Smartphone Addiction Inside Out:
A Cognitive Analysis of Smartphone Addiction

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Abstract: **Smartphone is a very integral part of our life and this paper is all about the statistical analysis of the smartphone. Advanced data science techniques is been used to do cognitive analysis. The data is been collected through a google form. We have divided the population between two categories of addicts and non-addicts. To differentiate an addict from the population we have used several categories. After creating addict and non-addict categories we have used several parameters to test effect of those parameters on addicts and non-addicts. We have gained some useful insights on psychological and physiological effects, factors like loss of productivity is also been observed in the addicts.**

This paper helps people to understand the side effects of smartphone and will help them to limit the use up to
a healthy level and lead a better life.

keywords—smartphone, addiction, statistical analysis, side effects, physical effects, psychological effects**.**

I. INTRODUCTION

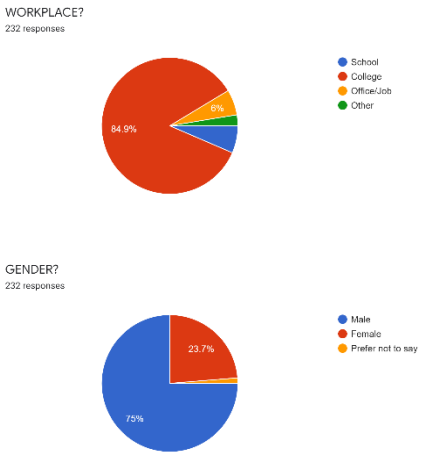
With over 8.97 billion mobile connections, surpassing the total population of 7.71 billion, we need to sit back and think how much we need our smartphones and how much we are using it? First thing we wanted to after opening our eyes in the morning is to check our mobile if there's any notification and, in the night,, we sleep after ending the loop we start every morning, both are influenced by smartphones. People have trapped themselves in one touch entrainment through smartphone. These latest gadgets have strongly impacted our lives in a not so positive way.

This research paper provides an inside out report on how smartphones affect our lives socially, emotionally, professionally, psychologically and academically.

This data and its analysis through this research will help mankind to improve ourselves towards betterment regarding the use of smartphones!

The data is collected through the google form. The data collected given some coding and we have used some scales to calculate some of the attributes.

About the data:



Addiction:

Cell phone addiction is not a new concept, though it is different than substance addiction like drugs and alcohols, the behavioural addiction is completely different from substance addiction. Cell phone addiction can be described as "dependence syndrome". (Term coined by WHO in 1964). Psychological and physical health problem are also been reported too much [4]. It been analysed that if individuals

can decrease their internet addiction, they may decrease their depression level [6].

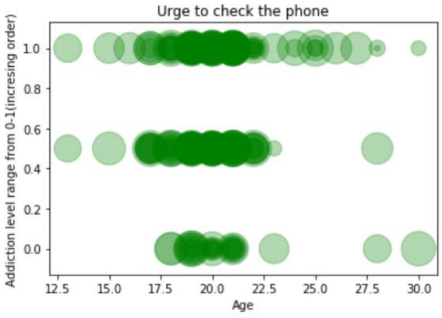
According to a report by New York Times (2017) [15], both adults and teens check their mobile phones 150 times a day, that is every 6 minutes and send an average of 110 texts per day.

Nobody gets addicted by just using mobile phone one time or maybe multiple times. It doesn't matter how many times you use it, it depends how you use it. There are certain parameters which have used while defining addiction.

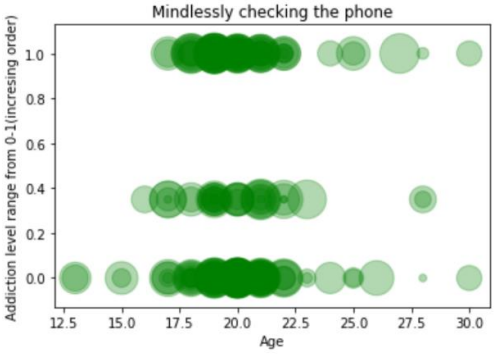
After defining the addiction traits if a person has 5 traits out of 9 then the person is qualified to be addicted. Then every person is categorized in two categories addicts and non-addicts. on the basis on these two parameters we have compared several different parameters.

So, according to that we have asked some questions that are given below which define addictive traits in the people and according to that we will create categories and analyse further.

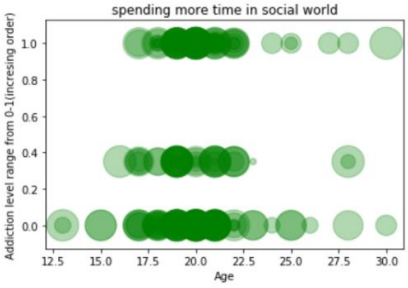
Q1. When your phone rings, beeps, buzzes, do you feel an intense urge to check for texts, tweets, or emails, updates, etc.?



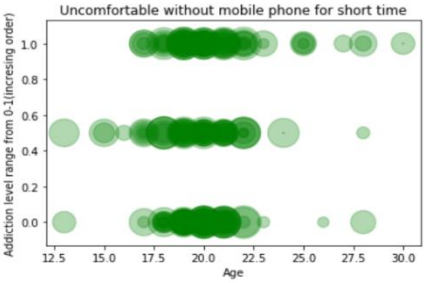
Q2. Do you find yourself mindlessly checking your phone many times a day even when you know there is likely nothing new or important to see?



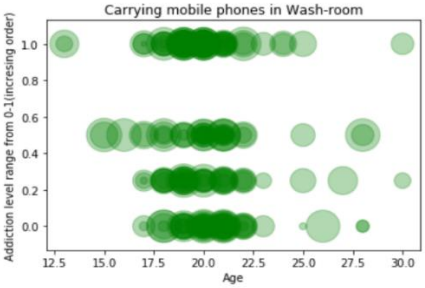
Q3. Do you find yourself spending more time texting, tweeting, or emailing as opposed to talking to real-time people?



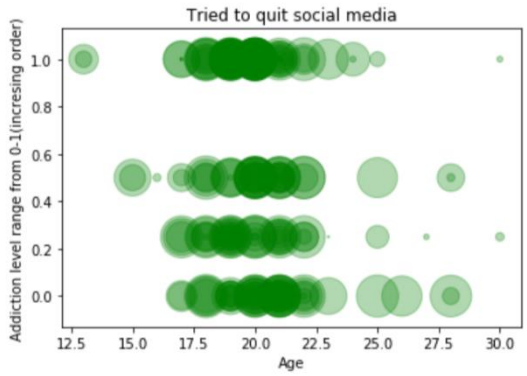
Q4. Do you feel reluctant/uncomfortable to be without your smartphone, even for a short time?



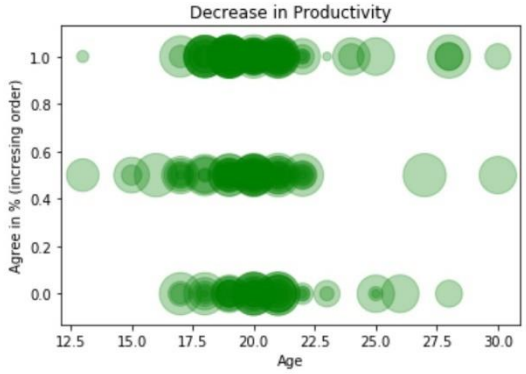
Q5. Do you use your smartphone in the Washroom?



Q6. Have you ever tried to withdraw or tried to decrease the use of smartphone to increase productivity?



Q7. Have you ever felt that smartphone is contributing in decreasing your productivity?



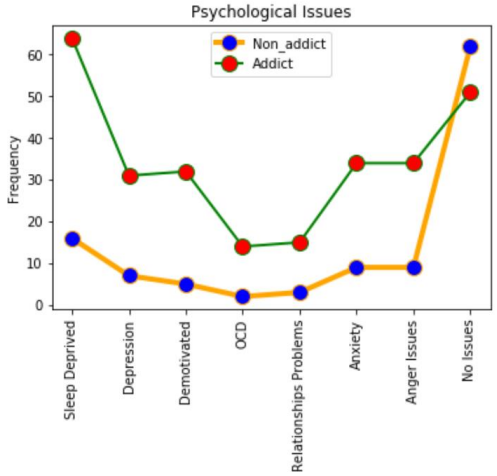
Psychological effects of mobile phone usage:

The over the line usage of smartphone leaves different effects at conscious or maybe sub-conscious level. These effects can affect the life of an individual in different ways. Smartphones is been linked to leisure and satisfaction with life[14].

In the table below we have divided the psychological issues into two parts male and female and percentage of the frequncy of the population is given as the values.

Issues	*Male*	*Female*
Sleep Deprived	**47.16**	**36.66**
Demotivated	**21.69**	**25.00**
OCD	**10.37**	**8.33**
Anger	**19.81**	**30.55**
Relationship	**11.32**	**8.33**
Anxiety	**19.81**	**30.55**
Depression	**18.86**	**27.77**
No issues	**38.67**	**36.11**

We ask people about what kind of psychological effect they think they have, and we found some common traits between the addicts.



In above figure, we have compared the addicts and non-addicts in between two parameters frequency of the population and different kinds psychological issues. We can see that addicts are more prone to these issues. We have seen a major difference in sleep depravedness which we have analysed further in this paper.

Mobile phone addiction and withdrawal from mobile network may increase anger, tension, depression, irritability, and restlessness which may alter the physiological behaviour and reduce work efficacy [3].

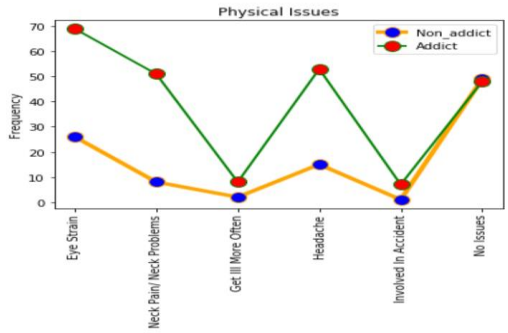
Physiological effects of mobile phone usage:

These days every individual already go through a lot psychologically and to go through something physically is the least one ever wanted.

In the table[] we have divided the physical isuues into two parts male and female and percentage of the frequncy of the population is given as the values.

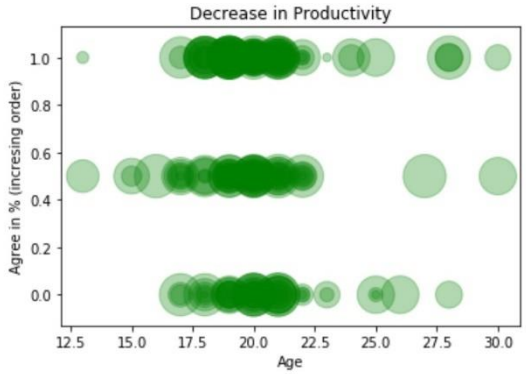
Physical Issue	*Male*	*Female*
Eye strain	47.16	38.88
Neck Pain	29.24	27.77
Headache	28.30	38.88
Ill more often	19.81	8.33
No issues	27.35	30.55
Accident	4.71	5.55

So, we asked some questions if people are having any physical issues with them and compared them between an addict and a non-addict.



In above figure , we have compared the addicts and non-addicts in between two parameters frequency of the population and different kinds physical issues. We can see that addicts are more prone to these issues. We have seen a major difference in reference with eye strain. We have analysed this part further in the paper.

Effect on productivity of an individual.

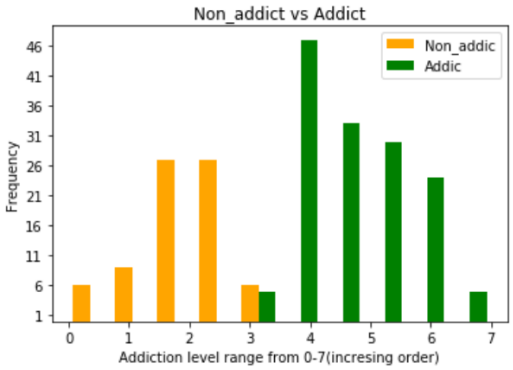


Comparison between addicts and non-addicts

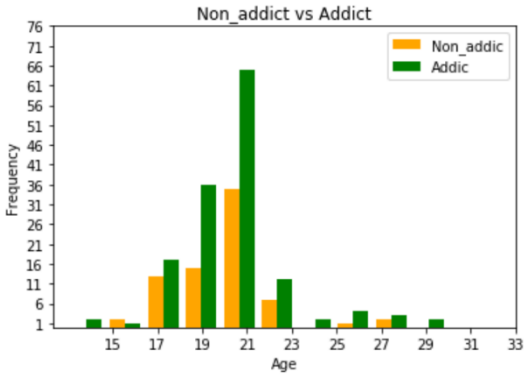
We have already divided the population into two categories based on 7 parameters which are already described above. Using the two categories we have applied some statistical analysis on the data to get some insights.

The comparison between these two categories of addicts and non-addicts can really help us to know where we are doing it wrong, so that we can correct it later.

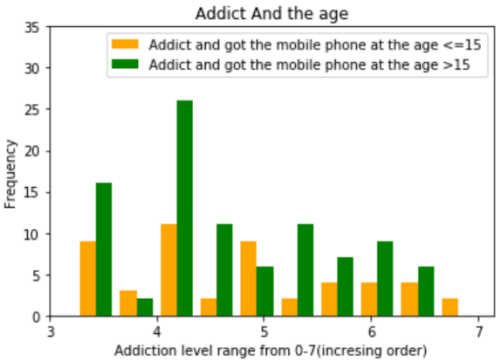
Further in the analysis we have found that the addicts having a very hard time in reference with all the side effects of smartphone usage and its addiction.



Above figure shows addiction level of the population in relation with the frequency or the count of the population. Here we can see that 62.23% people are addicted and people are having addiction traits between 2-4 are prone to be an addict in the future.



Above figure shows the relation between addicts, non-addicts and their age. People having 19- 23 are the most addicted people.



In the above graph, we tried to find is there is any relation between addiction and the age at which they get their first smartphone.

- 17% of people got their first smartphone at age less than 15

- 16.8% of people got their first smartphone at age 15
- 20% of people got their first smartphone at age 16
- 16.4% of people got their first smartphone at age 17
- 16.4% of people got their first smartphone at age 18
- 7.8% of people got their first smartphone at age 19

After analysing the above data we observed:

- Out of 100% people who are addicted 34.4% people got their smart phone at the age <=15 and from that 34.4% % people about 62.5 % of the people are addicted.
- Out of 100% of people who are addicted 65.67% people got their smartphone at the age >15 and from that 75.5% are addicted

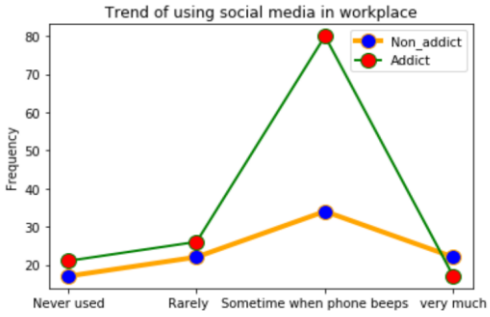
- 37.7 % of the total audience are not addicted

- **Social media:**

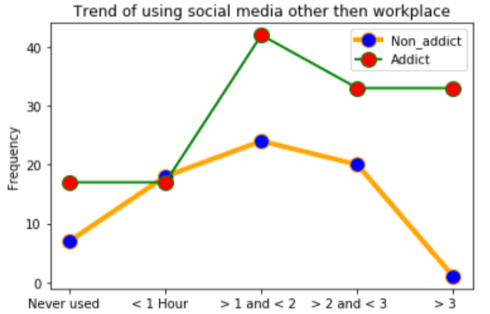
  Social media is one of the biggest factors of smartphone addiction. An addict spends most of his time surfing on social media. The addiction to social networking in the male students was significantly higher than female students [13].

CATEGORY	FREQUENCY%	FAVORITE %	
		M	F
WHATSAPP	96.6	98.2	89.2
INSTAGRAM	81.9	80.3	87.5
FACEBOOK	58.6	57.2	66
TWITTER	23.3	25.4	13.2
SNAPCHAT	21.1	13.2	43.3
TELEGRAM	25.4	23.1	11.3
LINKEDIN	55.2	55	45.2

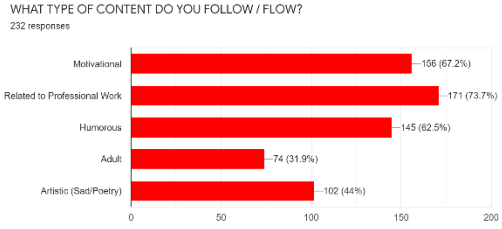
- 17.3 % people spend more than 3 hours daily on social media
- 24.2 % people spend around 2-3 hours daily on social media
- 30.3 % people spend around 1-2 hours daily on social media
- 16.9 % people spend less than 1 hour daily on social media
- 11.3 % people hardly use social media



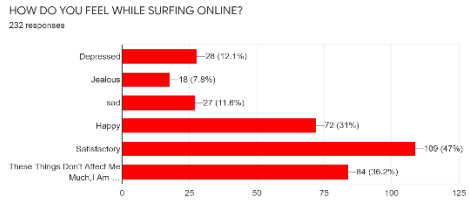
In the above graph, huge difference can be seen between addicts and non-addicts. using the above graph, we can deduce that addicts can't control their urges every time their phone beeps.
The graph shows the condition of an individual at their workplace, if a person keep checking his phone how he can do their work concentratedly. This behaviour will contribute in decreasing the productivity of an individual.



Through above line chart, we can see that there is obvious and huge difference between addicts and non-addicts in relation with their calling hours and frequency of the population.



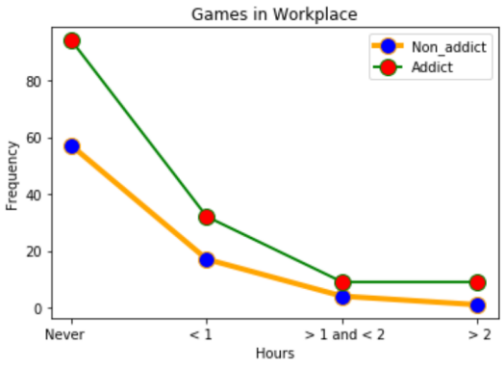
The type of content we follow/flow depicts a lot about the psychological condition of an individual. The above figure shows the trend of what people are following or flowing.



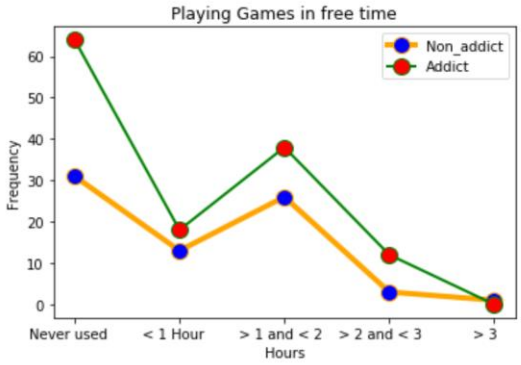
The things we see affect our minds at conscious and sub-conscious level. People get affected by the activity they do on online even if they are simply surfing or scrolling down. The figure [] shows the how do they feel while they are surfing through the social media. Almost half of the population feel satisfactory these traits are mostly seen in the profile of addicts.

Gaming:

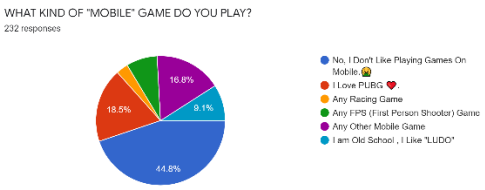
Mobile games are not only getting popular, but they are also getting improved every day. The game developing companies developing games which are engaging the people especially youth for several hours. They come up with several schemes like daily login rewards so that a person will login once a day to claim that. There are other schemes also like new maps, themes, contests, giveaway rewards etc.



People playing games at their workplace not only decrease their productivity, but also it is not ethical until or unless it is allowed. Here we can see that addicts' people are more prone to play to games even at their workplace which is somehow going to decrease their productivity.



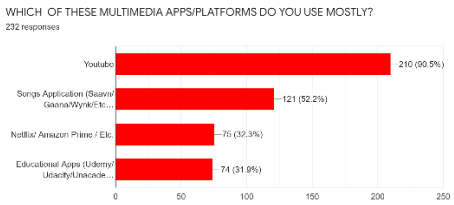
The above graph is comparing between addicts and non-addicts where the parameters are frequency of the population and the time spent while playing mobile games other than their workplace. Here also we can see that addicts are prevailing over non-addicts.



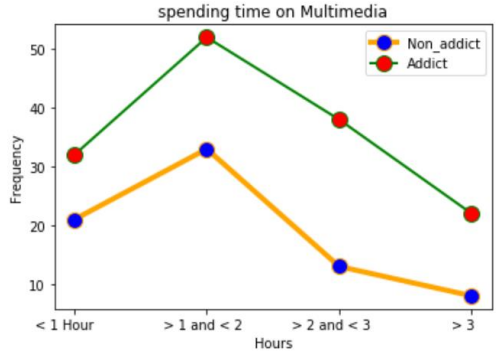
The above pie chart is showing the general trend about what kind of games people like to play.

Multimedia:

Multimedia is one of the oldest features of a smartphone. Earlier it was just camera, audio player, gallery and a thing or two. Now its been evolved to different kind of apps as things have shifted to online platforms like YouTube, Netflix, amazon prime and many more for video streaming and apps like gaana, saavn for music streaming. These days education industry also booming these days and people are also giving them great response and spending a lot of time on them and this is very productive way to spend time rather than scrolling for no reason.



In above figure, we can see the general trend what people like to do on multimedia apps. YouTube tops the list with almost 90% people using it.

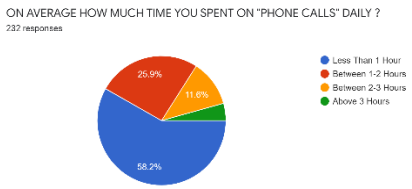


In above figure, we have compared the addicts and non-addicts between the parameters like frequnce of the populaton and time(in hours) they spent.

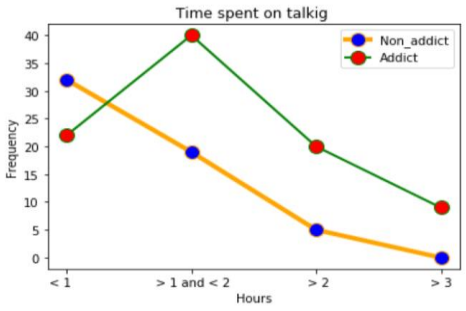
PHONE CALLS:

The basic need of the mobile phone and the reason why they are created is to call the people we want to talk.

Earlier calling someone wasn't efficient, economical and this much easy. Even though we have achieved all these things, but people don't talk much on mobile. People would rather text each other than calling. We asked some questions from the people to get the insights about the phone call trends.



In above chart, we asked the people how much they use the mobile just to call the people in a day. We can see that more than 50% of people don't use the mobile phone even for 1 hours to call the people which is good as using mobile affects the brain.



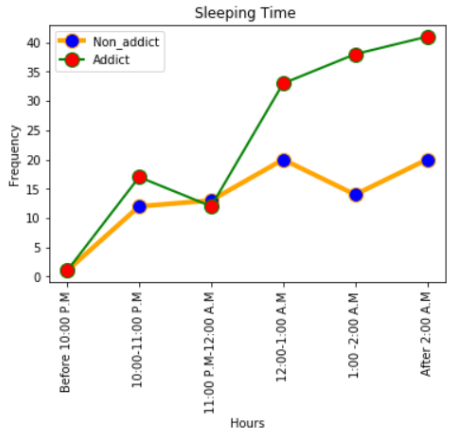
In above figure, we have compared the addicts and non-addicts between the parameter's frequency of the population and time spent they do on phone calls.

SLEEPING SCHEDULE:

Sleeping schedule is one of the integral parts of human brain health. At what time and how much a person sleeps affect the person psychologically and physically a lot. Sleep depreciation can lead to depression [5].

Its been found a negative correlation between smartphone's addiction and the sleep duration of students (r=-.167, p<.05) [1].

So, in our survey we asked people at what time they usually go to sleep and, in the figure[], we can see the general trend of the population with respect to their sleeping habits.



In the above figure [], we compared the addicts and the non-addicts on the two parameters sleeping time and the frequency of the population. Here, we can see that the addicts have more tendency to stay up late in the night which is not a good life style to lead. Using mobile phones at night have a very bad effect on the eyes.

Conclusion:

To conclude, we can say that even if smartphone has many features to ease our life and has many benefits, but we can't neglect the collateral damage we are paying for these benefits. People are been hit by different types of physical and psychological effects even if they are moderate user. As we all know extreme use of anything is harmful and we have seen all the analysis and not even single result is in favour of addicts. All the graphs and statistics showing danger signs and the negative factors like:

1. Psychological issues.
2. Physical issues.
3. Low productivity.
4. Messed up sleeping schedule.

Even though with these many side effects we can't eliminate smartphones from our life but at least we can control the use of it. Addicts people may have hard time as companies are creating these apps accordingly so that people get addicted to that to these apps.

As we have already proposed people should use monitoring apps to track their smartphone activity and try to limit their usage and try to lead a healthy life style in a real world.

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