

# Impact of Cell Phone in Bangladesh: Possible Solutions

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**Abstract:** *In Bangladesh, last fifteen years the service of cell phone has been expanded greatly. As well as their network coverage areas are also expanding very largely. Cell phone is impacting greatly to the people, their culture, environment and so on. These impacts can be both positive and negative impact. In this paper, we will discuss all the impact of cell phone including positive and negative impact. We here will try to find out the negative impact of cell phone as to filter the whole system, we will try to give some recommendations throughout our study to overcome all the negative impacts of cell phone as people of Bangladesh who use cell phone can be more beneficial by the cell phone.*

**Keywords:** Cell phone, radiation, talk time, youth, women, SNS

## 1. Introduction

Almost 131.085 million people use cell phone in Bangladesh. Using cell phone is now a demand of time. With the emerging use of cell phone in Bangladesh there are making so many impacts. We have also found from another study that total number of internet user in Bangladesh According to BTRC till April total internet user was 62.004 million where 58.661 million use internet over phone, 0.124 million use internet through WiMAX, 3.219 million use internet through ISP+PSTN. The first mobile phone company who have started its journey to Bangladesh is Grameen Phone that was founded in 1997. Later other four GSM operators (Banglalink, Tale talk, Robi, Airtel) and one CDMA operator city cell is now in Bangladesh. As the increasing of cell phone operator company and their service there are huge changes are now noticed in Bangladesh, with compared to the 20<sup>th</sup> century. Though cell have made a great development in all sector in Bangladesh but we cannot forget about the negative impact of cell phone hence cell phone is not an unmixed blessing. In this paper the reader will be able to understand that what kind of impacts are actually cell phone are causing and as well as what is solution of the impacting factor.

## 2. Literature Review

Although there are now over a billion cell phones in the developing world, these changes in social interactions in the developed world have captured the bulk of the research community's attention to date. [4] Mobile or cellular phones are now an integral part of modern telecommunications. In many countries, over half the population use mobile phones and the market is growing rapidly. There are almost 9 billion subscriptions globally among them Bangladesh is in 9<sup>th</sup> position according to the total number of mobile phone user. In some parts of the world, mobile phones are the most reliable or the only phones available. Given the large number

of mobile phone users, it is important to investigate, understand and monitor any potential public health impact. Mobile phones communicate by transmitting radio waves through a network of fixed antennas called base stations. Radiofrequency waves are electromagnetic fields, and unlike ionizing radiation such as X-rays or gamma rays, can neither break chemical bonds nor cause ionization in the human body. In the recent past years, there are many works are done in the negative impact of ICT sector especially on the south Asia region particularly in Bangladesh. The paper will discuss the positive impact of cell phone as well as this paper will discuss [6] about the negative impact of cell phone in very briefly; it was discussed specially on impact of radiation that is affecting human body as well as environment [3] The electromagnetic radiation on human brain [2] is also discussed already. In current technology of cell phone with GSM and CDMA there are huge problem with the highly emitting frequency and radiation on the human body [1]. To prevent and minimize the excessive radiation FCC has given few recommendations to resolve it. It also an important concern for communication sector that is affecting greatly [4]. Previous researchers have significantly addressed and documented different aspects of internet use in Bangladesh [8][9]. There are several Social Networking Sites(SNS) that people are using in Bangladesh. Most of the people use the social networking site by their cell phone.

## 3. Methodology

This paper contains basically in three portions. On the first we will show the positive impact of cell phone. Then we will try to find out all the negative impact of cell phone in Bangladesh and finally we will try to give some solution to resolve the problem. We have completed our study based on previously done various study, theoretical analysis as well as survey analysis. We have taken the experts opinion and as well as concern people opinion to evaluate the actual performance of cell phone in Bangladesh. We hope that our

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proposed solution will help to reduce the loss that is causing by cell phone and if it is applied properly then where total reduction is not possible but it will minimize the loss.

#### 4. Positive impact of Cell Phone

In recent years, there has been a tremendous growth of cell phones with over several billions of users worldwide. Cell phone has made a great impact with our society. It is hard to imagine lives without cell phones [7]. So, we cannot go apart from the blessings of cell phone. It can make so much effect on human as by their radiation as well as their services.

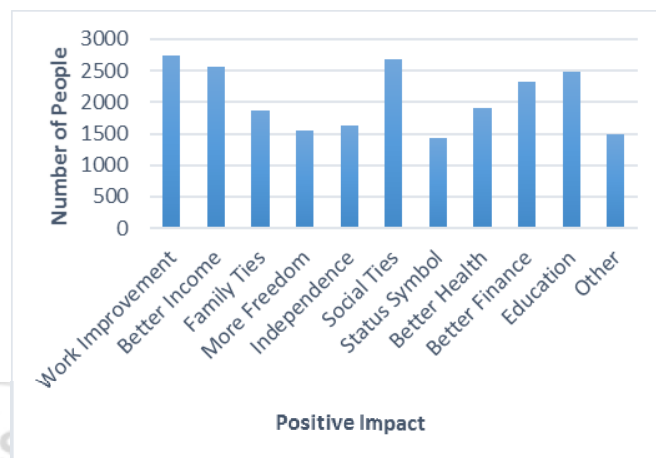
##### 4.1 Radiation

In the recent few years many research studies have indicated that there are some positive effects to the exposure of EMF radiation. EMF radiation is used for many therapeutic applications such as bone repair, nerve stimulation, wound healing, osteoarthritis treatment, electro acupuncture, tissue regeneration, immune system stimulation and neuroendocrine modulations. It can be divided in to thermal and non-thermal Diathermy [6]. Therapy utilizing EM waves at wavelengths from several hundred to several tens of meters is known as Diathermy. Thermal Diathermy is used for vasodilatation, increased rate of nerve conduction, acceleration of enzymatic activity, increased soft tissue extensibility, increased cutaneous circulation and increased muscular circulation Non thermal Diathermy is used for activation of growth factor in fibroblasts and nerve cells, macrophages activation, change in myosin phosphorylation, regulation of the cell cycle by altering calcium ion binding, stimulation of ATP and protein. Stiller had shown in 2006 that Pulsed EMF (PEMF) stimulation promotes cell activation and proliferation by an effect on cell membranes, particularly endothelial cell. Extremely low frequency electromagnetic fields (ELF-EMFs) can also effects on human spermatozoa [7].

##### 4.2 Cell phone on daily life

Since in Bangladesh mobile phone has started in 1997 in every sector in this country is easily found the impact of cell phone the life style of people has changed totally because of cell phone. Though from the beginning of cell phone the service was only limited to the rich people for the high price of mobile set, SIM as well as higher call rate but now a day's cell phone is almost a common device to everybody. People here cannot think a single without cell phone. It has given a great advantage in all sector, as a result the economy, culture, education, business, health and personal interaction to individuals has expanded greatly. It can help to achieve a higher growth of GDP rate. Many jobs are being created like mobile recharge point, mobile servicing center and so on by the blessings of cell phone. Again government are achieving huge amount of TAX and VAT through cell phone. It should be mentioned that to do job in cell phone is considered as one of the smartest job in the country. Now a day people can easily communicate on emergency condition like serious physical illness natural disaster or any kind of personal communication. At present many more apps are developed for cell phone (smart phone) using those apps people can full fill their needs and solve their problem like checking physical

condition, justify the diseases of crops by the farmer. In order to justify people acceptance and how much cell phone is impacting on them we have taken 3000 people as sample data. Here we have made the graph on basis of beneficial people on the particular sector Our achieved result from the survey study is shown graphically in below.



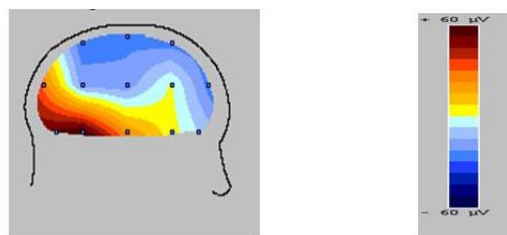
**Figure 1:** Positive impacts of having mobile phone

#### 5. Negative Impact of Cell Phone

Cell phone can impact on various sector as by its radiation [5] as well as the service that is provided its operator. In this paper we will try to show almost all the negative impact of cell phone in aim to reduce the loose. Though cell was first invented in communication purpose but now a day it is using on various purpose. Though cell operator obviously has made a revolution in the history communication in Bangladesh but still their remains few problems.

##### 5.1 Radiation Exploitation

In last 10 years the networking system of cell phone has expended very largely. With the large network system in Bangladesh in very small area here has five GSM operator (Grameen Phone, Banglalink, Robi, Airtel, Taletalk) and one CDMA operator that is city cell. One particular one region there is six operators that is reflecting its radiation. Though the most impact of this radiation is on human head but it also has impact on other part of human body as well [1]. Even most of the Bangladeshi cell phone user don't even enough conscious about the bad impact of these excessive amount of microwave radiation. It can damage the human cell, it causes brain cancer and more even it increases the possibility of brain cancer 390%.



**Figure 2:** Effect of electromagnetic radiation on human brain [2]

## 5.2 Specific Absorption Ratio

It is the measure of radio frequency that is absorbed by human tissue which unit is watts per kilogram. Actually, limit for frequency radiation is to determine the radiation in such certain level that our tissue can remove heat from the absorbed frequency energy [2]. The effect of mobile phone radiation to human body can be categorized into three part; non-thermal, thermal and genotoxic. In non-thermal effect when someone is transiting message the temperature is constant that is generated by the radio waves and it passes through cell membrane. Thermal effect is one way where the electromagnetic field of radio waves induces polar molecules and it generates dielectric heat resulting the live tissues die [2]. Next is genotoxic effect can make damage to chromosomes, it can make change or alterations in the activity of certain genes and a boosted rate of cell division. By talking with 10 top most doctor in Bangladesh we are able to know the diseases like; calcium ion changes, chronic fatigue, crohns disease, depression and heart disease. Diabetes, disorientation, epilepsy, facial rashes and swelling, genetic damage Blood pressure, kidney damage, Leukemia and other blood cancers, lymphoma and melatonin reduction. Anxiety, birth defects, Intra-epithelial tumors, neuro cognitive symptoms, nerve sheat tumors (including acoustic neuromas) and sleep disorders fibromyalgia are growing up rapidly in Bangladesh and they have found a huge change in the number of patient in last five years of these diseases.

## 5.3 Environment

Mobile phones use has a dangerous effect on our environment including birds, mammals and pet animals. It has been observed that the animal which are more exposed to radiations emerging from these BTS or cell phone have many rarity as compared to those who are not exposed to these types of radiations' radiation flux [3] from a BTS per square meter ranges from 17,100 micro-watts to 72,000 micro-watts generally. Though the human body can tolerate radiation level up to 1, 00,000 micro-watts, but the birds and other flying animals cannot tolerate the radiation level as like human. They cannot tolerate more than 40,000 micro-watts. Sometimes, the tolerance level of some people has decreased to 50,000 micro-watts. If they are directly exposed, they might suffer from skin diseases, as well as from cancer.

The overall risk reduction of radiation measures & regulations –

- Regulations for the field strength and power density due to excessive radiation.
- Regulations for involving the result that is occurring due to the specific absorption ratio (SAR).
- In order to maintain radio frequency-slope between the cell phone and the user the ICNIRP and FCC give the limit of radiation range that is established on the basis of frequency absorption to both human and animal. The exposure limits of RF frequency are from 3 KHz to 300 MHz range for both occupationally exposed workers and general public. These authorities also set the limit range for whole body to exposure for occupationally exposed workers (who are on

the field) is about to 0.4 W/kg and general public (people who are not involve with construction of radiation) is about to 0.08 W/kg in the frequency range of 10 MHz to 10 GHz for them. Above the radio-communication equipment's that are being used by several cell phone company should be tested and monitored in order to non-ionizing electromagnetic radiation to follow the guidelines properly that is established by ICNIRP.

- Ecophene-sloping technique can also redirect and make it possible to control near field exposure of radiation that is generated by the cell phone. These sloping or covering devices will be most effective during the time when the phone is used in outdoors, that is far from reflecting surfaces such as ground or air. As the efficiency of slop in the reduction of exposures to cell phone RF fields is relatively unexplored, the cell phone operator may use these devices to control the impact of radiation effects to near field.

## Recommendations

- People should limit the use of cell phones. They can also maintain the calls short.
- Children should not be allowed to talk over phone in general use phone rather than in emergency. As their thin skulls and very sensitive skin they can be very easily affected by radiation and it can also penetrate them much deeply.
- People can wear an air tube headset (not regular wired headset). Because the regular wired headset has been found clearly to intensify radiation into the ear canal much more deeply. As the transitions through the wire is occurring radiation from the cell phone and also serves as an antenna, it can be attracting EMFs from the surroundings. So, an air tube headset is over come with this problem.
- Human body tissue in the lower part of the body area has good conductivity, interaction and absorbs radiation more quickly as compared to the head. So, people should not put their phone on pocket or with belt while the phone is live or on. We have taken 1200 male people as sample data asked them where they keep their phone. We have find that 71% people put their cell phone on the that is near their lower body part and 26% put their phone in their chest pocket and the rest 3% use bag for keeping cell phone. We also take 1200 female people to observe the result we find something better in here almost every woman keep their phone in hand; while they are travelling they use their bag to keep cell phone. We are able to know from a study that men who wear cellphones near their groin could have their sperm count dropped by as much as 30% and can also damage their sex power through radiation.
- People can wait for the call to be connected with the other end and before connecting the call do not place the phone next to the ear.
- People should not use the cell phone in enclosed metal spaces as like vehicles or elevators because where devices may use more power to establish connection we have taken 1250 people both male and female and 75% people talk over phone while they are traveling again in the case of youth of Bangladesh they talk much more when travel they often talk on the romantic purpose with opposite sex, for

the youth is extended to 86% that they talk much when traveling; Though the talk time is proportional to the travelling distance.

- People should avoid call when the signal strength is weak that below CM3 level or (1 bar or less), as because much stronger radiation is then emitted by the phone when the signal is much weak. Is already mentioned that people in Bangladesh talk much when they travel, because of hand off operations of cell phone there are happen to get weak signal while moving one BTS to another BTS but they would not generally stop calling, again when the call drop is occurred they randomly trying to relive the line again.
- When purchasing a phone; people obviously should choose phone with a low SAR. Most phones contain a Specific Absorption Ratio (SAR) level that is listed in its instruction manual. The SAR level is a way of measuring and determining the quantity of RF energy and power that is absorbed by the human body.
- People can text instead of talk.
- As signal is mostly weak there prompting strong radiation from the cell phone so people should limit the use of cell phones in rural areas
- The base station should be placed in enough far distance from the forest, lake, canal. river, sea.
- The radiation of the microwave should be control according to the law.
- Most of the base station in Bangladesh is on roof of the apartment building moreover the cell phone company do not maintain the proper tower height weather it GSM or CDMA technique. These two things should be avoided by the operator.
- Faulty device cell and other instrument which are damaged those should not use in the base station.

## 6. Survey Analysis and Result

We have made a survey on Bangladeshi people that have contained 1250 sample data of several ages (here all people are more than 18 years' age) of people here 8% people are more than 18years' age,27.2% people are more than 20years' age,28% people are more than 22 years' age,8.8% people are more than 24 years' age,12.6% people are more than 26 years' age,15.2% people are more than 30years'age. In this survey 88.8% people are male and 19.2 % people are female. This survey also contains about their occupation. We have got 68.8% student of several institutions like, college and university; and 26.4% people are job holder in various kind of organizations like: government institution, bank, IT farm, educational institution, industry and so on. We have also got 4.8% business man.

### 6.1 People Using Multiple Phone

In our survey analysis, we are able to know that most of the Bangladeshi people use more than one cell phone instead of previously mentioned effect of radiation. Here we have got some data about using multiple mobile phone 56.3% people use only one phone,37.3. % people use two phone,4.8% use three phone, 0.8% use four phone and 0.8% people use no phone. Though now a day most phone contains with the

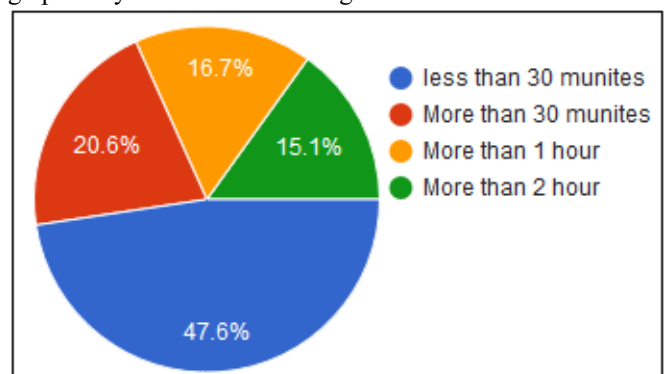
feature of dual SIM but they often using more than one phone where they should minimize the uses of cell phone.

### 6.2 People Using Multiple Sim

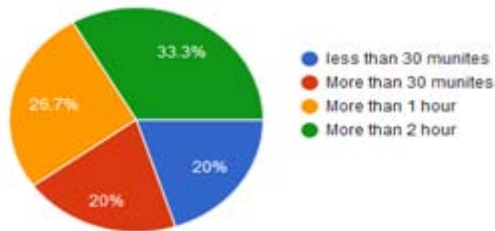
In our survey, we have got only 16.7% people who are using only one SIM (Subscriber Identity Module), 40.5% people who are using two SIM, 19% people who are using three SIM,11.1% people who are using four SIM, 5.6% people who are using five SIM,4% people who are using six SIM,2.4% people who are using more than six SIM, and only 0.8% people are who have no SIM. It has become a habit in here to more than one SIM; We have talked with the people that why they would use multiple SIM, they think that the service that is provided by the operator is so friendly and cost effective as they demand, again there is no opportunity for the user to switch one operator to another operator by using one number.

### 6.3 People Talking Over Phone

We have already mentioned in the part of radiation analysis of cell phone that people should avoid excessive talk over phone; as to avoid the absorption of radiation they can text to each other instead of talking but in Bangladesh people feel more comfort in talking rather than texting. Even they generally talk too much over phone for a long period. In our survey we find that only 47.6% people talk less than 30 minutes average on a day,20.6% people talk more than 30 minutes in a day;16.7% people talk more than 1 hour average in a day,15.1% people talk more than 1 hour average in a day; Among them 40% people talk particularly on day,23.2% people talk particularly on early night,11.2% people talk particularly talk particularly on mid night,0.8%% people talk particularly talk on late night and 16.8% people do not maintain any particular time for talking. The people of Bangladesh generally talk various purpose over cell phone, we find that 64 % people talk on personal purpose,16.8% people talk on educational purpose,10.4% people talk on business purpose,4% people on entertainment purpose,4.8% people talk on other purpose. We have found a grate changes in terms of talking habit of youth with compared to the adult people in all sector. More specifically we will mention about average talk time of youth. Only 20% youth talk less than 30 minutes again 20% talk more than 30 minutes 26.7% talk more than 1 hour and 33.3% youth talk more than 2-hour average per day. The resultant data will be shown graphically on the below two figure



**Figure 3:** People (age more than 18) Average talk time per day



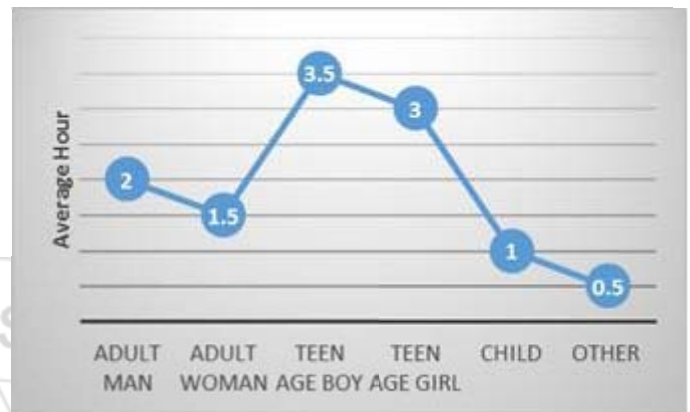
**Figure 4:** People (age less than 18) Average talk time per day

10	No crime	10.58%	14.3%

The below figure will show the graphical representation of social networking site (SNS) user of different ages people in Bangladesh who use SNS by their mobile in average hour per day. This is based on our survey data that was done to 1400 people as sample data. That will show the behavior of social networking site user in Bangladesh. Here we have added all the social networking site (SNS) that Bangladeshi people use.

#### 6.4 People Opinion About Cell Phone and Their Service

Above more than 13 crore people in Bangladesh use mobile phone. But most of them are insecure in various purpose. Though there are several regulations for cell phone operator in Bangladesh but they do not follow them properly, even Bangladesh Telecommunication Regulatory Board(BTRC) is often fails to control them. In order prevent the crimes concerned with security issue government has made a rule to registration SIM by the biometric fingerprint print but here is another problem as cell phone operator are mostly private multinational company (without Tale talk) here people of Bangladesh do not want feel comfort to give their unique patent to them and in our survey we have able to know that 86% people do not feel safe and secured with that system but even though they are completing the biometric registration as it is a government ordinance and if they don't do so their connection will be off. In survey analysis, we have collected 1500 sample data to identify actually what kind of crime or disturbance they face, these including adult men, women and youth also. The accrued data will be presented on the below two table.



**Figure 5:** Average Browsing hour of SNS of different ages people

#### 7. Recommendations

- BTRC should be more active to control any kind of privacy question.
- The mobile phone operator should maintain the rules and regulations properly.
- Ethical awareness should be arisen.
- Strong law should be run to prevent such kind of crime.
- The user should be also concern about their right and responsibility.
- Woman should be concern about their own privacy and security.
- Now a day's woman can take help of technology as operator are proving many services (like, call block) to prevent this kind of problem.
- If any woman fills that she is victim, then she can take legal action against the concern person.
- If the teen age girl faces this kind of problem, then she should immediately discuss it with her guardians.
- Creating awareness and positive attitude about use of mobile phone, especially among youth mobile phone should be used only to maintain contacts.
- Should not talk at late night (without sleep), Day call rate should be reduced and night call rate should be increased.
- Unnecessary use of call/gossip /SMS should be stopped.
- Not to disturb someone; specially girls or women by mobile phone which is very common practice by male person specially the teen age boys. There should be law to prevent such incidents.
- Not to call unknown people/number especially at night in order to disturb.
- Should not be addicted so much with SNS.
- Limit the use of social networking site.

**Table 1:** Disturbance faced by the adult

Serial No	Type of Disturbance or Crime	Percentage
1	Missed Call	20%
2	Unusual text	50.4%
3	Offensive Text	8.8%
4	Intimate photo sharing	1.6%
5	Threat	12.8%
6	Blackmail	10.4%
7	Security	3.2%
8	Other	4.8%
9	All	12%
10	No disturbance or crime	37%

**Table 2:** Disturbance faced by the teen ager

Serial No	Type of Disturbance or Crime	Percentage (Boy)	Percentage (Girl)
1	Missed Call	32%	75.77%
2	Unusual text	21.69%	23.85%
3	Offensive Text	7.12%	10%
4	Intimate photo sharing	5.3%	10.2%
5	Threat	18.67%	31%
6	Blackmail	19.63%	40.6%
7	Security	21%	17%
8	Other	10%	8%
9	All	6.01%	6.08%

## 8. Conclusion

With the touch of modern science Bangladesh is getting digitalized day by day. As a result, there are some challenges in using cell phone that are influencing negatively to the people of Bangladesh. This paper contains an overview of impact of cell phone in Bangladesh and also contains few possible solutions to overcome the impact that is being affected by negatively. Through survey analysis we have taken people's and the expert opinion to compare the acquired result. As this is just the beginning of the digitalization of Bangladesh, the discussed problem is most of case in primary condition, it can be solved if the given solution is applied properly otherwise the negative impacts will be risen with the passage of time and as a result the original blessings of cell phone cannot ever be able to make beneficial to the user of Bangladesh and finally the hope of digital Bangladesh will be fallen one day in failure. In some case if it not possible to completely solve the negative impacts where our recommendations will help to minimize the effect if the recommendations are applied properly and hopefully those solutions will help to achieve the actual goal of digital Bangladesh.

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