

Original Research Article

## Effectiveness of Laughter Therapy in Smartphone Addicts on Insomnia, Lung Functions and Flexibility

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### ABSTRACT

**Background:** The cell phone today is a lifeline for many. In India, the prevalence of smart phone addiction is 40 %. The incidence of mental health problems have increased worldwide. This has raised concerns about adverse effects of excessive mobile phone use on physical & mental health. Laughing aloud with whole body movement improves, blood circulation. Laughter therapy is easy to prescribe and do not require side-concerns with respect to allergies, dose, side effects. It is the cheapest medicine for preventing many diseases and fighting against them.

**Method:** It was an experimental study. The sample size was 30 and sampling method was purposive. Age Group of 18-24 years, males & females, Score of  $\geq 26$  on Smart phone addiction scale-short version and Score of  $\geq 6$  on Athens Insomnia Scale was the inclusion criteria. 20-30min laughter therapy was given. Outcome measures used were Athens insomnia scale, Peak expiratory flow rate and sit and reach test.

**Result:** Pre and post intervention results were compared. Paired t test was applied and p value was  $<0.05$  for all the outcome measures which was considered to be statistically significant.

**Conclusion:** The study concludes that laughter therapy was effective in smartphone addicts in reducing insomnia, improving lung functions and increasing flexibility.

**Keywords:** Laughter therapy, smart phone, insomnia, Lung functions, flexibility

### INTRODUCTION

Worldwide technology & its changes play a major role in each individual's life. The current trend of the society is to adapt every change in the field of communication technology. Mobile phone is considered as an important communication tool & became the integral part of society; it is not only a communication device but also a necessary social accessory. The cell phone today is a lifeline for many. It is estimated that around 4.5 billion people use cell phone worldwide. For youth it is more of luxury with constant texting, calling, listening to music, playing games, phone has become as integral part of lifestyle. [1] Despite its advantages of convenience & practicability, excessive use

has been associated with potential risks in people's life. Problematic mobile phone use is not a new term & it is defined as an inability to regulate one's use of mobile phone, which involves negative consequences in daily life. In India, the prevalence of smart phone addiction is 40 %. The incidence of mental health problems have increased worldwide. This has raised concerns about adverse effects of excessive mobile phone use on physical & mental health. [2] Laughter therapy started in the year 1970 and is a non-invasive, complementary, alternative therapy. Laughter therapy consists of opening, experiencing laughter and closure, and opening is warm – up time & reduces aversion to laughter by laughing variously together. Experiencing

laughter is subdivided into laughter, affirmation, thank and concentration. Laughter therapy is considered as one of the therapies which affects both the body & mind of the patients. Laughter therapy exercises are focusing on joking & laughing and used with various methods for each person. This method reduces physical stress, increases the health level & adaptability of the person. [3]

Therapeutic efficacy of laughter is mainly divided from spontaneous laughter (triggered by external stimuli or positive emotions) & self-induced laughter (triggered by oneself at will). [4]

- Psychological Benefits of laughter includes:
- Reduction in stress
- Anxiety and tension
- Elevation of mood
- Self Esteem
- Hope
- Energy and vigor
- Enhancement of memory
- Creative thinking and problem solving
- Improvement in interpersonal relationships
- Increase in friendliness and helpfulness
- Promotion of psychological well-being
- Improvement of quality of life. [5]

Laughter allows for pleasurable discharge of the accumulated energy in a socially acceptable manner without destroying the dominant social structure. [6]

Holistic benefits of Laughter :-

- Laughter put up intensely in the moment
- People who laugh don't worry as much as people who don't laugh, and as such enjoy life
- Laughter makes us feel good because it defuses the most painful emotions, by releasing them.
- Laughter lifts us up and makes life worth living.
- Laughter builds self-confidence
- Laughter puts up in control of our own emotions
- Laughter makes us feel safer & eases much of our awkwardness

- When we laugh with others, criticism seems to collapse
- Laughter is an important social skill that keeps communication fun.
- Laughter allows people to be more open with each other.
- Laughter breaks down the instinctive barrier between people. [7]

People often demonstrate poor posture when using smartphone. Poor posture has detrimental effect on lung volumes and capacities. Studies have indicated that frequent smart phone use can lead to adoption of a non-neutral neck posture or development of musculoskeletal disorders. Structural problems caused by faulty posture while using smartphone can lead to respiratory dysfunction. When used for many years with postural and respiratory compromise, it can further lead to decrease in functional capacity of the individual. [8] Prolonged smartphone usage can cause faulty posture such as forward neck posture, slouched posture or rounded shoulder. Smartphone users have decreased physical activity, which can lead to decrease in flexibility. Smartphone users tend to report pain in the neck, shoulder & thumb, as the total time spent using the smartphone increases. Studies have shown that 83% of patients with experienced a changed breathing pattern. People who used smart phones for prolonged duration had partly impaired respiratory function. Kyphotic posture caused by using smartphone for a long time can also impair respiratory function. [9] It is well documented that sleeping is a main component for solid cognitive & physical functions. Sleep has a crucial role in different aspects of life, proper sleep is especially important for children & adolescents. A number of studies have indicated that use of cell phones is associated with sleep disorders. Nightmare texting was associated with insufficient sleep. [10] Habitual use & checking one's smart phones, excessive reassurance seeking, the fear of missing important information or events, through which smartphone use can cause psychopathological symptoms such as stress & anxiety. Studies

have shown that stressful life situations generate complexities & challenges .If individual cannot respond adequately, illness can result. In order to reduce stress level no of relaxation techniques & exercises programs have been used. [11] Among these, laughter is considered as the best stress busting. Laughter as a therapy decreases the heart rate, blood pressure, relieves stress, boost the immune system by raising level of T cells Interferon and Beta cells. It also triggers the release of endorphins (natural painkiller) and produce sense of well-being hence, the need. Laughter therapy is cost effective, does not require high Technology and does not require any special place or preparations. Laughing aloud with whole body movement improves blood circulation. Laughter therapy is easy to prescribe and do not require side-concerns with respect to allergies, dose, side effects. It is the cheapest medicine for preventing many diseases and fighting against them. Respiratory system is coordinated in a precise way with laryngeal activity during a laugh. Phasic respiratory efforts are present during laughter. Laughter involves deep inspiration followed by forceful exhalation. It helps in improving the oxygen saturation in the body and improves the pulmonary function. [12]

The aim of the study was to find the effectiveness of laughter therapy on smartphone addicts on insomnia, lung functions and flexibility. The objectives of the study were to find the effect of laughter therapy on smart phones addicts on Athens Insomnia Scale, to find the effect of laughter therapy in smartphone addicts on Lung functions in terms of Peak Expiratory flow Rate, and to find the effect of Laughter therapy in smartphone addicts on Flexibility in terms of Sit & Reach test.

## **MATERIALS AND METHODS**

The study design was experimental. The study was carried out in Dr D.Y. Patil college of Physiotherapy. The sample size was 30 and sampling method was purposive. Age Group of 18-24 years, both Males & Females, Score of  $\geq 26$  on Smart phone addiction scale-short version and

Score of  $\geq 6$  on Athens Insomnia Scale was the inclusion criteria whereas individuals with diagnosed psychological disorder, difficulty in understanding & following commands, individuals with any addiction of smoking & alcoholism and individuals on any medications for sleep was the exclusion criteria. Materials used were Athens Insomnia Scale, Smart phone addiction Scale, Peak Expiratory Flow meter, Measuring Tape, and Yard Stick.

## **PROCEDURE:**

### **Laughter Therapy:**

#### **20 to 30 minute program:-**

Each bout of laughter should last for 30-40 seconds followed by clapping and “Ho Ho Ha Ha “exercise. Take two deep breaths after every laughter exercise.

Leader punctuates each activity by walking around clapping & saying several times “Ho Ho Ha Ha “ and after that group picks it up raise arms up & say “Very Good , Very Good , Vah!”.

#### **STEP 1:-**

Clapping in a rhythm 1-2, 1-2-3, along with chanting of “Ho – Ho –Ha- Ha-Ha”.

#### **STEP 2:-**

Deep breathing with inhalation through the nose and prolonged exhalation (3 times)

#### **STEP 3:-**

Shoulder neck and stretching exercises (5 times each)

#### **STEP 4:-**

Hearty Laughter:- Laughter by raising both the arms in the sky with the head tilted little backwards , feel as if laughter is coming right from your heart.

#### **STEP 5:-**

Greeting Laughter:- Joining both the hands and greeting in Indian style (Namaste) or shaking hands (Western Style) with at least 4-5 people in the group.

#### **STEP 6:-**

Appreciation Laughter:- Join your pointing finger with the thumb to make a small circle, while making gestures as if you are appreciating your group members and laughing simultaneously.

**STEP 7:-**

One meter laughter:- Move one hand over the stretched arm of the other side and extend the shoulder like stretching to shoot with a bow & arrow. The hand is moved in three jerks by chanting Ae....., Ae.....Aeee..... and then participants burst into laughter by stretching both the arms and throwing their heads a little backwards and laughing from the belly ( repeat 4 times).

Milk shake Laughter (a variation)

**STEP 8:-**

Silent Laughter (without sound):- Open your mouth wide & laugh without making any sound and look into each other's eyes & make some funny gestures.

**STEP 9:-**

Humming Laughter (with mouth closed) :- Laughter with closed mouth and a humming sound .While humming keep on moving in the group and shaking hands with different people.

**STEP 10:-**

Swinging Laughter:- Stand in a circle and move towards the center by chanting Aee.....Ooo.....Feee.....Uuuu.....

**STEP 11:-**

Lion Laughter:- Extend the tongue fully with eyes wide open and hands stretched out like the claws of a lion and laugh from the tummy.

**STEP 12 :-**

Cell Phone Laughter:- Hold an imaginary mobile phone and try to laugh, making different gestures & moving around in th group to meet different people.

**STEP 13 A:-**

Argument Laughter:- Laugh by pointing fingers at different group members as if arguing

**STEP 13 B:-**

Forgiveness/Apology Laughter:- Immediately after argument laughter catch both your ear lobes and laugh while shaking your head (Indian Style) or raise both your palms & laugh, as if saying sorry.

**STEP 14:-**

Gradient Laughter:- Gradient laughter starts with bringing a smile on the face, slowly

gentle giggles are added and intensity of laughter is increased further. Then the members gradually burst into hearty laughter and slowly & gradually bring the laughter down and stop.

**STEP 15:-**

Heart to heart laughter {Intimacy laughter}:- Come closer and hold each other's hands and laugh. One can shake hands or hug each other, whatever feels comfortable.

**CLOSING TECHNIQUE:-**

- Shouting 3 Slogans mentioned below :-
- “We are the happiest people in this world“ Y.....E.....S
- “We are the healthiest people in this world” Y.....E.....S
- “We are laughter Club members” Y.....E.....S

**Trunk Flexion (Sit-and-Reach) Test Procedure:-**

**Pretest:-**

Participant should perform a short warm-up prior to this test and include some stretches (e.g. modified hurdler's stretch. It is also recommended that the participant refrain from fast, jerky movements, which may increase the possibility of an injury. The participant's shoes should be removed.

1. For the YMCA sit-and-reach test, a yardstick is placed on the floor and tape is placed across it at a right angle to the 15-inch mark. The participant sits with the yardstick between the legs, with legs extended at right angles to the tapped line on the floor .Heels of the feet should touch the edge of the taped line and be about 10 to 12 inches apart.
2. The participant should slowly reach forward with both hands as far as possible, holding this position momentarily. Be sure that the participant keeps the hands parallel and does not lead with one hand. Fingertips can be overlapped and should be in contact with the yardstick for measuring portion of the sit-and –reach box.

- The score is the most distant point (in inches or centimeters) reached with the fingertips. The best of three trials should be recorded. To assist with the best attempt the participant should exhale and drop the head between the arms when reaching. Testers should ensure that the knees of the participant stay extended however, the participant's knees should not be pressed down. The participant should breathe normally during the test and should not hold his or her breath at any time.

### PEAK EXPIRATORY FLOW RATE:-

- Take a deep breath and put the mouthpiece in your mouth. Seal your lips and teeth tightly around the mouthpiece.
- Blow out as hard and as fast as you can. A "fast blast" is better than a "slow blow".
- Note the number where the sliding pointer has stopped on the scale.
- Reset the pointer to 0.
- Repeat this 3 times. The 3 readings should be close together. If not, adjust your technique.
- If you cough during a measurement, repeat the measurement.
- Record only the highest of the 3 readings in a notebook. Do not average the numbers together. The highest number is called your peak flow or personal best.
- Use the peak flow meter once a day. Measure peak flows about the same time each day.
- Clean and care for your meter as instructed.
- By using peak flow calculator, calculate the predicted value of the normal peak flow rate.

### PEAK FLOW READINGS:-

Peak flow readings are often classified into 3 zones of measurement according to the American Lung Association

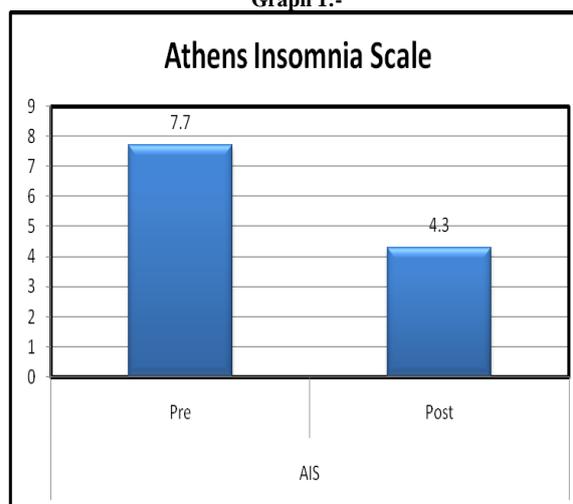
- Green:** - This means, "go". You should continue to follow your asthma plan as directed by your healthcare provider.
- Yellow:** - This means "caution" or "slow down." You should tell your healthcare provider at this time. He or she may tell you to increase or change your medicines. He or she may give you other instructions to help keep your symptoms from getting worse.
- Red:** - This means, "stop". This is a medical emergency. You should get help right away. Take your rescue medicine and call your healthcare provider or go to an emergency room.

## STATISTICS AND RESULTS

Table 1: ATHENS INSOMNIA SCALE:-

	PRE	POST	t	P	Inference
AIS	7.7 ± 1.7	4.3 ± 0.8	11.7	<0.05	Significant

Graph 1:-



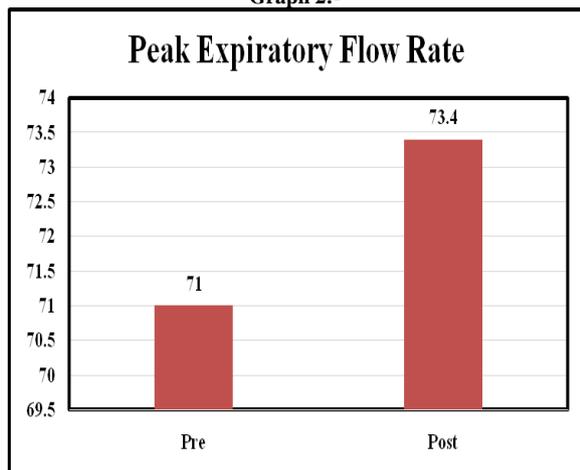
### Interpretation:-

Table 1 and Graph 1 show analysis of laughter therapy on Athens Insomnia scale. Paired t test was applied and the result shows statistically significant change pre & post intervention as  $p < 0.05$ . This shows that laughter therapy was effective in reducing insomnia.

Table 2: PEAK EXPIRATORY FLOW RATE:-

	PRE	POST	t	P	Inference
PEFR	71 ± 14.3	73.4 ± 14.2	3.64	<0.05	Significant

Graph 2:-

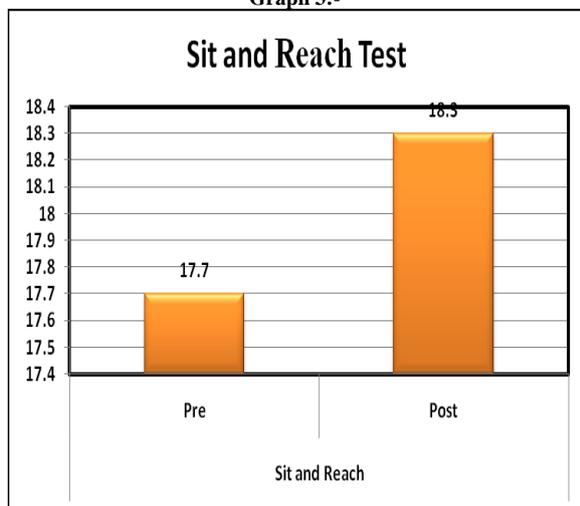


**Interpretation:-** Table 2 and Graph 2 show analysis of Laughter therapy on Peak Expiratory Flow Rate. Paired t test was applied and the result shows statistically significant change pre and post intervention as  $p < 0.05$ . This shows that laughter therapy was effective in improving the lung functions of smartphone addicts.

Table 3: SIT AND REACH TEST:-

	PRE	POST	t	P	Inference
Sit & Reach	17.7 ± 1.8	18.3 ± 2.4	2.62	<0.05	Significant

Graph 3:-



**Interpretation:-** Table 3 and Graph 3 show analysis of Laughter therapy on Flexibility. Paired t test was applied & the result shows statistically significant change pre and post intervention as  $p < 0.05$ . This shows that Laughter therapy was effective in increasing the flexibility of the smartphone addicts.

## DISCUSSION

The objective of the study was to find the effectiveness of laughter therapy in smartphone addicts on insomnia, lung functions and flexibility. [Table 1 and Graph 1] shows that laughter therapy was effective in reducing insomnia pre and post intervention. The reason behind it may be Anxiety, stress and depression are the most common causes of insomnia, so while laughing endorphin & serotonin which control anxiety and depression are secreted, which in turn will improve quality of sleep.

It may also be due to physical movement including stretching exercises to enhance the upper and lower extremities. [13]

Lee and colleagues stated that sleep has a significant correlation with physical activity, adding exercises of upper and lower extremities to the therapy, appeared to improve sleep. [13]

Stacy (2011) stated that 15 minutes of laughter is equal to benefits of two hours of sleep. [14]

Shahidi (2008), claimed that the release of energy is an enjoyable experience that is expressed as a laugh thereby reducing tension and stress, which in turn will improve the quality of sleep. [15]

According to group of researchers from Japan, claimed that laughing in the evening causes the body to produce more melatonin (hormone released by the brain at sleep on set) which will help relieve insomnia, while improving quality of sleep.

[Table 2 & Graph 2] shows that laughter therapy was effective in improving the lung functions of the smart phone addicts pre & post intervention. The reason behind it may be, Respiratory system is coordinated in a precise way with laryngeal activity during a laugh.

Phasic respiratory efforts are present during laughter. Due to increased respiratory muscle strength by regular laughter therapy, indirectly there is peak increase in the scores of PEFR post intervention. Study supporting this result was done by authors Supekar N, et al (2014). [4]

Laughter is good for the lungs overall as it provides an aerobic workout for the diaphragm. Laughter empties the lungs of more air than they take in, which result in a cleansing effect in much the same way that an act of deep breathing does. Study supporting this result was done by authors Dhamak K, et al (2011).<sup>[16]</sup> Laughter starts with the contraction of approximately fifteen facial muscles. The contractions of muscles continue down the body to the contraction of Diaphragm & other skeletal muscles found in the abdomen and around the lungs. This last contraction of muscles lower in the body is responsible for the sound of laughter. Changes can occur in respiratory patterns as well as increased contraction of muscles all over the body with dose of strong laughter study supporting this result was done by Sahakian & Frishman (2007).<sup>[5]</sup>

[Table 3 & Graph 3] shows that laughter therapy was effective in increasing the flexibility of the smart-phone addicts pre & post intervention. Self-Stretching like exercises of neck, shoulder, pectoralis major muscle, upper trapezius muscle and self-hamstring stretch improved flexibility which in turn reduces the chances of having musculoskeletal ailments, pains, gait limitation and risks of falling.

Cunha et al<sup>[4]</sup> found that stretching adds to functional fitness, helping to stay agile and independent as long as possible, improving general health.

Static stretching is preferred to create long lasting lengthening of muscles and surrounding tissue.

Physical activity improves patient's ability to perform tasks and patient's perception of impact of disability on their physical functioning.<sup>[4]</sup> A good belly laugh exercises the diaphragm, contracts the abs and even works out the shoulders, leaving muscles more relaxed afterwards.

The stretching of a muscle fiber begins with the sarcomere, the basic unit of contraction in the muscle fiber. As the sarcomere contracts, the area of the overlap between the thick & thin myofilaments

increases. So, it stretches, this area of overlap decreases, allowing the muscle fiber to elongate. Once the muscle fiber is at its maximum resting length, additional stretching places force on the surrounding connective tissues. As the tension increases the collagen fibers in the connective tissue align themselves along the same line of force as the tension. So, as you continue to stretch, the muscle fiber is pulled out to its full length sarcomere by sarcomere, & then the connective tissue takes up the remaining slack. When this occurs, it may help to realign any disorganized fibers in direction of the tension.<sup>[17]</sup> Small sample size, and only females completed the protocol (because males did not complete the protocol till the end). Comparison between males and females can be done, other outcome measures can be used, and the study can be carried out in other populations.

## CONCLUSION

The study concludes that laughter therapy was effective in smartphone addicts in reducing insomnia, improving lung functions and in increasing flexibility.

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