

## ORIGINAL ARTICLE

**Studies on Phantom Vibration and Ringing Syndrome among Postgraduate Students**

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**Abstract**

Phantom vibrations and ringing of mobile phones are prevalent hallucinations in the general population. They might be considered as a normal brain mechanism. The aim of this study was to establish the prevalence of Phantom vibrations and ringing syndrome among students and to assess factors associated it. The survey of 300 postgraduate students belonging to different field of specialization was conducted at Kurukshetra University. 74% of students were found to have both Phantom vibrations and ringing syndrome. Whereas 17% of students felt Phantom vibration exclusively and 4% students face only Phantom ringing syndrome. Both the syndrome occurs more fervent in students who kept their mobile phone in shirt or jean pocket than to who kept mobile in handbag. 75% of students felt vibration or ringing even when the phone is switched off or phone was not in their pocket. Also the frequency of both the syndrome is directly proportional to the duration of mobile phone use and person emotional behavior. Although most of students agree that the Phantom syndrome did not bother them but some students deals with anxiety when they feel symptoms associated with Phantom syndrome. By using mobile phones in proper way, one can avoid these syndromes, or at least can ameliorate the symptoms.

**Key Words**

Anxiety; Dopamine; Hallucination; Mobile Phone; Phantom; Ringing; Students; Vibration.

**Introduction**

Mobile phones become the base of communication technology today (1,2). It becoming a basic need of all the people on earth. With the advancement of cellular technology the problem associated with it also increases including the medical health problems, hypertension and certain psychological problems (3). Phantom vibration syndrome is the sensation of false belief that mobile phone is vibrating when actually it is not doing so (4). In the comic strip "Dilbert", cartoonist Scott Adams referenced such a sensation in 1996 as "phantom-pager syndrome" (5). In 2003 an article entitled "Phantom Vibration Syndrome" published in the New Pittsburgh Courier, written under a pen name of columnist Robert D. Jones states that our mind or body tell us the imaginary vibrations belts, pockets and even purses which may be result of physical nerve

damage or a mental health issue or both (5). Nearly a decade later, the term had made its way to Australia as Macquarie Dictionary's 2012's "Word of the Year" (6). Humans are particularly sensitive to auditory tones between 1,000 and 6,000 hertz (4) and basic mobile phone ringers fall within this range. This frequency range can generally be more difficult to locate spatially, thus allowing for potential confusion when heard from a distance. Phantom ringing syndrome is an intermittent perception that a mobile phone is ringing when actually it's not. It is a recent psychological phenomenon that has attracted the attention of medical community.

**Aims & Objectives**

To access the presence and frequency of phantom vibration and ringing syndrome among postgraduate students. Primary objective of study was to establish

the prevalence of phantom vibrations and ringing among students and secondary objective was to assess factors associated with Phantom syndrome.

**Material and Methods**

During April of 2014 a survey of students at Kurukshetra University, Kurukshetra (29°6’N, 76°5’E) was conducted.

Because this was the first study of its kind (hypothesis generating), so the sample size calculation was not performed. The sample size of 300 students was taken randomly (Pilot Study). The survey of 300 postgraduate students was conducted based on a questionnaire. The students were selected randomly from different field of specialization like Physics, Chemistry, Zoology, Computer Science, Education, Psychology, Geography, Home Science etc. To avoid biasing respondents, the invitation simply stated: “We are asking you to participate in a research study survey about mobile phone because you all have it and use in communication, study and entertainment etc.”

The survey was contained 12 questions, including potential factors associated with phantom vibrations—age, sex, position of keeping mobile and mobile using duration etc. (3).

**Questionnaire**

1. Name.....  
 Class..... Age..... Ph. No/Email Id..... Sex: Male [ ] Female [ ]
2. You have:  
 Fixed Line Phone [ ] Simple Mobile Phone [ ]  
 Smart Mobile Phone [ ]
3. Have you felt your phone is vibrating when it doesn’t?  
 If Yes then how many times.  
 Yes [ ] No [ ]  
 Daily [ ] Weekly [ ] Monthly [ ]
4. Did it bother you to feel like this:  
 Yes [ ] No [ ]
5. Have you felt your phone is ringing when it doesn’t?  
 If Yes then how many times.  
 Yes [ ] No [ ]  
 Daily [ ] Weekly [ ] Monthly [ ]
6. Did it bother you to feel like this:  
 Yes [ ] No [ ]
7. Have you felt vibration or ringing of mobile phone even when it is switched off or not in your pocket:  
 Yes [ ] No [ ]
8. Where you Kept your phone:  
 Shirt Pocket [ ] Jean Front Pocket [ ] Jean Back Pocket [ ] Handbag etc. [ ]
9. For which purpose you used the mobile phone:  
 Calls [ ] Text Message [ ]

- Facebook [ ] what’s App [ ]  
 GPS Navigation [ ] MP3 [ ] Other Applications [ ]
10. How much time you spent on your mobile phone in a day:  
 Less than 1 hour [ ] 1-3 hours [ ]  
 3-5 hours [ ] 5-10 Hours [ ]
  11. How much private information you have in your phone:  
 Not Private [ ] Some Private [ ] Very Private [ ]
  12. How much emotional person think you are:  
 Normal [ ] Very Emotional [ ] Much Emotional [ ]

**Results**

**Frequency of Phantom Vibration and Ringing Syndrome:** The frequency of Phantom vibration syndrome is more pronounced among students than the Phantom ringing syndrome. The 74% of students face the symptoms of both Phantom vibration and ringing syndrome. 17% of students found to have exclusively Phantom vibration syndrome and 4% of students are facing the Phantom ringing syndrome only. 5% of student did not show symptoms of either Phantom ringing or vibration syndrome (Figure 1). Most of students face the symptoms of Phantom syndrome on monthly basis (80%). Some students who feel symptoms on weekly (9%) and daily (6%) basis were also found.

**Factor associated with Phantom Vibration and Ringing Syndrome:** One of the main factor associated with the Phantom syndrome is the position of keeping mobile phones. The frequency of Phantom Vibration and ringing Syndrome was higher in students who keep their mobile phone in shirt pocket and jean front pocket, and was lower in students who keep mobile in their jean back pocket. The symptom was least in students who keep mobile phone in handbag (Figure 2). 75% of students felt vibration or ringing even when the phone is switched off or phone was not in their pocket

**Consequences of Phantom Vibration and Ringing Syndrome:** The Phantom syndrome are cause botheration among the students which in turn responsible for high anxiety level. However the 53% students having Phantom vibration or ringing syndrome stated that it does not bother them. But 42% of students deal with anxiety when they feel symptoms associated with Phantom syndrome (Figure 3). Comparatively, the Phantom vibration syndrome bothered the students more than the Phantom ringing syndrome.

**Other Implications of Study:** The students who used the smartphone face more problems of Phantom

syndromes because these students spent much more time on the phone in various mobile applications additional to normal calls and text. The anxiety level in such cases is high because user is always in state of mind that someone is calling, texting, notified, e-mailing or sending files to him over internet.

Smartphone also have huge data saving capacity so students keep their private content in their mobile phone. The anxiety level is also high because user always have a threat of losing important data from phone or stolen of private data by someone. This can be correlated with person emotional behavior. The people having more emotional behavior are more sensitive to the private data in phone so the anxiety level is propositionally high ([Figure 4](#)).

## Discussion

Present work supported the previous study revealed that 68% of people have experience the Phantom syndrome (3). The majority of peoples admitted that the hallucination of phantom vibration occurred in the period from the first month to one year after the purchase of the device and it usually happens once a week (7). In a 2012 study of college undergraduates, nearly 90% said they have felt phantom vibrations (8). Another study, this one of hospital workers, produced the same result with participants reporting phantom vibrations occurring on a weekly or monthly basis (3). In present study also the most of students found to face symptoms of Phantom syndrome on monthly basis whereas some found to face symptoms on weekly and daily basis.

### **The Mechanism of Phantom Vibration and Ringing Syndrome can be explained by Many Theories:**

The exact mechanism of Phantom vibration and ringing syndrome is still unknown. However many theories are put forward to explain how Phantom syndrome may occurred.

According to Signal Detection Theory when mobile phone is in pocket, there are two possible states: the phone is either ringing or not. Brain also has two possible states: the judgment that the phone is ringing, or the judgment that it isn't. Obviously brain would like to match these states in the correct way. True vibrations should go with "it's ringing", and no vibrations should go with "it's not ringing". Signal detection theory calls these faithful matches a "hit" and a "correct rejection", respectively. But there are two other possible combinations: brain could mismatch true vibrations with "it's not ringing" (a

"miss"); or mismatch the absence of vibrations with "it's ringing" (a "false alarm"). This second kind of mismatch leads to Phantom vibration and ringing syndrome (9). The present observation may be due to this reason.

According to second theory given by Dr. Larry Rosen, these sensations are repetitive memories of previous real experiences that might triggered by present situation (8), (10). The actual stimulus is unknown, but candidate sensations might include pressure from clothing, muscle contractions, or other sensory stimuli (11). Our work supports this theory because many students carrying phone in their pocket felt vibration even when phone is switched off which may be due to sensations from surroundings.

According to theory of neuroplasticity Phantom vibrations and ringing may be due to the brain's ability to form new connections in response to changes in the environment. When cellphone users regularly experience sensations, such as vibrating, their brains become wired to those sensations. It is an example of how our technology is changing how our brains process information (10), (11). The results of present study appeared to be consequences of neuroplasticity.

Another theory by a professor of psychology at the University of Sydney suggested that it may actually not be so Phantom after all, but could be the sensation interpreted by the nerves on the skin caused by a very small discharge of electricity given off by the phone when it connects to a new tower. This effect is apparently known as transcutaneous electrical nerve stimulation. (6). Present study strongly contradict this theory because many students felt vibration and ringing from pocket even when, the phone in their pocket is switched off or they do not have phone in their pocket.

### **Molecular Mechanism of Phantom Vibration and Ringing Syndrome:**

A Nokia study found that the average cell phone user checks their phone every 6.5 minutes. That is 150 times during our waking hours. That kind of behavior is compulsive, bordering on obsessive. So heavy smartphone users, when unable to check their devices or entirely losing access to their devices, feel a great deal of anxiety. Phantom vibrations and ringing appear to be a symptom of this anxiety (12). Every text, every Facebook or Twitter notification is positively reinforcing, giving our brains a little spurt of dopamine (12). A dys-regulated dopamine system has a central role in psychotic symptoms such as

hallucinations (13,14,15,16,17,18). So the release of dopamine under anxiety conditions may be cause of the Phantom vibrations and ringing syndrome. This implication is supported by present work because students who spent much more time on mobile and have high emotional behavior deals more with the anxiety problem which may leads to high dopamine release.

Anxiety fact also supported by earlier studies on the internship of hospital workers which revealed that Phantom syndrome magnitude increase with the training duration and become low when training ended. This may be due to anxiety and depression which high during initial period of training and decrease as the training ended because peoples become more adapted (10), (19,20).

#### **Effect of Position of Mobile Phone on Phantom Vibration and Ringing Syndrome:**

Present work support the previous study which identified that the symptoms of Phantom syndrome directly proportional to number of hours that the phone was carried and frequency of the phone use in vibration mode (3). Also carrying the device in a shirt pocket were enhance with phantom vibration and ringing syndrome symptoms (3). This fact is also supported by present study.

#### **Consequences of Phantom Vibration and Ringing Syndrome:**

Earlier work revealed that the vibrations bothered very little or not at all to 91% peoples in survey which is supported by our study (21). Another study depicted that nine out of 10 college students does not bothered by vibration feeling (8). In our study similar result was obtained. However comparatively, the Phantom vibration syndrome bothered the students more than the Phantom ringing syndrome. Also the students who have high emotional value do more text messages and more active over the smartphone applications. Present study supported the earlier observation that the people who had strong reactions to text messages were more bothered by phantom vibration syndrome (22).

#### **Conclusion**

The results of present study revealed that the most of the postgraduate students are facing the phantom vibration and ringing syndrome on monthly basis. The frequency of Phantom Vibration and ringing Syndrome was higher in students who keep their mobile phone in shirt pocket and jean front pocket. It was also found that the student having strong

emotional behavior are more prone to these syndromes, however most of the students don't bother with it.

#### **Recommendation**

New technology is a wonderful thing, but the more reliant we become to it, the more negatively we'll be affected by it. Smartphone users are constantly connected to their work and the world around them which leads to anxiety which in turn cause dopamine imbalance leading to phantom syndrome. A great way to break these compulsive habits of checking and rechecking our phones every few minutes is to separate ourselves from our devices for about a half hour each day in order to lower the anxiety level.

The Phantom vibration and ringing syndrome can be controlled by moving the devices to another location like from the belt to the back pocket and by stop using the device in vibrate mode. Because different types of electronic devices vibrate differently, it is suggested that people should try to change to another brand of device occasionally.

#### **Limitation of the study**

Present study was only a preliminary study and was conducted on only a small population size. A more detailed study with additional parameters and large population size need to be conducted to know more about phantom vibration and ringing syndrome. Once the etiology of phantom vibration syndrome is identified, users can take steps to avoid it, or at least to ameliorate the symptoms.

#### **Relevance of the study**

The present study give the baseline on which further studies can be conducted on phantom vibration and ringing syndrome.

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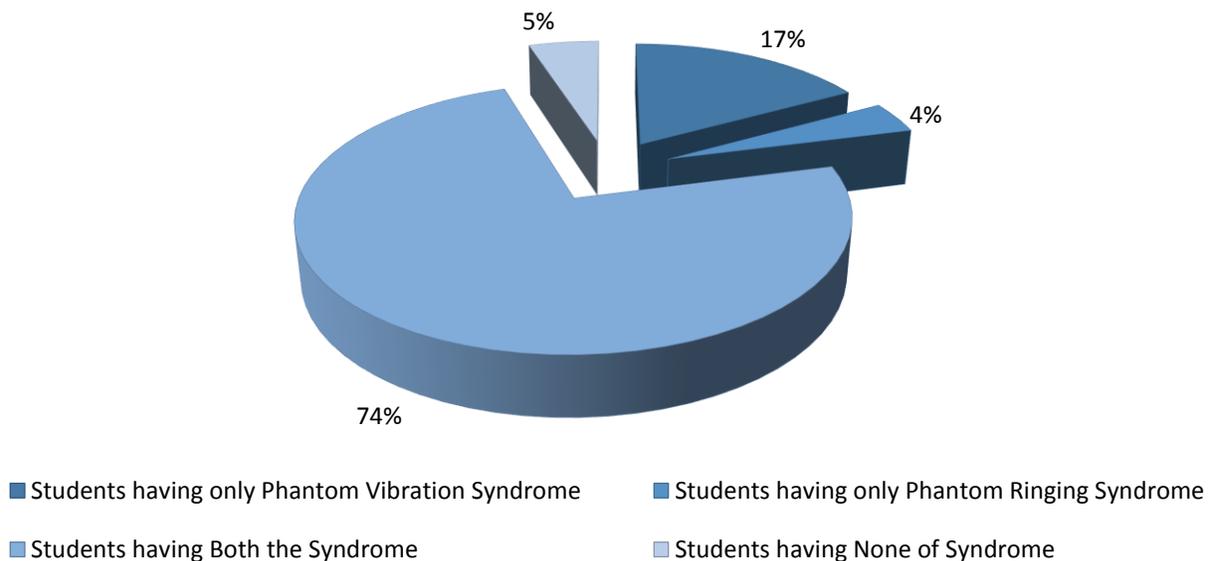
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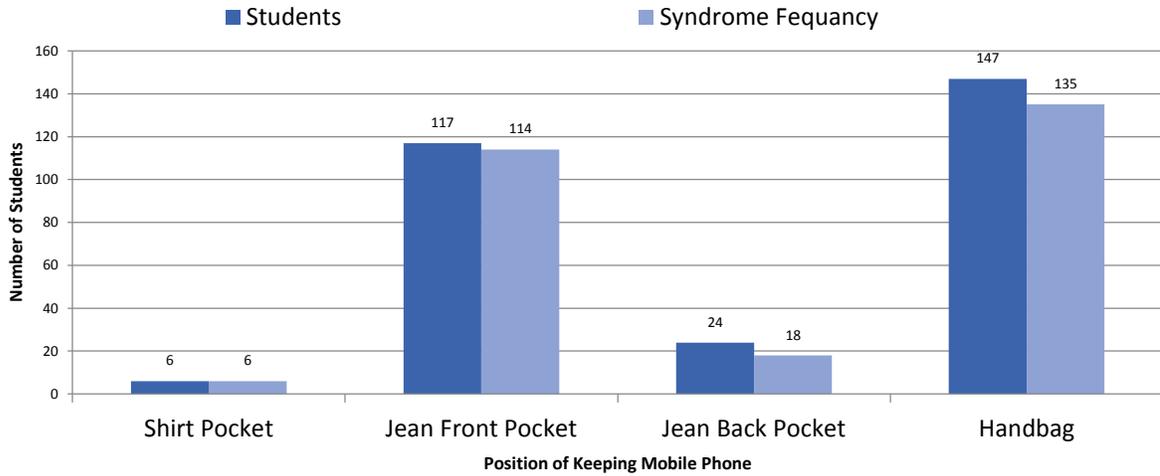
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**Figures**

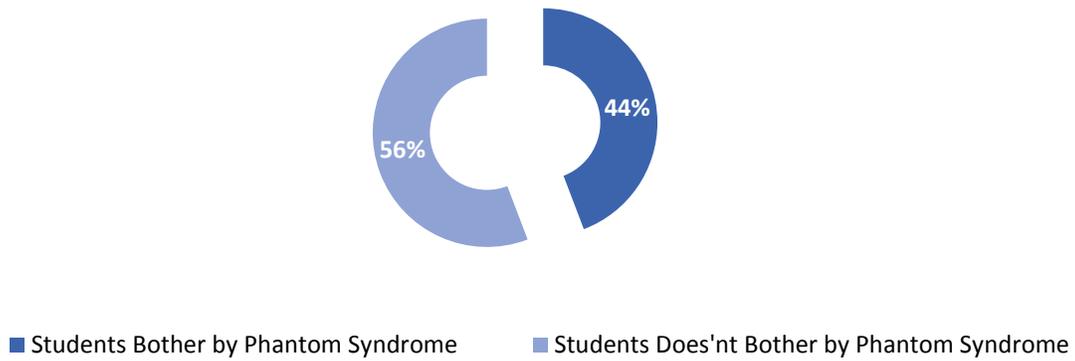
**FIGURE 1 FREQUENCY OF PHANTOM VIBRATION AND RINGING SYNDROME**



**FIGURE 2 FACTORS ASSOCIATED WITH PHANTOM VIBRATION AND RINGING SYNDROME.**



**FIGURE 3 CONSEQUENCES OF PHANTOM VIBRATION AND RINGING SYNDROME**



**FIGURE 4 DIAGRAMMATIC REPRESENTATION OF FACTORS ASSOCIATED WITH PHANTOM SYNDROME**

