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RESEARCH PAPER

Smartphone Addiction as Predictor of Sleep Quality and Happiness among Undergraduate Students

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ABSTRACT

The present study aimed to investigate the relationship between smartphone addiction, sleep quality and happiness among the university students of the Lahore, Pakistan. The excessive use of smartphone is problematic and disturbing the sleep quality of the students (Demirci et al.,2015). The sample was taken from (N=350) university students with the aged from 19 to 24 year consisting of 106 males and 244 females (M_{age}=20.45; SD= 1.38). Convienient sampling strategy was implemented for data collection. Smartphone Addiction Scale (Kwon et al.,2013), Sleep Quality Scale (Yi et al., 2006), and Oxford Happiness Scale (Hills & Argyle, 2002) were used for the data collection. The Pearson product-moment correlation and regression analysis revealed a significant positive relationship between smartphone addiction and poor sleep quality and is significant predictor of sleep quality as well as non-significant relationship between smartphone addiction and happiness.

Keywords: Happiness, Sleep Quality, Smartphone Addiction, University Students

Introduction

It is the era of modern technology and smartphone. smartphones have become one of the most embedded elements of life(Nuhel,2021). Mobile phone has become the essential part of our lives and besides communication, we have available a vast variety of apps that can make our daily life a lot easier (Radu, 2021). Smartphone brought drastic positive change in the society and human life styles and daily life tasks such as change in business, advertising, publishing, operating revenue and expenses (Sarwar, 2013). Besides the other different daily tasks, the smart phone has impact the student's life positively, students use smartphones for entertainment, social and educational use that increased the learning and knowledge (Singh et al.,2018). Prevent and treat chronic diseases such as diabetes (Arsand et al., 2015; Bain et al., 2015) or alcoholism (Gustafson et al., 2014).

As well as the smartphone changed the life positively it has negative impacts on the human life and student's performance. Increased use of smartphone has negatively impacted the mental and physical health, mental distress, self-injurious behavior and suicidality (Viola, 2021; Jaoude et al., 2020). Physical symptoms include neck ache (Lee et al., 2015) or smartphone usage while the driving affects the pedestrians and drivers and can cause serious road accidents (Klauer et al., 2014; Shelton et al., 2009). Smartphone addiction also decrease the academic performance and poor sleep among the students (Rathakrishnan et al., 2021). A cross-sectional study was intended to explore the association between the smartphone addiction, sleep quality and physical activity among the young adults. The data was collected from 113 young adults from the college. The result of study indicated that there is significant positive relationship between smartphone addiction and

sleep quality and moderately negative relationship between smartphone addiction and physical activity (Haripriya et al., 2019).

Smartphone addiction can cause the poor sleep quality (Zhang & Wu, 2020). A cross-sectional study was intended to investigate the effects of smartphone addiction and internet addiction on the sleep quality of Turkish adolescents. The data was collected from the 910 Turkish adolescents with age range 13 to 18 years. The results of the study showed that there is positive association between the Internet addiction, smartphone addiction and poor sleep quality in adolescents (Acikgoz et al., 2022). Another study also sported that that the sleep quality disturbed with excessive use of the smartphone. A cross-sectional study was conducted to explore the correlation between the smart phone addiction and sleep quality among the young adults. The data was collected from 1043 UK adults with the age range of 18 to 30. The results of the study indicated that the large proportion of participants who use excessive smartphone(68.7%) had poor sleep quality and 61.6% participants disclosed poor sleep, compared to 57.1% of those without. Smartphone addiction was associated with poor sleep (Sohn et al., 2021).

A study (Ozcan & Acimis, 2021) indicated that poor sleep quality is higher in smartphone addicted students as compare to as compare to others. The existing literature also support that there is association of smartphone addiction and poor sleep quality. A cross-sectional study was conducted to investigate the prevalence of smartphone addiction and its effects on sleep quality among the medical students. The 150 medical students were recruited for the study. The results of the study indicated that Smartphone addiction was fond positively associated with poor sleep quality (Kumar et al., 2019).

Another A study was carried out in Pakistan to evaluate the positive academic use of smartphones and to ascertain whether there is a link between potential smartphone addiction and sleep disturbance among the medical students in Karachi. A total of 212 students participated in which Males were (n=66), Females were (n=146). The study showed thee result that the significant positive relationship was found between the scores obtained from the Modified Smart phone addiction scale and Sleep Disturbance Scale (Mansoor et al., 2020).

Furthermore, smartphone addiction is negatively associated with happiness (Kaya et al.,2020). A study was conducted to investigate week-to-week associations between Problematic Smartphone Usage and two types of happiness motives (i.e., hedonic motives and eudemonic motives) using a weekly diary design. Data was collected from 270 young adults once a week for ten consecutive weeks. The results of the study indicated that hedonic motives were positively linked with PSU while eudemonic motives were negatively associated with it in the same week (Shi et al., 2023).

Therefore, the study was planned to investigate the relationship between smartphone addiction, sleep and happiness quality among the students by keeping the previous literature in mind and supporting facts of the existing studies.

Methodology

A data of 350 students was collected aged from 19 to 24 years, consisting of (*N*=106) males and (*N*=244) females (Age *M*=20.45; *SD*= 1.38). The data was collected from the universities of Lahore city by using convenient sampling technique. The participants were included in the study who have at least on social media account and are residents of the Lahore city.

Instruments

Smartphone Addiction Scale-Short Version (Kwon et al.,2013): The Smartphone Addiction Scale –Short Version is a 10 items dix point Likert type Scale (1= I absolutely disagree; 6= I absolutely agree). The scale assesses the smart phone addiction among the young adults. The scale has strong internal consistency (α=0.911).

Sleep Quality Scale (Yi et al., 2006): The sleep Quality Scale is comprising of 28 items 4- points Likert type scale (1=Rarely; 2= sometimes; 3= often; 4= almost). The scale comprising of six factors, daytime dysfunction, difficulty of falling asleep, difficult of getting-up, difficulty of maintaining sleep, sleep satisfaction and restoration after sleep. The scale has good internal consistency (α= 0.81)

Oxford Happiness Scale (Hills & Argyle, 2002): Oxford Happiness Scale is a self-report measure that assess the psychological well-being. The scale comprising of 29 items with 6-point Likert scale (1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly agree, 5 = moderately agree, 6 = strongly agree). The overall reliability of the scale was (α= 0.78).

Procedure

With the approval of the official institutional approvals and the authorization of the authors of the instruments used in this study, the study participants were selected through the sampling strategy discussed earlier in detail and the administration of the instruments carried out. The instructions were given to the participants. The participants were guaranteed the privacy of the information they submitted. The study was voluntary, and participants were free to discontinue participation at any time while it was still going on. The test administration took a total of 25 to 30 minutes for each participant. Pearson Product Moment Correlation, Regression analyses, reliability analysis were carried out using Statistical Package for Social Sciences (SPSS, v-25) to analyze the data.

Results and Discussion

Table 1
Inter-correlation, Means and Standard Deviation of the Smartphone Addiction, Sleep Quality and Happiness of the students (N=350)

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1.SA	…	.07	.26**	.38**	.27**	.25**	-.24	-.21
2-Happiness		…	.03	.04	.02	-.02	-.04	-.09
3-DD			…	.32**	.06	.24**	-.04	-.10
4-DFS				…	.11*	.01	-.09	-.21**
5-DGU					…	.10	-.81***	-.06
6-DMS						…	-.16**	.01
7-SS							…	.08
8-RAS								…
M	32.47	111.11	21.60	8.23	6.38	4.03	2.94	4.76
SD	4.56	7.82	4.51	2.05	1.56	1.32	1.70	2.29

P< .001, p< .01, p< .05

Note: SA= Smartphone Addiction; DD= Daytime Dysfunction; DFS=Difficulty of Falling sleep; DGU= Difficulty of Getting-up; DMS= Difficulty in Maintaining Sleep; RAS= Restoration after Sleep; SS= Sleep with Satisfaction

The Data given in the table showed that the Smartphone Addiction is positively correlated with the subscales of Sleep Quality that are Daytime Dysfunction (r=.26), Difficulty in falling sleep (r= .38), Difficulty in getting up (r=.26), difficulty in maintaining sleep (r=.25) as well as the two Subscales of the Sleep quality are negatively correlated with the smartphone addiction that are Restoration after Sleep (r=-.21) and

Satisfaction with Sleep (r=-.24). Furthermore, the smartphone addiction has non-significant correlation with happiness.

Table 2
The linear Regression Analysis indicating the Smartphone addiction as predictor of Daytime Dysfunction (N=350)

Predictor	*B*	*SEB*	*β*	*t*	*p<*
R^2 =.07, ΔR^2= .06					
Constant	26.82	1.16		23.2-	.001
Smartphone Addiction	.26	.05	.26	5.00	.001

P<.001

The table 2 results indicated that the smartphone addiction is the significant predictor of daytime dysfunction, depicting that with the increase of smartphone addiction the daytime dysfunction is also likely to increase in participants.

Table 3
The linear Regression Analysis indicating the Smartphone addiction as predictor of Difficulty in falling Sleep(N=350)

Predictor	*B*	*SEB*	*β*	*t*	*p<*
R^2 =.14, ΔR^2= .14					
Constant	25.56	0.94		27.32	.001
Smartphone Addiction	.84	.11	.38	7.61	.001

P<.001

The table 3 depicted the results that the smartphone addiction is the significant predictor of difficulty in falling sleep, that indicate that with the increase of smartphone addiction will increase the difficulty falling sleep in participants.

Table 4
The linear Regression Analysis indicating the Smartphone addiction as predictor of Difficulty in getting up (N=350)

Predictor	*B*	*SEB*	*β*	*t*	*p<*
R^2 =.09, ΔR^2= .09					
Constant	5.89	0.74		7.98	.001
Smartphone Addiction	.13	.02	.30	5.77	.001

P<.001

The table 4 showed the results that the smartphone addiction is the significant predictor of difficulty in getting up, that explain that with the increase of smartphone addiction will also increase the difficulty in getting up in participants.

Table 5
The linear Regression Analysis indicating the Smartphone addiction as predictor of Difficulty in Maintaining Sleep(N=350)

Predictor	*B*	SEB	β	t	p<
R^2 =.07, ΔR^2= .07					
Constant	3.32	0.61		5.48	.001
Smartphone Addiction	.10	.02	.26	5.11	.001

P<.001

The table 5 depicted the results that the smartphone addiction is the significant predictor of difficulty in maintaining sleep, that indicate that with the increase of smartphone addiction will increase the difficulty maintaining sleep in participants.

Table 6

The linear Regression Analysis indicating the Smartphone addiction as predictor of Restoration after Sleep(N=350)

Predictor	B	SEB	β	t	p<
R^2 =.11, ΔR^2= .09					
Constant	7.32	1.62		4.51	.001
Smartphone Addiction	-.14	.05	-.33	-2.59	.001

P<.001

The table 6 depicted the results that the smartphone addiction is the significant negative predictor of restoration after sleep, that indicate that with the increase of smartphone addiction will decrease the restoration after sleep in participants.

Discussion

Excessive use of smartphone is increasingly affecting the individuals and is negatively impacting the younger generation (Chaudhury & Tripathy, 2018). These negative consequences may include psychological, behavioral, and performance issues (King & Dong, 2017). While the advantages of this new technology are evident, regular use may also bring negative implications, such as a loss of productivity caused by disruptions in work life (Duke & Montag, 2017). The smartphone addiction may cause severe mental health problems such as disturbed sleep quality (Zhang & Wu, 2020). Therefore, it was planned to conduct a study to explore the association between smartphone addiction, sleep quality and happiness among the university students of Lahore city. The current study yielded various important findings that are discussed below. Since the first objective of the current study was to investigate the relationship between smartphone addiction and sleep quality among the university students, thus it was hypothesized that the smartphone addiction is positively correlated with poor sleep quality.

The results of this study revealed that smartphone addiction is significantly positively associated with poor sleep (Daytime Dysfunction, Difficulty in Falling asleep, Difficulty in getting-up and Difficulty in maintaining sleep) and negatively correlated with (Sleep Satisfaction and Restoration after Sleep). The same pattern was evident that smartphone addiction is found to be predictor of sleep quality (Daytime Dysfunction, Difficulty in Falling asleep, Difficulty in getting-up and Difficulty in maintaining sleep). Sleep Satisfaction and Restoration after Sleep are found to be a negative predictor. These revealed results are also supported by the existing literature. Park et al (2022) indicated that children who are at high risk for smartphone addiction are likely to have poor sleep quality and short sleep duration. A greater level of stress and smartphone addiction is linked to poorer sleep quality (Kim et al., 2019).

The second of objective of the study was also to investigate the association between the smartphone addiction and happiness quality, thus it was hypothesized that the smartphone addiction is negatively associated with happiness quality but the result of the study revealed that there is non-significant relationship among the smartphone addiction and happiness quality, but study (Choi & Kim, 2018;) indicates that there is negative relationship between the smartphone addiction and happiness quality. the result of our study indicated that there is no significant relationship between happiness and smartphone addiction because there may be other major factors that predicts happiness. Mehrdadi et al (2016) indicated that the residence area (Urban, Rural), employment status and physical activities also predict happiness.

Conclusion

Based on the current findings, it can be concluded that smartphone users are more prone to experience poor sleep quality and has non-significant relationship with happiness because there are many other factors to that are the cause of happiness. Excessive use of

smartphone significantly and adversely affects the sleep quality of the university students, as a whole.

Implication of the Study

The current study has significant implications for the concerned stakeholders – policymakers, government, and psychologists and cyber security team to take requisite, effective, and timely measures for better psychological development along with physical development of students with excessive phone use. The government and parent can make any strategy for the limited use of the smartphone. Besides this keeping the finding of the study in mind, mental health professionals can develop suitable interventions to provide effective psychological services to smartphone user. By consulting this study finding awareness can be spread to phone user and they can be guided about its negative consequences on the mental and physical health of the used.

Limitation & Recommendations

Apart from the important findings revealed through this study and its vital implications, the study had different things to improve in the terms of limitations as follows:

- The sample of the study was collected from only the Lahore city of Punjab province. In the future, more cities in the province may be chosen to have more generalizable findings.

- The sample of the male and female was not in equal ratio to understand the gender difference. In future studies, both genders can be sampled with equal ration to have an understanding of the problems faced by both genders.

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