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NOMOPHOBIA, INSOMNIA, ACADEMIC PERCENTAGE, AND MENTAL HEALTH PROBLEMS IN LATE ADOLESCENTS IN PAKISTAN

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Abstract

The current study aimed to investigate the mediating role of insomnia in the relationship between nomophobia, academic percentage and mental health problems in late adolescents. A sample of 200 college students was taken from various public and private colleges of Pakistan. For assessment, Nomophobia Questionnaire (Yildirim & Correia, 2015), Bergen Insomnia Scale by Pallesen, *et al.* (2008) and Mental Health Inventory (Viet & Ware, 1983) were used. Findings showed that nomophobia has a positive significant relationship with insomnia, mental health problems and a negative relationship with academic percentage. Insomnia fully mediated the relationship between nomophobia, academic percentage and mental health problems. Nomophobia significantly predicted behavioral control, emotional ties, and life satisfaction and significantly negatively predicted positive affect and academic percentage which demonstrates partial mediation. Women reported more insomnia and mental health problems as compared to men. The present research would be fruitful for educationist, students and parents in terms of creating awareness about the negative effects of excessive usage of smart phone.

Keywords

Nomophobia, Insomnia, Academic Percentage, Mental Health Problems, Late Adolescents, Pakistan.



1. Introduction

Digital communication and electronic media have made social interaction easy, including chatting with friends, (Wilson *et al.*, 2015), arranging meetings (Denstadli, Julsrud, & Hjorthol, 2011), providing online education (Sun & Chen, 2016) and various daily activities (Abdel-Aziz, Abdel-Salam, & El-Sayad, 2016). People also use smart phone for entertainment and socialization which makes them dependent on smartphone (Parasuraman *et al.*, 2017; Kingdon, 2018). People are developing nomophobia due to the excessive use of smart phone (Cha & Seo, 2018; Nawaz *et al.*, 2017). Nomophobia is a kind of contemporary phobia of being without a digital smartphone (Bhattacharya, Bashar, Srivastava, & Singh, 2019). Nomophobia creates feelings of missing out from using different social networking apps which cause insomnia and mental health problems in late adolescents (King *et al.*, 2014; Lynkova, 2019; Tamura *et al.*, 2017). Fear of not having smartphone for a long time can lead to insomnia which results in low academic grades and other psychological problems in late adolescents (Bhattacharya, Bashar, Srivastava, & Singh, 2019; Lepp, 2014; Choueiry *et al.*, 2016). As per statistics of Pew Research Center, the usage of smartphones is most common in Asia, Europe and the United States. In May 2020, the statistic of nomophobia is one of the most leading problems in all countries (Qutishat *et al.*, 2020; Gradisar *et al.*, 2013). Continuously spending five hours a day on smartphones is 71% which increases suicidal risks for teenagers (Lynkova, 2019). Various psychological (Demirci, Akgonul, & Akpinar,

2015) and academic issues appeared in the life of students having nomophobia (Farooq *et al.*, 2019; Ozdemir, Cakir, & Hussain, 2018). Nomophobia is significantly related to fear of missing out which in return associated with depression and anxiety (Ali *et al.*, 2019). Mental health is impacted, causing physical and psychological issues, and behavior changes, with negative effects on a person due to nomophobia (Rodriguez, Moreno, & Belmonte, 2020). It is commonly known that in recent years, smartphones and their features are playing a vital role in building and maintaining social connection, expression, etc. If a person having sleep deprivation, his mental health will be affected (Zainab *et al.*, 2019; Kidwai & Ahmed, 2013). Poor sleep quality was closely bounded with the capacity of students to learn. The less sleep you get, it turned out that it aggravates the success into a healthier life (Maheshwari & Shaukat, 2019; Zafar, Kausar, & Pallesen, 2018; Iqbal *et al.*, 2018; Zeek *et al.*, 2015; Alsaggaf *et al.*, 2016; Choueiry *et al.*, 2016; Taylor *et al.*, 2011).

2. Objective

The main objective was to investigate whether insomnia mediates relationship between nomophobia, academic percentage, and mental health problems in late adolescents.

3. Hypotheses

H1. There is likely to have a positive relationship in nomophobia, insomnia and mental health problems in late adolescents. H2. Nomophobia is likely to have a negative relationship with the academic percentage in late adolescents.

H3. Insomnia is likely to mediate relationship in nomophobia, mental health problems, and academic percentage in late adolescents.

H4. Girls are more likely to have a high score on nomophobia, insomnia, mental health problems, and academic percentage compared to boys.

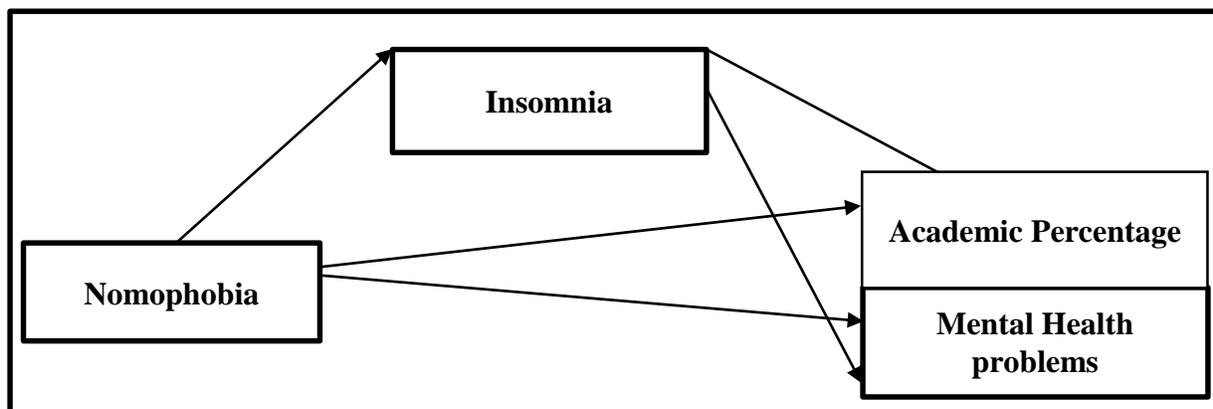


Figure 1. Proposed Model of Research

Figure 1 shows the mediation model of insomnia as being the predictor of academic percentage and mental health problems via nomophobia in late adolescents

4. Method

4.1 Sample

The sample of N = 200 late adolescents was collected through online modes from different

public and private colleges of Pakistan. The age range of sample was 17 to 19 years ($M = 18.28$, $SD = .82$). Students who owned personal smartphones were taken only. Duration of smartphone usage up to six hours a day, and with good mental and physical health reported by the participants were included in this research. The sample characteristics are given in Table 1.

Table 1: Description of Participants' Characteristics (N=200)

Variable	M(SD)	f(%)
Age (in years)	18.28(.82)	
Gender		
Men		82(41)
Women		118(59)
Last Examination Percentage	61.41(10.47)	
Usage of phone per day (in hours)	8.29(4.45)	
Sleeping hours per day	6.84(2.26)	
Day time sleeping hours (weekdays)	4.29(4.76)	
Nighttime sleeping hours (weekdays)	4.98(1.91)	
Day time sleeping hours (weekends)	5.14(2.16)	
Nighttime sleeping hours (weekends)	4.61(2.20)	

5. Assessment Measures

5.1 Nomophobia Questionnaire

This scale was developed by Yildirim and Correia in 2015. It has 20 items which measures four types of nomophobia including communication problems, feeling disconnectedness, unable to access information, and giving up convenience. It is a 7-point rating scale from “strongly disagree to strongly agree.” The sample items are “I would be annoyed if I could not look information up on my smartphone when I wanted to do so” and “Running out of battery in my smartphone would scare me”. A high score on the scale indicates high nomophobia. The reliability of this scale is .90 for the present sample. The scale was translated by researchers in Urdu language following MAPI guidelines.

5.2 Bergen Insomnia Scale

It was developed by Pallesen, et al. (2008). It is comprised of six items; it has an eight-point scale representing the number of days per week when insomnia related symptoms appear. The scale has good test-retest reliability. The sample item is “how many days a week you took more than 30 minutes to sleep after the light was switched off?” The high score on scale shows more insomnia. The reliability of the scale in current study was .93. The Urdu version of the scale translated by Zafar and Kausar (2016) was used in this research.

5.3 *The Mental Health Inventory* The Mental Health Inventory by Viet and Ware,

7. Results

Results of psychometric analysis are presented in table 2.

Table 2: Psychometric Properties of Assessment Measures (N=200)

1983 was used to assess mental health issues including depression, mood problems, behavioral control. It is 38 items scales with 6-point rating scale. The sample items are “For past one month, how happy and satisfied you have been with your personal life” and “In the past month, how many times have you felt crying often?”. The MHI score system produces total score and subscales scores separately. For the current research, reliability was .84. The Urdu version of the scale translated by Zafar and Kausar, (2016) was used in this research.

6. Procedure

Permissions to use and translate assessment measures before data collection were received by the respective authors. Participants were assured of the confidentiality of information on the results. Participants were also assured that they can withdraw at any time during the research. It was mentioned that ten participants will be given incentives after filling the measures. Then researchers administered all assessment measures online. It took around 40 minutes approximately to fill all the assessment measures. After collecting data, the participants were given incentives in the form of mobile top up via lucky draw and were expressed with gratitude to be a part of the study.

Scales	<i>K</i>	α	<i>M</i>	<i>SD</i>	<i>Actual</i>	<i>Potential</i>
Nomophobia Questionnaire	20	.90	74.18	18.87	33-132	20-140
Bergen Insomnia Scale	6	.93	25.02	8.23	10-42	6-42
Mental Health Inventory (overall score)	38	.84	145.36	29.97	91-220	38-226
Anxiety	9	.81	32.18	7.63	12-51	9-54
Depression	5	.69	16.36	4.08	7-27	5-29
Loss of Behavioral/Emotional control	10	.46	34.52	6.51	21-53	10-59
General positive affect	10	.84	33.90	7.61	20-56	10-60
Emotional ties	2	.73	6.76	2.22	3-12	2-12
Life satisfaction	2	.52	7.31	2.03	2-12	2-12

Note. k=number of items; α =reliability; M=mean; SD=standard deviation

Psychometrics shows that all scales have acceptable reliability to proceed further.

Table: 3 Relationship in Nomophobia, Insomnia, Academic Percentage and Mental Health Problems in Late Adolescents (N=200)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. PMY	-																	
2. MPH	-.19**	-																
2. MUA	-.01	-.16*	-															
3. SHD	-.14*	-.08	.12	-														
4. SDT (WDS)	.15*	-.04	.02	.14*	-													
5. SNT (WDS)	.17*	-.35***	.17*	.01	-.03	-												
6. SDT (WND)	.15*	-.10	.06	.16*	.51***	-.01	-											
7. SNT (WND)	.22**	-.35***	.12	.03	.01	.61***	-.02	-										
8. NMP	.21**	-.10	.07	-.04	-.03	.23**	.06	.24**	-									
9. INS	.12	.15*	.06	-.05	-.07	.13	.07	.15*	.67***	-								
11. APA	.13	-.04	-.05	.01	.10	.04	.03	-.001	-.31***	-.25***	-							
12. MHP	.27***	-.24**	.15*	-.01	.09	.24***	.11	.27***	.76***	.72***	-.17*	-						
13. ANX	.20**	-.18**	.09	-.12	.04	.16*	.06	.14*	.44***	.68***	-.01	.64***	-					
14. DEP	.21**	-.21**	.13	-.02	.05	.25***	.05	.25***	.53***	.58***	-.14*	.66***	.65***	-				
15. LBE	.23**	-.15*	.11	.01	.07	.18*	.13	.17*	.53***	.47***	-.06	.64***	.56***	.60***	-			
16. GPA	.23**	-.15*	.17*	-.13	.23**	-.02	.07	.01	-.21**	-.10	-.01	-.04	-.09	-.16*	-.23**	-		
17. TET	.11	-.03	.14*	-.17*	.04	.09	.19**	-.02	.21**	.08	.07	.23**	.06	.00	.10	.43***	-	
18. TLS	.30***	-.19**	.15*	.10	.13	.19**	.15*	.10	.33***	.22**	-.01	.35***	.12	.11	.31***	.32***	.47***	-

Note. PMY= pocket money; MPH= mobile phone usage in hours; MUA= mostly used applications; SHD= sleeping hours per day; SNT (WDS)= sleeping hours during night time on weekends; SDT (WND)= sleeping hours during daytime on weekdays; SDT (WND)= sleeping hours during daytime on weekdays; NMP= Nomophobia; INS= insomnia; APA= academic percentage; MHP= mental health problems; ANX= anxiety; DEP= depression; LBE= loss of behavioral/emotional control; GPA= general positive affect; TET=emotional ties; TLS= life satisfaction * $p < .05$, ** $p < .01$, *** $p < .001$

Results showed that nomophobia has a significant positive relationship with insomnia and all subscales of mental health problems except positive affect and insomnia have significant negative relationship with academic percentage and general positive affect. To test the mediation hypothesis, mediation analysis was applied. First of all, Barron and Kenny's assumptions

of mediation were checked. As all the assumptions were fulfilled, hierarchical regression analysis was used for mediation. In block 1, control variables were added. In block 2, insomnia was added and in block 3 nomophobia was added. The results are shown in table 4.

Table 4: Mediating Role of Insomnia in the relationship between Nomophobia, Academic Percentage and Mental Health Problems in Late Adolescents

Predictors	Academic Percentage				Mental Health Problems									
			Anxiety		Depression		Loss of behavioral/ emotional control		General positive affect		Emotional ties		Life satisfaction	
	β	SE	β	SE	β	SE	B	SE	β	SE	β	SE	β	SE
Block 1														
PMY	.12	.001	.13	.01	.13	.001	.18	.001	.18*	.01	.06	.001	.28***	.001
MPH	-.03	.18	-.12	.13	-.09	.06	-.04	.11	-.15*	.12	.01	.03	-.08	.03
MUA	-.06	.24	.07	.17	.09	.09	.08	.14	.19**	.16	.15*	.05	.11	.04
SHD	.02	.34	-.13	.24	-.03	.12	.001	.20	-.16*	.23	-.21**	.06	.10	.06
SDT (WDS)	.10	.18	.02	.13	.02	.06	-.001	.11	.26**	.12	-.04	.03	.04	.03
SNT (WDS)	.08	.50	.07	.35	.11	.18	.07	.30	-.10	.33	.15*	.10	.15*	.09
SDT (WND)	-.04	.40	.04	.28	.01	.15	.09	.24	-.08	.27	.22**	.08	.05	.07

SNT (WND)	-.08	.44	.01	.31	.10	.16	.06	.26	-.04	.29	-.13	.08	-.10	.07
Block 2														
Insomnia	-.27***	.09	.66***	.04	.55***	.02	.44***	.05	-.12*	.06	.04	.01	.17*	.01
Block 3														
Nomophobia	-.32**	.05	-.04	.02	.21	.01	.35***	.02	-.31***	.03	.27**	.01	.28**	.01
R	.39		.71		.65		.58		.49		.40		.48	
R²	.15		.50		.43		.34		.24		.16		.23	
F	3.50***		19.45***		14.31***		10.02***		6.16***		3.74**		5.86**	
											*		*	
ΔR²	.05		.00		.02		.06		.05		.03		.04	

Note. PMY= pocket money; MPH= mobile phone usage in hours; MUA= mostly used applications; SHD= sleeping hours per day; SDT (WDS)= sleeping hours during the daytime on weekdays; SNT (WDS)= sleeping hours during nighttime on weekends; SDT (WND)= sleeping hours during the daytime on weekdays; SDT (WND)= sleeping hours during daytime on weekdays * $p < .05$, ** $p < .01$, *** $p < .001$

Results of mediation showed that the relationship between academic percentage and mental health problems was mediated by insomnia via nomophobia. Nomophobia was a significant positive predictor of loss of behavioral/emotional control, emotional ties, and life satisfaction, and a significant negative predictor of academic percentage and general positive effect in late adolescents. Moreover, Insomnia was a significant positive predictor of anxiety, depression, loss of behavioral/emotional control and life satisfaction, and a significant negative predictor of academic percentage and general positive effect in late adolescents. Results also showed that insomnia fully mediates the relationship between nomophobia with

academic percentage and subscales of mental health (emotional control and general positive affect, and life satisfaction) and partially mediates the relationship between nomophobia and subscales of mental health problems (emotional ties, anxiety and depression) in late adolescents. Sobel test was applied to check the significance of mediation. Results of the Sobel test suggested that there was a negative association between nomophobia and the academic percentage which was significantly mediated by insomnia ($z' = -2.56, p < 0.05$). Depression ($z' = 2.60, p < 0.05$), behavioral control ($z' = 3.68, p < 0.05$) and life satisfaction ($z' = 1.95, p < 0.05$) was positively significant mediated by insomnia.

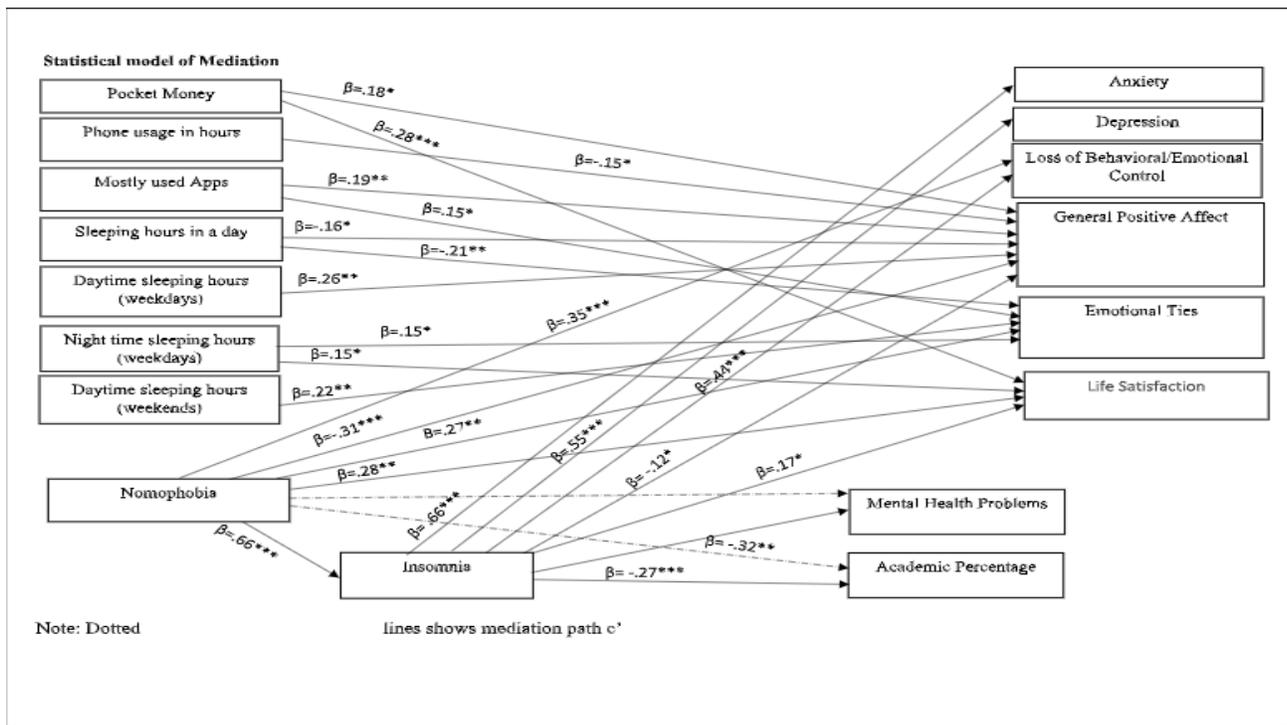


Figure 2: shows the statistical model for nomophobia and insomnia as a predictor of academic percentage and mental health problems.

Table 5: Gender Differences in Nomophobia, Insomnia, Academic percentage and Mental Health Problems in Late Adolescents (N=200)

Variables	Men (n=82)		Women (n=118)		<i>t</i>	<i>p</i>	95% <i>CI</i>		<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>	
Nomophobia	71.71	18.04	75.88	19.31	-1.54	.12	-9.50	1.16	
Insomnia	22.90	7.47	26.50	8.44	-3.10	.001	-5.88	-1.31	.45
Academic Percentage	61.28	10.59	61.50	10.43	-.14	.88	-3.19	2.75	
Mental Health (overall)	138.91	28.76	149.83	30.09	-2.57	.01	-19.30	-2.54	.37
Anxiety	30.47	6.91	33.37	7.89	-2.68	.001	-5.02	-.76	.39
Depression	15.97	3.92	16.63	4.18	-1.12	.26	-1.81	-4.96	
Behavioral/emotional control	33.95	6.03	34.92	6.82	-1.03	.30	-2.81	.87	
General positive affect	34.07	8.01	33.77	7.36	.26	.78	-1.87	2.45	
Emotional ties	6.77	2.28	6.76	2.18	.01	.98	-.62	-.63	
Life Satisfaction	7.39	1.97	7.25	2.06	.46	.64	-.44	.71	

Note: M=mean; SD=standard deviation; LL=lower limit; UL= upper limit; 95% CI= 95 percent confidence interval

The results of table 5 showed that significant gender differences were found only in insomnia, overall mental health problems, and anxiety in late adolescents. Moreover, women reported more problems with insomnia, overall mental health problems, and anxiety as compared to men.

8. Discussion

The present research showed that nomophobia is related to insomnia, poor mental health and poor academic performance. These findings are in line with the previous researches conducted on the subject (Bhattacharya, Bashar, Srivastava, & Singh, 2019; Lepp, 2014). Findings also demonstrated that insomnia has a significant positive impact on nomophobia and mental health problems such as depression and life satisfaction. Findings of our research are in line with the past researches of Veerapu *et al.*, (2019) and Farooq *et al.*, (2019), they concluded the positive relationship of nomophobia, sleep difficulty, and anxiety among students. In today's times, when smartphone addiction is on its peak people rely more on mobile phones to be communicated with all the world at a single time. Thus, the person having nomophobia symptoms has a fear of missing out from the social networking apps which causes sleep deprivation and affects the mental health of millions of people around the world (Kumari *et al.*, 2019; Nour *et al.*, 2016). The research supports the hypothesis that insomnia would mediate with academic percentage and mental health in the light of nomophobia. A person may suffer only from nomophobia because they have a mental health problem. Instead, if a

person does not sleep properly due to the excessive use of smartphones, the person is at risk of developing more mental health problems than those who sleep properly (Tavernier & Willoughby, 2014). Smartphone addiction is increasing worldwide day by day (Kingdon, 2018). Sleeping hours during the day is a symptom with high clinical and public health importance because it is related to increased risk for poor academic performance, impaired quality of life and poor mental health (Fu *et al.*, 2020; Hayley *et al.*, 2015). Insomnia symptoms and mental health problems were related to occurrences of daytime sleepiness in one study (Hasler *et al.*, 2005; Ohayon *et al.*, 2012). However, sleeping hours during the day were related to depression, but not with emotional ties and life satisfaction in another study (Hayley *et al.*, 2013). Our results explained a significant relationship between sleeping hours during the daytime with emotional ties and life satisfaction. This could be because the more sleep the students need for better sleep, the more comfortable they can be in life and then work effectively over the rest of the hours (Iftikhar *et al.*, 2014, Shabir *et al.*, 2014). Studies on insomnia and academic percentage, have shown that the two constructs seem to be negatively related. Findings proved that if adolescents have sleep deprivation than their academic performance will be affected (Alqudah *et al.*, 2019; Haile, Alemu, & Habtewold, 2017; Maheswari & Shaukat, 2019; Vedaa, 2019). Thus, students should be educated that adequate sleep is important to help healthy every-day and learning and memorizing information. Furthermore, results showed that insomnia had a significant positive relationship with

poor mental health which is consistent with previous meta-analysis conducted by Choueiry *et al.*, (2016) and (Staner, 2003). However, mental health problems such as depression associated with academic performance (Hysenbegasi, Hass, & Rowland, 2005; Moreira de Sousa, Moreira, & Telles-Correia, 2018). Our results showed a significant negative relationship between depression and academic percentage. In Asian culture, specifically in Pakistan, there are few opportunities for kids to play football, cricket, soccer, swimming, jogging, etc., but very few for girls to leave their homes because of the cultural constraints (Ahmed & Qazi, 2011). The relationship of nomophobia and mental illnesses was also stronger for girls than boys. The threat to the security system in Pakistan is also a major concern, and because of this, parents are unable to allow their children to spend more time outside their homes. Typically, students spend time at home after school, college, or university, and smartphone use is the only source of entertainment and also a need to do socializing. To conclude, study results showed that nomophobia and insomnia were significantly related to academic performance as well as with mental health problems.

9. Implications

Despite the above-stated limitations, the study has important implications. The present research contributes to the existing body of knowledge about how nomophobia and insomnia have consequences on student's mental health and academic performance. This study is important because it

provides information to create awareness about nomophobia and insomnia, on educational attainment among adolescents. This research will increase the awareness to concentrate on student's sleep deprivation to start their day fresh and learning new things effectively to get academic success. Finally, it will control children's activities which lead to academic failure and poor patterns of life achievement.

Limitations of the Study

The present study has some limitations that are mentioned here.

1. First of all, data on sleep diaries were not included in this analysis due to time constraints. Future work is suggested to collect data through the sleep diary on sleep quantity and efficiency.
2. The research was mainly based on Lahore (online data collection), so the results could not be extended to other cities and regions. It is proposed that data from other cities of Pakistan should in the future be collected to get an overview of smartphone use and, accordingly, to establish some action and take precautionary steps to overcome the trending behavioral addiction.
3. The screening question regarding good mental and physical health was not included.
4. The sample of this research was collected during COVID-19, acts as a confounding variable that affects mental health problems.

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