The Journal of Behavioral Science
2022, Vol. 17, Issue 2, 16-28

ISSN: 1906-4675 (Print), 2651-2246 (Online)

The Journal of Behavioral Science (TJBS)

Original Article

The Role of Psychosocial Factors affecting Internet Addiction among Indonesian University Students

Ulwiyyah[1] and Jinghuan Zhang[2*]

Author Affiliation

[1] Doctoral student, School of Psychology, Shandong Normal University, P. R. China; Sharia Faculty, Ponorogo State Islamic Institute, Indonesia.
[2] Professor, School of Psychology, Shandong Normal University, P. R. China.

[*]Corresponding author e-mail: zhangjinghuan@sdnu.edu.cn

Article Information

Received: 15.12.21
Revised: 14.1.22
Accepted for initial review: 18.1.22

Keywords

Social support, compulsive behavior, fear of missing out, emotional intelligence

Abstract

Smartphone addiction has become a new form of addiction among university students. This study aimed to examine how perceived social support, emotional intelligence, and fear of missing out (FOMO) predicts smartphone addiction. A total of 403 Indonesian university students, aged 17-41 years (M = 20, SD = 2.3) from various universities were involved in this study. Participants were recruited using snowball sampling technique to complete online self-reporting questionnaires. Path analysis results indicated that perceived social support has a positive effect on FOMO (β= .15, p = .02) and emotional intelligence (β = .60, p < .001); FOMO has a significant positive effect on smartphone addiction (β= .38, p < .001); and emotional intelligence has a significant negative effect on smartphone addiction (β = -.26, p < .001). An unexpected result showed that FOMO positively predicted perceived social support. The relationship between perceived social support and smartphone addiction was fully mediated by FOMO and emotional intelligence (a^*b = .02, Bootstrap CI_{95} = -.89 and -.05). The findings contribute to the behavioral sciences by providing evidence that adequate social support could promote the establishment of healthier coping mechanisms, relieve perceived pressure, and reduce behavioral addictions among students.

Smartphones are the most used mobile devices in higher education (Ataş & Çelik, 2019) and considered essential by university students (Alsayed et al., 2020). Global data released by Statista (April 2022a) shows that most smartphone owners are in the younger age group of 18-45 years. Scholars argue that young adults, especially university students are a vital demographic for use of smartphone technology for development, information transmission and entertainment (Ahmed et al., 2020; Olmsted et al., 2012). Smartphones are also reported to be preferred mobile computing device to use in lectures for students (Ataş & Çelik, 2019). However, due to its multiple functions, especially for entertainment and communication, the use of smartphone impacts learning among students.

Several studies in psychology report that smartphones enable people to meet their social needs, regulate emotions, receive feedback from others, do group identification, and collective self-esteem (Floros & Siomos, 2013; Kuss & Griffiths, 2011; Neubaum & Krämer, 2015). Smartphone has proven to give a distinctive experience of online social networks and communication applications to communicate/interact with others at any place and any time. Thus, it has huge potential of overuse (Alan & Eyuboglu, 2012), compulsive checking behaviors and excessive engagement (Choi et al., 2015; Li et al., 2021; Montag et al., 2015).

Smartphone addiction has been reported as a new form of addiction among youths (Kim et al., 2015). According to the fifth revision of the Diagnostic and Statistical Manual of Mental Disorders, behavioral addiction involves compulsive behaviors, functional impairment, withdrawal, tolerance, and so on (American Psychiatric Association [APA], 2013). There are many standpoints against smartphone, such as wasting time and missing studies for students, avoiding exercises, being unmindful on roads while walking and driving etc. (Nayak, 2018).

In human beings, social interaction is one of essential human needs which can shape and preserve behavior and personal identities. Furthermore, cognitive-behavioral theory explains that when an individual has less social support, he/she tends to seek shortcut satisfaction even if it is from irrational acts (Zebardast & Radaei, 2022). This condition will stimulate him/her to obtain it more and become excessive. When this behavior drives him/her without control, it causes addiction which subsequently changes the behavior (Davis, 2001). While social relationships are built from emotional states and then involve those emotions during the relationship process. Researchers found that negative emotional feeling could increase smartphone usage (Charoensukmongkol, 2016; Davis, 2001; Nongpong & Charoensukmongkol, 2016). Additionally, fear of missing out (FOMO) which is defined as a pervasive concern that a person might be having valuable experiences from which one is absent (Przybylski et al., 2013) could increase frequency of social media use (Wolniewicz et al., 2018).

In Indonesia, smartphone users have been increasing rapidly since 2011. Fast forward during the COVID-19 pandemic, has shifted physical mobilization and interaction to digital and virtual. This circumstance urges more people to rely on smartphone activities. According to the data released by Statista in March 2022, the total number of smartphone users in 2021, increased to 199.18 million from 11.7 million in 2011 out of a total population of 272.2 million. Indonesia is the fourth largest user in the world after China, India and the US (Statista, April 2022b). This large number might describe the majority of people's behavior toward smartphone. As suggested by previous researcher (Olmsted et al., 2012) to examine the behaviors toward newer media technology among university students is urgent because they rely their affairs and activities for educational purposes on it. Several studies have examined smartphone addiction associated with psychopathology symptoms such as loneliness, stress, anxiety and depression (Banjanin et al., 2015; Charoensukmongkol, 2016; Davis, 2001; Nongpong & Charoensukmongkol, 2016; Przybylski et al., 2013). However, there are only a few empirical studies on the relationship of social and personal skills on smartphone addiction, especially among university students in Indonesia which limits the understanding of the relationship. Thus, this study aimed to examine the role of emotional intelligence and FOMO, on the relationship between perceived social support and smartphone addiction among university students. This research aims to provide an understanding of how to reduce smartphone addiction in the context of Indonesian university students.

Literature Review

Perceived Social Support and Smartphone Addiction

Social support is the process of social interaction in relationships, which enhances belonging, coping, and valuing through the exchange of physical or psychosocial resources (Gottlieb, 2000). Perceived social support from close social ties and other network members is linked to positive results for people, whereas a low level of support leads to hopelessness, behavioral and emotional problems (Dunn et al., 1987). In the past 50 years, in particular there have been many medical studies on the importance of social support (familial support, support of friends, support of partner) for helping individuals to overcome their illnesses and continue to live a healthy life. Social support could diminish negative perceptions such as feeling discriminated against and pathological internet use (Wang & Zhang, 2020). When people have lack of social support, they are prone to cover up this need from smartphone (Davis, 2001).

Sensory features of smartphone attract users and stimulate their expressive side (Kim et al., 2015). During online activities, they secure benefits of social support provided by receiving shared information or

advice to overcome the crisis they are dealing with (Molinillo et al., 2019). Smartphone engagement in virtual social communication was found to allow lonely individuals to feel socially connected with other people (Charoensukmongkol, 2016; Nongpong & Charoensukmongkol, 2016).

Social support on online activities can sustain individuals from the effects of risk factors (Wang et al., 2018). For instance, the perceived availability of social support from family members and friends having close ties buffers the privacy issues of individuals and reduces psychological distress (Cha, 2016; Chiu, 2014; Kim et al., 2015). Prior studies have found that online social support can enhance social capital, individuals' core network decision (Lazuras & Dokou, 2016; Li et al., 2015) and improve their mental well-being (Nambisan, 2011).

Meanwhile, negative psychological emotion could predict smartphone addiction which was proven by a study conducted by Roberts et al. (2014) that addiction to smartphone is ultimately an attempt to escape from another person, a more significant problem, such as boredom, low self-esteem, relationship problem, etc. The common observation of these studies indicates that smartphone usage has reached such levels where people neglect their work. Previous studies have proved that perceived social support negatively correlated with problematic smartphone use (Gökçearslan et al., 2018; Lei et al., 2018). Hence, we hypothesized:

H1: Perceived social support has a direct negative effect on smartphone addiction.

Fear of Missing Out and Emotional Intelligence as Mediators of Smartphone Addiction

Prior studies found that psychological factors such as loneliness, shyness, stress, anxiety, depression, self-esteem, and self-efficacy were being predictors of smartphone addiction (Banjanin et al., 2015). Smartphone could be people's mode to express their feelings as well as to obtain complacency of social needs.

People have a tendency to think about what others are thinking and doing (Abel et al., 2016). Fear of missing out (FOMO) reflects people's fears and worries about being alienated with experiences across their extended social environment. FOMO comes from unfulfilled social connectedness needs, anxiety and depression (Wolniewicz et al., 2018). Therefore, people who have a higher level of FOMO tend to have a higher level of desire to stay up-to-date of what others are doing (Przybylski et al., 2013).

The role of FOMO has been confirmed to mediate the link between psychopathological symptoms and negative impact of maladaptive use of applications on mobile devices (Oberst et al., 2017), between motivational hardship and social media engagement (Alt, 2015), phubbing behaviors (Franchina et al., 2018) and between need deficits or emotional problems and social media use (Przybylski et al., 2013). Furthermore, it was proven to be a predictor of smartphone addiction (Chotpitayasunondh & Douglas, 2016; Li et al., 2022). Hence, the following hypotheses were proposed:

H2: FOMO mediates the relationship between perceived social support and smartphone addiction.
H3: FOMO has a positive effect on smartphone addiction and negative effect on perceived social support.

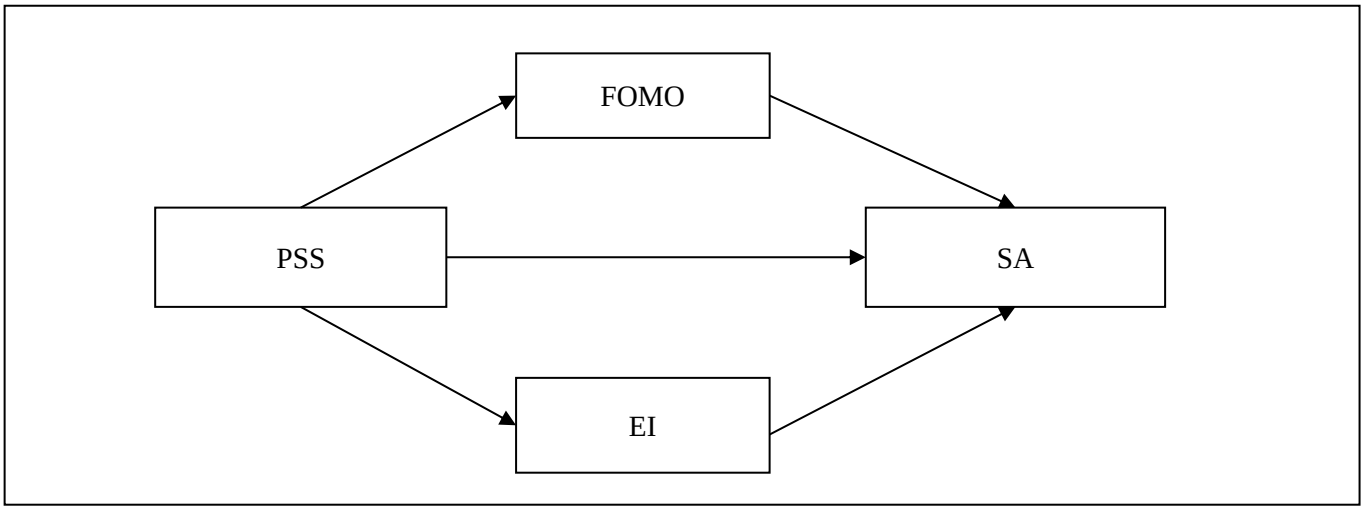
Another variable, emotional intelligence, which is defined as an ultimate reference for mutual understanding, communication, and cooperation has been found to significantly affect individuals' performance. Salovey and Mayer (1990) defined emotional intelligence to reflect the ability of people to deal with their emotions. In terms of emotion-related abilities for cognition, research has found that emotional intelligence is a key factor of psychological and social adaptation and success (Ng et al., 2008). Individuals with high emotional intelligence have more capability of enhancing mutual understanding and communication to work with others, dealing with stressful situation, thereby they achieve positive performance (Emmerling & Cherniss, 2003; Wong & Law, 2002).

Emotional intelligence is considered as an important psycho-social ability. According to social skill models, the lack of social skills predisposes individuals to develop preference for online social interaction, which increases the risk of smartphone addiction (Jeong et al., 2016; Karaer & Akdemir, 2019). Therefore, emotional intelligence has been linked to gadget use problems. Prior studies have found that maladaptive use of mobile phones of college students is related to lower emotional intelligence (Beranuy et al., 2009). Emotional intelligence could be protective factors for smartphone addiction or problematic smartphone use thoughts, and manage and regulate emotion (Lei et al., 2018). Therefore, the following hypotheses were proposed:

H4: Emotional intelligence mediates the relationship between perceived social support and smartphone addiction.
H5: Emotional intelligence has a positive effect on perceived social support and negative effect on smartphone addiction.

The conceptual framework of this research is presented in Figure 1.

Figure 1
Conceptual Framework



Note. PSS = Perceived Social Support, EI = Emotional Intelligence, FOMO = fear of missing out, SA = Smartphone Addiction.

Method

Participants

This study involved 404 students from various universities in Indonesia who were selected using the snowball sampling technique. Data collection took over two months starting from February to April 2021. The survey was administered online since the data was collected during pandemic with restriction of physical mobilization. Participants were recruited in several ways. Some were recruited through private message and email, the others were recruited by researcher's fellows being university students by sharing the e-questionnaire in their social media account, and lecturers of universities by distributing through WhatsApp group during online and virtual classes. To avoid self-selection bias, the data collection was gathered voluntarily from university students using a WhatsApp group.

The participants were requested to complete an online questionnaire anonymously. One participant was excluded from analysis due to the same response in all items. Thus, the final participants were 403, 119 (27.8%) were males and 291 (72.2%) were females. With respect to educational level, 389 (96.5%) participants were undergraduate students, 13 (3.2%) participants were master students, and 1 (0.2%) participant was a PhD student. The mean age was 20 years (*SD* = 2.3, age range 17 to 41 years).

Instruments

A questionnaire was administered to collect information about the age, gender and education level. All the measures were translated into Indonesian language by the researcher, a lecturer of psychology and a translator by following World Health Organization (WHO) translation protocol.

Perceived Social Support

Perceived social support was measured using the multidimensional scale of perceived social support (MSPSS) by Zimet et al. (1988). The scale consisted of 12 items of self-report measure of perceived social support divided into three dimensions: family support, friend support, and other support. The MSPSS was rated on a 5-point Likert scale, with responses (1 = strongly disagree, 5 = strongly agree). The Cronbach's alpha was .86, and the reliability of each dimension were .84, .80 and .74.

Emotional Intelligence

The Wong and Law's emotional intelligence scale (WLEIS) 2002 was adopted to measure emotional intelligence. The WLEIS consisted of 16 items including four dimensions: self-emotional appraisal, other's emotional appraisal, use of emotion, and regulation of emotion. The total of 16 items were scored with a 5-point Likert scale, with responses (1 = strongly disagree, 5 = strongly agree). The Cronbach's alpha coefficient of the total scale was .87 with reliability of each dimension .79, .80, .81 and .83.

Fear of Missing Out

The fear of missing out scale developed by Przybylski et al. (2013) with a 10-item was adopted to measure FOMO. The scale uses a Likert scale with responses (1 = Not at all true of me, 5 = Extremely true of me). The Cronbach's alpha was .76.

Smartphone Addiction

The smartphone addiction proneness scale for adult (APS-A) developed in Korea (Shin et al., 2011) with 15 items was used. The responses rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The Cronbach's alpha was .81.

Ethical Considerations

This study was approved by the Institutional Review Board of Shandong Normal University, China, on January 2nd 2022.

Data Analyses

Data were analyzed using the IBM SPSS Statistic software version 23 and AMOS 22. Descriptive analysis was carried out to test the characteristics of the participants and variables. Skewness, kurtosis, and outliers were examined for multivariate normal distribution. Kurtosis does not affect the estimates if the degree of kurtosis is 2 or more, or the kurtosis is 7 or more (West et al., 1995). The correlations of all the variables were examined by bivariate correlations. All the continuous variables were centralized. The researchers undertook further analysis, structural equation modeling approach to test the mediating effect model. To access the model fit, researchers reported the Chi-square ($\chi 2$), the Tucker-Lewis index (TLI), the comparative fit index (CFI), the Bentler-Bonett Normed Fit Index (NFI), and root mean square error of approximation (RMSEA). Chi-square is not considered to be a very useful fit index because it is sensitive to sample size. The TLI, CFI, NFI (good fit>.90) and RMSEA (good fit <.05, acceptable fit <.08) are indicative of a well-fitting model. The bootstrap procedure was followed to verify the significance of the mediator effect within the model. Following Chan (2007), phantom variables were performed to test the indirect effects.

Results

Descriptive Statistics

The descriptive statistical analysis was run to check the variables of the study. All variables as shown in Table 1, satisfied skewness <2 and kurtosis <7, necessary for multivariate normal distribution (Hu &

Bentler, 1999); thus, this model was suitable for SEM analysis. The Table 1 also presents correlation among variables.

Table 1

Descriptive Statistic and Correlations among Variables (n=403)

	1	2	3	4	5	6	7	8	9
1. SO	-								
2. FAM	.43**	-							
3. FRI	.48**	.44**	-						
4. SEA	.32**	.16**	.28**	-					
5. OEA	.22**	.04	.20**	.36**	-				
6. UE	.32**	.27**	.27**	.44**	.33**	-			
7. RE	.27**	.22**	.22**	.34**	.30**	.43**	-		
8. FOMO	.10*	.04	.13**	.05	.17**	.10	-.01	-	
9. SA	-.09	-.08	-.01	-.12*	-.11*	-.16**	-.15**	.35**	-
M	15.1	15.9	14.7	15.0	14.4	15.2	14.2	26.6	41.8
SD	3.0	2.7	2.4	2.6	2.6	2.4	2.6	5.3	7.0
Skewness	-.67	-.39	.02	-.14	-.04	-.22	-.01	.34	.01
Kurtosis	.67	-.39	-.11	.31	.42	.86	.40	1.81	1.53

Note. FOMO = fear of missing out, SA = Smartphone Addiction, SO = support of others, FAM = family, FRI = friend, SEA = self-emotional appraisal, OEA = other's emotional appraisal, UE = use of emotion, RE = regulation of emotion. $^{*}p < .05$, $^{**}p < .01$.

The results indicated that support from others positively correlated with self-emotional appraisal ($r = .32$, $p < .001$), other's emotional appraisal ($r = .22$, $p < .001$), use of emotion ($r = .32$, $p < .001$), regulation of emotion ($r = .27$, $p < 001$), and FOMO ($r = .10$, $p = .04$). Support from family also positively correlated with self-emotional appraisal ($r = .16$, $p < .001$), use of emotion ($r = .27$, $p < .001$) and regulation of emotion ($r = .22$, $p < 001$). Support from friends positively correlated with all dimensions of emotional intelligence: self-emotional appraisal ($r = .28$, $p < .001$), other's emotional appraisal ($r = .20$, $p < .001$), use of emotion ($r = .27$, $p < .001$), regulation of emotion ($r = .22$, $p < 001$) and FOMO ($r = .13$, $p = .007$). Self-emotional appraisal negatively correlated with smartphone addiction ($r = -.12$, $p = .01$). Other's emotional appraisal positively correlated with FOMO ($r = .17$, $p = .001$). However, other's emotional appraisal negatively correlated with smartphone addiction ($r = -.11$, $p = .02$). Use of emotion negatively correlated with smartphone addiction ($r = -.16$, $p = .001$). Regulation of emotion negatively correlated with smartphone addiction ($r = -.15$, $p = .003$). FOMO positively correlated with smartphone addiction ($r = .35$, $p < .001$).

Examination of the Measurement Model

A confirmatory factor analysis was performed through Maximum-likelihood estimation (MLE) in order to verify the measurement model. A measurement model with four latent factors corresponding to the study constructs evidence good fit to the data [$\chi 2 = 42.83$, $df = 24$, $p = .01$; TLI =.96; CFI = .97; NFI = .94; RMSEA = .04, CI = .02 - .06]. The factor loadings of the latent variables on the measurement variables were significant for perceived social support (.61 to .72), and emotional intelligence (.50 to .72).

Examination for the Structural Model

Researchers analyzed the structural model to determine whether FOMO and emotional intelligence mediate the effects of perceived social support on smartphone addiction. The structural model offered a good to fit data [$\chi 2 = 42.83$, $df = 24$, $p = .01$; TLI =.96; CFI = .97; NFI = .94; RMSEA = .04, CI = .02 - .07]. The hypothesized model is shown in Figure 2. The paths between perceived social support and FOMO ($\beta = .15$, $p = .006$), FOMO and smartphone addiction ($\beta = .38$, $p < .001$), perceived social support and emotional intelligence ($\beta = .60$, $p < .001$), and emotional intelligence and smartphone addiction ($\beta = -.26$, $p < .001$) were statistically significant. These paths fitted the H3 and H5. However, paths of perceived social support and smartphone addiction ($\beta = .03$, $p = .68$) were not significant, thus H1 was rejected.

Among the five paths of the model, one path was not significant. Thus, a modified model was established and was used to compare the fit index with the hypothetical model (see Table 2). Only one model had a hierarchical relationship, a chi-square test was performed (see Table 3). This model was used as the final model.

Testing for Mediating Effect Verification

Further analysis used a bootstrap method to verify the mediating effect of the final model. The indirect effects were estimated from the 5000 samples developed by random assignment in the original data. The results were considered significant since no 0 was included in the 95% confidence intervals (CIs) ($p < .05$ as per Shrout and Bolger (2002)).

The indirect effects of perceived social support on smartphone addiction was mediated by emotional intelligence and FOMO (a*b = .02, Bootstrap CI_{95} = -.89 and -.05). This result verified hypotheses H2 and H4.

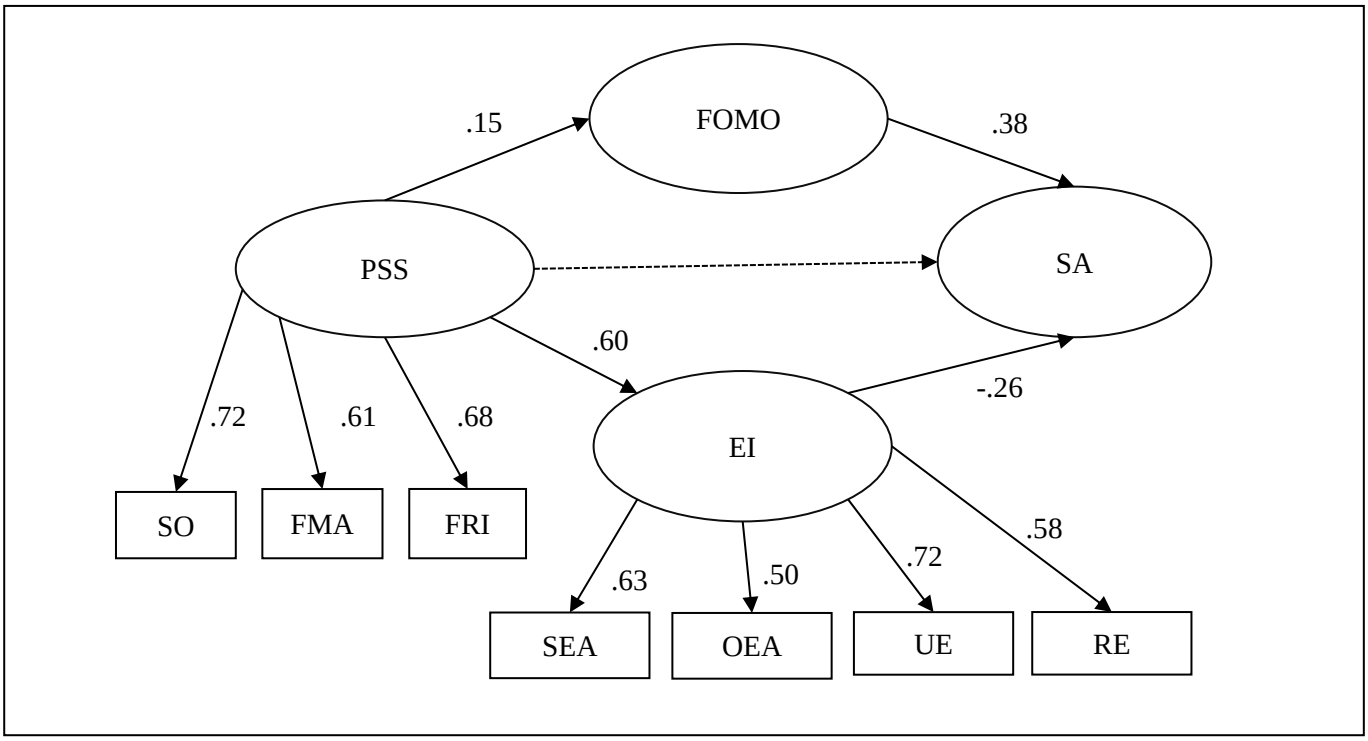
Table 2

Fit Index of The Hypothetical Model and the Modified Model

	$\chi 2$	*p*	df	NFI	TLI	CFI	RMSEA
Hypothetical model	42.83	.01	24	.94	.96	.97	.04 (.02 - .06)
Modified model	14.93	.83	21	.98	1.01	1.00	.00 (.00 - .03)

Figure 2

The Indirect Effect of Perceived Social Support on Smartphone Addiction Through FOMO and Emotional Intelligence



Note. Standardized path coefficients are reported in the figure, and bold lines indicate a significant association in the model. Observed variables are represented by boxes and latent variables by circles. PSS = perceived social support, EI = emotional intelligence, FOMO = fear of missing out, SA = Smartphone addiction, SO = support of others, FAM = family, FRI = friend, SEA = self-emotional appraisal, OEA = other's emotional appraisal, UE = use of emotion, RE = regulation of emotion.

Table 3
Standardized Estimates of the Direct, Indirect, and Total Effects on Smartphone Addiction

Path			Standardized direct effect [95% CI]	*p*	Standardized indirect effect [95% CI]	*p*	Standardized total effect [95% CI]	*p*
PSS	→	FOMO	[.05 - .93]	.03			[.02 - .29]	.03
PSS	→	EI	[.38 - .76]	.000			[.47 - .71]	.000
FOMO	→	SA	[.34 - .65]	.001			[.26 - .48]	.000
EI	→	SA	[-1.92 - .64]	.000			[-.37 - -.13]	.000
PSS	→	SA			[-.89 - -.05]	.02	[-.19 - .01]	.03

Note. CI = Confidence Interval. PSS = perceived social support, EI = emotional intelligence, FOMO = fear of missing out, SA = Smartphone addiction

Discussion and Conclusion

This study investigated the structural relationship between perceived social support, FOMO, emotional intelligence, and smartphone addiction among university students. Correlation analysis revealed significant relationships between dimensions of perceived social support and emotional intelligence, FOMO, and smartphone addiction. These results are in line with the theoretical assumptions of present study. Hierarchal of human's need explains that social support and belongingness reassure social and emotional needs (Maslow, 1970). When a person could not fulfill them from the surroundings, they will try to obtain satisfaction from the internet. This satisfaction will generate and drive the user to use it repeatedly. Furthermore, the result demonstrated that perceived social support indirectly affected smartphone addiction through the full mediation path of FOMO, and full mediation path of emotional intelligence. The total effect in the study indicated that perceived social support is a significant negative predictor of smartphone addiction which corresponds to H1.

An individual with a high level of perceived social support tends to have a low level of smartphone addiction. This result is consistent with previous studies (Park et al., 2009; Vicary & Fraley, 2010). Some researchers noticed that lack of perceived social support drives people to spend their time on smartphone as it supplies enjoyment, plentiful information, and expands social networking (Lin et al., 2018). In addition, social support through interpersonal interaction is also provided through online activities which allow people with lack of offline social support to sacrifice their time on smartphone in order to fulfill their support needs (Sela et al., 2020). The Use-satisfaction theory (Hegney et al., 2006) explains that the satisfaction obtained from the Internet will increasingly stimulate people to be more active in it and to some extent head to maladaptive cognition.

Regarding the present model, the main focus of the study is the role of FOMO and emotional intelligence. Researchers examined the mediating role of FOMO and emotional intelligence in the pathway from perceived social support to smartphone addiction. The present findings provide insight into understanding the inconsistent relationship between perceived social support and smartphone addiction. Previous studies found a direct relationship between perceived social support and smartphone addiction without the mediation role of other factors (Wang & Zhang, 2020; Wu et al.,2019). The possible explanation is that the findings suggest FOMO and emotional intelligence are key factors of smartphone addiction. FOMO and emotional intelligence had a significant effect on the direct path to smartphone addiction which is in line with prior studies (Beranuy et al., 2009; Chotpitayasunondh & Douglas, 2016; Jeong et al., 2016; Karaer & Akdemir, 2019; Wang & Zhang, 2020).

Fear of missing out (FOMO) was found to have a positive effect on perceived social support and smartphone addiction which means higher level of Fear of missing out was to be associated with high level of perceived social support and tendency toward smartphone use. These findings contradicted previous

reports that FOMO negatively affected perceived social support and positively associated with smartphone addiction (Franchina et al., 2018; Oberst et al., 2017; Wang & Zhang, 2020). This result did not support H3. However, it indicates that support is significant for individuals and generates a sense of belonging toward people around them. Notably, Indonesian people generally have a high sense of belonging and inclusion and are well-known to have communal spirit. Therefore, it makes them fear and worry of being excluded in their experience which in turn to the more addictive on smartphone. Over all, these findings proposed that perceived social support and FOMO predict smartphone addiction.

Another significant variable is emotional intelligence as a mediator on the relationship between perceived social support and smartphone addiction which means higher level of perceived social support and emotional intelligence results in lower smartphone addiction tendency. It is in line with previous findings that emotional intelligence could help individuals cope with negative environmental pressure and boost mental health that might protect them from compulsive or addictive behavior (Slaski & Cartwright, 2002).

Limitations

Several limitations of this study should be noted as considerations for future research directions. First, this study found a different effect of FOMO which contradicts theory and previous study. Thus, it is necessary to replicate this study with larger samples and unmeasured factors in order to clarify the validity of present findings that might be influenced by other factors. Second, this study only used snowball sampling techniques for the convenience of data collection due to the Covid-19 pandemic which may cause sampling error and bias. Future research might use probability sampling to obtain more accurate data.

Finally, present findings are necessary to be generalized due to a narrow sample with exploring various factors mainly on age and occupation to present a comprehensive understanding of smartphone addiction. Future research might extend to diverse and large participants as a consequence of that smartphone addiction is not only a problem of university students, rather it is contagious into people irrespectively to particular age groups and consider other factors which may attribute to the variables.

Implications for Behavioral Science

The basis findings of this study emphasize that social support plays major significance for Indonesian university students. Behavioral science study confirms that emotion, environment, and social factors predispose an individual's act (Zebardast & Radaei, 2022). Additionally, the buffering model of social support suggested that adequate social support can promote an establishment of healthier coping mechanisms, relieve individuals' pressure and reduce their overdependence on smartphone use (Wood & Cook, 2019).

The finding also suggests to provide social support and improve positive emotional skills to reduce smartphone addiction tendency as current activities mostly rely on smartphones. Thus, this enables people to organize and manage their behavior for more positive to generate controllable outcomes. Ability to control prior learned behavior is essential to reduce detrimental activities and to prevent prospective unfavorable behaviors as well as to shape intended behavior (Zebardast & Radaei, 2022). In addition, present study highlights the significance of emotional intelligence which affects directly on pathological behavior. Positive stimuli could predict positive outcomes respectively. Emotional intelligence should be considered as an intervention to mitigate and to heal behavioral addiction. The more individuals have higher level of emotional intelligence, the more they feel belonged to society. Therefore, they have more ability to control their behavior that potentially inflict threats.

Conclusion

The current study confirmed interactions between perceived social support, FOMO, emotional intelligence, and smartphone addiction. This study adds to the evidence for the direct effect of FOMO and emotional intelligence on smartphone addiction. The findings prove that FOMO and emotional intelligence

play as mediators of the relationship between perceived social support and smartphone addiction. Perceived social support could be a protective factor for behavioral and emotional problems.

References

Abel, J. P., Buff, C. L., & Burr, S. A. (2016). Social media and the fear of missing out: Scale development and assessment. *Journal of Business & Economics Research (JBER), 14*(1), 33–44. https://doi.org/10.19030/jber.v14i1.9554

Ahmed, R. R., Salman, F., Malik, S. A., Stremikiene, D., Soomro, R. H., & Pahi, M. H. (2020). Smartphone use and academic performance of university students: A mediation and moderation analysis. *Sustainability, 12*(1), 439. https://doi.org/10.3390/su12010439

Alan, A. E., & Eyuboglu, E. (2012, January). *Generation Y consumers in Turkey: Are they really social media nerds or pretend to be?* 11th International Marketing Trends Congress, January 19-21, 2012, Venice, Italy.

Alsayed, S., Bano, N., & Alnajjar, H. (2020). Evaluating practice of smartphone use among university students in undergraduate nursing education. *Health Professions Education, 6*(2), 238-246. https://doi.org/10.1016/j.hpe.2019.06.004

Alt, D. (2015). College students' academic motivation, media engagement and fear of missing out. *Computer Human Behavior, 49*, 111-119. https://doi.org/10.1016/j.chb.2015.02.057

American Psychiatric Association [APA]. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). American Psychiatric Publishing.

Ataş, H. A., & Çelik, B. (2019). Smartphone use of university students: Patterns, purposes, and situations. *Malaysian Online Journal of Educational Technology, 7*(2), 59-70. http://dx.doi.org/10.17220/mojet.2019.02.004

Banjanin, N., Banjanin, N., Dimitrijevic, I., & Pantic, I. (2015). Relationship between internet use and depression: Focus on physiological mood oscillations, social networking and online addictive behavior. *Computers in Human Behavior, 43*, 308–312. https://doi.org/10.1016/j.chb.2014.11.013

Beranuy, M., Oberst, U., Carbonell, X., & Chamarro, A. (2009). Problematic internet and mobile phone use and clinical symptoms in college students: The role of emotional intelligence. *Computers in Human Behavior, 25*(5), 1182–1187. https://doi.org/10.1016/j.chb.2009.03.001

Cha, M. (2016). The mediation effect of mattering and self-esteem in the relationship between socially prescribed perfectionism and depression: based on the social disconnection model. *Personal Individual Differences, 88*, 148–159. https://doi.org/10.1016/j.paid.2015.09.008

Chan, W. (2007). Comparing indirect effect in SEM: A sequential model fitting method using covariance-equivalent specifications. *Structural Equation Modeling: A Multidisciplinary Journal, 14*(2), 326-346. https://doi.org/10.1080/10705510709336749

Charoensukmongkol, P. (2016). Exploring personal characteristics associated with selfie-liking. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 10*(2), Article 7. http://dx.doi.org/10.5817/CP2016-2-7

Chiu, S. I. (2014) The relationship between life stress and smartphone addiction on Taiwanese university students: A mediation model of learning self-efficacy and social self-efficacy. *Computers in Human Behavior, 34*, 49-57. http://dx.doi.org/10.1016/j.chb.2014.01.024

Choi, S. W., Kim, D. J., Choi, J. S., Ahn, H., Choi, E. J., Song, W. Y., Kim, S., & Youn, H. (2015). Comparison of risk and protective factors associated with smartphone addiction and Internet addiction. *Journal of Behavioral Addictions, 4*, 308–314. https://doi.org/10.1556/2006.4.2015.043

Chotpitayasunondh, V., & Douglas, K. M. (2016). How "phubbing" becomes the norm: The antecedents and consequences of snubbing via smartphone. *Computers in Human Behavior, 63*, 9-18. https://doi.org/10.1016/j.chb.2016.05.018

Davis, R. A. (2001). A cognitive-behavioral model of pathological internet use. *Computers in Human Behavior, 17*(2), 187-195. https://doi.org/10.1016/S0747-5632(00)00041-8

Dunn, S., Putallaz, M., Sheppard, B., & Lindstrom, R. (1987). Social support and adjustment in gifted adolescents. *Journal of Educational Psychology, 79*, 467-473. https://psycnet.apa.org/doi/10.1037/0022-0663.79.4.467

Emmerling, R. J., & Cherniss, C. (2003). Emotional intelligence and the career choice process. *Journal of Career Assessment, 11*(2), 153–167. http://dx.doi.org/10.1177/1069072703011002003

Floros, G., & Siomos, K. (2013). The relationship between optimal parenting, internet addiction and motives for social networking in adolescence. *Psychiatry Research, 209*, 529–534. http://dx.doi.org/10.1016/j.psychres.2013.01.010

Franchina, V., Abeele, M. V., Rooij, A. J. V., Coco, G. L., & Marez, L. D. (2018). Fear of missing out as a predictor of problematic social media use and phubbing behavior among Flemish adolescents. *International Journal of Environmental Research and Public Health, 15*, 2319. https://dx.doi.org/10.3390%2Fijerph15102319

Gökçearslan, Ş., Uluyol, Ç., & Şahin, S. (2018). Smartphone addiction, cyberloafing, stress and social support among university students: A path analysis. *Children and Youth Services Review, 91*, 47-54. https://doi.org/10.1016/j.childyouth.2018.05.036

Gottlieb, B. H. (2000). Selecting and planning support interventions. In S. Cohen, L. G. Underwood, & B. H. Gottlieb (Eds.). *Social support measurement and intervention: A Guide for Health and Social Scientists* (pp. 195–220). Oxford University Press. https://psycnet.apa.org/doi/10.1093/med:psych/9780195126709.003.0006

Hegney, D., Plank, A., & Parker, V. (2006). Extrinsic and intrinsic work values: Their impact on job satisfaction in nursing. *Journal of Nursing Management, 14*(4), 271-281. https://doi.org/10.1111/j.1365-2934.2006.00618.x

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Jeong, S. H., Kim, H. J., Yum, J. Y., & Hwang, Y. (2016). What type of content are smartphone users addicted to?: SNS vs. games. *Computers in Human Behavior, 54*, 10-17. https://doi.org/10.1016/j.chb.2015.07.035

Karaer, Y., & Akdemir, D. (2019). Parenting styles perceived social support and emotion regulation in adolescents with internet addiction. *Comprehensive Psychiatry, 92*, 22–27. https://doi.org/10.1016/j.comppsych.2019.03.003

Kim, W., Kreps, G. L., & Shin, C. N. (2015). The role of social support and social networks in health information–seeking behavior among Korean Americans: A qualitative study. *International Journal of Equity Health, 14*(1), 1–10. https://dx.doi.org/10.1186%2Fs12939-015-0169-8

Kuss, D. J., & Griffiths, M. D. (2011). Online social networking and addiction: A review of the psychological literature. *International Journal of Environmental Research and Public Health, 8*, 3528–3552. http://dx.doi.org/10.3390/ijerph8093528

Lazuras, L., & Dokou, A. (2016). Mental health professionals' acceptance of online counseling. *Technology in Society, 44*, 10–14. http://dx.doi.org/10.1016/j.techsoc.2015.11.002

Lei, H., Li, S., Chiu, M. M., & Lu, M. (2018). Social support and internet addiction among mainland Chinese teenagers and young adults: A meta-analysis. *Computers in Human Behavior, 85*, 200-209. https://doi.org/10.1016/j.chb.2018.03.041

Li, L., Niu, Z., Mei, S., & Griffiths, M. D. (2022). A network analysis approach to the relationship between fear of missing out (FOMO), smartphone addiction, and social networking site use among a sample of Chinese university students. *Computers in Human Behavior, 128*, 107086. https://doi.org/10.1016/j.chb.2021.107086

Li, N., Li, S., & Fan, L. (2021). Risk factors of psychological disorders after the COVID-19 outbreak: The mediating role of social support and emotional intelligence. *Journal of Adolescent Health, 69*(5), 696-704. https://doi.org/10.1016/j.jadohealth.2021.07.018

Li, X., Chen, W., & Popiel, P. (2015). What happens on Facebook stays on Facebook? The implications of Facebook interaction for perceived, receiving, and giving social support. *Computers in Human Behavior, 51*(Part A), 106–113. https://doi.org/10.1016/j.chb.2015.04.066

Lin, M. P., Wu, J. Y. W., You, J., Chang, K. M., Hu, W. H., & Xu, S. (2018). Association between online and offline social support and Internet addiction in a representative sample of senior high school students in Taiwan: The mediating role of self- esteem. *Computers in Human Behavior, 84*, 1-7. https://doi.org/10.1016/j.chb.2018.02.007

Maslow, A. H. (1970). *Motivation and personality* (2nd ed.). Harper & Row.

Molinillo, S., Anaya-Sánchez, R., & Liébana-Cabanillas, F. (2019) Analyzing the effect of social support and community factors on customer engagement and its impact on loyalty behaviors toward social commerce websites. *Computers in Human Behavior, 108*, 1-27. https://doi.org/10.1016/j.chb.2019.04.004

Montag, C., Blaszkiewicz, K., Sariyska, R., Lachmann, B., Andone, I., Trendafilov, B., Eibes, M., & Markowetz, A. (2015). Smartphone usage in the 21st century: Who is active on WhatsApp? *BMC Research Notes, 8*, 1–6. http://dx.doi.org/10.1186/s13104-015-1280-z

Nambisan, P. (2011). Information seeking and social support in online health communities: Impact on patients' perceived empathy. *Journal of American Medical Informatics Association, 18*(3), 298–304. http://dx.doi.org/10.1136/amiajnl-2010-000058

Nayak, J. G. (2018). Relationship among smartphone usage, addiction, academic performance and the moderating role of gender: A study of higher education students in India. *Computers in Human Behavior, 123*, 164-173. https://doi.org/10.1016/j.compedu.2018.05.007

Neubaum, G., & Krämer, N. C. (2015). My friends right next to me: A laboratory investigation on predictors and consequences of experiencing social closeness on social networking sites. *Cyberpsychology, Behavior and Social Networking, 18*, 443-449. http://dx.doi.org/10.1089/cyber.2014.0613

Ng, K. M., Wang, C., Zalaquett, C. P., & Bodenhorn, N. (2008). A confirmatory factor analysis of the wong and law emotional intelligence scale in a sample of international college students. *International Journal for the Advancement of Counselling, 29*(3), 173-185. https://doi.org/10.1007/s10447-007-9037-6

Nongpong, S., & Charoensukmongkol, P. (2016). I don't care much as long as I am also on Facebook: Impacts of social media use of both partners on romantic relationship problems. *The Family Journal: Counseling and Therapy for Couples and Families, 24*(4), 351-358. https://doi.org/10.1177%2F1066480716663199

Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). Negative consequences from heavy social networking in adolescents: The mediating role of fear of missing out. *Journal of Adolescence, 55*, 51-60. https://doi.org/10.1016/j.adolescence.2016.12.008

Olmsted, S. C., Rim, H., & Zerba, A. (2012). Mobile news adoption among young adults: Examining the roles of perceptions, news consumption and media usage. *Journalism & Mass Communication Quarterly, 90*(1), 126-147. http://dx.doi.org/10.1177/1077699012468742

Park, N., Kee, K. F., & Valenzuela, S. (2009). Being immersed in social networking environment: Facebook groups, uses and gratifications, and social outcomes. *Cyber Psychology & Behavior, 12*(6), 729–733. http://dx.doi.org/10.1089/cpb.2009.0003

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior, 29*, 1841–1848. https://doi.org/10.1016/j.chb.2013.02.014

Roberts, J., Yaya, L., & Manolis, C. (2014). The invisible addiction: Cell-phone activities and addiction among male and female college students. *Journal of behavioral addictions, 3*(4), 254–265. http://dx.doi.org/10.1556/JBA.3.2014.015

Salovey, P., & Mayer, J. D. *(*1990). Emotional intelligence. *Imagination, Cognition, and Personality, 9*, 185-211. https://doi.org/10.2190/DUGG-P24E-52WK-6CDG

Sela, Y., Zach, M., Hamburger, Y. A., Mishali, M., & Omer, H. (2020). Family environment and problematic internet use among adolescents: The mediating roles of depression and fear of missing out. *Computers in Human Behavior, 160*, 106226. https://doi.org/10.1016/j.chb.2019.106226

Shin, K., Kim, D. I., & Chung, Y. (2011). Report: Development of Korean smartphone addiction proneness scale for youth and adults. *National Information Society Agency, 24*, 231-238.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*(4), 422-445. https://doi.org/10.1037/1082-989X.7.4.422

Slaski, M., & Cartwright, S. (2002). Health, performance and emotional intelligence: an exploratory study of retail managers. *Stress and Health, 18*(2), 63-68. https://psycnet.apa.org/doi/10.1002/smi.926

Statista. (2022a). *Technology & telecommunications.* https://www.statista.com/statistics/489255/percentage-of-us-smartphone-owners-by-age-group/

Statista. (2022b). *Number of smartphone users in Indonesia from 2017 to 2020 with forecasts until 2026.* https://www.statista.com/statistics/266729/smartphone-users-in-indonesia/

Vicary, A. M., & Fraley, R. C. (2010). Student reactions to the shootings at Virginia tech and Northern Illinois university: does sharing grief and support over the internet affect recovery? *Personal and Social Psychology Bulletin, 36*(11), 1555–1563. http://dx.doi.org/10.1177/0146167210384880

Wang, P., Lei, L., Wang, X., Nie, J., Chu, X., & Jin, S. (2018). The exacerbating role of perceived social support and the "buffering" role of depression in the relation between sensation seeking and adolescent smartphone addiction. *Personal Individual Differences, 130*(59), 129–134. http://dx.doi.org/10.1016/j.paid.2018.04.009

Wang, S., & Zhang, D. (2020). The impact of perceived social support on students' pathological Internet use: The mediating effect of perceived personal discrimination and moderating effect of emotional intelligence. *Computers in Human Behavior, 106*, 106247. https://doi.org/10.1016/j.chb.2020.106247

West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables: Problems and remedies. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 56–75). Sage.

Wolniewicz, C. A., Tiamiyu, M. F., Weeks, J. W., & Elhai, J. D. (2018). Problematic smartphone use and relations with negative affect, fear of missing out, and fear of negative and positive evaluation. *Psychiatry Research, 262*, 618–623. https://doi.org/10.1016/j.psychres.2017.09.058

Wong, C., & Law, K. S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The Leadership Quarterly, 13*(3), 243–274. https://doi.org/10.1016/S1048-9843(02)00099-1

Wood, E. P., & Cook, S. H. (2019). Father support is protective against the negative effects of perceived discrimination on CRP among sexual minorities but not heterosexuals. *Psychoneuroendocrinology, 110*, 1-9. https://doi.org/10.1016/j.psyneuen.2019.06.019

Wu, Q., Luo, J., Bai, J., Hou, M., & Li, X. (2019). Effect of security on mobile addiction: Mediating role of actual social avoidance. *Psychological Development and Education, 35*(5), 589-596. https://doi.org/10.16187/j.cnki.issn1001-4918.2019.05.10

Zebardast, L., & Radaei, M. (2022). The influence of global crises on reshaping pro-environmental behavior, case study: The COVID-19 pandemic. *Science of The Total Environment, 811*, 151436. https://doi.org/10.1016/j.scitotenv.2021.151436

Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30-41. https://doi.org/10.1207/s15327752jpa5201_2