DOI Number: 10.5958/2320-608X.2019.00037.4

Influence of Smart Phone Addiction on Depression and Aggression in Medical Students

Shobha MV[1], Jagadamba Aswathappa[1], Hima Varshini[2]

[1]Associate Professor, [2]Undergraduate Student, Department of Physiology/ SDUM, Sri Devaraj URS Higher Education & Research Centre, Tamaka, Kolar, Karnataka, India

Abstract

To determine the relationship of smart phone addiction with depression and aggression scores. **Materials & Method;** Cross sectional observational data was collected from 205 young adults in the age group 18-25 years who uses smartphone more than 6 months. Smartphone addiction was assessed using scale-SV questionnaire. Beck Depression Inventory is widely used self-rated instrument to assess depression. Buss–Perry Aggression Scale(BRAQ) is a 29 item self-report measure of subject's present level of aggressiveness. **Results:** Spearman correlation coefficients were used to evaluate the relationship among the different variables. Multiple linear regression was used to assess the relationship between mental health problems (depression, aggression) and smartphone addiction score, after controlling for the effects of confounders. From this data smartphone addiction emerged as an independent predictor for aggression & depression in young adults($P < 0.001$).

Conclusion: In conclusion, smartphone addiction symptoms has a potential influence on the mental health factors (Depression & aggression) among young adults.

Keywords: *Smartphone addiction, Depression, Aggression, young adults.*

Introduction

The popularity of smart phones usage is increasing rapidly leading to its overuse. Addiction consists of elements such as engagement in the behavior to achieve appetitive effects, preoccupation with the behavior, temporary satiation, loss of control, and suffering negative consequences as continous use of something for the sake of relief or stimulation,which often causes cravings when it is absent.[1]

A new kind of health disorder among young adults, "smartphone's addiction/abuse/misuse" is now a herculean task for health policy makers globally to think on this rapidly emerging issue.Smartphone addiction which is a type of behavioural addiction has been defined as the overuse of smartphones to the extent that it disturbs users' daily lives. This might lead to behavioural difficulties, reduced performance in school or work, decreased real-life social interaction, neglect of personal life, mental preoccupation, mood modifying experiences and leading to relationship disorders.[2]

The age group of 25-34 is found to have the highest Smartphone usage rate of 62%.[3] 53% youngsters are currently driving Smartphone's market in India The number of smartphone users worldwide is projected to amount to nearly 2.7 billion by 2019. With a rise in smartphone ownership globally, China will have highest number of smartphone users, 1.3 billion, in 2018, followed by India with 530 million users. The US being in third, with 229 million users.[4]Aggression is apparent, harmful, social interaction which is intended to inflict damage or other unpleasantness upon another individual.[5] It includes aggression-related feelings such as anger or hostility, and aggression-related behaviors such as physical or verbal aggression.[6] In Depression an

Jagadamba Aswathappa
Corresponding author:
Associate Professor, Department of Physiology/ SDUMC, Sri Devaraj URS Higher Education & Research Centre, Tamaka, Kolar, Karnataka, India
E-mail: jagguravi@gmail.com

individual cannot control the emotions, and symptoms last for a long time. If left untreated, depression can lead to serious incidents and fatalities.[7]

Since smart phone usage has become a trend in present society especially in young adults and excessive usage has an effect on psychological behavior, hence there is a need to study the influence of smart phone addiction on depression and aggression in this particular vulnerable group to take necessary preventive measures.

Objectives;

1. To determine the Smart phone addiction in young adults using Smart Phone Addiction questionnaire.
2. To determine Depression score in young adults using Becks Depression inventory in smart phone users.
3. To determine Aggression in young adults using Buss Perry questionnaire in smart phone users.
4. To determine the relationship of smart phone addiction with depression and aggression scores.

Material and Method

This is a descriptive cross sectional study carried out in 205 young adults in the age group of 18-25years. Institutional ethical clearance & informed consent was obtained**.** Subjects with history of sleep disorders, psychological disorders neurological and endocrine disorders was excluded from the study.

The data was collected by self-administering the questionnaire to the students which was consist of two parts. First part recorded the demographic information including age,gender,smart phone usage,time spent on smartphone usage, facebook, whatsapp,webusage, education purpose,Email. Second part consists of Smartphone addiction scale-SV questionnaire was given to young adults to know whether they are Smartphone addictors or non-addictors.[8] Beck Depression Inventory is widely used self-rated instrument to assess depression. It contains 21questions being scored on Likert scale from 0 to 3. A score of 0 to 13 indicates minimal depression, 14 to 19 mild depressions, 20 to 28 moderate depressions and 29 to 63 severe depressions. The inventory has shown high internal consistency.[9]

Buss–Perry Aggression Scale(BRAQ) is a 29 item self-report measure of subject's present level of aggressiveness. Participants mark responses on a 5 point scale ranging from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me). BRAQ consists of four subscales: physical aggression (PA), verbal aggression (VA), the emotional component of anger (A) and hostility (H). Each question is based on a 7-point Likert scale scoring from one to seven (''extremely uncharacteristic of me''to''extremely characteristic of me''). For each student, score of each subscale of aggression will be calculated. Total aggression score also will be calculated.[10]

Statistical analysis

Statistical analyses was performed using the Statistical Package for Social Sciences (SPSS) version 20 for Windows. Descriptive statistics for the total sample were performed. Quantitative and qualitative measurements were summarized as mean ± standard deviation and n (%), respectively. Spearman correlation coefficients were used to evaluate the relationship among the different variables. Multiple linear regression was used to assess the relationship between mental health problems (depression, aggression) and smartphone addiction score, after controlling for the effects of confounders. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. Model 1 was unadjusted, showing the main effect of smartphone addiction level (total SAVS score-independent variable) on depression/anxiety (Dependent variables); Model 2 was adjusted for smartphone addiction score,& duration of usage of phone. Model 3 was our fully adjusted model in which Smartphone addiction score, Duration of usage of smart phone, Webusage ,Education purpose, Email ,Facebook ,Whatsapp usage, were controlled for. A p-value < 0.05 was considered statistically significant.

Results

Out of 205 questionnaires distributed majority participants were females(53.7%) .Their age range from 18-25 years with a mean age of 19.13± 1.16 years. Frequency distribution of time spent on smart phone perday,apps installed, apps uninstalled, email usage, education purpose, facebook,games, text messages, webusage & whatsapp usage in young adults was done. 62% of them used smart phones more than 3 hours /

day.46.8% of them used smartphone daily for webusage and 29.8% of them used smart phone for education purpose once per week.59.5% of them used smartphone daily for facebook usage & 95.6% of them spent daily on whatsapp usage.

Table-1: Frequency distribution of Smartphone addiction, Becks depression scale and Bussy Perry aggression scale in young adults(n=205)

Variable		N (%)
Smart phone addiction	Non adductors	166(81%)
	Addictors	39(19%)
Becks Depression score	Minimal depression	112(54.6%)
	Mild	70(34.1%)
	Moderate/severe	23(11.2%)
Bussy Perry Aggression score	Normal	152(74.1%)
	Aggressive	53(25.9%)

Table-1 shows 81% were smart phone non addictors and 19% were addictors. In Becks depression score 54.6% of young adults had minimal depression,34.1% mild and 11.2% moderate to severe depression. In Bussy Perry aggression score, 74.1% of them were normal and 25.9% of them showed aggressive behavior.

Table -2: Spearman's rank correlation analysis of duration of Smartphone usage with web usage, education purpose, e-mail, facebook. whatsapp, & Smart phone addiction score

Variable	Duration of usage of smart phone	
	R	P
Web usage	0.065	0.356
Education	-0.069	0.323
E-mail	0.046	0.514
Facebook	0.142	0.043
Whatsapp	0.048	0.498
Smart phone addiction score	0.379	0.001**

Duration of smart phone usage shows a significant positive correlation with the smart phone addiction score(r=0.379,p<0.001)

Table-3; Spearman's rank correlation analysis of Becks depression score and Bussy perry Aggression score with,duration of smart phone usage, web usage, education,E-mail,Facebook,Whatsapp, Smart phone addiction score.

Variable	Depression		Aggression	
	r	P	r	P
Smart phone addiction score	0.345**	0.001	0.316**	0.001
Duration of smart phone usage	0.230**	0.001	0.179*	0.01
Web usage	0.076	0.279	0.111	0.114
Education	-0.066	0.350	-0.22	0.755
E-mail	0.038	0.587	0.112	0.111
Face book	0.170*	0.015	0.116*	0.018
Whatsapp	0.019	0.785	0.003	0.968

Table -3 shows Correlation between Depression & smart phone addiction score showed a significant positive correlation (r=0.345,p<0.001) and also showed significant positive correlation for aggression with smart phone addiction score (r=0.316,p< 0.001). Both depression and aggression scores shows significant positive correlation for facebook usage among the young adults.

Table- 4: Assocciation between smartphone addiction & Becks depression score as assessed by multiple linear regression analysis

BD score	Unstandardized β	SE	Standardized β	pvalue	R^2
Model -1	Constant:4.606,F(df:1,203)=25.186,p<0.001				
Smartphone addiction score	0.274	0.055	0.332	<0.001	0.110
Model -2	Constant :3.987,F(df:2,202)=15.667,p<0.001				
Smartphone addiction score	0.222	0.058	0.269	<0.001	0.134
Duration of usage of smart phone	1.418	0.600	0.167	<0.019	
Model-3	Constant :2.461,F(df:7,197)=4.795,p<0.001				
Smartphone addiction score	0.2016	0.061	0.249	0.001	0.146
Duration of usage of smart phone	1.325	0.611	0.156	0.031	
Webusage	0.248	0.451	0.046	0.584	
Education purpose	0.463	0.469	-0.070	0.325	
Email	0.049	0.488	0.009	0.920	
Facebook	0.376	0.390	0.072	0.336	
Whatsapp usage	0.218	1.023	0.015	0.832	

Multiple linear regression was used to assess the ability of smart phone addiction to predict two mental health problems (depression & aggression), after controlling for the influence of confounding variables.

Table-4: In the unadjusted model (Model 1), higher depression (total BDS scores) were found to be significantly associated with higher smartphone addiction score, whereby the total BDS score increases by about 4.606 units for each unit increase in smartphone addiction score, and with smartphone score explaining about 11% of the variance in total BDS score, respectively.

Smartphone addiction score,& duration of usage of phone were entered in Model 2, increasing the variance in BDS explained by the independent variables (smartphone addiction score & duration of usage of phone) to 13%. After additional entry of the independent variables that pertain to smartphone use habits in the final model (Model 3) (Smartphone addiction score, Duration of usage of smart phone,Webusage, Education purpose, Email, Facebook,Whatsapp usage), the total variance explained by the model as a whole increased to 14.6% , $p < 0.000$, respectively.

In the final model in which smartphone addiction score was entered as the main independent variable in model 1, higher BDS score was found to be significantly associated with higher duration of smartphone usage ,smartphone addiction score with the highest beta value ($\beta = 0.249$, $p < 0.001$) followed by duration of smartphone usage ($\beta = 0.156$, $p < 0.001$), (Table 4).

Table -5: Assocciation between smartphone addiction & BPAS score as assessed by multiple linear regression analysis

BPAS	Unstandardized β	SE	Standardized β	pvalue	R^2
Model -1	Constant:61.104, F(df:1,203)=22.368,p<0.001				
Smartphone addiction score	0.54	0.116	0.315	<0.001	0.099
Model -2	Constant :60.376,F(df:2,202)=12.067,p<0.001				
Smartphone addiction score	0.485	0.125	0.280	<0.001	0.107
Duration of usage of smart phone	1.668	1.283	0.093	0.195	
Model-3	Constant :53.572,F(df:7,197)=3.950,p<0.001				
Smartphone addiction score	0.470	0.129	0.270	0.001	0.123
Duration of usage of smart phone	1.437	1.304	0.081	0.272	
Webusage	0.202	0.962	-0.018	0.834	
Education purpose	0.622	1.001	-0.044	0.535	
Email	1.384	1.039	0.115	0.185	
Facebook	0.480	0.832	0.043	0.564	
Whatsapp usage	0.918	2.181	0.030	0.674	

Table- 5: In the unadjusted model (Model 1), higher aggression (total Busperry Aggression scores) were found to be significantly associated with higher smartphone addiction score, whereby the total Busperry Aggression score increases by about 61.104 units for each unit increase in smartphone addiction score with overall significance(F=22.638,p<0.001) and with smartphone score explaining about 10% of the variance in total BDS score, respectively.

Smartphone addiction score,& duration of usage of phone were entered in Model 2, increasing the variance in Busperry Aggression score explained by the independent variables (, smartphone addiction score & duration of usage of phone) to 11% ,p<0.001. After additional entry of the independent variables that pertain to smartphone use habits in the final model (Model 3) (Smartphone addiction score,Duration of usage of smart phone,Webusage ,Education purpose, Email ,Facebook ,Whatsapp usage), the total variance explained by the model as a whole increased to 12.3% , $p < 0.001$, respectively.

In the final model in which smartphone addiction score was entered as the main independent variable in model 1, higher Busperry Aggression score score was found to be significantly associated with ,smartphone addiction score with the beta value ($\beta = 0.270$, $p < 0.001$) (Table-5).

Discussion

The present study examined the association while controlling simultaneously for the effects of all the confounding variables such as (Duration of usage of smart phone, Webusage, Education purpose, Email, Facebook, Whatsapp usage) for depression & aggression.

Most of the participants used smartphone for >3 hours/day(62%) & 95.6% of them spent their time daily on whatsapp usage.Among the participants the prevalence of smartphone addiction was 19%, mild depression 34.1% & aggression was 25.9%.

In our study duration of smartphone usage shows a significant positive correlation with smartphone addiction score. ,which is consistent with other studies done among the college students.[11] Result from this study found 45.0% of students spent 4-6 hours a day to use the smartphone. The findings of this study supported by Hatice et al. who found 40.1% of students spend 4 to 6 hours a day on smart phone.[12]

The present study shows a significant positive correlation between depression & smartphone addiction score,duration of smart phone usage & facebook usage among the participants ,which is comparable in the study done by Kim etal.[13] The time spent on smartphone usage is of serious concern as it hampers academic performance in young adults.[14]In another study, depression emerged as a significant independent positive predictor of smartphone addiction.[15]

In the present study shows a significant positive correlation between aggression & smartphone addiction score,duration of smart phone usage & facebook usage among the participants ,which is comparable in the study done by Kang etal.[16]This might of be of serious concern as it may lead to sleep disturbances, & in between the usage of smartphone getting more aggressive if they get disturbed & becomes unresponsive.Thus the cycle moves on where the social interaction decreases.[17]

In our study, smartphone addiction score emerged as independent positive predictor of depression & aggression. Our findings shows similar results from multiple studies which looked at the relationship between smart phone addiction, & depression, aggression & impulsion among college students.[18] Preoccupation with use of smartphone for longer duration for various uses as mentioned above,their will be increase tendencies towards aggression ,which might lead to physical harm to others. Thus increased access to smartphone for various usages like facebook,whats app usage etc.. can lead to difficult to withdraw from it, leading anger,stress & depression. All this might lead to arguments,poor academic performance, isolation & fatigue.[19]

According to a study excessive smart phone users experienced difficulty in expressing emotions and had higher level of interpersonal anxiety than their counterparts. Smartphone abuse and addiction canbecome cause of an accident and ruining the personal or social life. [20]

Conclusion

In conclusion, smartphone addiction symptoms has a potential influence on the mental health factors (Depression & aggression) among young adults. Smart phone addiction emerged as an independent risk factor risk factor for depression & aggression. Thus it is important bring in preventive measures,so that they can move towards positive stress coping and psycho-behavioural management techniques .

Conflicts of Interest---NIL

Source of Funding ----Self

Ethical Clearance---Taken from Institute ethics committee (order No.DMC/KLR/IEC/ 11/2016-17) SDUMC

References

1. Sussman S, Sussman AN .Considering the Definition of Addiction. Int. J. Environ. Res. Public Health 2018;8:4025-4038.
2. Kuss DJ, Griffiths MD. Online social networking and addiction—a review of the psychological literature.Inter J Environ Res Pub Health 2011; 8(9):3528-52.
3. Katz JE, Akhus M. United Kingdom: Cambridge University Press; 2002. Perpetual contact: Mobile communication, private talk, public performance.
4. India set to have 530 million smartphone users in 2018.The Indian Express: 2017 October 16.
5. Anderson CA, Bushman BJ. Human aggression. Annu Rev Psychol 2002; 53: 27–51.
6. Ramı´rez JM, Andreu JM. Aggression and some related psychological constructs (anger, hostility, and impulsivity); some comments from a research project.Neurosci Biobehav Rev 2006; 30:276–91.
7. Diagnostic and Statistical Manual of Mental Disorders, DSM-5. Washington, DC: American Psychiatric Association. 2013.

8. Kwon M, Kim D-J, Cho H, Yang S.The Smartphone Addiction Scale: Development and Validation of a Short Version for Adolescents. PLoS ONE 2013; 8(12): e83558.

9. Beck A,Ward CH,Mendelson M,Mock J,Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry1961; 4:561–71.

10. Buss, A.H., & Perry, M.The Aggression Questionnaire. Journal of Personality and Social Psychology 1992 63:452-459.

11. Hwang KH, Yoo YS, Cho OH. Smartphone overuse and upper extremity pain, anxiety, depression, and interpersonal relationship among college students. The Journal of the Korea Contents Association 2012; 12(10):365–75.

12. Hatice Y, Sut K, Kurt S. Effects of smartphone addiction level on social and educational life in Health Sciences Students. Euras J Fam Med. 2016;5(1):13-933.

13. Kim SM, Huh HJ, Hyun Cho H, Kwon M, Choi JH, June Ahn H etal . The effect of depression, impulsivity, and resilience on smartphone addiction in university students. J Korean Neuropsychiatr Assoc. 2014; 53(4):214-20)

14. Kibona L ,Mgaya G. Smartphones' Effects on Academic Performance of Higher Learning Students. Journal of Multidisciplinary Engineering Science and Technology. 2015;2(4):3159.

15. Kim M, Kim H , Kim K , Ju S , Choi J, Yu M. Smartphone Addiction: (Focused Depression, Aggression and Impulsion) among College Students .Indian Journal of Science and Technology 2015; 8(25):1-6.

16. Kang HY, Park CH. Smartphone addiction scale, factor analysis, cross-validation, preoccupation, life difficulty, usual, excessiveness, relationship. Kor J Psychol Gen 2012; 31(2):563–80.

17. Demirci K, Akgonul M, Akpinar A. Relationship of smartphone use severity with sleep quality, depression and anxiety in university students. Journal of Behavioral Addictions 2015; 4(2):85- 92

18. Boumosleh JM, Jaalouk D. Depression, anxiety, and smartphone addiction in university students- A cross sectional study. PLoS ONE 2017;12(8): e0182239

19. Weinstein, A,Lejoyeux, M. Internet addiction or excessive internet use. The American journal of drug and alcohol abuse 2010; 36(5):277-283.

20. Davey S, Davey A. Assessment of Smartphone Addiction in Indian Adolescents: A Mixed Method Study by Systematic-review and Meta-analysis Approach. Int J Prev Med 2014;5:1500–1511.