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Preventive Respiratory Physiotherapy with Incentive in spirometer assistance in School Teachers EBI Adventist Education Center

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Abstract— *There are several factors that can cause us to have any disease, with those of the cardiorespiratory system is no different. They can arise by genetic inheritance, viroses and bacteria. Prevention in such cases is essential. Directly with the speech, the cardiorespiratory system of the teachers must be worked, be it of rehabilitative or preventive form. The* ***objective*** *of this work was to preempt the activities with respiratory exercises to strengthen and stretch the muscles responsible for breathing.* ***Materials and methods****: stretches, exercises, Respiron® and explanatory folders of how to perform the breathing exercises were used in a closed room with a maximum of 5 teachers at a time, so that there was relaxation.* ***Results****: The entire group of teachers performed the exercises, and they reported that there was a significant decrease in stress in the classroom, and improved sleep.* ***Conclusion****: it was concluded that with the exercises and stretches, the improvement occurred in the cardiorespiratory system, in the quality of life, as well as in the classroom.*

Keywords— ***Cardiorespiratory system, prevention, teachers, exercises, stretching.***

I. INTRODUCTION

Twenty-eight centuries ago, the first cardiopulmonary resuscitation was recorded in ancient Babylon and ancient Egypt, which they considered to be one of the four basic elements. Over time, new forms of prevention, identification and treatment for cardiopulmonary system dysfunction have emerged [1].

Cardiorespiratory diseases can arise in a variety of ways, be they from generic inheritance, viruses and bacteria, unhealthy acts such as smoking, and breathing in unclean air (with smoke from factories, automobiles, etc.) [1].

There are ways to prevent respiratory illnesses such as: not smoking, wearing safety equipment in factories, always washing your hands, taking regular vaccinations that are offered annually and others for lung disease, staying away when a person has a cough or flu, and keeping same distance when you have the flu [1].

Other forms of prevention are breathing exercises performed by health professionals on patients, improving thoracopulmonary expandability, oxygenation, ventilation, volumes and capacities, and compliance [1]. Although this prevention process is still under construction, it has been observed that the physiotherapist has been showing an increasing participation in primary care services. its functions and attributions are constituted by a set of health actions, which includes prevention, as well as kinesio-functional diagnosis, treatment, rehabilitation and health maintenance [2], which is provided for in the Federal Council of Physiotherapy and Occupational Therapy [3].

In this context, physiotherapy works in the prevention of the cardiorespiratory system with stretches that help the flexibility of the responsible muscles, making the breathing lighter and quieter.

According to Deliberato [4], the meaning of the word prevention in health, despite the problems in

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conceptualizing it, is certainly broader than simply defining it as "the act of preventing something from happening".

There are three levels of prevention: primary, secondary and tertiary prevention. Also according to the author, the primary level of prevention is applicable during the pre-pathogenesis period, that is, when the individual is in an optimal state of health or at least suboptimal health. The secondary level of prevention can be characterized when the body already has changes in form and function that is in the pathogenesis period and in real illness. At the tertiary level of prevention, it is established when the individual with the disease has gone through the previous stages, remaining with a residual sequel and / or disability that need to be minimized, to avoid total disability after anatomical changes and physiological are already more or less stabilized.

Preventive respiratory physiotherapy serves to prevent diseases that may appear in the future, as well as improving the current and future quality of life of the individual. Corrects incorrect postures that often hinder the movements required for complete breathing. It works directly with the muscles that aid in breathing, making them better able to perform their functions in the cardiorespiratory system.

According to Costa e Silva [5], health education, global and specific physical exercises, postural orientations, performed both individually and in groups, can be defined as primary physical therapy measures to treat motor aging. This preventive physical therapy approach decreases medication use, improves functional capacity, thus stimulating the improvement of quality of life.

The incentive inspirometer, also called Respiron®, is used to strengthen inspiratory muscles and restore lung capacity and volume [1]. Respiron® is an easy to use, portable and portable device. It consists of three transparent tubes, each of which houses a sphere. The tubes are interconnected, providing difficulty in inspiring with a dynamic flow, when we put our mouth in the mouthpiece and inhale the spheres form a visual incentive [1]. It is suitable for all people and can be used preventively or rehabilitatively [1]. The difficulty of the encourager can be regulated, with each frequency going to the individual's ability [1].

The role of preventive respiratory physiotherapy in health promotion in patients without respiratory disease aims to improve quality of life, improve cardiorespiratory conditioning, improve blood circulation, posture, thus avoiding future removal from their workplace by this type of pathology.

In this context, the objective of this study was to develop a preventive respiratory physiotherapy protocol to improve teachers' quality of life through the practice of physiotherapeutic maneuvers to prevent cardiorespiratory diseases at the Caçador-SC Adventist School.

II. THEORETICAL REFERENCE

HISTORY OF RESPIRATORY PHYSIOTHERAPY

Several techniques for treating respiratory therapy have made the profession of respiratory therapist evolving in the twentieth century. Forms of treatment and diagnosis emerged, with the need for a healthcare professional to perform them, the so-called oxygen technicians, in 1940 [1].

2.1 RESPIRATORY SYSTEM

Even before the human being is born the respiratory system already works, not for the purpose of gas exchange, but during pregnancy, develops for this function after birth.

Lung respiration is the exchange between atmospheric gas and blood (O^2 absorption and CO^2 excretion). For this to occur, the gas is brought close to the blood flow through the pulmonary circulatory system, allowing a simple diffusion gas exchange [1].

To treat the respiratory system, the physical therapist must have a great knowledge of respiratory physiology. The system is processed by pressure variations that occur from the nose to the alveolus and from the nose to the pulmonary capillary [6].

According to Azeredo [6], we can compare our respiratory system with a pump, which without realizing it, the gas goes in and out of the lungs, and the respiratory muscles are the main "pumpers".

Each of these muscles are indispensable in breathing.

The diaphragm is responsible for lowering the dome with increasing pressure and shifting the abdominal wall outward. It is the main breathing muscle [6].

The intercostals prevent paradoxical movement of the rib cage by stabilizing it. [6].

Responsible for chest elevation and expansion, scalenes also prevent paradoxical movement [6].

Sternocleidomastoid is activated when ventilation is increased, so it is an accessory muscle [6].

Coughing and forced exhalation the abdominal muscles play an important role for the respiratory system [6].

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2.2 RESPIRATORY FREQUENCY

Respiratory rate is measured by cycles per minute, in how many breaths and breaths are taken per minute, with an average of 12 to 20 breaths per minute (cycles per minute) being normal.

When the patient has above normal values, he has a tachypnea, when these values are below normal, it is bradypnea, and when the patient is unable to breathe we call apnea.

When assessing respiratory rate, the physical therapist should observe and identify if the patient's breathing is apical, diaphragmatic or mixed. Being apical the breathing with the thorax, diaphragmatic with the abdomen and mixed with both.

2.3 SPIROMETRY

Spirometry is the quantitative and qualitative analysis of the lung. The exam is the most used in the diagnosis, therapeutic program and discharge criteria by the physiotherapist. It does not provide medical diagnosis. The ventilatory patterns provided by spirometry are very useful in clinical and therapeutic practice. They are: obstructive pattern, mixed or combined pattern and restrictive pattern [6].

The indications of spirometry are:

• Admission exam in clinic or office;

• Early diagnosis and control of restrictive or obstructive ventilatory disorders;

• Constant surveillance of clinical evolution in hospitalized or outpatient patients;

• Foot and postoperative surveillance;

• Sanatoriums for pulmonary diseases;

• Quick and practical information for physicians from insurance companies, factories and health insurance clinics upon admission;

• Evaluation of fitness in sports associations;

• Emergency syndromic diagnosis in the emergency room [6].

There are two measuring systems with the spirometer closed and open. The closed is made with the patient breathing an isolated air in a compartment and the open the patient breathes the ambient air normally.

The spirometer reading is presented in graph, digital or simultaneous records.

2.4 PREVENTIVE RESPIRATORY PHYSIOTHERAPY

According to Deliberato [4], the meaning of the word prevention in health, despite the problems in conceptualizing it, is certainly broader than simply defining it as “the act of preventing something from happening”.

There are three levels of prevention: primary, secondary and tertiary prevention. Also according to the author, the primary level of prevention is applicable during the pre-pathogenesis period, that is, when the individual is in an optimal state of health or at least suboptimal health. The secondary level of prevention can be characterized when the body already has changes in form and function, there is in the pathogenesis period and in real illness. Already at the tertiary level of prevention is established when the individual with the disease has gone through the previous stages, remaining with a residual sequel and / or disability that need to be minimized, to avoid, in this case, total disability after anatomical changes and physiological conditions are already more or less stabilized.

2.5 INCENTIVE INSPIROMETER

The incentive inspirometer, also called Respiron®, is used to strengthen inspiratory muscles and restore lung capacity and volume.

Respiron® is an easy to use, portable and portable device. It consists of three transparent tubes, each of which houses a sphere. The tubes are interconnected, providing difficulty in inspiring with a dynamic flow, when we put our mouth in the mouthpiece and inhale the spheres form a visual incentive.

It is suitable for all people and can be used preventively or rehabilitatively.

The difficulty of the encourager can be regulated, with each frequency going to the individual's ability.

III. MATERIALS AND METHODS

An extension study was carried out, with a weekly meeting lasting two hours in the morning and two in the afternoon. Teachers were separated into groups, two or three at a time, giving a total of 17 teachers in both periods, held on the premises of the EBI Adventist Education Center school.

Two stretches and five breathing exercises were performed per meeting, which were the stretching of the lower limbs of the auxiliary muscles of breathing (pectoral minor, scalene, sternocleidomastoid, abdominal and intercostal), and breathing exercises of three to seven minutes each, with goal of improving teachers' breathing.

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Respiron® was also used. Making five inspirations each teacher per session.

Questions were also clarified about the importance of the exercises, what they are for and the results in the human body.

The procedures were performed as follows:

Activities for 1st Week:

- Delivery of folders that contained guidelines regarding health prevention;

- Practice of diaphragmatic breathing;

- deep inspiration;

- minor pectoral elongation;

- Use of Respiron®.

Activities for Week 2:

- Guidance on healthy habits;

- Stretching the rib cage;

- Square breath;

- Elongated breathing.

Activities for Week 3:

- Delivery of folders containing guidelines on prevention of respiratory problems;

- Fractional inspiration;

- Breathing hiccups;

- Scalene stretching.

- Use of Respiron®.

Week 4 Activities:

- Guidance and clarification of questions from participants.

- Flexion of the trunk;

- Switch nostrils;

- Respiratory technique with lip brake.

Activities for Week 5:

- Guidance and clarification of questions from participants.

- Diaphragmatic breathing;

- Unilateral lower thoracic expansion;

- Intercostal stretching;

- Use of Respiron®.

IV. RESULTS AND DISCUSSIONS

With the application of this project, it was reported by teachers the improvement in sleepless nights, which after performing some of the past exercises, were able to sleep normally. In addition, there was a positive result regarding teachers' stress reduction in the classroom. They also felt the improvement in breathing capacity caused by the use of Respiron®.

The teachers participating in the project had no respiratory problems or practiced preventive activities.

V. CONCLUSION

Teachers may suffer cardiorespiratory disease from the influence of speech, making preventive respiratory physiotherapy essential to increase chest mobility and to stimulate the correct use of all muscles responsible for breathing.

It is concluded that preventive respiratory physiotherapy in teachers, in relation to the proposed objectives of this project, improved the quality of life of teachers of the school EBI Adventist Education Center of Caçador - SC.

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