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Research Article

EFFECTIVENESS OF GAME BASED BREATHING EXERCISES VERSUS CONVENTIONAL PHYSIOTHERAPY TREATMENT WITH ERGONOMIC ADVICES ON IMPROVING PULMONARY FUNCTION IN SMART PHONE ADDICTED YOUNG ADULTS

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A R T I C L E I N F O

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A B S T R A C T

Background: Smartphone user's numbers are more grown up worldwide. Overuse ought to cause musculoskeletal troubles. These issues because of defective posture can also result in pulmonary disorder related to the extended use of smart phones. The study is aimed to determine the effectiveness of Game based breathing exercises versus conventional physiotherapy treatment and to find out which treatment protocol is better in to improve respiratory function in smart phone addicted subjects in young adults.

Material and Methodology: Total 76 Subjects were selected according to inclusion and exclusion criteria and divided into 2 groups. Group A had given Game based breathing exercise and group B performed the Conventional physiotherapy treatment. Protocol followed by 5 days for 6 weeks. The outcome measure PFT taken at 0 day of treatment and after last day of treatment.

Conclusion: Study concluded that the both group are significant in improving pulmonary function. Statistically, inter group analysis: the comparison of post treatment score for pulmonary function shows that P-value at <0.05 is significant for group A. Game based breathing exercise having more significant improvement rather than conventional physiotherapy treatment in smart phone addicted young adults.

INTRODUCTION

The smart phone makes life easy like communication, camera entertainment, education as well as it has some disadvantage also like health issues, addiction, and social distraction. The negative aspects of Smartphone overuse have been emerging as a major topic of interest in young adults. Smartphone Overuse ought to cause musculoskeletal troubles and reduced pastime in telephone users might also have an effect on their pulmonary function.[1]

The majority of the users are in the age group of 15 to 25 years. Some people are use the cell phones so excessively that it assumes the shape of addiction. The Cell telephones are arising with type of talents like net get proper of access to, sending e-mails, playing, usage of networking sites like face-e-book, taking note of song, gambling FM, reading library and so forth.

Some people are the use of the cellular telephones so severely that it like the shape of addiction with the growing Use of mobiles, worries have too accelerated approximately musculoskeletal troubles like, Ache within the neck, shoulder and thumb, and the severity of the signs of incorrect posture together with ahead neck posture, slouched posture, or rounded shoulders.[2]

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Sustained ahead neck posture can motive harm to the shape of the cervical and lumbar backbone, as well as ligaments. These issues because of defective posture can also result in pulmonary disorder related to the extended use of smartphones.[3,4]

Virtual game systems (VGS) are a progressive way to inhibit bodily activity, and were brought as a healing modality inside the rehabilitation environment. VGS Can provide same exercise to that to be had in conventional rehabilitation settings, extra studies is needed to evaluate whether it will improve adherence to everyday workouts at home.[5,6,7]

Stanford University gives ergonomics guidance for smart phones that Use fingers free devices to take away offensive, static postures at some stage in lengthy cell phone calls.[8]

METHODOLOGY

This experimental study is to evaluate the effectiveness of Game based breathing exercises versus conventional physiotherapy treatment to improve respiratory function in smart phone addicted in young adults. This study was conducted in Parul Sevashram Hospital Limda, Vadodara. Samples of 76 outdoor subjects between the ages of 18-35 years were included in the study. The subject who met the inclusion criteria was included in the study. An informed

written consent from the subject was taken. Initial cardio-respiratory assessment is done and subjects were divided into 38 in each group by using chit method. Group A(Game based breathing exercise) n=38 and Group B (Conventional physiotherapy treatment) n=38. The study was approved and conducted between 2018 and 2020 in accordance to the guidelines of the Parul University Institutional Ethics Committee for Human Research (PU – IECHR). The study is carried out for the duration of 6 months the protocol for both the group is 5 days in a week for 6 weeks. Evaluation is taken before start of the treatment and at the end of the treatment with the use of pulmonary function test.

Inclusion Criteria: Both gender included with 18 to 35 years of age, Subjectwho is able to understand and follow simple verbal instruction, Subjects should have addiction of smart phones according to smart addiction scale.(Likert)

Exclusion Criteria: History of severe cardio pulmonary disease, Significant perceptual, cognitive, or communication impairments, Pregnancy, Presence of severe optical disability as well as optical field defects, Receiving anycardiopulmonary fitness training, Facial palsy (more than grade II according to House Brackmamm Classification of facial palsy), Smokers.

Procedure

Treatment duration of both the groups was 30 minutes for 5 days for 6 weeks. Initially Smart phone Addiction scale was done and subjects were divided into 38 into each group by using chit methods. Both the groups were received 05 minute breathing control at the start as well as end of the treatment period of treatment.

Group A (Game Based Breathing Exercise)

The breathing game was used it consists of a game application that wasdownloaded to a smart phones as well as a headset. Once the sport software is started, the sensor inside the headset acknowledges the patient's respiration, which initiates the game, depending on the breathing pressure and the rhythm of the breathing cycle. This application instructs how to perform game based breathing. This game application includes 05 various games along with blowing a balloon (In which they instruct the subject to take long breath and expired air inside the microphone), flying a kite (give blow in microphone to fly the kite), an airplane, and windmill. Every game has 10 repetitions and was provide the inhalation period, and were provide the inhalation periods, the longest exhalation periods and the game scores will be recorded. With this subject improve the respiration. In breathing control we gave instruction do deep inhalation followed by holding breath for few second as much as patient can do and then relax by exhaling.

Group B (Conventional Physiotherapy Treatment)

Firstly we give 5 minutes breathing control techniques than 20 minutes we include spirometer exercise give break and diaphragmatic breathing exercise.For breathing control exercise we follow same step as we done in game based breathing exercise.

spirometer exercises instruction given with images and videos. Hold the spirometer in upright position. 3 times deep inspiration and 3 times deep expiration. In inspiration subject was guided while taking deep breath via mouthpiece the 3 balls are move upwards. Then ask them to invert the spirometer as the connecting tube comes upward and then blow the air inside so the ball moves upwards.

Diaphragmatic breathing exercise

Patient position: a relaxed and comfortable position in which gravity assists the diaphragm, such as a semi fowler's position. Therapist position: Side of the patient's bed.

Instruction to the patient:Place the hand on the rectus abdominis (abdomin) just below the anterior costal margin; breathe in slowly and deeply through the nose. Keep the shoulders relaxed and upper chest quiet, allowing the abdomen to rise slightly. Relax and exhale slowly through the mouth.
Ergonomic advice for both the groups was same.

Avoid distracted smart phone use while strolling, driving, or biking.

Possible solution

- Smartphones and tablets should not be used for extended computer work - use a desktop/laptop computer and ensure a proper ergonomic setup. Phone Setup Use fingers unfastened gadgets to eliminate awkward, static postures at some stage in long telephone calls. Tablet Setup
- For tremendous text entry (e.g. Emails, assembly notes), use a separate keyboard and prop the tablet on a stand to improve the viewing angle.
- Sync the tablet with a well matched computer screen or television to enhance neck posture and wide display size. Place the pill keyboard in a position that permits the shoulders to relax and the elbows to rest at the edges. Work Practices • Limit duration and frequency of calls, texts, and emails. Take frequent micro breaks from phones/tablets. Alternate fingers when using buttons/touch screens. Reduce keystrokes with textual content shortcuts (seek "text shortcuts" for your web browser), or wherein viable, use speech-recognition packages. Maintain impartial wrist posture and alternate arms while keeping devices. For tablets, bear in mind instances with hand straps to lessen gripping.
- Focus on neck posture - avoid excessive looking down when analyzing emails or texts.

Statistical Analysis

Descriptive statistical analysis was accomplished in the present study. Outcome measurement was measured using pulmonary function test. Significance were assessed at 5% level of significance $p<0.05$(2 tailed hypothesis test considered).

Statistical tests

Paired't' test as a parametric was used for analysis through pulmonary function test variables within the group A and group B with calculation of percentage of change. Independent't' test as a parametric was accustomed analysis the means of pulmonary function test variables between the group with calculation of percentage of difference between the means.

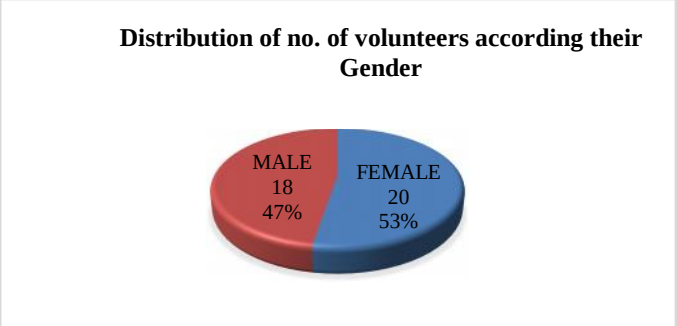
Statistical software

The statistical software namely SPSS 20 was accustomed used for the compare of the data, Micro soft Word and Excel was accustomed develop linear representation, tables etc.

RESULT

Tabular Presentation

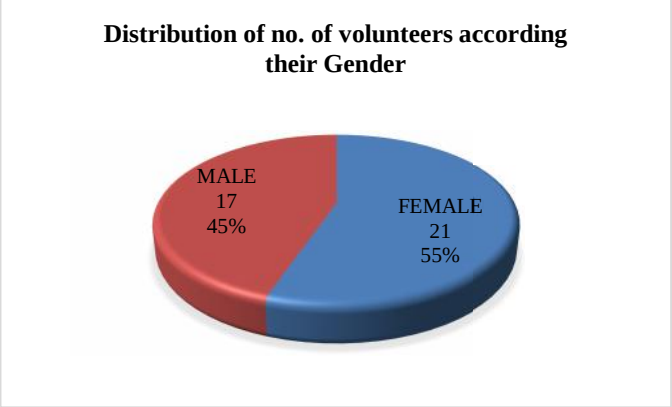
Group – A



Graph no 1

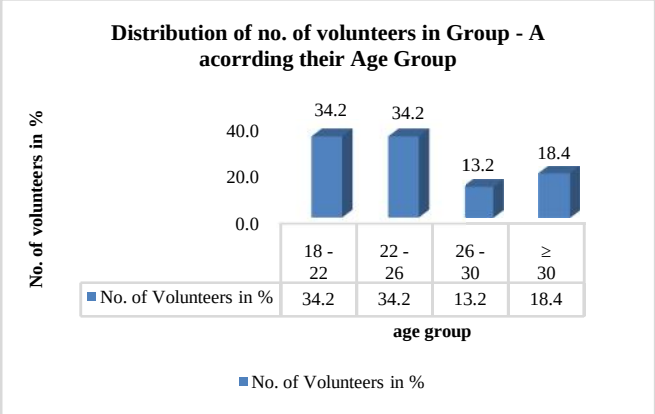
Conclusion: In group – A, 48% volunteers are male and 53% are female.

Group – B



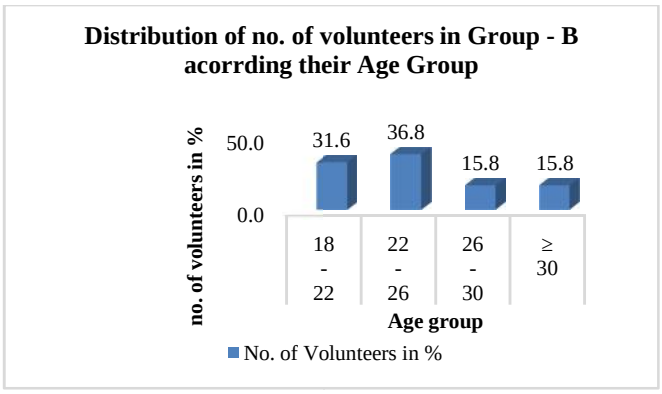
Graph no.2

Conclusion: In group – B, 45% volunteers are males and 55% are females.



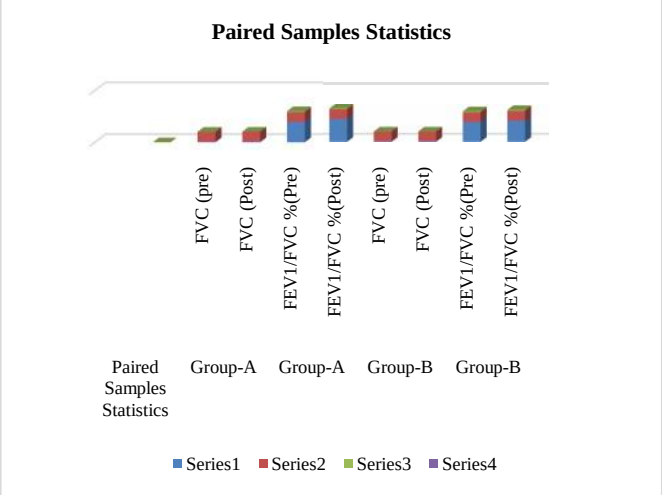
Graph no.3

Conclusion: In group – A, Age group 18 – 22 and 22 – 26 have same no. of volunteers i.e. both age groups have 34.2% no. of volunteers, Age group 26 – 30 have 13.2% no. of volunteers and 18.4% no. volunteers have their age ≥ 30.

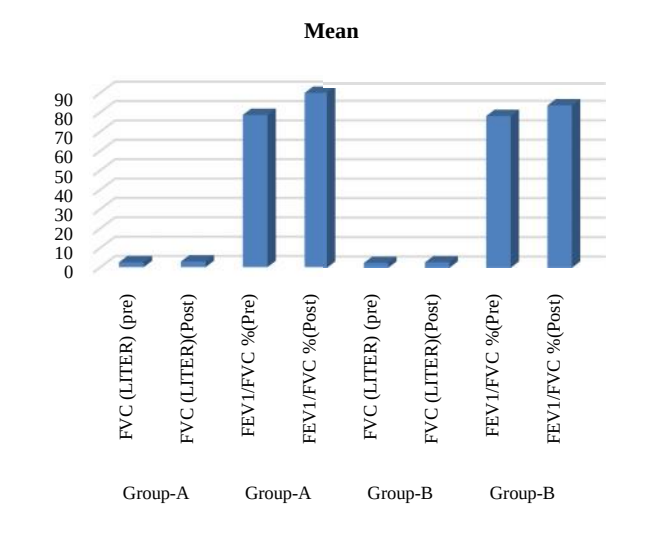


Graph no 4

Conclusion: In group – B, Age group 18 – 22 have 31.6% no. of volunteers, Age group 22 – 26 have majority no. of volunteers i.e. 36.8% no. of volunteers, Age group 26 – 30 and ≥ 30 both have same no. of volunteers i.e. 15.8% no. of volunteers.



Graph no 5



Graph no 6

Conclusion: In intra group analysis Group A having 0.05 litter more improvement and in comparison of FEV1/FVC ratio in both groups. In that group A having 6.56% more effective than group B.

DISCUSSION

The purpose of our instant research was to determine effectiveness of game based breathing exercises versus conventional physiotherapy treatment with ergonomic advices on improving pulmonary function in smart phone addicted young adults. Research has shown that pulmonary function problems are common in smart phone addicted who are using more smart phone have a high prevalence of pulmonary dysfunction. So for that this study was conducted in which for the improvement of pulmonary function we gave them 2 different kinds of treatment in which one was game based breathing exercise and other side conventional physiotherapy treatment given. Total 76 subjects were taken.

They provided treatment for the 6 weeks for 5 days. All the subjects were observed through the side of respiratory function. We took the pulmonary function test for checking the pre and post measurement of pulmonary function. After the 6 week protocol we seen that both treatment are effective but the game based breathing exercise is higher efficient than the conventional physiotherapy. As we found that the interest in game based breathing exercise is more than the conventional physiotherapy treatment. They felt easier to perform no need of guidelines every time even app give the command as well as they can see how much they can inspire as well as expires, so whenever they perform they try to improve and want highest score in game. In conventional physiotherapy they need guideline more for performance and they need more supervision during these exercise. Statistically, intra group analysis: the comparison of pre and post treatment scores for pulmonary function shows that P-value is <0.05 for PFT (Pulmonary function test) in both group which suggest that both groups are significant in improving pulmonary function. Long term effects of smart phone usage with inappropriate postures they involve the complications of pulmonary function which lately leads pulmonary disorder. For the prevention of that there are different ergonomics exercise is there in which I choose the comfortable for them game based breathing exercise and conventional physiotherapy treatment. In game based breathing exercise there is easy and free application we downloaded on smart phone as well as in laptop with proper posture designing. Application had its own command for the exercise so easy to perform and in game there is scoring system so subject inspires to improve the self for the best score. In conventional physiotherapy treatment we taught them different kind of breathing exercise like diaphragmatic breathing exercise, pulsed lip breathing exercise.

CONCLUSION

This study supports alternative hypothesis that group A game based breathing exercise improves the pulmonary function more than conventional physiotherapy treatment. Statistically, intra group analysis: the comparison about pre and post treatment scores for pulmonary function shows that P-value is significant <0.05 for PFT (Pulmonary function test) in both groups.

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