

# Study of Awareness about Mobile Phone Towers among the Residents of Housing Societies

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**Abstract:** *Over the years, in a number of residential buildings, microwave towers have been erected on the terrace. Even though it is argued that there is no concrete evidence to prove the health hazards posed by these towers, their probable ill effects on health of human beings and the ecology cannot be denied or over looked. For the well-being and development of human resources and maintaining the ecological balance in an economy, any factor that can impact health and ecology needs special attention. In the Advisory guidelines pertaining to mobile phone towers issued by the Department of Telecommunications (DoT) in 2013, it has been recommended that State Governments may organise public awareness programs with DoT involving civil society members. Given this background, this exploratory study was undertaken to find out the extent of awareness about the existence of micro wave towers in the near vicinity, the permissible limit of emissions from them and the impact of radiation from mobile phone towers on the health of human beings and ecology. It is found that among the families surveyed, awareness about mobile phone towers, radiation from the towers and the impact of the radiation is inadequate. Further research covering a larger population needs to be undertaken so that appropriate measures such as the ones suggested by the author can be undertaken.*

**Index Terms - Environment, Awareness, Micro wave towers, Radiation, Emissions, Ecological balance**

## I. INTRODUCTION

The number of mobile phone and internet subscribers in India is increasing in leaps and bounds. (Study Report, Indian Express 2017). As per a study report published in the Indian Express (Online) in October, 2017, India had 650 million mobile phone users 2017. (AWARENESS NOTE ON MOBILE TOWER RADIATION & ITS IMPACT ON ENVIRONMENT. n.d.). With the growing population of India, the wireless communication density and its network has escalated at a rapid pace over the past few years. The growing mobile subscriber base also means that there will be a growth in the number of mobile phone towers. (Indian Tower Industry: The Future is Data, 2015). There are close to 400,000 telecom towers in India at present and are estimated to increase at a CAGR of 3% over next 4-5 years.. This probably is pertaining to the period before May 2015, as in the Report, data pertaining to 2014 is reflected. While use of mobile phones improves connectivity and may contribute to economic development, the adverse effects on human health due to the use of mobile phones and the ill effects of exposure to emissions on the ecology from mobile phone towers cannot and should not be overlooked. In advanced countries such as Canada, mobile phone towers are located away from residential areas and even if they are erected on top of residential buildings they are at a certain feet above the habitable height. In India, particularly in cities such as Mumbai, indiscriminate erection of mobile towers can be seen. Mobile phone service providers usually brush aside the suspected ill effects of emissions from the towers. (Bioinitiative Working Group, 2012). "Bioeffects are clearly established and occur at very low levels of exposure to electromagnetic fields and radiofrequency radiation. Bioeffects can occur in the first few minutes at levels associated with cell and cordless phone use. Bioeffects can also occur from just minutes of exposure to mobile phone masts (cell towers), WI-FI, and wireless utility 'smart' meters that produce whole-body exposure. Many of these bioeffects can reasonably be presumed to result in adverse health effects if the exposures are prolonged or chronic". It is to be noted that the objective of this paper is not to prove or disprove the adverse effects on human health and/or the ecology if any, due to exposure to radiation from mobile phones and/or mobile phone towers. Irrespective of whether radiation from mobile phones and towers has adverse effects on health and ecology, it cannot be denied that it is important for people to be aware of their surroundings. The emphasis of this paper is on awareness about the existence of mobile phone towers in the near vicinity and the suspected ill effects of exposure to radiation from mobile phone towers.

## II. OBJECTIVES

This study was undertaken with the following objectives:

- 2.1 To study the awareness about the existence of mobile phone towers in the neighbouring buildings.
- 2.2 To understand the awareness about permissible limits of radiation from mobile phone towers.
- 2.3 To find out if the residents are aware about the suspected ill effects of exposure to radiation from mobile phone towers.

## III. RESEARCH HYPOTHESIS

- 3.1 There is lack of awareness about the existence of mobile phone towers in the neighbourhood/neighbouring buildings.
- 3.2 People are not aware about the permissible limit of radiation from mobile phone towers.
- 3.3 People will have very limited awareness about the ill effects of exposure to radiation from mobile phone towers.

**IV. LITERATURE REVIEW**

- 4.1 (Dhami A.K, 2012) undertook a study to estimate microwave pollution by measuring the power densities near schools and colleges in the city of Chandigarh, India. The area near 50 schools and 12 hospitals were studied and it was found that in 22 schools and 4 hospitals, the radiation was above the biologically safe exposure limits.  
This is a very significant finding and therefore creating awareness in the community about mobile phone towers and the hazards of radiation is of paramount importance.
- 4.2 (Gulati et.al, 2015), in a study conducted in Kurukshetra University, Haryana, India to study the genetic damage caused by radiation from mobile towers found that symptoms such as depression, memory status, insomnia and hair loss were significantly associated with exposure to Electromagnetic Radiation from mobile phone towers.  
Thus, the impact of exposure to radiation from mobile phone towers on human health cannot be neglected and people should be aware of the existence of mobile phone towers in the neighbourhood and the associated health problems due to exposure to radiation from the towers.
- 4.3 (Dykes Melissa, 2015) in an article says that six engineers studied over 5000 of the 2.3 million cell phone towers and antennas in USA. It was found that one in 10 was violating the Federal rules on EMF radiation. In the article it is also stated that many of these are located on play grounds in schools and close to schools. Federal rules require carriers to use barricades, signs, and training to protect people from excessive radio-frequency radiation, the waves of electric and magnetic power that carry signals. The power isn't considered harmful by the time it reaches the street, but it can be a risk for workers and residents standing directly in front of an antenna. It can be understood from this article that adverse effect of radiation from mobile phone towers on health is a matter of concern everywhere and it is to be noted that even in advanced countries cell phone companies are violating rules pertaining to the sites where the towers and antennas are located.
- 4.4 (Group Discussion, 2016). In an article titled "Are mobile towers in residential areas harmful?" based on group discussions on cell phone towers in India, it is stated that, out of all the mobile phone towers in metropolitan cities, a shocking 45% of them are illegal. They did not follow the norms that are set for the purpose and ignorantly put the lives of people at risk of cancer and other disastrous ailments. The buildings on which the tower is to be set must be authorized by the concerned government body but since most of them are illegal, hence unauthorized too.
- 4.5 (Department of Telecommunications, 2013). In the advisory guidelines for issue of clearance for installation of mobile towers in India of DoT (Effective from 01.08.2013) the permissible limits of radiation from mobile towers in India have been specified and it is stated that the limits are  $1/10^{\text{th}}$  of international norms. It is mentioned in the document that apart from getting clearances from the respective Fire Safety department, Environment and Forest department etc. of the state, No Objection Certificate from the owner of the building or ground or roof top rights depending on the location has to be obtained.
- 4.6 (Rajapaksha et al., 2018) studied the effect of cell phone towers on house prices in Brisbane, Australia. They found that the proximity to cell phone towers negatively affects house values. It is evident that house buyers are aware of the existence of cell phone towers and is an important parameter for decision making in Brisbane, Australia.

**V. RESEARCH METHODOLOGY**

It is an exploratory and empirical study involving personal interviews of members of housing societies. The details are as follows:

**5.1 Sample**

15 families of three housing societies were selected for participation. Convenience-cum-Judgement sampling was used. Three housing societies that did not have mobile phone towers within the premises but had mobile phone towers on a few buildings in the immediate neighbourhood were selected. The respondents were educated, out of which 13% were post graduates, 2% had professional qualifications and 85% were graduates. Articles and research papers from secondary sources have also been used to gain a better understanding of the problem. Descriptive statistics has been used for analysing the responses. An interview schedule has been used for collecting the responses.

**5.2 Sources of Data**

Articles and research papers from secondary sources have also been used to gain a better understanding of the problem other than the data obtained through the personal interviews.

**VI. LIMITATIONS OF THE STUDY**

As the sample size is very small and this being an exploratory study, it is not appropriate to draw statistical inferences. Only broad conclusions could be drawn. Further research with a large sample from different clusters can be undertaken to draw inferences.

## VII. RESULTS AND DISCUSSION

An interview schedule having the following questions was used for the survey:

7.1 Are there mobile phone towers erected in any one or more of the neighbouring buildings?

- Among the members of 15 families, members of 3 families were not aware about the existence of mobile phone towers in any of the neighbouring buildings. The reasons that they gave were that they were staying as tenants and that this information was not provided to them.

7.2 Were you informed about the erection of mobile towers in the neighbouring buildings?

- 80% of the 15 families, i.e. respondents of 12 families said that they were not informed before the erection of the mobile phone towers and were of the opinion that as radiation from mobile phone towers are suspected of having adverse effects on health of people who are exposed, the office bearers of the neighbouring housing society that has erected the tower should have informed them. In one of the buildings in which some of the respondents lived, a notice was put up by the society that the adjacent building was erecting a mobile phone tower. They also said that the notice was not read by everybody living in the society. As a result even before anybody could object, the tower was erected in the adjacent building.

7.3 After noticing/finding out that mobile phone towers have been erected in the neighbouring buildings, did you speak to anybody about it?

- 5 of the respondents said that when they spoke to the office bearers of the society of the building which had erected the tower, the most common reasons cited for the decision for erecting the towers were:
  - The Society earned a good income that supplemented the maintenance charges paid by the residents.
  - The income helped in the reduction of the maintenance charges to be paid by the residents.
  - Even if there were health hazards, as the tower was erected on the terrace, none of the residents were exposed to radiation from the tower and a very safe distance has been maintained from the neighbouring buildings.

7.4 Are you aware of the suspected health related problems that exposure to radiation from mobile phone towers can cause among human beings?

- All the respondents said that it is suspected that exposure to radiation from the towers can cause health problems such as cancer. None of them were aware that it is suspected of causing Alzheimer's Dementia.

7.5 Are you aware of the suspected impact that radiation from mobile phone towers can have on the ecology, which includes birds, other organisms etc.

- Not a single respondent knew anything about the suspected impact of radiation from mobile phone towers on ecology.

7.6 Are you aware of the permissible limit of radiation/emissions from mobile phone towers?

- Not a single respondent knew the permissible limit of radiation from mobile phone towers. It is important to acknowledge that as the permissible limits of emissions are measured and stipulated in scientific terms and units, which even educated people may find difficult to understand, remember and recollect.

It is apparent from the results of analysis of the responses that awareness about mobile phone towers is poor among respondents. The level of education and awareness do not have much correlation in the sense that, educated people are also unaware about certain important factors in the immediate surroundings of their residences. Efforts as recommended by DoT for creating awareness about mobile phone towers and issues pertaining to radiation from the towers are not adequate. Educated persons of the society are not taking adequate interest in their surroundings.

## VIII. SUGGESTIONS

Creating awareness about the hazards of exposure to radiation from mobile phone towers is crucial for ensuring that adequate precautions are taken. Following are some suggestions to improve awareness:

8.1 Awareness drives have to be made mandatory by the state government in schools and colleges.

(Ganguly, 2013). In a survey conducted in October 2013 by Assocham after the Hindu festival 'Diwali', it was found that there was a 25% fall in demand for crackers and this was attributed to the anti cracker campaigns in schools (timesofindia.indiatimes.com, (2013)). Similar campaigns pertaining to hazards of exposure to radiation from mobile phone towers can ensure that students maintain a safe distance from mobile phone towers. There are guidelines for use of mobile phones also and such campaigns should also spread awareness about the same.

8.2 Students should be encouraged to create awareness among the residents in their housing complexes.

8.3 Housing societies have to take written permission from the residents of adjacent buildings before erecting the tower. Periodic checks to check the level of radiation have to be undertaken to ensure that they do not exceed the permissible limits.

8.4 Mobile phone companies and service providers should also exercise discretion while setting up towers. They should also undertake awareness campaigns. They should proactively check the level of radiation from the towers erected by them.

The need and importance of the use of mobile telephones cannot be overlooked or denied. However, adequate precautions have to be taken to ensure that radiation from mobile phone towers do not cause wide spread health problems or adversely impact the ecological balance in the environment.

Table 1:

As per Corrigendum issued by Department of Telecommunication, Government of India, in June, 2013, following table shows the permissible limits for antennae (Base Station) emissions for general public:

Frequency Range	E-Field Strength (Volt/Meter (V/m))	H-Field Strength (Amp/Meter (A/m))	Power Density (Watt/Sq. Meter (W/Sq.m))
400MHz to 2000MHz	$0.434f^{1/2}$	$0.0011f^{1/2}$	$f/2000$
2GHz to 300GHz	19.29	0.05	1

(f=frequency in MHz)

Source: Corrigendum, Department of Telecommunication, Government of India (2013)

#### IX. ACKNOWLEDGMENT

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