Problematic Social Media Use, Personality Traits, and Mental Health Among Bangladeshi University Students

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Abstract

Problematic social media use (PSMU) has received increasing attention among mental health professionals. There are a few studies that have explored the relationships between PSMU, personality traits, and mental health. However, there is scarcity of information related to usage duration, usage purpose of different social media, and prevalence rates of the risk of PSMU in Bangladesh. Consequently, the present survey study explored the relationship between these variables among university students in Bangladesh ($N = 332$). The present study found that 8.7% social media users were classed as problematic social media users. Results also showed (i) low conscientiousness (i.e., being careless, impulsive, disorganized) was significantly associated with PSMU; (ii) low agreeableness (i.e., cold, unfriendly), low conscientiousness, and high social media use were predictors of PSMU; and (iii) low conscientiousness, high neuroticism, and PSMU were significantly associated with self-rated poor mental health. Specialized programs and workshops are needed to raise awareness among Bangladeshi students, and counseling services are recommended to counter the negative effects of PSMU and facilitate improved mental health.

Keywords Social media use · Problematic social media use · Personality traits · Mental health · University students

1. Introduction

Physical health and mental health both are equally important to live a healthier and happier life. The World Health Organization (WHO, 2004) noted that "mental health is a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (p. 12). Studies suggested that personality traits and mental health are associated with each other (Amini et al., 2015; Cheng & Furnham, 2003). However, there are no general models that explain how personality influences mental health (Lamers et al., 2012). Existing literature also suggests individual differences among those who use social media and that one of the key determinants appears to be personality factors (Kircaburun et al., 2019). In addition, excessive social media use and problematic social media use (PSMU) can negatively affect users' mental health (Chou & Edge, 2012; Rahman & Ahmed, 2018; Valkenburg et al., 2006). Although the direct relationships between (i) PSMU and mental health, and (ii) personality traits and mental

health, have been investigated in the extant literature, the combined role of these factors on mental health has yet to be studied.

1.1 Personality traits and mental health

Personality has been defined as "the unique patterning of behavioral and mental processes that characterizes an individual and individual's interaction with the environment" (Crider et al., 1983) and is connected to an individual's interaction with others. In research terms, arguably the most important personality traits are the Big Five (neuroticism, extroversion, agreeableness, openness, conscientiousness) (Costa & McCrae, 1992). Extroverted individuals have larger networks and higher frequencies in contact (Anderson et al., 2001; Russel et al., 1997) and are highly associated with individuals' interaction with their peers (Asendorf & Wilpers, 1998). People having higher conscientiousness traits are careful, disciplined, and organized (Feldman, 2015). Conscientiousness and agreeableness have been found to be highly associated with personal network structure. Highly open individuals are more likely to keep up-to-date with new technologies than individuals low in openness. Neurotic people are characterized through having low self-esteem, irrational perfectionistic beliefs, pessimistic attitude (MaCrae & Costa, 2008).

Individuals who are less conscientious, extroverted, open to experience, agreeable, and more neurotic are susceptible to having elevated depressive symptoms (Amiri et al., 2017). Malouff et al. (2005) found that higher neuroticism and lower extraversion, agreeableness, conscientiousness are associated with mental health disorders. Lamers, et al. (2012) have suggested low emotional stability (i.e., the opposite to high neuroticism) is the only predictor of psychopathology, while extraversion and agreeableness were predictors of positive mental health. Neuroticism is negatively associated with happiness, and extroversion is positively associated with happiness (Cheng & Furnham, 2003). Meta-analyses have suggested that neuroticism is the biggest predictor of psychopathology compared to other personality traits (Kotov et al., 2010). Neuroticism is associated with depression, panic disorder, generalized anxiety disorder, phobias, antisocial personality disorder (Khan et al., 2005).

1.2 Social media use and addiction as mediators

In this era of information and technology, social media platforms are popular online spaces for connecting with others virtually. Social media platforms are virtual resources in which

individuals use to share text, messages, opinion, photos, videos, news, gossip, etc. Recently, researchers have raised concerns about the excessive social media use that lead to PSMU. Historically, addiction has referred to a dependency upon ingested substances (Brenner, 1997). More recently, researchers have argued that some problematic behaviors can also be genuine addictions (Brown, 1997; Griffiths, 1996; Marks, 1990). Here, addictive behaviors can be viewed as repetitive habits that lead to detrimental social and personal problems (Marlatt et al., 1988). The latest (fifth) edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5: American Psychiatric Association, 2013) has formally recognized this with gambling disorder being included as a behavioral addiction. This type of addiction produces many of behavioral symptoms and consequences comparable to substance-based addiction.

Technology-based behavioral addictions are now being increasingly researched and problematic social media use has argued to be a sub-type of behavioral addiction (Griffiths et al., 2014). Social media addiction (in the present study conceptualized as PSMU) can be defined in simple terms as severe disruption in daily activities (e.g., occupation or education) and social relationships due to excessive engagement in social media (Griffiths et al., 2014). Symptoms of PSMU include complete preoccupation with social media relating to cognition, emotion, and behavior (salience), build-up of excessive use over time (tolerance), the use of social media as a form of mood regulation (mood modification), experience of displeasing emotional and physical symptoms if the individual is restricted from using social media (withdrawal), psychological and interpersonal problems caused by excessive use of social media (conflict), and after periods of abstinence, a quick reversal to problematic use of social media (relapse) (Griffiths, 2005; Griffiths et al., 2014).

Studies suggest that neurotic social media users spend more time on Facebook (Moore & McElroy, 2012), but engage passively (Ryan & Xenos, 2011). Users having higher extraversion post higher number of status updates and photos on their timeline (Kim & Chock, 2017) and have a higher number of friends on social media (Amichai-Hamburger & Vinitzky, 2010) Agreeableness negatively correlates with expressing popular self in social media (Horzum, 2016), and individuals having higher agreeableness traits are more involved in likes and comments in shared posts of their own and others (Choi et al., 2017). Individuals with higher conscientiousness engage in social media use to maintain existing relationships and individuals lower in this trait utilize social media for news and information (Choi et al., 2017). Individuals higher in openness

to experience share more personal information on their social media timeline (Amichai-Hamburger & Vinitzky, 2010) and but are less involved in selfie-related activities (such as liking, comments, etc.) (Choi et al., 2017).

Existing literature also suggests an association between PSMU and personality traits. For instance, Marino et al. (2016) reported that problematic Facebook use was negatively predicted by emotional stability and extraversion, and positively predicted by conscientiousness. Kircaburun (2016) suggested that gender, introversion, non-conscientiousness, and disagreeableness were significant predictors of Twitter addiction. In a recent study, Kircaburun et al. (2019) found that higher problematic social media users were more likely female, introverted, neurotic, non-conscientious, and agreeable.

Heavy use of social media can cause various negative consequences (e.g., relationship problems, poor academic performance, etc.) (Kuss & Griffiths, 2011). Rosen et al. (2013) found Facebook use predicted bipolar-mania, depressive disorder, narcissism, anti-social personality disorder, and dysthymia. An individual's poor social relationships impacts on their mental health (Santini et al., 2015) and increasing social media usage has been positively associated with depression (Chou & Edge, 2012). Researchers have suggested that technological addictions (e.g., social networking site addiction and generalized internet addiction) are associated with stress, anxiety, and depression and which negatively affect the life satisfaction of online users (Kabasakal, 2015; Kuss et al., 2014; Leep et al., 2014). Valkenburg et al. (2006) found that among adolescents, frequent use of social media indirectly affected their wellbeing and social self-esteem.

1.3 The present study

Statistics show that a large number of people in Bangladeshi (the location of the present study) have access to the internet. At the end of October 2020, the number of Bangladeshi internet users was 110.762 million (Bangladesh Telecommunication Regulatory Commission, 2020). According to Digital in Bangladesh Report (Financial Express, 2018), more than 30 million Bangladeshi individuals (18% of total population) are active social media users, of which 91.93% are Facebook users (State Counter, 2018). More recently, addiction to social media has become an issue in the country and 39.7% young social media users are at risk of addiction (Mamun & Griffiths, 2019). As PSMU negatively affects users' mental health and a large portion of young users at risk of addiction, it is urgent to reduce PSMU among Bangladeshi youth. For reduction of

addiction-like problems, it is important to assess the role of PSMU in the association between personality traits and mental health. Consequently, the present study explored the relationship between personality traits, social media use, PSMU, and mental health of young Bangladeshi individuals.

In the study here, a hypothetical model (Figure 1) concerning the role of social media use duration and PSMU on the relationship between personality traits (i.e., Big Five) and mental health was developed based on empirical studies in the extant literature. The main objective of the study was to test this model. Other areas examined included (i) the prevalence of PSMU, and (ii) the exploration of the interaction between socio-demographic characteristics and risk of PSMU.

2. Method

2.1 Participants

The present study's sample (*N*=332; 44.9% males and 55.1% females) comprised undergraduate students from the University of Chittagong (Bangladesh) recruited via a convenience sampling technique. The only inclusion criterion was that participants must have used any type of social media for more than one year. The *mean* age of the participants age was 21.05 years (*SD*=1.88). Among the sample, 28.3% were in their first year, 24.7% in the second year, 22.3% in the third year, and 24.7% in the fourth year. Among them, 33.4% were residential students (living in university halls), and 66.6% were non-residential students (living outside university halls). Most were from a nuclear family (77.7%), and the remainders were from an extended family (22.3%).

2.2 Measures

In addition to socio-demographic questions (i.e., gender, age, academic year, corresponding faculty where they were studying, residential status, family type, etc.), the offline ('paper-and-pencil') survey included the Bangla version (Ahmed et al., 2018) of Bergen Social Media Addiction Scale (BSMAS: Andreassen et al., 2016), the Bangla version (Ahmed & Hossain, in press) of the Big Five Personality Inventory-10 (Rammstedt & John, 2007), and the Bangla version (Ahmed et al., 2018) of the Mental Health Inventory-18 (Veit & Ware, 1983).

2.2.1 Bergen Social Media Addiction Scale (BSMAS)

The Bergen Social Media Addiction Scale (Andreassen et al., 2016) was adapted from its predecessor, the Bergen Facebook Addiction Scale (Andreassen et al., 2012). The scale was used to provide an indication of problematic social media use (PSMU). It comprises six items for assessing six components of addiction. These components are salience, withdrawal, mood modification, relapse/loss of control, conflict/functional impairment, and tolerance (Griffiths, 2005). The scale had high internal consistency reliability in the original study (Cronbach's alpha=.88). This adaptation was made by replacing the word 'Facebook' with the words 'social media'. Each question is answered on a five-point Likert scale ranging from 1 (*very rarely*) to 5 (*very often*). Total scores range from 6-30. The cut off score of the BSMAS for classifying as being at risk of developing addiction was 24. The Cronbach's alpha was good in the present study (.731, 95% CI [.684, .774]). Confirmatory factor analysis from the present study data indicated that the scale was a good model fit (χ^2/df=1.93, GFI=.98, CFI=.98, TLI=.96, SRMR=.03, RMSEA=.05).

2.2.2 Big Five Personality Inventory-10

The Big Five Personality Inventory-10 (BFPI-10) comprises10 items (two items for each trait) assessing the Big Five personality traits (neuroticism, extraversion, openness, conscientiousness, and agreeableness). This scale had sufficient test-retest reliability (.68-.83). It is also correlated (.51-.70) with NEO-PI-R [10]. Participants responded on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly disagree*). Total scores range between 2 and 10 for each trait. Higher scores in a trait suggest higher level of this trait. Test-retest reliability of the BFPI-10 Bangla version was previously satisfactory (.60-.79). The inter-item correlations of this scale in this study were sufficient (.29-.65) (Pallant, 2016). Confirmatory factor analysis from the present study data indicated that the scale had good model fit (χ^2/df=1.92, GFI=.97, CFI=.97, TLI=.94, SRMR=.06, RMSEA=.05).

2.2.3 Mental Health Inventory-18

The Mental Health Inventory (MHI) assesses overall emotional functioning (Veit & Ware, 1983). The original MHI is a 38-item measure. Internal consistency reliability of this scale was good (Cronbach's alpha ranged from .81 to .94, stability coefficient ranged from .56 to .64). The 18-item version of the MHI is included in the MSQLI (Ritvo et al., 1997) and is reasonably brief and reliable, and preserves the subscale structure. The MHI-18 has four subscales – Anxiety,

Depression, Behavior Control, Positive effect. Each question is answered on a 6-point Likert type scale ranging from 1 (*none of the time*) to 6 (*all of the time*). Higher scores indicate a better state of mental health. Internal consistency reliabilities of the MHI-18 Bangla version were good (Cronbach's Alphas ranged from .830 to .886, split-half reliabilities with Spearman-Brown coefficient ranged from .835 to .905). Factor structure of MHI-18 Bangla version had sufficient level of model fit (χ^2/df ratio = 2.12, CFI = .97, GFI = .95, RMSEA = .04, SRMSR = .04). Cronbach's alpha of the MHI-18 Bangla was very good in the present study (.89, 95% CI [.876, .910]). Confirmatory factor analysis from the present study data indicated that the scale had acceptable model fit (χ^2/df=2.46, GFI=.90, CFI=.91, TLI=.90, SRMR=.06, RMSEA=.07).

Along with these psychometric scales, participants were also asked a question regarding average time spent on social media daily. Demographic information (age, gender, academic year, corresponding faculty where they were studying, residential status [whether they resided in university halls or not], and family type [how they were brought up, either nuclear or extended family]) was also collected from them.

2.3 Procedure

Data were collected from the participants via a questionnaire booklet that included the aforementioned scales and questions. Each booklet took approximately 20 minutes to complete. One author of the study and a group of research assistants distributed the booklet to 400 participants. A total of 332 participants returned their completed booklet (response rate=83%). One month was taken to collect all the data. Internet facilities utilized by students are not strong enough for all. Therefore, data were collected offline in this study although it about the online use.

2.4 Statistical analysis

Data were processed and analyzed utilizing the Statistical Package for Social Science (SPSS) version 26.0 and the IBM AMOS version 24.0. Descriptive statistics (e.g., means, standard deviations, frequencies, percentages, skewness, and kurtosis), chi-square (χ^2) test, and independent sample t-tests, Pearson product moment correlation coefficient, logistic regression, and path analysis were performed. Means, mean differences, correlation coefficients, and regression coefficients are reported with 95% confidence intervals.

3. Results

3.1 Data preparation

Before the formal analysis, the data were analyzed to test normality and homoskedasticity. The normality of the data was tested through *residuals in regression analysis*. The obtained *skewness* (-.084), *kurtosis* (-.252), *p*-values of the *Kolmogorov-Smirnov* (.200) and *Shapiro-Wilk* tests (.518) indicted the data's normality. The *Normal Q-Q plot* and *Histogram* also supported these scores to indicate the normality of the data. Homoskedasticity of the data was tested using the *Breusch-Pagan* and *Koenker* test. The obtained score on *Breusch-Pagan* test (9.347, *p*<.252) and *Koenker* test (10.099, *p*<.170) indicated homoskedasticity of the data.

3.2 Final analysis

Based on suggested cut off of the BSMAS, 8.7% participants were classed as problematic social media users using the BSMAS. Among participants, 7.4% males and 9.8% females were classed as being problematic social media users. Differences in risk by gender was non-significant (χ^2=.620, *p*>.05, odds ratio=.731, 95% CI [.334, 1.599]). Among them, 7.2% residential and 9.5% non-residential participants were classed as being problematic social media users, and 9.3% from nuclear families and 6.8% from extended families were classed as being problematic social media users. Neither residential status (χ^2=.488, *p*>.05, odd ratio=1.352, 95% CI [.579, 3.158]), or family type (χ^2=4.67, *p*>.05, odd ratio=1.415, 95% CI [.521, 3.848]) were significantly associated with PSMU. Among participants' university faculties, 5.5% from Biological Sciences, 4.0% from Arts, 17.2% from Sciences, 10.9% from Social Sciences, 7.8% from Engineering, and 6.0% from Business Studies were classed as problematic social media users. A large proportion of users who used social media more than four hours daily (18.9%) were classed as problematic social media users (χ^2=20.056, *p*<.001) than those who used social media less than four hours daily (4.0%), a difference that was significant (odds ratio=5.607, 95% CI [2.456, 12.800], *p*<.001).

Table 1 and Figure 2 shows the impact of personality traits, social media usage duration, and PSMU on mental health. From Table 1 and Figure 2, (i) personality traits explained 6% variance of social media usage duration, (ii) personality traits and social media usage duration explained 27% variance of PSMU, and (iii) personality traits, social media usage duration, and

PSMU explained 30% variance of lower mental health self-ratings. Among personality traits, only low conscientiousness (β = -.19, $p<.01$) significantly predicted social media usage duration. Low agreeableness, low conscientiousness, and high social media usage duration were significant predictors of PSMU (agreeableness: β = -.14, $p< .01$; conscientiousness: β = -.22, $p<.001$; social media usage duration: β = .33, $p<.001$). Among personality traits, low conscientiousness, high neuroticism, and PSMU were significant predictors of lower mental health self-ratings (conscientiousness: β = .17, $p< .01$; neuroticism: β = -.22, $p< .001$; PSMU: β = -.29, $p< .001$). Table 2 shows that direct effect and total effect of extroversion (-.005, .50), agreeableness (.041, .053), openness (.001, .093), conscientiousness (.066, .238), neuroticism (-.029, -.251), social media usage duration (-.094, -.017) on mental health.

4. Discussion

The present study explored the role of personality traits (extroversion, openness, agreeableness, neuroticism, and conscientiousness), social media usage duration, and addiction on social media users' mental health. The present study indicated that 8.7% social media users were classed as problematic social media users (using a cut-off score of 24 out of 30 on the Bergen Social Media Addiction Scale [BSMAS]). Mamun and Griffiths (2019) reported 39.7% Bangladeshi Facebook users, mainly university students, were potentially addicted to Facebook (although they used a very low cut-off score of just 18 out of 30) while Ahmed and Hossain (2018) reported the rate of potential Facebook addiction among Bangladeshi students as being 19% (with a cut-off score of 20 out of 30). These differences are therefore most likely due to the differing cut-off scores using the same scale (with the prevalence rate of PSMU decreasing as the cut-off score increases). Predictably, findings also showed that social media usage duration (more than four hours daily) was significantly associated with PSMU. Over two-thirds of those at-risk users were on social media for more than four hours daily (69.0%).

Path analysis, for testing hypothesized model, explored the direction of influence of personality traits, social media usage duration, and PSMU on mental health. These factors explained 30% of the variance of lower mental health self-ratings. Extroversion and openness had non-significant influence on social media usage duration, PSMU, and mental health. Low agreeableness significantly predicted PSMU only. High neuroticism strongly predicted mental health only. Previous studies suggest that neuroticism is associated with lower levels of happiness

and higher levels of depressive symptoms (Cheng & Furnham, 2003). Individuals having higher neurotic traits often feel uneasy, become anxious, and express negative emotional experience.

Findings also suggested that low conscientiousness was strong and negative predictor of social media usage duration, PSMU, and lower mental health self-ratings. Landers and Lounsbury (2004) found that individuals low in conscientiousness accessed the internet more frequently compared to those with high conscientiousness. Echeburua and Corral (2010) found that low conscientiousness negatively related to private social media use in the work place. It is also strong predictor of addictive behavior more generally (Ryan & Xenos, 2011). Andreassen et al. (2012) suggested that scores on the Bergen Facebook Addiction Scale's scores were related to low conscientiousness. Andreassen et al. (2013) conducted a study on university students examining the association between personality traits and different forms of behavioral addiction. They found that low openness, low conscientiousness, and high extroversion were significant predictors of Facebook addiction, and high neuroticism, low agreeableness, and low conscientiousness significantly predicted internet addiction.

Findings here showed that social media use duration was significantly associated with PSMU (as found in other studies such as Rahman and Ahmed, 2018) but not to lower mental health self-ratings. This contradicts the study finding of Rahman and Ahmed (2018) who collected their data from the same study population (i.e., Bangladeshi students). They also found Facebook use as significant predictor of poor mental health. Studies have suggested that fear of missing out (FOMO) partially leads to more engagement in social media (Buglass et al., 2017; Oberst et al., 2017). FOMO is also associated with PSMU (Gil et al., 2016). The present study's findings also showed that PSMU was a strong positive predictor of lower mental health self-ratings. Donnelly and Kuss (2016) found that PSMU and Instagram use were predictors of depression (and consequently, a sign of poor mental health). Other studies have shown Facebook addiction negatively affects life satisfaction and mental health [Blachnio et al., 2016; Rahman & Ahmed, 2018].

Because excessive social media use can lead to PSMU, the increasing time spent on social media might be a possible reason for positive association between PSMU and lower mental health self-ratings. Individuals might be unable to allocate enough time for their daily activities and social relationships due to more engagement in social media leading to a time-demand conflict. This

conflict might lead to negative feelings about one's self and produce anxiety. The users' need for belongingness might also be led to such positive association between PSMU and poor mental health. Due to the demand for belongingness, social media users want to stay connected, maintaining relationships with virtual friends via social media (Quan-Haase & Young, 2010).

The present study has a number of limitations. The data in the study were collected from a non-representative sample utilizing self-report measures. Self-report data comprise well-known biases including social desirability, memory recall, etc. More specifically, social desirability bias can be an important confounding factor when using personality trait measurement scales. Additionally, the data were collected from a single university that recruited utilizing anon-probability sampling technique. Consequently, the present study findings' generalizability to other age group both inside and outside of Bangladesh may be limited. Further research using a larger national representative sample would help overcomes these limitations.

Recommendations and Conclusion

The present study showed that a minority number of young adults (i.e., university students) appears to be dependent upon the social media. Personality traits, especially low agreeableness and conscientiousness affects problematic social media use that, in turn affect users' mental health. Therefore, effective steps are needed to help prevent problematic social media use and to help users better control their time spent on social media. Awareness programs and workshops need implementing in Bangladeshi universities to raise awareness among young users about responsible use of social media. Counseling and behavior modification therapy could also be provided for problematic social media users and to counter the negative effects of PSMU and facilitate improved mental health. During designing and implementing the above-mentioned programs, personality variables should be considered. Especially, when individual cases will be delt by mental health professionals. Besides, further research would be undertaken to explore in-depth how personality traits impacts problematic social media use and then what factors leads this association to impact on users' mental health.

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Table 1. Regression coefficients of the study variables

Predictors	R^2	Unstandardized coefficient		standardized coefficient (β)	p-value
		B	*SE*		
Outcome: Social Media usage duration					
Extraversion	.06	.05	.03	.08	.132
Agreeableness		-.05	.06	-.04	.434
Conscientiousness		-.14	.05	-.19	.003
Neuroticism		.01	.04	.01	.866
Openness		-.06	.05	-.07	.256
Outcome: Problematic social media use					
Extraversion	.27	.03	.10	.01	.789
Agreeableness		-.48	.17	-.14	.005
Conscientiousness		-.54	.14	-.22	<.001
Neuroticism		.23	.12	.10	.060
Openness		.002	.15	.001	.987
Social media usage duration		1.09	.16	.33	<.001
Outcome: Mental health					
Extraversion	.30	.35	.30	.06	.236
Agreeableness		.13	.53	.01	.805
Conscientiousness		1.35	.44	.17	.002
Neuroticism		-1.62	.38	-.22	<.001
Openness		.82	.48	.09	.088
Social media usage duration		.82	.54	.08	.127
Problematic social media use		-.91	.17	-.29	<.001

Table 2. Indirect and total effect of personality traits, SNSs use and addiction of mental health

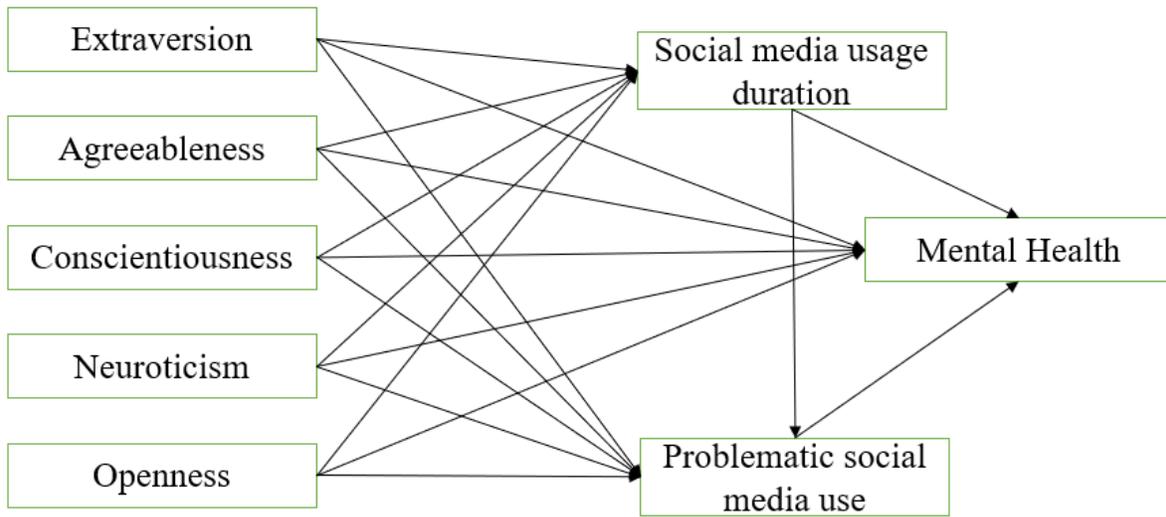| Effect	Extroversion	Agreeableness	Openness	Conscientiousness	Neuroticism	Duration
Indirect	-.005	.041	.001	.066	-.029	-.094
Total	.050	.053	.093	.238	-.251	-.017

Figures

Figure 1: Hypothesized model of the relationship among personality traits, social media usage duration, problematic social media use, and mental health.
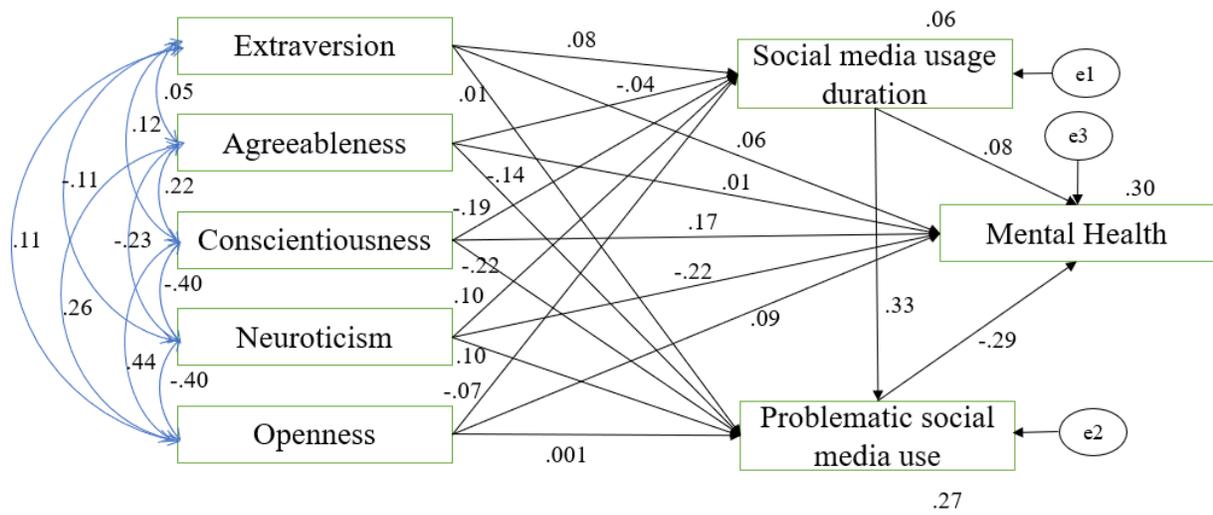
Figure 2: Model of the present study. Black arrows denote standardized regression weights (*β* values), and blue arrows denote correlations among the variables.