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EFFECTIVENESS OF RESPIRATORY MUSCLE TRAINING AMONG SMART PHONE USERS IN COLLEGIATES

Physiotherapy

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ABSTRACT

Background: Prolong usage of smartphone leads to musculoskeletal disorders such as upper cross syndrome or otherwise called as forward head posture or text neck. Prolonged improper posture leads to increased load on the cervical muscles and joints which leads to reduction of cervical muscle strength followed by weakening of respiratory muscles and alters the expansion of thoracic spine during inspiration and to rest during exhalation. **Materials and methods:** 50 participants were selected and they were divided into two groups (Group A, Group B) each group consisted of 25 participants. Lung functions (Forced vital capacity and forced expiratory volume in one second of both groups (Group A, Group B) were measured using spirometer (pre test and post tests). **Conclusion:** Group-A (stretching) has improved significantly than Group-B (controlled breathing exercise).so it is concluded statistically that group-A (stretching) improved respiratory functions among smartphone using collegiate.

KEYWORDS

Respiratory muscle training, pulmonary function, smart phone users, spirometer.

INTRODUCTION:

Recently the number of smartphone users has been increasing worldwide. The total number of smartphone users among worldwide is about 6.1 billion worldwide [1]. With the introduction of modern technologies such as new age computers and other communication devices such as hand held devices like smart phones are available to everyone even youths. Individuals frequently use these devices in a bad sitting posture[2].It is stated that different postures such as forward head postures have shown altered breathing mechanism.

Prolong usage of smartphone leads to musculoskeletal disorders such as upper cross syndrome or otherwise called as forward head posture or text neck. This leads to tightening of upper trapezius muscles, pectoralis major muscle and weakening of muscles used for cervical flexion [3]

The forward head posture is a poor habitual neck posture that is defined by hyperextension of the upper cervical vertebrae and forward translation of the cervical vertebrae and the centre of the gravity of head in this posture is positioned at the front rather than the vertebral body. [4]

Prolonged improper posture leads to increased load on the cervical muscles and joints which leads to reduction of cervical muscle strength followed by weakening of respiratory muscles and alters the expansion of thoracic spine during inspiration and to rest during exhalation [5]

Such posture leads to weakness of the respiratory muscles and decreases lung capacity and normal respiration is a very intricate function which consists of mechanical and non mechanical components.

Forward head posture is one of the most common musculoskeletal disorders associated with the hand held techniques .When the head comes forward muscles in the front of the neck and immediately below the head at the back contracts.

The scalene muscle and the sternocleidomastoid muscles are flexors of the neck and play a vital role in the posture control of neck [6] .This muscles also acts as an inspiratory muscle .This helps to lift the chest wall with breathing. Prolong forward head posture shortens and weakens these muscles resulting in weakened breathing. Forced vital capacity and forced expiratory volume in 1 second and the accessory respiratory muscle activity is said to be affected.

In addition forward head posture is known to have a large influence on respiratory function by weakening the respiratory muscles .The sternocleidomastoid muscle, scalene muscle, upper trapezius, pectoralis major, serratus anterior, latismus dorsi are important accessory muscles involved in inspiration. Hence a forward head posture shortens, weakens these muscles and decreases their respiratory function [7].

Accessory muscles of respiration are those muscles which assist in respiration. Accessory muscles are the sternocleidomastoid, upper trapezius , pectoralis major, scalene ,serratus anterior, latismus dorsi.

PROCEDURE:

70 smartphone using college students for more than 1 hour/day were selected. After getting the informed consent from the participants, based on inclusion criteria and exclusion criteria 50 participants were selected and they were divided into two groups (Group A, Group B) each group consisted of 25 participants. INCLUSION CRITERIA: Age: 19-25 , Smartphone users of one year (one hour per day) EXCLUSION CRITERIA: orthopedic conditions , Herniated disc, Rheumatiod arthritis, History of cervical fracture , Cardiac conditions , COPD exacerbation, Neurological conditions, Cervical Rediculopathy.

Lung functions (Forced vital capacity and forced expiratory volume in one second of both groups (Group A, Group B) were measured using spirometer (pre test and post tests).

Group A was given stretching (to accessory muscles)
Duration : 15seconds/Muscles
Repetitions : 10 times/Minute
Frequency : 4 times a week

Group B was given control breathing exercises
4:6ratio, 6 cycles (per minute)
Repetitions: 10 times
Frequency: 4 times a week.

After the intervention period, the lung functions values (Forced vital capacity and Forced expiratory volume in 1second) of both the groups (A, B) were evaluated by using spirometer (post-test).

Pre and post values of both groups (A, B) were statistically analysed and results were interpreted.

RESULT:

The mean values for (Group A) FVC was P<O.0006 and t-value was 3.9287 and FEV1 was P<0.0008 and t-value 3.8362. The mean value located for (Group B) FVC was P<0.0024 and tvalue 3.3812 and FEV1 was P<0.2595 and t- value 1.1547.

DISCUSSION:

Frequent smartphone use can lead to adaption of a non-neutral neck posture or development of musculoskeletal disorders. people use it with head shifted forward and the smart phones placed on waist or lap

in difficulty and reduces respiratory function.

Flexed posture of head will lead to intense stiffness in the accessory respiratory muscles which will lead to reduction of forced vital capacity. Stretching exercises increase joint mobility of thoracic cage and thereby further improves pulmonary functions NA KYUNG LEE el al. stated that the variables of the respiratory function showed significant improvement in the exercise group the result could be explain that the correlated effect of facilitated respiratory muscles (sternocleidomastoid, scalene, serratus anterior, trapezius) these muscles are also known as accessory muscles of respiration.

This facilitated muscles influence the improvement of respiratory function. This study showed that proper exercises could be a good method of improving respiratory function.

REKHA K et al. provided evidence for 4 weeks of stretching and control breathing exercise which enhances the function of accessory respiratory muscles.

This study was done to determines the effectiveness of respiratory muscle training in smartphone users among collegiate

CONCLUSION:

As per the statistical report by comparing both the group, Group-A (stretching) has improved significantly than Group-B (controlled breathing exercise).so it is concluded statistically that group-A (stretching) improved respiratory functions among smartphone using collegiate.

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