and life satisfaction. *Journal of Adult Development*, *24*(2), 109–118. https://doi.org/10.1007/s10804-016-9250-9

Kwon, M., Kim, D. J., Cho, H., & Yang, S. (2013). The smartphone addiction scale: Development and validation of a short version for adolescents. *PLoS ONE*, *8*(12), 1-7. https://doi.org/10.1371/journal.pone.0083558

Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist*, *64*(4), 241–256. https://doi.org/10.1037/a0015309

Lei, L. Y. C., Ismail, M. A. A., Mohammad, J. A. M., & Yusoff, M. S. B. (2020). The relationship of smartphone addiction with psychological distress and neuroticism among university medical students. *BMC Psychology*, *8*(1), 1-9. https://doi.org/10.1186/s40359-020-00466-6

Leung, L. (2008). Linking psychological attributes to addiction and improper use of the mobile phone among adolescents in Hong Kong. *Journal of Children and Media*, *2*(2), 93–113. https://doi.org/10.1080/17482790802078565

Li, M. N., Wang, M. F., Feng, X. J., Bai, X., Fang, J., & Zheng, W. K. (2024). Relation between neuroticism and tendency of mobile phone addiction among nursing undergraduates: The mediating role of perceived stress and self-control. *Sichuan Mental Health, 37*(1), 70-76. https://pesquisa.bvsalud.org/portal/resource/pt/wpr-1012560#

Lin, L., Wang, X., Li, Q., Xia, B., Chen, P., & Wang, W. (2021). The influence of interpersonal sensitivity on smartphone addiction: A moderated mediation model. *Frontiers in Psychology*, *12*. 1-9. https://doi.org/10.3389/fpsyg.2021.670223

Liu, Q. Q., Yang, X. J., Hu, Y. T., & Zhang, C. Y. (2020). Peer victimization, self-compassion, gender and adolescent mobile phone addiction: Unique and interactive effects. *Children and Youth Services Review*, *118*, 1-9. https://doi.org/10.1016/j.childyouth.2020.105397

Liu, Y., Tan, D., Wang, P., Xiao, T., Wang, X., & Zhang, T. (2024). Physical activity moderated the mediating effect of self-control between bullying victimization and mobile phone addiction among college students. *Scientific Reports*, *14*(1), 1-10. https://doi.org/10.1038/s41598-024-71797-2

López, A., Sanderman, R., Smink, A., Zhang, Y., Van Sonderen, E., Ranchor, A., & Schroevers, M. J. (2015). A reconsideration of the Self-Compassion Scale's total score: Self-compassion versus self-criticism. *PLOS ONE*, *10*(7), 1-12. https://doi.org/10.1371/journal.pone.0132940

Marciano, L., Camerini, A. L., & Schulz, P. J. (2022). Neuroticism and internet addiction: What is next? A systematic conceptual review. *Personality and Individual Differences*, *185*, 1-10. https://doi.org/10.1016/j.paid.2021.111260

Md. Mahfuzur Rahman Khan. (2021). Predicting Big Five model personality traits in recent social context. *British Journal of Nursing Studies*, *1*(1), 8-12. https://doi.org/10.32996/bjns.2021.1.1.2

Mei, S., Hu, Y., Wu, X., Cao, R., Kong, Y., Zhang, L., Lin, X., liu, Q., Hu, Y., & Li, L. (2023). Health risks of mobile phone addiction among college students in China. *International Journal of Mental Health and Addiction*, *21*(4), 2650–2665. https://doi.org/10.1007/s11469-021-00744-3

Meng, S. Q., Cheng, J. L., Li, Y. Y., Yang, X. Q., Zheng, J. W., Chang, X. W., Shi, Y., Chen, Y., Lu, L., Sun, Y., Bao, Y. P., & Shi, J. (2022). Global prevalence of digital addiction in general population: A systematic review and meta-analysis. *Clinical Psychology Review*, *92*, 1-12. https://doi.org/10.1016/j.cpr.2022.102128

Mental Health and Wellbeing Strategy - Monash University. Monash University. (n.d.). https://www.monash.edu/about/who/equity-diversity-inclusion/framework-and-priority-areas/mental-health-and-wellbeing-strategy

Mohd Amin, N. A. F., Tuan Ismail, T. N. N., Ponnuraj, K. T., & Shahidan, W. N. S. (2024). Psychosocial impact of smartphone addiction among university student: A review. *Malaysian Journal of Medicine and Health Sciences, 20*(1), 343–358. https://doi.org/10.47836/mjmhs.20.1.42

Mohtarami Zavardeh, S. Z., Salimi, F., & Amani, O. (2024). The mediating role of cognitive emotion regulation in the relationship between psychological flexibility and self-compassion with problematic use of smartphone in none-clinical population. *Journal of Psychology New Ideas*, *20*(24), 1–12. https://jnip.ir/article-1-1128-en.html

Moore, B. C., Biegel, D. E., & McMahon, T. J. (2011). Maladaptive coping as a mediator of family stress. *Journal of Social Work Practice in the Addictions, 11*(1), 17–39. https://doi.org/10.1080/1533256X.2011.544600

Mousavi, N., Effatpanah, M., Molaei, A., & Alesaeidi, S. (2023). The predictive role of personality traits and demographic features on post-traumatic stress disorder in a sample of COVID-19 hospitalized patients. *Middle East Current Psychiatry, 30*(1), 1-7. https://doi.org/10.1186/s43045-023-00323-3

Munusamy, K. A., & Ghazali, A. H. A. (2020). Effects of mobile phone usage behavior and mobile phone addiction among youth. *International Journal of Academic Research in Business and Social Sciences*, *10*(16), 134-145. https://doi.org/10.6007/IJARBSS/v10-i16/8297

Muris, P., & Otgaar, H. (2020). The process of science: A critical evaluation of more than 15 years of research on self-compassion with the self-compassion scale. *Mindfulness, 11*(6), 1469–1482. https://doi.org/10.1007/s12671-020-01363-0

Nasser, N. S., Loh, J. L., Rashid, A. A., Sharifat, H., Ahmad, U., Ibrahim, B., Mustafa, S., Hoo, F. K., Ching, S. M., & Suppiah S, S. (2020). A survey on smartphone dependence and psychological effects among undergraduate students in a Malaysian University. *The*

Medical journal of Malaysia, *75*(4), 356–362. https://pubmed.ncbi.nlm.nih.gov/32723994/

NCI Dictionary of Cancer terms. Comprehensive Cancer Information - NCI. (n.d.). https://www.cancer.gov/publications/dictionaries/cancer-terms/def/cross-sectional-study

Neff, K. D. (2009). The role of self-compassion in development: A healthier way to relate to oneself. *Human Development*, *52*(4), 211–214. https://doi.org/10.1159/000215071

Neff, K. D. (2016). The self-compassion scale is a valid and theoretically coherent measure of self-compassion. *Mindfulness*, *7*(1), 264–274. https://doi.org/10.1007/s12671-015-0479-3

Neff, K. D. (2023). Self-compassion: Theory, method, research, and intervention. *Annual Review of Psychology*, *74*(1), 193–218. https://doi.org/10.1146/annurev-psych-032420-031047

Nikolic, A., Bukurov, B., Kocic, I., Vukovic, M., Ladjevic, N., Vrhovac, M., Pavlović, Z., Grujicic, J., Kisic, D., & Sipetic, S. (2023). Smartphone addiction, sleep quality, depression, anxiety, and stress among medical students. *Frontiers in Public Health*, *11*, 1-10. https://doi.org/10.3389/fpubh.2023.1252371

O'Neill, C. D., Prince, S. A., Mitra, M., & Reed, J. L. (2025). Considerations for assessing physical activity in those at risk of and living with cardiovascular disease. *Canadian Journal of Cardiology*, *41*(3), 553–557. https://doi.org/10.1016/j.cjca.2024.12.011

Olson, J. A., Sandra, D. A., Colucci, É. S., Al Bikaii, A., Chmoulevitch, D., Nahas, J., Raz, A., & Veissière, S. P. L. (2022). Smartphone addiction is increasing across the world: A meta-analysis of 24 countries. *Computers in Human Behavior*, *129*, 1-11. https://doi.org/10.1016/j.chb.2021.107138

Ormel, J., & Neeleman, J. (2000). *Towards a dynamic stress-vulnerability model of depression. The role of neuroticism, life events and gender*. (1st ed.). ResearchGate. https://www.researchgate.net/publication/318817895

Palczyńska, M., & Rynko, M. (2021). ICT skills measurement in social surveys: Can we trust self-reports? *Quality & Quantity*, *55*(3), 917–943. https://doi.org/10.1007/s11135-020-01031-4

Pandis, N. (2014). Cross-sectional studies. *American Journal of Orthodontics and Dentofacial Orthopedics*, *146*(1), 127-129. https://doi.org/10.1016/j.ajodo.2014.05.005

Pfattheicher, S., Geiger, M., Hartung, J., Weiss, S., & Schindler, S. (2017). Old wine in new bottles? The case of self–compassion and neuroticism. *European Journal of Personality*, *31*(2), 160–169. https://doi.org/10.1002/per.2097

Phillips, E. D. (2018). *An investigation of personality traits as predictors for mobile phone dependency*. [Degree thesis, James Madison University]. Senior Honors Projects. https://commons.lib.jmu.edu/honors201019/590

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

Ponto J. (2015). Understanding and evaluating survey research. *Journal of the advanced practitioner in oncology*, *6*(2), 168–171. https://pmc.ncbi.nlm.nih.gov/articles/PMC4601897/

Porzoor, P., & Hajipour, M. (2023). Predicting mobile phone addictive behavior in students based on emotional self-regulation, self-compassion, and attachment styles to god. *Journal of School Psychology and Institutions, 12*(2), 45-47. https://doi.org/10.22098/jsp.2023.2438

Pruessner, M., Iyer, S. N., Faridi, K., Joober, R., & Malla, A. K. (2011). Stress and protective factors in individuals at ultra-high risk for psychosis, first episode psychosis and healthy controls. *Schizophrenia Research*, *129*(1), 29–35. https://doi.org/10.1016/j.schres.2011.03.022

Qiu, Y., Gong, S., Yang, Y., Wang, J., & Tan, L. (2025). Self-compassion and smartphone addiction tendency among college students: The chain-mediating effect of self-concept clarity and experiential avoidance. *Behavioral Sciences*, *15*(4), 1-17. https://doi.org/10.3390/bs15040512

Quaedflieg, C. W. E. M., & Smeets, T. (2020). Stress Vulnerability Models. In *Encyclopedia of Behavioral Medicine* (pp. 2161–2164). Springer International Publishing. https://doi.org/10.1007/978-3-030-39903-0_65

Raes, F., Pommier, E., Neff, K. D., & van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy*, *18*(3), 250–255. https://doi.org/10.1002/cpp.702

Rahman, M. M. (2023). Sample size determination for survey research and non-probability sampling techniques: A review and set of recommendations. *Journal of Entrepreneurship, Business and Economics*, *11*(1), 42–62. https://www.scientificia.com/index.php/JEBE/article/view/201/190

Ratan, Z., Parrish, A. M., Zaman, S., Alotaibi, M., & Hosseinzadeh, H. (2021). Smartphone addiction and associated health outcomes in adult populations: A systematic review. *International Journal of Environmental Research and Public Health*, *18*(22), 1-17. https://doi.org/10.3390/ijerph182212257

Raza, A. (2023). *Researchers track global smartphone addiction patterns in largest-ever study*. University of Toronto Mississauga. https://www.utm.utoronto.ca/main-news/researchers-track-global-smartphone-addiction-patterns-largest-ever-study

Saha, A. K., & Saha, A. (2018). Smartphone as a means of communication & its influence upon college students. *Indian Journal of Industrial Relations*, *53*(4), 560–571. https://www.jstor.org/stable/26536481

Salafi, K. A., Widianti, E., & Praptiwi, A. (2023). Self-compassion among undergraduate nursing students at a state university in Indonesia during the COVID-19 Pandemic. *Revista Brasileira de Enfermagem*, *76*(4). 1-18. https://doi.org/10.1590/0034-7167-2022-0585

Salkind, N. J. (2012). Exploring research (8th ed.). *Pearson*.

Schell, C., Godinho, A., & Cunningham, J. A. (2021). Examining change in self-reported gambling measures over time as related to socially desirable responding bias. *Journal of Gambling Studies*, *37*(3), 1043–1054. https://doi.org/10.1007/s10899-020-09970-1

Schiele, M. A., Herzog, K., Kollert, L., Schartner, C., Leehr, E. J., Böhnlein, J., Repple, J., Rosenkranz, K., Lonsdorf, T. B., Dannlowski, U., Zwanzger, P., Reif, A., Pauli, P., Deckert, J., & Domschke, K. (2020). Extending the vulnerability–stress model of mental disorders: three-dimensional *NPSR1* × environment × coping interaction study in anxiety. *The British Journal of Psychiatry*, *217*(5), 645–650. https://doi.org/10.1192/bjp.2020.73

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

Sharma, L. A. (2020). Neuroticism. In *Encyclopedia of Behavioral Medicine* (pp. 1501–1501). Springer International Publishing. https://doi.org/10.1007/978-3-030-39903-0_607

Sibona, C., & Walczak, S. (2012). Purposive sampling on Twitter: A case study. *2012 45th Hawaii International Conference on System Sciences*, 3510–3519. https://doi.org/10.1109/HICSS.2012.493

Sirois, F. M., Molnar, D. S., & Hirsch, J. K. (2015). Self-compassion, stress, and coping in the context of chronic illness. *Self and Identity*, *14*(3), 334–347. https://doi.org/10.1080/15298868.2014.996249

Sönmez, M., Gürlek Kısacık, Ö., & Eraydın, C. (2021). Correlation between smartphone addiction and loneliness levels in nursing students. *Perspectives in Psychiatric Care*, *57*(1), 82–87. https://doi.org/10.1111/ppc.12527

Stauffer, M. (2015). *Inducing self-compassion and the impact on neuroticism and other personality characteristicsi*. [Degree thesis, University of South Carolina]. USC Aiken Psychology Theses. https://scholarcommons.sc.edu/aiken_psychology_theses/29

Taris, T. W., Kessler, S. R., & Kelloway, E. K. (2021). Strategies addressing the limitations of cross-sectional designs in occupational health psychology: What they are good for (and what not). *Work & Stress*, *35*(1), 1–5. https://doi.org/10.1080/02678373.2021.1888561

Teng, Z., & Liu, Y. (2013). The role of neuroticism in the relation between self-esteem and aggressive emotion among 1085 Chinese adolescents. *Psychology*, *4*(10), 729–735. https://doi.org/10.4236/psych.2013.410103

Terzioğlu, M. A., Ugurlu, T. T., Aksoy, C., & Gumus, U. (2023). An evaluation of the relationship between self-compassion and nomophobia and comorbid mental disorders in adolescents. *Addicta: The Turkish Journal on Addictions*, *10*(1), 75–85. https://doi.org/10.5152/ADDICTA.2023.22019

Thurackal, J. T., Corveleyn, J., & Dezutter, J. (2016). Personality and self-compassion: Exploring their relationships in an Indian context. *European Journal of Mental Health*, *11*(1–2), 18-35. https://doi.org/10.5708/EJMH.11.2016.1-2.2

Ursu, A. S., Panisoara, I. O., & Chirca, R. C. (2021). *The changes brought by digital technology to cognitive learning* (pp. 161–182). https://doi.org/10.4018/978-1-7998-3756-5.ch010

Van Der Walt, K., Campbell, M., Stein, D. J., & Dalvie, S. (2023). Systematic review of genome-wide association studies of anxiety disorders and neuroticism. *The World Journal of Biological Psychiatry*, *24*(4), 280–291. https://doi.org/10.1080/15622975.2022.2099970

Wadsworth, M. E. (2015). Development of maladaptive coping: A functional adaptation to chronic, uncontrollable stress. *Child Development Perspectives*, *9*(2), 96–100. https://doi.org/10.1111/cdep.12112

Wakelin, K. E., Perman, G., & Simonds, L. M. (2022). Effectiveness of self-compassion-related interventions for reducing self-criticism: A systematic review and meta-analysis. *Clinical Psychology & Psychotherapy*, *29*(1), 1–25. https://doi.org/10.1002/cpp.2586

Wang, T., & Wu, X. (2024). Self-compassion moderates the relationship between neuroticism and depression in junior high school students. *Frontiers in Psychology*, *15*(1), 1-6. https://doi.org/10.3389/fpsyg.2024.1327789

Wang, Y., & Ma, Q. (2024). The impact of social isolation on smartphone addiction among college students: The multiple mediating effects of loneliness and COVID-19 anxiety. *Frontiers in Psychology*, *15*(1), 1-13. https://doi.org/10.3389/fpsyg.2024.1391415

Wei, P. (2024). The effect of self-compassion on social media addiction among college students - the mediating role of gratitude: An observational study. *Medicine*, *103*(21), 1-8. https://doi.org/10.1097/MD.0000000000037775

White, M. (2023). Sample size in quantitative instrument-based studies published in Scopus up to 2022: An artificial intelligence aided systematic review. *Acta Psychologica*, *241*(1), 1-8. https://doi.org/10.1016/j.actpsy.2023.104095

Wilson, A. C., Mackintosh, K., Power, K., & Chan, S. W. Y. (2019). Effectiveness of self-compassion related therapies: A systematic review and meta-analysis. *Mindfulness*, *10*(6), 979–995. https://doi.org/10.1007/s12671-018-1037-6

Wong, B. Y., Yeo, K. J., Lee, S. H., & Handayani, L. (2023). Validation of smartphone addiction scale-short version among Malaysian undergraduate students. *International Journal of Public Health Science (IJPHS)*, *12*(4), 1679-1686. https://doi.org/10.11591/ijphs.v12i4.23425

Worsley, J. D., Pennington, A., & Corcoran, R. (2022). Supporting mental health and wellbeing of university and college students: A systematic review of review-level evidence of interventions. *PLOS ONE*, *17*(7), 1-20. https://doi.org/10.1371/journal.pone.0266725

Wu, Y. Y., & Chou, W. H. (2023). Smartphone addiction, gender and interpersonal attachment: A cross-sectional analytical survey in Taiwan. *Digital Health*, *9*. 1-11. https://doi.org/10.1177/20552076231177134

Xin, L. J., & Wan Jaafar, W. M. (2024). Self-compassion as mediator between self-critical perfectionism and depressive symptoms among Malaysian university students. *International Journal of Academic Research in Business and Social Sciences*, *14*(10). 1037-1063. https://doi.org/10.6007/IJARBSS/v14-i10/23190

Yan, Y., Chai, X., Zheng, W., Wang, M., Feng, X., Heng, C., Du, J., & Zhang, Q. (2024). The effect of neuroticism on mobile phone addiction among undergraduate nursing students: A moderated mediation model. *BMC Psychiatry*, *24*(1), 1-11. https://doi.org/10.1186/s12888-024-06238-5

Yang, J., Mao, Y., Niu, Y., Wei, D., Wang, X., & Qiu, J. (2020). Individual differences in neuroticism personality trait in emotion regulation. *Journal of Affective Disorders*, *265*, 468-474. https://doi.org/10.1016/j.jad.2020.01.086

Yang, L. L., Guo, C., Li, G. Y., Gan, K. P., & Luo, J. H. (2023). Mobile phone addiction and mental health: The roles of sleep quality and perceived social support. *Frontiers in Psychology*, *14*, 1-9. https://doi.org/10.3389/fpsyg.2023.1265400

Yang, X., Ma, H., Zhang, L., Xue, J., & Hu, P. (2023). Perceived social support, depressive symptoms, self-compassion, and mobile phone addiction: A moderated mediation analysis. *Behavioral Sciences*, *13*(9), 1-13. https://doi.org/10.3390/bs13090769

Yang, Z., Huang, J., Li, Z., Xu, H., & Guo, C. (2023). The effect of smartphone addiction on the relationship between psychological stress reaction and bedtime procrastination in young adults during the COVID-19 pandemic. *BMC Psychiatry*, *23*(1), 1-12. https://doi.org/10.1186/s12888-023-05276-9

Yip, V. T., & Tong M. W., E. (2021). Self-compassion and attention: Self-compassion facilitates disengagement from negative stimuli. *The Journal of Positive Psychology*, *16*(5), 593–609. https://doi.org/10.1080/17439760.2020.1778060

Yoon, J. Y., Jeong, K. H., & Cho, H. J. (2021). The effects of children's smartphone addiction on sleep duration: The moderating effects of gender and age. *International Journal of Environmental Research and Public Health*, *18*(11), 1-11. https://doi.org/10.3390/ijerph18115943

Zeerak, Q., Imran, M., Azeez, K., Lokanathan, T. H., & Ismail, I. M. (2024). The effects of smartphone addiction on academic performance among undergraduate medical students in Karnataka, India: A multi-centric study. *Cureus*. *16*(6). https://doi.org/10.7759/cureus.62796

Zhan, Z., Wei, Q., & Hong, J. C. (2021). Cellphone addiction during the Covid-19 outbreak: How online social anxiety and cyber danger belief mediate the influence of personality. *Computers in Human Behavior*, *121*, 1-10. https://doi.org/10.1016/j.chb.2021.106790

Zhang, H. (2023). Smartphone addiction among university students' during the post-COVID-19 era: The role of emotional intelligence and future anxiety. *Psychiatry Investigation*, *20*(10), 951–961. https://doi.org/10.30773/pi.2023.0021

Zhang, J., & Zeng, Y. (2024). Effect of college students' smartphone addiction on academic achievement: The mediating role of academic anxiety and moderating role of sense of academic control. *Psychology Research and Behavior Management*, *17*, 933–944. https://doi.org/10.2147/PRBM.S442924

Zhang, S., Roscoe, C., & Pringle, A. (2023). Self-compassion and physical activity: The underpinning role of psychological distress and barrier self-efficacy. *International Journal of Environmental Research and Public Health*, *20*(2), 1-13. https://doi.org/10.3390/ijerph20021480

Zhong, S., Hai, R., Ahemaitijiang, N., Wang, X., Chen, Y., & Liu, X. (2024). Attachment avoidance mediates the relationship between relatedness frustration and social networking sites addiction: Conscientiousness and neuroticism as moderators. *Behavioral Sciences*, *14*(11), 1-10. https://doi.org/10.3390/bs14111068

Zimba, O., & Gasparyan, A. Y. (2023). Designing, conducting, and reporting survey studies: A primer for researchers. *Journal of Korean Medical Science*, *38*(48), 1-11. https://doi.org/10.3346/jkms.2023.38.e403

Zubin, J., & Spring, B. (1977). Vulnerability: A new view of schizophrenia. *Journal of Abnormal Psychology*, *86*(2), 103–126. https://doi.org/10.1037/0021-843X.86.2.103

Zuhir Al-Rawashda, A., Alzoubi, A. M., Hameed, M., Altaa, K., & Al-Arab, A. R. (2024). Kurdish studies the negative social effects of using artificial intelligence programs and applications on the smartphone - a cultural study in digital sociology. *Kurdish Studies*, *12*(2), 2028–2647. https://kurdishstudies.net/menu-script/index.php/KS/article/view/2300/1818

List of Tables

Table		Page
3.1	Reliability of Instruments in Pilot Study (*n*=30) and Actual Study (*n*=110)	33
3.2	Reliability of SCS-SF in Pilot Study (*n*=30) after Items Dropped	33
4.1	Demographic Characteristics of Participants (*n*=110)	37
4.2	Descriptive Statistics of Topic-Specific Variables (i.e. Neuroticism, Self-Compassion and Phone Addiction)	38
4.3	Pearson's Correlations (*n*=110)	42
4.4	Shapiro-Wilk Test for Bivariate Normality	42
4.5	Pearson's Correlations (*n*=110)	43
4.6	Shapiro-Wilk Test for Bivariate Normality	43
4.7	Pearson's Correlations (*n*=110)	44
4.8	Shapiro-Wilk Test for Bivariate Normality	44
4.9	Multiple Linear Regression Model Summary (*n*-85)	45
4.10	Multiple Linear Regression Model (*n*-85)	46
4.11	Multiple Linear Regression Coefficient	47

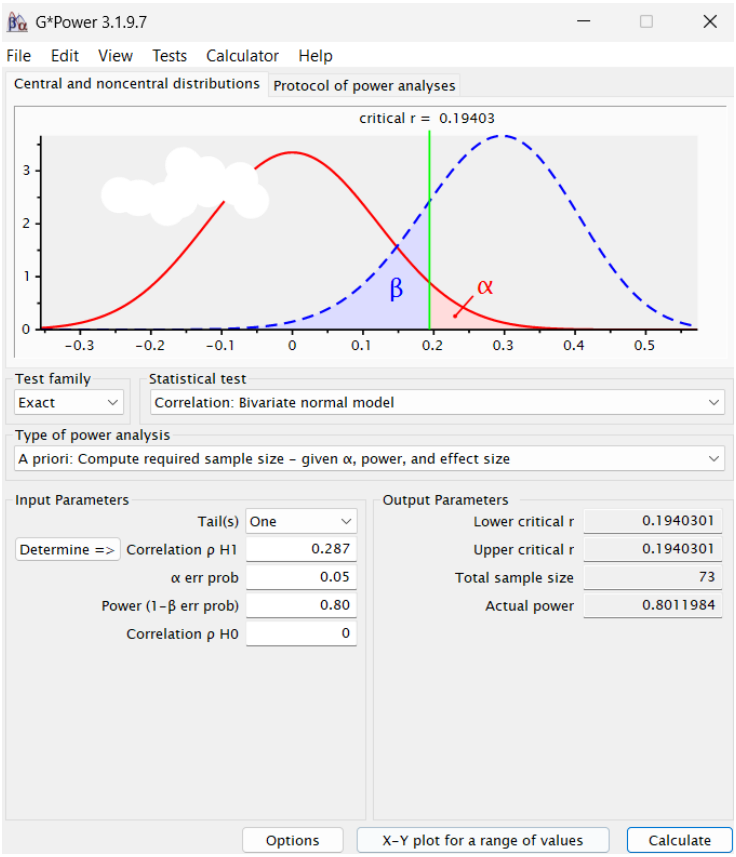
List of Figures

Figure		Page
2.1	The study's theoretical framework, “The relationship between neuroticism, self-compassion and phone addiction among undergraduate students in Malaysia.”.	23
2.2	The conceptual framework of the study's research objectives, “The relationship between neuroticism, self-compassion and phone addiction among undergraduate students in Malaysia.”.	24

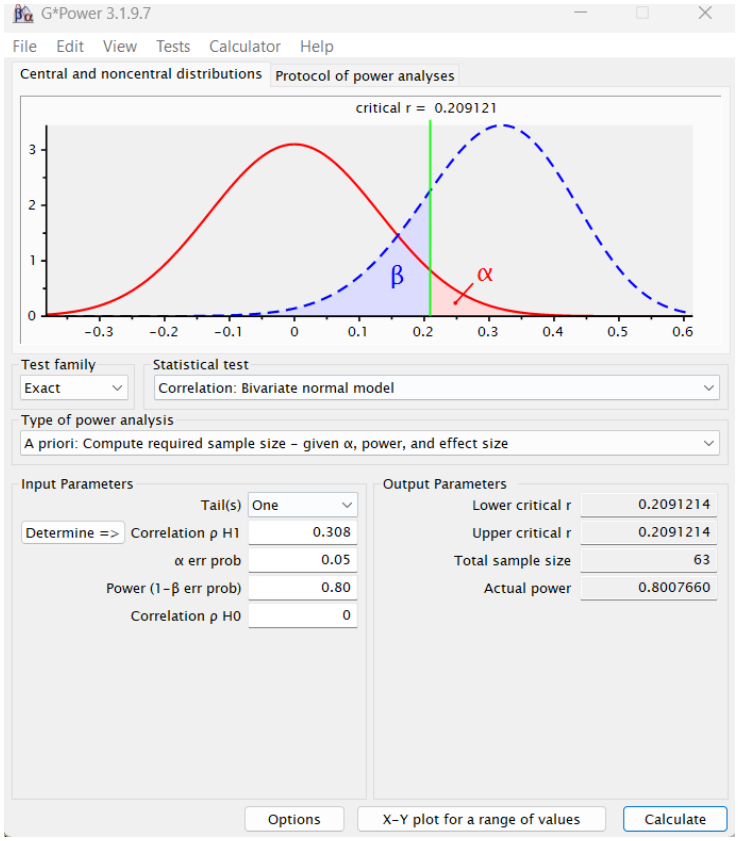
Appendices

Appendix B: G*Power Analysis

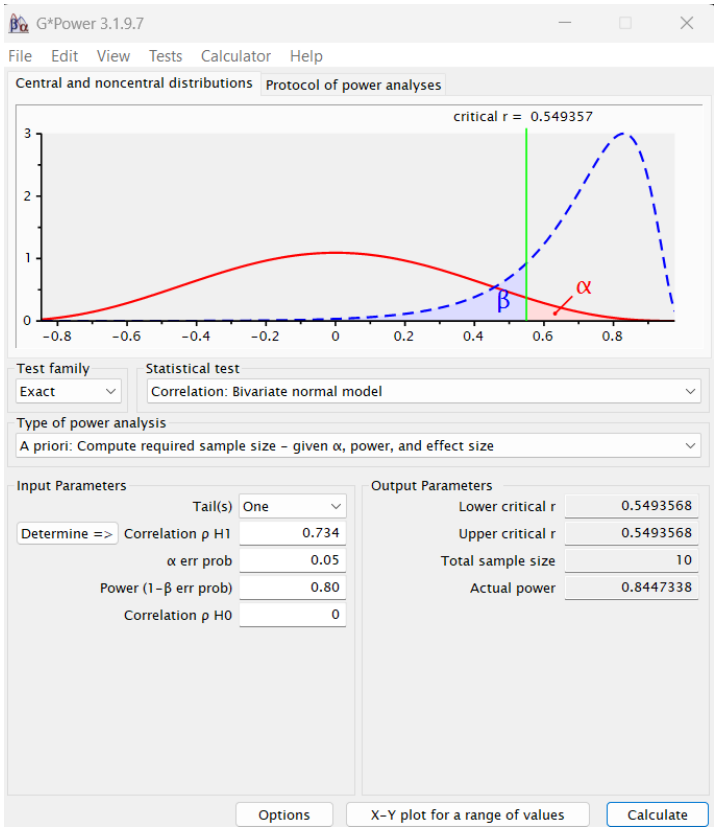
Pearson Correlation Test: Phone addiction & neuroticism



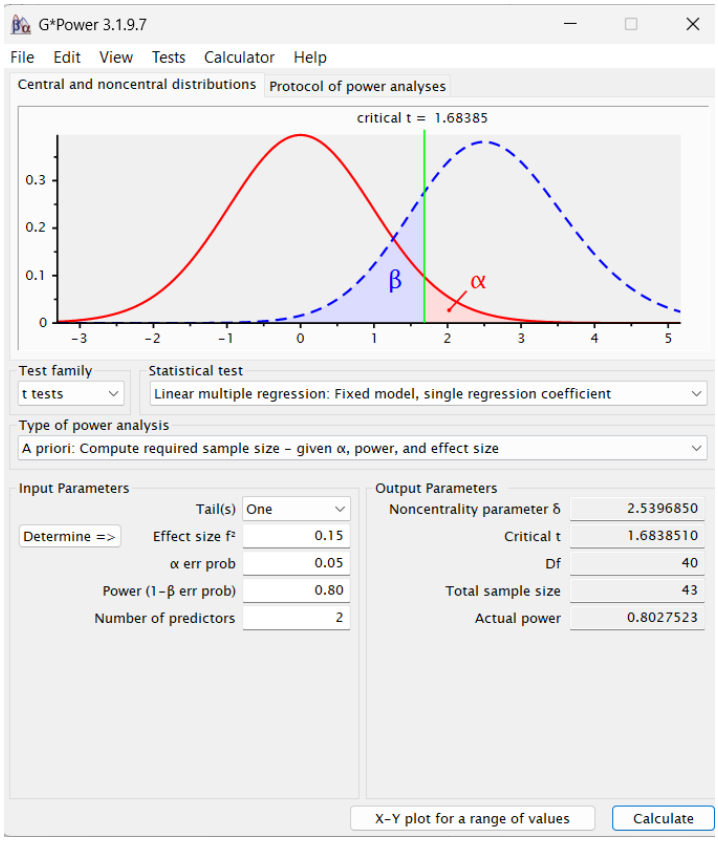
Pearson Correlation Test: Phone addiction & self-compassion



Pearson Correlation Test: Neuroticism & self-compassion

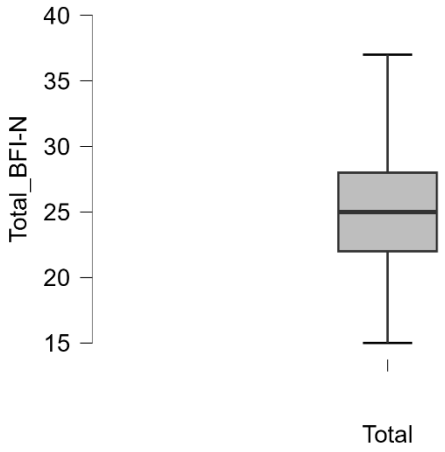


Multiple Linear Regression: Phone addiction, neuroticism and self-compassion

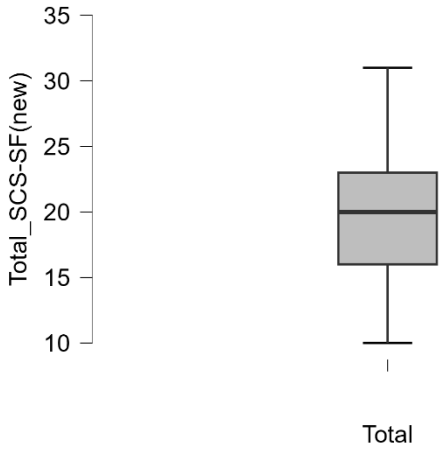


Appendix C: Boxplots

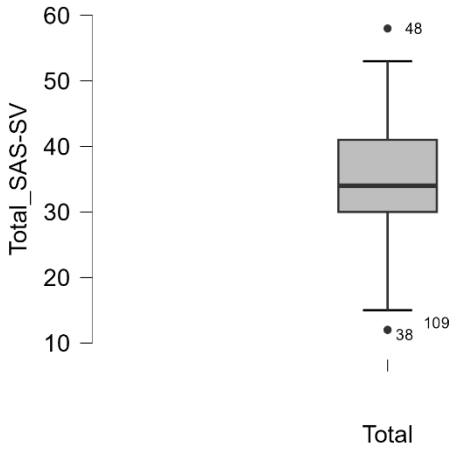
Neuroticism



Self-Compassion



Phone Addiction



Appendix D: Casewise Diagnostics

Influential Cases

Case Number	Std. Residual	Total_SAS-SV	Predicted Value	Residual	Cook's Distance
1	-1.311	28.000	39.201	-11.201	0.045
2	0.823	40.000	32.768	7.232	0.004
3	-0.386	34.000	37.372	-3.372	0.001
4	0.835	33.000	25.926	7.074	0.023
5	-0.754	33.000	39.610	-6.610	0.004
6	-0.610	33.000	38.357	-5.357	0.003
7	-0.978	27.000	35.556	-8.556	0.009
8	0.927	36.000	28.017	7.983	0.017
9	-1.464	23.000	35.844	-12.844	0.016
10	0.451	37.000	33.049	3.951	0.002
11	1.321	51.000	39.476	11.524	0.020
12	1.545	53.000	39.469	13.531	0.020
13	-0.396	36.000	39.469	-3.469	0.001
14	0.623	41.000	35.556	5.444	0.004
15	1.195	42.000	31.655	10.345	0.024
16	0.360	43.000	39.885	3.115	0.002
17	0.700	50.000	44.515	5.485	0.046
18	1.611	50.000	35.837	14.163	0.015
19	-0.563	32.000	36.956	-4.956	0.001
20	-1.033	24.000	33.043	-9.043	0.010
21	-0.513	30.000	34.450	-4.450	0.004
22	-0.686	20.000	25.778	-5.778	0.017
23	0.319	40.000	37.244	2.756	0.002
24	0.532	38.000	33.324	4.676	0.002
25	0.414	46.000	42.404	3.596	0.003
26	-0.908	34.000	41.841	-7.841	0.015
27	-1.210	22.000	32.627	-10.627	0.010
28	0.955	41.000	32.775	8.225	0.018
29	-1.199	27.000	37.512	-10.512	0.011
30	-1.098	32.000	41.567	-9.567	0.014
31	1.051	42.000	32.768	9.232	0.007
32	0.345	39.000	35.984	3.016	0.001
33	0.896	47.000	39.188	7.812	0.009
34	-0.340	34.000	36.963	-2.963	0.001
35	1.484	51.000	37.935	13.065	0.011
36	0.883	48.000	40.313	7.687	0.010
37	-1.453	26.000	38.772	-12.772	0.013
38	0.605	41.000	35.696	5.304	0.003
39	1.055	49.000	39.751	9.249	0.008

Influential Cases

Case Number	Std. Residual	Total_SAS-SV	Predicted Value	Residual	Cook's Distance
40	1.026	41.000	32.064	8.936	0.013
41	0.566	42.000	37.090	4.910	0.005
42	-0.541	36.000	40.729	-4.729	0.003
43	-1.217	27.000	37.660	-10.660	0.013
44	-2.467	15.000	36.675	-21.675	0.040
45	0.723	50.000	43.798	6.202	0.012
46	0.460	45.000	41.004	3.996	0.003
47	-0.554	30.000	34.865	-4.865	0.002
48	-1.197	20.000	30.389	-10.389	0.021
49	0.631	40.000	34.443	5.557	0.002
50	0.398	33.000	29.551	3.449	0.003
51	-1.511	19.000	32.212	-13.212	0.023
52	-0.625	27.000	32.486	-5.486	0.003
53	1.481	46.000	33.043	12.957	0.020
54	-0.504	30.000	34.443	-4.443	0.001
55	0.399	34.000	30.536	3.464	0.002
56	-0.884	25.000	32.768	-7.768	0.005
57	0.936	47.000	38.772	8.228	0.005
58	1.084	42.000	32.486	9.514	0.008
59	-0.897	21.000	28.720	-7.720	0.017
60	1.448	52.000	39.335	12.665	0.020
61	-0.512	34.000	38.491	-4.491	0.002
62	1.153	50.000	39.891	10.109	0.011
63	0.431	40.000	36.253	3.747	0.003
64	0.560	43.000	38.075	4.925	0.002
65	-0.640	34.000	39.462	-5.462	0.011
66	-1.210	29.000	39.610	-10.610	0.011
67	1.330	44.000	32.346	11.654	0.015
68	-1.118	33.000	42.686	-9.686	0.020
69	-0.980	23.000	31.515	-8.515	0.014
70	-0.884	31.000	38.772	-7.772	0.005
71	0.514	43.000	38.497	4.503	0.002
72	0.674	42.000	36.125	5.875	0.006
73	1.296	43.000	31.649	11.351	0.014
74	-2.078	16.000	34.302	-18.302	0.021
75	-0.572	29.000	34.021	-5.021	0.002
76	0.699	40.000	33.880	6.120	0.004
77	-0.897	32.000	39.757	-7.757	0.014
78	-2.001	16.000	33.605	-17.605	0.021
79	1.182	41.000	30.818	10.182	0.028
80	-0.507	31.000	35.415	-4.415	0.003
81	-0.876	28.000	35.703	-7.703	0.004

Influential Cases

Case Number	Std. Residual	Total_SAS-SV	Predicted Value	Residual	Cook's Distance
82	1.080	46.000	36.534	9.466	0.010
83	-0.809	18.000	24.807	-6.807	0.024
84	0.592	43.000	37.794	5.206	0.002
85	0.860	47.000	39.469	7.531	0.006

Appendix E: Action Plan

Action Plan of UAPC3093 Project Paper II

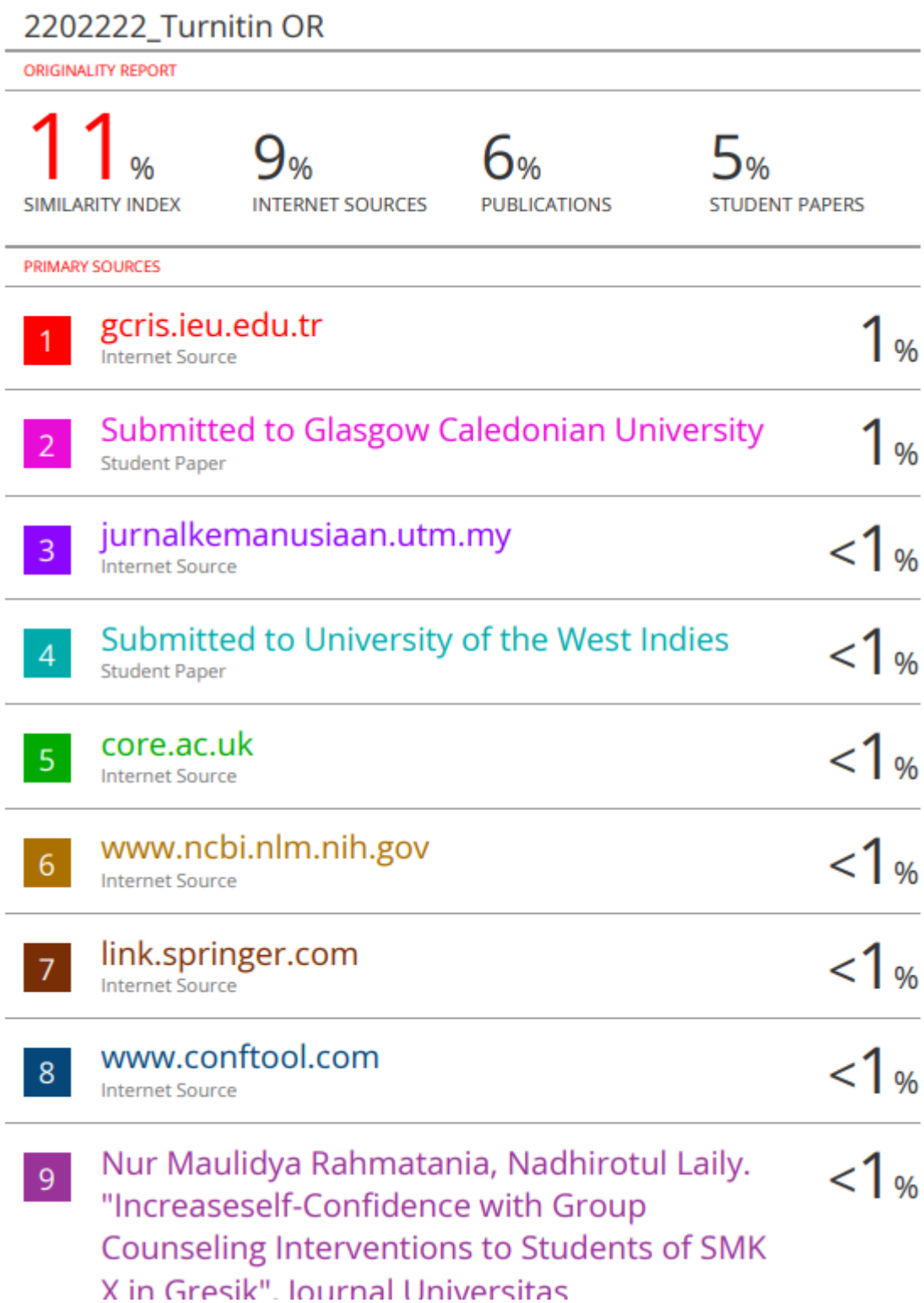
Supervisee Chong Rui Hong

Supervisor Mr. Ho Khee Hoong

Task Description	Date	Supervisee's Signature	Supervisor's Signature	Supervisor's Remarks	Next Appointment Date/Time
Methodology					
Submit Chapter 3: Methodology	2/3/25				3rd Mar 2025
Amend Chapter 3: Methodology	2/3/25				
Results & Findings					
Submit Chapter 4: Results	10/3/25				17th Mar 2025
Amend Chapter 4: Results	13/3/25				
Discussion & Conclusion					
Submit Chapter 5: Discussion	24/4/25				24th Mar 2025
Amend Chapter 5: Discussion	26/4/25				
Abstract	24/4/25				28th Apr 2025
Turnitin Submission	26/4/25			Generate similarity rate from Turnitin.com	
Amendment	28/4/25				
Submission of final draft	28/4/25			Submission of hardcopy and documents	
Oral Presentation					

Notes:
1. **Deadline for submission cannot be changed, mark deduction is as per faculty standard.**
2. **Supervisees are to take the active role to make appointments with their supervisors.**
3. **Both supervisors and supervisees should keep a copy of this action plan.**
4. **This Action Plan should be attached as an appendix in Project Paper 2.**

Appendix F: Turnitin



2202222_Turnitin OR

ORIGINALITY REPORT

11%	9%	6%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	gcris.ieu.edu.tr Internet Source	1%
2	Submitted to Glasgow Caledonian University Student Paper	1%
3	jurnalkemanusiaan.utm.my Internet Source	<1%
4	Submitted to University of the West Indies Student Paper	<1%
5	core.ac.uk Internet Source	<1%
6	www.ncbi.nlm.nih.gov Internet Source	<1%
7	link.springer.com Internet Source	<1%
8	www.conftool.com Internet Source	<1%
9	Nur Maulidya Rahmatania, Nadhirotul Laily. "Increaseself-Confidence with Group Counseling Interventions to Students of SMK X in Gresik", Journal Universitas	<1%