DEPRESSION AND MOTIVATION OF GAMING AS PREDICTORS OF INTERNET

GAMING DISORDER (IGD) SYMPTOMS AMONG MALAYSIAN YOUTHS

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A RESEARCH PROJECT

SUBMITTED IN

PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR

THE BACHELOR OF SOCIAL SCIENCE (HONS) PSYCHOLOGY

FACULTY OF ARTS AND SOCIAL SCIENCE

UNIVERSITI TUNKU ABDUL RAHMAN

MAR 2019

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ACKNOWLEDGEMENTS

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APPROVAL FORM

This research paper attached hereto, entitled "Depression and Motivation of Gaming as Predictors of Internet Gaming Disorder (IGD) Symptoms among Malaysian Youths" prepared and submitted by "Khor Jia Huan, Poh Lin Shan, and Tee Ru Yuan" in partial fulfilment of the requirements for the Bachelor of Social Science (Hons) Psychology is hereby accepted.

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Abstract

The usage of Internet gaming was increasing enormously which was risky to prompt the development of Internet Gaming Disorder (IGD). Present study was a cross-sectional, descriptive study that aimed to examine the predictive effects of depression and motivation of gaming (achievement, social and immersion) on Internet Gaming Disorder (IGD) symptoms among Malaysian youths who play multiplayer online battle arena (MOBA) games. A total of 698 participants were recruited in this study by using non-probability sampling method, more specifically purposive sampling by distributing the online survey via social media like gaming groups in Facebook. The participants recruited are those who being MOBA gamer, youths aged from 18 to 29 years old ($M = 21.91$ years), and with gaming experience of at least 12 months. There were more males ($N = 502$; 71.9%) than females participated in the present study ($N = 196$; 28.1%). In the final sample, there were 173 Malays (24.8%), 398 Chinese (57.0%), 105 Indians (15.0%), and 22 with other races (3.2%). The findings revealed that depression, achievement motivation, and immersion motivation significantly and positively predict IGD's symptoms among Malaysian youths, while social motivation not significantly, negatively predict IGD's symptoms. Present study contributed the new findings for future studies to explore more on this topic, and also provide useful information to relevant authorities to implement effective interventions for the youths, in order to promote a healthier and more positive gaming behaviour.

Keywords: Internet gaming disorder, depression, motivation of gaming, Malaysian youths, MOBA gamers

DECLARATION

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

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Abbreviations

1. IGD   Internet Gaming Disorder

2. IGDS-9   Internet Gaming Disorder Scale-Short Form

3. MADRS-S   Self-assessment version of Montgomery-Asberg Depression Rating Scale

4. MOBA   Multiplayer Online Battle Arena

4. MPOG-AS   Motivation for Play in Online Games-Achievement Scale

5. MPOG-IS   Motivation for Play in Online Games-Immersion Scale

6. MPOG-SS   Motivation for Play in Online Games-Social Scale

Chapter I

Introduction

Background of Study

Internet gaming has become a booming market during the past few decades and it is one of the most popular online leisure activities for young people. According to Newzoo (2017b), a global games market intelligence firm, there were total of 2.2 billion active online gamers all over the world in year 2017. The first commercial video games was released in US, and by the 1980s, video game addiction started to appear in academic literature (Griffiths, Kuss, & King, 2012). Following to the 2000s, this topic has received considerable attention as there has been a substantial growth of research studying on video game addiction or online game addiction.

In year 2013, Internet Gaming Disorder (IGD) was recommended to include as a "condition for further study" in the latest (fifth) edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association [APA], 2013). IGD is defined as the persistent and ongoing use of Internet to engage in online video games, and leading to significant impairment or distress as indicated by five or more criteria in a 12-month period (APA, 2013). IGD contains nine criteria: preoccupation, withdrawal symptoms, tolerance, lack of control, loss of interests in other activities, continue gaming even though knowing its negative consequences, deception, escape from adverse moods, and losing a relationship, job, or other opportunities (APA, 2013).

A growing number of studies indicate that IGD-related behaviours might result in variety of negative consequences and functional impairment including having conflict in social relationships (Kardefelt-Winther, 2014a), lower psychosocial wellbeing and loneliness (Lemmens, Valkenburg, & Peter, 2011), depressive, musculoskeletal, and psychosomatic symptoms (Hellström, Nilsson, Leppert, & Åslund, 2015), auditory and visual hallucinations

(Ortiz de Gortari & Griffiths, 2013, 2014, 2016), and even death (Guarino, 2017). Since IGD presents a significant potential risks, understanding its symptoms as well as discovering its potential factors may provide information that can be used for designing and implementing effective interventions.

In present study, the first predictor to examine associated with IGD's symptoms is depression. Depression has been considered as one of the risk factors for IGD, and studies suggest that higher levels of depression associate with more intensive IGD behaviours (Burleigh, Stavropoulos, Liew, Adams, & Griffiths, 2017; Li, Liau, & Khoo, 2011; Vanzoelen & Caltabiano, 2016). Caplan (2007) proposed that Internet games may be used for mood regulation. This is supported by a study suggested that a depressed individual might be at risk for using Internet gaming to regulate their mood, as they gain positive feelings, pleasure of control, and respect from others from the Internet (Yen, Ko, Yen, Wu, & Yang, 2007). However, this might then lead to an inability to control their gaming and prompt the development of IGD (Haagsma, Caplan, Peters, & Pieterse, 2013). The above findings suggest that depression may be a predictive factor to IGD's symptoms, where a depressed individual participates in Internet gaming to address the feeling of depressed he or she experienced offline and is then becomes reliant and addicted on these activities to feel better.

In another perspective, motivation of gaming serves as the second predictor of IGD's symptoms in present study. Empirical studies have highlighted that motivation of playing online games serve as a crucial role in predicting problematic game behaviours (Billieux et al., 2011; Kuss, Louws, & Wiers, 2012; Yee, 2006a; Zhong & Yao, 2013). Hence, it appears significant to investigate the underlie motives that drive gamers to engage in online gaming. Yee (2006a) measured player motivation and discovered that they can be categorized into three major components: (1) achievement, (2) social, and (3) immersion. These three types of motivations might influence players differently, and they are likely to determine the

absorption level of players in the game world *(*Zhong & Yao, 2013*)*. Furthermore*,* when player's motivational needs become strong and frequent, and when such needs can be always satisfied by playing games, individual would be very likely to play games even excessively (Robinson & Berridge, 2003). This situation might be possible to urge the development of IGD's symptoms. Hence, it is suggested to understand players' reasons or motives for playing games excessively, as it is helpful in developing possible behaviour-change interventions in order to reduce the risk of problematic gaming behaviour, for example IGD (Haagsma, Pieterse, Peters, & King, 2013).

Furthermore, current study aims to examine IGD's symptoms focusing on youths in Malaysia. According to Malaysia Youth Policy 2018, the age range for youths has redefined, in which youths refer to people aged from 15 to 29 (Ministry of Youth and Sports Malaysia, 2018). Internet Users Survey 2017 conducted by Malaysian Communications and Multimedia Commission showed that there are total of 24.5 million Internet users in Malaysia in which approximately 76.1% or 18.6 million of total Internet users are youths (Povera, 2018). Moreover, there are 41.6% of users use Internet to play online games. In term of Malaysian Gamer Population, Newzoo (2017a) reported that among the 14 million of gamers who play online games through PC/laptop, mobile, or console, youths occupied the highest percentage which is 47% of total PC/laptop gamers. In another perspective, youths are more vulnerable to addictive behaviours (Burleigh et al., 2017) due to the discomfort they feel during their developmental period, as multiple transitions will take place during that time, such as initiation of mature interpersonal relationships, formation of identity and new adult-type roles (Arnett, 2000). Hence, it is important to put attention on Malaysian youths regarding the issue of online gaming, as they might have the potential to be addicted in it, which might then lead to the development of IGD's symptoms.

Present study is focusing on Malaysian youths, specifically to those playing Multiplayer Online Battle Arena (MOBA) games. When looking into topic of Internet gaming, earlier researches are mostly focused on Massively Multiplayer Online Role-Playing Games (MMORPGs; Dieter et al., 2015; Hussain, Williams, & Griffiths, 2015; Sioni, Burleson, & Bekerian, 2017). MMORPGs are online games in which numerous players around the world can develop own character, and interact with other players without the limitations of time and space (Kuss et al., 2012). It enable large amount of players exploring in the same virtual worlds at one time, and players are solely dependent on the player itself (Billieux et al., 2011; Yee, 2006a). On the other hand, MOBA games are having two small teams composed of five players each, and two teams compete to beat each other and destroy the opponent's "headquarters". MOBA games generally offer team objectives in which players are heavily dependent on others in the same team (Mora-Cantallops & Sicilia, 2018). The two most popular MOBA games are *League of Legends* (LoL), with around 100 million unique players every month (Painter, 2018), and *Defense of the Ancients 2* (DotA 2), with more than 11 million monthly users according to their website. In Malaysia, LoL and DotA 2 are also being wide spread. According to their Facebook page based in Malaysia, LoL and DotA 2 have owned up to 140,045 and 68,041 of followers respectively as at September 2018. According to Mountbatten (2018), Mobile Legends which is considered as a mobile version of DotA 2 and LoL, is in demand among various gamers too, especially in Asia. It reported that a total of 10 million accounts are found to have downloaded this game on the Google Play Store or Apple App Store.

Previous finding pointed out that game genres like MOBA games are more related to addictive behaviours (Nuyens et al., 2016). This might be due to the unique and specific characteristics of these games, attracting gamers to invest a lot of time for playing which later lead to addictive behaviours. Thus, present study aims to investigate IGD's symptoms among

youths in Malaysia, and more specifically MOBA gamers in relation to depression and motivation of gaming, which constitute critical IGD risk factors.

Problem Statement

Internet gaming become more popular and common nowadays. However, many people overlooked some negative consequences of Internet gaming. An increasing number of studies illustrates that Internet gaming disorder is related to a variety of negative consequences (Kuss & Griffiths, 2012b). According to Kuss (2013), the psychological consequences including sacrificing real-life relationships, other pastime activities, sleep, work, education, socializing, and relationships (Batthyány, Müller, Benker, & Wölfling, 2009 ; King & Delfabbro, 2009 ; Liu & Peng, 2009 ; Peng & Liu, 2010 ; Peters & Malesky, 2008 ; Rehbein, Psych, Kleimann, Mediasci, & Mößle, 2010 ; Yee, 2006b ; Yee, 2006c), gaming obsession and lacking of real-life relationships (Allison, von Wahlde, Shockley, & Gabbard, 2006), and low well-being and high loneliness (Lemmens et al., 2011). These reveal that Internet gaming problems must be concern seriously as they can influence or impact individual in different ways negatively.

Recently, an enormous amount of people involved and engaged in Internet gaming. According to Chan and Vorderer (2006), the amount of online gamers is increasing continuously and estimated approximately five million over the world. Moving on to the year 2017, report shown there are 2.2 billion active gamers over the world (Newzoo, 2017b) which shown a substantial growth in few years. On the other hand, putting attention to Malaysia context, Internet Users Survey 2017 pointed out that there are 24.5 million Internet users in Malaysia (Malaysian Communications and Multimedia Commission, 2017) and among them, approximately 18.6 million or 76.1% are youths (Povera, 2018), age range fall at 15 to 29 (Ministry of Youth and Sports Malaysia, 2018). In addition, 41.6% of Internet users in Malaysia use Internet to play games in 2016 (Malaysian Communications and

Multimedia Commission, 2017). It proposed that people and society should raise their awareness on this issue as there is a high percentage of Malaysian Internet users especially youths engage in online gaming.

Among Internet users in Malaysia, youths shown the highest engagement among populations (Povera, 2018). Since the engagement of youths in Internet gaming is higher compared with other age groups, they are at risk of involving in addictive behaviours which might lead to the development of IGD's symptoms. Study defined that youths are vulnerable to addictive behaviours which probably due to it is a distinct transitional developmental time that forms identity, initiate mature interpersonal relationships, and new adult-type roles appear that these multiple transitions might cause uncomfortable lead to underlying precipitate addictive behaviours (Arnett, 2000; Burleigh et al., 2017). Researchers from other countries such as Singapore (Subramaniam et al., 2016), Taiwan (Ko et al., 2014), and Westerns countries (Festl, Scharkow, & Quandt, 2012; Loton, Borkoles, Lubman, & Polman, 2016; Sioni et al., 2017) have put the focus on the population of youths when studying the topic of Internet Gaming Disorder (IGD). Viewing in the context of Malaysia, there is lack of attention on the new form of behaviour disorder, in which only one study found investigating IGD (Fam, 2018). As reported, the percentage of Malaysian youth playing Internet games keeps on increasing (Aziz, Iida, Ariffin, Akhir, & Sugathan, 2011), meanwhile, this indicates that the risk for IGD's symptoms to develop might increase. Due to that, there is a need to investigate further on IGD among Malaysia youth in order to find the best control and treatment for the disorder.

According to Casselman (2015), some 205 million people played or watched eSports in 2014. Among the variety of eSports games, MOBA games are considered in the forefront, both in players and watchers (Mora-Cantallops & Sicilia, 2018). Recently, MOBA games become more popular and wide spread in Malaysia and also trendy among passionate young

gamers (Ahmad, 2018; SimilarWeb, 2018; "Moba battle at eCurve," 2018). According to

Sensor Tower which is a marketing intelligence firm and mobile data company, Malaysia

contribute 21% of total revenue of Mobile Legends (one of the MOBA games) which is the

top country with a large amount of players (Murray, 2018). However, even though many

players are addicted and showed daily to MOBA games, research about this is still

insufficient and at an early stage (Mora-Cantallops & Sicilia, 2018), and it remains

underexplored by academics mentioned by Ferrari (2013). Nowadays, although MOBA

games have become the most popular online video games among gamers (Ahmad, 2018;

SimilarWeb, 2018; "Moba battle at eCurve," 2018), this topic has not adequately been

examined and investigated in Malaysia.

Furthermore, there are few research gaps that need to focus and emphasize on. One of

the research gap is insufficient and lack of study about Internet gaming disorder in Malaysia,

whereas, there are few studies conducted about Internet addiction in Malaysia (Mohd Isa,

Hashim, Kaur, & Ng, 2016; Kapahi, Choo, Ramadass, & Abdullah, 2013; Ching et al., 2017;

Moslehpour & Batjargal, 2013), and Internet addiction disorder and Internet gaming disorder

are different which unable to be compared (Griffiths & Pontes, 2014). Furthermore, there are

limited study conducted on the risk factors or predictors on Internet gaming disorder which

included only psychological factors, technological factors, and role of media (Arshad,

Zakaria, Che Othman, & Mazlan, 2013) and there is a need to discover and explore more on

other factors. Moreover, depression and motivation of gaming as predictors of Internet

gaming disorder in Malaysia context have not adequately explored in previous study in

Malaysia. Besides, there are inadequate of study focus on MOBA games compared with

MMOG and MMORPG (Latif, Aziz, & Jalil, 2017; Loh, 2013; Adris & Yamat, 2015). Thus,

there is a need to fill the research gaps on MOBA games and Internet gaming disorder in

Malaysia context and also focus on youths population. Additionally, fulfill the research gaps

of no study incorporate depression and motivation of gaming and use these variables together as predictors of Internet gaming disorder in Malaysia.

Besides, referring and discovering from past studies, there are inconsistency found on the relationships of depression and Internet gaming disorder. Few studies illustrates that depression is positively associated with Internet gaming disorder (Burleigh et al., 2017; Vanzoelen & Caltabiano, 2016; Liu et al., 2018) while findings from another study proposed that there are no significant relationships between depression and Internet gaming disorder (Lau, Stewart, Sarmiento, Saklofske, & Tremblay, 2018). From those discrepancies and differences of findings, noticeable that there is a need to consolidate past findings and also determine whether depression predicts Internet gaming disorder in Malaysia context. On the other hand, findings from past studies proposed that motivation of gaming have significantly positive relationship and associated with Internet gaming disorder (Zhong & Yao, 2013; Carlisle, 2017; Blinka & Mikuška, 2014). There is a need to determine whether motivation of gaming also have significant positive relationship in Malaysia context as those findings are from Czech Republic, Slovakia, Hong Kong, United States and international which not focus on Malaysia context. Meanwhile, our study also determining and discovering new findings on depression, motivation of gaming, and Internet gaming disorder symptoms which there are insufficient of study conducted in Malaysia.

In a nutshell, this study claimed that (1) depression predicts Internet gaming disorder; (2) motivation of gaming predicts Internet gaming disorder.

Research Questions

1. Does depression positively predict Internet gaming disorder symptoms among Malaysian youths?

2. Does achievement motivation positively predict Internet gaming disorder symptoms among Malaysian youths?

3. Does social motivation positively predict Internet gaming disorder symptoms among

Malaysian youths?

4. Does immersion motivation positively predict Internet gaming disorder symptoms among

Malaysian youths?

Research Objectives

1. To investigate whether depression will predict Internet gaming disorder symptoms

positively among Malaysian youths.

2. To determine whether achievement motivation will predict Internet gaming disorder

symptoms positively among Malaysian youths.

3. To examine whether social motivation will predict Internet gaming disorder symptoms

positively among Malaysian youths.

4. To identify whether immersion motivation will predict Internet gaming disorder symptoms

positively among Malaysian youths.

Hypotheses

1. Depression positively predicts Internet gaming disorder symptoms among Malaysian

youths.

2. Achievement motivation positively predicts Internet gaming disorder symptoms among

Malaysian youths.

3. Social motivation positively predicts Internet gaming disorder symptoms among Malaysian

youths.

4. Immersion motivation positively predicts Internet gaming disorder symptoms among

Malaysian youths.

Significance of Study

Firstly, the significance of this study is rebounding and bring advantages to society, enable people thinking over about Internet gaming disorder symptoms, addiction, and obsession seriously and pay more concern and attention about Internet gaming disorder, impact and influences of IGD to human well-being and life nowadays. The findings of this study will fill the research gaps mentioned in problem statement and contribute to the society by thinking over about depression and motivation of gaming as predictors and factors to IGD. Besides, the findings of this study might help to raise awareness of the society and community about MOBA games, Internet gaming disorder, depression and motivation of gaming. Thus, people will cooperate to create, intervene, and apply useful approaches and methods or effective solutions that helps to control and reduce the phenomena for the benefits of society and especially good for the Internet gaming disorder individual and population. Next, the findings of this study can provide information and some useful details for practical significance. Ministry of Youths and Sports, Ministry of Women, Family and Community, policymakers, mental health and care centre, practitioners can get benefits from this study and also providing support for further study and future researchers. Lastly, this study also enables readers to explore more about new things, domains and areas, gain more knowledge and information, study and learn more about research which help and benefit to their personal development as well.

Conceptual Definitions

Depression. It can be defined as intense sad, in which an individual is experiencing depressed mood most of the day and had lasted for two or more weeks. The individual might feel loss of hope, worth and passion, as well as experiencing reduced appetite, concentration and energy. In addition, a depressed person might have excessive guilt feeling, lose or gain

weight without dieting, difficult to fall asleep or overslept, and think of suicide when severe (APA, 2013).

Achievement motivation. It means the desire to understand the rules of the games and the desire to gain power and compete with other players in the games (Yee, 2007).

Social motivation. It means the desire to know others, to form relationships with others and to build teamwork in the games (Yee, 2007).

Immersion motivation. It means desire to discover new things, role-playing and customize character appearance in games, as well as using games to escape reality (Yee, 2007).

Internet gaming disorder. It refers to people who pay over attention to online games until neglecting other interests or hobbies in their life. They failed to control themselves on stop playing Internet games, and continue to spend much time on it repeatedly even they know their behaviour had led to impairment on their academic or occupational functioning and relationship with others. When Internet gaming is prohibited, they felt discomfort and experienced withdrawal symptoms (APA, 2013).

Operational Definition

Depression. It refers to level of depressed and is assessed by using Self-assessment version of Montgomery-Asberg Depression Rating Scale (MADRS-S; Svanborg & Asberg, 1994). It include nine item to measure the gamers' depression level based on their mood, feeling of unease, sleep, appetite, ability to concentrate, initiative, emotional involvement, pessimism and zest for life. Higher total score in MADRS-S scale indicates higher level of depression.

Achievement motivation. It means to what extent gamers are motivated for achievement and is measured by using Motivation for Play in Online Games-Achievement Scale (MPOG-AS; Yee, 2007). It include 14 items to assess the level of gamers' interest in

achieving goals in games such as gaining power to compete with other players. Higher

average score in MPOG-AS refers to higher achievement motivation for game.

Social motivation. It means to what extant gamers are motivated by social.

Motivation for Play in Online Games-Social Scale (MPOG-SS; Yee, 2007) had used to

measure social motivation, which include 11 items. The higher the average score in MPOG-

SS, the higher the gamers' desire to bond with other and gain social support in the game.

Immersion motivation. It means to what extent the gamers are motivated by

immersion and is assessed by using Motivation for Play in Online Games-Immersion Scale

(MPOG-IS; Yee, 2007). It has 14 items that used to measure to what extent the gamers is

immersed into the game. Higher average score in MPOG-IS indicates higher level of

immersion.

Internet gaming disorder. It refers to how much one had engaged in Internet gaming

until it become a risk. Internet Gaming Disorder Scale-Short Form (IGDS-9; Pontes &

Griffiths, 2015) is used to detect IGD's symptoms of gamers during the past 12 months. It

included nine items to measure the severity of IGD and the following harmful effects to the

gamers. The higher the total score, the higher the degree of gaming disorder.

Chapter II

Literature Review

Theoretical Framework

The uses and gratifications theory by Katz, Blumler and Gurevitch (1973a) emphasized on the reason and the way people actively seek for and use mass media or other sources to gain needs gratification. It focused on what people use social media to do and how people use social media to gratify their needs (Katz et al., 1973a).

There are five important assumptions addressed in this theory, which are: (1) the audiences or users are assumed as active, (2) the audiences or users are much initiative to link the need gratifications and media choice in the mass communication process, (3) there are other sources of need satisfactions compete with media, (4) many of the goals of using mass media can be originated from the information supplied by the audiences or the users themselves, in which the audiences or users were assumed to aware on their own interests, and (5) when audience directions are delved into their own terms, the value judgments about the cultural significance of mass communication should be suspended (Katz et al., 1973a). The uses and gratifications theory explained that when people have social and psychological needs, it provoke them to create expectation towards the mass media or other sources, then different patterns of media exposure will be generated to fulfill their expectation, and thus they satisfy their needs and gain a sense of gratification (Katz et al., 1973a). This theory can be used to explain the gamers behaviour, in which they actively seek for and play Internet games to gratify their needs, and the gratification can led them to stick on Internet games (Wu, Wang, & Tsai, 2010).

The five needs highlighted in this theory are (1) cognitive needs, (2) affective needs, (3) personal integrative needs, (4) social needs, and (5) escapism needs (Katz, Gurevitch, & Haas, 1973b). Cognitive needs refers to the needs to learn knowledge, gain information and

improve understanding, as well as the curiosity to explore new things. Affective needs means

the needs to pursue aesthetic, feel pleasurable and gain emotional experience. Personal

integrative needs refers to the needs to acquire self-confidence, personal stability, integrity,

credibility, status and respect. Social needs refers to the needs for affiliation and desire to

contact with family, friends and outside world. Escapism needs means the needs to release

tension and to escape from the reality by changing attention from unpleasant to pleasant one

(Katz et al., 1973b).

In conclusion, the uses and gratifications theory (Katz et al., 1973a) had served as the

theoretical base of the current study as it is corresponding to current study. Gamers who have

the needs to reduce depression and have achievement, social and immersion motivation to

play Internet games will actively search for Internet games and play it to gratified their needs.

Conceptual Framework

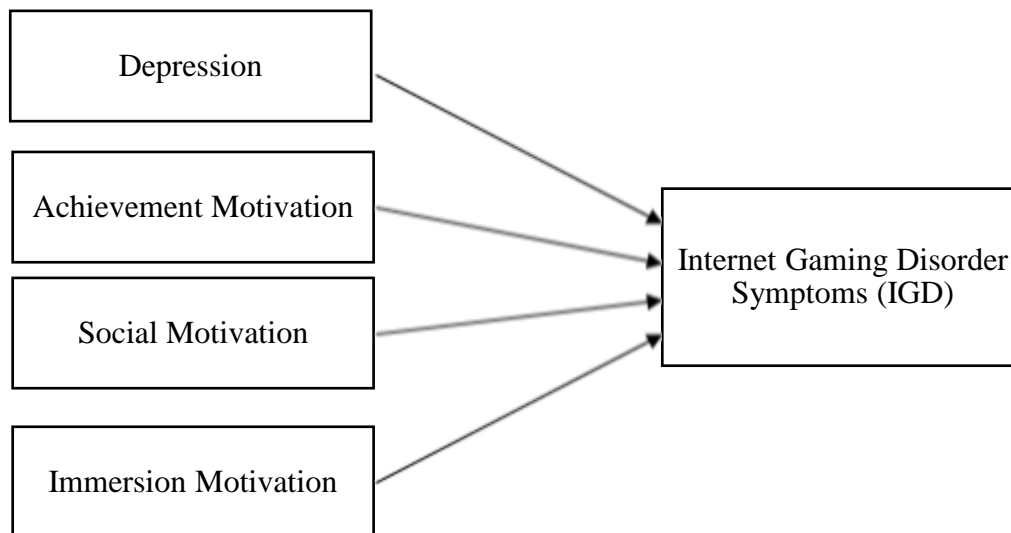*Figure 2.1.* Conceptual framework of present study.

In present study, depression and motivations for gaming including achievement

motivation, social motivation and immersion motivation is hypothesized as predictors of

IGD's symptoms. With higher depression, higher achievement motivation, higher social

motivation and higher immersion motivation, one is predicted to have more IGD's symptoms.

The uses and gratifications theory explained that people use social media to fulfill the five needs thus gain gratifications that could reinforce the behaviour and lead to repeating behaviour or stickiness on a particular behaviour (Katz et al., 1973a; Katz et al., 1973b; Wu et al., 2010). This had gave idea for the relationship between depression, achievement motivation, social motivation, immersion motivation and IGD's symptoms.

The variables of current study is related to the five needs of using social media in the uses and gratification theory. Firstly, the depression is related to affective needs, as when affective needs are not fulfill or when affection is deprived, an individual may more likely to become depressed (Floyd, 2014). This can make the relationship between depression and IGD become reasonable as depression people may use Internet game (also consider as a type of social media) to fulfill their affective needs. Past studies also showed support for the relationship of depression and IGD, in which higher depression related with higher IGD (Burleigh et al, 2017), and depression is predictive to IGD (Liu et al, 2018; Vanzoelen & Caltabiano, 2016).

Secondly, the achievement motivation is related to the cognitive and personal integrative needs. Achievement motivation include need to learn knowledge about the game and understand the underlying system of the games which can refer to the cognitive needs. While the desire to gain power, wealth and status in game, as well as compete other to gain self-confidence and respect in the achievement motivation is tally with the personal integrative needs (Katz et al., 1973b; Yee, 2007). This relation had support that achievement motivation will predict to IGD as people will seek for the Internet games to satisfy their cognitive and personal integrative needs. Empirical studies also proved that there is a significant relationship between achievement motivation and online gaming addiction (Khan & Muqtadir, 2016; Zhong & Yao, 2013), and achievement motivation can significantly predict IGD (Beard & Wickham, 2016).

Thirdly, the social motivation is directly link to the social needs, as social motivation included the gamers' desire to connect and collaborate with other players which is corresponding to the need of affiliation comprised in social needs (Katz et al., 1973b; Yee, 2007). This indicates that social motivation will predict IGD as people with higher social motivation will more likely to play Internet games to fulfill their social needs. Study from Blinka and Mikuška (2014) had provided evidence that social motivation has a significant positive relationship with online game addiction. Recent study also found out that higher proportion of friends known from Internet reported to be significant factor of IGD (Watberg, Kriston, & Kammerl, 2017).

Lastly, the immersion motivation is bond with the escapism needs, as the immersion motivation included the gamers' needs to relax and needs to use game to escape from reality (Katz et al., 1973b; Yee, 2007). This served as the underlying theory that support the relationship between immersion motivation and IGD, in which people with immersion motivation will use Internet gaming to satisfy their escapism needs. Studies had also supported that immersion motivation is an important factor of IGD and will significantly predict problematic gaming that lead to higher risk of IGD (Kneer & Rieger, 2015; Laconi, Pirès, & Chabrol, 2017; Šporčić & Glavak-Tkalić, 2018).

Using the uses and gratifications theory (Katz et al., 1973a) perspective to ground current study, the relationship that depression, achievement motivation, social motivation, immersion motivation will predict IGD's symptoms can be explained, in which gamers use Internet gaming to fulfill the needs that relevant to depression, achievement motivation, social motivation and immersion motivation, thus they gain gratifications on playing Internet games and increase the risk of having IGD's symptoms.

Therefore, current study is to extend the application of the uses and gratifications theory specifically to Internet gaming field, as well as examine whether depression,

achievement motivation, social motivation and immersion motivation will predict IGD's symptoms in Malaysian youths.

Conceptualizing on Internet Gaming Disorder

According to DSM-5, there are nine criteria in IGD, which one need to fulfil at least five criteria in past 12 months or within a year to be diagnosed (APA, 2013). The first criterion of IGD is preoccupation with Internet games, which means a person mind is dominated by Internet games. The second criterion will be withdrawal symptoms. This refers to a person might have negative feelings, such as sadness, anxiety or irritability, if Internet gaming is kept away from them. Thirdly, tolerance in IGD refers to one will spend more and more time engaging in Internet games in order to achieve pleasure or satisfaction. The fourth criterion includes lack of control, which indicates that an individual attempts to reduce or stop from Internet gaming but unsuccessful. The following criterion will be loss of interests. This refers to one losses his or her interests in previous or other hobbies and entertainment due to Internet gaming. The sixth included criteria in IGD is a person still prefer to engage in Internet gaming excessively even though he or she knows the negative impacts that Internet gaming will bring to him or her. The following criterion will be deception. This refers to an individual will tend to deceive others such as family members and therapists about the amount of he or she had engaged in Internet gaming. The eighth criterion of IGD is one aimed to escape or relieve from negative feelings, emotions or moods such as helplessness, guilt or anxiety by participating in Internet gaming. Lastly, IGD includes the criterion of jeopardising or losing a significant relationship, job, education or career opportunity due to participate in Internet games. This indicates that IGD may result in failure in school or college, failure in marriage or loss of job, as the problematic gaming behaviour will influence or bring impact on one's usual daily activities that relevant to social, work or education, relationship, and family (APA, 2013).

Conceptualizing on Depression

Depression refers to an individual experience extreme sad and depressed most of the day during last two or more weeks (APA, 2013). According to MADRS-S by Svanborg and Asberg (1994), there are a total of nine depression symptoms can be used to measure the level of depression, which are (1) mood, (2) feeling of unease, (3) sleep, (4) appetite, (5) ability to concentrate, (6) initiative, (7) emotional involvement, (8) pessimism, and (9) zest for life. Higher score in these nine symptoms means higher level of depression.

Conceptualizing on Achievement Motivation

Achievement motivation means the gamers' desire to strengthen power, progress faster and accumulate greater wealth and higher status in the game, as well as to understand and analyze the underlining rules and system of the games, so that they could optimize their character performance. It also included the gamers' urge to challenge others and compete with other to gain sense of provocation and dominant in games (Yee, 2007).

Conceptualizing on Social Motivation

Social motivation refers to gamers' interest to chat with other players and help other players in the game in order to build long-term meaningful relationship with other players in game. It also means the gamers' interest of collaborating with other players, and feeling satisfy when being a part of group efforts and reaching group achievements (Yee, 2007).

Conceptualizing on Immersion Motivation

Immersion motivation can be assessed by the level of gamers' interest in exploring lore and pitting efforts on finding hidden things that other players do not know, as well as gamers' interest in customizing their characters' appearance in the game and creating a character with background and history in order to interact with other players and build improvised story line in the game. It also refers to the gamers' needs of relaxing and desire to use game environment to escape from real-life problems (Yee, 2007).

Depression and Internet Gaming Disorder

Based on past studies, the findings illustrates that depression is associated with Internet gaming disorder (Allison et al., 2006; Archer, 2018; Brunborg, Mentzoni, & Frøyland, 2014; Burleigh et al., 2017; Li et al, 2011; Liu et al., 2018; Vanzoelen & Caltabiano, 2016; Wang, Cho, & Kim, 2018; Wei, Chen, Huang, & Bai, 2012; Yen et al., 2017). Past studies shown that Internet gaming disorder is associated with depression (Hellström et al., 2015; Kim et al., 2017; Wei et al., 2012). The possible explanations might be poor or impaired emotional regulation, escapism from negative emotions and problem faced in life (Hellström et al., 2015; Kim et al., 2017). Poor emotional regulation individual usually involve in maladaptive behaviour to escape from negative emotions, which at risks of addictive disorders and mood disorders (Hellström et al., 2015; Yen et al., 2017). Although past studies found Internet gaming disorder is associated with depression, however it is possible that depression have relationship with Internet gaming disorder as individual with depression will try to escape from reality through playing Internet games (Li et al., 2011). Some studies also supported that depression related to IGD (Burleigh et al., 2017; Vanzoelen & Caltabiano, 2016; Liu et al., 2018).

Through reading past findings, depression shown association with Internet gaming disorder (Burleigh et al., 2017; Vanzoelen & Caltabiano, 2016; Liu et al., 2018; Brunborg et al., 2014; Wang et al., 2018). One study stated that depression and Internet gaming disorder have reciprocal and bidirectional relationship (Liu et al., 2018). The possible explanations are aberrant interactions among emotional and executive control networks, emotional distress can be coped through playing online games, and depression induced by inadequate of or withdrawal from real-life relationships when playing Internet games prolonged (Liu et al., 2018; Rappeneau & Bérod, 2017). Besides, few studies proposed that depression have significantly positive relationships with Internet gaming disorder (Burleigh et al., 2017;

Vanzoelen & Caltabiano, 2016). The reasons are due to addictions always functioning as maladaptive emotional regulation strategies, online games can regulate mood, also counterbalance for real-life obstacles and problems by escaping online, and at first offer positive feelings that may then enlarge real-life dysfunctions which lead to perpetuate and precipitate depressive emotions, therefore, give rise to a malignant cycle (Stavropoulos, Gentile, & Motti-Stefanidi, 2015; Kardefelt-Winther, 2014b; Caplan, 2007). In contrast, finding from another study stated that there are no significant relationships between depression and Internet gaming disorder, but anhedonia (an item of overall depressive symptoms) had significantly predicts problematic video gaming (Lau et al., 2018).

Achievement Motivation and Internet Gaming Disorder

There were various studies that linked achievement motivation to Internet gaming addiction, online gaming addiction, excessive gaming, problematic gaming as well as IGD (Beard & Wickham, 2016; Carlisle, 2017; Hussain et al., 2015; Khan & Muqtadir, 2016; King, Herd, & Delfabbro, 2017; Demetrovics et al., 2011; Kneer & Glock, 2013; Kuss, et al., 2012; Lehenbauer-Baum et al., 2015; Lewis, 2016; Zhong & Yao, 2013). Studies had found out that achievement motivation had a significant positive relationship with problematic online gaming behaviour, in which higher achievement motivation is reported in problematic gamers (Billieux et al., 2013; Kardefelt-Winther, 2014a; Khan & Muqtadir, 2016; King et al, 2017). This might due to the gamers want to fulfill their achievement need through Internet games which is unmet in their real life (Khan & Muqtadir, 2016; Wan & Chiou, 2006). King, Herd and Delfabbro (2017) also pointed out the possible reason might be the gamers perceived outcome of the game is not met, so they invest more to achieve goal.

Other than that, studies from Beard and Wickham (2016), as well as Carlisle (2017) had found that achievement motivation was significantly predict IGD. Meanwhile, other studies also showed support that achievement motivation was a significant predictor of online

gaming addiction (Lewis, 2016; Zanetta-Dauriat et al., 2011), and has a direct effect on

problem and salience symptoms of online gaming addiction (Zhong & Yao, 2013). Study

from Lehenbauer-Baum and his colleagues (2015) also found that achievement motivation is

a factor that can differentiate Internet gaming addiction from Internet gaming engagement.

Mechanics and competitive motivation (also included in achievement motivation) also found

to predict excessive gaming and online gaming addiction (Hussain et al., 2015; Kuss et al.,

2012). This is because if gamers want to reach better performance in the game, they required

to know the game well and find out the best strategy to play the game, thus they invest more

energy and time in the game, which could then lead to problematic gaming (Kuss et al.,

2012).

However, there are also few studies reported that achievement motivation was not

predictive to problematic gaming or online gaming addiction (Cross, 2016; Kneer & Rieger,

2015). Both studies from Cross (2016) and Kneer and Rieger (2015) had limitation in the

sample which is lack of participants that showed addictive symptoms towards online gaming,

that might externally affect or weaken the relationship between achievement motivation and

online gaming addiction. The games of the participants played might also not focusing on

improving character level or acquiring power and wealth, thus decrease the predictive value

of achievement motivation to online gaming addiction (Cross, 2016). These limitations are

strive to reduce in present study.

Social Motivation and Internet Gaming Disorder

A number of studies had examine the relationship between social motivation and IGD

or other relevant gaming addiction (Beard & Wickham, 2016; Blinka & Mikuška, 2014;

Carlisle, 2017; Demetrovics et al., 2011; Hussain et al., 2015; Khan & Muqtadir, 2016; King

et al., 2017; Kneer & Glock, 2013; Lewis, 2016; Wartberg et al., 2017; Zhong & Yao, 2013).

Study reported that social motivation had a significant relationship with uncontrollable play,

problem and salience symptoms in gaming addiction (Zhong & Yao, 2013), as well as positively associated with online gaming addiction (Blinka & Mikuška, 2014). Later, study from Khan and Muqtadir (2016) also found that social motivation was significantly positively related to and predicts online gaming, in which they found higher level of social motivation reported in problematic gamers. The underlying reason of this association could be the online games are providing rich social interactions opportunities such as collective play to allure gamers who want to enrich social life in games (Blinka & Mikuška, 2014; Zhong, 2011; Zhong & Yao, 2013). The social environment in online game would also reinforce gamers to be more socially active, and encourage them to play longer and more frequently, thus reduce their time spending and bond with offline social as well as gaining pressure from offline social, thus resulted in negative consequences like problem or salience symptoms in online gaming addiction (Blinka & Mikuška, 2014; Zhong & Yao, 2013).

Evidences for social motivation as a significant predictor of IGD also can be found in past studies (Beard & Wickham, 2016; Carlisle, 2017). Other supportive studies also report that social motivation significantly predict online gaming addiction, in which higher social motivated will predict higher risk of online gaming addiction (Hussain et al., 2015; Lewis 2016; Xu, Turel, & Yuan, 2012; Zanetta-Dauriat et al., 2011). Study from Wartberg, Kriston and Kammerl (2017) also showed that there is a significant relationship between Internet social and IGD, in which respondents with IGD was reported to have higher proportion of friends only know though the Internet. This might due to the greater amount of online friend is associated with higher online social interactions and lower offline social connection, that could triggered addiction (Hussain et al., 2015; Hussain & Griffiths, 2009; Wartberg et al., 2017).

Inconsistency of past studies on social motivation and IGD were found, which some studies stated that socializing, relationship and social interactions (also included in social

motivation) was not significantly predict video game playing and problematic gaming (Kneer & Rieger, 2015; Kuss et al., 2012). The possible reason is that social motivation might related to well-being rather than wrong copping strategies that led to problematic gaming (Kneer & Rieger, 2015). Study from Carras and her colleague (2016) also pointed out negative relationship, which respondents with greater social interactions in online reported fewer symptoms of gaming addiction or problematic gaming. This is because the more online social interactions may contribute to better quality of friendship, and reduce risk of problematic gaming (Carras et al., 2016).

Immersion Motivation and Internet Gaming Disorder

Based on past studies, immersion motivation was often studied with IGD, online gaming addiction and problematic gaming (Carlisle, 2017; Cross, 2016; Demetrovics et al., 2011; Khan & Muqtadir, 2016; Kneer & Glock, 2013; Kneer & Rieger, 2015; Kuss et al., 2012; Laconi et al., 2017; Li et al., 2011; Šporčić & Glavak-Tkalic, 2018; Zhong & Yao, 2013). Immersion motivation is significantly positively relate with online gaming, in which problematic gamers reported to have higher immersion motivation (Khan & Muqtadir, 2016). In addition, study from Zhong and Yao (2013) concluded that immersion motivation, specifically escape motivation, had a positive relationship with symptom of problem and salience in online gaming addiction. This is because the gamers use fantasy online gaming world to escape from real-life problem and to fulfill unmet psychological needs in real life, but this irresponsible behaviour cannot solve their real problem and can only satisfy their needs virtually, thus it make the gap between gaming world and real world become bigger and real problem become more serious (Khan & Muqtadir, 2016; Zhong & Yao, 2013).

Not only relationship, direction between immersion motivation and IGD also supported by past studies, in which immersion motivation was a significant predictor of IGD and was predictive to problematic gaming (Carlisle, 2017; Kneer & Rieger, 2015). Study

from Lehenbauer-Baum his colluegues (2015) also showed that immersion motivation can separate engaged players from addicted players as addicted players were reported to have higher immersion motivation. Besides, escapism (also included in immersion motivation) was reported to significantly predict excessive gaming, online gaming addiction, online games craving, problematic gaming and pathological gaming (Billieux et al., 2013; Cross, 2016; Kardefelt-Winther, 2014b; Kuss et al., 2012; Laconi et al., 2017; Li et al., 2011; Šporčić & Glavak-Tkalic, 2018; Xu et al., 2012; Zanetta-Dauriat et al., 2011), as well as was an important factor of IGD (Laconi et al., 2017). This can be explained by there are extensive or huge possibilities that provided in the online games for the gamers to withdraw from real life (Šporčić & Glavak-Tkalic, 2018). Yet, only one study has found out that immersion motivation was not a significant predictor of IGD (Beard & Wickham, 2016).

In conclusion, there were inconsistent findings in past studies about the relationship between depression, achievement motivation, social motivation, immersion motivation and IGD. Thus, the aim of present study is to contribute new findings to literature field, as well as discover association between depression, achievement motivation, social motivation, immersion motivation and IGD in Malaysia youths context.

Chapter III

Methodology

Research Design

Present study was a cross-sectional, descriptive study that aimed to examine the predictive effects of depression and motivation of gaming on IGD's symptoms among Malaysian youths. Cross-sectional study refers to all the measurements on each person are made at only one point in time (Mann, 2003). This study design was used as it fitted with the objectives of current study. This study design is particularly suitable for estimating the prevalence of a behaviour or other outcome of interest in a population (Sedgwick, 2014), and it can be used to investigate relationship between risk factors and the outcome variable (Levin, 2006). Further, cross-sectional study design is considered as an affordable study method as it is relatively easy, inexpensive and takes up little time to carry out (Levin, 2006; Sedgwick, 2014).

Sampling Method

Non-probability sampling method was used in this study. Non-probability sampling refers to sample is not selected randomly, and it mostly involves judgement (Showkat & Parveen, 2017). More specifically, present study used purposive sampling for the selection of participants. In this type of sampling method, sample was chosen based on researcher's judgement in which individual with specific characteristics that match with topic of interest was selected. Further, purposive sampling is considered less costly, more convenient, more readily accessible, and able to select only those who are relevant to or meet required criteria for the study topic (Showkat & Parveen, 2017).

In present study, purposive sampling was used due to the sampling frame was not identified (Oakshott, 2016), where the exact population was not known (Martínez-Mesa, González-Chica, Duquia, Bonamigo, & Bastos, 2016). For instance, the targeted participants

who are gamers might not situated at a particular setting, for example at school, as they might also play online games at home. There were several empirical studies adopted purposive sampling method in collecting responses from MOBA players (Damariva, Santiya, Hutomo, & Ardiko, 2018; Djamaluddin, Kindangen, & Tielung, 2017; Dumrique & Castillo, 2018; Hudson & Cairns, 2016; Škařupová & Blinka, 2016). For instance, study conducted by Škařupová and Blinka (2016) on online gaming addiction have recruited participants who play MOBA games through online gaming magazines and gaming discussion forums. This showed that the researchers recruited their sample in a purposeful way which is through the gamer's platforms, as they might able to collect the relevant data they want. Similarly, purposive sampling was suitable to use in present study as the targeted participants were geographically scattered (Oakshott, 2016), in which those gamers were situated at different places across Malaysia. Hence, present study approached the targeted participants purposefully by sending online survey through social media.

Purposive sampling was suitable to use in present study as only participants who meet inclusion criteria were involved. This was tally with the aim of purposive sampling which only select those meet the requirements of study (Showkat & Parveen, 2017). Inclusion criteria of the study included being 18 to 29 years old, being a MOBA gamer who play League of Legends (LoL), Defense of the Ancients 2 (DotA 2), Mobile Legends, King of Glory or any other MOBA games, and having at least 12-month of gaming experience which in line with the IGD criteria according to DSM-5 (APA, 2013). Exclusion criteria of the study encompassed individual who is a professional gamer, with age below 18 or above 29, not a MOBA gamer, and with less than 12-month of gaming experience. People with any of the exclusion criteria was not included in the present study.

Sample Size

Soper's (2019) computer software statistics calculator was used to calculate the sample size. There were several components included in the sample size calculation, such as (1) anticipated effect size, referring to a measure of the strength of the relationship between any two variables (Wilkinson, 1999). Cohen (1988) interpreted values near 0.02 as small, near 0.15 as medium, and above 0.35 as large effect size. (2) Desired statistical power level refers to the probability of rejecting a false null hypothesis, and a range of values such as 0.8 to 0.95 can be used as power, (3) number of predictors, and (4) probability level means probability of a type-I error (alpha), which occurs when null hypothesis is rejected but in fact it is true. Historically, the value of 0.05 has been used for alpha (NCSS, n.d.).

The present calculation entered 0.15 for anticipated effect size, 0.95 for desired statistical power level, with four predictors, and with probability level of 0.05. The calculation showed the target number of participants for the study was at least $n = 129$ (refer to Appendix A, p.71).

Participants

Participants who meet the inclusion criteria of being MOBA gamer, youths aged from 18 to 29 years old, and with gaming experience of at least 12 months were recruited in the study. On the other hand, subject with the exclusion criteria, including aged below 18 or above 29, not MOBA gamer, have less than 12 months of gaming experience, and being professional gamer were excluded from the present study.

The final sample comprised of 698 individuals all of who were MOBA gamers, youths aged between 18 to 29 years ($M = 21.91$ years; $SD = 2.31$ years). There were more males ($N = 502$; 71.9%) than females participated in the present study ($N = 196$; 28.1%). In the final sample, there were 173 Malays (24.8%), 398 Chinese (57.0%), 105 Indians (15.0%), and 22 with other races (3.2%).

Location

Present study was conducted across Malaysia states, by delivering online survey through social media, such as gaming groups found in Facebook. Gamers who met the inclusion criteria and situated in Malaysia were targeted to participate in the study.

Procedures

Pilot study was conducted before the actual data collection, and 100 participants were recruited. The analysis showed that the reliability for all the scales used was high which ranged from Cronbach's alpha of .79 to .91. After reliability was computed, actual study then began. Online survey which included informed consent, demographic details and scales for IGD, motivation of gaming and depression was created. The survey link was then sent via social media, such as gaming groups in Facebook to approach the participants. The examples of gaming groups that have approached were League of Legends Malaysia, [OFFICIAL COMMUNITY] League of Legends Malaysia, Dota 2 Malaysia – D2M, DOTA 2 Malaysia, Mobile Legends: Bang Bang, Mobile Legends: Bang Bang Official Malaysia, *Komuniti* dota 2 (zon Malaysia), *Komuniti* Dota 2 Malaysia, DOTA 2 大马华人玩家群 (Malaysia Chinese DOTA 2 Players), 王者荣耀吹水站 (King of Glory Forum), 王者荣耀-新交流区 (King of Glory New Forum; refer to Appendix B, p. 72). The target participants for present study were individuals who are MOBA gamers aged from 18 to 29 years old, and with at least 12 months of gaming experience. In contrary, people who are professional gamers, aged below 18 or above 29, not playing MOBA games, or having less than 12 months of gaming experience were not recruited in the study.

To obtain the consent of participants, informed consent sheet was included in the online survey and distributed through social media. Participants have voluntarily agreed to participate before they proceed to the remaining parts of survey. After the data collection process, data analysis was carried out by using SPSS version 21.

Instruments

Internet Gaming Disorder Scale-Short Form (IGDS9-SF). The IGDS9-SF

constructed by Pontes and Griffiths (2015) was used in the study to detect IGD's symptoms

of participants. This scale examined online gaming activities occurring over 12 months'

period. It was aimed to detect symptoms of IGD, but not for diagnosis purpose. It contained

nine items based on the nine core criteria of IGD according to the DSM-5 (APA, 2013). The

scale included items such as "Do you feel more irritability, anxiety or even sadness when you

try to either reduce or stop your gaming activity?", "Have you continued your gaming

activity despite knowing it was causing problems between you and other people?", and "Have

you deceived any of your family members, therapists or others because the amount of your

gaming activity?" The nine questions were answered based on a 5-point Likert scale (1 =

never, 5 = *very often*). The final IGD score was calculated by summing up each item score.

The total score was ranged from 9 to 45, with higher score indicated greater intensity of

IGD's symptoms. The internal reliability of IGDS9-SR was high with a Cronbach's alpha

of .81 in the present study.

Self-assessment version of Montgomery-Asberg Depression Rating Scale

(MADRS-S; Svanborg & Asberg, 1994). It is not a diagnostic scale, but a self-rated scale

that has a total of nine items to detect nine depression symptoms, which are mood, feeling of

unease, sleep, appetite, ability to concentrate, initiative, emotional involvement, pessimism

and zest for life. The items were rated using 4-point Likert scale which was ranged from 0 to

3 (*no depressive symptoms to worst depressive symptoms*). For examples, question related to

feeling of unease is "Here you should indicate to what extent you have had feelings of inner

tension, uneasiness, anxiety, or vague fear, during the past 3 days. Pay particular attention to

how intense any such feelings have been, whether they have come and gone or persisted

almost all the time.", rated from 0 (*I feel calm for the most part*) to 3 (*I have dreadful,*

persistent or unbearable feelings of anxiety); question related to mood is "Here you should

try to indicate your mood, whether you have felt sad or gloomy. Try to recall how you have

felt during the past 3 days, whether your mood has been changeable or much the same.",

rated from 0 (*I can either cheerful or sad, depending on the circumstances*) to 3 (*I feel so

utterly low and miserable, that I can imagine nothing worse*); question related to appetite is

"Here you should indicate how your appetite has been, and try to recall whether it has

differed in any way from normal. If your appetite has been better than usual, you should mark

the scale at zero (0).", rated from 0 (*My appetite has been much the same as usual)* to 3 (*I*

haven't felt like eating at all. I need persuading if I am to get anything down). The range for

possible total score was 0 to 27, in which higher total score indicated greater symptom

severity. In present study, the internal reliability of MADRS-S was high, in which $\alpha = .82$.

Motivation for Play in Online Games (MPOG) Scale. The MPOG constructed by

Yee (2007) was used to assess people's motivation of gaming. It comprised total of 39 items

which categorized into three main components, including achievement, social and immersion.

In achievement dimension, there were 14 items included to examine the extent of

gamer's interest in achieving goals in online games, like gaining power and wealth or

competing with other players in order to reach higher status (e.g., "Levelling up your

character as fast as possible", "How important is it to you that your character is as optimized

as possible for their profession / role?", "How often do you purposefully try to provoke or

irritate other players?"). The internal reliability of achievement motivation subscale was high

which is $\alpha = .86$ in the present study.

Social dimension contained 11 items assessing the desire and interest of gamers to

socialize, form relationship with other players and build teamwork through online gaming

(e.g., "How often do you talk to your online friends about your personal issues?", "Chatting

with other players.", "How much do you enjoy working with others in a group?"). In present

study, social motivation subscale has a high internal reliability with Cronbach's alpha of .79.

In immersion dimension, there were 14 items used to measure the extent of gamers

immersed in online gaming, as in their interest in customizing their appearance and finding

lore in online games and their desire to use gaming world to escape from real-life (e.g., "How

much do you enjoy exploring the world just for the sake of exploring it?", "How much time

do you spend customizing your character during character creation?", "How often do you

play so you can avoid thinking about some of your real-life problems or worries?").

Immersion motivation subscale has a high internal reliability which is $\alpha = .85$ in present

study.

All the items were rated based on a 5-point fully-labelled construct-specific scale,

where there were five options listed for each item, and they were worded differently across

different type of items (e.g., 1 = *not important at all* to 5 = *tremendously important;* 1 = *not*

interested at all to 5 = *extremely interested*; or 1 = *never* to 5 = *always*). The final score for

each component was calculated by averaging the item score according to the three main

components. The higher score indicated the greater motivation of achievement, social or

immersion. In present study, the internal reliability of overall MPOG scale has a Cronbach's

alpha of .93.

Data Cleaning

In present study, there were total of 781 responses collected. Initially, seven cases

were removed as they did not meet the inclusion criteria. Responses with missing value were

then be cleaned up, and 45 cases were removed at this stage. After cleaning up cases with

missing values, 31 cases were found as univariate outliers and were removed from the data

set (refer to Appendix C, p. 76). A total of 83 cases were removed and 698 responses were

retained as the final sample for data analysis.

Data Analysis

Multiple regression was used in present study for data analysis to assess the association between depression, achievement, social, immersion, and IGD's symptoms. In the analysis, IGD scores was used as the outcome variable, depression, achievement, social, and immersion scores served as the predictors. Before actual analysis was conducted, normality was checked and assumptions for multiple linear regression were examined.

Assumptions for normality included (1) skewness which was the degree of asymmetry of a distribution around its mean (Čisar & Čisar, 2010), (2) kurtosis which was the relative flatness or peakness of given distribution compared with normal distribution (Čisar & Čisar, 2010), and the values for skewness and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2010), (3) histogram characterized by disclosed the distribution of data values, outlier values, and also the shape of the distribution adeptly (Kaplan, Gabrosek, Curtiss, & Malone, 2014), (4) Quantile-Quantile plot (Q-Q plot) was a graphical tool for determining the goodness-of-fit of observed data to a theoretical distribution in which each observation in the data that used a symbol to represented (V´elez & Morales, 2015), (5) normality test can be checked with a goodness of fit test like Kolmogorov-Smirnov (K-S) provided a means of assessing whether a sets of observations was from certain completely specified continuous distribution (Lilliefors, 1967) and would be accepted more than the alpha level (.05) (Massey, 1951).

On the other hand, assumptions for multiple linear regression were also examined which were (1) variables types stated each variables' data type and can be classified into two main types of data which are qualitative variable and quantitative variable (discrete or continuous) (Afzal & Rizwi, 2013), (2) independent which assumed that all of the data value of any particular subjects are independent (Berry, 1993), (3) multicollinearity means the assumption that the independent variables was uncorrelated (Darlington, 1968; Keith, 2006).

Variance Inflation Factors (VIF) and tolerance were used to examine multicollinearity. VIF

defined as an amount index which variance of each regression coefficient is inclined over that

with uncorrelated independent variables while tolerance assess the influence of each

independent variable on all other independent variables (Keith, 2006). The rule of thumb for

a large value of VIF is 10 meanwhile large value of VIF and small values for tolerance reveal

the presence of multicollinearity (Keith, 2006; Shieh, 2010), (4) independent errors defined

as the assumption that errors are independent between each other, implying that subjects was

independently responding (Stevens, 2009). Durbin-Watson statistics could be used to assess

the assumption that the residuals are independent which preferably close to two (Reddy &

Sarma, 2015).

Besides, (5) multivariate outliers were combination of unusual scores on two or more

variables (Complete Dissertation, n.d.). Mahalanobis distance was a famous criterion that

used to detect outliers in multivariate data (Penny & Jolliffe, 2001). Cook introduced Cook's

distance measure for generally used estimates of the influence of a data point when showing

least squares regression analysis while an observation with supreme value on an independent

variable was defined as a high leverage point (Kannan & Manoj, 2015). These can be used to

examine multivariate outliers, cases with Mahalanobis distance more than 25 in large samples

(500) was potential outliers (Barnett & Lewis, 1978) while cases with Cook's distance more

than one was potential outliers (Cook & Weisberg, 1982), and cases with values more than

two times of Leverage's value suggested to be investigate (Hoaglin & Welsch, 1978), (6)

linearity which can be display in scatter plot of residuals and y values which are taken on the

vertical y axis and standardized residuals are next plotted on the horizontal x axis. The

linearity assumption is met if the scatter plot follows a linear pattern, but not curvilinear

pattern (Bansal, n.d.; Reddy & Sarma, 2015), (7) normality of residuals refers to errors are

normally distributed, also a plot of the values of the residuals will approximate a normal

curve (Keith, 2006). Scatterplots was a good way to examine normality of residuals (Gan &

Ahmad, 2011), (8) homoscedasticity which defined as the error terms along the regression

line are held constant or equal and scatterplots was a good method to assess homoscedasticity

(Reddy & Sarma, 2015). The overall pattern of a scatterplot can be determined by the form

(linear or curvilinear), direction, and strength (strong, moderate, or weak) of the relationship

while outlier can be detected when individual's value falls outside the overall pattern (Moore,

Notz, & Flinger, 2013). Scatterplot illustrates the direction of the relationship whether have a

positive association which shown positive slope (upward trend) or a negative association

which shown negative slope (downward trend; Moore et al., 2013).

Chapter IV

Results

Normality Assumptions

      Univariate outliers. Before conducting actual analysis, the assumptions of normality were checked. Firstly, outliers were determined using boxplot, and a total of 31 univariate outliers were found and removed (refer to Appendix C, p. 76).

      Skewness and kurtosis. After cleaning up all the outliers, skewness and kurtosis were examined to check on the normality of each distribution. According to Table 4.1, the results showed that there was no violation for the assumption of skewness and kurtosis. The values of skewness and kurtosis did not exceed the benchmark ranging from -2 to +2 (George & Mallery, 2010).

Table 4.1

Skewness and Kurtosis

	Skewness	Kurtosis
IGD	.359	-.394
Achievement	-.181	-.299
Social	-.010	-.307
Immersion	.071	-.414
Depression	.616	-.318

      Histogram. Furthermore, normality could be checked through histogram. The scales used in present study have met this assumption as the results showed the histograms were in bell-shaped curve (refer to Appendix C, p. 79).

      Normal Q-Q plots. Other than histogram, normal Q-Q plots could test for normality. According to the normal Q-Q plots in present study, the results showed that the data were normally distributed as the data points were near to the straight line for all scales (refer to Appendix C, p. 82).

Normality test. Lastly, a normality test named Kolmogorov-Smirnov (K-S) test were

used to examine on normality in present study. According to Ghasemi and Zahediasl (2012),

the distribution is non-normal if the test is significant. According to Table 4.2, the current K-

S test showed significant value with $p < .05$ for all scales due to a large sample size in present

study. This result was acceptable as previous study indicated that significant results would be

derived for study with large sample size (Ghasemi & Zahediasl, 2012). Although this

assumption was not met, another four out of five measures in normality checking showed no

violation.

Table 4.2

Kolmogorov-Smirnov (K-S) Test

	Significant value
IGD	.000
Achievement	.005
Social	.004
Immersion	.021
Depression	.000

* refer to Appendix C, p. 85 for the SPSS output.

Descriptive Statistics

In the present study, the final sample included 698 participants who 57.0% were

Chinese ($n = 398$), 24.8 % were Malays ($n = 173$), 15.0% were Indians ($n = 105$), and 3.2%

were from other races ($n = 22$). The total participants were aged ranged from 18 to 29 years

($M = 21.91$; $SD = 2.31$), in which 71.9% were males ($n = 502$) and 28.1% were females ($n =

196$) in the present study. Based on majority, 59.5% of the participants had played MOBA

games for two to four hours ($n = 415$), 33.8% of the participants had played MOBA games

for nine times and above per week ($n = 236$), 28.4% of the participants had two to four years

of gaming experience ($n = 198$), and 82.4% of the participants spent RM0 to RM100 monthly

for MOBA games ($n = 575$).

In present study, the mean score of IGD's symptoms variable was 21.46, 55.2% of the participants had low IGD's symptoms (n = 385), while 44.8% had high IGD's symptoms (n = 313). The achievement motivation variable had a mean score of 45.29, 50.3% of the participants had low achievement motivation (n = 351), while 49.7% had high achievement motivation (n = 347). The mean score of social motivation variable was 34.22., 52.6% of the participants had low social motivation (n = 367), while 47.4% had high social motivation (n = 331). The immersion motivation variable had a mean score of 40.37, 50.7% of the participants had low immersion motivation (n = 354), while 49.3% had high immersion motivation (n = 344). The mean score of depression variable was 5.52, 56.7% of the participants had low depression (n = 396), while 43.3% had high depression (n = 302) (Refer to Table 4.3).

Table 4.3

Frequency Distribution of Participants for Demographic Variables and Main Variables

	n	%	M	SD
Demographic variables				
Age			21.91	2.31
Sex				
Male	502	71.9		
Female	196	28.1		
Relationship status				
Single	503	72.1		
Married	13	1.9		
In relationship	178	25.5		
Separated/divorced	4	0.6		
Employment status				
Employed	157	22.5		
Unemployed	64	9.2		
Others	477	68.3		

Note. N=698. All variables have no missing value except starting age with 4 missing value.

Table 4.3 (Continued)

Frequency Distribution of Participants for Demographic Variables and Main Variables

	n	*%*	*M*	*SD*
Race				
Malay	173	24.8		
Chinese	398	57.0		
Indian	105	15.0		
Others	22	3.2		
Educational level				
Secondary school/ Pre-U	144	20.6		
Diploma	129	18.5		
Bachelor degree	400	57.3		
Postgraduate degree	25	3.6		
Gaming frequency/week				
0-1 time	75	10.7		
2-4 times	202	28.9		
5-8 times	185	26.5		
9 times and above	236	33.8		
Average gaming duration/day				
1 hour and below	123	17.6		
2-4 hours	415	59.5		
5-7 hours	140	20.1		
8-10 hours	0	0.0		
11 hours and above	20	2.9		
Gaming experience (year)				
1 year	58	8.3		
2-4 years	198	28.4		
5-7 years	174	24.9		
9-10 years	128	18.3		
11 years and above	140	20.1		
Starting age			14.26	6.13

Note. N=698. All variables have no missing value except starting age with 4 missing value.

Table 4.3 (Continued)

Frequency Distribution of Participants for Demographic Variables and Main Variables

	n	%	*M*	*SD*
Average monthly spend (RM)				
0-100	575	82.4		
101-200	65	9.3		
201-300	27	3.9		
301-400	13	1.9		
401 and above	18	2.6		
Family members play				
Yes	481	68.9		
No	217	31.1		
<u>**Main variables**</u>				
IGD's symptoms			21.46	6.44
High (≥21.46)	313	44.8		
Low (<21.46)	385	55.2		
Achievement motivation			45.29	9.72
High (≥45.29)	347	49.7		
Low (<45.29)	351	50.3		
Social motivation			34.22	6.93
High (≥34.22)	331	47.4		
Low (<34.22)	367	52.6		
Immersion motivation			40.37	9.80
High (≥40.37)	344	49.3		
Low (<40.37)	354	50.7		
Depression			5.52	4.06
High (≥5.52)	302	43.3		
Low (<5.52)	396	56.7		

Note. N=698. All variables have no missing value except starting age with 4 missing value.

Multiple Linear Regression Assumptions

   Types of variables. In multiple linear regression, each variable used in the study was preferably to be in metrics form. This assumption was met in present study since the variables used were all continuous variables.

Independent. The data of any particular subject in present study was independent of the data of all other subjects (Berry, 1993), in which indicated that the participants in present study were independent from the others.

Multicollinearity. Moreover, multiple linear regression (MLR) model assumed that there is no multicollinearity in the data. According to Table 4.4, the Variance Inflation Factor (VIF) values for each predictor were less than 10, while tolerance values were larger than .10 (Keith, 2006; Shieh, 2010). This indicated that the multicollinearity assumption was not violated.

Table 4.4

Collinearity Statistics

	Tolerance	VIF
Achievement	.456	2.193
Social	.506	1.975
Immersion	.487	2.052
Depression	.958	1.043

* refer to Appendix C, p. 86 for the SPSS output.

Independent error. The fourth assumption of MLR model was independent error, and Durbin Watson test was used to check for this assumption. It was suggested that the benchmark for this test was from one to three, and preferably close to two (Reddy & Sarma, 2015). Referring to Table 4.5, this assumption was met in present study as the data analysis showed that the value did not exceed the benchmark.

Table 4.5

Independent Error Test

Model	Durbin-Watson
1	1.853

Note. Predictors: Achievement, social, immersion, and depression
Dependent variable: IGD

* refer to Appendix C, p. 86 for the SPSS output.

Multivariate outliers. One of the assumptions of MLR model included multivariate

outliers should be removed. To check for multivariate outliers, Mahalanobis distance, Cook's

distance and Centered Leverage distance were used to test. The results were shown in Table

4.6. Using the standard deviation of two, the result showed that there were 29 cases exceeded

the standard deviation of two and being labelled as potential multivariate outliers. After

checking with the benchmark of Mahalanobis distance (Barnett & Lewis, 1978), Cook's

distance (Cook & Weisberg, 1982), and Centered Leverage distance (Hoaglin & Welsch,

1978), none of the cases found violated Mahalanobis distance and Cook's distance, whereas

the Centered Leverage distance with the benchmark of 0.014 were violated by four cases.

However, these four cases were not removed as the other two distances showed no violation.

Table 4.6

Multivariate Outliers Tests

		Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value
Group_ MO	1	30	5.23887	.01267	.00752
	2	81	1.24756	.00298	.00179
	3	97	3.09995	.00506	.00445
	4	108	2.01825	.00700	.00290
	5	114	3.46397	.00884	.00497
	6	135	3.69075	.00647	.00530
	7	170	3.72513	.00666	.00534
	8	247	13.51697	.02106	.01939
	9	272	1.19718	.00260	.00172
	10	282	7.32525	.02003	.01051
	11	301	4.60219	.00761	.00660
	12	331	2.81428	.00719	.00404
	13	340	7.68869	.01060	.01103
	14	343	3.47608	.00529	.00499
	15	359	11.74032	.04756	.01684
	16	406	8.53412	.01837	.01224
	17	449	7.12475	.01112	.01022
	18	457	6.62254	.02213	.00950
	19	468	6.87840	.01037	.00987
	20	471	14.85511	.02267	.02131
	21	533	10.14859	.02277	.01456

Table 4.6 (Continued)

Multivariate Outliers Tests

		Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value
Group_ MO	22	538	2.98974	.01297	.00429
	23	556	9.07441	.01242	.01302
	24	563	8.05786	.01355	.01156
	25	582	5.49419	.01466	.00788
	26	634	1.83943	.00347	.00264
	27	637	4.20232	.00644	.00603
	28	669	1.35427	.00313	.00194
	29	675	2.06359	.00556	.00296
	Total N		29	29	29

Linearity, residual normality and homoscedasticity. Furthermore, MLR model required linearity of residual, residual normality and lastly, homoscedasticity. According to Figure 4.1, the scatterplot showed that the assumptions for linearity, residual normality and homoscedasticity were met.
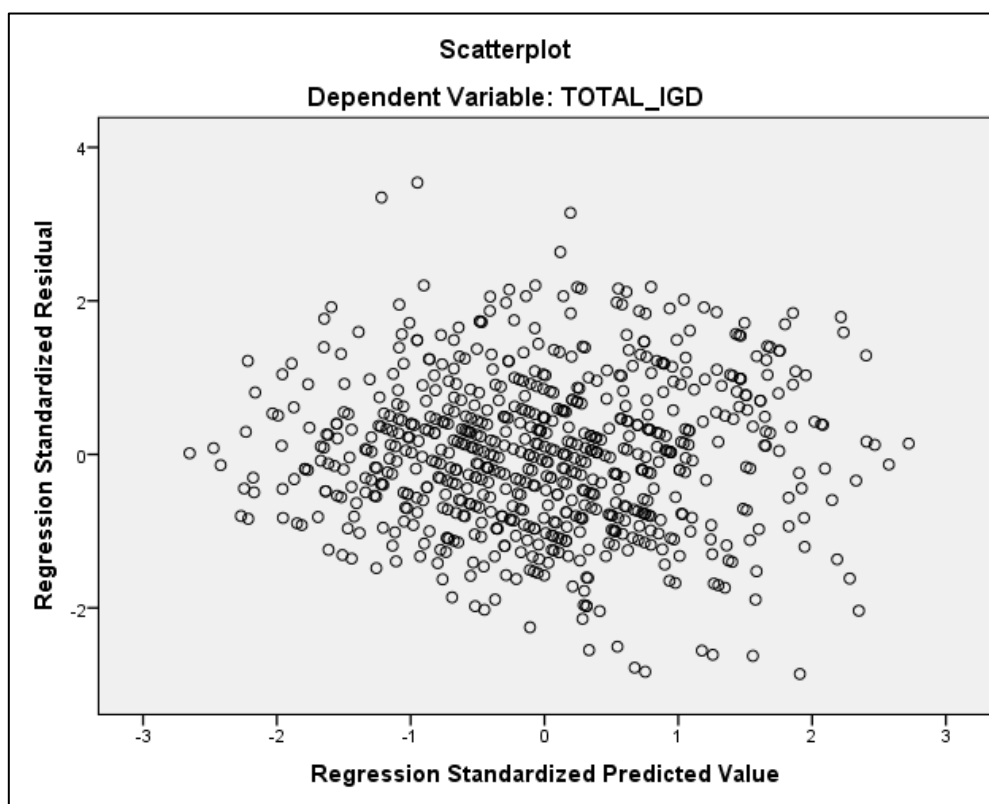
Figure 4.1. The scatterplot showed that the assumptions for linearity, residual normality and homoscedasticity were met.

Multiple Regression Analysis

Multiple regression analysis was used to test if depression and motivation of gaming significantly predict IGD's symptoms. The model was statistically significant, $F(4, 693) = 78.615, p < .001$ and accounted for 30.8% of the variance. It was found that immersion motivation ($\beta = .378, p < .001$), depression ($\beta = .295, p < .001$), and achievement motivation ($\beta = .161, p = .001$) significantly predict IGD's symptoms, but not social motivation ($\beta = -.081, p = .069$) (Refer to Table 4.7 and 4.8).

Table 4.7

Result of Regression Model

	df	F	p	Adj. R^2
Regression	4	78.615	.000	.308
Residual	693			
Total	697			

Note. Dependent variable = IGD's symptoms. Predictors = achievement motivation, social motivation, immersion motivation, depression.

*refers to Appendix C, p.86 for SPSS output.

Table 4.8

Result of Regression Coefficient

	t	Std. β	p
Achievement motivation	3.458	.161	.001
Social motivation	-1.821	-.081	.069
Immersion motivation	8.385	.378	.000
Depression	9.164	.295	.000

Note. Dependent variable = IGD's symptoms.

*refers to Appendix C, p.86 for SPSS output.

Summary of Results

In conclusion, Table 4.9 showed that the H1, H2 and H4 hypotheses were supported, while the H3 hypotheses was not supported by the present study.

Table 4.9

Summary of Results

Hypotheses	Std. β	*p*	Decision
H1: Depression positively predicts Internet gaming disorder symptoms among Malaysian youths.	.295	.000	Supported
H2: Achievement motivation positively predicts Internet gaming disorder symptoms among Malaysian youths.	.161	.001	Supported
H3: Social motivation positively predicts Internet gaming disorder symptoms among Malaysian youths.	-.081	.069	Not supported
H4: Immersion motivation positively predicts Internet gaming disorder symptoms among Malaysian youths.	.378	.000	Supported

Chapter V

Discussion

The aim of present study was to determine whether depression and motivation of gaming significantly and positively predicted IGD's symptoms. The result from regression model of present study showed that depression, achievement motivation and immersion motivation were the positive significant predictors of IGD's symptoms, while social motivation was a negative non-significant predictor of IGD's symptoms.

H1 Depression positively predicts Internet gaming disorder symptoms among Malaysian youths.

According to the results of the current study, it supported the hypotheses and share similarity with several past studies (Brunborg et al., 2014; Burleigh et al., 2017; Liu et al., 2018; Vanzoelen & Caltabiano, 2016; Wang et al., 2018). The possible reasons and explanations are online games can help to harmonize or vary mood, counteract or offset the challenges faced in daily life via use online games as a platform to escape from reality and problematic relationships. Online games can provide positive feelings at first and might enjoy the feeling of success and the power that could dominate and become master that unable to get in real-life situations and unconsciously leads to addiction gradually, thus, cause dysfunction in life incline due to addiction in Internet gaming and unsolved obstacles in reality (Caplan, 2007; Kardefelt-Winther, 2014a; Stavropoulos et al., 2015). Moreover, Internet games provide a sense of security as they are hidden and other players are strangers which they can bravely tell their story and divulge their resentful and dissatisfaction of daily life and release their real emotions and also secret. They may feel safe to tell other players that they trusted about their sadness or problems and try to get understanding, encourages or solutions from others (Caplan, 2003; Caplan, 2005; Morahan-Martin, 1999). Besides, Internet games might provide need fulfilment that individuals are failing to gain their needs satisfied

in real-life situation that associated with depression (Scerri, Anderson, Stavropoulos, & Hu,

2018). Individuals who unable to satisfice their needs in real-life and feel distress will tend to

seek for ways to reduce distress and satisfied their needs through playing games may fulfill

their needs such as dominant in games, make friends, communicate and share their

experiences with other players which lead to become difficult to separate from games as

much feelings and efforts had paid in the gaming world and thus it becomes a negative cycle

(Anderson, Steen, & Stavropoulos, 2016).

H2 Achievement motivation positively predicts Internet gaming disorder symptoms

among Malaysian youths

The findings of present study had supported the second hypothesis which is also

showed similar results with the past researches (Beard & Wickham, 2016; Carlisle, 2017;

Hussain et al., 2015; Kuss et al., 2012; Lehenbauer-Baum et al., 2015; Lewis, 2016; Zanetta

Dauriat et al., 2011). The possible reason might be the operant conditioning of reinforcement

occurred in the process of gaming (Skinner, 1958). The achievement motivation that gives a

sense of rewarding such as feeling excited when beating opponent players and snatched their

property, which had served as a reinforcement to the participants' gaming behaviour, thus led

them to continuously playing games to attain higher rank and greater power. Meanwhile, in

order to achieve higher in the games, they required to sacrifice much of their time, and put

much effort on seeking and thinking ways to beat opponent, which result in most of their

times and minds were occupied by games, and eventually impact their normal daily routine

which met with the IGD's symptoms. Another possible factor might relevant to needs

fulfilment. Study from Scerri and his colleagues (2018) found that lack of need fulfilment in

real life will prompt to IGD behaviour, which can explain why achievement motivation will

predict IGD's symptoms, as achievement-oriented gamers had fulfilled the needs that they

might deficit in real life, such as gaining sense of control, accomplishment and respect in

gaming. Thus, they continue play games to fulfil their real-life unfulfilled needs of

achievement, which can lead to overtime on playing game and IGD's symptoms.

H3 Social motivation positively predicts Internet gaming disorder symptoms among

Malaysian youths

However, the third hypothesis was not supported by results of present study. In

contrast with past studies (Beard & Wickham, 2016; Carlisle, 2017; Hussain & Griffiths,

2009; Hussain et al., 2015; Lewis 2016; Wartberg, Kriston & Kammerl, 2017; Xu, Turel, &

Yuan, 2012; Zanetta-Dauriat et al., 2011), the present study found social motivation as a

negative non-significant predictor of IGD's symptoms. This might due to social motivation

had stimulated better social interaction and social support, which helps in promoting the

gamers well-being instead of bringing negative impact to them and leading them to higher

risk of IGD's symptoms (Kneer & Rieger, 2015; Sandstrom & Dunn, 2014). Unlike

achievement-oriented and immersion-oriented gamers, social-oriented gamers play games to

maintain relationship with existing friends as well as making new friends, which they did not

use gaming as substitute or maladaptive means to attain goals, fulfil needs and deal problems,

but use it as a platform to socialize. Thus, when they playing games, they might actually

create bonds with other, widen their social network, strengthen their social relationship, gain

social support and improve their social skills. Some studies also support this view as they

found that gaming social capital, which means the concept of forming social ties with

gaming-related community, will actually positively affect the face-to-face social capital, in

simple, development in online social will foster development in offline social in the way that

gamers learned how to communicate and interact with other gamers online, then applied it in

real-life or offline communications (Molyneux, Vasudevan & Gil de Zúñiga, 2015; Trepte,

Reinecke & Juechems, 2012). Therefore, it reduced the negative impacts of gaming

behaviours and decreased possibility of involving in IGD's symptoms.

H4 Immersion motivation positively predicts Internet gaming disorder symptoms among Malaysian youths

Lastly, similar with past studies (Billieux et al., 2013; Carlisle, 2017; Cross, 2016; Kardefelt-Winther, 2014b; Kneer & Rieger, 2015; Laconi et al., 2017; Li et al., 2011; Šporčić & Glavak-Tkalic, 2018; Xu et al., 2012; Zanetta Dauriat et al., 2011), the results of present study found that immersion motivation positively predicted IGD's symptoms, which had supported the fourth hypothesis. This is because immersion-oriented gamers might involve in projecting ideal self and perfect storyline that hardly be reached in real life into gaming virtual world, for example they wish to have good appearance and dress up very nice in real life but can be hardly to reach this ideal self in real life, thus they projecting this wish into gaming world through customizing the appearance of gaming character or avatar. This can then lead them to elicit more fond of the customized self in gaming environment than reality, and increase or strengthen their identification with their gaming character or avatar, thus spent large amount of time and energy to gaming world, and result in detaching from reality which is risky to IGD's symptoms (Sioni et al., 2017; Turkay & Kinzer, 2014). Another possible reason might be maladaptive coping strategy was used by immersion-oriented gamers to deal with negative emotion brought by real life problem, which involve in escaping the real life problem though playing games (Blasi et al., 2019). This escapism had connived the initial problem "snowballing" and creating more problems that eventually negatively impact their well-being, and lead to negative outcomes of gaming behaviour including excessive gaming that is contributed to IGD's symptoms (Kardefelt-Winther, 2014b). Study from Kaczmarek and Drążkowski (2014) also provided possible reason explained why immersion motivation predicted IGD's symptoms, because escapism will lead to longer time spent in gaming and stronger game realism belief in which gamers perceived believed the gaming world is as realistic as the real world.

Implications

Theoretical implications. This study could rebound and contribute to society in few different ways. It enables society to pay concern on issues, factors, depression, and motivation of gaming as well as Internet gaming disorder symptoms. This study also provides valuable information for understanding and offered references for further study and future research as no study focus on MOBA players that including depression, motivation of gaming, and IGD together in Malaysia context and only found limited past studies that separated these variables. Present study found that depression, immersion motivation, and achievement motivation were positive significant predictors of IGD's symptoms, while social motivation non-significantly and negatively predicts IGD's symptoms can provide better understanding and etiology for readers. It can clearly provide more details and demonstrate results that incorporate these variables together.

Practical implications. Other than that, the current study is able to raise awareness and strengthen the knowledge of public and readers on MOBA games, depression, motivation of gaming, and IGD and can refers to the different parts for better and clearer understanding. Society members and professionals could gain some useful ideas to apply in treatment and could be useful and effective which brings benefits to the community especially IGD population. For instance, to pinpoint the issues and factors to resolved the issues such as come out with an effective solutions targeted the problems accurately or detect the useful methods to guide them to learn about effective coping strategies, and enhance problem-solving skills to become more adaptive to the environment.

Next, Ministry of Youths and Sports, Ministry of Women, Family and Community, policymakers, mental health and care centre, practitioners, social workers, and counselor should cooperate together and pay more concern and efforts on spreading and promoting good stress management methods via various platforms including social media, as well as

organizing talks to teach and enhance skills to incline the ability to adapt and deal with life problems, also introducing helpful alternative coping strategies with guidance provided, in order to reduce gamers with high depression level, achievement-oriented gamers and immersion-oriented gamers, who are prompt to IGD's symptoms.

Limitations of Study

There are several limitations that present study need to be considered. Firstly, current study was a cross-sectional study, which all variables were measured at one point in time (Mann, 2003). However, IGD is considered as an addictive behaviour which is persistent and recurrent (APA, 2013). By measuring variables at one time was not sufficient to examine the long-term development of IGD.

Another limitation in the present study was the use of self-report online questionnaires and their associated possible bias, such as social desirability bias Social desirability bias refers to the tendency of individuals present themselves in the most favourable manner due to the social norms and social acceptance (King & Bruner, 2000). For instance, there was a risk that the participants who have completed the questionnaires might not truthfully report for their actual responses due to the social desirability effect. This potential bias might consequently influence the accuracy of the final results in present study.

In addition, the findings of present study suggested that IGD was only 30.8% explained by the predictors which are depression and motivation of gaming. This indicates that there are approximately 70% can be explained by other potential risk factors.

Moreover, the present study only focused on youths with age range between 18 to 29 years old. It was stated that other age groups might also at risk of developing IGD's symptoms, especially adolescents. Griffiths (2011) revealed that addictions tend to have precursors during adolescence. Further, video gaming is more appealing to adolescents and it is reasonable to suggest that they might be more risky and vulnerable to develop gaming

addiction or IGD (Kuss & Griffiths, 2012a). Hence, examining solely on youths aged

between 18 to 29 is insufficient to deal with the development of IGD in the whole population.

The last limitation found in the present study was the ratio of the gender and the races

were not proportionate. This was because the present study was not aimed to explore on the

gender difference or racial difference on IGD's symptoms or other key variables, hence this

criteria was not importantly emphasize in the present study. Future research which study on

difference in gender and races should ensure that the sample is collected with gender and

races equally proportionate.

Recommendations of Study

Internet gaming disorder is considered as an addictive behaviour which requires a

long period of time to examine on its development. Further studies are recommended to apply

longitudinal study design to investigate on IGD. Longitudinal study which applies repeated

measurements of the same subjects over a period of time, is more enough and effective in

measuring a detectable change in an individual's developmental status of the outcome

variable (Rajulton, 2001). Further, longitudinal design is useful for examining cause-and-

effect relationship between risk factors and the development of particular behaviour over a

time span (Caruana, Roman, Hernández-Sánchez, & Solli, 2015). Hence, future research can

adopt longitudinal study design to examine the relationship between risk factors and IGD

since this design might produce a more reliable and accurate results.

In term of the limitation caused by social desirability bias, future research should take

this issue into account to consider for the study's findings. To overcome social desirability

bias, future studies could include validated scale such as Marlowe-Crowne Social Desirability

Scale to detect and overcome this bias (Pontes, Király, Demetrovics, & Griffiths, 2014).

Although present findings found that IGD was significantly predicted by depression,

achievement motivation, and immersion motivation, the variance only accounted for 30.8%,

and there are about 70% can be predicted by other more important risk factors on IGD. Thus, future research is recommended to study and explore more on other potential variables that will significantly predict IGD. By exploring other potential predictors, a more effective and comprehensive intervention can be made in order to reduce the risk of developing IGD among Malaysian youths.

The present study only targeted on youths aged between 18 to 29 to explore on IGD and other key variables. Future research is recommended to widen and explore more on other age groups which also at risk for developing IGD's symptoms, especially for adolescents. Since adolescents are consider as a vulnerable group towards addictive behaviours and IGD, by studying and understanding on their behaviour, earlier detection and interventions can be carried out to prevent more severe consequences to happen.

Lastly, the ratio of gender and races in present study were not proportionate. Future research which aims to compare on the difference of gender and races on IGD or other key variables is recommended to collect participants with gender and races equally proportionate. Stratified random sampling method is suggested to use in order to collect a proportionate gender and races. This sampling technique applies when the population is divided into subgroups or also refers to strata, in which each unit belongs to a single stratum, and the researcher then selects units from those strata (Teddlie & Yu, 2007). For instance, if future research is focusing on the gender difference on IGD or other key variables, researchers have to separate the target population into two strata which is male and female, and select participants according to gender from the strata proportionately.

Conclusion

In conclusion, the present study has achieved the objectives to determine the predictive effects of depression and motivation of gaming towards IGD's symptoms among Malaysian youths. The present findings showed depression, achievement motivation, and

immersion motivation significantly and positively predicted IGD's symptoms, but social motivation not significantly, negatively predicted IGD's symptoms. The results indicated that youths with higher depression level, greater in achievement motivation and immersion motivation were predicted to have greater IGD's symptoms. The phenomenon of IGD on youths who play MOBA games are still being understudied in Malaysia context. It is important to put more attention on this issue since IGD brings negative impacts. Hence, the present study contributed the new findings to serve as a reference for future studies to explore more on this topic, and also provide useful information to relevant authorities to implement effective interventions for the youths, in order to promote a healthier and more positive gaming behaviour.

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Appendices

Appendix A

Calculation of Sample Size

Appendix B
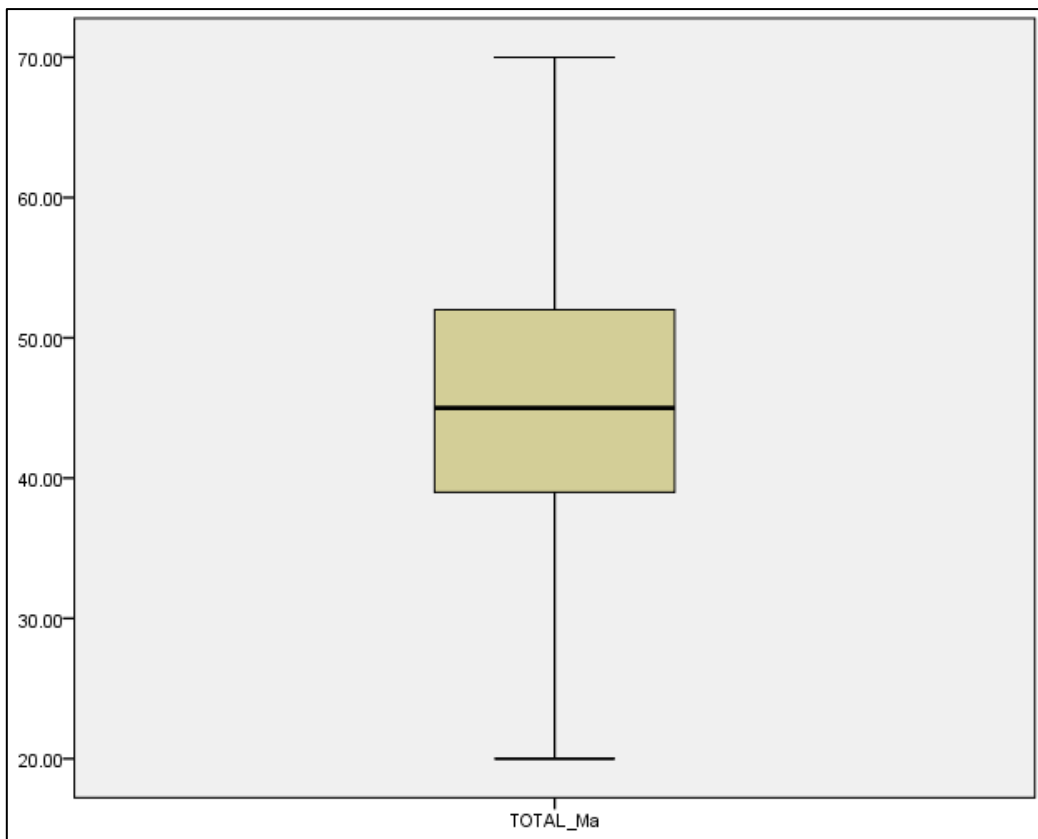
Examples of Gaming Groups in Facebook

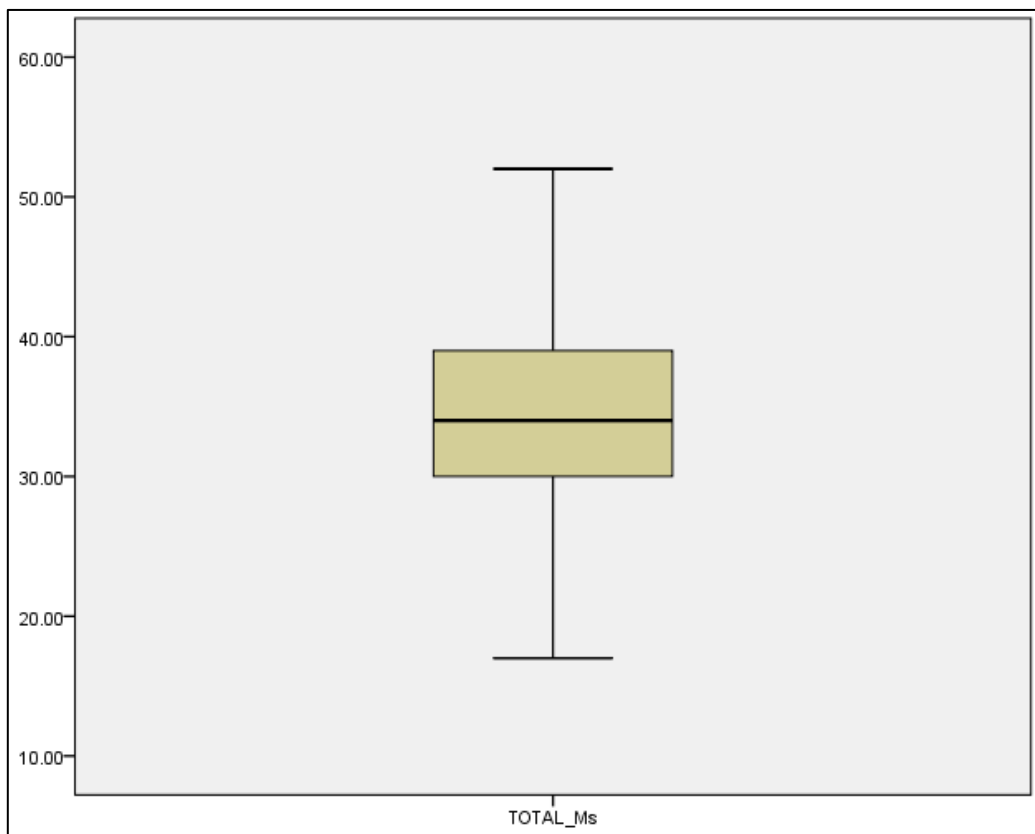Appendix C

Boxplots for Each Distribution without Outliers

IGD
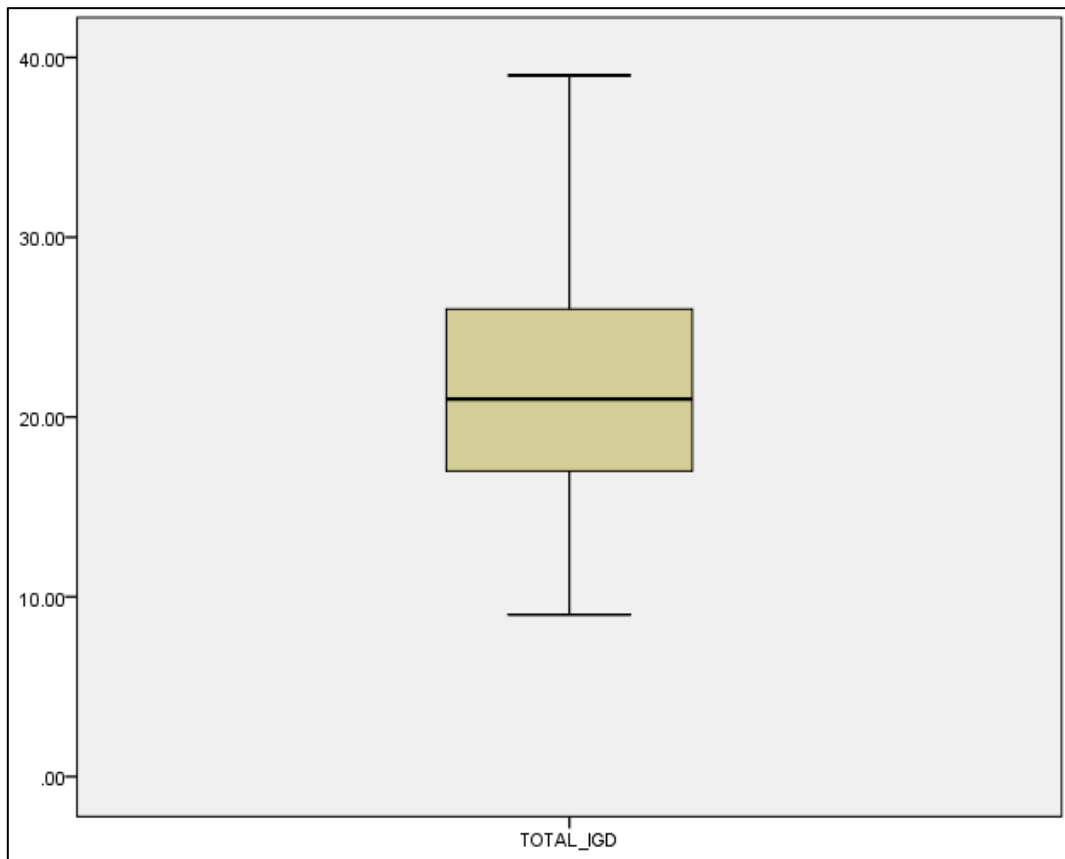
Achievement Motivation

Social Motivation

Immersion Motivation

Depression

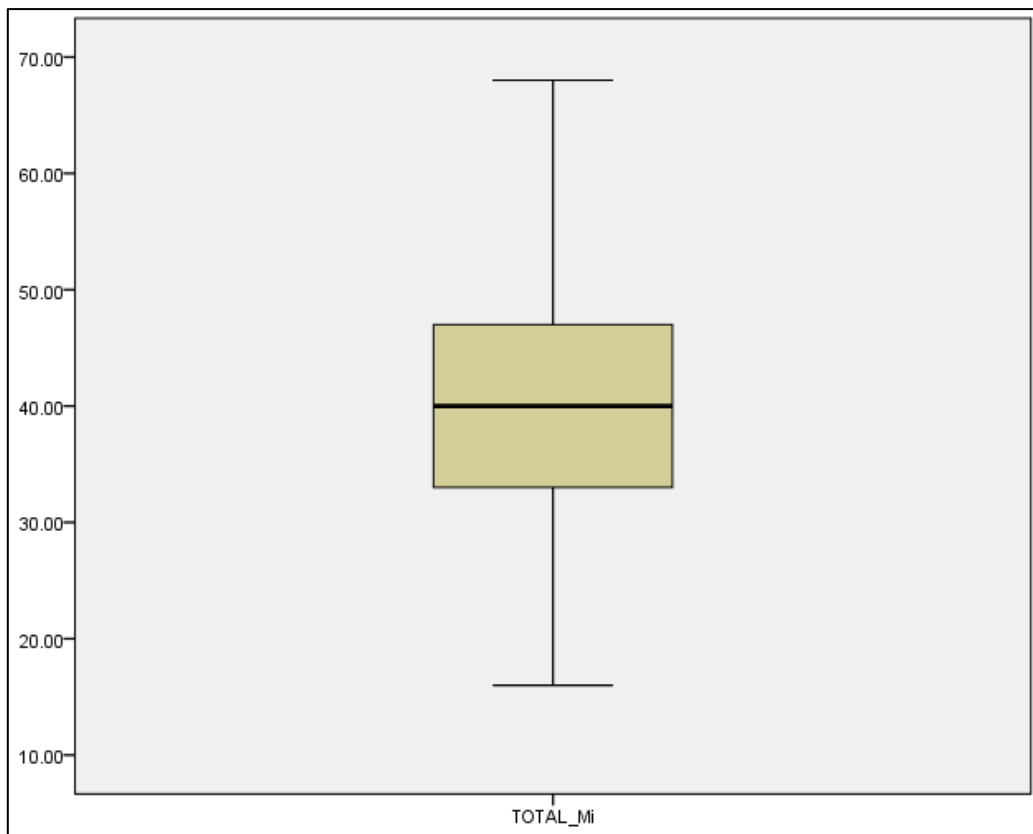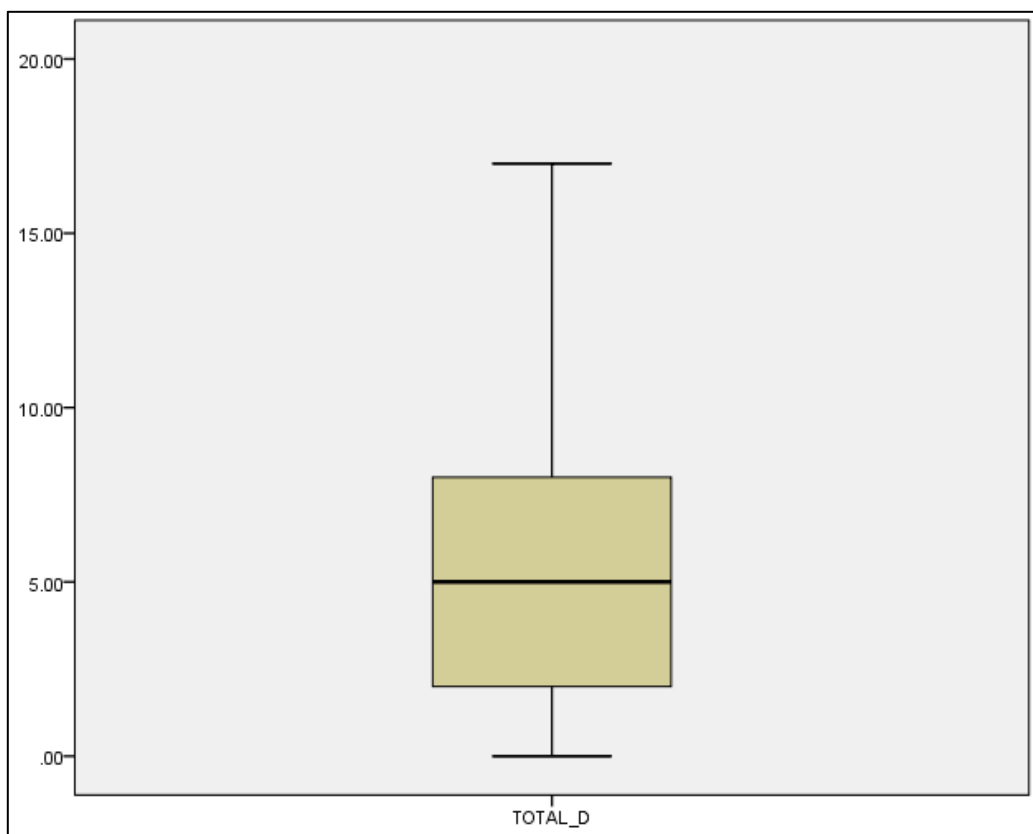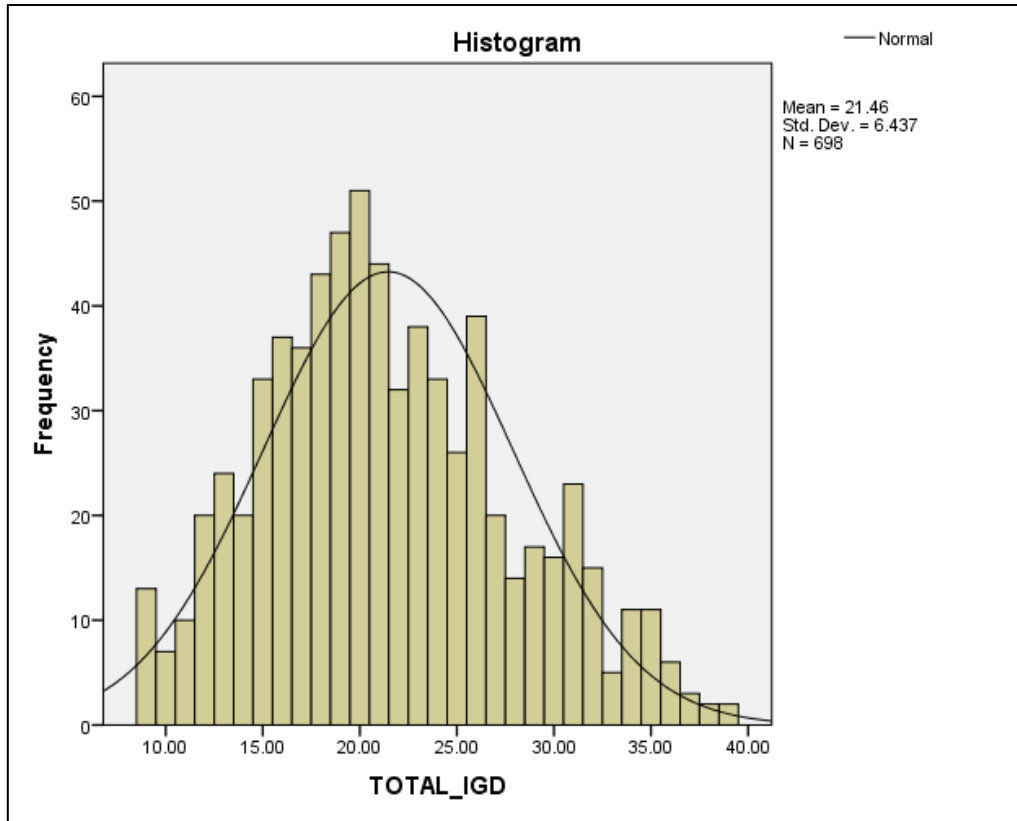Histogram for Each Distribution

IGD

Achievement Motivation
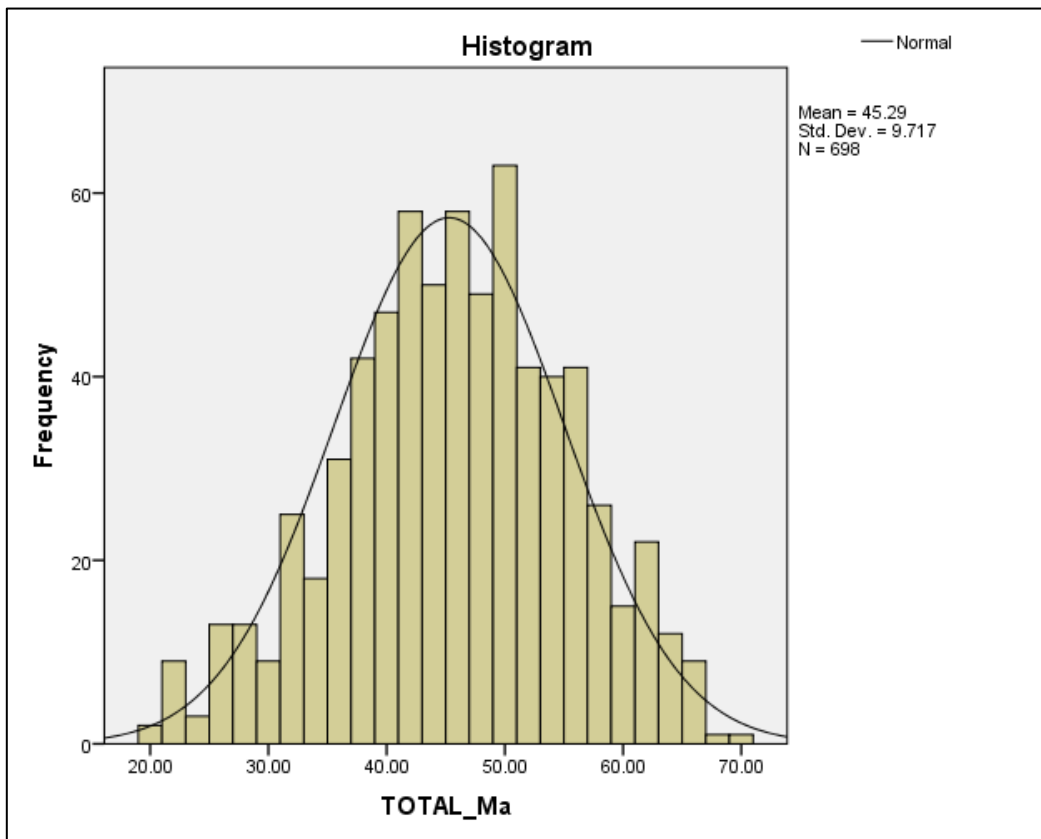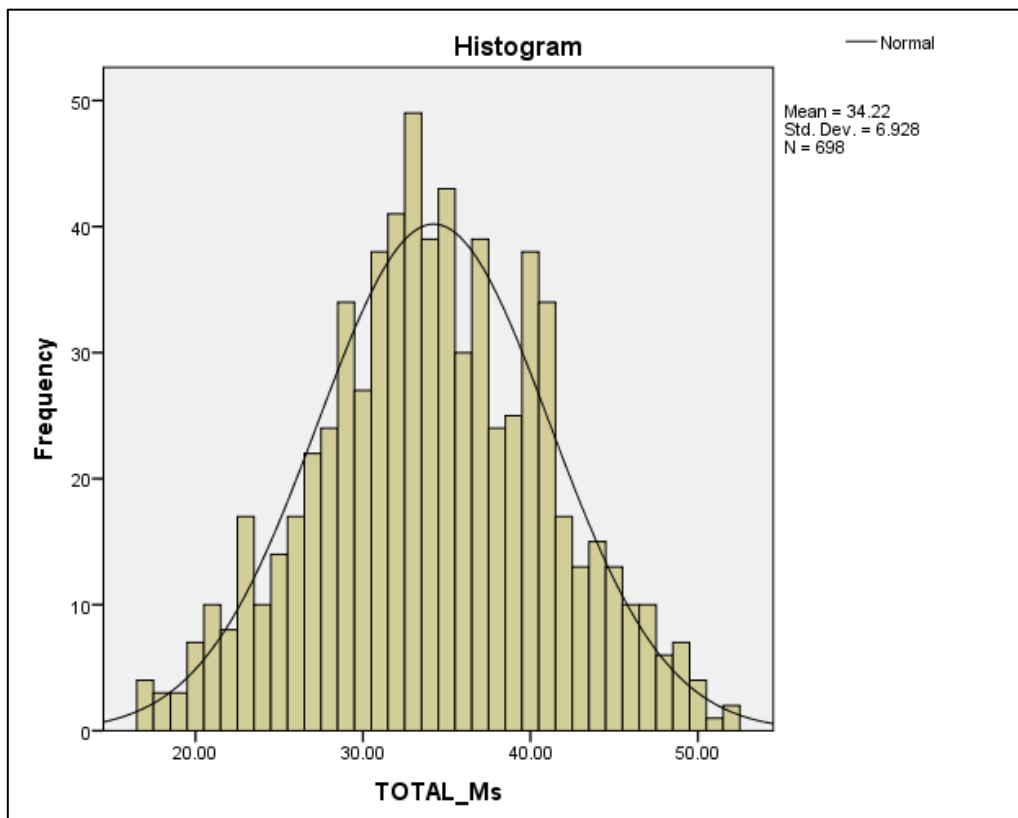

Social Motivation

Immersion Motivation

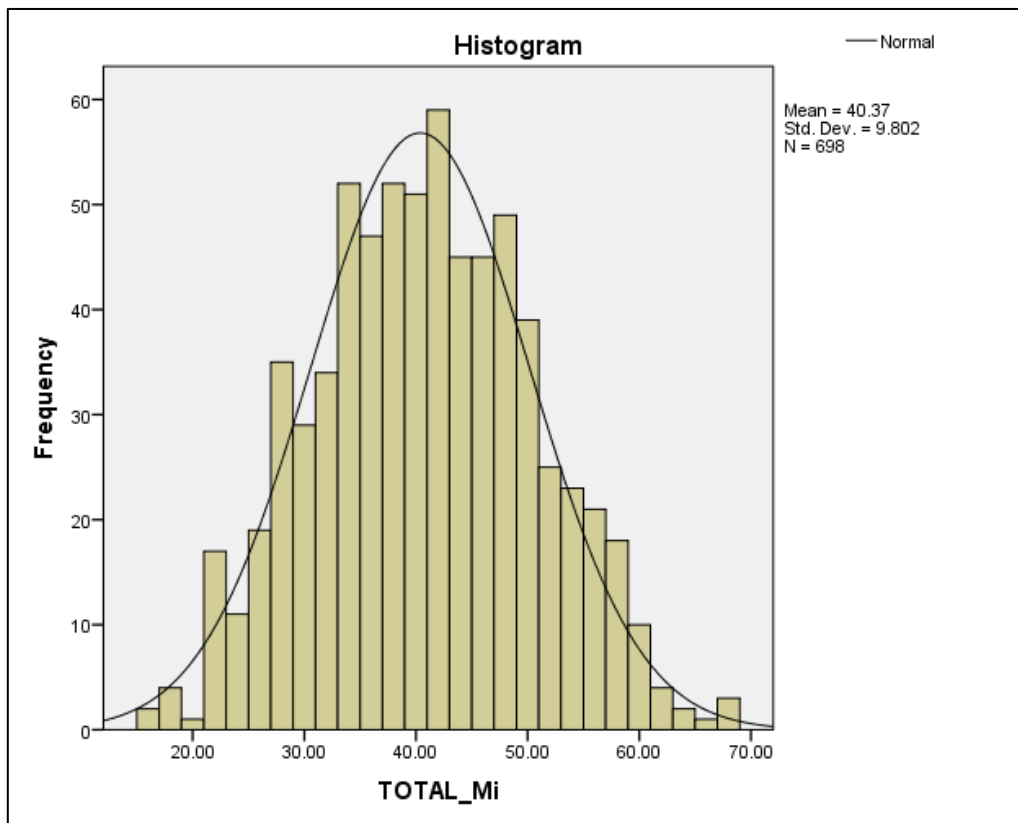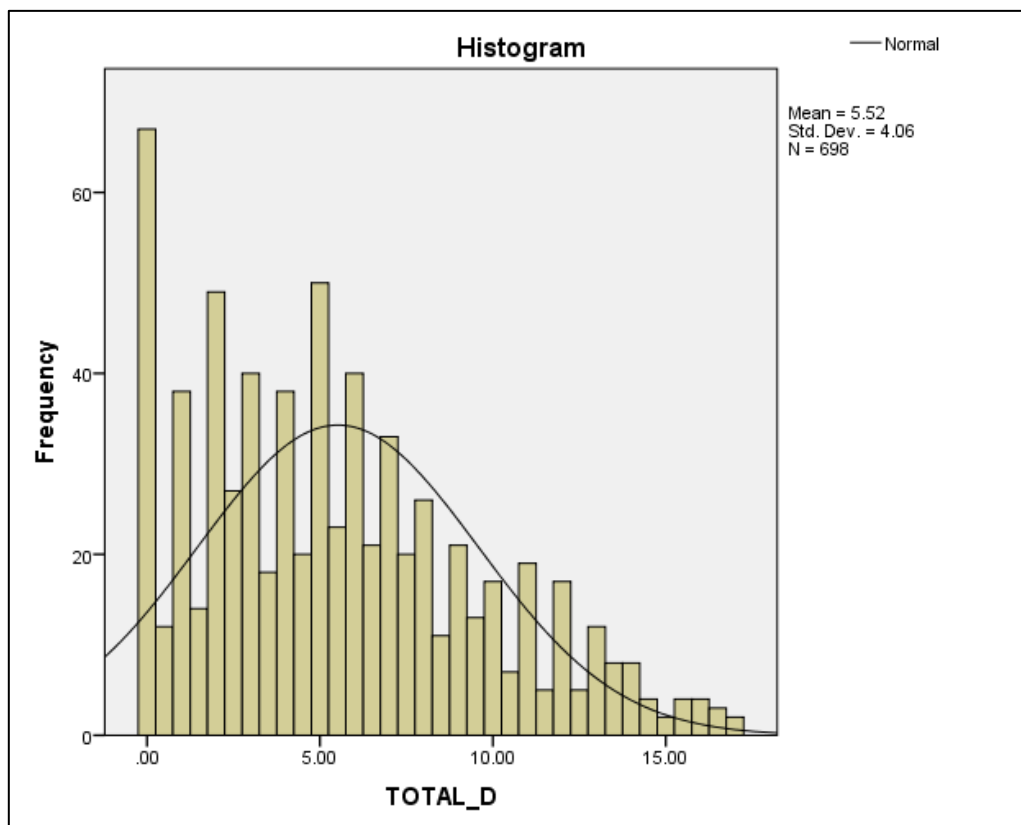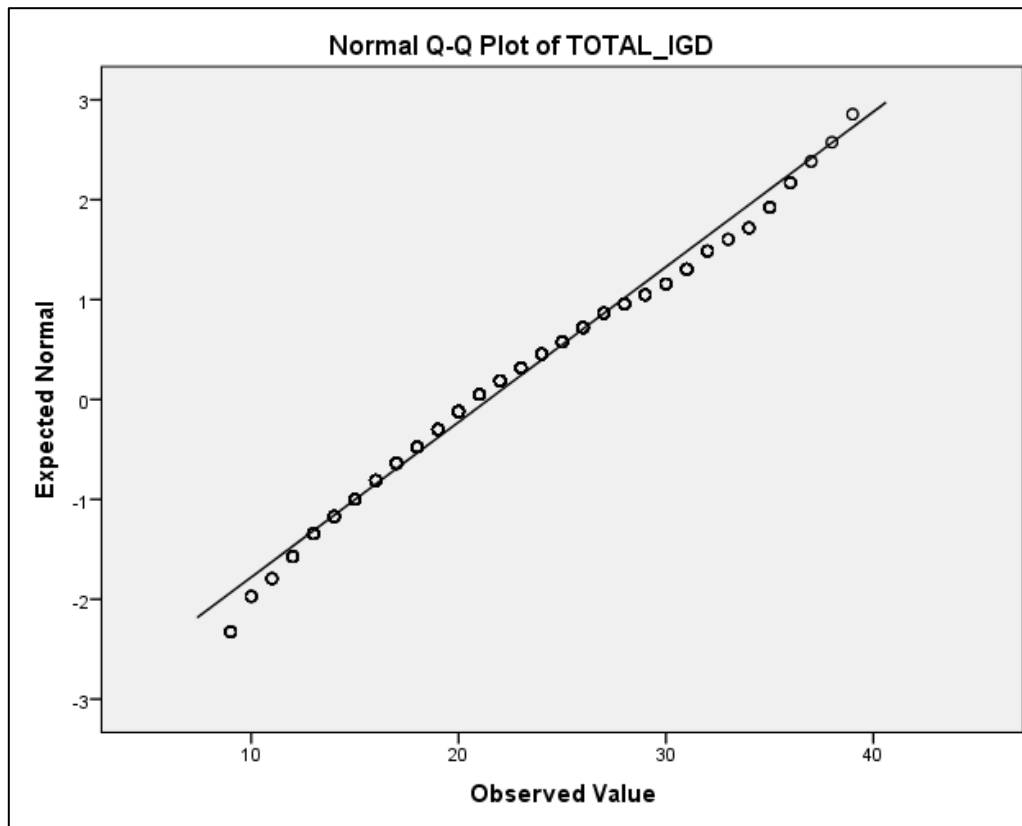Depression

Normal Q-Q Plots for Each Distribution

IGD

Achievement Motivation
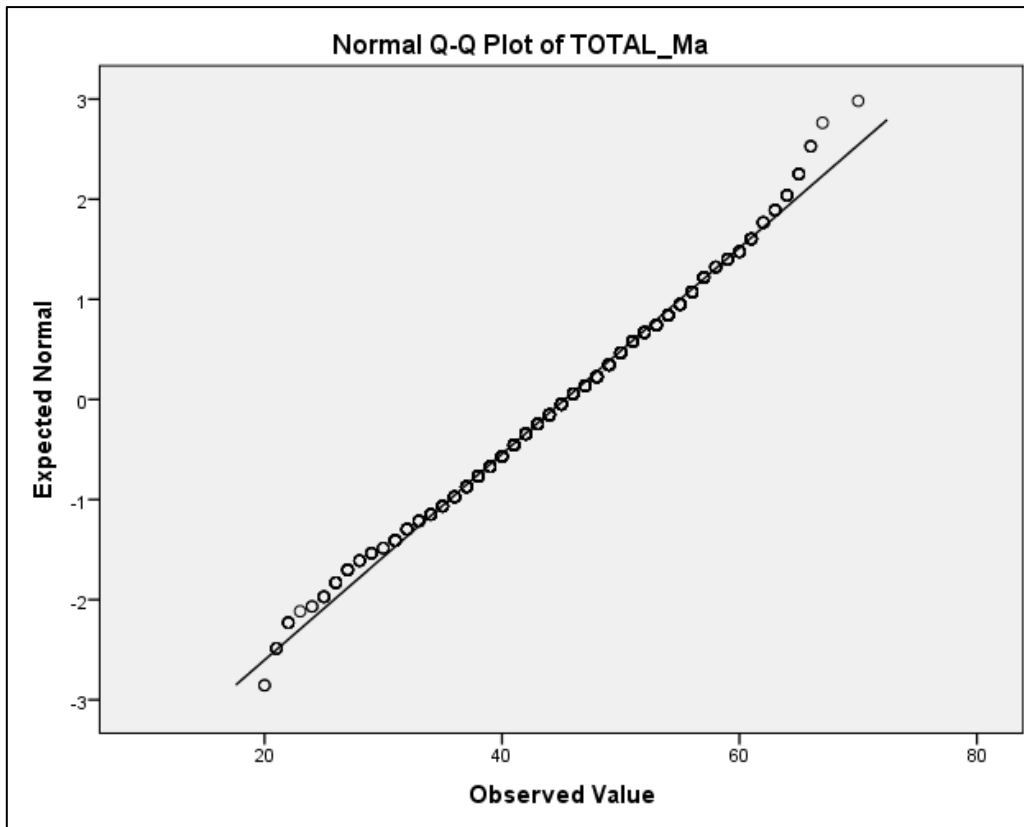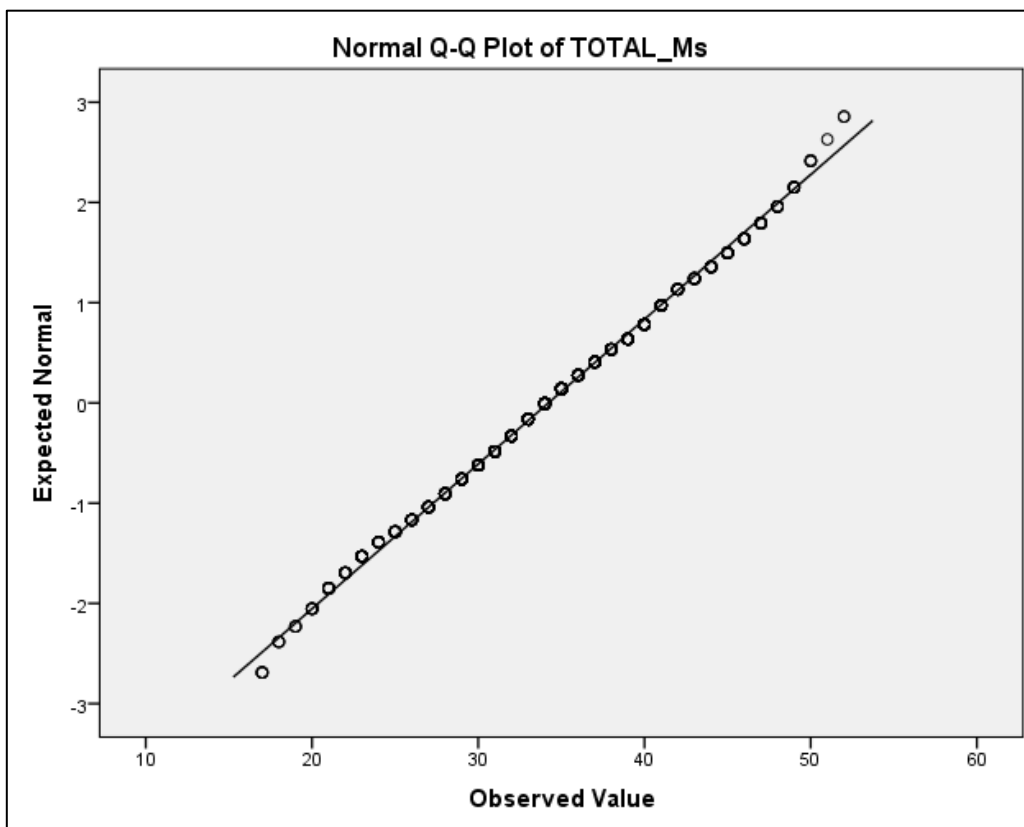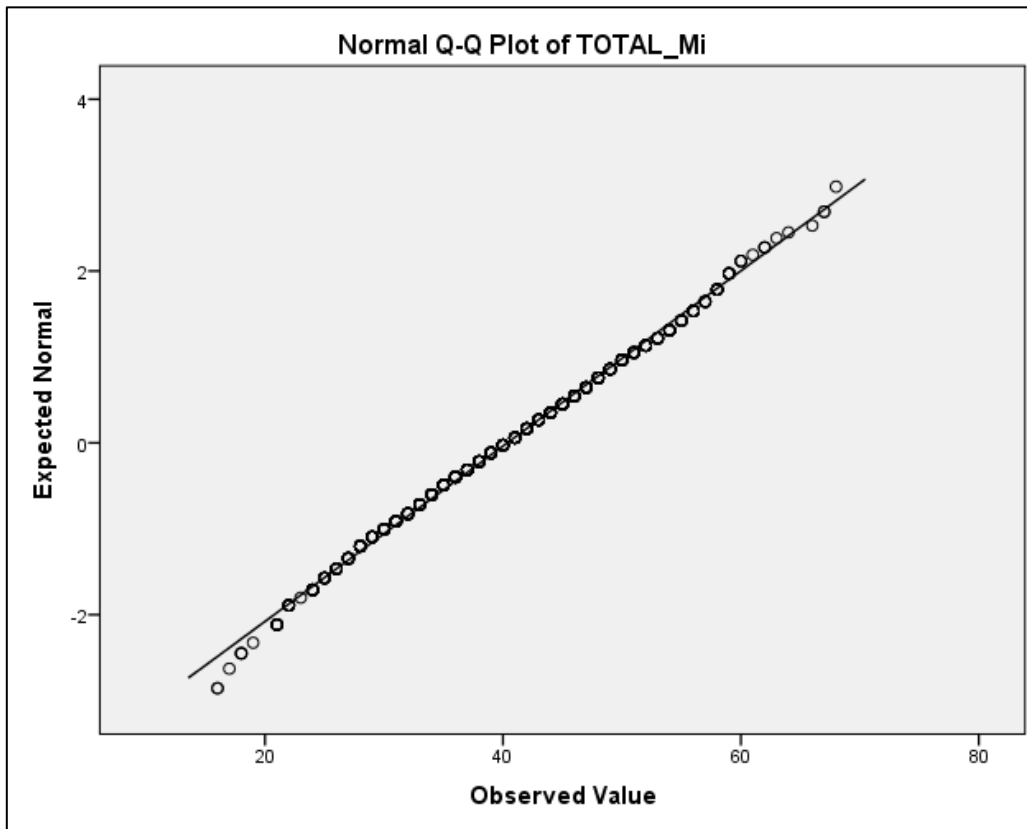

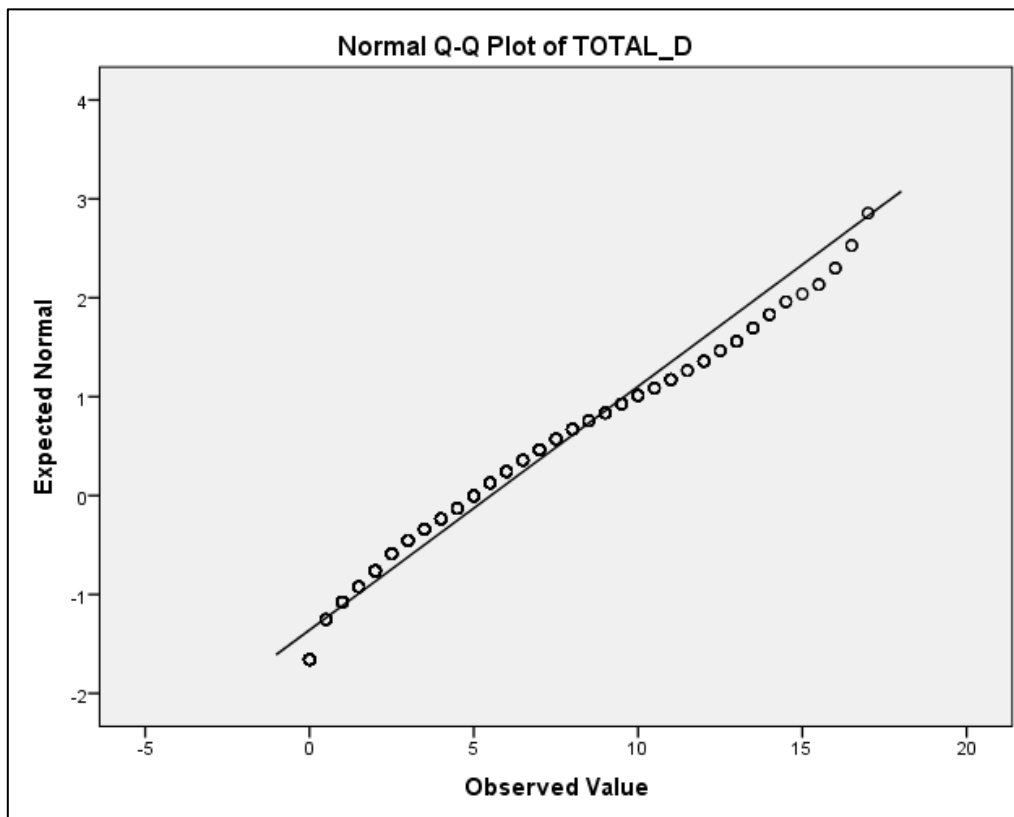Social Motivation

Immersion Motivation

Depression

Kolmogorov-Smirnov (K-S) Test for Each Distribution

IGD

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TOTAL_IGD	.080	698	.000	.981	698	.000

a. Lilliefors Significance Correction

Achievement Motivation

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TOTAL_Ma	.042	698	.005	.993	698	.002

a. Lilliefors Significance Correction

Social Motivation

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TOTAL_Ms	.043	698	.004	.994	698	.012

a. Lilliefors Significance Correction

Immersion Motivation

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TOTAL_Mi	.038	698	.021	.995	698	.027

a. Lilliefors Significance Correction

Depression

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TOTAL_D	.087	698	.000	.949	698	.000

a. Lilliefors Significance Correction

Variance Inflation Factor (VIF) Values and Tolerance Values

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	6.564	1.145		5.733	.000		
	TOTAL_Ma	.107	.031	.161	3.458	.001	.456	2.193
	TOTAL_Ms	-.075	.041	-.081	-1.821	.069	.506	1.975
	TOTAL_Mi	.249	.030	.378	8.385	.000	.487	2.052
	TOTAL_D	.468	.051	.295	9.164	.000	.958	1.043

a. Dependent Variable: TOTAL_IGD

Durbin-Watson Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.559[a]	.312	.308	5.35418	1.853

a. Predictors: (Constant), TOTAL_D, TOTAL_Ma, TOTAL_Ms, TOTAL_Mi

b. Dependent Variable: TOTAL_IGD