

ASSESSMENT OF PROBLEMATIC FACEBOOK USE AMONG UNDERGRADUATE STUDENTS IN UPM CORRELATED WITH DEPRESSION, ANXIETY AND STRESS

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ABSTRACT

Introduction: Facebook has emerged as one of the top social networking sites (SNSs) among university students but at the cost of leading to negative implications on psychosocial wellbeing. Psychological factors such as depression, anxiety and stress have been implicated in the development of addictions; however studies that evaluate this are scarce among the Malaysian population. Our objective was to identify problematic Facebook use among undergraduate students in Universiti Putra Malaysia (UPM) and to correlate the psychological factors that influence problematic Facebook use.

Methods: A cross sectional study was conducted among 1060 students from various faculties in UPM. Validated Facebook Addiction Test (FAT) and DASS-21 questionnaires were used to collect data. Descriptive analysis was done for demographic data. Pearson correlation and regression analysis were used in the analytical part.

Results: Problematic Facebook use was detected among 16.6% of the undergraduate students. Problematic Facebook use was significantly related to the level of depression, anxiety and stress ($p < 0.05$). Multiple regression analysis indicated that younger age, male gender and depression were significant predictors of problematic Facebook use ($p < 0.05$).

Conclusion: Problematic Facebook use is significantly related to the level of depression, anxiety and stress. Young male university students are more prone to problematic Facebook use than females. Depression plays an important role in the development of problematic Facebook usage, thus requires careful monitoring of young students for early detection and prevention.

Keywords: Internet Addiction, Malaysia, social networking, student psychology, university

1.0 INTRODUCTION

Facebook has been one of the most powerful and influential social networking sites on an international scale since its launch in the year 2004. Facebook recorded 1.2 million active users in 2006 which grew to 21 million members in 2007 within a period of one year (Ryan, Chester, Reece, & Xenos, 2014). To date, the latest report indicates that it has 1.45 billion daily active users and is one of the most widely used social platforms for social interaction, expression of identity, and building and understanding youth culture regardless of race, religion and country (<https://newsroom.fb.com/company-info/>). In 2018, statistics revealed that 27% active Facebook users globally were between the ages of 18-24 years (<https://www.statista.com/statistics/376128/facebook-global-user-age-distribution/>).

Additionally, the study by Kuss and Griffiths (2011) noted 68.5% of the teenagers to be active Facebook users. Furthermore, few studies have reported that gender plays a significant role in the development of Facebook addiction. Few studies found males to be more vulnerable to Facebook use as compared to females (Błachnio, Przepiórka, & Pantic, 2015; Çam & Işbulan, 2012). Facebook was initially a computer-mediated Social Networking Site (SNS), which has now been designed into a smartphone application, and continues to be one of the most popular means of communication and entertainment in many countries, including Malaysia. Facebook, being a handy and easily accessible communications tool that serves as a platform for photo-sharing recent updates and even free calling and instant messaging, has allowed distant relatives or friends to keep in touch with each other for the past decade. Facebook has proved its importance in increasing the level of communication among people (Chang, Lin, Lin, Chang, & Chong, 2014; Kerkhof, Finkenauer, & Muusses, 2011). Despite its benefits, there is a rising trend of Facebook preoccupation among the young generation leading to problematic use, thus causing many social and psychological problems among its users (Szczegielniak, Palka, & Krysta, 2013).

Compulsive use of Facebook has commonly been described as a behavioral addiction from a biopsychosocial perspective (Zaremohzzabieh, Abu Samah, Omar, Bolong, & Kamarudin, 2014). People with problematic use can range from preoccupation to addiction to Facebook, thus they will most likely experience a spectrum of addictive symptoms: ranging from mood modification to favorable mood change after being online, emotional preoccupation with Facebook, developing tolerance to longer duration of Facebook use and withdrawal symptoms if the usage of Facebook is restricted, as well as social and occupational impairment due to excessive Facebook use (Griffiths, 2013). Several tools have been developed to assess the usage

or overuse of Facebook and the resulting addiction to Facebook among different populations, especially the youth. The tools include validated questionnaires such as The Bergen Facebook Addiction Scale (BFAS) (Andreassen, Torsheim, Brunborg, & Pallesen, 2012), Facebook Attitude Scale (Tuğba, 2016), Behavioral Inhibition System (BIS) and Behavioral Activation System (BAS) (Yasuda & Sato, 2002). In addition to these questionnaires, the Facebook Addiction Test (FAT) developed by a clinical psychologist, Dr. Brent Conrad provides a simple scoring method and cutoff scores to determine problematic Facebook usage (Conrad, 2012).

It has been postulated that addiction in general is caused by the psychological nature of the individuals, which predisposes them to develop addictive behaviors (Lu et al., 2017; Munno et al., 2017). Another hypothesis is the environmental cues from their surrounding and the rewards and gratification that the individuals get by their repetitive addictive behaviors, which reinforces their need to seek the addictive object that they crave (Sundar & Limperos, 2013). In particular, regarding Facebook addiction, the positive biofeedback that the individuals receive from the comments and 'likes' that they receive from their Facebook friends will stimulate their reward system. This acts similarly to other types of addictions, whereby the object of the addiction will evoke a response in the cerebral dopaminergic reward system causing cravings, and perpetuating habits to maintain their euphoria (Yacubian & Büchel, 2009). Thus, among Facebook addicts this can result in a constant tendency to be online to gratify their urges and maintain a euphoric state of mind.

Furthermore, problematic Facebook use has been linked to adverse mental wellbeing such as depression, anxiety and stress. Depression is defined by DSM-5 criteria as a negative mental state characterized by persistent sadness, lack of pleasure/ loss of interest in leisure activities, emotional disturbances of feelings of worthlessness and diminished ability to concentrate (American Psychiatric Association, 2013). Additionally, there have been theories that indicate depression as a potential cause for individuals to develop an addiction (Koc & Gulyagci, 2013). Anxiety is defined by DSM-5 as a psychological factor that accompanies fear, worrying thoughts and tensed feeling (American Psychiatric Association, 2013). Anxiety can also have an influence over Facebook overuse as staying offline can generate more anxiousness and worry pertaining to the happenings around them, thus compelling them to frequently check their posts, profile and updates (Zaffar, Mahmood, Saleem, & Zakaria, 2015). Stress is defined by DSM-5 criteria as a state of being worried/ overwhelmed thus leading to psychological health issues (American Psychiatric Association, 2013). It has been reported that students indulge in social networking applications such as Facebook, to escape the levels of stress (Ching et al., 2017; Gabre & Kumar, 2012).

In Malaysia, only a few studies have looked specifically into the effects of Facebook addiction among university students. It was previously reported that the Facebook addiction prevalence was as high as 47% among young adults in a local university in Malaysia in 2016 (Jafarkarimi, Tze, Saadatdoost, & Mei Hee, 2016). However, to date, there has not been any study that investigated the relationship between problematic Facebook use and psychological factors in a large-scale population. Therefore, we aimed to look into the relationship between problematic

Facebook use and psychological factors and to identify the psychological factor that can predict problematic Facebook use among undergraduate students in a Malaysian public university.

2.0 MATERIALS AND METHODS

2.1 Subject Recruitment

After receiving ethical clearance from our institutional ethical board, Jawatankuasa Etika Universiti Untuk Penyelidikan Melibatkan Manusia (JKEUPM) (UPM/TNCPI/RMC/1.4.18.2), we distributed 1362 sets of questionnaires to undergraduate students from various faculties in Universiti Putra Malaysia (UPM) by advertising in student notice boards and student portals as well as soliciting help from lectures. We recruited the respondents by using the convenience sampling method. The sample size calculation was based on a prevalence study conducted among student population (Pourhoseingholi, Vahedi, & Rahimzadeh, 2013). The sample size formula is:-

$$n_r = \frac{Z^2 P(1-P)}{d^2}$$

with the prevalence of addiction, $P = 0.084$ (Agency-NISA, 2012), $Z = 1.96$ and d (precision of an estimate) of 0.0168, generated a required sample size of 1048. To counter for potential dropouts, we distributed 1362 sets of questionnaires. We achieved a total of 1060 students who responded to our questionnaires with a response rate of 77.8%.

2.2 Tool for Data Collection

A proforma document was distributed to the undergraduate students in UPM to gather socio-demographic information, to identify the frequency of smartphone usage and the most frequently used social networking applications.

We utilized the Facebook Addiction Test (FAT) questionnaire which was developed by a clinical psychologist, Dr. Brent Conrad (Conrad, 2012) to assess the prevalence of problematic Facebook use among the students. The Depression, Anxiety and Stress Scales (DASS-21) questionnaire was also distributed to the respondents to determine their psychological well-being (Lovibond, 1996). All information from respondents was anonymized and no incentives were provided to the respondents. Participation in this survey was voluntary and the students provided informed consent to be involved in this study, in keeping with the Declaration of Helsinki principles. The students were made clear that their responses or denial to join this study would not affect their grades.

2.3 Facebook Addiction Test (FAT) Questionnaire

The FAT is a questionnaire to assess problematic Facebook use. Validation of the FAT questionnaire was performed in reference to the Kuder Richardson reliability testing method. The

Cronbach's alpha (α) value was 0.872 with 95% Confidence Interval [CI], which reflected an optimal internal consistency of this questionnaire as an assessment tool for detecting problematic Facebook use among the respondents (Mehdizadeh, 2010). The questionnaire consisted of 29 items with "True" and "False" responses for each statement. All the items are positively worded statements, thus 1 mark will be assigned to every "True" response and 0 marks for every "False" response. The total score for 29 items was added together and further classified into 4 categories based on the total score: (i) light user (0-5 score); (ii) moderate user (6-10 score); (iii) unhealthy or problematic user (11-20 score); and (iv) addicted (> 20 score). We define problematic Facebook use as users with a score of 11 and above, comprising the unhealthy/problematic and addicted user groups.

2.4 Depression Anxiety and Stress Scale (DASS-21) Questionnaire

DASS-21 was utilized to study the severity of the symptoms of depression, anxiety and stress. The reliability estimates of this questionnaire in detecting depression were reported to be $\alpha = 0.85$; 95% confidence interval [CI] (Osman et al., 2012). It involves 21 statements describing different symptoms in the above mentioned mental health traits (7 questions for each trait). The respondents are required to rate their severity on a Likert scale of 0-3 for each statement. A rate of 0 meaning 'never' applied to the individual, 1 meaning applied to the individual 'sometimes', 2 meaning applied to the individual 'often' and 3 meaning applied to the individual 'always'. The total scores for depression were then categorized, and each individual were classified into 5 groups of severity, namely (i) normal (0-9 score), (ii) mild (10-13 score), (iii) moderate (14-20 score), (iv) severe (21-27 score), and (v) extremely severe (28+ score).

2.5 Statistical Analysis

The data was analyzed using the SPSS V25.0 (SPSS 25.0, Chicago, IL, USA). General demographic data of the students was described using tables for categorical data, and medians and range for continuous variables. Comparison of categorical and continuous variables was performed using chi square test and Independent-Sample t test. Pearson's correlation was done to determine the strength of the relationship between FAT scores and DASS-21 scores respectively. A p value < 0.05 was considered statistically significant. Subsequently, multiple regression analysis was conducted to identify the psychological factors that significantly predict problematic Facebook use.

3.0 RESULTS

3.1 Demographic Data

There were a total of 1060 respondents consisting of UPM undergraduate students ranging from 17 – 25 years old (Table 1), having a female preponderance ratio of 3:1. A major portion of the students were from the Faculty of Medicine and Health Sciences (FMHS) (35.8%); followed by

10.8% of students from the Faculty of Veterinary Medicine, 13.0% from the Faculty of Engineering, 9.8% from the Faculty of Agriculture, 9.0% from the Faculty of Modern Languages and Communication, and the rest of the faculties had smaller percentage of participants as shown in Figure 1.

The most widely used social networking application was Instagram (13.7%) followed by Facebook (7.8%). Among all the participants, 97.1% (n = 1029) were Facebook users and 2.9% (n = 31) were not Facebook users. Subsequent analysis was conducted using the sample size of 1029 subjects. The average FAT score among the Facebook users was 5.67 ± 5.06 . There was significant difference in the mean values of Facebook addiction score between male students (6.29 ± 5.35) and female students (5.45 ± 4.95) ($p = 0.025$). There was also a significant correlation of the age of our respondents with FAT scores ($r = 0.214$; $p < 0.05$).

3.2 Results from Facebook Addiction Test

The distribution of the 4 Facebook user categories is depicted in Figure 2. There were 31 (2.9 %) students who actually did not use Facebook at all and the 31 Facebook non-users were removed from the final analysis. The majority of active Facebook respondents were light users (56.1%) and approximately a quarter of the users were moderate users; both of which are classified as within acceptable range of Facebook usage. Unhealthy and addicted users, who are grouped as problematic Facebook users; were represented by 16.6% of our students. Hence, the active Facebook respondents were divided into two groups, i.e. Unhealthy/problematic group (scores ≥ 11) and the acceptable range of Facebook use group (scores < 11). The data regarding grouping of Facebook users in this study is depicted in Figure 2.

3.3 Results from Depression, Anxiety and Stress Scores

The majority of our Facebook users (52.9%) did not suffer from any depressive symptoms. Approximately 17.1% and 20.3% of the respondents reported that they had mild and moderate depression respectively. A minority of our Facebook users declared severe depressive symptoms (5.4%) and a small percentage admitted to extremely severe depression (4.3%). Approximately 13% of our Facebook users declared severe anxiety symptoms and 15% were found to have extremely severe anxiety. Notably, 5.2% of our Facebook users declared severe stress symptoms and 0.8% were found to have extremely severe stress levels. The distribution of psychological factors of Depression, Anxiety and Stress among the Facebook users is depicted in Figure 3, Figure 4 and Figure 5 respectively.

3.4 Effects of Problematic Facebook Use

Depression, anxiety, stress and FAT scores were higher in the problematic Facebook users than the acceptable range of Facebook use group ($p < 0.001$). Comparison between the problematic Facebook users and the acceptable range of Facebook users group for depression, anxiety, stress and FAT scores is given in Table 2. Furthermore, problematic Facebook use severity was

positively correlated with depression ($r = 0.215$, $p < 0.001$), anxiety ($r = 0.163$, $p < 0.001$) and stress scores ($r = 0.155$, $p < 0.001$).

Two regression models were used in a hierarchical regression analysis to predict factors that influenced problematic Facebook use. Model 1 included socio-demographic factors of Facebook users (age & gender) and Model 2 comprised of depression, anxiety and stress scores. Model 1 accounted for a significant 5% of the variance in FAT score, $R^2 = 0.053$, $F(2, 1026) = 28.51$, $p < 0.05$. When Model 2 was added to the regression equation, it accounted for an additional 5.7% of the variance in FAT score, $\Delta R^2 = 0.10$, $\Delta F(3, 1023) = 21.68$, $p < 0.05$. In combination the 5 predictors variables explained 10.9 % of the variance in FAT score (Table 3). As seen in Table 3, the significant predictors of FAT score in the final regression model was age ($sr^2 = 0.055$), male gender ($sr^2 = 0.00$) and depression ($sr^2 = 0.00$).

4.0 DISCUSSION

Problematic Facebook use has been studied among university students in many countries, due to the rising popularity trend among the youths of this generation. A recent study conducted among university students in a Malaysian academic institution in 2016, stated an alarming prevalence of 47% for Facebook addiction among their students (Jafarkarimi et al., 2016). Our study detected problematic Facebook usage among 16.6% of students in our institution, which is a relief due to a smaller prevalence than other countries. This could be explained that there is a reducing trend to use Facebook among local university students compared to two years ago; which may be due to the wearing out of its novelty and the availability of many more social networking applications such as Twitter and Instagram. Additionally, the differences might be a result of the various types of questionnaires used, i.e. Jafarkarimi et al. (2016) employed the Bergen Facebook Addiction scale (BFAS) in their study; which may have overestimated the prevalence of Facebook addiction among their respondents. Apart from that, the mean age of their respondents i.e. 25 years old was also slightly older than our population i.e. 21 years old.

We detected a significant difference in the mean values of Facebook addiction score between male students (6.29 ± 5.35) and female students (5.45 ± 4.95) ($p = 0.025$) which is in line with previous studies that cited male gender to be more addicted to Facebook (Çam & İşbulan, 2012) and social media in general (Alnjadat, Hmaid, Samha, Kilani, & Hasswan, 2019). Furthermore, similar to the study by Błachnio et al., 2015, who identified male and young age to be significant predictors of Facebook intrusion, we also noted male gender and young age to be significant predictors of Facebook use. A study by Pfeil, Arjan, and Zaphiris (2009) has reported that younger people have larger social networks as compared to older people. Furthermore, males are more experienced and tech-savvy using the Internet and so called mobile social networking and usually receive less parental supervision compared to females. These studies also reported increased involvement of male who were on the Internet for purpose of entertainment, while females showed restriction towards certain behaviors (Asiri, Fallahi, Ghanbari, & Kazemnejad-Leili, 2013; Bahrainian, Alizadeh, Raeisoon, Gorji, & Khazae, 2014). Additionally, Liang,

Zhou, Yuan, Shao, and Bian (2016) postulated that males tend to be more addicted to Internet-based content as they tend to be more affected by depression.

Depression, anxiety and stress scores have often been associated with FB and Internet addiction. Individuals who suffer from depressive symptoms tend to engage themselves more in the social networking platforms as it can provide an easy means of communication, granting them high anonymity which enables them to satisfy their social and emotional needs without requiring them to engage in face-to-face communications (Kim, LaRose, & Peng, 2009). The prevalence of depression, anxiety and stress among Facebook addicts is 28.95%, 48.68%, and 25% in the Philippines (Labrague, 2014), and is 27.7%, 55.3% and 66.8% among Internet addicts in Lebanon (Younes et al., 2016). The prevalence of depression and anxiety levels in our study was 47.1% and 66.6% respectively, which is greater than the previous studies. The prevalence of stress level was 31.1%, which is greater than the previous Facebook addiction study and less than the previous Internet addiction study. We observed significant positive correlations between the FAT scores and depression, anxiety and stress levels. Multiple regression analyses revealed that depression levels were capable of predicting FAT severity. To the best of our knowledge, this is the first study to determine the relationship between Facebook addiction severity and mental well-being among a large-scale population of students in Malaysia.

There are several limited studies have been done to determine the relationship between Facebook addiction with psychological factors such as depression, anxiety and stress (Aker, Sahin, Sezgin, & Oguz, 2017; Labrague, 2014). The study by Gabre and Kumar (2012) among African-American accounting students found stress to be related with Facebook use. Similar to what we had observed, Labrague (2014) and Brailovskaia and Margraf (2017) also noted a correlation between Facebook use and the levels of depression, anxiety and stress. A study conducted in Pakistan among the higher secondary school students also identified a strong positive relationship between Facebook addiction with depression and anxiety (Zaffar et al., 2015). Thus, it can be assumed that students with increased levels of anxiety may be prone to develop nervousness, worry and fear towards missing out on something important on Facebook when they go offline. Additionally, they may also develop the fear of losing contact and relationship with their Facebook friends, which prompts them to frequently check their Facebook account, therefore leading to problematic usage. Furthermore, transition into any new environment i.e. entry into a new university, may lead to loneliness and pose as an underlying factor that increases the amount of time spent on Facebook for seeking stress relief.

Previous study by Koc and Gulyagci (2013) identified depression and anxiety as independent predictors of Facebook addiction among Turkish students. Similarly the study by Hong, Huang, Lin, and Chiu (2014) among Taiwanese students also found depression to be a predictor of Facebook addiction. Nonetheless, depression alone was noted to be a predictor of problematic Facebook use in our study. This observation is supported by previous studies, which postulated that subjects suffering from depression, low self-esteem and social inadequacy might be more prone to Facebook overuse as a channel to escape from their feelings of depression and to relieve stressful situations that they are experiencing (Błachnio et al., 2015; Koc & Gulyagci, 2013). A review by Ryan et al. in 2014 that analyzed 24 studies pertaining to Facebook addiction

suggested that problematic Facebook use is likely due to impaired social skills and the desire for mood alteration, simply by being online. Subjects with mild depression may find it therapeutic to be online, thus fueling their addictive behaviours (Ryan et al., 2014).

With regards to this, we recommend that students who experience depression should seek activities that could distract them from dwelling on their blue moods, such as taking up a hobby, playing sports, hanging out with friends, going for a vacation, doing meditation or even turning to religious activities for guidance. Furthermore, lectures and fellow students are encouraged to recognize early signs of depression among their students and peers respectively to prevent the development of social media addiction particularly Facebook addiction.

5.0 CONCLUSION

Young male university students are more prone to problematic Facebook use than females, and this has a profound impact on their mental well-being. Depression is also identified as a significant predictor of problematic Facebook use.

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AUTHOR DISCLOSURE STATEMENT

All authors declare no conflict of interest in this study.

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Table 1 Socio-demographic distribution of respondents (n=1064)

Variables	n (%)
Age (min-max) Mean= (\pm SD)	(17-25) Mean=21.08(\pm 1.68)
Gender	
Male	269 (25.4)
Female	791 (74.6)
Male:Female ratio	1:3
Faculty	
Faculty of Medicine and Health Sciences (FMHS)	380 (35.8)
Faculty of Veterinary Medicine (FVM)	114 (10.8)
Faculty of Human Ecology (FHE)	44 (4.2)
Faculty of Modern Language and Communication (FMLC)	95 (9.0)
Faculty of Economics and Management (FEM)	14 (1.3)
Faculty of Agriculture (FA)	104 (9.8)
Faculty of Engineering (FE)	138 (13.0)
Faculty of Biotechnology and Biomolecular Sciences (FBBS)	60 (5.7)
Faculty of Food Science and Technology (FSST)	86 (8.1)
Faculty of Science (FS)	8 (0.8)
Faculty of Computer Science and Information Technology (FCSIT)	17 (1.6)

Table 2

Mean comparison of psychological factors and FAT between the problematic Facebook users and acceptable range of Facebook use group (n= 1029)

	Problematic Facebook users		Acceptable range of Facebook users		P value
	Mean \pm SD	Min-Max	Mean \pm SD	Min-Max	
FAT score	14.37 \pm 3.87	11-29	3.93 \pm 3.11	0-10	<0.001
Depression	13.37 \pm 8.91	0-42	8.97 \pm 7.71	0-42	<0.001
Anxiety	14.05 \pm 8.44	0-42	10.62 \pm 7.5	0-42	<0.001
Stress	15.04 \pm 8.01	0-42	11.30 \pm 7.39	0-40	<0.001

*Significant at $p < 0.05$

FAT: Facebook Addiction Test

Table 3

Determinants of Facebook usage severity in a linear regression model

	Model 1		Model 2	
	B	β	B	β
Constant	-8.611			
Age	0.664	0.218**		
Male Gender	0.952	0.082**		
Depression			0.067	0.108**
Anxiety			0.034	0.052
Stress			0.066	0.099
R ² (Δ R ²)		0.053		0.109 (0.057)
F		28.51		25.11

**Significant at $p < 0.05$

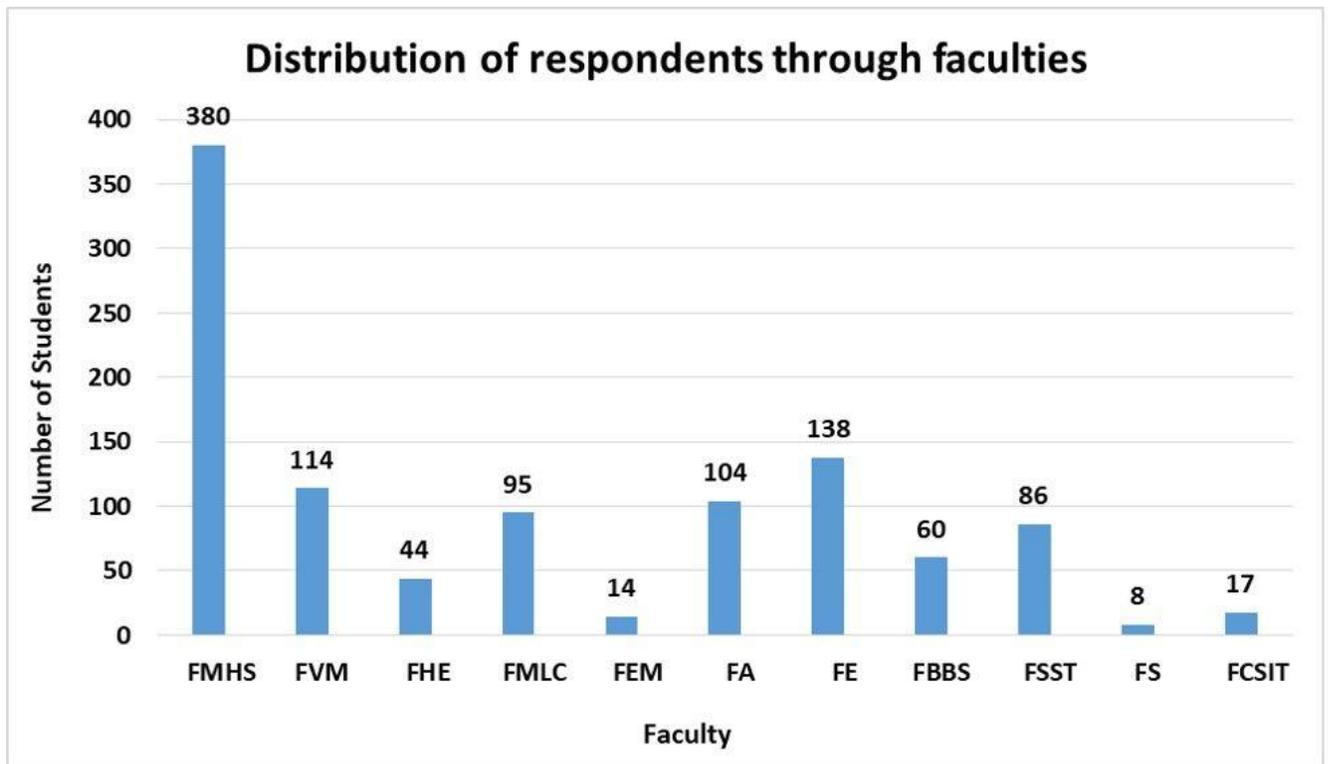


Figure 1. Distribution of respondents based on academic faculties

FMHS: Faculty of Medicine and Health Sciences; FVM: Faculty of Veterinary Medicine; FHE: Faculty of Human Ecology; FMLC: Faculty of Modern Language and Communication; FEM: Faculty of Economics and Management; FA: Faculty of Agriculture; FE: Faculty of Engineering; FBBS: Faculty of Biotechnology and Biomolecular Sciences; FSST: Faculty of Food Science and Technology; FS: Faculty of Science; FCSIT: Faculty of Computer Science and Information Technology

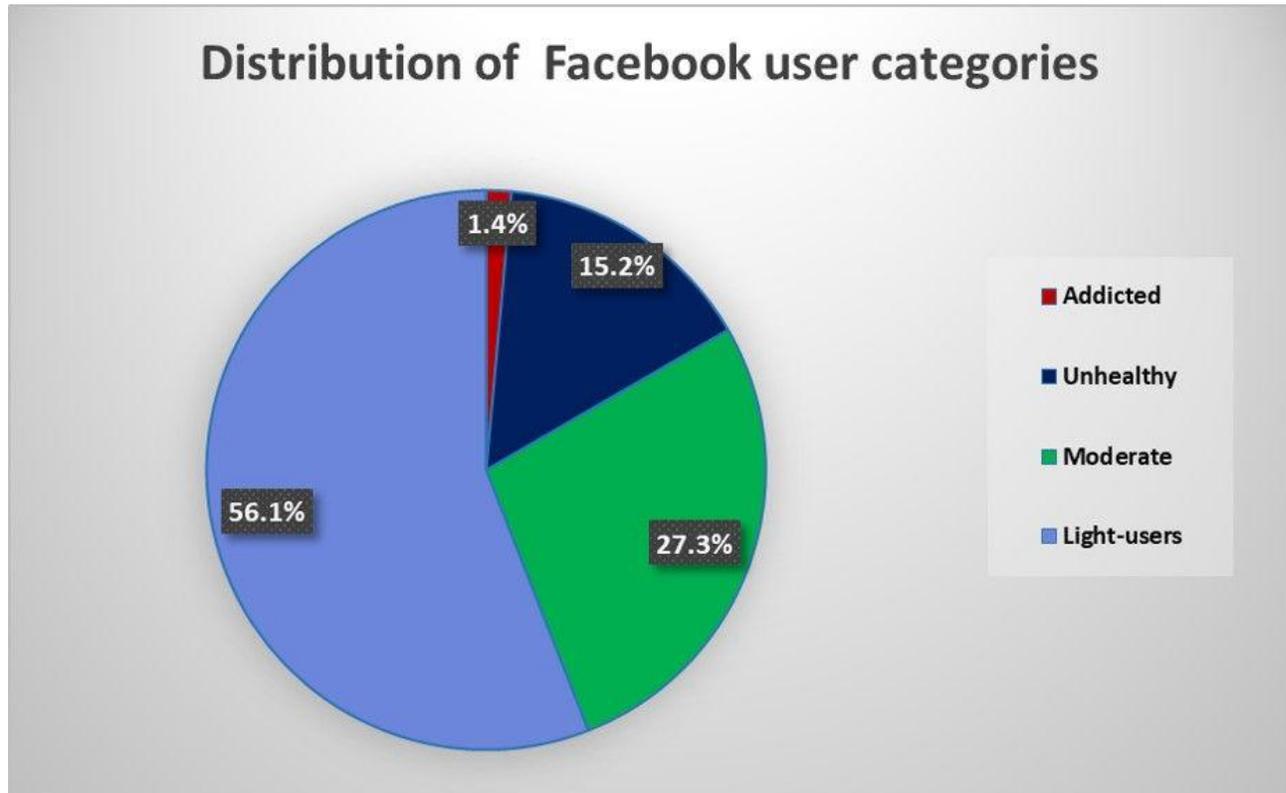


Figure 2. Distribution of Facebook user categories among students based on the Facebook Addiction Test scores

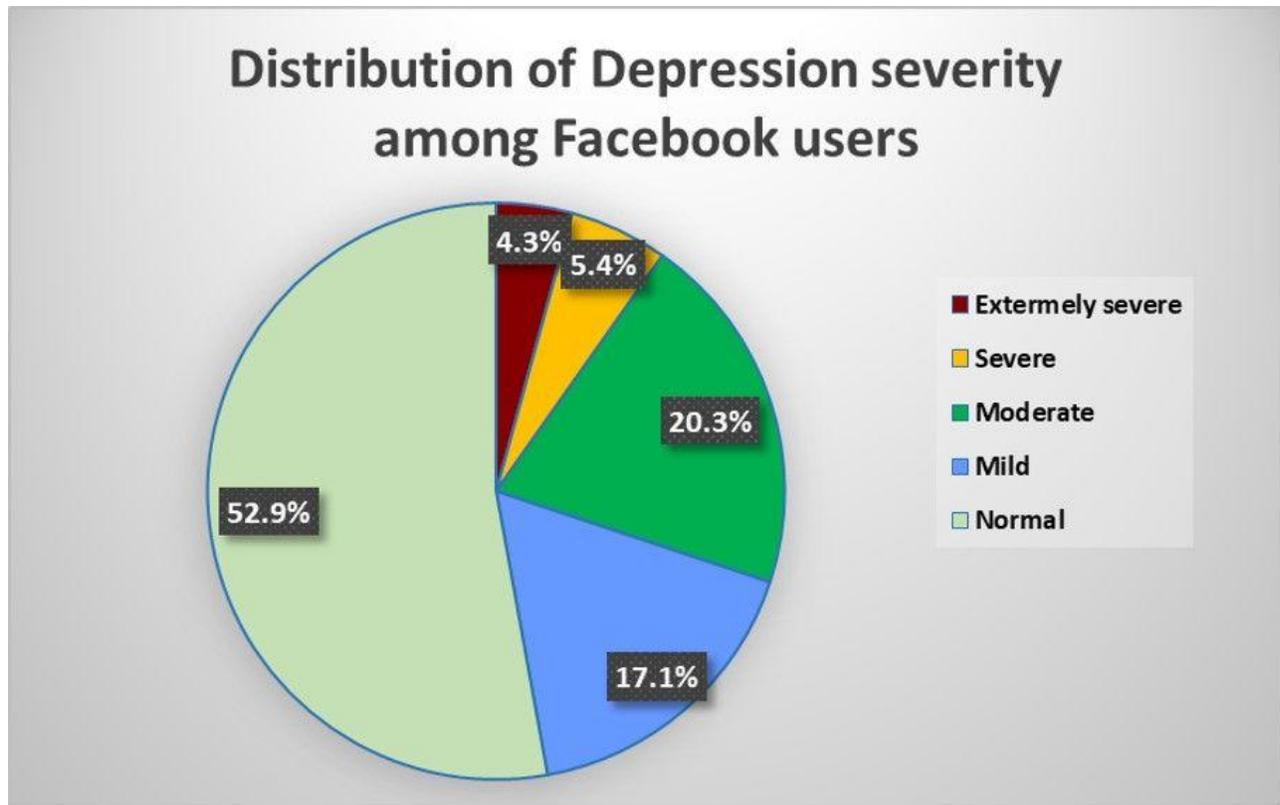


Figure 3. Distribution of depression severity among Facebook Users

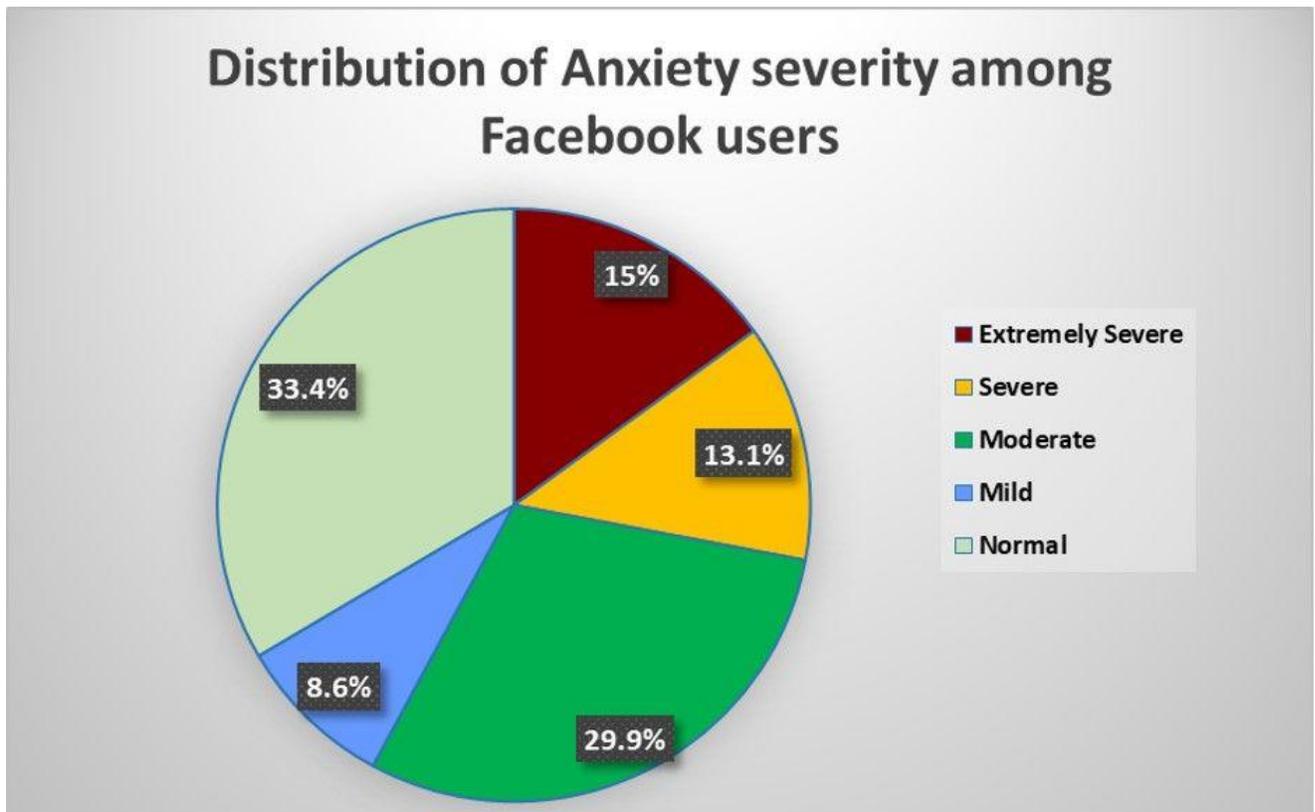


Figure 4. Distribution of anxiety severity among Facebook Users

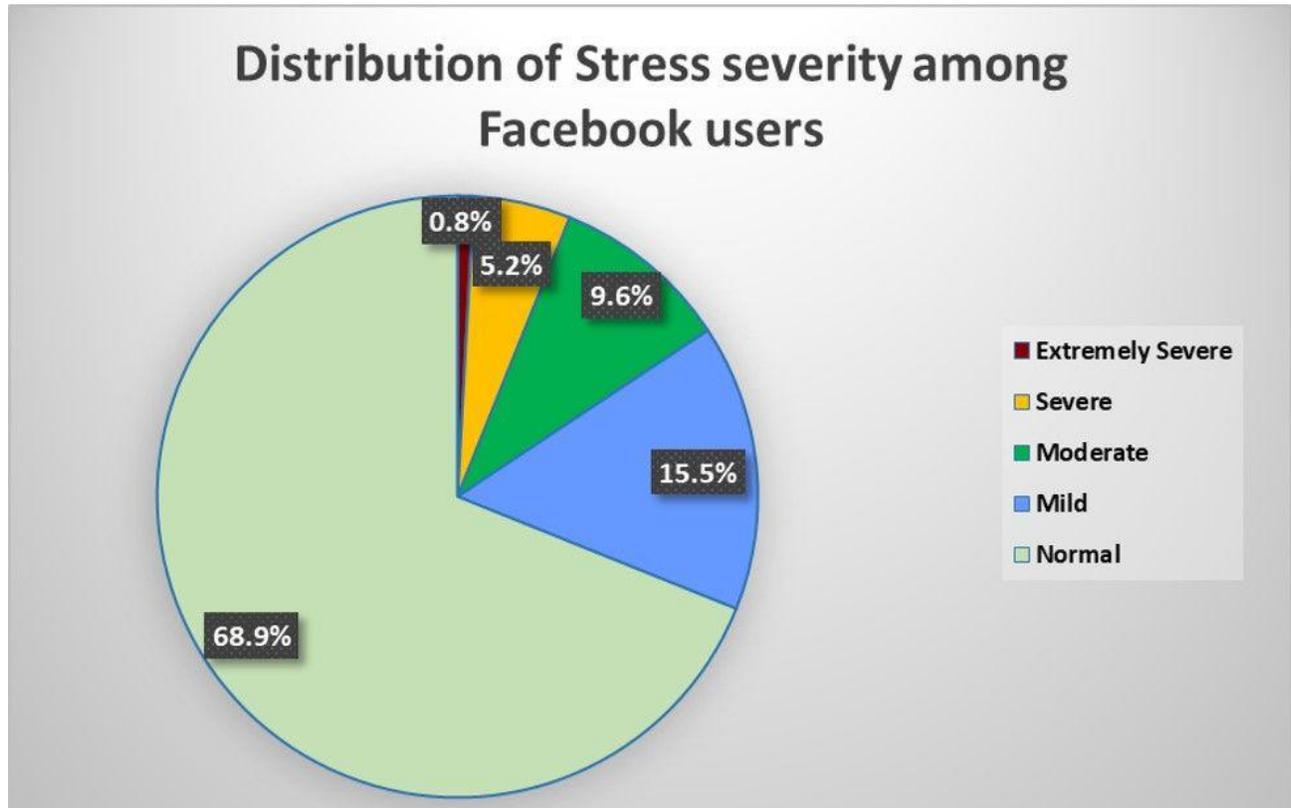


Figure 5. Distribution of stress severity among Facebook Users