

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/343699580>

# Pakistani Youth and Social Media Addiction: the Validation of Bergen Facebook Addiction Scale (BFAS)

Article in *International Journal of Mental Health and Addiction* · August 2020

DOI: 10.1007/s11469-020-00391-0

CITATIONS

0

READS

4

3 authors, including:



[Qaisar Khalid Mahmood](#)

International Islamic University, Islamabad

33 PUBLICATIONS 44 CITATIONS

[SEE PROFILE](#)



[Sara Rizvi Jafree](#)

Forman Christian College

31 PUBLICATIONS 89 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



rae jean [View project](#)



Facebook Use and Social Capital [View project](#)



# Pakistani Youth and Social Media Addiction: the Validation of Bergen Facebook Addiction Scale (BFAS)

Qaisar Khalid Mahmood<sup>1</sup>  · Sara Rizvi Jafree<sup>2</sup>  · Malik Muhammad Sohail<sup>3,4</sup>

Published online: 17 August 2020

© Springer Science+Business Media, LLC, part of Springer Nature 2020

## Abstract

Majority of Pakistan's population is comprised of youth who are increasingly using social media networks like Facebook. Though Facebook provides a platform for social interaction, there are also considerable problems associated with excessive Facebook usage that can result into addiction. Measurement of usage and addiction of Facebook through a validated scale is needed to promote better policies for protection against the pernicious consequences of addiction. Until now, the Bergen Facebook Addiction Scale (BFAS) has not been widely used and validated in Pakistan. The objective of the present study was to conduct a psychometric validation in a sample of university students of Pakistan. Responses of 713 respondents were included in the final analysis. Confirmatory factor analysis was run to confirm construct validity, and results showed that the BFAS demonstrates a one-factor solution with high factor loadings for all items. Criterion validation was also performed through structural equation modeling. Results showed that the BFAS primarily measures intensity of usage in context of addiction. Internal consistency was proven through Cronbach's alpha analysis which was above 0.78. To conclude, the BFAS can be used in both epidemiological and clinical settings. Longitudinal use of the BFAS on larger population can help to devise policies for positive social media networking in university students to improve mental health and social development.

**Keywords** Facebook addiction · Social media · Psychometric analysis · Pakistan

---

✉ Qaisar Khalid Mahmood  
Qaisar.khalid@iiu.edu.pk

Sara Rizvi Jafree  
sarajafree@fccollege.edu.pk

Malik Muhammad Sohail  
sohailmujahid@hotmail.com

Extended author information available on the last page of the article

The rate of social media usage in the developing world is faster than that of the developed world (Poushter et al. 2018). Young people are more inclined to use social media to express identity and connect with others (Mahmood et al. 2018a). Majority of the global youth population lives in developing regions of the world (United Nations 2011). The primary reasons of increased Internet use include cheaper Internet facilities and the availability of GSM on mobile phones (Alabi 2013; Poushter 2016). Research also suggests that there is greater use of social media in regions of conflict and instability (Henken 2015; Zeitzoff 2017) in order to share information about events, and also to share arguments about subaltern perspectives (Kadoda and Hale 2015; Nel 2015). Social media has benefited disadvantaged populations by providing them information about their rights and potential opportunities (Yigit and Tarman 2013) and also by contributing to literacy and social mobilization for human rights (Mahmood and Saud 2018; Joseph 2012; Livingstone 2014). Many agree that, in the contemporary world, it is the language and symbols of social media and the intensity of social media use which influence social cohesion and social connectedness (Kane 2012; Rinaldi and Farr 2018). Though social media can become a platform for improvement in tolerance and harmony (Shaw and Gant 2004; Velasquez and LaRose 2015), there is a need to preempt the negative use of social media before it manifests on psychosocial and political factors (Kalpidou et al. 2011).

Nearly 45 million people in Pakistan use the Internet of which 92% are young adults who actively use Facebook (AlphaPro Digital Statistical Indicators 2018; Sathar et al. 2016). Facebook can play a positive role in abandonment of regressive cultural traditions (D'Ambrosi et al. 2018), rejection of extremism (Avis 2016), and even violence in youth of Pakistan. Many positive aspects are associated with Facebook usage in university students, such as development and maintenance of social relationships (Desjarlais and Willoughby 2010; Kalpidou et al. 2011) and seeking companionship and support (Lin et al. 2012; Quan-Haase and Young 2010). Facebook can provide increased academic communication (Kabilan et al. 2010; Madge et al. 2009; Rosen et al. 2013a) and opportunities to develop of social capital (Mahmood et al. 2018b; Ellison et al. 2007; Steinfield et al. 2008). There are many who argue that Facebook impacts academic outcomes and grade achievement negatively (Englander et al. 2010; Hawi and Samaha 2016; Junco 2012).

Some scholars have highlighted that the excessive usage of Facebook can lead to Facebook Addiction Disorder (Karaiskos et al. 2010). Addiction to Facebook has been predicted to occur due to relationship problems and attachment bonds with parents and peers (Badenes-Ribera et al. 2019; Monacis et al. 2017) and the incessant need for admiration and belonging (Casale and Fioravanti 2018). There are considerable risks to Facebook usage which can divert attention from salient life responsibilities and also contribute to breakdown of meaningful relationships (Ryan et al. 2014). Detrimental physical health consequences have been evidenced (Brailovskaia and Margraf 2017), including sleep disorders (Altin and Kivrak 2018), eye strain (Masthi et al. 2015), back and joint pains (Saied et al. 2017), and death caused by embolism (Altin and Kivrak 2018).

Over the past few years, usage of Facebook has expanded beyond individual use. Companies have occupied social media's big data and virtual space to promote products and services (Sherman 2011). A growing number of researches are suggesting that usage of online application can cause addictive behavior (Griffiths 2013). Literature suggests that a low level of self-control is related to Internet addiction (Cerniglia et al. 2019). Excessive use of Facebook shows negative behavioral consequences including hyperactivity, attention deficit, depression, jealousy, and multi-tasking mania (Sharifah et al. 2011; Elphinston and Noller

2011). Lack of self-control and self-regulation among Facebook users can cause Facebook addiction (Błachnio and Przepiorka 2016). Most popular motives for Facebook use are relationship maintenance, passing time, entertainment, and companionship (Ryan et al. 2014). Chen and Kim (2013) found that diversion, self-presentation, and relationship building were positively related to problematic use of social networking sites.

Scholarship has also indicated that Facebook addiction can lead to psychological problems (Hong et al. 2014; Suissa 2014), including anxiety and depression (Andreassen 2015; MPH 2015a), and even suicidal behavior (Luxton et al. 2012). It is also argued that Facebook addiction can lead to excessive social comparisons leading to jealousy and envy (Muise et al. 2009; Pera 2018) and surveillance behavior which increases problems of insecurity (Marshall 2012; Tandoc Jr. et al. 2015). Much of the problems associated with comparisons and surveillance can lead to social disintegration in family function (Kimpton et al. 2019; Yan et al. 2014), reduced commitment and productivity for work (Davis et al. 2002; Duke and Montag 2017), and personality disorders related to self-esteem (Andreassen et al. 2013; Rosen et al. 2013b). Other studies show that deviant social behavior can result from Facebook addiction such as intoxicant consumption (Costello and Ramo 2017), online stalking (Haron and Yusof 2010), and organized and complex forms of cybercrimes (Broadhurst et al. 2014).

Very little work on Facebook addiction in Pakistani setting can be found in the literature. Saleem et al. (2016) found a positive correlation between Facebook addiction and loneliness in a sample of 600 students. In another study, Malik and Khan (2015) found Facebook addiction as a significant predictor of narcissistic behavior and low levels of self-esteem. Zaffar et al. (2015) found that intense Facebook usage is imparting anxiety and depression and declining social life of the students. There is need for more research for the benchmarking of psychosocial disorders and Facebook addiction in Pakistan, which would propel policy efforts for the development of youth policy, cyber policy, and mental health policy, all of which need improvement in the country (Awan and Memon 2016; Gadit and Mugford 2007; Yusuf 2008).

For Pakistan, the first essential step is the validation of a psychometrically sound procedure to assess usage and addiction of Facebook. Studies to validate scales for the measurement of social media addiction are few in Pakistan. Therefore, it is important to consistently measure the level of usage and of young Pakistani Facebook users' in order to further research for the following: (i) identification of how Facebook usage may be utilized as a positive tool for extending knowledge, growth, and solidarity for the country's youth, and (ii) assessing the mental and physical health challenges related to Facebook addiction.

## Methodology

For this study, the BFAS was used to test the following hypotheses: (1) the BFAS demonstrates one-factor solution with higher factor loadings for all items, fit indexes (root mean square error of approximation (RMSEA), goodness of fit index (GFI), alternative goodness of fit index (AGFI), and comparative fit index (CFI)) showing a good fit with the data; (2) the composite reliability will be higher than the accepted threshold of 0.70; (3) scores on the BFAS correlate positively with ratings on intensity of Facebook use; and (4) BFAS is primarily explained by

Facebook usage variables and socio-demographics do not have any effect on BFAS. For measuring intense use of Facebook, the authors used three variables: (i) number of Facebook accounts, (ii) time spent on Facebook, and (iii) intensity of use.

## Ethics

Ethical approval for this study was obtained from the Ethical Research Committee of the Department of Sociology, International Islamic University Islamabad. A written consent was taken from the respondents and their anonymity and confidentiality was assured. The respondents participated in this study on voluntary basis and no financial rewards were provided to them.

## Participants

A cross-sectional survey was conducted with students enrolled across four different universities in Islamabad, the capital of Pakistan. The students were selected on the basis of availability through a non-random sampling method between October and December 2018. The available students were informed about the purpose of research study. The inclusion criteria for the respondents were as follows: (a) regular students enrolled in graduate and postgraduate programs, (b) boarders, and (c) Facebook user for more than a year.

For this study, the researchers collected socio-demographic data to suit the research needs and included the variables of age, gender, education, and family income. Variables for Facebook usage included the following: (i) time spent on the platform daily, (ii) number of accounts, and (iii) intensity of Facebook use. As presented in Table 1, complete data from 713 surveys was analyzed. Respondents ranged from the ages 18 to 40 years ( $M = 22.92$ ,  $SD = 3.87$ ), and majority belonged to the lower middle class strata (32%).

## Instruments

The scales used in the study were in the English language. English is the medium of instruction at university level in Pakistan and is also the official working language in the country.

**Table 1** Socio-demographic characteristics of respondents

	Frequency	Percent
Gender		
Female	353	49.5
Male	360	50.5
Monthly family income		
< PKR 30,000	181	25.4
PKR 30,000–60,000	228	32.0
PKR 60,000–90,000	128	18.0
PKR 90,000–120,000	95	13.3
> PKR 120,000	81	11.4
Age		
18–20 years	194	27.2
21–30	484	67.9
31–40	35	4.9
Total	713	100.0

## Bergen Facebook Addiction Scale

In order to assess Facebook addiction among the students, the BFAS (Andreassen et al. 2012) was used. This scale consists of six items, covering core features of addiction (i.e., salience, mood modification, tolerance, withdrawal, conflict, and relapse). The items are scored on a 5-point scale (i.e., 1: very rarely to 5: very often) within a time-frame of 12 months (e.g., How often have you spent a lot of time thinking about Facebook or planned to use of Facebook?) for assessing Facebook addiction. Total scores have been obtained by summing participant ratings of each item (ranging 6–30), with higher scores indicating heightened addiction to Facebook. The means, standard deviations, and Pearson correlation coefficients of the BFAS items have been reported in Table 4 (Appendix 1). The items of the BFAS and inter-correlations of ratings are reported in Table 5 (Appendix 2), the values for which ranged from minimum = 0.528 to maximum = 0.712. The English version of the BFAS was used as English is the official and instructional language at universities in Pakistan. Andreassen et al. (2012) reported psychometric properties of original version of BFA, good internal consistency ( $\alpha = 0.83$ ), test-retest reliability ( $r = 0.82$ ), and a one-factor structure with good fit indicators (RMSEA = 0.046, CFI = 0.99).

## Intensity of Facebook Use

The Facebook Intensity Scale was developed by Ellison et al. (2007). This scale measures emotional connectedness and its integration into individuals' daily activities. The six attitudinal items (sample item: "I feel out of touch when I haven't logged onto Facebook for a while") are scored on a 5-point scale (i.e., 1: strongly disagree to 5: strongly agree). Total scores have been obtained by summing participant ratings of each item (ranging 6–30), with higher scores indicating intense use of Facebook. The first reported Cronbach's alpha of this scale was 0.83, which showed higher level of reliability of the scale. In Pakistani context, this scale also showed good internal consistency ( $\alpha = 0.86$ ) (Mahmood et al. 2018a).

## Data Analyses

The statistical analysis for this study involved the following: (i) screening of missing values in all relevant instruments; (ii) inspection of normal distribution of all items of FBI and BFAS using standard guidelines (i.e., skewness  $> 3$  and kurtosis  $> 9$ ) (Kline 2011); and (iii) cleaning the outliers for each items of both scales that scored  $\pm 3.29$  standard deviations from the  $z$ -scores (Field 2013). This procedure resulted in 20 excluded cases, yielding a final dataset of 713 valid cases. Descriptive analysis was performed to understand sample's characteristics. Cronbach's alpha was calculated for assessing the reliability of both scales. Confirmatory factor analysis (CFA) was done to assess the construct validity of the BFAS. To analyze criterion validity of the BFAS, structural equation modeling (SEM) was performed with intensity of Facebook use as the latent predictor of Facebook addiction. All statistical analyses were performed using IBM SPSS Statistics 20 (IBM Corp 2011).

## Results

Most participants were using only one Facebook account (86.8%,  $n = 619$ ), and a considerable number of students (55.5%,  $n = 396$ ) were using Facebook more than an hour in a day, as

shown in Table 2. Overall, the surveyed students were considered intense users of Facebook ( $M = 16.83$ ,  $SD = 5.92$ ) in their routine life.

### Construct Validity

CFA was run on the six items of the BFAS to test one-factor solution of the Facebook addiction construct (Andreassen et al. 2013). The analysis revealed that the chi-square test demonstrated good model fit:  $\chi^2(9) = 26.37$ ,  $p < 0.002$ , and  $\chi^2/df = 2.971$ . Likewise, alternate fit indices (comparative fit index [CFI] = 0.985, root mean square error of approximation [RMSEA] = 0.053 [90% CI 0.030–0.076]) showed a good fit in the overall sample. The other fit indices (GFI = 0.987, AGFI = 0.971, and RMR = 0.038) also showed a good fit of the sample. In addition, standardized item loadings were all statistically significant and ranged from 0.50 to 0.73. Overall, these results clearly demonstrate that the one-factor solution model for the BFAS presents a good fit to the data (Fig. 1).

### Criterion Validity

Criterion validation was performed through a SEM analysis. As proposed in this study, Facebook Intensity (FBI) was taken as the predictor of Facebook addiction in the structural model. The findings revealed an excellent fit to the data ( $\chi^2 = 104.3$ ,  $df = 49$ ,  $\chi^2/df = 2.130$ ,  $p < .001$ ; CFI = 0.976, AGFI = 0.962, RMR = 0.045; RMSEA = 0.040, 90% CI [0.029–0.050]; GFI = 0.976). A further inspection to the correlation coefficient provided additional support for the BFAS's criterion validity ( $r = 0.62$ ,  $R^2 = 0.3$ ,  $p < 0.0001$ , 95%) (Fig. 2).

### Reliability

The value of Cronbach's alpha was  $\alpha = 0.782$  for BFAS, which is considered high and could not be improved upon deletion of any item. Composite reliability was good (CR = 0.81), and average variance extracted (AVE = 0.43) was below the threshold value  $> 0.50$ . Inter-item correlations were also good (Min = 0.361, Max = 0.520). For BFAS, the calculated value of composite reliability was 0.81, which is much higher than the accepted threshold of 0.70 (Hair et al. 2011). Factor determinacy for the

**Table 2** Facebook use among respondents

	Frequency	Percent
No. of Facebook accounts		
1	619	86.8
2	94	13.2
Average time spent on Facebook in a day		
Less than 1 h	317	44.5
1 to 2 h	174	24.4
2 to 3 h	99	13.9
More than 3 h	123	17.3
Intensity of Facebook use		
High	348	48.8
Low	365	51.2
Total	713	100.0

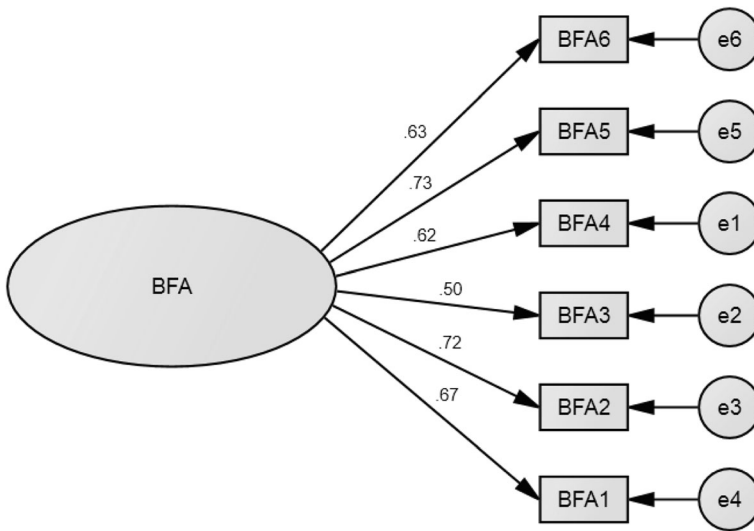


Fig. 1 Summary of the confirmatory factor analysis of the Bergen Facebook Addiction Scale

BFAS was 0.91, which is above the desired threshold of 0.80 (Muthén and Muthén 2012). These results show that the BFAS presents adequate internal consistency levels as evaluated by several different indicators.

**Generalized Linear Model Results**

In order to see the effect of socio-demographic variables on BFAS, GLM (UNICOVA) was run while controlling for Facebook use variables. There is no statistically significant effect of age ( $F(1, 636) = 0.273, p = 0.602$ ), gender ( $F(1, 636) = 1.40, p = 0.236$ ), and monthly family income ( $F(4, 636) = 1.34, p = 0.251$ ) on BFAS. The interaction between all the variables does not have any effect on BFAS. The generalized linear model results show that there is effect of

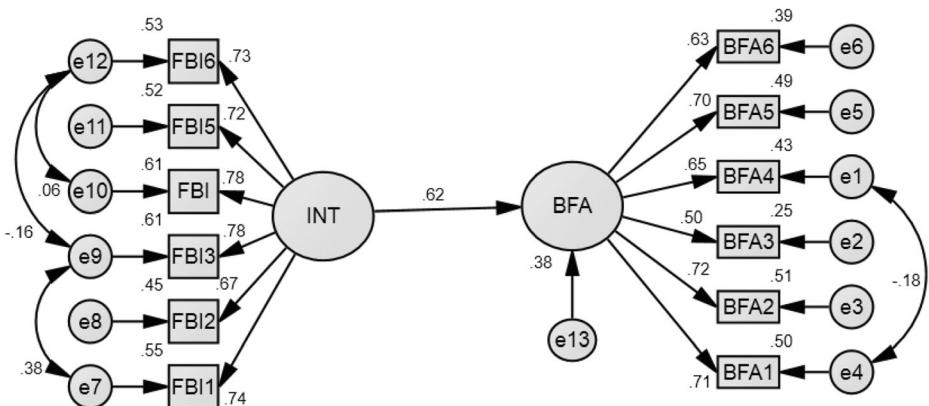


Fig. 2 Criterion validation of the Bergen Facebook Addiction Scale



intensity of use ( $F(2, 636) = 110.83, p < 0.001, \eta^2 = 0.148$ ), time spent on Facebook ( $F(3, 636) = 5.65, p < 0.001, \eta^2 = 0.026$ ), and number of Facebook accounts ( $F(2, 636) = 4.01, p < 0.001, \eta^2 = .006$ ) on BFAS with  $\Delta R^2 = 0.316$  (Table 3). These results are aligned with hypothesis 4 that BFAS is primarily explained by Facebook use variables and socio-demographics do not have any effect on BFAS.

## Discussion

The aim of this study was to investigate the Facebook addiction among university students. Results show that a considerable number of students are intense users of Facebook and are using the site for more than an hour every day. Previous findings from Pakistan report that women use less social media compared with men (Sathar et al. 2016). In contrast, our findings suggest there is no gender difference in amount of social media usage. To achieve the objective of this study, researchers conducted psychometric analysis with regard to reliability, construct validity, and criterion validity. Our first hypothesis was that the BFAS demonstrates a one-factor solution with high factor loadings for all items. All loadings were above 0.50. The CFI was above 0.98, and the RMSEA was below 0.05, showing a good fit over the sample. Thus, using confirmatory factor analysis, our first hypothesis is supported. The BFAS one-factor structure reflects six salient features of addiction, including salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse (Andreassen et al. 2012). Studies from other developing regions also confirm that the BFAS is a one-factor solution for youth (MPH 2015b).

**Table 3** Generalized linear model (UNICOVA) predicting variance of BFAS

Source	Type III sum of squares	df	Mean Square	F	Sig.	$\eta$
Corrected model	7781.320 <sup>a</sup>	76	102.386	5.322	0.000	0.389
Intercept	481.903	1	481.903	25.050	0.000	0.038
(A) Age	5.243	1	5.243	0.273	0.602	0.000
(B) Intensity of use	2132.235	1	2132.235	110.836	0.000	0.148
(C) Gender	27.046	1	27.046	1.406	0.236	0.002
(D) Monthly family Income	103.605	4	25.901	1.346	0.251	0.008
(E) Time spent on Facebook	326.619	3	108.873	5.659	0.001	0.026
(F) Facebook accounts	77.146	1	77.146	4.010	0.046	0.006
C * D	75.361	4	18.840	0.979	0.418	0.006
C * E	75.119	3	25.040	1.302	0.273	0.006
C * F	0.101	1	.101	0.005	0.942	0.000
D * E	168.188	12	14.016	0.729	0.724	0.014
D * F	62.025	4	15.506	0.806	0.522	0.005
E * F	45.509	3	15.170	0.789	0.501	0.004
B * D * E	140.138	12	11.678	.607	0.837	0.011
B * D * F	79.776	4	19.944	1.037	0.387	0.006
B * E * F	10.084	3	3.361	0.175	0.914	0.001
D * E * F	165.633	12	13.803	0.717	0.735	0.013
B * D * E * F	58.164	7	8.309	0.432	0.882	0.005
Error	12,235.190	636	19.238			
Total	163,712.000	713				
Corrected total	20,016.511	712				

<sup>a</sup>  $R^2 = 0.389$  ( $\Delta R^2 = 0.316$ )

The second hypothesis was that the composite reliability of BFAS will be higher than the accepted threshold. The results show that Cronbach's alpha was above 0.78. The composite reliability for BFAS was above 0.81 and the factor determinacy for the BFAS was 0.91 which is much higher than the threshold for 0.70 and 0.80, respectively. In this way, our second hypothesis for internal consistency is also supported. Our third hypothesis implied that the scores for the BFAS correlate positively with ratings on intensity of Facebook usage. Other scholars have been using the BFAS and Facebook Intensity Scale to measure the relationship between addiction and intensity of use (Błachnio and Przepiorka 2016). Results reveal that the scores are positively correlated with the Facebook Intensity Scale measures. This indicates that the BFAS primarily measures intensity of usage, in context to addiction; therefore, hypothesis 3 is also supported. In addition, GLM results of this study proved that the intensity of Facebook use is the main predictor of BFAS. Our fourth hypothesis stated that the BFAS is primarily explained by Facebook usage variables and socio-demographics do not have any effect on BFAS. The results reflect that age, gender, and monthly family income do not have a statistically significant effect on BFAS. Thus, our fourth hypothesis is also supported.

The findings of this study approve that BFAS has acceptable psychometric properties in terms of factor structure, internal consistency and reliability, and construct and criterion validity. The main contribution of this study is to provide an empirical evidence of rising problem of Facebook addiction in society. Keeping these results in view, the authors conclude that Facebook addiction is a phenomenon that exists across the countries.

This study has some limitations too. In this study, the data were collected from only university students through non probability sampling. In future studies, the data should be collected using probability sampling and survey general population, including youth populations such as those participating in paid work and not enrolled at university. In addition, studies are recommended for the assessment of the optimal cut-off point for this instrument based on clinical data (e.g., structured clinical interviews) or empirical data (e.g., latent class/profile analysis). Facebook usage motivation among university students is an important area yet to be explored in Pakistan. Further research on psychological and social factors initiating stimulation to use Facebook is needed. In addition, the use of BFAS in longitudinal studies in diverse sociocultural settings can provide better insight of social media addiction.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** Ethical approval for this study was obtained from the Ethical Research Committee of the Department of Sociology, International Islamic University Islamabad.

**Informed Consent** A written consent was taken from the respondents and their anonymity and confidentiality was assured.

## Appendix 1

**Table 4** Means, standard deviations, and Pearson correlation coefficients for items of Bergen Facebook Addiction Scale ( $N = 713$ )

	M	SD	BFA1	BFA2	BFA3	BFA4	BFA5	BFA6
BFA1	2.17	1.17	1	0.520**	0.309**	0.361**	0.496**	0.416**
BFA2	2.35	1.22		1	0.396**	0.429**	0.513**	0.430**
BFA3	2.49	1.19			1	0.361**	0.338**	0.296**
BFA4	2.45	1.25				1	0.460**	0.436**
BFA5	2.28	1.20					1	0.474**
BFA6	2.46	1.34						1

\*\*Correlation is significant at the 0.01 level (2-tailed)

## Appendix 2

**Table 5** The Bergen Facebook Addiction Scale: items and inter-correlations of ratings

Item-total correlation	
Saliency	
Spent a lot of time thinking about Facebook or planned use of Facebook?	0.667
Thought about how you could free more time to spend on Facebook?	0.661
Thought a lot about what has happened on Facebook recently?	0.613
Tolerance	
Spent more time on Facebook than initially intended?	0.679
Felt an urge to use Facebook more and more?	0.694
Felt that you had to use Facebook more and more in order to get the same pleasure from it?	0.712
Mode modification	
Used Facebook in order to forget about personal problems?	0.528
Used Facebook to reduce feelings of guilt, anxiety, helplessness, and depression?	0.549
Used Facebook to reduce restlessness?	0.559
Relapse	
Experienced that others have told you to reduce your use of Facebook but not listened to them?	0.671
Tired to cut down on the use of Facebook without success?	0.612
Decided to use Facebook less frequently, but not managed to do so?	0.615
Withdrawal	
Become restless or troubled if you have been prohibited from using Facebook?	0.700
Become irritable if you have been prohibited from using Facebook?	0.665
Felt bad if you, for different reasons, could not log on to Facebook for some time?	0.571
Conflict	
Used Facebook so much that it has had a negative impact on your job/studies?	0.624
Given less priority to hobbies, leisure activities, and exercise because of Facebook?	0.656
Ignored your partner, family members, or friends because of Facebook?	0.601

## References

- Alabi, O. F. (2013). A survey of Facebook addiction level among selected Nigerian University undergraduates. *New Media and Mass Communication*, 10(2012), 70–80.
- AlphaPro Digital Statistical Indicators. (2018). Pakistan Social Media Stats 2018. Retrieved from <http://alphapro.pk/pakistan-social-media-stats-2018/>
- Altin, M., & Kivrak, A. O. (2018). The social media addiction among Turkish university students. *Journal of Education and Training Studies*, 6(12), 13–20.
- Andreassen, C. S. (2015). Online social network site addiction: a comprehensive review. *Current Addiction Reports*, 2(2), 175–184.
- Andreassen, C. S., Torsheim, T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook addiction scale. *Psychological reports*, 110(2), 501–517.
- Andreassen, C. S., Griffiths, M. D., Gjertsen, S. R., Krossbakken, E., Kvam, S., & Pallesen, S. (2013). The relationships between behavioral addictions and the five-factor model of personality. *Journal of behavioral addictions*, 2(2), 90–99.
- Avis, W. (2016). *The role of online/social media in countering violent extremism in East Africa*. Retrieved from Awan, J., & Memon, S. (2016). *Threats of cyber security and challenges for Pakistan*. Paper presented at the International Conference on Cyber Warfare and Security.
- Badenes-Ribera, L., Fabris, M., Gastaldi, F., Prino, L., & Longobardi, C. (2019). Parent and peer attachment as predictors of Facebook addiction symptoms in different developmental stages (early adolescents and adolescents). *Addictive behaviors*, 95, 226–232.
- Błachnio, A., & Przepiorka, A. (2016). Personality and positive orientation in Internet and Facebook addiction. An empirical report from Poland. *Computers in Human Behavior*, 59, 230–236.
- Brailovskaia, J., & Margraf, J. (2017). Facebook Addiction Disorder (FAD) among German students—a longitudinal approach. *PLoS One*, 12(12), e0189719.
- Broadhurst, R., Grabosky, P., Alazab, M., Bouhours, B., & Chon, S. (2014). An analysis of the nature of groups engaged in cyber crime. *An analysis of the nature of groups engaged in cyber crime, International Journal of Cyber Criminology*, 8(1), 1–20.
- Casale, S., & Fioravanti, G. (2018). Why narcissists are at risk for developing Facebook addiction: the need to be admired and the need to belong. *Addictive behaviors*, 76, 312–318.
- Cerniglia, L., Guicciardi, M., Sinatra, M., Monacis, L., Simonelli, A., & Cimino, S. (2019). The use of digital technologies, impulsivity and psychopathological symptoms in adolescence. *Behavioral Sciences*, 9(8), 82.
- Chen, H. T., & Kim, Y. (2013). Problematic use of social network sites: the interactive relationship between gratifications sought and privacy concerns. *Cyberpsychology, Behavior, and Social Networking*, 16(11), 806–812.
- Costello, C. R., & Ramo, D. E. (2017). Social media and substance use: what should we be recommending to teens and their parents? *Journal of Adolescent Health*, 60(6), 629–630.
- D'Ambrosi, L., Papakristo, P., & Polci, V. (2018). Social media and gender violence: communication strategies for a “new education”. *Italian Journal of Sociology of Education*, 10(2).
- Davis, R. A., Flett, G. L., & Besser, A. (2002). Validation of a new scale for measuring problematic Internet use: implications for pre-employment screening. *CyberPsychology & Behavior*, 5(4), 331–345.
- Desjarlais, M., & Willoughby, T. (2010). A longitudinal study of the relation between adolescent boys and girls' computer use with friends and friendship quality: support for the social compensation or the rich-get-richer hypothesis? *Computers in Human Behavior*, 26(5), 896–905.
- Duke, É., & Montag, C. (2017). Smartphone addiction, daily interruptions and self-reported productivity. *Addictive behaviors reports*, 6, 90–95.
- Economic, U. N. D. o., & Division, S. A. P (2010). *World population prospects: The 2010 revision*: UN.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook “friends”: social capital and college students' use of online social network sites. *Journal of computer-mediated communication*, 12(4), 1143–1168.
- Elphinston, R. A., & Noller, P. (2011). Time to face it! Facebook intrusion and the implications for romantic jealousy and relationship satisfaction. *Cyberpsychology, Behavior, and Social Networking*, 14(11), 631–635.
- Englander, F., Terregrossa, R. A., & Wang, Z. (2010). Internet use among college students: tool or toy? *Educational Review*, 62(1), 85–96.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*: sage.
- Gadit, A. A. M., & Mugford, G. (2007). Prevalence of depression among households in three capital cities of Pakistan: need to revise the mental health policy. *PLoS One*, 2(2), e209.
- Griffiths, M. D. (2013). Social networking addiction: emerging themes and issues. *Journal of Addiction Research & Therapy*, 4(5).

- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *Journal of Marketing theory and Practice*, *19*(2), 139–152.
- Haron, H., & Yusof, F. B. M. (2010). *Cyber stalking: the social impact of social networking technology*. Paper presented at the 2010 International Conference on Education and Management Technology.
- Hawi, N. S., & Samaha, M. (2016). To excel or not to excel: strong evidence on the adverse effect of smartphone addiction on academic performance. *Computers & Education*, *98*, 81–89.
- Henken, L. (2015). Internal instability and technology: do text messages and social media increase levels of internal conflict?
- Hong, F.-Y., Huang, D.-H., Lin, H.-Y., & Chiu, S.-L. (2014). Analysis of the psychological traits, Facebook usage, and Facebook addiction model of Taiwanese university students. *Telematics and Informatics*, *31*(4), 597–606.
- IBM Corp. (2011). *IBM SPSS statistics for windows, version 20.0*. New York: IBM Corp.
- Joseph, S. (2012). Social media, political change, and human rights. *BC Int'l & Comp. L. Rev.*, *35*, 145.
- Junco, R. (2012). Too much face and not enough books: the relationship between multiple indices of Facebook use and academic performance. *Computers in Human Behavior*, *28*(1), 187–198.
- Kabilan, M. K., Ahmad, N., & Abidin, M. J. Z. (2010). Facebook: an online environment for learning of English in institutions of higher education? *The Internet and higher education*, *13*(4), 179–187.
- Kadoda, G., & Hale, S. (2015). Contemporary youth movements and the role of social media in Sudan. *Canadian Journal of African Studies/Revue canadienne des études africaines*, *49*(1), 215–236.
- Kalpidou, M., Costin, D., & Morris, J. (2011). The relationship between Facebook and the well-being of undergraduate college students. *CyberPsychology, behavior, and social networking*, *14*(4), 183–189.
- Kane, G. C. (2012). Psychosocial stages of symbolic action in social media.
- Karaiskos, D., Tzavellas, E., Balta, G., & Paparrigopoulos, T. (2010). P02–232-Social network addiction: a new clinical disorder? *European Psychiatry*, *25*, 855.
- Kimpton, M., Campbell, M. A., Weigin, E. L., Orel, A., Wozencroft, K., & Whiteford, C. (2019). The relation of gender, behavior, and intimacy development on level of Facebook addiction in emerging adults *Gender and Diversity: Concepts, Methodologies, Tools, and Applications* (pp. 1706–1719): IGI Global.
- Kline, R. B. (2011). *Convergence of structural equation modeling and multilevel modeling*: na.
- Lin, J.-H., Peng, W., Kim, M., Kim, S. Y., & LaRose, R. (2012). Social networking and adjustments among international students. *New Media & Society*, *14*(3), 421–440.
- Livingstone, S. (2014). Developing social media literacy: how children learn to interpret risky opportunities on social network sites. *Communications*, *39*(3), 283–303.
- Luxton, D. D., June, J. D., & Fairall, J. M. (2012). Social media and suicide: a public health perspective. *American journal of public health*, *102*(S2), S195–S200.
- Madge, C., MEEK, J., Wellens, J., & Hooley, T. (2009). Facebook, social integration and informal learning at university: 'It is more for socialising and talking to friends about work than for actually doing work'. *Learning, media and technology*, *34*(2), 141–155.
- Mahmood, Q. K., & Saud, M. (2018). Civic participation and facebook: A cross sectional survey of Pakistani university students. In *4th International Conference on Contemporary Social and Political Affairs (ICoCSPA)* (Vol. 13, pp. 59–65).
- Mahmood, Q. K., Zakar, R., & Zakar, M. Z. (2018a). Role of Facebook use in predicting bridging and bonding social capital of Pakistani university students. *Journal of Human Behavior in the Social Environment*, *28*(7), 856–873.
- Mahmood, Q. K., Bhutta, M. H., & ul Haq, M. A. (2018b). Effects of sociodemographic variables and Facebook group membership on students political participation. *Education and Information Technologies*, *23*(5), 2235–2247.
- Malik, S., & Khan, M. (2015). Impact of Facebook addiction on narcissistic behavior and self-esteem among students. *J Pak Med Assoc*, *65*(3), 260–263.
- Marshall, T. C. (2012). Facebook surveillance of former romantic partners: associations with postbreakup recovery and personal growth. *CyberPsychology, behavior, and social networking*, *15*(10), 521–526.
- Masthi, N. R., Cadabam, S. R., & Sonakshi, S. (2015). Facebook addiction among health university students in Bengaluru. *International Journal of Health & Allied Sciences*, *4*(1), 18.
- Monacis, L., De Palo, V., Griffiths, M. D., & Sinatra, M. (2017). Social networking addiction, attachment style, and validation of the Italian version of the Bergen Social Media Addiction Scale. *Journal of Behavioral Addictions*, *6*(2), 178–186.
- MPh, M. M. (2015a). Facebook addiction and its relationship with mental health among Thai high school students. *J Med Assoc Thai*, *98*(3), S81–S90.
- MPh, M. M. (2015b). Validation of the Thai version of Bergen Facebook addiction scale (Thai-BFAS). *J Med Assoc Thai*, *98*(2), 108–117.

- Muise, A., Christofides, E., & Desmarais, S. (2009). More information than you ever wanted: does Facebook bring out the green-eyed monster of jealousy? *CyberPsychology & Behavior, 12*(4), 441–444.
- Muthén, L. K., & Muthén, B. O. (2012). *Mplus: Statistical Analysis with Latent Variables; User's Guide; [version 7]*: Muthén et Muthén.
- Nel, R. (2015). Social media and the new struggles of young people against marginalisation: a challenge to missional ecclesiology in Southern Africa. *Stellenbosch Theological Journal, 1*(2), 511–530.
- Pera, A. (2018). Psychopathological processes involved in social comparison, depression, and envy on Facebook. *Frontiers in Psychology, 9*, 22.
- Poushter, J. (2016). Smartphone ownership and Internet usage continues to climb in emerging economies. *Pew Research Center, 22*, 1–44.
- Poushter, J., Bishop, C., & Chwe, H. (2018). *Social media use continues to rise in developing countries but plateaus across developed ones*. Washington: Pew Internet and American Life Project.
- Quan-Haase, A., & Young, A. L. (2010). Uses and gratifications of social media: a comparison of Facebook and instant messaging. *Bulletin of Science, Technology & Society, 30*(5), 350–361.
- Rinaldi, R. L., & Farr, A. C. (2018). Promoting positive youth development: a psychosocial intervention evaluation. *Psychosocial Intervention, 27*(1), 22–34.
- Rosen, L. D., Carrier, L. M., & Cheever, N. A. (2013a). Facebook and texting made me do it: media-induced task-switching while studying. *Computers in Human Behavior, 29*(3), 948–958.
- Rosen, L. D., Whaling, K., Rab, S., Carrier, L. M., & Cheever, N. A. (2013b). Is Facebook creating “iDisorders”? The link between clinical symptoms of psychiatric disorders and technology use, attitudes and anxiety. *Computers in Human Behavior, 29*(3), 1243–1254.
- Ryan, T., Chester, A., Reece, J., & Xenos, S. (2014). The uses and abuses of Facebook: a review of Facebook addiction: Akadémiai Kiadó, co-published with Springer Science+ Business Media BV.
- Saied, S. M., Elsabagh, H. M., & El-Afandy, A. M. (2017). Internet and Facebook addiction among Egyptian and Malaysian medical students: a comparative study, Tanta University, Egypt. *International Journal of Community Medicine and Public Health, 3*(5), 1288–1297.
- Saleem, M., Irshad, R., Zafar, M., & Tahir, M. A. (2016). Facebook addiction causing loneliness among higher learning students of Pakistan: a linear relationship. *Journal of Applied and Emerging Sciences, 5*(1), 26–31.
- Sathar, Z. A., Kamran, I., Sadiq, M., & Hussain, S. (2016). *Youth in Pakistan: priorities, realities and policy responses*. Islamabad: Population Council.
- Sharifah, S. Z. S., Siti, Z. O., Jusang, B., & Mohd, N. O. (2011). Facebook addiction among female university students. *Revista de Administratie Publica si Politici Sociale., 2*(7), 95–109.
- Shaw, L. H., & Gant, L. M. (2004). In defense of the Internet: the relationship between Internet communication and depression, loneliness, self-esteem, and perceived social support. *Internet Research, 28*(3).
- Sherman, E. (2011). *Facebook addiction: factors influencing an individual's addiction*. University of Massachusetts Boston.
- Steinfeld, C., Ellison, N. B., & Lampe, C. (2008). Social capital, self-esteem, and use of online social network sites: a longitudinal analysis. *Journal of Applied Developmental Psychology, 29*(6), 434–445.
- Suissa, A. J. (2014). Cyberaddictions: toward a psychosocial perspective. *Addictive behaviors, 39*(12), 1914–1918.
- Tandoc Jr., E. C., Ferrucci, P., & Duffy, M. (2015). Facebook use, envy, and depression among college students: is Facebooking depressing? *Computers in Human Behavior, 43*, 139–146.
- United Nations., Department of Economic and Social Affairs., Population Division (2011). *World Population Prospects: The 2010 Revision, Volume I: Comprehensive Tables*. ST/ESA/SER.A/313.
- Velasquez, A., & LaRose, R. (2015). Youth collective activism through social media: the role of collective efficacy. *New Media & Society, 17*(6), 899–918.
- Yan, W., Li, Y., & Sui, N. (2014). The relationship between recent stressful life events, personality traits, perceived family functioning and Internet addiction among college students. *Stress and Health, 30*(1), 3–11.
- Yigit, M. F., & Tarman, B. (2013). The impact of social media on globalization, democratization and participative citizenship. *Journal of Social Science Education, 12*(1), 75–80.
- Yusuf, M. (2008). Prospects of youth radicalization in Pakistan. *Brookings, Analysis Paper, 14*(7), 1–27.
- Zaffar, M., Mahmood, S., Saleem, M., & Zakaria, E. (2015). Facebook addiction: Relation with depression, anxiety, loneliness and academic performance of Pakistani students. *Science International (Lahore), 27*(3), 2469–2475.
- Zeitsoff, T. (2017). How social media is changing conflict. *Journal of Conflict Resolution, 61*(9), 1970–1991.

## Affiliations

**Qaisar Khalid Mahmood<sup>1</sup> · Sara Rizvi Jafree<sup>2</sup> · Malik Muhammad Sohail<sup>3,4</sup>**

<sup>1</sup> Department of Sociology, International Islamic University, Islamabad, Pakistan

<sup>2</sup> Department of Sociology, Forman Christian College (A Chartered University), Ferozpur Road, Lahore 54600, Pakistan

<sup>3</sup> Department of Sociology, University of Sargodha, Sargodha, Pakistan

<sup>4</sup> Higher Education Department Punjab, Lahore, Pakistan