

Validation Study of the Bergen Facebook Addiction Scale On a Sample of Bangladeshi People

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Abstract

The present study was designed to validate the Bergen Facebook Addiction Scale (BFAS) in Bangladeshi culture in response to the scarcity of instrument for measuring Facebook addiction of Bangladeshi people. The BFAS was translated and back translated by following standard procedures. The translated version of the measure was administered, after pre-test, on a sample of 237 respondents who selected through non-probability sampling techniques. The psychometric properties were assessed by item analysis, exploratory factor analysis, confirmatory factor analysis, Pearson product moment correlation coefficients. Findings revealed that the Bangla BFAS had sufficient item-total correlation, internal consistency reliabilities (Chronbach's Alpha, Split-half reliabilities), and test-retest reliability. These findings suggested that the Bangla BFAS had sufficient level of reliability and validity and this measure could be applicable in Bangladeshi culture for screening out Facebook addiction.

Keywords: Facebook addiction; Reliability; Validity

Introduction

Facebook is one of the popular and most used social networking sites in the present virtual world. It is the 3rd highest visited website [1]. At present, 2.1 billion people are using Facebook. Among them, 1.4 billion are active users of Facebook [2]. According to BTRC's monthly report, the number of internet users in Bangladesh was 86.87 million at the end of May 2018 [3]. From the authors' personal observations, almost all internet users have a Facebook account. Even, internet and Facebook both are used as same meaning to a large number of people here. A statistics said, among social networking sites users, 91.93% are Facebook users in Bangladesh [4].

As a behavior addiction, internet addiction gets huge attention to the behavioral scientists. Social media (i.e., Facebook) addiction is regarded as a kind of Internet addiction [5]. Facebook addiction is the dependency on Facebook due to excessive use of it that causes for disruption in daily activities. A strong and uncontrollable desire for being online is a common symptom of the Facebook addiction. Researchers found that excessive use of electronic media causes for delayed rising times and bedtimes also [6]. There are 6 core components of the Facebook addiction as existing literature suggested. This are salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse [7,8]. Salience refers to particular activities that become the most important in one's life and dominates one's thinking, feelings, and behavior. Mood modification refers to engage in certain activities for modifying or improving moods. Tolerance refers to an increase in activity level that is required for achieving the previous effect. Withdrawal symptoms refer to the occurrence of psychological feelings or physiological reactions when a certain activity is suddenly discontinued (i.e., stop Facebook use). Conflicts refer to problematic relations due to more engagement in the certain activity. Relapse refers to a tendency for reversion to the earlier patterns of particular activity after control or abstinence.

As large numbers of people are using Facebook, it is important to identify who are becoming addicted to Facebook. It is equally important to know their behavior pattern, effects on their daily lives. The prevalence statistics of Facebook addiction is not available in Bangladesh context. Siddiqi et al. [9] conducted a study on a sample of 376 (aged 13-19 years) students from the Dhaka city. In this study, authors found that only 7% were natural Facebook users and rest 93% were somewhat addicted (2% severely addicted, 41% moderately addicted, and 50% mild addicted).

There was a scarcity of developed or adapted instrument for assessing Facebook addiction among Bangladeshi people. So, this study was aimed to validate an instrument for measuring Facebook addiction. The main objective of this study was to validate the Bergen Facebook Addiction Scale [8] for Bangladeshi people. This scale was validated in Thai [10], Turkish [11], Spanish [12], Portuguese [13] language. Others objectives were: i) To estimate the item-total correlations of items of the BFAS; ii) To explore the factor structure; iii) To test the model fit of the explored structure; iv) To estimate the internal consistency and test-retest reliabilities; v) To determine the utility of the scale to identify the people who are addicted on Facebook.

Methods

Participants

The target population of the present study was Bangladeshi young and the accessible population was university students of Bangladesh. A sample of 303 students from the University of Chittagong was selected through non-probability sampling technique. At first, the University of Chittagong was selected conveniently. Then, respondents were selected purposively from different faculties. Respondents' age mean was 19.93 years with standard deviation 2.48 years. Among respondents, 35.6% were male and 64.4% were female. In term of respondents' academic year, 45.2% were in 1st year, 12.9% in 2nd year, 14.5% in 3rd year, 14.2% in 4th year at the undergraduate level, and 13.2% in Masters Level.

Among them, 31.6% resided in suburban areas and 68.4% were in urban areas, and 84.5% were from nuclear family and 15.5% from extended family.

Measures

The Bergen Facebook Addiction Scale [8] is 6 items measure with a five-point Likert-type scale (1=very rarely, 2=rarely, 3=sometimes, 4=often, 5=very often). This scale is concerned with experiences during the past one year related to Facebook use. The 6 items reflected the six core elements of addiction i.e., salience, tolerance, mood modification, conflict, relapse, withdrawal. Total score ranged from 6 to 30. Higher scores indicated higher level of addiction. The BFAS is a psychometrically sound measure that could be used in clinical settings also. The Cronbach's Alpha of this measure in the original study was 0.83. Item-total correlations were ranged from 0.60 to 0.73 and the test-retest reliability was 0.82 as reported by authors. This measure was highly correlated with the Addictive Tendencies Scale [14] and the Facebook Attitude Scale [15].

Procedure

The original version of the Bergen Facebook Addiction Scale (BFAS) was translated and validated into Bangla language for Bangladeshi young. The procedure for the translation and validation of the BFAS was carefully done with taking into account the rules and guidelines established by the International Test Commission (ITC) for the translation and adaptation of measurement instruments from one language to another language and from one culture to another culture. Following steps were used for validating the BFAS:

Step One: Ensuring construct equivalence

Available literature on the BFAS, published in different scientific journals and books, had been reviewed to determine whether the original version of the BFAS had the same meaning in Bangladeshi culture as in foreign culture. Experts' opinions were sought to determine the equivalence of the construct between two cultures. It appeared convincing from experts' opinions along with literature review that the BFAS had the same meaning and the same definitions and equally applicable to Bangladeshi culture. Then, authors' permission was taken to validate this scale in Bangladeshi culture.

Step Two: Forward translation

The BFAS was translated into Bangla with the help of one language expert and one subject expert without consulting each other. They put in much effort to select the best words, expressions while translating the scale. Then their translations of the measure were synthesized into one. The synthesized translation was examined by other 2 experts. They were requested to check and systematic revision of conceptual equivalence of words or phrases, but not a word for word translation. According to their recommendations on some words, and expressions, the translated version of the BFAS was synthesized again.

Step Three: Back translation

The synthesized translated draft of the BFAS was back translated to English by 2 experts' one subject expert and one language expert. Then their translations were synthesized into one and checked by two different experts. They were requested to compare the content of the BFAS in the original language and in back translated version. They also requested to recommend correction and advice if they would have.

They had no major recommendations. All of them rated that items of the two versions had the same content.

Step Four: Pilot study

Administration

In this stage, the translated BFAS was administered on a sample of 35 students, selected purposively, from the Chittagong University. At first, respondents were requested to read the instructions on the top of the questionnaire very carefully. Also, administrators of the questionnaire explained what respondents had to do. Respondents were informed about the objectives and significance of the study. They were requested to fill in the personal information form and read the questionnaire and express their opinions for each item by putting 'tick' mark (.) on the appropriate response box that was the best expression of their opinions. During the test, respondents were allowed to ask questions about the words or concepts that they did not understand. The words or expressions that they asked were noted by the test administrators to verify whether it was necessary to modify these.

Analysis

The pilot study data were subjected to item analysis to estimate the Cronbach's Alpha and corrected item-total correlation. This analysis revealed that Cronbach's Alpha was 0.809 and corrected item-total correlation ranged from 0.324 to 0.781. These scores suggested suitability of the measure to apply in the next stage of the study.

Step Five: Field Study

The final study was carried out to estimate the reliability and validity of the Bangla BFAS. At the beginning of the administration of the questionnaire, respondents were requested to read the written instructions carefully. Verbal instructions about their tasks were also given. They were informed about the objectives and significance of the study. They were told that there was no right or wrong answer but, it was important to answer honestly. Administrators also assured them that the information collected from them would be kept strictly confidential and would be used only research purposes. They were asked to fill-in the personal information form and read the questionnaire and express their opinion for each item by putting 'tick' marks (.) on the appropriate response boxes that were the best expression of their opinions. After completing their tasks, they were thanked for their cordial cooperation.

Results

Item analysis

Collected data of the present study were subjected to the item analysis to estimate corrected item-total correlations for each item of the Bangla BFAS. Corrected item-total correlations and Cronbach's Alphas if item deleted were presented in Table 1.

Item	Corrected item-total correlation	Cronbach's Alpha if item deleted
Item 1	0.791	0.901
Item 2	0.78	0.903
Item 3	0.772	0.903

Item 4	0.786	0.901
Item 5	0.735	0.908
Item 6	0.757	0.906

Table 1: Item-total correlations of each item of the Bangla BFAS were ranged from 0.735 (item 5) to 0.791 (item 1). All of the items had a sufficient level of item-total correlation.

Validity of the Bangla BFAS

The validity of the Bangla BFAS was determined by following-

Face validity: Face validity is related to the subjective content of a test or measure. Researchers of the study and also authors of the measure recognized face validity of the measure. Each item of the Bangla BFAS seems to measure Facebook addiction as it is a behavioral addiction.

Construct validity: Construct validity of the Bangla BFAS was determined through exploratory factor analysis (exploring factor structure) and confirmatory factor analysis (determining goodness to fit the structure model).

Exploratory factor analysis: Data were subjected to the Exploratory Factor Analysis (EFA) to identify the factor structure of the Bangla BFAS. Before subjected to EFA, several statistics were examined to determine whether the collected data were suitable for EFA or not. The correlation matrix of 6 items revealed that all coefficients were above 0.30 and also no high coefficient (coefficient above 0.90 possess the multicollinearity problem). The determinant value (0.017) was greater than the recommended value (0.0001) [16]. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (0.899) and Bartlett's test of sphericity ($2 = 1214.04$, $df = 15$, $p < 0.001$) suggested that the collected data were suitable for EFA.

In this study, for each item's considered factor loading was $0.4 \leq$ for retaining of the items in the factor. Component that had Eigen value ≥ 1 (the Kaiser-Guttman criterion) and at least 3 or more items were considered as a factor. Total variance explained by the extracted factors that fulfilled criteria is presented in Table 2.

Total variance explained by extracted factors

Component	Initial Eigen Value		
	Total	% of Variance	Cumulative %
1	4.279	71.317	71.317
2	0.487	8.111	79.428
3	0.383	6.378	85.805
4	0.338	5.636	91.442
5	0.299	4.983	96.425
6	0.215	3.575	100

Table 2: The analysis with eigen value ≥ 1 extracted 1 factor that accounted for 71.32% variance; Extraction method: Principal component analysis

Component matrix of the EFA

The Component matrix generated in the EFA of the Bangla BFAS is presented through Table 3.

Items	Component 1
Item 1	0.861
Item 2	0.855
Item 3	0.845
Item 4	0.855
Item 5	0.818
Item 6	0.833

Table 3: The extracted factor composed of all items of the Bangla BFAS. All items of the measure had sufficient factor loading (ranged from 0.818 to 0.861).

Confirmatory factor analysis: Collected data were subjected to Confirmatory Factor Analysis (CFA), to estimate the model fit of the data. Before proceeding to model fit statistic, we need to examine the multivariate normality. The normalized estimate of kurtosis ((Composite Reliability) CR value of the kurtosis) was 4.757. The CR value greater than 5 indicated the data were not normally distributed [17]. So, data were subjected to CFA analysis. The obtained fit statistics of CFA analysis are presented in Table 4.

Model fit indices	χ^2/df	CFI	GFI	TLI	sRMR
1 st Model	5.377	0.951	0.967	0.946	0.029
2 nd Model (Revised)	3.395	0.97	0.984	0.97	0.02

Table 4: The except χ^2/df (5.377) and TLI (0.946) all modification indices were at accepted level. So, modification indices were examined and model was edited.

χ^2/df ratio, Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA) for the Bangla Bergen Facebook Addiction Scale obtained in CFA.

Table 4 indicated that except χ^2/df (5.377) and TLI (0.946) all modification indices were at accepted level. So, modification indices were examined and model was edited. The revised model had good model fit indices. The diagram of the revised model is presented.

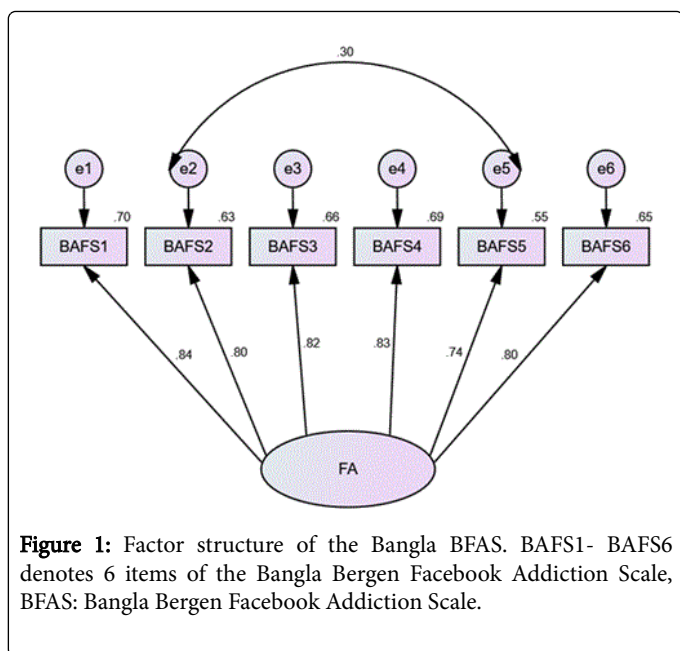


Figure 1: Factor structure of the Bangla BFAS. BAFS1- BAFS6 denotes 6 items of the Bangla Bergen Facebook Addiction Scale, BFAS: Bangla Bergen Facebook Addiction Scale.

In Figure 1, factor loadings for each item were ranged from 0.74 (item 5) to 0.84 (item 1) which were sufficient to constitute a factor.

Reliability

Internal consistency reliabilities: Collected data of the study were subjected to the item analysis again to estimate the internal consistency reliabilities including Chronbach's Alpha, Split-half coefficient (odd and even number items) through Spearman-Brown coefficient, and the 'Pearson product moment correlation coefficient' for test-retest reliability. Results are presented in Table 5.

Internal consistency reliabilities of the Bangla Bergen Facebook Addiction Scale

Scale	Cronbach's Alpha	Split-Half through Spearman-Brown Coefficient	Reliability	Test-retest reliability (n=36, 1 month gap)
BFAS	0.919 [0.904,0.932]	0.934		0.879*** [0.775, 0.937)

Table 5: Estimation results data study through Chronbach's Alpha, Split-half coefficient (odd and even number items) through Spearman-Brown coefficient, and the 'Pearson product moment correlation coefficient'; ***p<0.001, values in the parentheses are 95% confidence interval. Accepted level of reliability is 0.7.

Average Variance Extracted (AVE): The AVE of the Bangla BFAS was 0.713 (Accepted level of AVE ≥ 0.5).

Composite Reliability (CR): The CR of the Bangla BFAS was 0.937 (Accepted level of CR ≥ 0.7).

Standard Error of Measurement (SEM): The SEM of the Bangla BFAS was 1.744 (Accepted level of SEM ≤ SD/2).

Reliability information described above suggested that the Bangla BFAS scale had sufficient reliability to apply in the Bangladeshi culture.

Prevalence of Facebook addiction

As a new concept of behavioral addiction and scarcity of availability of assessment measure of the Facebook addiction, authors suggested using either polythetic or monothetic scheme for determining the cut off score of the scale [8]. In this study, we used the monothetic scheme to determine the cut off score. The cut off score of the Bangla BFAS was 20. Among respondents, 19% were identified as addicted. Results are presented in Figure 2.

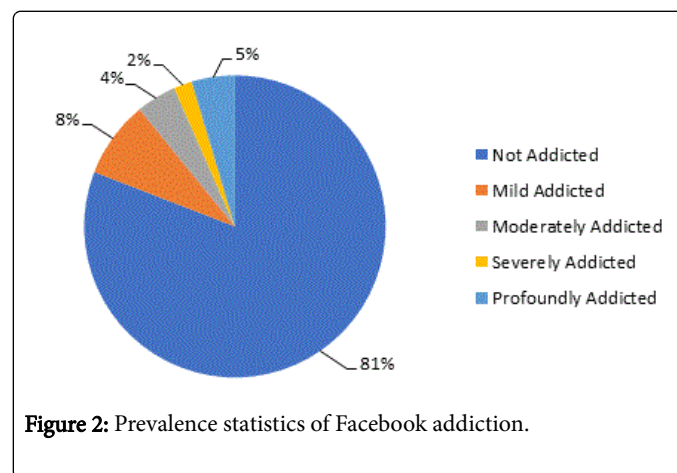


Figure 2: Prevalence statistics of Facebook addiction.

Discussion

The present study was aimed to validate the Bergen Facebook Addiction Scale (BFAS) in Bangladeshi culture as it has been recognized as both research tool and clinical diagnostic tool. The BFAS was a reliable and valid instrument to measure Facebook addiction of the Facebook users. Table 1 showed sufficient item-total correlation (ranged from 0.735 to 0.791). An item-total correlation value less than 0.3 indicates that the item does not correlate very well with the scale overall [18]. As all items had sufficient level of item-total correlation, researchers of the study proceeded to identify the factor structure of the Bangla BFAS.

The KMO measure of sampling adequacy score (0.899) suggested that sample size was adequate to run the exploratory factor analysis to explore the factor structure of the measure. The KMO score below 0.50 unacceptable, 0.50 as miserable, 0.60 as mediocre, 0.70 as middling, 0.80 as meritorious, 0.90 as marvellous or superb [19]. The significant score of the Barlett's test of sphericity suggested the suitability of the variables to be included in the factor analysis as this test compares the original correlation matrix with the identity matrix. A significant Barlett's test of sphericity (p<0.001) score suggests both matrices are not same and study variables are suitable to apply to factor analysis [18]. Table 2 suggested one factor was extracted as it fulfilled the criteria to be a factor (Eigen value ≥ 1). The extracted factor explained 71.32% of total variance and all 6 items were included in the extracted factor. Field [18] recommended examining the communalities for deciding the number of the factors to be extracted. If the average of the communalities is 0.7 or above and the number of the test variables less than 30, the number of extracted factors will be according to the Kaiser's criterion (Eigen value ≥ 1). If sample size exceeds 250 and the average of the communalities is 0.6 or above then the Kaiser's criterion is fine. Alternatively, with participants ≤ 200, the scree plot can be used. Analysis revealed that the average of the communalities was 0.713, total variables were 6, and the sample size was 303. In these

conditions, the Kaiser's criterion was appropriate to this data. Table 3 showed the factor loadings the Bangla BFAS were above the 0.4 (ranged from 0.818 to 0.861). Stevens [20] suggested that this cut-off score was appropriate for interpretative purposes. Table 4 suggested that the explored factor structure of the Bangla BFAS had the acceptable level of model fit. To fit a model at acceptable level, the χ^2/df ratio should be smaller than 5 [21], CFI, GFI, TLI values in 0.95 or more [22], and sRMR value in 0.05 or less [17]. All of these values of the revised model of the Bangla BFAS met these criteria to be accepted. Figure 2 also showed sufficient level of factor loadings of the measure (ranged from 0.74 to 0.84).

Table 5 showed that Cronbach's Alpha was 0.919, split-half reliability (odd and even number) through the Spearman-Brown coefficient was 0.934, and the test-retest reliability was 0.879. The Cronbach's Alpha indicates the overall reliability of a measure. For Cronbach's Alpha, as a rule of thumb, a reliability of 0.70 or higher is expected before it will use in an instrument [23]. Kilne [24] suggested that alpha less than 0.50 is unacceptable, 0.50 to 0.60 is poor, 0.60 to 0.70 is acceptable, 0.70 to 0.90 is good, and above 0.90 is excellent. For Spearman-Brown coefficient, as a rule of thumb, a reliability 0.80 or high is adequate reliability. From these points of view, the Bangla BFAS had sufficient level of internal consistency reliabilities. However, there are no clear cut-off points those separating poor and good reliabilities, but values between 0.70-0.80 are viewed as sufficient [25]. The reliability coefficient of 0.80 higher is suitable for screening-level clinical decisions [26]. So, the Bangla BFAS had sufficient level of reliabilities that would be used to measure the Facebook addiction level of Bangladeshi young.

Facebook addiction has gotten the greater attention of researchers. Excessive use of Facebook and strong motivation to log onto it impacts on daily activities, real social life, interpersonal relations and psychological well-being [27]. Facebook addiction as causes various negative consequences (i.e., difficulties in social life, relationship problem, decrease in academic performance, etc.) [5]. In a study authors found that college students who had higher friends on Facebook experienced lower emotional adjustment [28]. Rosen, Whaling, Rab, Carrier, and Cheever [29] found Facebook usage predicted depressive disorder, dysthymia, bipolar-mania, narcissism, and anti-social personality disorder.

Authors of the BFAS suggested that this measure would be used in clinical settings for screening out the individuals who have the dependency on Facebook along with research purposes. The cut off value of this scale for screening an individual who has somewhat dependency on Facebook is 20. Siddiqi et al. [9] also used cut off score 20 in their study to identify respondents' Facebook dependency. In this study, 93% of respondents were identified as addicted on Facebook. Among them, 7% were in severe level. However, the nationwide prevalence rate of this disorder is not known till now. Cases about Facebook addiction those seek professional psychological help are very few in Bangladesh. Experts write several blogs about treatment for recovering from Facebook addiction. Soron [30] reported a case about Facebook addiction. He applied the Cognitive Behavior Therapy (CBT) to treat his client and got effective results.

Limitations

However, the present study had some limitations. The study sample was not selected from across the country. So, one should take decisions cautiously while applying this scale to screen out individual whether

addicted or non-addicted. As prevalence rate is unknown, a large study should be conducted to identify the prevalence rate of Facebook addiction. Such large scale study would be helpful to deal effectively with Facebook addiction disorder among Bangladeshi people. This scale also can be used to assess addiction in others social networking sites (i.e., Twitter, Instagram, Snapchat, etc.) among Bangladeshi people. This could be done with replacing targeted social networking site's name instead of Facebook.

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