Research Paper

Exploring The Relationship Between Mobile Phone Dependence, Depression and Loneliness Among Rural College Students

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ABSTRACT

Background: In the digital era, multipurpose phones have become inevitably to lifestyle, mostly among youths. Whereas these gadgets offer various benefits, their comprehensive use and dependence can adversely affect student's mental well-being. This present study examines the relationship between mobile phone dependence, depression and loneliness among rural college students. **Aim:** The present study aims to discover the relationships between mobile phone dependence, depression, and loneliness among rural college students. **Methods:** 183 rural college students (aged 17 to 21) from the rural colleges of Kolhapur district were selected for the study as a sample. The Test of Mobile Phone Dependence (TMD), Mental Depression Scale (MDS), and Loneliness Inventory (LI) were used as a tool to measure mobile phone dependence, depression, and loneliness, respectively. Statistical analysis consists of descriptive statistics, correlation analysis, and regression analysis. **Results:** The findings from the present research explain a significant positive correlation between measure variables. Where depression ($r = 0.762$, $p < 0.01$) and loneliness ($r = 0.682$, $p < 0.01$) both are positively correlated with mobile phone dependence. Also, depression ($R^2 = 0.580$, $F = 250.393$, $p < 0.01$) and loneliness ($R^2 = 0.465$, $F = 157.552$, $p < 0.01$) both are significantly predicted on the basis of mobile phone dependence. Findings from the research suggest that higher dependence on mobile phone use is correlated with increased depression and loneliness among rural college students. **Conclusions:** The study asserts that mobile phone dependence, depression and loneliness are positively correlated with each other and mobile phone dependence significantly predicts both depression and loneliness. So, keeping in this view, educational institutions should implement awareness programs and provide psycho-social management resources to help students effectively use mobile phones. **Implications:** implications are also an important part of the present study, in terms of developing strategic initiatives to address students for mobile phone dependence and its psychological effects. To create supportive environments that promote mental well-being among rural college students, mental health professionals, policymakers and educators must collaborate. Conducting workshops, counselling programs, digital detox initiatives, and mindfulness training to foster healthier mobile phone use habits are the ways to work together.

Keywords: *Mobile Phone Dependence, Depression, Loneliness, Rural College Students*

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Within the modern advanced age, mobile phones have become a basic part of everyday life, especially among young adults. The availability and network these gadgets advertise disentangle quick communication, data get, and plenty of amusement alternatives. As a result, the extensive dependence on mobile phones has raised concerns about mental wellbeing. Extensive use and dependence on mobile phones interfere with daily life and cause various psychological problems, particularly among vulnerable populations such as college students (Roberts et al., 2014). Rural college students indicate frequently understudied statistics. These students confront diverse challenges that set them apart from their urban partners, which incorporate obstacles to their mental well-being assets, social segregation, and particular socio-economic impediments (Ecklund, 2013). As they explore the basic formative organize from puberty to adulthood, the extra academic stress and adjusting to college life can cause to decrease in their mental wellbeing (Beiter et al., 2015).

Depression and loneliness among college students
Loneliness and depression are two predominant psychological issues among college students. Depression includes persistent sadness, lack of or loss of interest in previously enjoyed activities, and different emotional and physical problems, severe impairment in day-to-day functioning and academic performance (American Psychiatric Association, 2013). Studies have found the prevalence of depression among college students, to have a negative impact on students' psychological well-being and overall academic performance (Ibrahim et al., 2013). Loneliness is the subjective feeling of social isolation and poses a risk to mental well-being. It is described as inconsistency between the person's expectations and relationships with the society. Various psychological issues like higher anxiety, depressed mood and dissatisfaction in life can be seen due to long-term loneliness (Hawkley & Cacioppo, 2010). Due to geographical isolation and limitations with social opportunities, rural college students may experience higher levels of loneliness (Russell et al., 2012).

Mobile phone dependence and mental health
The relationship between the use of mobile phones and related psychological problems has been a major part of the research for a long time. There are multiple negative outcomes of extensive use of mobile phones, high levels of anxiety, increase in stress and depression (Thomée et al., 2011). Also, dependency on mobile phones may contribute having feelings of loneliness (Primack et al., 2017).

Aim
1. to explore the relationships between mobile phone dependence, depression and loneliness, among rural college students.

Objectives
1. To examine the correlation between mobile phone dependence and depression among rural college students.
2. To examine the correlation between mobile phone dependence and loneliness among rural college students.
3. To determine the extent to which mobile phone dependence predicts depression among rural college students.
4. To determine the extent to which mobile phone dependence predicts loneliness among rural college students.

Hypotheses
1. There will be a significant and positive correlation between mobile phone dependence and depression among rural college students.
2. There will be a significant and positive association between mobile phone dependence and loneliness among rural college students.
3. Mobile phone dependence will be a significant predictor of depression among rural college students.
4. Mobile phone dependence will be a significant predictor of loneliness among rural college students.

METHODOLOGY

Participants

A total of 183 participants were selected for the study from different rural colleges in the Kolhapur district. The participants, aged 17 to 21 years, represented a range of socio-economic statuses from lower-middle to high and came from diverse racial backgrounds. All subjects were free from any psychological problems.

Measures
1. **The Test of Mobile Phone Dependence (TMD):** The test developed by Chóliz M. (2012) consists of 22 items with four alternatives respectively 0 for Never, 1 for Rarely, 2 for sometimes 3 for Often and 4 for Frequently for the first ten items and 0 for Completely disagree, 1 for Disagree somewhat 2 for Neutral 3 for Agree somewhat and 4 for Completely agree for remaining 12 items. Distributed in the following factors Abstinence, Lack of Control/Problems and Tolerance/Interference. The reliability and validity of the instrument is high.
2. **Mental Depression Scale (MDS):** The present scale consisting of 50 items with 'Yes' and 'No' options, was constructed to measure the depression level of college students aged 12 to 45 years, developed by L. N. Dubey (1993). The reliability of the mental depression scale is found quite high. Reliability has been calculated by test-retest and split-half methods. The obtained coefficients of correlation score are 0.64 and 0.69 respectively. The validity was found 0.41 and 0.39 on the rating scale by teachers and parents respectively. In scoring one score allotted to the 'Yes' option and zero for the 'No' option obtained total score in the scale shows the total level of depression. For the interpretation of row score Mean SD and Standard score values have been provided as the norms for males and females. According to row score classification of level of depression is provided viz., very high to very low depression level independently for male and female. A high score on the scale shows a higher level of depression and a lower score shows a lower level of depression. Finally, the scale has been used for research.
3. **Loneliness Inventory (LI):** The present inventory is developed by Uma and Meenakshi. R., the inventory consists of 19 items with five alternatives namely never, rarely, sometimes, many times and always. The inventory is useful for the assessment of college student's loneliness. The reliability of the inventory with the split-half method is 0.72 and the construct validity of the inventory is 0.85. Both indicate high in terms of psychometric properties.

Statistical Analysis: To provide a detailed overview of the normality of the measure variables Descriptive Statistics has been used. Mean, median, SD and other parameters have been calculated for assessing normality. Correlation Analysis has been used to examine the

relationships between mobile phone dependence and the mental health variables of depression and loneliness. The Regression Analysis has been also computed to identify the predictive power of mobile phone dependence on depression and loneliness.

Theoretical Framework

This research is based on the Uses and Gratifications Theory (UGT) (Katz et al., 1973), and the Cognitive-Behavioral Model of Pathological Internet (PIU) (Davis, 2001). UGT suggests that satisfaction of specific needs and desires is the reason for the use of media for the person (Katz et al., 1973). In terms of the use of mobile phones, individuals depend on mobile phone use to satisfy their needs. Such as entertainment, communication and social connection. However, extensive use of gratifications may lead to negative psychological outcomes, such as increased dependence and adverse mental health effects (Stafford et al., 2004). Moreover, PIU, suggests that maladaptive cognitions and behaviours related to internet use can lead to negative psychological outcomes (Davis, 2001). In terms of mobile phone use, this model suggests, that individuals with higher levels of mobile phone dependence may lead to depression and loneliness as a result of disruption of healthy social interactions and daily activities.

RESULTS AND ANALYSIS

Table 1 Shows the Descriptive Analysis of Major Variables

	Mobile Phone Dependence	Depression	Loneliness
Mean	52.5792	10.5956	48.4208
Median	49.0000	10.0000	49.0000
SD	2.30980E1	5.20676	6.59862
Skewness	.319	1.110	.343
Kurtosis	-.699	1.801	-.201
N	183		

For the analysis of the measure variables (Mobile Phone Dependence, Depression, and Loneliness) descriptive statistics have been used. The Mean for Mobile Phone Dependence is 52.5792 with a Median of 49.0000. The Kurtosis value is -0.699 indicates a slight platykurtic distribution (lighter tails), but it is within the normal range. The Skewness value is 0.319 indicates a slight positive skew (right-skewed), but it is relatively close to zero, suggesting a near-normal distribution. In summary, Skewness (0.319) and kurtosis (-0.699) are within the range considered approximately normal. The mean and median are also close, supporting near-normality. For the variable Depression mean value is 10.5956 with a Median of 10.0000. A skewness is 1.110. and Kurtosis is 1.801 for depression. For Loneliness, the Mean is 48.4208 with a Median of 49.0000. Skewness is 0.343. it is relatively close to zero, suggesting a near-normal distribution. Kurtosis value is -0.201. The value of -0.201 indicates the normal range.

Table 2 shows the Pearson Product Moment Correlation Coefficient between mobile phone dependence and depression.

Variables	Depression
Abstinence	.707**
Lack of control and problems derived from use	.485**
Tolerance and interference with other activities	.640**
Overall Mobile Phone Dependence	.762**

**. Correlation is significant at the 0.01 level (2-tailed).

Table no. 2 shows a correlation between mobile phone dependence and its subfactors with depression among college students. There is a strong positive correlation between Abstinence and Depression (0.707**, p < 0.01). Which is statistically significant. It means presumably, difficulty in abstaining from mobile phone use is positively correlated with depression. Lack of Control and Problems Derived from Use were found moderately correlated with Depression (0.485**, p < 0.01) which is also statistically significant. It means students who show a lack of control over mobile phone use have close to depression. The third subfactor of mobile phone dependence, Tolerance and Interference with Other Activities is also found strongly correlated with Depression (0.640**, p < 0.01) which is statistically significant. It indicates, needing to use the phone more to get the same effect and interference with other activities are correlated with depression. In the end, the Overall Mobile Phone Dependence and Depression strongly and positively correlated (0.762**, p < 0.01) with each other and were highly statistically significant. This strong positive correlation between overall mobile phone dependence and its factors with depression shows that students who depend more on mobile phone use have depression. All aspects of mobile phone dependence (abstinence, lack of control and problems derived from use, and tolerance and interference with other activities) are positively correlated with depression. The strongest correlations were seen between overall mobile phone dependence (0.762) and abstinence (0.707) with depression. These correlations suggest that higher levels of mobile phone dependence are associated with higher levels of depression and this relationship is statistically significant.

These findings are also supported by previous studies. Some research has consistently shown a significant relationship between mobile phone dependence and depression. According to Demirci et al., higher levels of smartphone use cause increased depressive symptoms among university students (Demirci et al. (2015). Likewise, Elhai et al. (2017) found that problematic smartphone use was linked to greater anxiety and depression, and also mediated by ruminative thoughts and fear of missing out (FoMO). Çağan, Ö., Ünsal, A., & Çelik, N. (2014) found A positive correlation is found between cellular phone addiction and depression levels. Higher addiction levels are associated with increased depression (p<0.05). Thomée, S. (2018) found Frequent Mobile Phone Use is Linked to mental health outcomes such as depressive symptoms and sleep problems.

Hence, hypothesis no. 1 There is a significant positive correlation between mobile phone dependence and depression among rural college students is accepted here and supported by the previous studies.

Table 3 Showing Pearson Product Moment Correlation Coefficient between mobile phone dependence and Loneliness

Variables	Loneliness
Abstinence	.647**
Lack of control and problems derived from use	.428**
Tolerance and interference with other activities	.545**
Overall Mobile Phone Dependence	.682**

**. Correlation is significant at the 0.01 level (2-tailed).

Table no. 3 shows a correlation between mobile phone dependence and its subfactors with loneliness. The correlation between Abstinence and Loneliness is 0.647** which is a strong positive correlation and statistically significant (p < 0.01). Lack of Control and Problems

Derived from Use and Loneliness is also positively correlated with each other. The correlation value is 0.428**. Which shows a moderate positive correlation between the variables and statistically significant (p < 0.01). there is a positive correlation (0.545**.) between Tolerance and Interference with Other Activities and Loneliness. This moderate correlation is also statistically significant (p < 0.01). The correlation between Overall Mobile Phone Dependence and Loneliness is 0.682**. This strong positive correlation is also highly statistically significant (p < 0.01). Finally, all aspects of mobile phone dependence (abstinence, lack of control and problems derived from use, and tolerance and interference with other activities) are positively correlated with loneliness. Among the all subfactors, the overall mobile phone dependence (0.682) and abstinence (0.647) showed the strongest correlation with loneliness. It suggests that higher levels of mobile phone dependence are associated with higher levels of loneliness.

Present results are supported by the previous studies. Some links between mobile phone dependence and loneliness are recognized in previous studies. Bian and Leung (2015) found that excessive smartphone use was associated with higher levels of loneliness and also with social anxiety. Li, X., Feng, X., Xiao, W., & Zhou, H. (2021) found positive Correlations Loneliness, boredom proneness, and mobile phone addiction were significantly and positively correlated with each other. Dikeç, G., Yalnız, T., Bektaş, B., Turhan, A., & Çevik, S. (2016) found higher loneliness is associated with higher smartphone addiction. Hence hypothesis no. 2. There is a significant positive correlation between mobile phone dependence and loneliness among rural college students is also accepted here and supported by previous studies.

Table 4 shows the stepwise multiple regression analysis results where depression is the dependent variable and mobile phone is the predictor variable.

Predictor	R Square	Df	F	Standardized Coefficients Beta	Sig.
Mobile phone dependence	0.580	182	250.393	0.762	0.000

Table no. 4 presents the results of a stepwise multiple regression analysis where depression is the dependent variable and mobile phone dependence is the predictor variable. The value of R Square (R^2) is 0.580 which means that the level of mobile phone dependence can explain 58.0% of the variance in depression. In other words, mobile phone dependence accounts for 58% of the variability in depression scores which is statistically significant (F-value: 250.393) and it indicates that mobile phone dependence is a significant predictor of depression. The Standardized coefficient beta for mobile phone dependence is 0.762, indicating a strong positive relationship, between mobile phone dependence and depression which is also consistent with the previous results of a correlation coefficient. In short, this analysis shows a strong and statistically significant relationship between mobile phone dependence and depression. Mobile phone dependence explains 58% of the variance in depression, and the relationship is positive, signifying that higher mobile phone dependence is associated with higher levels of depression. This prediction is highly significant, with an F-value (250.393) and p-value (0.000). therefore, the hypothesis no. 3 Mobile phone dependence is a significant predictor of depression among rural college students and is accepted here.

Table 5 shows the stepwise multiple regression analysis results where Loneliness is the dependent variable and mobile phone dependence is the predictor variable

Predictor	R Square	Df	F	Standardized Coefficients Beta	Sig.
Mobile phone dependence	0.465	182	157.552	0.682	0.000

Table no. 5 shows the stepwise multiple regression analysis where mobile phone dependence is the predictor variable and loneliness is the dependent variable. The R² value (0.465), indicates that 46.5% of the variance in loneliness can be explained by mobile phone dependence. The F-value (157.552), shows that the observed R² value is statistically significant and that mobile phone dependence significantly predicts loneliness. The standardized beta coefficient value is 0.682, suggesting a strong positive relationship between mobile phone dependence and loneliness which has been consistent with previous correlation results, meaning higher dependence on mobile phones is associated with higher loneliness. The significance level is 0.000, confirming that the results and the relationship are highly significant and reliable. Inclusively, the present analysis demonstrates a strong, statistically significant relationship between mobile phone dependence and loneliness among rural college students, with mobile phone dependence accounting for 46.5% of the variance in loneliness. Hence, hypothesis no. 4 Mobile phone dependence is a significant predictor of loneliness among rural college students is accepted here.

CONCLUSION

1. There is a significant positive correlation between mobile phone dependence and depression among rural college students.
2. There is a significant positive correlation between mobile phone dependence and loneliness among rural college students.
3. Mobile phone dependence is a significant predictor of depression among rural college students.
4. Mobile phone dependence is a significant predictor of loneliness among rural college students.

Implications of the Study

There are many implications of the study. Results from the study are helpful for policy making Understanding the relationship of mobile phone dependence with depression and loneliness can enlighten the strategic development to moderate its negative effects on students' mental health. Results are also helpful for Educators. By implementing awareness programmes, colleges and universities can create awareness among students about the potential negative effects of mobile phone dependence. Educational institutions can provide resources and programs to help students manage their mobile phone use effectively. Such as for dealing with mobile phone addiction organizing Workshops and Seminars, Digital Detoxing Programs, Support Groups and Counseling programs, Launching Educational Campaigns, App Recommendations for digital wellbeing, organizing Mindfulness and Stress Reduction Programs and Parental Involvement programs.

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