ORIGINAL ARTICLE

Association of mobile usage with Depression Disorder.

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ABSTRACT… Objective: To evaluate the association of mobile usage with depression disorder. **Study Design:** Case Control study. **Setting:** Private medical university and schools of Karachi. **Period:** Jan 2022 to June 2022. **Methods:** Mobile phone user depression level was assess with the help of Patient Health Questionnaire (PHQ-9) Score. Statistical analysis was done by version 25 SPSS and all data was expressed using mean and standard deviation. **Results:** Out of 258 participants, 172(66.7%) were male and 86(33.33%) female with male to female ratio of 2:1 with mean 32.85±10.85 years. Most of the participants were single 231(89.5%) cases and followed by married 27(10.5%) cases. The participants were student 159(61.6%) cases and followed by house hold 26(10.1%) cases, jobless 7(2.7%) cases and shop keeper 6(2.3%) cases. According to language majority participants were sindhi 159(61.6%) cases and followed by balochi 60(23.3%) cases, pashto 13(5%) cases, panjabi 7 (2.7%) and Urdu 6(2.3%) cases. Majority of the participants 150(58.1%) were used more than 3 hours, followed by 1 to hours 46(17.8%) and 2 to 3 hours 42(16.3%) and 20(7.8%) used were less than one hour (Table-I and II). Majority of the participants suffering the mild depression observed in 168(65.1%) due to mobile used, followed by moderate depression in 20(7.8%). **Conclusion:** Our study concludes that excessive mobile phone usage is associated with increased anxiety, stress, and mild depression symptoms.

Key words   Depression Disorder, Mobile Usage, Smartphones.

INTRODUCTION

In recent years, the use of mobile phones has spread widely across the world.[1] Although smartphones offer benefits like improved social connections and increased productivity, research increasingly shows that many people use them excessively, which disrupts their daily routines.[2-4] Overusing mobile phones has been linked to serious health risks, such as accidents caused by texting while driving, as well as mental health issues like anxiety and depression[5-7] According to Karthikeyan Selvaganapathy, heavy smartphone usage is connected to problems such as anxiety, headaches, insomnia, depression, poor sleep quality, fatigue, reduced concentration, and dependency on mobile phones.[8]

The idea of the mobile phone originated during the Second World War and was later developed by American scientist Dr. Martin Cooper in April 1973 in New York. The invention aimed to enable faster communication across various locations.[9] Previous research has also indicated a high prevalence of mental health issues, particularly depression, anxiety, and stress, among university students worldwide[10,11], who are going through a unique phase filled with significant challenges and risks. In today's world, there is ongoing concern that the growing use of mobile phones may negatively impact certain aspects of health. However, mobile phones, especially smartphones, also provide many valuable benefits in areas such as medicine, education, and other fields.[12,13] An international study by Zahra Babadi-Akashe[14] in 2014 found that cell phone addiction can lead to social and psychological issues. The results revealed notable rates of depression (17.30%), obsessive-compulsive disorder (OCD) (14.20%), and interpersonal sensitivity (13.80%).

The purpose of this study is to investigate the patterns and extent of mobile phone usage and to assess its impact, particularly the long-term effects on specific mental health aspects, by evaluating depression levels among university students in Karachi.

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METHODS

The case control study was carried out at Private medical university and schools of Karachi from January to June 2022, after ethical permission taken for the current study by the Institutional Review Committee of College of Physician and Surgeon Pakistan Karachi (Ref No. App-1516R-014, Dated: November 07, 2015). Data was collected on questionnaire through interview from public health tertiary care hospital and school employee. Taking detailed history regarding socio-demographic and symptoms of depressive disorder. The depression levels among mobile phone users were assessed using the Patient Health Questionnaire (PHQ-9) score. The study included both male and female participants over the age of 18, specifically those between 18 to 30 years, including employees and students who provided consent, were present during the study period, and could read and write in English. The exclusion criteria involved employees and students who were unwilling to participate or were not available at the time of the study.

Frequencies and percentages were calculated for qualitative variables such as gender, marital status, employment status, educational level, and Patient Health Questionnaire (PHQ-9) scores. The mean and standard deviation were determined for the quantitative variable, which is age. Age, considered as an effect modifier, was controlled through stratification. The chi-square test was used to assess the impact of these factors on the PHQ-9 score outcome. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Among the 258 participants, 172 (66.7%) were male and 86 (33.3%) were female, resulting in a male-to-female ratio of 2:1. The participants' ages varied widely, ranging from 18 to 60 years, with a mean age of 32.85 ± 10.85 years. In our study, most of the participants were primary graduate 159(61.6%) cases, followed graduate in 53(20.5%) cases, Matriculate in 19(7.4%) cases and undergraduate 7(2.7%) cases. In our study, most of the participants were single 231(89.5%) cases and followed by married 27(10.5%) cases. In our study, most of the participants were student 159(61.6%) cases and followed by house hold 26(10.1%) cases,

job less 7(2.7%) cases and shop keeper 6(2.3%) cases. In our study, most of the participants were sindhi 159(61.6%) cases and followed by balochi 60(23.3%) cases, pashto 13(5%) cases, panjabi 7 (2.7%) and Urdu 6(2.3%) cases. Majority of the participants 150(58.1%) were used more than 3 hours, followed by 1 to hours 46(17.8%) and 2 to 3 hours 42(16.3%) and 20(7.8%) used were less than one hour (Table-I and II).

Majority of the participants suffering the mild depression observed in 168(65.1%) due to mobile used, followed by moderate depression in 20(7.8%) (Table-I and II).

TABLE-I		
Demographic variables (n=258)		
Variables	**Frequency**	**Percentage**
Age		
18-25 years	82	31.8%
26-30 years	52	20.2%
31-35 years	21	8.1%
36-40 years	31	12%
41-45 years	40	15.5%
46-50 years	21	8.1%
>50 years	11	4.3%
Gender		
Male	86	33.33%
Female	172	66.7%
Educational Status		
Primary	82	31.8%
Matriculate	52	20.2%
Under Graduate	21	8.1%
Graduate	31	12%
Others	40	15.5%
Marital Status		
Married	27	10.5%
Unmarried	231	89.5%
Occupation Status		
Student	152	61.6%
House hold	26	10.1%
Shop keeper	6	2.3%
Job less	7	2.7%
Other	60	23.25%
Duration of mobile phone used per day		
≤ 1 hr	159	61.6%
1 to 2 hrs	60	23.3%
2 to 3 hrs	7	2.7%
≥3 hrs	6	2.3%
Health Questionnaire (PHQ-9) Score		
0-4 none	69	26.7%
5-9 Mild Depression	168	65.1%
10-14 Moderate Depression	20	7.8%
15-19 Moderately severe Depression	0	0%
20-27 severe Depression	1	0.4%

TABLE-II

Chi-square relationship of PHQ-9 with socio-demographic details (n=258)

Variables	PHQ-9					P-Value
	0-4 None	5-9 Mild Depression	10-14 Moderate Depression	15-19 Moderately Severe Depression	20-27 Severe Depression	
Gender						
Male	21(8.13%)	60(23.25%)	5(1.9%)	0	0	0.001
Female	48(18.6%)	108(41.86%)	15(5.8%)	0	1(0.38%)	
Age						
18-25 years	20(7.75%)	53(20.54%)	8(3.1%)	0	1(3.8%)	
26-30 years	13(5.03%)	36(13.95%)	3(1.16%)	0	0	
31-35 years	6(2.32%)	13(5.03%)	2(0.77%)	0	0	
36-40 years	6(2.32%)	22(8.52%)	3(1.16%)	0	0	0.012
41-45 years	15(5.8%)	24(9.3%)	1(3.8%)	0	0	
46-50 years	7(2.71%)	12(4.65%)	2(0.77%)	0	0	
>50 years	2(0.77%)	8(3.1%)	1(3.8%)	0	0	

DISCUSSION

Mobile usage has become an integral part of our daily lives, and it has been observed that people with depression disorder tend to use their mobile phones more frequently than others.[14] Mobile phones offer a sense of connection and distraction from negative thoughts, which can be beneficial for those struggling with depression.[15] However, excessive mobile usage can also have negative effects on mental health. It was observed in the current study out of 258 patients, 172(66.7%) were male and 86(33.33%) female with male to female ratio of 2:1. Shima Hashemi[16] reported that out of 1100 cases, 153 (72.2%) were females and 59 (27.8%) males with female to male ratio 2.5:1."

In the present study, participants ranged in age from 18 to 60 years, with a mean age of 32.85 ± 10.85 years. Among the 134 cases, the majority were distributed in the third and fourth decades of life. Age-related differences were observed in the association between mobile phone usage and depression disorder. Younger individuals, particularly college students, exhibited a stronger link between excessive mobile usage and depressive symptoms. This group appeared more susceptible to emotional disturbances caused by social media exposure, online comparisons, and mobile addiction, which can contribute to social isolation, poor academic performance, and sleep disturbances—all factors that increase the risk of depression. In the study conducted by Andrea K. Graham[17] reported mean ages of participants were 42.3±13.8 years.

In contrast, employees, mostly from the older age group, showed a different pattern. The association in this group was more related to work-related mobile stress, such as after-hours communication, digital overload, and difficulty maintaining work-life balance. Although social media had a less significant emotional impact on employees compared to college students, prolonged exposure to mobile devices for work and continuous connectivity contributed to mental fatigue, stress, and depressive tendencies. These findings highlight that both college students and employees are affected by mobile usage, but the underlying causes and psychological impacts vary according to age.[18,19]

The majority of participants, 150 (58.1%), reported using mobile phones for more than three hours per day. This was followed by 46 participants (17.8%) who used mobile phones for one to two hours, and 42 participants (16.3%) who used them for two to three hours daily. Only 20 participants (7.8%) reported using mobile phones for less than one hour per day. In the study conducted by Lukasz[20] Tomczyk and reported in August 2023, screen time was measured using data directly retrieved from participants' smartphones. On average, adolescents used their devices for about 3 hours and 49 minutes per day. Of this time, approximately

37 minutes were spent browsing the internet, while around 2 hours and 22 minutes were dedicated to social media platforms. More than half of the adolescents surveyed reported daily phone usage exceeding 2 hours and 20 minutes. Additionally, the top 25% of users (above the 75th percentile) spent over 5.5 hours per day on their smartphones, with at least 2 hours and 15 minutes devoted to social networking. The highest recorded usage in the study was nearly 13 hours per day on a smartphone, including more than 14 hours specifically on social media platforms.[21]

The findings indicate that prolonged mobile phone use is a common behavior, particularly among the younger age group and college students. The study further showed a significant association between mobile usage duration and depression severity, as assessed by the PHQ-9 scores. Mild depression was the most frequently observed condition, affecting 168 participants (65.1%), followed by moderate depression in 20 participants (7.8%). A very small number of cases, only one participant (0.4%), showed severe depression. The data suggest that excessive mobile phone usage is strongly linked to higher levels of mild depression, especially among younger participants aged 18 to 30 years. Additionally, the results highlighted a statistically significant relationship between gender and depression levels, with female participants experiencing higher rates of depression compared to males. Overall, the study emphasizes that both mobile usage patterns and demographic factors such as age and gender play an important role in influencing the risk of depression.

In the study of Baoan Feng[22] reported in 2024 presents the distribution of smartphone usage per day and its association with different levels of depression. The majority of participants, 1374 (49.7%), reported using their smartphones for more than six hours per day, followed by 1148 participants (41.5%) who used their phones between three to six hours daily. A smaller proportion, 226 participants (8.2%), used their phones for one to three hours per day, while only 16 participants (0.6%) reported using their phones for less than one hour daily. Regarding depression levels, most of the participants, 1859 (67.3%), were classified

as normal with no significant depressive symptoms. However, mild depression was observed in 450 participants (16.3%), moderate depression in 330 participants (11.9%), and severe depression in 125 participants (4.5%). These findings suggest that prolonged smartphone usage, particularly usage exceeding three hours per day, is common among participants and may contribute to varying levels of depression, with a notable portion of the sample experiencing mild to severe depressive symptoms. The data indicates a potential link between excessive smartphone use and increased risk of developing depressive symptoms.[23]

CONCLUSION
In conclusion, overuse of mobile phones is linked to higher levels of anxiety, stress, and mild symptoms of depression. Continuous alerts and frequent social media updates can create a sense of overload and pressure to stay connected. Moreover, exposure to blue light from screens can interfere with sleep cycles, further worsening depressive symptoms.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

SOURCE OF FUNDING

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AUTHORSHIP AND CONTRIBUTION DECLARATION	
1	**Syed Alamdar Raza:** Conception, Statistical analysis.
2	**Shabnam Khan:** Critical revision.
3	**Rozina Khan:** Data collection.
4	**Ubedullah Shaikh:** Revision.
5	**Nida Lathiya:** Drafting.