

Review Article

Mobile Phone Use Among Adolescents and Young Adults: A Review of Usage Patterns, Self-Esteem, Academic Performance, and Intervention Strategies

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A B S T R A C T

Every technological advancement offers both benefits and potential drawbacks. Mobile phones are a prominent example of a technology that has become an integral part of everyday life. Although mobile phones have been used for many years, increasing concern has recently emerged regarding their effects on society, particularly among adolescents and young adults. Excessive or problematic smartphone use may be described as a psychological state in which persistent and uncontrolled use of mobile devices affects an individual's mental and emotional well-being and interferes with academic, occupational, and social functioning.

Several studies have investigated the effects of smartphone use among adolescents and young adults, with particular attention to the psychological and physiological changes associated with excessive usage. Researchers have employed a variety of behavioural, psychological, and physiological variables, along with different assessment methods and intervention strategies, to understand the consequences of smartphone use and identify effective approaches for reducing problematic behaviours. Therefore, this review aims to examine the major effects associated with excessive smartphone use among adolescents and young adults and to summarize the effectiveness of various interventions designed to minimize these effects and promote healthier patterns of mobile phone use.

Keywords: Smartphone, Mobile Phone, Self Esteem, Addiction, Adolescents, Interventions

Introduction

Mobile phones have many positive impacts such as used for communication, facilitate information and build social connections. Its multifunctionality also helps us to do multitasking hence saves our time. But these impacts have

resulted many negative impacts on the development and growth of adolescence. Students have low self-esteem; their physical fitness and mental health is becoming detriment. Due to these decreasing fitness activities or sports practice, they are developing many other diseases such as cardiovascular diseases, obesity and osteoporosis.

Furthermore, they are also moving more towards the sedentary lifestyle and hence causing further harm to themselves. Some researchers also have tried to focus their studies to show that whether smartphone usage have any gender role to play. Since, it has been noticed that girls are at higher risks of through smartphone usage than boys.

Other than that, it has also been observed that light emitted from smartphones have negatively impacted upon the attention and verbal memory of young adults. Due to higher user of smartphones during night time many adults suffer from problems like insomnia. As a consequence of which they suffer from low cognitive functioning, reduced sleep quality and academic scores. In order to reduce such effects a few studies have also been done on the adaptation of Cognitive-Behavioral Therapy (CBT). Till date there are only a few studies done for the smartphone usage which has used CBT intervention. Most of the times, the usage of internet and smartphones go hand in hand for the studies related to CBT. Also, through the result of such studies it has been observed that CBT intervention has been beneficial not only in limiting the internet usage but is also helpful in reducing anxiety, depression and anger. The other intervention that this review study talks about is the Mind subtraction meditation. This is an effective tool which helps in reducing the smartphone addiction

in young adults. From the previous studies it has also been noticed that use of meditation program in schools has shown significant enhancement in youth depression (Raes, F et al., 2014)¹, in elementary students' reduction in aggregation and anger, and in middle school students' self-control has been observed (Choi, E.H et al., 2020)².

Overall, from this review article we can conclude about the detrimental causes of smartphone usage, their effects on the physical and mental wellbeing of teenagers. Also, how different interventions can be used as a method to reduce such effects.

For the research problems, the review article was divided into three parts:

- Problems based on usage of mobile phones
- Cause and effects of mobile phone usage on adolescents and young adults
- Interventions used to reduce the effects induced through mobile phone usage

Research Problems

- Problems based on usage of mobile phones
- Cause and effects of mobile phone usage on adolescents and young adults Problems related to Self-esteem
- Mobile phone usage and its association with cognitive functioning and Academic performance

Table 1.Methods Used.³⁻⁶

Study 1.	Study 2.	Study 3.	Study 4.
Design: 1.cross-sectional survey was done 2. Mobile Related Experience Questionnaire (CERM)was designed	Design: A multistage stratified sampling method was used	Design: correlational study was done	Design: An Adolescence Health Questionnaire was prepared to measure the duration of MPU
Participants: 501 students from the secondary schools were selected from the region of Castilla-La Mancha (Spain).	Participants: 1. 385 undergraduate students from eight different faculties at University Putra Malaysia participated. 2. Out of these 73% were female while 37% were male 3. According to the ethnicity 73.8% of the participants were Bumiputera and 26.2% were non-Bumiputera	Participants: the selected students were from Rishikesh, Uttarakhand, India	Participants: 11,831 adolescents from three countries of Shandong Province, China participated into the baseline survey
Physical fitness test: Tests included the Abdominals in 1 minute, 2kg overhead medicine-ball throw, Standing Long Jump Test (Broad jump), 50 m sprint, Trunk flexion test and 10*5 m shuttle run test (Agility test).	Clinical Assessments done: 1. Pittsburgh Sleep Quality Index (PSQI) 2. Bedtime Mobile Phone Use Scale (BMPUS)	Clinical Assessments done: 1. A behavioral Likert scale was used to estimate the behavioral changes	Evaluation tool: 1. Pittsburgh Sleep Quality Index 2. checklist of Achenbach's Child Behavior was used

Statistical analysis: 1. IBM SPSS Statistics 23.0 2. Kolmogorov–Smirnov test was used to check the normality of the data 3. 2 way ANOVA (2*3) was done between the three mobile user groups (LMP, MMP and HMP)	Statistical analysis: 1. skewness and kurtosis was measured for the univariate outliers 2. Bivariate analysis was done using Pearson’s correlation	Statistical analysis: 1. For descriptive analysis-frequency, percentage, mean, mean percentage, and standard deviation was assessed. 2. For inferential statistics- r-test, linear regression analysis, independent sample-test, and one-way ANOVA test was done	Statistical analysis: 1. Logistic regression model
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Table 2. Interventions used to reduce the effects induced through mobile phone usage Methods Used.^{1,2,7,8}

Study 1.	Study 2.	Study 3.	Study 4.
Design: cross-sectional survey was done	Design: 12 weekly sessions of IACBT-ESU were conducted	Design: A randomized controlled trial (RCT) design with a pragmatic psychosocial intervention was conducted	Design: self-report questionnaire was prepared for smartphone users only
Participants: two elementary schools were selected	Participants: Participants from urban regions of Rawalpindi and Islamabad of northern Pakistan were selected.	Participants: selected through snow-ball sampling techniques.	Participants: High school students of urban area from South Korea.
	Clinical Assessments done: 1. Smartphone Addiction Scale (SAS) 2. Depression Anxiety Stress Scales (DASS) 3. Strengths and Difficulties Questionnaire 4. Satisfaction With Life Scale (SWLC).	Clinical Assessments done: 1. The Smartphone Distraction Scale 2. The Mindful Attention Awareness Scale (MAAS) 3. The Emotional Self-Awareness Scale (ESAS) 4. The Perceived Stress Scale (PSS) 5. The seven-item Generalized Anxiety Disorder Scale (GAD-7) 6. The Self-Report Behavioural Automaticity Index (SRBAI) 7. The Generalized Self-Efficacy Scale (GSE) 8. The Online Vigilance Scale (OVS) 9. The Deficient Self-Regulation Measure The Bergen Social Media Addiction Scale (BSMAS) 10. The Fear of Missing Out Scale (FoMOS) 11. The Nomophobia Questionnaire (NMP-Q)	Evaluation tool: 1. Smartphone Addiction Self-Report Scale 2. Self-Control Scale 3. Stress Coping Strategies 4. Stress Scale
		Interventions used: 3 smartphone lifestyle apps: (i) Antisocial (screen time) (ii) Headspace (mindfulness) (iii) Pacifica (mood tracking)	Interventions used: School-Based Meditation
Statistical analysis: 1. SPSS 21 was used for data analysis. 2. Kolmogorov Smirnov test, t test, analysis of variance, and chi-square test were done for smartphone addiction and other variables.	Statistical analysis: 1. SPSS 24.0 was used for data analysis. 2. For parametric data- t test was performed 3. For non-parametric data- Fisher’s exact test was performed 4. ANCOVA was performed to discover level of smartphone usage with baseline scores.	Statistical analysis: 1. G*Power v.3 software was used for sample size estimation. 2. SPSS v.25 was used for data analysis. 3. for continuous variables t test was done 4. for the categorical variables chi-square tests were done 5. Analysis of covariance (ANCOVA) was done to assess the effects of intervention.	Statistical analysis: 1. SPSS 25.0 was used for data analysis 2. for quantitative variables t-test was done 3. Wilcoxon signed rank test was done to assess school-based meditation program

Solutions Found

Problems based on usage of mobile phones

According to a study by (Dinesh B, 2021) on smart phone usage and addictions, 'today's young regard mobile phones as a "symbolic and affective investment," with only a handful choosing mobile phones above television and the internet⁹. The study also revealed that the appearance of mobile phones and related gadgets has now become a status symbol. Sixty percent of adolescents said they have changed or upgraded the functionality on their phones. With the availability of mobile wallpaper, ring tones, phone covers, carry bags, and other allied gadgets, mobile phones are viewed as a fashion statement that fits the desire for individuality.

Another paper (Babu D, Sandhya RJ, 2018) discusses the usage patterns and dependency of mobile phones, as well as how this technology and its use have evolved over the last few decades. Ringtones, browser types, wireless cameras, messaging, video streaming, music, video playing, downloading clips and music, study materials and reviews, on-air music, and so on are all examples. However, additional possibilities will be provided in the future, to the point where mobile phones will be able to be used as credit cards.¹⁰

Cause and effects of mobile phone usage on adolescents and young adults

The first piece in this review examines the complicated and extensive topic of consciousness and self-esteem in the context of a girl student's smartphone addiction. The results suggest that the majority of the students' monthly household income was in the range of 2000 to 4999 dollars, which is considered middle-lower middle-class. Mobile phone addiction, according to the research, has a significant negative influence on self-esteem while having a significant positive impact on social anxiety and interpersonal sensitivity. Even so, there was a significant negative connection between interpersonal acuity and self-esteem. There was a significant positive association between social anxiety and interpersonal sensitivity. Due to social anxiety and interpersonal sensitivity, the first study indicated that self-esteem had only a minor impact on cell phone addiction. Despite their shortcomings, the studies suggest that they have a positive influence on the intervention and prevention of mobile phone addiction.

The final section describes how Davis's (2001) cognitive-behavioral model demonstrated that maladaptive self-cognition is a major component of problematic internet use. Reduced self-esteem is unquestionably a significant component of maladaptive cognition. People with low self-esteem may believe that they are only valued when they interact with others online, and as a result, they turn

to their phones for approval and attention. Furthermore, the third article demonstrated statistically that there is no clear link between self-esteem and PSU. High interpersonal trust was associated with better psychosocial adjustment in adolescents.

Mobile phone usage and its association with cognitive functioning and Academic performance

The use of mobile phones is linked to sleep quality and academic performance, according to a study conducted with college students. It explains how the increased use of electronics before night has had a substantial impact on kids' cognitive functioning. The study (Singh Y, M., Malar Kodi, S., and Deol, R., 2021) produced some impressive results in terms of participant usage and reliance on mobile phones¹¹. Result revealed that Receiving and using mobile phones: (1) 58.10 percent of 14–16-year-olds received a mobile phone. (2) On school days, 70.50 percent of participants use their phones for 1-2 hours, and on weekends, they use their phones for 1-4 hours. (3) About 1-50 times per day, 91.60 percent of participants used their phones. (4) Communication, photos, entertainment, social media, education, sports, and reading are some of the most common reasons why people use their phones. (b) Mobile phone reliance: (1) 54.70 percent of participants have a low level of dependency, whereas 30.5 percent have a moderate level of dependency. (2) 1.1 percent of those polled have a significant reliance on mobile phones.

Conclusions

Problems based on usage of mobile phones

Adolescents and young adults were found to have a significant prevalence of mobile phone reliance, according to the findings of the study. The most prevalent uses of mobile phones among young adults include making and receiving calls, texting and multimedia messaging, conversing, and listening to music. A mobile phone, when used properly, can be a lifesaver. As a result, increased cell phone usage requires adolescent motivation. Increased awareness of this dependent behavior, as well as effective education, information, and remedies, are all urgently needed right now.¹²

Cause and effects of mobile phone usage on adolescents and young adults

Problems related to Self-esteem

According to studies, there is no link between self-esteem and mobile phone addiction, as demonstrated by Park and Lee (2014) and Kim and Koh (2018). It's worth noting that social anxiety had no discernible impact on the relationship between self-esteem and cell phone addiction. The second paper found a strong negative association between self-esteem and self-consciousness and smartphone addiction,

as well as a positive relationship between self-esteem and self-consciousness and self-esteem in students, based on the regression equation with standard coefficients.¹³

The third study states that, according to the cognitive-behavioral model, maladaptive self-concept is the major element leading to problematic internet usage, and the fourth paper claims that student addiction is high and that they may soon become locked in a vicious cycle.

Mobile phone usage and its association with cognitive functioning and Academic performance

Despite the fact that mobile phones are used in a variety of ways and make our lives easier, these studies focus on the negative effects of using them on adolescents and undergraduate students. Because this is a time when children are changing both emotionally and physically, the impact of technology on their health is the worst. Students' academic performance has been found to be declining as they spend more time on their phones. This has had a negative impact on their cognitive performance, and as a result, kids are becoming increasingly nervous and depressed.¹⁴

Interventions used to reduce the effects induced through mobile phone usage

Based on the findings of all of the studies included in this review, it can be stated that smartphone usage has risen dramatically in recent years, and that this has become a leading cause of stress, depression, mental disorders, and poor academic performance. It has also been linked to a reduction in focus, self-control, and anxiety levels. However, we can generalize from these research that interventions such as school-based meditation programmes and phone-based applications are partly successful in minimizing the negative impacts of mobile phone usage. As a result, a variety of initiatives could be beneficial to students and their well-being in order to reduce their reliance on mobile phones.¹⁵

Scope for Future Work

Problems based on usage of mobile phones

Most teenagers can't picture life without their cellphones, even if they mostly use them for entertainment rather than for work or school. As a result, teenagers have become focused on mobile phone services like music streaming and talking on Whatsapp, Facebook, and other social media platforms. Adolescents must make an effort to utilize their phones for more positive objectives, such as homework completion and job research.

Higher education institutions are expected to implement programmes to encourage young adults to use their phones to fulfil their work, given that today's mobile phones include functions for downloading documents such as journal

articles and accessing the internet. Adolescents may be assigned group projects that require them to complete using mobile phone features such as video conferencing. Future research should look into how mobile phone use affects young people's academic performance as well as their financial situation.

On the other hand, the researcher has gained an awareness of the limitations of the many research papers analyzed, such as:

- Adolescents were hesitant to react to the questions for fear of being judged.
- Instead of collecting data based on the participants' subjective feelings, mobile phone applications could be used to create a more objective method of data collection.
- Examining students' mental health conditions, which may have a substantial impact on how they use their phones.

There is also a need for young adults to consider how this addiction might be converted into a tool for self-improvement.

Cause and effects of mobile phone usage on adolescents and young adults

Problems related to Self-esteem

Because of the small screen, the person constantly concentrates on the small portion, which leads to the said problem, the future of the study may lead to Computer vision syndrome, which is also known as increased issues of eye vision problem, but no such study has been done by any of the researchers. The sound and ringtones, as well as music in headphones, produce tinnitus in the individual, and a study can be conducted to investigate this issue.¹⁶

Texting frequently, sitting in a specific position, which causes damage to the thumb, elbow, and neck, among other things, is known as a mobile phone chronic disease cause. More investigation into this problem area is needed.

Finally, we must investigate no-mo phobia, which is defined as a fear of missing out on something, the impact of mobile phone radiation on the skin, the study of brain cancer patients and mobile phones, which emit radio waves that burn the tissues in the body system, eventually leading to cancer, glioma, and acoustic neuroma, insomnia, a sleep disorder, and cell phones.¹⁷

Mobile phone usage and its association with cognitive functioning and Academic performance

Despite the fact that the study (Bravo-Sanchez, A., Moran-Garca, J., Abian, P., and Abian-Vicen, J., 2021) addressed all major characteristics related to mobile phone usage. However, by incorporating variables such as socioeconomic

position and physical activities undertaken by students in their daily lives, the study's perspectives can be broadened.

The research conducted in this publication (Ragupathi, D., Ibrahim, N., Kit-Aun, T., and Ng Andrew, B., 2020) revealed some significant findings about the use of mobile phones before bedtime and its impact on cognitive functioning, sleep quality, and academic achievement. However, because the study comprises a sample of college students between the ages of 21 and 24, a longterm data study for the same group is required to further understand the bidirectional effect of mobile phone use at night.

According to this study (Singh Yadav, M., Malar Kodi, S., and Deol, R., 2021), mobile phone dependency has become a serious concern for today's teens and is negatively harming their health. Teenagers' use of cell phones is a key cause of behavioural change. However, because a country like India is diverse in terms of people, ethnicity, and socioeconomic level, this study was limited to one region and a few schools. As a result, studies like these must be conducted on a bigger scale involving individuals from various regions.

This is an important study (Xianchen, L., Yachen, L., Zhen-Zhen, L., Yanyun, Y., Jianghong L., and Cun-Xian, J., 2020) investigating the relationship between mobile phone usage and adolescent academic achievement. This is the only study with such a big sample size, and numerous factors were adjusted to analyse the GPA and MPU, including smoking, gender, high school, and class position. However, because the MPU self-report was completed by the students, there may be discrepancies that need to be investigated further. To assess the pupils' academic achievement, no physical activity was measured. As a result, such activities have a significant influence in the lives of adolescents and, as a result, in their academic achievement.

Interventions used to reduce the effects induced through mobile phone usage

The study (Lee, E. J., & Ogbolu, Y., 2018) provided some valuable insights into the use of smartphones by teens in a technologically advanced country, however there are still some holes that need to be filled. The study only examined parents' limited control over their children's phones; however, this has to be expanded and additional metrics added as well.

Nonetheless, the study (Khalily, M. T., Bhatti, M. M., Ahmad, I., Saleem, T., Hallahan, B., Ali, S. A., Khan, A. A., & Hussain, B., 2021) was able to offer evidence of IACBR-ESU intervention success. There are a few points that should be taken into account in the next investigation of this nature. 1. A diverse group of participants should be chosen in order to capture the impact of the IACBR-ESU intervention on people of different ages. 2. People who

have a concomitant mental health issue should be included in these trials as well.

Although the study (Throuvala, M. A., Griffiths, M. D., Rennoldson, M., & Kuss, D. J., 2020) provided some valuable insights, further effort is needed to correct earlier flaws and make similar studies more relevant and useful. In the future, RCT methodologies must be included in order to increase the accuracy of self-reported data. Second, a poll of people of various ages should be conducted to have a better understanding of the process.

Meditation was employed as an intervention in this study (Choi, E. H., Chun, M. Y., Lee, I., Yoo, Y. G., & Kim, M. J., 2020) to lessen the negative impacts of smartphone usage. However, a few factors, such as the utilization of a bigger sample size and group randomization, can make such studies more relevant in the future. Students from various nations and age groups should also participate.

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