

# Effects of Problematic Mobile Phone Use (PMPU) among college students in Kerala

ANJALI PK

Assistant Professor, Department of Economics, Christ (Deemed to be University), Bangalore

## Abstract

Wide spread use of mobile phones can cause potential risks. One such risk is the Problematic mobile phone usage (PMPU). Study examines the self-reported health issues of mobile phone usage among the students using "Self Rating Questionnaire for Adolescent Problematic Mobile Phone Use" (SQAPMPU). Study reveals that more than one among the four persons in each category of respondents is problematic mobile phone user.

**Keywords:** PMPU, mobile phone, college students

## Introduction

Mobile phones deeply influence academic and social life. People's appearance, actions and the way they work, do business, shop and communicate, etc., have all been astonishingly transformed by these gadgets. It makes every one smart by encouraging them to undertake a variety of tasks and to share the photos and videos of such events with persons whom they have never seen but became friends in the virtual world. Social media like facebook, instagram 'and whatsapp actually open up a virtual world where the boundaries of private life and public life get blurred. Theselfies, videos and audios of their private life when uploaded to the social media through their smart phones become public. It is actually universe is revolving on the tip of her index finger, thanks to the 3G/4G connectivity revolution available to these communication devices. The usage of mobile phones has altered the social facets of the youngsters. Some students show the main symptoms of dependence disorders, such as: extreme use, problems with parents, trouble in controlling the use, interference with other activities, emotional anxiety when they cannot use the mobile phone

Wide spread use of mobile phones can cause potential risks. One such risk is the Problematic mobile phone usage (PMPU). It is defined as the inability of a person to regulate the use of mobile phone by herself. PMPU can lead to severe physical and mental health hazards. Sleep disorders, depression, insomnia, psychological distress are examples of such physical and mental health hazards resulting out of PMPU among adolescents and college students. (Adriana & James, 2005).

Effects of excessive usage of mobile phone are:

### Thermal effects

Radiations from mobile phones throughout communication rise body temperature by 0.1°C. The prolonged cell phone usage increase the exposure to radio frequency radiation contributing to rise in issue or body temperature and related effects on human bod(Maier.M, 2006).

### Non-thermal effects

"Acute exposure to radiofrequencies from mobile phones may induce a rise in body temperature of 1°C which may invite a variety of behavioural and physiological disorders. In

thermally vulnerable areas of the body such as eyes and testes, cataract formation and reduced sperm counts are well-documented acute exposure hazards" (Hyland, 2000).

### **Carcinogenic Effects**

Mobile phone radiation has the capability to damage the structure of human body cells which leads to serious health hazards. It increase the risk of cancer. Thyroid gland and bone becomes sensitive. Radiation also exposes leukaemia, which is a kind of cancer. Other reported disorders include lung, skin, thyroid, brain, breast, stomach, cancer, nervous system disorder and brain tumour" (Hardell, Nasman, Pahlson, Hallquist, & Hansson-Mild, 1999). "Continuous use of cell phone affects adolescents' health and behavioural changes on the immunological system, reproductive effects, changes in hormone levels, headaches, irritability, fatigue and cardiovascular effects" (Srivastava & Tiwari, 2013).

For people who have used cell phones for ten years or longer, and when they are used mainly on one side of the head, the risk of malignant brain tumour will be doubled and the risk is higher for person in the younger age group. Radiation from cell phone has significant risks for cancer in adolescents as well as in adults. According to reports on the Interphone study, reported that approximately 30 minutes of cell phone use a day increases the risk of brain cancer (Abdusalam, Elumelu, & Adenipekun, 2008).

### **Effects on Children**

"Children are at greater risk than adults from exposure to radio frequency energy when using a cell phone. Their bodies and brains are still evolving and are more vulnerable to exposures. Children have the likely to accumulate many more years of cell phone exposure than adults. To understand the child health risks, more research is underway. Thus, it is essential to limit children's cell phones use as they are more exposure to risk" (DPH, 2015).

### **Effect on Hearing**

Increased use of mobile phone can lead to hearing deficiency. "Sensation of warmth on the ear, behind or around the ear and burning sensations in the facial skin can occur in connection with the use of a mobile phone" (Ofstedal, Wilen, Sandstrom, & Mild, 2000). As the ear is closeness to the mobile telephone during its usage there is a possibility for deterioration in the hearing quality. "Prolonged use of mobile phone can also result in unpleasant sensations, such as a burning feeling or a dull ache mainly occurring in the auricular areas" (Hocking, 1998).

### **Effect on Vision**

"Exposure to high-density microwaves has detrimental effects on the eyes and other tissues and induces significant biological changes through thermal actions. It also reported that in Sweden people who had extensively used mobile phone for many years, went blind in one eye, on the side of the head they had used their phone. Symptoms begin with intense pain in one eye, which was eventually diagnosed as cornea ulceration" (Nakamura, Matsuzaki, Hatta, Nobukuni, Kambayashi, & Ogino, 2003).

### **Sleep Disturbance and Depression**

Over use was related with symptoms of stress, sleep disturbances and high vulnerability to stress and symptom of depression for both male and female. Unlimited mobile phone use was a risk aspect for mental health for young adults (Thomé, Härenstam, & Hagberg, 2011)

### **Other Health Effects**

Other health outcomes investigated following Radio Frequency (RF) exposure from hyper use of mobile phone include headaches, general malaise, short-term memory loss, nausea,

changes in electroencephalography and other central nervous system functions, sleep disturbances, Alzheimer's disease, Parkinson's disease, asthma, heart trouble, insomnia, high blood pressure, birth defects and rheumatoid arthritis. (<http://source.southuniversity.edu/health-risks-of-using-mobile-phones>). Individuals have claimed to be hypersensitive to EMF. The most common symptoms are headaches, insomnia, tingling and rashes of the skin, difficulty in concentrating and dizziness (Repacholi, 2001)

### **Review of literature**

(Shuman, Xiaoyan, Yukun, Shichen, Shilu, & Fangbiao, 2017), examine the Problematic Mobile Phone Use (PMPU) and its association with mental health among college students in China. A cross sectional survey was directed to inspect the health and welfare by distributing questionnaire to 4747 students, data was collected regarding PMPU and mental health. Findings showed that PMPU were observed in 28.9 percent students and poor sleeps were observed in 9.8 percent leads to the risk of mental health problems.

(Dickson, 2012), investigated problematic mobile phone use among 50 participants from various undergraduate psychology courses at the Texas State University, San Marcos campus. Physiological and psychological responses were worn for measuring pre and post manipulation. Finding shows an increase in anxiety positively correlated with Mobile Phone Problematic Use Scale scores and changes in physiological indices were non-significant.

(Lopez-Fernandez, 2013), examine the problematic use of mobile phone among adolescents in London. Problematic Internet Entertainment Use Scale and Mobile Phone Problematic Use Scale are tools used for the study. A sample of 1000 school students is taken. Result shows that problematic use was greater among youngest age group.

(Nilesh & Tukaram, 2014), examine attitude regarding health threats of mobile phone users among college students in Maharashtra. Descriptive survey research design was used to examine the link between information and outlook regarding health threats of mobile phone use. Findings shows that majority of students were having average information regarding physical health hazards whereas poor information about psychological health hazards due to excessive mobile phone usage.

(Milena, Katharina, Anna, & Martin, 2015), examine effects of mobile phone use on health and behaviour pattern. Mobile Phone Problem Use Scale were used for collect data from 412 adolescents in Switzerland. Result shows that principal component analysis (PCA) showing issues related to symptoms of addiction are temper, bad life consequences, thirst and peer dependence.

(Suhag, Larik, Mangi, Khan, S.K, & Madiha, 2016), investigate the special effects of extreme use of mobile phone on human health. 150 questionnaires were given to the doctors of Civil Hospital of Karachi city. Result shows that, 97% of respondent stated optimistic effects of mobile phone on health. Study also found different disease due by extreme use of mobile devices is brain tumour, heart disease and ear hearing function.

(Naveenta, Sonia, & Khushdeep, 2016), examine the outline of mobile phone usage and its impact on psychological health among medical university students in Chandigarh. Study found that late night time mobile phone use was significantly connected with trouble in waking up,

tiredness, waste of study time and concentration problem. Misuse of mobile phone has adverse impact on psychological health, sleep, and academic routine of students.

(Noyes, 2017), examined cognitive and social health implications of mobile phone use among children between 8 and 14 years old in UK. Questionnaire was distributed to 256 samples population. Descriptive statistics show that 95% of children has access to a mobile phone and that 66% own mobile phone.

### Objective

To examine the self-reported health issues of mobile phone usage among the students using “Self Rating Questionnaire for Adolescent Problematic Mobile Phone Use” (SQAPMPU)

### Hypothesis

There is no significant difference among respondents who belong to various gender groups, age groups, levels of education and groups with different duration of mobile phone use in problematic mobile phone use.

### Methodology

The study is based on primary data collected from four major affiliating Universities in Kerala like University of Kerala, Mahatma Gandhi University, University of Calicut and Kannur University. A sample of 845 students have been selected at random from these four universities. Collected data are analysed using Standardised rating scale and descriptive statistics. The hypothesis has been verified with the help of Mann – Whitney U test and Kruskal Wallis test statistics.

### Analysis and interpretation

If a person uses smart phone more than three hour a day then it is problematic. Smart phone entice us to spend more time with them. Time spends on mobile phone keeps on growing day by day.

Table 1.1 Time Spent on Mobile Phone per Day in Hours

|         | Cou<br>r<br>s<br>e<br>s | Stre<br>a<br>m<br>s | Sex   | 3 hours<br>(Normal) | 3 -6 hours<br>(Excess) | > 6 hours<br>(Too Excess) | Total      |
|---------|-------------------------|---------------------|-------|---------------------|------------------------|---------------------------|------------|
| Courses | Under<br>Graduation     | Scienc<br>e         | Boys  | 9(4.95)             | 95 (52)                | 78(42.8)                  | 182(45)    |
|         |                         |                     | Girls | 7(13.73)            | 28(55)                 | 16(31.3)                  | 51(21.88)  |
|         |                         |                     | Total | 16(6.87)            | 123(53.13)             | 94(40.34)                 | 233(.31)   |
|         |                         | Arts                | Boys  | 4(13.79)            | 25(86.21)              | 6(2.68)                   | 29(6.50)   |
|         |                         |                     | Girls | 31(7.43)            | 270 (65.09)            | 114(27.4)                 | 417(93.49) |
|         |                         |                     | Total | 35(7.85)            | 326(73.09)             | 120(26.9)                 | 446(65.68) |
|         | A. Total UG             |                     |       | 51(7.51)            | 465(68)                | 214(32)                   | 679(80.35) |
|         | Post<br>Graduation      | Scienc<br>e         | Boys  | 2(4.17)             | 43(95.83)              | 3(6.25)                   | 48(65.75)  |
|         |                         |                     | Girls | 2(8.00)             | 23(92.00)              | 2(8)                      | 25(34.24)  |
|         |                         |                     | Total | 4(5.48)             | 69(94.52)              | 5(6.80)                   | 73(43.97)  |
|         |                         | Arts                | Boys  | 6(50)               | 1(8.3)                 | 5 (41.7)                  | 12(12.90)  |
|         |                         |                     | Girls | 2(2.47)             | 79(95.13)              | 2 (2.4)                   | 81(87.09)  |
|         |                         |                     | Total | 8(8.60)             | 85(91.40)              | 7 (7.5)                   | 93(56.02)  |
|         | B. Total PG             |                     |       | 12(7.23)            | 142(83)                | 12 (.2)                   | 166(19.64) |
|         | Grand Total (A+B)       |                     |       | 63(7.0)             | 554(66)                | 226(27)                   | 845(100)   |

Source: Survey Data

Table shows the average time spend on mobile phone per day. It is clear from the table that 66% of the respondent spends 3 to 6 hour on mobile phone in a day, which indicates addiction to the mobile phone. 95 male students of science stream from undergraduate and 28 female from the same use mobile phone from 3 to 6 hours a day. 25 male student and 270 female students from arts stream of under graduate use mobile phone about 3 to 6 hour a day. The study, found that, girls are too more excess use as compared to boys. Only 7.46% respondents spend less than 3 hour in mobile phone.

PMPU was assessed with the "Self Rating Questionnaire for Adolescent Problematic Mobile Phone Use (SQAPMPU), a standardized instrument suitable for use with college students. It contained 13 items, each item scored from 1 (Not true at all) to 5 (Extremely true) based on a 5 point Likert Scale." Since there exists 13 items with a maximum value of 5 for a response and minimum score 1, the total score of each respondent would lie between 13 and 65. In order to reach a decision that whether a respondent is a problematic mobile phone user, a threshold limit of value has been reached by taking the 75<sup>th</sup> percentile of the total score of the individuals. Besides, the consistency of the items used in the questionnaire to measure whether the respondent is a problematic mobile phone user, has been measured by using scaling statistics, alpha. The descriptive statistics related to the items used for the estimation of PMPU is delineated in the Table 1.2

Table 1.2 Descriptive statistics of the items in the Problematic use of Mobile Phone

| Code  | Items   | Mean | SD  | No  |
|-------|---|------|-----|-----|
| PMU1  | There are times when I would rather use the mobile phone than deal with other more pressing issues.                         | 3.2  | 1.1 | 845 |
| PMU2  | I become irritable if I have to switch off my mobile phone for meetings, dinner engagements, or at the movies.              | 3.8  | 0.8 | 845 |
| PMU3  | When out of range for some time, I become preoccupied with the thought of missing a call.                                   | 4.0  | 1   | 845 |
| PMU4  | I hear the phone ringing when it actually hasn't which is called "ringxiety", I always check my mobile phone involuntarily. | 3.9  | 1   | 845 |
| PMU5  | I feel anxious if I have not checked for messages or switched on my mobile phone for some time.                             | 3.4  | 0.9 | 845 |
| PMU6  | I feel lost without my mobile phone.  | 3.5  | 0.9 | 845 |
| PMU7  | I can never spend enough time on my mobile phone.   | 3.5  | 1.3 | 845 |
| PMU8  | I need to spend more time on my mobile phone to be satisfied.   | 3.0  | 0.7 | 845 |
| PMU9  | I have frequent dreams about the mobile phone.  | 1.9  | 1.1 | 845 |
| PMU10 | I lose sleep due to the time I spend on my mobile phone.  | 2.1  | 0.8 | 845 |
| PMU11 | There are times when I would rather use the mobile phone than deal with other more pressing issues.                         | 2.3  | 0.8 | 845 |
| PMU12 | My leisure activities are reduced due to the time I spend on my mobile phone.   | 3.1  | 0.8 | 845 |

|                                   |   |             |     |     |
|-----------------------------------|---|-------------|-----|-----|
| PMU13                             | My productivity has decreased as a direct result of the time I spend on the mobile phone. | 2.3         | 0.9 | 845 |
| Cronbach's Alpha                  | Cronbach's Alpha Based on Standardized Items  | No of Items |     |     |
| 0.697                             | 0.702   | 13          |     |     |
| 75 <sup>th</sup> percentile value |   | 43          |     |     |

Source: Computed with the help of Primary Data

The table shows that the coefficient of Cronbach Alpha, the consistency measure estimated, is 0.697, which is an acceptable level of consistency among the variables for preceding the analysis with these variables. The value of 75<sup>th</sup> percentile calculated is 43. The respondents who have a total score of 43 and above for the responses of the items of PMPU are considered to be those with problematic mobile phone use. And those who have a total score of their responses below this value is considered to be persons with no problematic mobile phone use. The number of persons with problematic mobile phone use and its disaggregated analysis are depicted in the table no1.2

Table 1.2: Problematic Mobile Phone Use by Gender, Age and Level of Education

| Sl No | Variables                      | Categories | Problematic Mobile Phone Usage |    |          |    |           |
|-------|--------------------------------|------------|--------------------------------|----|----------|----|-----------|
|       |                                |            | Yes                            |    | No       |    | Total     |
|       |                                |            | No                             | %  | No       | %  | No        |
| 1     | Gender                         | Female     | 156(64)                        | 28 | 418(69)  | 72 | 574 (68)  |
|       |                                | Male       | 86(36)                         | 32 | 185(31)  | 68 | 271 (32)  |
|       |                                | Total      | 242(100)                       | 29 | 603(100) | 71 | 845(100)  |
| 2     | Age                            | 18 -20 yrs | 151(62)                        | 22 | 529(88)  | 78 | 680 (80)  |
|       |                                | 21&above   | 91(38)                         | 55 | 74(12)   | 45 | 165 (20)  |
|       |                                | Total      | 242(100)                       | 29 | 603(100) | 71 | 845 (100) |
| 3     | Level of Education             | UG         | 195(80)                        | 29 | 484(80)  | 71 | 679 (80)  |
|       |                                | PG         | 47(20)                         | 28 | 119(20)  | 72 | 166 (20)  |
|       |                                | Total      | 242(100)                       | 29 | 603(100) | 71 | 845(100)  |
| 4     | Duration of Mobile Phone Usage | < 3hrs/day | 106(44)                        | 29 | 260(43)  | 71 | 366(43)   |
|       |                                | 3-6hrs/day | 67(27)                         | 25 | 199(33)  | 75 | 266(31)   |
|       |                                | >6hrs/day  | 69(29)                         | 32 | 145(24)  | 68 | 214 (25)  |
|       |                                | Total      | 242(100)                       | 29 | 603(100) | 71 | 845 (100) |

Source: Survey Data. Figures in the parenthesis are percentage of PMPU in each category, except in the column of Total where the figures in the parenthesis show the percentage of each category to total respondents

The table 1.2 shows that 29 percent (242 persons out of 845) of the respondents has problematic mobile phone use. A disaggregated analysis of the respondents by gender, age, level of education and duration of mobile phone usage has also been undertaken. It would help the enquiry to see who all among the gender groups, age groups, broad categories of education and call duration has higher proportion of problematic mobile phone use. The hypothesis that is put forward in this respect is that there is no significant difference among the respondents who belong to the aforementioned groups or categories.

Gender wise disaggregation of the problematic mobile phone use among the respondents shows that the number of girls is more than the number of boys. Among the 242 problematic mobile phone users, 156 (64 % of total PMPU cases) are girls and 86 (36 % of total PMPU cases) are boys. However, it does not mean that girls are more problematic users of mobile phone than boys. For this, assessment of the proportion of problematic mobile phone users in each group is to be undertaken. The percentage of girls who have problematic mobile phone use as a proportion to the total number of girls in the survey sample is 28, which is less than the proportion (29) of problematic mobile phone users among the total respondents. However, the percentage of boys with problematic mobile phone use as a proportion to the total number boys in the sample is 32, greater than the girls as a proportion to total girls in the survey.

Age wise dissection of the problematic mobile phone use points out that percent of those who belong to the age group of 18 to 20 is 62 and that of those who belong to 21 years and above is 38. However, the percent of respondents in the age group of 18 to 20 years as proportion to the total number of such respondents in the sample survey is just 22, whereas, the percent of the second group, as a proportion to their total number in the sample survey, is 55. A possible explanation of this situation is the presence of larger proportion of students in the age group of 18 to 20 in sample survey compared to that of the students in the group of 21 and above.

Disaggregated analysis of the problematic mobile phone use of respondents by the level of their education shows that 80 percent (195 persons) of problematic mobile phone users are undergraduate students, while the post graduates are just 20 percent (47 persons out of the 242 PMPU cases). However, the percent of undergraduates who have the problem of problematic mobile phone use as a proportion of total number of undergraduates in the survey is 29 and that of post graduates is just 28 percent. Hence the percent of problematic mobile phone users among under graduates and post graduate as a proportion to their total number in the sample survey do not differ too much, just 1 point of difference in their percentage.

Classification of problematic mobile phone users on the basis of duration of mobile phone use shows that 44 percent (106 out of 242 PMPU cases) belong to those groups with less than three hours per day of use. 27 (67 persons out of 242 PMPU cases) and 29 (69 persons out of 242 PMPU cases) percent belong to respondents who use mobile phone between 3 to 6 hours per day and those who use more than 6 hours per day respectively. However, examining the case of PMPU as a proportion of these respondents with the total number of respondents of each category in the survey becomes 29, 25 and 32 respectively. Hence when the analysis of the PMPU cases as a proportion of each category to their total number in the sample survey, it is the group who have duration of use of mobile phone more than 6 hours per day has the highest percent in the level of PMPU,

In short, the foregone analysis reveals that more than one among the four persons in each category of respondents is problematic mobile phone user. Besides, boys, persons who are 21 years or above in age, undergraduates and those who have duration of usage of mobile phone more than 6 hours are susceptible to problematic mobile phone use.

### **Problematic Mobile Phone Use: Testing of Hypothesis**

A hypothesis has been put forward to see whether there is significant difference among various groups of respondents in the problematic use of mobile phone. The hypothesis set is

*H1: There is no significant difference among respondents who belong to various gender groups, age groups, levels of education and groups with different duration of mobile phone use in problematic mobile phone use.*

The hypothesis has been verified with the help of Mann – Whitney U test in the case of two independent and Kruskal Wallis test statistics in the case of more than 2 independent samples and the result is produced in the table

Table No.5.6: Hypothesis Testing: Problematic Mobile Phone Usage

| Variables                | Categories | Mean Rank | Sum of Ranks | Mann – Whitney U | z      | Sig. (Two tailed) | Accept/Reject H1 |
|--------------------------|------------|-----------|--------------|------------------|--------|-------------------|------------------|
| Gender                   | Female     | 419.0     | 240525.      | 7.55E+04         | -0.878 | 0.415             | Accepted H1      |
|                          | Male       | 431.4     | 116909.      |                  |        |                   |                  |
| Age                      | 18 -20 yrs | 418.9     | 319271.      | 2.86E+04         | -1.847 | 0.065             | Accepted H1      |
|                          | 21&above   | 459.8     | 38163.5      |                  |        |                   |                  |
| Level of Educatio        | UG         | 423.3     | 287445.      | 5.61E+04         | -0.104 | 0.918             | Accepted H1      |
|                          | PG         | 421.6     | 69989.5      |                  |        |                   |                  |
| Kruskal – Wallis Test    |            | N         | Mean Rank    | Chi Square       | df     | Sig. 2 tailed     | Decision on H1   |
| Duration of Mobile Phone | <          | 366       | 416.51       | 0.671            | 2      | 0.715             | Accepted H1      |
|                          | 3-         | 266       | 419.98       |                  |        |                   |                  |
|                          | >6hrs/da   | 214       | 428.98       |                  |        |                   |                  |

Source: Computed from Primary Data

It's obvious from the table that the test static value computed has a significance level  $>.05$ . Hence, the hypothesis that there is no significant difference between the gender, age groups, level of education and duration of mobile phone usage in the problematic mobile phone usage is accepted. It can thus be concluded that the various respondents of each group do not differ significantly with respect to the problematic mobile phone use.

### Findings and conclusion

Study reveals that more than one among the four persons in each category of respondents is problematic mobile phone user. Besides, boys, persons who are 21 years or above in age, undergraduates and those who have duration of usage of mobile phone more than 6 hours are susceptible to problematic mobile phone use. The usage of mobile phones for various activities by students in Kerala has also been on the increase. Mobile phones which serve as the computer eats away a greater chunk of time and money of the students. The addiction to selfies and its sharing among peer groups has remarkably increased. Its excessive use has been termed by psychologists and medical experts as problematic mobile phone use (PMPU). "PMPU is defined as the inability to regulate one's use of the mobile phone with negative consequences in daily life". The prevalence of PMPU, can adversely affect mental and physical health of students resulting in anxiety, sleep disorder, hearing and concentration problems, chronic headache, impaired memory, fatigue, skin disease and warmth around the ear. It influences the association between psychological symptoms and addictive behaviour. It indicates that the consequences of increased use of mobile phones are multifarious in nature.

### Suggestions



1. Government should undertake awareness programmes and Universities may be entrusted to it with the help of psychologists/behavioural scientist/social scientists, National Service Scheme (NSS) or counselling experts to infuse information campaign against excess usage of mobile phones both at the University and College levels.
2. Student assistance club under the supervision and guidance of the faculties of all departments and or other such teachers who have hands on training on counselling and guidance to identify the students who suffer from mobile addiction excess mobile phone dependency and to extend required help in overcoming such problems.

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