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RESEARCH ARTICLE

Correlation of anxiety, depression, and socioeconomic status with phantom vibration syndrome in healthy individuals

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ABSTRACT

Background: Worldwide, an increasing number of people carry cell phones and utilize the vibration mode to ensure silence in quiet areas. Extensive use of this mode may be associated with the perception that the phone is vibrating when it is not, i.e., the phantom vibration syndrome. **Aims and Objectives:** The present study is based on the hypothesis that moderate to extreme levels of anxiety or depression and low socioeconomic status (SES) could predispose such false vibrations. The study also aims to classify the participants into respective classes based on anxiety level, depression level, and SES mentioning the prevalence of phantom vibration in each class and thereby mentioning its relationship, if any. **Materials and Methods:** A total of 258 participants were selected from GMERS Medical College, Patan, Government Nursing College, Patan, and Sheth M N Arts and Commerce College, Patan. Participants were asked to respond to self-reported questionnaires. Assessment was done using Hamilton anxiety scale, Hamilton depression scale, and modified Kuppuswamy's SES scale. Chi-square test was applied for statistical analysis to found the association of anxiety, depression, and SES with phantom vibration syndrome. **Results:** Of total participants, 34% of participants had experienced phantom vibrations from the mobile phone. The perceptions were most common among the participants who were associated with frequency of mobile use. Significant association was also found between anxiety/depression and phantom vibration which was in accordance with hypothesis of this study. The study was also based on the hypothesis that low SES could predispose to false vibrations, but we did not find any significant association between phantom vibration syndrome and SES of an individual. **Conclusion:** The present study can help to elaborate the ill effects of mobile overuse that might lead to damage in terms of intellectual and cognitive skills. It can also help to determine the factors mediating human behavioral patterns that might lead to such false sensations. A more comprehensive longitudinal study design is needed to validate the phenomena identified in this study and to explore the underlying mechanisms further.

KEY WORDS: Anxiety; Depression; Socioeconomic Status; Phantom Vibration Syndrome

INTRODUCTION

Rapid technological advancements have led to increased obsession of mobile phone among adolescents. One such concern related to obsession is "phantom vibration syndrome" which is the false sensation to a person that his/her mobile phone is vibrating when it is not. Mobile phone abuse can lead to a pathological stress that might cause phantom vibration syndrome.

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The study aims to correlate various parameters such as anxiety, depression, and socioeconomic status (SES) of an individual with the phantom vibration syndrome. The term "anxiety" refers to specific psychiatric ailments which involve extreme, intense, and persistent worry or fear for

day-to-day situations. It also includes specific phobias, panic attacks, generalized anxiety disorders, and obsessive-compulsive disorder. Depression is a specific type of mood disorder characterized by persistently loss of interest in activities causing significant impairment in daily life for more than 2 weeks. Modern lifestyle modifications inclusive of excessive work stress, disorganized sleep, unusual food habits, excessive working hours, etc., have led to increased prevalence of such disorders across the globe. According to some scientific epidemiological surveys, approximately one-third of the population is affected by an anxiety and anxiety-related disorders during their lifetime.[1] As per the WHO, depression is the 4th leading cause of disability across the globe with millions of people affected and major depression can lead to wide range of behavioral problems as well as suicidal tendencies.[2] Simultaneously with the technological advancements at its peak, the obsession for mobile usage among people can be easily seen. Thus, it becomes increasingly important to find the association of all these major disorders along with SES of an individual with the phantom vibration syndrome which clearly depicts the abuse of mobile phones.

This study can provide the insight of how the behavioral pattern of a person and his/her lifestyle would affect the mental state of that person and will also help to provide a regime for its correction allowing certain modifications with the pattern of living.

The study is based on the hypothesis that moderate to extreme levels of anxiety or depression and low SES could predispose to false vibrations. It would elaborate the current prevalence of phantom vibration, its recurring frequencies, and any specific cause that might be causing such sensations. The study also aims to classify the participants into respective classes based on anxiety level, depression level, and SES mentioning the prevalence of phantom vibration in each class and thereby mentioning its relationship, if any.

MATERIALS AND METHODS

Participants

A total of 258 participants were selected from GMERS Medical College, Patan, Government Nursing College, Patan, and Sheth M N Arts and Commerce College, Patan. Participants were asked to respond to self-reported questionnaire and return them back. The study was conducted after taking prior permission from the institutional ethical committee. Participants were duly informed about voluntary participation for the study and informed written consent was taken from all the volunteers. Before beginning of the questionnaire, the participants were asked to give their personal details including name, age, gender, institute, field of study, residential status, any major illness he/she is suffering from, and any kind of addiction he/she possesses.

Measurement

Mobile usage questionnaire

The questionnaire included the questions about how much time do the respondents spend on using mobile phone, time spent on different features, did he/she experienced any false vibrations in the past, if yes, the frequency of recurrence of such false vibrations, since when did it started and do such recurrences are associated with any specific activity of the respondent. The participants were categorized into suitable based on their daily hours of mobile usage and frequency of false vibrations.

Hamilton anxiety (HAM-A) scale

It is popular and very widely used rating scale to measure the severity of anxiety disorders in clinical practice as well as research setup. There are 14 items in the scale depending on the symptoms and each item is scored on a 5-point scale, ranging from 0 (not present) to 4 (severe). The participants were explained about the symptoms associated with anxiety. The individuals were then classified into following based on their total score: Total score 0–13=Normal individuals; 14–17=Mild anxiety; 18–24=Moderate anxiety; and 25 or more=Severe anxiety.

HAM-depression (HAM-D) scale

It has been designed to quantify a person's level of depression. Although it includes 21 items, the scoring is based on the first 17 answers. Eight items are scored on a 5-point scale, ranging from 0 = not present to 4 = severe and nine are scored from 0 to 2. On the basis of total scores, the respondents were classified into following categories: Total score 0–7=Normal; 8–13=Mild depression; 14–18= Moderate depression; 19–22=Severe depression; and more than or equal to 23=Very severe depression.

Modified kuppuswamy's SES scale

This scale is commonly used to measure SES in urban and peri-urban communities. This scale classifies the study population into upper, middle, and lower socioeconomic class based on education of head of family (scored from 1 to 7 based on different strata), occupation of head of family (scored from 1 to 10 based on different occupations), and monthly income of family (scored from 1 to 12 based on income) followed by grand total of all the three. Assessment was done as follows: Total score 26–29=Upper class; 16–25=Upper middle class; 11–15=Lower middle class; 5–10=Upper lower class; and <5=Lower class.

Statistical Analysis

The effect of phantom vibration occurrence mediated by factors of HAM-A scale, HAM-D scale, SES, hours of daily phone usage, and specific activities that predispose it was examined.

The association of anxiety, depression, and SES with phantom vibration syndrome was found by applying the Chi-square test.

RESULTS

The findings of the present study are depicted in Tables 1-7.

DISCUSSION

In the present study, it was found that approximately 34% of participants experienced the phenomenon of phantom vibrations regarding the mobile phone. The perceptions were generally found to be common among the participants who were using the mobile phone excessively. In our study, we also found an association between phantom vibration syndrome and anxiety/depression in this group of participants, but we did not find any significant association between phantom vibration syndrome and SES of an individual.

Table 1: Institute-wise distribution of phantom vibration

Institute	Vibration felt	Vibration not felt	Total
GMERS Medical College, Patan	40	123	163
Government Nursing College, Patan	35	15	50
Sheth M N Science and Commerce College, Patan	12	33	45
Total	87	171	258

Table 2: Correlation between anxiety and phantom vibration syndrome

Vibration	Anxiety		Total
	Yes	No	
Yes	22	65	87
No	14	157	171
Total	36	222	258

P-value is significant. The level of significance is at $P<0.05$

Table 3: Correlation between depression and phantom vibration syndrome

Vibration	Depression		Total
	Yes	No	
Yes	38	49	87
No	40	131	171
Total	78	180	258

P-value is significant. The level of significance is at $P<0.05$

The exact cause of such false sensation is not known. According to Dr. Michael Rothberg, the term is not a syndrome but is better characterized as a tactile hallucination.[3] It is suggested that the cerebrum may misinterpret other sensory inputs such as muscular contractions or sounds of any music or attire touch as a phone vibration when anticipating a phone call.[4] The brain starts applying filters related to what it subconsciously expects to find to deal with that substantive amount of sensory input. The study by Lin *et al*.[5] found that subjects who experienced severe phantom vibrations were generally more depressed than subjects who were experiencing subclinical level of phantom ringing only. The correlation between them establishes that cognitive mechanism has definite role in genesis of phantom vibration. Research shows that sedentary lifestyle caused generally due to social media abundance interfere with personal communication or interaction and reduced physical activity. Interrupted sleep due to the presence of blue light in mobile screen can also lead to degraded mental health.[6] Even though our study was based on the hypothesis that low SES could predispose to false vibrations, we did not find any significant association between phantom vibration syndrome and SES of an individual.

The importance of the topic is demonstrated by the connection between overusage of mobile phone and disturbed mental health. Young individuals are at higher risk of consequences of the potential harmful effects related with social media and mobile phone overusage. It is very much possible that mental health consequences developed during young adulthood can potentially prolong throughout their lifespan. In this context, it may be advisable to have a continued detailed research and subsequent exploration on the topic under consideration. Finding new insights on the method of human interactions in this era of rapid technological developments is the need of the time. A few limitations of this study can be attributed to dearth of reliable and quantifiable data about the prevalence of phantom vibration syndrome in public at large. Despite the selection of subjects from various academic institutes located in Patan district, attributes of their personality and existing individual responsibilities along with personal or academic stressors were not feasibly identified. Moreover, the derived data were based on self-reported responses and not on any direct diagnostic investigations. Therefore, appropriate and

Table 4: Correlation between socioeconomic status and phantom vibration syndrome

Vibration	Socioeconomic status					Total
	Upper class	Upper middle class	Lower middle class	Upper lower class	Lower class	
Yes	33	33	13	8	0	87
No	70	62	21	18	0	171
Total	103	95	34	26	0	258

P-value is insignificant. The level of significance is at $P<0.05$

Table 5: Percentage distribution of anxiety in those who felt vibration

Institute	Normal (%)	Mild (%)	Moderate (%)	Severe (%)	Grossly disabling
GMERS Medical College, Patan (*n*=40)	34 (85.00)	0	4 (10.00)	2 (5.00)	0
Government Nursing College, Patan (*n*=35)	24 (68.57)	8 (22.85)	2 (5.71)	1 (2.85)	0
Sheth M N Science and Commerce College, Patan (*n*=12)	7 (58.33)	4 (33.33)	1 (8.33)	0	0
Total (*n*=87)	65 (74.71)	12 (13.79)	7 (8.04)	3 (3.44)	0

Table 6: Percentage distribution of depression in those who felt vibration

Institute	Normal (%)	Mild (%)	Moderate (%)	Severe (%)	Very severe (%)
GMERS Medical College, Patan (*n*=40)	25 (62.50)	12 (30.00)	1 (2.50)	0	2 (5.00)
Government Nursing College, Patan (*n*=35)	17 (4.57)	15 (42.85)	2 (5.71)	1 (2.85)	0
Sheth M N Science and Commerce College, Patan (*n*=12)	7 (58.33)	3 (25.00)	0	1 (8.33)	1 (8.33)
Total (*n*=87)	49 (56.32)	30 (34.48)	3 (3.44)	2 (2.29)	3 (3.44)

Table 7: Percentage distribution of socioeconomic status of persons suffering from phantom vibration syndrome

Institute	Upper class (%)	Upper middle class (%)	Lower middle class (%)	Upper lower class (%)	Lower class
GMERS Medical College, Patan (*n*=40)	21 (52.50)	14 (35.00)	3 (7.50)	2 (5.00)	0
Government Nursing College, Patan (*n*=35)	11 (31.42)	15 (42.85)	5 (14.28)	4 (11.42)	0
Sheth M N Science and Commerce College, Patan (*n*=12)	1 (8.33)	4 (33.33)	5 (41.67)	2 (16.67)	0
Total (*n*=87)	33 (37.90)	33 (37.90)	13 (14.94)	8 (9.19)	0

extensive study design is required so that the phenomena identified in this study can be validated. Last but not the least, this survey represents only a solitary point of time. Better prediction about who is prone to develop phantom vibration syndrome and in what timeframe can be possible only after prospective studies further.

CONCLUSION

Millions of people worldwide carry cellular phone and majority of these devices are set on vibrate mode for some time or another. Global impact of developing phantom vibrations can be substantial even if it covers about two-thirds of the population. Effective treatment will be required even if meager proportion of those users experience severe symptoms. Hence, further elaborate research on the subject is necessary to understand genesis of phantom vibration syndrome and such modalities required to prevent it. Users can take preventive steps to avoid or ameliorate the symptoms if exact mechanism for phantom vibration syndrome is identified. Our study will help to elaborate the ill effects of mobile overuse that might lead to damage in terms of intellectual and cognitive skills. It will also help to determine the factors mediating human behavioral patterns that might lead to such false sensations. This will also help in determining the cause and mechanism of such false vibrations.

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