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ORIGINAL ARTICLE

SMARTPHONE USE AND PSYCHOLOGICAL WELL-BEING AMONG GENERATION Z: ROLE OF PHUBBING

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ABSTRACT

OBJECTIVE: To explore the mediating role of phubbing in the relationship between smartphone addiction and psychological well-being among generation Z (people born between the mid-1990s and late 2000s).

METHODS: This cross-sectional survey was conducted on 794 students from two public universities of south Punjab, Pakistan, ranging in age between 18-24 years. Data were collected through a multistage cluster sampling technique. Three reliable and valid measures were used to measure the study variables. Data analysis was done with SPSS-23 and Smart-PLS 3.3.3.

RESULTS: Out of 794 respondents, 373 (47%) were males and 421 (53%) were females. Majority (n=442; 55.7%) were from 21-23 years' age group. Most respondents used smartphones for more than five years (38%), followed by 3-5 years (33.6%) and 1-3 years (28.3%), respectively. WhatsApp was the most preferred medium of networking (74.4%), and the primary motive of smartphone use was educational (48.7%). All the scales exhibited excellent reliability; the smartphone addiction scale (α=0.913), the Phubbing scale (α=0.887), the psychological well-being scale (α=0.978), and validity were also achieved through Fornell-Larcker and HTMT criteria. Results of structural model exhibited that smartphone addiction had a significant negative impact on psychological well-being (β= -0.16, p<0.000), and smartphone addiction was associated with phubbing (β=0.248, p<0.000), but phubbing did not mediate relationship between smartphone addiction and psychological well-being among generation Z university students.

CONCLUSION: Majority of youngsters are using smartphones frequently and heavily. Smartphone addiction is a risk factor for psychological well-being. Smartphone addiction negatively impacts psychological well-being and is positively associated with phubbing behavior.

KEYWORDS: Smartphone (MeSH); Internet Addiction Disorder (MeSH); Phubbing (Non-MeSH); Psychological Well-being (MeSH); Students (MeSH); Behavioral Addiction (Non-MeSH); Generation Z (Non-MeSH)

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INTRODUCTION

In recent years, smartphones have swiftly replaced classical mobile phones and computers and become the world's most popular electronic device. Though they provide significant convenience, addiction to this tinny device prevails worldwide, becoming a serious concern.[1] Its popularity and overuse have raised severe concerns about the addictive elements inherent to the use of this device among all age groups.[2] Addiction to a smartphone could cause poor health, including physical consequences, psychological problems, and social issues.[1] In general, smartphone addiction is considered a mental health concern, but it is specifically considered a type of "behavioral addiction".[3]

People born between the mid-1990s and late 2000s are referred to as Generation Z and are considered distinct from previous generations in several ways. Generation Z is a generation of digital natives who live differently from millennials and generation Y.[4] The assumption is that smartphone usage, particularly among younger generations, has become an addiction, affecting their social lives and psychological well-being.[5] A significant outcome of smartphone overuse is "phubbing," which refers to snubbing or ignoring the other person in a social setup by being absorbed in one's smartphone rather than talking to the person or listening to the person.[6] Phubbing is simply ignoring people around and staying connected with the smartphone. Smartphone addiction (SPA) contributes to the development of phubbing behavior. Phubbing is a detrimental upshot for the quality of social interactions and relations and results in the "tele-cocooning" (diversion from face-to-face communication) effect;[7] it is highly unfavorable for individuals' well-being.[8]

Only 45% of Generation Z members state that their mental health is outstanding. Generation Z is the most vulnerable generation to seek help for anxiety and depression from a therapist or psychologist.[9] Youngsters who spend more time using smartphones, social media, and screens (e.g., social media, the internet, texting, and video games) and less time doing things such as spending time with family and friends report lower PWB. Smartphones have intensified the fall in adolescents' psychological well-being;[10] research reported a correlation between smartphone use and psychological well-being.[11] A study found a significant

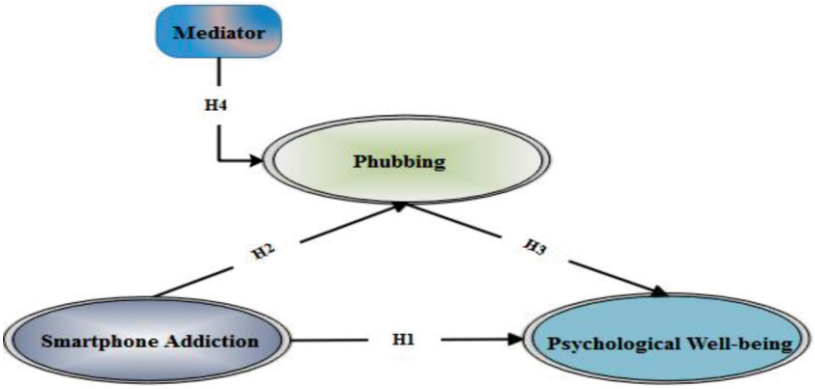

Figure 1: Conceptual Model

TABLE I: DEMOGRAPHIC INFORMATION ABOUT THE RESPONDENTS (N=794)

Patient Variables	Attribute	Frequency (%)
Gender	Male	373 (47%)
	Female	421 (53%)
Age (years)	18-20	240 (30.2%)
	21-23	442 (55.7%)
	24 years old	112 (14.1%)
Family Structure	Nuclear	454 (57.2%)
	Joint	340 (42.8%)
Order among siblings	1st Born	218 (27.5%)
	2nd Born	193 (24.3%)
	3rd Born	141 (17.8%)
	4th Born	107 (13.5%)
	5th Born	86 (10.8%)
	6th Born	27 (3.4%)
	7th Born	22 (2.8%)

relationship between smartphone addiction and PWB among university students. Another study reported that smartphone addiction is associated with lower well-being.[12] These statistics call for studying the underlying mechanisms of this relationship. Smartphone addiction is a precursor for phubbing behavior because both include smartphone involvement.[6] A study conducted in India among youth informed that phubbing is influenced by smartphone and internet addictions and results in distress and depression. These findings set the ground to speculate that phubbing may mediate the relationship between smartphone addiction and psychological well-being.

In Pakistan, few studies have explored the effects of smartphone addiction on academic performance, academic achievements, classroom connectedness, and depression.[13-16] Moreover, few studies have studied phubbing behavior only in romantic relationships and organizations.[17,18] The literature is insufficient regarding the role of phubbing in the relationship between smartphone addiction and PWB among Generation Z in Pakistan. Therefore, researchers aimed to study smartphone use patterns, smartphone addiction, phubbing behavior, and psychological well-being among Generation Z studying at universities. This study assessed the mediating role of phubbing in the relationship between smartphone addiction and psychological well-being to understand the underlying mechanism of this relationship (Figure 1)

METHODS

For this study, ethical approval was obtained (UPM/TNCPI/RMC/1.4.18.2 (JKEUPM), and permission from the university administration was acquired to collect the data. A cross-sectional study using the multistage cluster random sampling technique was conducted to approach study participants from two universities in Pakistan: Bahauddin Zakariya University, Multan, and Islamia University Bahawalpur. Two universities were randomly selected from South Punjab, and faculties were divided into two groups: Science and Others. Departments were randomly selected from the science and "others" groups. At the final stage, classes were randomly chosen from the selected departments.

To be included in the study: participants must be 18 years and above and in the age range of Generation Z; they should be regular smartphone users for at least one year. All students above age 24 were excluded from participation. Participants meeting the inclusion criterion were approached in their virtual classrooms with the help of their instructors from June-August 2020. Before filling out the online survey questionnaire, participants were informed about the purpose of the study and debriefed afterward, and 794 responses were finalized for the analyses.

Questions about smartphone use patterns were taken from literature, and questionnaires for study variables were also adopted from existing literature. Smartphone addiction was measured through the ten items scale "Smartphone Addiction Scale" (SAS-SV), which is a validated unidimensional measure of addictive aspects of smartphones comprised of 10 items.[19] A Likert-type scale anchored from "strongly disagree" to "strongly agree" recorded the responses. A high score expressed the maximum existence of "smartphone addiction" in the past year. The original or short version scale exhibits internal consistency, concurrent and content validity (Cronbach's alpha: 0.91). The Phubbing Scale comprising ten items, was used to measure phubbing behavior. The response format is a five-point Likert scale ranging from 1 to 5 (never to always). One subscale of the phubbing scale, namely "communication

TABLE II: DEMOGRAPHIC INFORMATION ABOUT THE SMARTPHONE USE PATTERNS OF THE RESPONDENTS (N=794)

Patient Variables	Attribute	Frequency (%)
Since when are you using a smartphone?	from 1-3 years	225 (28.3%)
	from >3-5 years	267 (33.6%)
	> 5 years	302 (38%)
Smartphone use hours/Per day?	Less than 1 hour	16 (2%)
	1-2 hour	67 (8.4%)
	>2-3 hour	148 (18.6%)
	>3-4 hour	190 (23.9%)
	>4 hours	373 (47%)
The primary use of the smartphone?	Text messages	172 (21.7%)
	Calls	73 (9.2%)
	Chatting Apps	100 (12.6%)
	Internet	235 (29.6%)
	Entertainment	180 (22.7%)
	Games	34 (4.3%)
The primary motive to use a smartphone?	Interpersonal	176 (22.2%)
	Killing time	75 (9.4%)
	Amusement	156 (19.6%)
	Study needs	387 (48.7%)
Most used social media platform?	Facebook	97 (12.2%)
	WhatsApp	591 (74.4%)
	Instagram	31 (3.9%)
	Twitter	38 (4.8%)
	Others	37 (4.7%)

disturbance" (α = .87; 5 items), was used in the current study.[20] Internal validity of the subscales of the phubbing scale is acceptable. The original scale possesses good psychometric properties (Communication disturbance: α=0.77). Psychological well-being was measured with Ryff's Psychological well-being scale with an 18-item version, a very comprehensive, reliable, and valid scale.[21,22] The responses were anchored from strongly agree to disagree strongly. Negatively phrased items (q1, q2, q3, q8, q9, q11, q12, q13, q17, and q18) were re-coded before analysis.

RESULTS

Smart-PLS 3.3.3 and SPSS 23 software were used for data analysis. First, descriptive statistics were obtained through SPSS. Out of 794 respondents, 373 (47%) were males and 421 (53%) were females. Majority (n=442; 55.7%) were from 21-23 years' age group (Table 1).

The information about the participants' smartphone use patterns is presented in Table II. A strong majority (n=373; 47%) used smartphones for more than 4 hours daily. Among all smartphone users, 235 (29.6%) respondents used them for internet browsing, while 43.5% used smartphones for communication (texting, calls, and chatting). The primary motive for using smartphones was study needs (n=387; 48.7%), followed by interpersonal needs (n=176; 22.2%),and entertainment/amusement (n=156; 19.6%). The preferred social media platform among generation Z was WhatsApp (n=591; 74.4%) as compared to Facebook (n=97; 12.2%) and other social media platforms.

Measurement and structural models were tested using Smart-PLS. The measurement model measures construct validity, reliability, discriminant, and convergent validity. And the structural model tests the study's hypothesis.[23] Each item had significant loading on the relevant construct, and loading was above the cutoff value of 0.5; Composite Reliabilities (CRs) were above 0.7, and Average Variance Extracted (AVE) values of the constructs were above 0.5 (Table III).[23] Discriminant validity was ensured between the constructs as correlations were less than 0.85. The square root of AVEs surpassed the correlations of factors and other constructs (Table III). HTMT values are also under the threshold of 0.90 (Table III), as required.[24] All the measures demonstrated excellent psychometric properties.

The structural model was tested, and R^2 values informed the variance in the outcome variables explained by the independent variable.[25] Path coefficients were determined to assess the association among constructs' strength, direction, and significance. As depicted in Table IV and Figure 2, smartphone addiction has a significant negative impact on psychological wellbeing (β = -0.16, p < .000) and smartphone addiction has a significant impact on phubbing behavior (β = 0.248, p < .000) whereas phubbing has an insignificant impact on PWB (β = 0.027, p = .504). Results support H1 and H2, whereas H3 did not get support through this data. To test the mediation of phubbing in the relationship between smartphone addiction and psychological well-being bootstrapping method was used (β = 0.007, p < .520) (Table IV), phubbing did not mediate this path, and H4 got rejected

DISCUSSION

While most people understand addiction in terms of physical reliance on substances like alcohol, nicotine, illicit drugs, or even prescription pharmaceuticals, they struggle with the concept of addictive behaviors. However, it is possible to establish a behavioral addiction that contains responses similar to substance disorders. People can become addicted to anything from gambling to sex, the internet, and smartphones. Widespread smartphone use has become the norm, exposing users to health and other risk issues. The age group between 18 and late 20s is most vulnerable to addictions and risky behaviors,[26] and the risk for behavioral addictions are equally present. This study assessed smartphone use patterns, smartphone addiction, phubbing, and psychological well-being among Generation Z university students in Pakistan. Researchers aimed to understand the underlying mechanism in the relationship between smartphone addiction and PWB. The study's first hypothesis was about the impact of smartphone addiction on the PWB. Results reported that smartphone addiction negatively impacted

TABLE III: ASSESSMENT OF THE MEASUREMENT AND STRUCTURAL MODEL

Reliability, Validity, and AVE	**Constructs**	**CA**	**CR**	**AVE**
	Phubbing	0.887	0.917	0.688
	PWB	0.978	0.980	0.732
	SPA	0.913	0.928	0.563
Discriminant Validity- (Fornell-Larcker)	**Constructs**	**Phubbing**	**PWB**	**SPA**
	Phubbing	0.829		
	PWB	-0.012	0.856	
	SPA	0.248	-0.153	0.75
Discriminant Validity- (HTMT)	**Constructs**	**Phubbing**	**PWB**	**SPA**
	Phubbing			
	PWB	0.034		
	SPA	0.264	0.158	
R-Square	**Endogenous Variables**	**R Square**	**R Square Adjusted**	0.26: Substantial, 0.13: Moderate, 0.02: Weak 23
	Phubbing	0.062	0.061	
	PWB	0.024	0.022	
Effect Size (F-square)	**Endogenous Variables**	**PWB**	VIF <= 5.0 [23]	
	Phubbing	1.066		
	PWB	1.066		
Predictive Relevance (Q-Square)	**Endogenous Variables**	**Q^2**	Any value larger than zero indicates Predictive Relevance 23	
	Phubbing	0.04		
	PWB	0.017		

Note: CA is the Cronbach alpha; CR is the composite reliability; AVE (average variance extracted); SPA= Smart Phone Addiction; HTMT= Heterotrait-Monotrait; PWB=Psychological Well-Being; CR value in the PLS-SEM should exceed 0.7; AVE (Average Variance Extracted) above or equal to 0.5 confirm convergent validity.

TABLE IV: PATH COEFFICIENTS, DIRECT & INDIRECT EFFECTS FOR THE MEDIATION MODEL

Hypotheses	Beta	LL	UL	SD	t	P
SPA-> PWB	-0.16	-0.23	-0.092	0.036	4.38	0.000***
SPA-> P	0.248	0.167	0.309	0.035	7.021	0.000***
P -> PWB	0.027	-0.055	0.099	0.041	0.669	0.504
SPA -> P-> PWB	0.007	-0.014	0.026	0.011	0.644	0.520

Note: SPA= Smart Phone Addiction; P= Phubbing; PWB=Psychological Well-Being; Significant at the $p < 0.05$ level

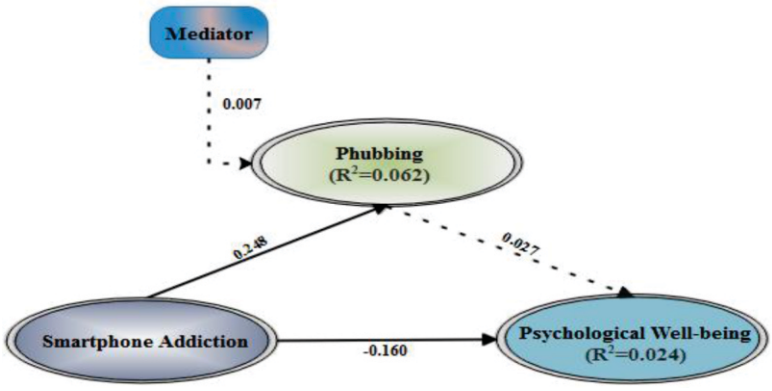

Figure 2: Structural Model with Beta Values

psychological well-being; an increase in smartphone addiction decreases the psychological well-being of young people. These findings are consistent with the findings reported by Twenge and colleagues that an increase in screen time causes a reduction in psychological well-well-being.[10] Current findings are also supported by Abid and fellows, who found similar results that Smartphone addiction, had a significant relationship with depression among University Students in Karachi, Pakistan.[16] The second hypothesis was to assess the impact of SPA on phubbing behavior. Results supported the idea and showed a positive association between SPA and phubbing; smartphone addiction leads to phubbing behavior. The person with smartphone addiction gets absorbed in the device and ignores the surroundings. These findings align with a large-scale study that explored 17 countries, including Pakistan, and concluded about the negative influence of smartphone addiction on phubbing.[27]

The next hypothesis was about the negative impact of phubbing on PWB, but the data did not support this hypothesis. Phubbing is not a widely studied phenomenon in Pakistan, and the available literature is not about the students or the general population. Existing literature in Pakistan only informs about phubbing behavior in organizational setup or among intimate partners.[17,18] The current study's insignificant results may be due to the cultural factor. Pakistani culture still discourages using smartphones in the presence of others as it is considered disrespectful.

On the contrary, another justification for current results may be the new norm about phubbing behavior that explains the acceptance of phubbing behavior in society.[6] The last hypothesis was about the mediating role of phubbing in the relationship between SPA and PWB. This assumption was also not fulfilled, and phubbing did not mediate the relationship between smartphone addiction and psychological well-being. These findings contradict 's study in 2019, which found phubbing as a significant mediator.[27] Still, in a subsequent study in 2021, Blachino's team emphasized country indicators' moderating role in the relationship between phubbing and psychological distress.[28] So, it is important evidence that many other factors determine the outcomes of phubbing behavior that need to be considered in future studies.

To sum up, smartphone addiction negatively affected PWB, but the underlying mechanism for this relationship was not explained through phubbing, which was a critical outcome of smartphone addiction. Further studies must be conducted to explore the relationship between phubbing and psychological well-being. Future researchers should explore other possible mediating variables in the relationship between SPA and PWB to fully explore the issue.

Current findings highlight the importance of exploring ways to reduce the negative impact of smartphone addiction on the psychological well-being of Generation Z students, who are the country's future. This study is important for policymakers, mental health workers, and universities to find ways to protect the psychological well-being of young students. As the study was conducted in South Punjab only, further studies must be completed in other parts of the country to better estimate smartphone addiction's prevalence, epidemiology, and effects

CONCLUSION

The majority of youngsters are using smartphones frequently and heavily. Smartphone addiction is a risk factor for psychological well-being. Smartphone addiction negatively impacts psychological well-being and is positively associated with phubbing behavior. Although phubbing does not mediate the relationship between smartphone addiction and psychological well-being, it calls for further studies to look for additional factors that explain this relationship, such as social isolation. To conclude, policymakers, government authorities, practitioners, and social workers must create awareness to prevent modern technology's excessive use to avoid negative consequences.

REFERENCES

1. Ding D, Li J. Smartphone overuse–A growing public health issue. J Psychol Psychother 2017;7(1):289. https://doi.org/10.4172/2161-0487.1000289
2. Billieux J, Maurage P, Lopez-Fernandez O, Kuss DJ, Griffiths MD. Can disordered mobile phone use be considered a behavioral addiction? An update on current evidence and a comprehensive model for future research. Curr Addict Rep 2015;2(2):156-62. https://doi.org/10.1007/s40429-015-0054-y
3. Griffiths M. Does Internet and computer" addiction" exist? Some case study evidence. Cyberpsychol Behav 2000;3(2):211-8. https://doi.org/10.1089/109493100316067
4. Gentina E, Parry E. Generation Z in Asia: A research agenda. The New Generation Z in Asia: Dynamics, Differences, Digitalisation. The changing context of managing people. Emerald Publishing Limited. 2020. https://doi.org/10.1108/9781800432208
5. Ozkan M, Solmaz B. Mobile addiction of generation z and its effects on their social lifes:(An application among university students in the 18-23 age group). Procedia Soc Behav Sci 2015;205:92-8. https://doi.org/10.1016/j.sbspro.2015.09.027
6. Chotpitayasunondh V, Douglas KM. How "phubbing" becomes the norm: The antecedents and consequences of snubbing via smartphone. Comput Hum Behav 2016;63:9-18. https://doi.org/10.1016/j.chb.2016.05.018
7. Ito ME, Okabe DE, Matsuda ME. Personal, portable, pedestrian: Mobile phones in Japanese life. 2006. ISBN: 9780262590259. MIT Press Cambridge USA.
8. Roberts JA, David ME. My life has become a major distraction from my cell phone: Partner phubbing and relationship satisfaction among romantic partners. Comput Hum Behav 2016;54:134-41. http://doi.org/10.1016/j.chb.2015.07.058
9. Casey AE. Generation Z and Mental Health: the Annie E. Casey Foundation. 2021. [Accessed on: May 20, 2021]. Available from URL: https://www.aecf.org/blog/generation-z-and-mental-health.
10. Twenge JM, Martin GN, Campbell WK. Decreases in psychological well-being among American adolescents after 2012 and links to screen time during the rise of smartphone technology. Emotion 2018;18(6):765-80. https://doi.org/10.1037/emo0000403
11. Lowe-Calverley E, Pontes HM. Challenging the concept of smartphone addiction: An empirical pilot study of smartphone usage patterns and psychological well-being. Cyberpsychol Behav Soc Netw 2020;23(8):550-6. https://doi.org/10.1089/cyber.2019.0719
12. Horwood S, Anglim J. Problematic smartphone usage and subjective and psychological well-being. Comput Hum Behav 2019;97:44-50. https://doi.org/10.1016/J.CHB.2019.02.028
13. Khan AA, Khalid A, Iqbal R. Revealing the relationship between smartphone addiction and academic performance of students: Evidences from higher educational Institutes of Pakistan. Pak Adm Rev 2019;3(2):74-83.
14. Raza SA, Yousufi SQ, Rafi ST, Javaid ST. Impact of Smartphone Addiction on Students' Academic Achievement in Higher Education Institute of Pakistan. J Educ Soc Sci 2020;8(1):1-14. http://dx.doi.org/10.20547/jess0812008101
15. Soomro KA, Zai SAY, Nasrullah, Hina QA. Investigating the impact of university students' smartphone addiction on their satisfaction with classroom connectedness. Educ Inf Technol 2019;24(6):3523-35. https://doi.org/10.1007/s10639-019-09947-7
16. Abid U, Khan TJ, Sheikh A, Saleem S, Kayani HA, Habib MA. The relationship between smartphone addiction and depression among university students in Karachi: a cross-sectional study. Int J Community Med Public Health 2020;7(9):3472-9. https://dx.doi.org/10.18203/2394-6040.ijcmph20203909
17. Zonash R, Saghir S, Ahsan R, Murtaza S. Phubbing Behavior and Romantic Relationship: Mechanism of Mental Health among Married Couples. Foundation Univ J Psychol 2020;4(1):103-37.

18. Yasin RM, Bashir S, Abeele MV, Bartels J. Supervisor phubbing phenomenon in organizations: determinants and impacts. Int J Bus Commun 2020; 60(1):150–72. https://doi.org/10.1177/2329488420907120

19. Kwon M, Kim DJ, Cho H, Yang S. The smartphone addiction scale: Development and validation of a short version for adolescents. PLoS One 2013;8(12):e83558. https://doi.org/10.1371/journal.pone.0083558

20. Karadağ E, Tosuntaş ŞB, Erzen E, Duru P, Bostan N, Şahin BM, et al. Determinants of phubbing, which is the sum of many virtual addictions: A structural equation model. J Behav Addict 2015;4(2):60-74. https://doi.org/10.1556/2006.4.2015.005

21. Ryff CD, Keyes CLM. The structure of psychological well-being revisited. J Pers Soc Psychol 1995;69(4):719-27. https://doi.org/10.1037//0022-3514.69.4.719

22. Ryff CD. Psychological well-being revisited: Advances in the science and practice of eudaimonia. Psychother Psychosom 2014;83(1):10-28. https://doi.org/10.1159/000353263

23. Hair JF, Hult GTM, Ringle CM, Sarstedt M, Thiele KO. Mirror, mirror on the wall: A comparative evaluation of composite-based structural equation modeling methods. J Acad Mark Sci 2017;45(5):616-32. https://doi.org/10.1007/s11747-017-0517-x

24. Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. J Acad Mark Sci 2015;43(1):115-35.

25. Gefen D, Straub D, Boudreau MC. Structural equation modeling and regression: Guidelines for research practice. Commun Assoc Inf Syst 2000;4(1):7. https://doi.org/10.17705/1cais.00407

26. Hsieh K-Y, Hsiao RC, Yang Y-H, Liu T-L, Yen C-F. Predictive effects of sex, age, depression, and problematic behaviors on the incidence and remission of internet addiction in college students: A prospective study. Int J Environ Res Public Health 2018;15(12):2861. https://doi.org/10.3390/ijerph15122861

27. Błachnio A, Przepiórka A, Gorbaniuk O, Ivanova A, Abreu AM, Angeluci A, et al., editors. Determinants and effects of mobile phone addiction and phubbing: A study in 17 countries. Poster session presented at: 3rd World Conference on Personality, Hanoi, Vietnam. 2019 http://hdl.handle.net/10400.14/32486

28. Błachnio A, Przepiórka A, Gorbaniuk O, McNeill M, Bendayan R, Durak M, et al. Country indicators moderating the relationship between phubbing and psychological distress: A study in 20 countries. Front Psychol 2021;12:588174. https://doi.org/10.3389/fpsyg.2021.588174f

AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

RSB: Concept, acquisition, analysis and interpretation of data, drafting the manuscript, approval of the final version to be published.

HBA, WMWJ, & AAS: Concept and study design, critical review, approval of the final version to be published..

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest

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DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request