

A STUDY OF INTERNET ADDICTION AND ITS
ASSOCIATION WITH PERSONALITY TRAITS,
DEPRESSION AND ANXIETY SYMPTOMS AMONG
YOUNG ADULTS IN KLANG VALLEY, MALAYSIA.

BY

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DECLARATION

I hereby declare that the work in this dissertation is of my own effort except quotations and summaries which I have already acknowledged.

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CERTIFICATION

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TABLE OF CONTENTS

DECLARATION.....	1
CERTIFICATION.....	2
ACKNOWLEDGEMENT.....	3
TABLE OF CONTENTS.....	5
LIST OF FIGURE.....	8
LIST OF TABLES.....	9
LIST OF ABBREVIATIONS.....	11
LIST OF APPENDICES.....	12
ABSTRAK.....	13
ABSTRACT.....	15
CHAPTER ONE: INTRODUCTION.....	1
RATIONALE OF THE STUDY.....	3
CHAPTER TWO: LITERATURE REVIEW.....	4
2.1 Internet Addiction.....	4
2.2 Prevalence.....	4
2.3 Internet Addiction and Psychological Symptoms.....	7
2.3.1 Internet Addiction and Depression.....	10
2.3.2 Internet Addiction and Anxiety.....	12
2.3.3 Internet Addiction and Personality Traits.....	13
CHAPTER THREE: OBJECTIVES AND RESEARCH HYPOTHESIS.....	24
General Objectives.....	24
Specific Objectives.....	24
Research Questions.....	25
Research Hypothesis.....	25
CHAPTER FOUR: METHOD.....	26
4.1 Study Setting.....	26
4.2 Study Design and Study Period.....	26
4.3 Study Population and Study Sample.....	26

4.3.1	Reference population.....	26
4.3.2	Source population	26
4.3.3	Sampling frame	27
4.3.4	Study sample	27
4.3.4.1	Inclusion criteria	28
4.3.4.2	Exclusion criteria	28
4.3.5	Sampling Method	28
4.3.6	Sample size calculation	29
4.4	Research Tools.....	32
a.	Personal data	32
b.	Translated Malay version of Internet Addiction Test (IAT-M)	32
c.	Translated Malay version of Hospital Anxiety and Depression Scale (HADS-M)	33
d.	Translated Malay version of Zuckerman-Kuhlman Personality Questionnaire-40- Cross Culture (ZKPQ-M-40-CC)	35
4.5	Plans for Minimizing the Study Errors.....	37
4.6	Ethical Consideration	37
4.7	Data Collection	38
4.8	Data Entry and Statistical Analysis.....	39
	Summary of data analysis strategy based on objective.....	40
	Flow chart of the study	41
	CHAPTER FIVE: RESULTS	42
5.1	Socio-demographic data.	42
5.1.1	Descriptive statistics for the socio-demographic data among the students.	42
5.1.2	Descriptive statistics for the internet use habits among the students.	44
5.2	Prevalence of IA.	45
5.3	Factors associated with IA.....	46
	CHAPTER SIX: DISCUSSION.....	57
6.1	Internet addiction and sociodemography.	57
6.1.1	Prevalence of IA.	57
6.1.2	Association of IA and sociodemographic factor and internet use habit.....	58
6.2	Associations of IA and anxiety and depression.	59

6.3	Association of IA and personality traits.....	60
CHAPTER SEVEN: STRENGTHS AND LIMITATIONS OF THE STUDY.....		62
7.1	Strengths of the study	62
7.2	Limitations of the study	62
CHAPTER EIGHT: CONCLUSION.....		65
CHAPTER NINE: RECOMMENDATIONS FOR FUTURE STUDY		67
REFERENCES		68
APPENDICES		75
APPENDIX 1: Personal Information		75
APPENDIX 2: Translated Malay version of Internet Addiction Test (IAT-M).....		76
APPENDIX 3: Translated Malay version of Hospital Anxiety and Depression Scale (HADS-M).....		78
APPENDIX 4: Translated Malay version of Zuckerman-Kuhlman Personality Questionnaire-40- Cross Culture (ZKPQ-M-40-CC)		81
APPENDIX 5: USM Turn-It-In.....		83
APPENDIX 6: Ethical Committee Approval from HUSM		84
APPENDIX 7: Approval from Institution of Study		88

LIST OF FIGURE

Figure 2.1: Conceptual framework	23
Figure 4.1: Flow chart of the study	41
Figure 5.1: ROC Curve	53
Figure 5.2: Cook's influential statistic	54

LIST OF TABLES

Table 2.1: The Big Five Model of personality traits	14
Table 2.2: Summary of literature review	16
Table 4.1: Summary of data analysis strategy based on objective	40
Table 5.1: Participant's socio-demographic data	42
Table 5.2 Descriptive statistics for the internet use habits among the students	44
Table 5.3: Internet addiction among the students	46
Table 5.4: Association of internet addiction with anxiety	46
Table 5.5: Association of internet addiction with depression	46
Table 5.6: Mean, standard deviation and independent t-test of internet addiction with personality traits	47
Table 5.7: Comparison between IA and non-IA on other study variables	49
Table 5.8: Two-ways interaction term	51
Table 5.9: Multicollinearity term	51
Table 5.10: The Hosmer-Lemeshow Test for Goodness of Fit	52
Table 5.11: Classification Table for Model of Fitness	52

Table 5.12: Area under ROC Curve	52
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Table 5.13: Factors associating with internet addiction	55
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LIST OF ABBREVIATIONS

ADHD	Attention-Deficit/Hyperactivity Disorder
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders- Fourth Edition
DSM-V	Diagnostic and Statistical Manual of Mental Disorders- Fifth Edition
IA	Internet Addiction
IAT	Internet Addiction Test
IAT-M	Translated Malay version of Internet Addiction Test
IM	Instant Messaging
HADS-M	Translated Malay version of Hospital Anxiety and Depression Scale
HUSM	Hospital Universiti Sains Malaysia
ROC	Receiver Operating Characteristic
SPSS	Statistical Package for Social Sciences
USM	Universiti Sains Malaysia
ZKPQ	Zuckerman-Kuhlman Personality Questionnaire
ZKPQ-50-CC	Zuckerman-Kuhlman Personality Questionnaire-50-Cross Culture
ZKPQ-M-40-CC	Translated Malay version of Zuckerman-Kuhlman Personality Questionnaire-40-Cross Culture

LIST OF APPENDICES

APPENDIX 1: Personal Information	74
APPENDIX 2: Translated Malay version of Internet Addiction Test	75
APPENDIX 3: Translated Malay version of Hospital Anxiety and Depression Scale (HADS-M)	77
APPENDIX 4: Translated Malay version of Zuckerman-Kuhlman Personality Questionnaire-40-Cross Culture (ZKPQ-M-40-CC)	80
APPENDIX 5: USM Turn-It-In	82
APPENDIX 6: Ethical Committee Approval from HUSM	83
APPENDIX 7: Approval from Institution of Study	87

ABSTRAK

Latar Belakang: Internet kini memainkan peranan yang penting di dalam negara maju dan yang sedang membangun dari segi capaian maklumat, rangkaian, komunikasi dan cara berinteraksi. Internet tidak syak lagi menjadi satu alat yang tidak ternilai pada era ini. Walaubagaimanapun, ia juga telah didapati mempunyai kesan negatif terhadap kesihatan psikologi di kalangan penggunaanya apabila disalahgunakan. Didapati juga personaliti tertentu ada berkaitan dengan ketagihan internet.

Objektif: Kajian ini bertujuan untuk menentukan prevalens ketagihan internet, dan kaitannya dengan kegelisahan, kemurungan dan personaliti berdasarkan model lima alternatif di kalangan dewasa muda pelajar kesihatan bersekutu yang ditugaskan ke Hospital Tengku Ampuan Rahimah, Kelang.

Metodologi: Ini merupakan satu kajian keratan rentas yang menggunakan kaedah persampelan mudah dengan merekrut 267 sampel pelajar dewasa muda kesihatan bersekutu yang ditugaskan di hospital dalam tempoh November 2015 hingga Januari 2016. Soal selidik berkaitan dengan maklumat demografi dan tabiat penggunaan internet telah diedarkan bersama-sama dengan Internet Addiction Test, Hospital Anxiety and Depression Scale dan Zuckerman-Kuhlman Personality Questionnaire-40-Cross Culture Scale versi Bahasa Malaysia yang telah disahkan. Analisa data telah dilakukan dengan menggunakan Statistical Package for Social Sciences (SPSS) versi 22 dengan menggunakan ujian Pearson Chi Square dan analisa regresi logistik pelbagai untuk menyiasat bagi korelasi kegelisahan,

kemurungan dan personaliti dengan ketagihan internet dan faktor sosiodemografi dan tabiat penggunaan internet sebagai factor yang membaurkan.

Keputusan: Terdapat 267 sampel dewasa berumur di antara 18 hingga 24 tahun dan 30.7 % didapati sederhana ketagih kepada internet dan 1.1% teruk ketagih kepada internet. Ujian Pearson Chi Square telah menunjukkan tiada kaitan antara ketagihan internet dan kegelisahan (df) 0.822 (1), $p=0.365$, manakala ketagihan internet didapati berkait dengan kemurungan (df) 13.352 (1), $p<0.001$. Analisa regresi logistik menunjukkan bahawa Impulsivity-Sensation Seeking ($p=0.021$), dengan Neuroticism-Anxiety ($p<0.001$), dan aktiviti dalam talian seperti e-mel ($p=0.034$) berhubung kait dengan ketagihan internet.

Kesimpulan: Keputusan menunjukkan bahawa kemurungan dikaitkan dengan ketagihan internet manakala Impulsivity-Sensation Seeking, Neuroticism-Anxiety dan aktiviti atas talian seperti e-mel dikaitkan dengan ketagihan internet. Pesakit yang murung dan pesakit yang mempamerkan ciri-ciri tersebut perlu disiasat untuk juga berkemungkinan mengidap ketagihan internet.

Kata kunci: Ketagihan internet, kegelisahan, kemurungan, ciri personaliti, dewasa muda, kajian keratin rentas.

ABSTRACT

Background: The internet is now playing an important role in the developed as well as the developing countries in terms of information access, networking, communication and the way interaction is being carried out. It no doubt has become an invaluable tool of the era. However, it has also been found to have negative impacts upon the psychological health of its users when the way it is used has become pathological. It has also been found that certain personality traits are associated to the addiction of the internet.

Objectives: This study aimed to determine the prevalence of internet addiction, and its association with anxiety, depression and personality traits based on the alternative five model among the young adult allied health students who are being posted in Hospital Tengku Ampuan Rahimah, Klang.

Method: A cross sectional study which uses convenience sampling method in recruiting the 267 samples of young adults allied health students attached to the hospital during the period of November 2015 to January 2016. A questionnaire in related to demographic details and internet use habits were distributed along with the validated Malay version of Internet Addiction Test, the validated Malay version of Hospital Anxiety and Depression Scale and the validated Malay version of Zuckerman-Kuhlman Personality Questionnaire-40-Cross Culture Scale. Data analysis were done using the Statistical Package for Social Sciences

(SPSS) version 22 by using Pearson Chi Square test and Multiple Logistic Regression analysis to investigate for the association of anxiety, depression and personality traits with internet addiction, and sociodemographic factor and internet use habits as possible confounding factors.

Results: There were 267 adult samples of age 18 to 24 years old and 30.7% are moderately addicted to the internet and 1.1% of are severely addicted. Pearson Chi-square test have shown no significant association between internet addiction and anxiety (df) 0.822 (1), $p=0.365$, whereas internet addiction is significantly associated to depression (df) 13.352 (1), $p<0.001$. Multiple logistic regression analysis showed that Impulsivity-Sensation Seeking trait (p -value=0.021), Neuroticism-Anxiety trait (p -value<0.001), and the online activity of e-mailing (p -value=0.034) to be associated to internet addiction.

Conclusion: The results suggest that depression and the personality trait of Impulsivity-Sensation Seeking and Neuroticism-Anxiety is significantly associated with internet addiction. Depressed patients and patients who exhibit such personality traits need to be also considered for the possibility of internet addiction.

Keywords: internet addiction, anxiety, depression, personality traits, young adult, cross sectional study.

CHAPTER ONE: INTRODUCTION

The internet is a global system of interconnected computer networks that uses the standard internet protocol suite (TCP/IP) to link several billion devices worldwide. It is a creation which has revolutionized the Information Age, allowing human to gain access to unlimited amount of information as well as changing the way human communicates with each other. It was created in the 1980's and made available to the Western population in the mid 90's and later to the developing countries in the late 90's. The proportion of people using the internet has grown from 23.2% in 2008 to 38.1% in 2013 and it is predicted that there will be 2.9 billion users by the end of 2014. Its use in Asia alone has grown from 100 million population in year 2000 to 1 billion users as of 2012, which constitutes an estimated 842% growth, with 27.5% of its 3.9 billion population having used the internet. Malaysia, with a population of 29 million, has but 3.7 million users in year 2000, but a remarkable increase to 17.7 million users as of June 2012, with the internet penetrating to 60.7% of the population. As of Dec 2012, 13.6 million, that is 46.9% of the Malaysian population, have used Facebook (Internetworldstats.com 2012). As an invaluable tool used for gaining information, communication as well as entertainment, it has changed the lifestyle of most of its users. The prevalence of internet use among adolescence is much greater than adult and internet has become an integrated part of their life, serving as an inexpensive platform for wider social and leisurely activities (Cenameri 2013).

In the 2013 edition of Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-V), internet gaming disorder, also commonly referred to as internet addiction (IA), has been included under Section 3- Emerging Measures and Models, which warrant for

further clinical research before it can be considered as a formal disorder. IA has nevertheless now been recognized as a public health issue, with behavior according to literatures, similar to that of gambling disorder, and has shown to cause dysfunction in the many aspect of the individual's life. IA was eventually described by Kimberly Young in 1998 and was conceptualized based on the diagnostic criteria of pathological gambling from the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV). It is through these criteria which allow further researches to be done and the subject further elaborated and investigated. Subsequently, many terms has been introduced describing the same concept of IA, such as internet addiction disorder, pathological internet use, problematic internet use, excessive internet use and compulsive internet use (Widyanto and Griffiths 2006).

Its high prevalence rate in Asia and among adolescence male between 12-20 years of age has led to extensive studies done in China, Taiwan and Korea in particular. Pathological internet use or internet addiction has definitely impacted our society globally and there are now evidence which suggest its impact towards the pathological internet user's psychological health. Excessive internet use has been found to be strongly correlated with depression (Young and Rogers 1998), anxiety and stress (Akin and İskender 2011) and impulsivity (Cao, *et al.* 2007). Recent studies have also shown association between internet addiction and memory impairment (Yuan 2011) and cognitive failures (Ali and Nisa 2013).

RATIONALE OF THE STUDY

Many part of the world has already progressed towards investigating rehabilitation in regards to IA whereas Malaysia still lacks even the appropriate data on its population affected by the pathological use of internet. To date, studies conducted on IA in Malaysia were either not using a validated tool or does not represent the population of Malaysia itself. The studies conducted are also of schooling children and of adolescence age group. This study is designed to investigate on the prevalence of IA among the young adults in Malaysia and its association with depressive and anxiety disorder as well as its correlation with personality traits to strengthen the current available findings. With the preliminary data available for the local population of Malaysia, it will help in identifying these individuals earlier and to initiate the necessary treatment or intervention required. Perhaps it will also provide the foundation necessary to plan in the establishment of appropriate centers for the rehabilitative needs of these individuals in the future.

CHAPTER TWO: LITERATURE REVIEW

2.1 Internet Addiction

IA was described by Kimberly Young in 1998 and was conceptualized based on the diagnostic criteria of pathological gambling from the DSM-IV, whereby 8 out of the 10 criteria for pathological gambling were incorporated into diagnosing IA. These include preoccupation with internet use, the increasing need to spend more time online to attain similar satisfaction, failed efforts in attempting to overcome internet use, withdrawal symptoms when internet access is limited, utilizing the internet longer than anticipated, experiencing negative impacts in interpersonal or occupational function due to internet use, not being honest about the duration spent online and using the internet to regulate one's mood (Young 1998). She subsequently developed the Internet Addiction Test (IAT) based on these criteria (Young 2000). Her descriptions of the disorder have allowed many other researchers to revolutionize further study and developed other tools to investigate into the pathological use of the internet.

2.2 Prevalence

The prevalence of IA has been found to vary greatly across the region. Katherine L. *et al* (2013) has done a cross sectional study among the university students in the US via email survey, with sample size of 2108 using the IAT, Perceived Stress Scale (PSS), Minnesota Impulsive Disorders Interview (MIDI) and Patient Health Questionnaire (PHQ-9). It was found that 237 (12.9%) students were limited internet users, 1502 (81.8%) were

mild internet users or normal users, while 98 (5.3%) were moderate and severe internet users (Katherine, *et al.* 2013). There were evidence of gross demographic differences whereby Asians/Pacific Islanders were found to be at a higher rate to fall under the category of moderate and severe category as compared to Caucasian participants.

The prevalence of internet addiction indeed varies from region to region. Poli R. (2012) found a prevalence of 5.01% moderately addicted and 0.79% severely addicted in his cross sectional study of 2533 students in different school in Italy using the Italian version of IAT (Poli R 2012). There were no statistical difference between age and urban or rural conditions with internet addiction. However, there is a preponderance towards the male gender and IA.

In India, Goel D. *et al* (2013) performed a cross sectional study on 987 students in various faculties in Mumbai using IAT and found 24.8% being a moderate users and 0.7% were found to be severe addicts (Goel 2013).

In Nepal, Pramanik *et al* (2012) performed a cross sectional study on 130 medical students using IAT and found 41.53% as moderate users while 3.07% with severe addiction (Pramanik, *et al.* 2012).

. Whang *et al* (2003) used a modified Young's IAT on 13,588 users in a Korean portal site and found 3.5% diagnosed with severe IA and 18.4% as moderate IA. They also find depressed or stressed out subject tend to have higher tendency to access internet more, and has the highest degree of loneliness, depressed mood and compulsivity tend to be found more among those diagnosed with IA (Whang, *et al.* 2003).

Yen *et al* (2009) uses the Chen Internet Addiction Scale, which is a more popular test used in Taiwan, finds the prevalence of 12.3% among 2453 university students to have IA (Yen, *et al.* 2009).

Kalaitzaki *et al* (2013) who has done a cross sectional study from 774 high school students (mean age was 20.2, SD = 2.8), using the Greek version of IAT with finds 22.4% are moderate users and 1.0% in severe addictive use (Kalaitzaki, *et al.* 2014).

There were not many research done in regards to IA in Malaysia. Yong SQ (2011) conducted a study on 120 secondary school students of SMJK Pei Yuan, Kampar using Young's IAT and found 42.5% to be moderate users and 3.3% to be of severe category (Yong 2011). However, the IAT has yet to be translated and neither has the psychometric property of the test evaluated when the research was being done.

Another study was done by Najmi H.U. *et al* (2014) in Malaysia, whereby 120 students of Universiti Teknologi Malaysia (UTM) were selected randomly and Young's IAT was administered and found 69.2% were moderately addicted internet users while 5.0% were severely addicted (Najmi, *et al.* 2014). Unfortunately the study is only conducted among the foreign students originating mainly from China, Yemen, Somalia and Indonesia. Thus, it does not give any picture of IA in the local setting. The study also found that there is no significance difference between genders in internet use, nor is there significance difference between the countries of origin.

There can be many factors leading to this vast range of prevalence of IA globally. Some researchers have found that different cultures have different behaviors towards

information technology adoption (D. Straub 1997; Srite and Karahanna 2006). Some reports also suggested that cultural values influence how its people use the information technology, the type of information technology used or the outcome of its use (Chau, *et al.* 2002; Downing, *et al.* 2003). Also, Leida & Ravi (2016) who has collected data from three different countries of different cultural, economic and technological context, namely the United States, Africa and China and found that there is significant difference in psychometric construct across different cultural settings. They have also found that the Africans are more prone to use the internet for mood modification and has a higher emotional dependency towards its use despite having spent the least amount of time online (Leida and Ravi 2016). It is thus crucial to examine the prevalence of IA in its own region for a better understanding of the extent of the problem.

2.3 Internet Addiction and Psychological Symptoms

Although the prevalence of IA varies from region to region, it is nevertheless a current globalizing disorder which cannot be ignored. Not only has IA changes ones' social lifestyle but also has an impact in their psychological health. Carli *et al* (2013) has done a systemic review on pathological internet use and comorbid psychopathology, using either the identified effect sizes for the correlation observed from the research articles or calculated using Cohen's d or R^2 , and have found from twenty articles, which met the preset inclusion and exclusion criteria, that 75% have reported significance correlation with depression. Other findings include 57% with anxiety, 100% with symptoms of Attention-Deficit/Hyperactivity Disorder (ADHD), 60% with obsessive-compulsive symptoms, and

66% with hostility/aggression (Carli, *et al.* 2013). The majority of the research conducted were from Asia and of cross sectional design and one of prospective design.

Ko *et al* (2012) has also done reviews on 18 literatures mainly from Taiwan and Korea and find IA to be associated with depressive disorder and social phobia. It is also associated with substance use disorder, ADHD, and hostility. He also finds depressive disorder, social phobia, hostility and ADHD to be predictive of IA (Ko, *et al.* 2012). They also have done a prospective study on 2293 adolescents from Southern Taiwan with self-reported questionnaires on IA, depression, ADHD, social phobia and hostility at 0, 6, 12 and 24 months and found depression, ADHD, social phobia and hostility to be predictive of the occurrence of IA, and hostility and ADHD were found to be the most significant predictors of internet addiction in male and female adolescence respectively (Ko, *et al.* 2009).

Roger, *et al.*, (2014) conducted a meta-analysis study, with eight studies involving a total of 1641 patients suffering from IA and 11210 of control subjects. They found that the prevalence for depression among IA was 26.3% comparing to the control group of 11.7% (OR = 2.77, 95% CI = 2.04-3.75, $z = 6.55$, $P < 0.001$). The prevalence for anxiety among IA was 23.3% comparing to control group of 10.3% (OR = 2.70, 95% CI = 1.46-4.97, $z = 3.18$, $P = 0.001$) Besides that, they also found positive association between IA with alcohol abuse and ADHD (Roger, *et al.* 2014).

Liang, *et al.*, (2016) have performed a longitudinal study on 2242 sixth grade students in Hangzhou, China, using Young's Internet Addiction Diagnostic Questionnaire and Childhood Depression Inventory and follow up data were obtained one year later and two years later. The final samples after two years later is 1715 and they uses a cross-lagged

structural equation modeling method to examine the relationship between IA and depression. They found among the male subjects, depression was significant to predict subsequent IA whereas in the female subjects, internet addiction was found to be significant to predict subsequent depression (Liang, *et al.* 2016).

Priyanka, *et al.*, (2013) did a cross sectional study on 552 subjects among the school students of 11th and 12th grade in Ahmedabad, India using the IAT and 21-Depression, Anxiety and Stress Scale (21-DASS) questionnaires. When a score of >51 is used as a cut-off point, a prevalence of 11.8% students were found to have IA, that is moderate and severe internet users, and it has a strong correlation between IA and depression, anxiety and stress. Depression, anxiety and stress are also found to be strong predictors of IA. The author mentioned in having difficulty to view each entity in isolation as correlation analysis was used. Other predictors include time spent online and usage of social network and chat room sites. Age, gender and academic performance however, did not predict IA (Priyanka, *et al.* 2013).

Fischer, *et al.*, (2012) studied 1,435 adolescents students (48% boys, 52% girls) from Heidelberg, Germany, using Young's Diagnostic Questionnaire, Beck's Depression Inventory, the Deliberate Self Harm Inventory, and Paykel Suicide Scale. 80.7% of the students reported regular, 14.5% risky, and 4.8% pathological internet use and those that are categorized under risky and pathological internet users showed significantly higher rates of depression, deliberate self-harm and suicidal behavior (Fischer, *et al.* 2012).

Given the strong correlation of internet addiction with depression and anxiety symptoms, it is thus beneficial to identify early individual with IA and proceed in screening for depression and anxiety so that the proper treatment and intervention can be given to the individual. It has been found that depression and hostility worsen when the process of the IA continues whereas remission of IA will cause depression, social anxiety and hostility to decrease within a short duration (Ko, *et al.* 2014).

2.3.1 Internet Addiction and Depression

Many studies have now correlated IA with depression. However, it still remain uncertain as to whether IA directly leads to depression or whether depression itself precedes IA. There has been hypothesis to explain the correlation of IA with depression, that is the mood enhancement hypothesis and the social displacement hypothesis.

The mood enhancement theory hypothesize that individual uses the media or in this context, internet, according to their mood. Individual that are harboring negative emotions, are more likely to indulge in relaxing activities, such as internet, playing games or watching television to relieve their stress. Studies have shown reduction in depressive effect using internet entertainment, especially among those with low initial social resources (Bessiere, *et al.* 2004). Internet users uses the internet in order to relieve themselves off their negative emotion. This is more seen in internet addicted users showing a high tendency to access the internet when they are stressed at work or were just depressed. Such group was also found to have the highest degree of loneliness, depressed mood and compulsivity compare to the

others (Whang, *et al.* 2003). Some study has also shown that depression precedes internet addiction (Park, *et al.* 2013) which supports this theory.

On the other hand, in the social displacement hypothesis, Kraut, *et al.* (1998) have found that the use of internet causes a small but significant decline in social involvement, which he measured by communication within the family and the size of the individual's social network. He also finds increase in loneliness in these individuals. He concluded that using of the internet adversely affects ones' social involvement and psychological wellbeing by means of displacing social activities by spending more time online and displacing strong ties when one reduces in social involvement physically (Kraut, *et al.* 1998). The more time one spend using the internet, eventually the more they will lose contact with their social environment (Nie and Erbring 2002), and the poorer the relationship with their family members and friends (Sanders, *et al.* 2000). The use of chat rooms, internet games and entertainment also predicted reduction in relationship quality with best friends and romantic partners (Blais, *et al.* 2008). Peer interaction regulates an individual's socioemotional functioning through social evaluation. Participation in adopting existing culture and constructing new cultures for social evaluation plays a part in an individual's development, particularly children, and gives a sense of security and belonging (Chen 2012). A lack of interaction and increase in internet time thus may lead to building up of negative emotions and according to the social displacement theory, may lead to depression. There are studies that also shows IA to precede depression in support of this theory (Ko, Yen *et al.* 2009).

2.3.2 Internet Addiction and Anxiety

Anxiety have been significantly correlated with IA as suggested by many studies. The socially anxious individuals were noted to be more susceptible to IA, and it has also been found that social anxiety is predictive of IA in a two years follow up study (Ko, *et al.* 2009). Individuals with social anxiety are constantly worried about how the society would closely look at them, judge them and evaluate them. They are found to be more IA susceptible as it is related to the perception by these individual that online form of communications are a safer form of interaction which they can have better control of when it comes to the presentation of self while they are interacting with others through the internet. Interacting through the internet is also perceived as having less risk of negative evaluation and has an improved quality of relationship for them (Lee and Stapinski 2012). “Chat” group users who are socially anxious are found to be using the internet as a form of low risk approach to participate in interacting with others with the benefit of rehearsing their social behavior and communication skill beforehand as compare to interacting with others offline and face to face in the real social environment (Campbell, Cumming *et al.* 2006). Individuals who are found with IA are noted to have the worse interpersonal relationship when compare to those who are non-pathological internet users (Milani, Osualdella *et al.* 2009), and are also noted to be more shy and have the tendency to alienate themselves from family, peers and school (Huang and Leung 2009). They apparently perceive to find more comfort and support when they interact on the internet when compare to real life situation (Shepherd and Edelman 2005). The behavior of going online and involve in a “successful interaction” gives the impression of social success which is a positive reinforcement to these individual despite this success being attributed to the safety behavior rather than their own

personal quality or ability. This safety behavior keeps these individual from gaining new experience that may change their perception, and continue with their cognitive error of overestimating negative evaluation from others and underestimating their social ability (Rapee and Heimberg 1997) which keeps them to be socially anxious and continue to indulge in internet interaction.

2.3.3 Internet Addiction and Personality Traits

Personality is defined as the unique way in which each individual thinks, acts, and feels throughout life. There are many explanations on personality itself as it is something which is difficult to measure scientifically and accurately itself. However, to date, there are four main perspectives on personality that are commonly being applied, namely;

- 1) Psychodynamic perspective,
- 2) Behaviorist perspective,
- 3) Humanistic perspectives, and
- 4) Trait perspectives.

A trait is a consistent, enduring way of thinking, feeling, or behaving, and trait theorists are attempting to describe personality in terms of a person's trait (Ciccarelli and White 2006). Gordon Allport and colleague was the first to describe traits and apparently went through the dictionary looking for words that could be traits and found 18,000, which after eliminating

the synonyms, pared down to 200 (Allport and Odbert 1936). Raymond Cattell then used factor analysis and grouped these 200 traits into 16 source traits which are seen as a traits' continuums (Cattell 1990). These 16 source traits were further reduced by several groups of researchers and come up to five trait dimensions, which is known as the Five Factor Model or the Big Five Model (Costa and McCrae 2000), which consist of; Openness to new experiences, Conscientiousness, Extraversion, Agreeableness and Neuroticism.

Table 2.1: The Big Five Model of personality traits

Higher scorer characteristics	Factor	Lower scorer characteristics
Creative, artistic, curious, imaginative, nonconforming.	<i>Openness</i>	Conventional, down-to-earth, uncreative.
Organized, reliable, neat, ambitious.	<i>Conscientiousness</i>	Unreliable, lazy, careless, negligent, spontaneous.
Talkative, optimistic, sociable, affectionate.	<i>Extraversion</i>	Reserved, comfortable being alone, stays in the background.
Good-natured, trusting, helpful.	<i>Agreeableness</i>	Rude, uncooperative, irritable, aggressive, competitive.
Worrying, insecure, anxious, temperamental.	<i>Neuroticism</i>	Calm, secure, relaxed, stable.

Adopted from Psychology, by (Ciccarelli and White 2006)

It has been well established that certain personality traits, are correlated with addictive behaviors, such as increased emotional reactivity, proneness to stress, impulsivity, and negative affect in drug addictions (Gossop and Eysenck 1980) and pathological gamblers also showed similar traits compared to the normal population (Clarke 2003). Since pathological internet use is currently viewed also as an addictive behavior, and given IA is being conceptualized from the diagnostic criteria of pathological gambling itself, personality traits is thus an important factor which may predispose an individual to IA itself.

Many studies have been done to establish a relation between IA with personality using the Big Five Model and inconsistent results, both positive and negative correlation, were found in the same personality traits in different literatures examined. Kayaş, *et al.*, (2016) have done a meta-analysis on 12 such studies and found that all the five personality traits in the big five model are significantly associated with IA. Openness, conscientiousness, extraversion and agreeableness were apparently negatively related with IA, that is, a high scoring of these traits are found to be protective against development of IA. Whereas, he found neuroticism to be positively related to IA, that is, individual with a higher score in this traits is a risk factor in developing IA (Kayaş, *et al.* 2016).

Mark & Ganzach (2014) believed that the reason to a conflicting results found in previous studies were due to the small sample size recruited by the studies which does not represents the true population. She examined the relationship between personality and internet use on a larger scales of over 6900 young adults in the United States with an average age of 26 years old, and found that global internet use is postively related to extraversion, neuroticism and conscientiousness (Mark and Ganzach 2014).

G. Dong *et al* (2013) used the Eysenck Personality Questionnaire, another personality inventory which differs from the big five model in their studies but still yielded similar results and found students addicted to internet to have higher neuroticism/stability scores, higher psychoticism/socialization scores and lower lie scores, which suggest neuroticism, psychoticism, and immaturity (Dong, *et al.* 2013). It was also found that neuroticism tend to be a more common trait among IA along with poor self-esteem (Tsai, *et al.* 2009). Other traits that are being studied separately in found to be correlated with IA are

aggression (Kiriakidis and Kavoura 2010) and hostility (Yen, *et al.* 2011). Adolescence who were reported to be with IA also were found to have higher hostility & aggressive behavior (Ko, *et al.* 2009).

By knowing the personality traits that may predict IA, early identification and intervention may be taken before the patient who is prone to the disorder develops it.

Table 2.2: Summary of literature review

Author	Instrument used	Subjects	Findings
Bessiere, <i>et al.</i> , 2004 Longitudinal effects of internet uses on depressive affect: A social resources approach.	Longitudinal study Survey forms at 0, 6 months. General survey questions 12-items version of the CES-D ISEL-12 The Big Five Inventory (only Extraversion item) 14-item scale from Cheek and Buss for shyness	1222 samples	There is reduction in depressive effect using internet entertainment, especially among those with low initial social resources.
Blais, <i>et al.</i> , 2008 Adolescents Online: The Importance of Internet Activity Choices to Salient Relationships	Longitudinal study of 1 year. Examine using of chat room, ICQ, internet of entertainment and online games whether changes in quality of best friendship and romantic relationship.	884 adolescence	Instant messaging (ICQ) was positively associated with most aspects of romantic relationship and best friendship quality. In contrast, visiting chat rooms was negatively related to best friendship quality. Using the internet to play games and for general entertainment predicted decreases in relationship quality with best friends and with romantic partners.
Campbell, <i>et al.</i> , 2006 Internet use by the socially fearful: addiction or therapy?	Cross sectional Zung Depression Scale (ZDS), Depression, Anxiety and Stress Scales (DASS), Eysenck Personality Questionnaire. Revised Short Scale (EPQ-R Short), Fear of Negative Evaluation (FNE) scale, Internet Use Questionnaire (IUQ), and an	118 online and 27 undergraduate university student	There was no relationship between time spent online and depression, anxiety, or social fearfulness. Those who primarily used the internet for online chat believed that the internet is psychologically beneficial to them, but also believed that frequent internet users are lonely and that the internet can be addictive. "Chat" users who are socially fearful may be using the internet as

	Internet Effects Questionnaire (IEQ).		a form of low-risk social approach and an opportunity to rehearse social behavior and communication skills, which, may help them improve interaction with offline, face-to-face, social environments.
Carli <i>et al</i> (2013) The Association between Pathological Internet Use and Comorbid Psychopathology : A Systematic Review	Did literature reviews using electronic digital search. (Majority Asian literatures) Cross section and one prospective design.	20 articles which met the preset inclusion & exclusion criteria.	75% have significance correlation with depression. 57% with anxiety, 100% with symptoms of ADHD, 60% with obsessive-compulsive symptoms, and 66% with hostility/ aggression
Chen, 2012 Culture, Peer Interaction, and Socioemotional Development	Peer interaction as an important context that mediates the links between culture and socioemotional development. According to this perspective, cultural norms and values provide a basis for social evaluation processes in peer interaction, which, in turn, serve to regulate individual socioemotional functioning. Children play an active role in their development through their response to peer influence and through their participation in adopting existing cultures and constructing new cultures for social evaluation and other peer activities. Culture may also guide the social processes by specifying the functional and structural characteristics of children's peer relationships such as friendships and group networks in which interaction occurs.		
Dong, <i>et al.</i> , 2013 Risk personality traits of Internet addiction: a longitudinal study of Internet-addicted Chinese university students	Prospective study Personality Questionnaire Internet addiction test Two years later, repeat.	868 students	49 IA after 2 years. Students addicted to the internet showed higher neuroticism/stability scores, higher psychoticism/socialization scores, and lower lie scores than their normal peers before their addiction. These results suggest that the risk personality traits of IA include neuroticism, psychoticism, and immaturity.
Fischer, <i>et al.</i> , (2012) Depression, deliberate self-harm and suicidal behavior in adolescents engaging in risky and pathological internet use.	A cross sectional study. Young's Diagnostic Questionnaire, Beck's Depression Inventory, the Deliberate Self Harm Inventory, and Paykel Suicide Scale.	1,435 adolescents students (48% boys, 52% girls) from Heidelberg, Germany	80.7% of the students reported regular, 14.5% risky, and 4.8% pathological internet use Those that are categorized under risky and pathological internet users showed significantly higher rates of depression, deliberate self-harm and suicidal behavior.
Huang & Leung, 2009 Instant messaging addiction among		330 teenagers in China	95.8% of participants use IM, and 9.8% of them can be classified as IM addicts. Four major IM addiction symptoms: preoccupation with IM,

teenagers in China: shyness. Alienation, and academic performance decrement			loss of relationships due to overuse, loss of control, and escape. Results also showed that shyness and alienation from family, peers, and school are significantly and positively associated with levels of IM addiction. As expected, both the level of IM use and level of IM addiction are significantly linked to teenagers' academic performance decrement.
Kayış, <i>et al.</i> , (2016) Big five-personality traits and internet addiction: A meta-analytic review	Meta-analysis	12 studies studying relationship between internet addictions with the big five personality model.	All the big five personality traits are significantly associated with internet addiction. Openness, conscientiousness, extraversion and agreeableness were apparently negatively related with internet addiction, Neuroticism- positively related to internet addiction.
Kiriakidis & Kavoura, 2010 Cyberbullying: a review of the literature on harassment through the Internet and other electronic means	Cyberbullying, differences, and similarities with traditional bullying; its extent; the forms of cyberbullying; the characteristics of cyberbullies and cyber victims; the effects of cyberbullying on the psychosocial development of youth; age and gender differences of cyberbullying; and perceived causes of cyberbullying. In addition, the steps that can be undertaken by youth, parents, teachers, and schools to deal with the problem and possible pathways for interventions, from a public health perspective, at the individual, class, organizational, and community levels are presented from the literature. Finally, possible legal solutions deriving from both criminal and civil law are presented.		
Ko <i>et al</i> (2009) Predictive values of psychiatric symptoms for internet addiction in adolescents: a 2-year prospective study.	A prospective study. A self-reported questionnaires on internet addiction, depression, ADHD, social phobia and hostility at 0, 6, 12 and 24 months.	2293 adolescents from Southern Taiwan	Depression, ADHD, social phobia and hostility to be predictive of the occurrence of internet addiction. Hostility and ADHD were found to be the most significant predictors of internet addiction in male and female adolescence respectively.
Ko <i>et al</i> (2012) The association between Internet addiction and psychiatric disorder:	Did literature reviews using electronic digital search. (Literatures were mainly from Taiwan, Korea and China)	17 literatures on prevalence of internet addiction. 18 literatures on cross sectional studies with coexisting psychiatric illness.	IA is a globalizing disorder with a prevalence ranging from 1-36.7%. IA has significant correlation with substance use disorder, ADHD, depression, hostility and social anxiety disorder.
Ko, <i>et al.</i> , 2009 The associations between	Demographic questionnaire Adolescent Aggressive Behaviors Questionnaire	9405 adolescents	Adolescents with Internet addiction were more likely to have aggressive behaviors during the

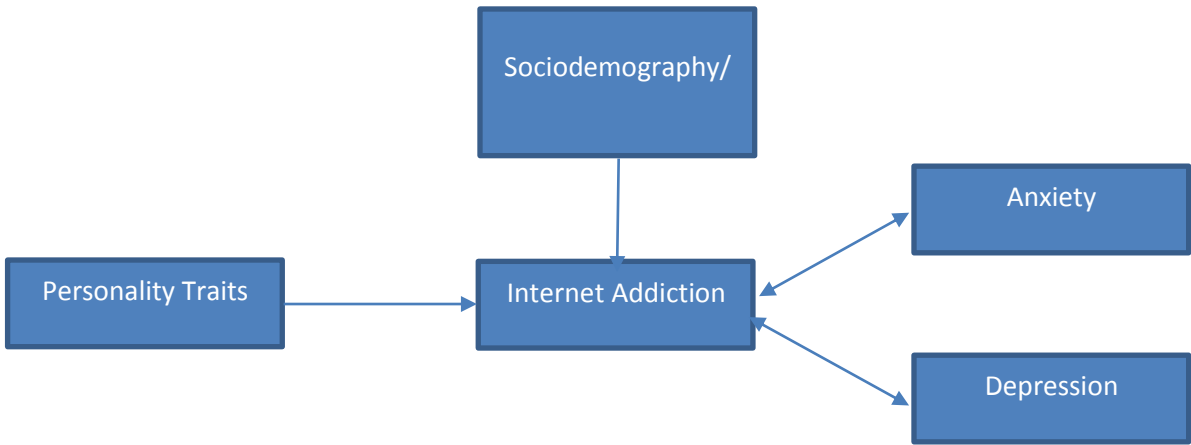
aggressive behaviors and internet addiction and online activities in adolescents.	Chen Internet Addiction Scale (CIAS) family APGAR index 20-item Mandarin Chinese version of the Center for Epidemiological Studies' Depression Scale (CES-D) Rosenberg Self-Esteem Scale		previous year. Association was more significant among adolescents in junior high schools than in senior high/vocational schools. Online chatting, adult sex Web viewing, online gaming, online gambling, and Bulletin Board System were all associated with aggressive behaviors.
Ko, <i>et al.</i> , 2014 The exacerbation of depression, hostility, and social anxiety in the course of Internet addiction among adolescents: A prospective study	Prospective study, questionnaire at 0, 1 yr. Chen Internet Addiction Scale (CIAS) Center for Epidemiological Studies Depression Scale (CES-D) The Buss–Durkee Hostility Inventory-Chinese Version-Short Form (BDHIC-SF)	2293 adolescents in grade 7 students	The incidence group exhibited increased depression and hostility more than the non-addiction group and the effect of on depression was stronger among adolescent girls. Further, the remission group showed decreased depression, hostility, and social anxiety more than the persistent addiction group. Depression and hostility worsen in the addiction process for the Internet among adolescents. Intervention of Internet addiction should be provided to prevent its negative effect on mental health. Depression, hostility, and social anxiety decreased in the process of remission. It suggested that the negative consequences could be reversed if Internet addiction could be remitted within a short duration.
Kraut, <i>et al.</i> , (1998) Internet paradox: A social technology that reduces social involvement and psychological well-being?	A longitudinal study Recording on demographic variables, internet usage, personal electronic mail use, world wide web use and social involvement and psychological wellbeing questionnaire.	169 participants over 1 or 2 years internet use.	Internet use has a causal effect on social involvement and psychological wellbeing.
Lee & Stapinski, 2012 Seeking safety on the internet: Relationship between social anxiety and problematic internet use	Online survey, cross sectional Erwin <i>et al</i> (2004) internet usage survey Depression, Anxiety and Stress Scale-21-item version Liebowitz Social Anxiety Scale he Brief Fear of Negative Evaluation scale II The Levels of Development in Online Relationships survey The Generalized Problematic Internet Use Scale	338 participant >18 years old	Social anxiety was associated with perceptions of greater control and decreased risk of negative evaluation when communicating online, however perceived relationship quality did not differ. Negative expectations during face-to-face interactions partially accounted for the relationship between social anxiety and problematic internet use. There was also preliminary evidence that preference for online

	<p>The Preference for Online Social Interaction scale</p> <p>The Subtle Avoidance Frequency Examination (SAFE)</p> <p>The Probability and Consequences of Threat survey</p>		communication exacerbates face-to-face avoidance.
<p>Liang, <i>et al.</i>, (2016)</p> <p>Gender differences in the relationship between internet addiction and depression: A cross-lagged study in Chinese adolescents</p>	<p>A longitudinal study with follow up data were obtained one year later and two years later.</p> <p>Internet Addiction Diagnostic Questionnaire and Childhood Depression Inventory.</p> <p>.</p>	<p>2242 sixth grade students in Hangzhou, China.</p> <p>Final samples were left with 1715 subjects.</p>	<p>Among the male subjects, depression was significant to predict subsequent IA.</p> <p>Female subjects, IA was found to be significant to predict subsequent depression</p>
<p>Mark & Ganzach (2014)</p> <p>Personality and Internet usage: A large-scale representative study of young adults</p>	<p>Cross sectional study.</p> <p>Global Internet use</p> <p>Internet activities</p> <p>The Big Five personality dimension</p>	<p>>6900 adults in US with average age of 26 years old.</p>	<p>Global internet use is positively related to Extraversion, Neuroticism and Conscientiousness.</p> <p>Also examined the relationship of the Big 5 with online communication, leisure, academic, and economic activities.</p> <p>Extraversion is correlated with the most different internet activities.</p>
<p>Milani, <i>et al.</i>, 2009</p> <p>Quality of interpersonal relationships and problematic Internet use in adolescence.</p>	<p>Cross sectional study</p> <p>the Internet Addiction Test (IAT),</p> <p>the Test of Interpersonal Relationships (TRI); and the Children's Coping Strategies Checklist (CCSC).</p> <p>Parents of the participants were administered the Child Behavior Checklist (CBCL)</p>	<p>98 adolescents ages 14 to 19</p>	<p>36.7% showed signs of pathological internet use.</p> <p>These adolescents use the internet for many hours per week; most utilize dysfunctional coping strategies and show worse interpersonal relations than peers who do not show signs of pathological internet use.</p>
<p>Nie & Erbring, 2002</p> <p>Internet and Society: A Preliminary Report</p>	<p>Questionnaires were completed independently</p> <p>television broadcast and reply via control pane for their television.</p>	<p>Random samples of 4113 individuals</p>	<p>The more time people spend using the internet, the more they lose contact with their social environment and the more they turn their back on traditional media.</p>
<p>Park, <i>et al.</i>, 2013</p> <p>The association between problematic internet use and depression, suicidal ideation and bipolar</p>	<p>The Internet Addiction Proneness Scale for Youth–Short Form (KS-scale) was used to evaluate the presence and severity of problematic internet use.</p> <p>The frequencies of depression, suicidal ideation and probable</p>	<p>795 middle & high school students</p>	<p>9.4% met the criteria for problematic internet use.</p> <p>Significantly associated with suicidal ideation & depression.</p> <p>Pathological internet use significantly predicted depressive symptoms which predicted suicidal ideation.</p>

disorder symptoms in Korean adolescents.	bipolar disorder were compared between adolescents with and without internet addiction.		Conversely, depressive symptoms and suicidal ideation also predicted pathological internet use.
Priyanka, <i>et al.</i> , (2013) Internet addiction and its correlates among high school students: A preliminary study from Ahmedabad, India.	A cross sectional study. Internet Addiction Test (IAT) and 21-Depression, Anxiety and Stress Scale (21-DASS) questionnaires	552 subjects among the school students of 11 th and 12 th grade in Ahmedabad, India	Prevalence of 11.8% students were IA. Strong correlation between IA and depression, anxiety and stress.
Rapee & Heimberg, 1997 A cognitive-behavioral model of anxiety in social phobia	Explains the model describes the manner in which people with social phobia perceive and process information related to potential evaluation and the way in which these processes differ between people high and low in social anxiety. It is argued that distortions and biases in the processing of social/evaluative information lead to heightened anxiety in social situations and, in turn, help to maintain social phobia. Potential etiological factors as well as treatment implications are also discussed.		
Roger, <i>et al.</i> , (2014) The association between internet addiction and psychiatric co-morbidity: a meta-analysis.	Meta-analysis of eight studies	Eight studies comprising 1641 patients suffering from IA and 11210 controls were included.	Significant and positive association between IA and alcohol abuse (OR = 3.05, 95% CI = 2.14-4.37, $z = 6.12$, $P < 0.001$), ADHD (OR = 2.85, 95% CI = 2.15-3.77, $z = 7.27$, $P < 0.001$), depression (OR = 2.77, 95% CI = 2.04-3.75, $z = 6.55$, $P < 0.001$) and anxiety (OR = 2.70, 95% CI = 1.46-4.97, $z = 3.18$, $P = 0.001$).
Sanders, <i>et al.</i> , 2000 The relationship of Internet use to depression and social isolation among adolescents.	Cross sectional study Questionnaire that measured low (less than 1 hour per day), moderate (1-2 hours per day), and high (more than 2 hours per day) Internet use; relationships with mother, father, and peers; and depression.	89 high school seniors	The more time one spent on internet, the poorer the relationship with friends & family.
Shepherd & Edelmann, 2005 Reasons for Internet use and social anxiety			Research suggests that socially anxious individuals may find it easier to interact online where anonymity can be maintained rather than engage in face to face interaction where being observed by others might induce a fear of negative evaluation. In line with the self-regulation model, it was hypothesized that social anxiety, low ego strength, anxiety and depression, would be related to use of the internet to cope

			with social fears. The results were partially in line with the hypothesis.
Tsai, <i>et al.</i> , 2009 The risk factors of Internet addiction—a survey of university freshmen.	Cross sectional study Chinese Internet Addiction Scale-Revision (CIAS-R), the 12-item Chinese Health Questionnaire (CHQ-12), the Measurement of Support Functions (MSF), The neuroticism subscale of the Maudsley Personality Inventory (MPI).	1360 freshmen of the National Cheng Kung University in Taiwan	680 college freshmen (17.9%) in the IA group IA is prevalent among university freshmen in Taiwan. Risk factors included male gender, habit of skipping breakfast, mental health morbidity, deficient social support; and neurotic personality characteristics
Whang, <i>et al.</i> , 2003 Internet Over-Users' Psychological Profiles: A Behavior Sampling Analysis on Internet Addiction	Cross section study modified Young's Internet Addiction Scale	13,588 users out of 20 million from a major portal site in Korea	3.5% had been diagnosed as IA 18.4% of them were classified as possible IA. IA strong relationship with dysfunctional social behaviors, assess internet more when stressed or depressed and has highest degree of loneliness, depressed mood, and compulsivity compared to the other groups.
Yen, <i>et al.</i> , 2011 Hostility in the real world and online: the effect of internet addiction, depression, and online activity.	Cross sectional study Chen Internet Addiction Scale, the Center for Epidemiological Studies' Depression Scale, and the questionnaire for online activity Buss-Durkee Hostility Inventory-Chinese version-short form	2,348 college students	Levels of all four dimensions of hostility were lower when getting online than those in the real world. Subjects with IA had higher hostility both in the real world and online as do subjects with depression. College students with IA had increased expressive hostility behavior and those with depression had decreased hostility cognition, hostility affection, and suppressive hostility behavior when getting online. Buffering effect of the internet on hostility was attenuated among subjects paying the most online time in chatting. Those using the internet mainly for online gaming had higher expressive hostility behavior not only in the real world but also online. Depressed college students would be less hostile after entering the internet. It is suggested that the internet would be one possible interactive media to provide intervention for depression.

Figure 2.1: Conceptual Framework



CHAPTER THREE: OBJECTIVES AND RESEARCH HYPOTHESIS

General Objectives

To study on internet addiction and its relationship with personality traits, depression and anxiety among young adult samples from the allied health colleges around Klang Valley doing their postings in Hospital Tengku Ampuan Rahimah, Klang.

Specific Objectives

- 1) To determine the prevalence of internet addiction in the young adult samples from the allied health colleges around Klang Valley doing their postings in Hospital Tengku Ampuan Rahimah, Klang.
- 2) To determine the association of internet addiction with anxiety in the young adult samples from the allied health colleges around Klang Valley doing their postings in Hospital Tengku Ampuan Rahimah, Klang.
- 3) To determine the association of internet addiction with depression in the young adult samples from the allied health colleges around Klang Valley doing their postings in Hospital Tengku Ampuan Rahimah, Klang.
- 4) To determine the association of internet addiction with personality traits in the young adult samples from the allied health colleges around Klang Valley doing their postings in Hospital Tengku Ampuan Rahimah, Klang.