

## 87 - CHANGES IN LUNG FUNCTION IN DIFFERENT CONDITIONS OF EQUILIBRIUM IN CLASSICAL DANCERS

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### 1. INTRODUCTION

The dance was born with the man who always tried to dance on festive and / or religious situations, but ballet, as is its importance today, emerged in Italy in the mid-fifteenth century, more precisely in 1489 at the wedding of the Duke of Milan with Isabel Aragon. Soon after, the ballet was taken to France by Catherine de Medici in terms of her marriage to Henry II. France then became the great stage of world ballet. Around 1830 began the period of Romantic ballet, with masterful creations of "La Sylphide" and "Giselle". At the end of the Romantic era, the world center of the ballet moved from Paris to St. Petersburg, Russia. And after the 1st World War, has expanded to London, New York, England and Brazil, where it was presented for the first time in Rio de Janeiro (Caminada, 1999).

Dancer to occur in a good performance in the ballet, will keep a technique and constant improvement of performance in view of the perfection of movement. There for this one conservation levels of physical qualities, requiring specific jobs for the correct and harmonious realization. With this view, the entire exercise to be completed will be combined with the breath: taxpayer system for maintaining the internal environment of the body in relation to the external environment, in which the movements of contraction and expansion are directly linked to the breathing process that contribute to the muscular work, support and balance, key factors to a ballerina.

For Davies et al (2002), the human breath is a circular process with oxygen from the air being captured and brought into the cells of the body from one side of the circuit; while the carbon dioxide is driven in the opposite direction on the other side of the circuit. The mechanics of breathing is optimized for neural control of breathing pattern, so that the work of breathing is minimized at any level of ventilation work involving the respiratory muscles, which perform mechanical strength against the chest wall and the lung elasticity against the resistance of the airway, the gas flow.

With the above concept, one sees the influence of respiration in humans as a way of life and for carrying out its activities. Then, the classical dancer is directly dependent on the development of breathing movements and the quality of the dance.

Therefore, the approach of breath, as influencing factor in the physical quality of a ballerina, is required for work with global objectives in terms of understanding the movement in his body, aiming at an improved quality dance ballet, as well as life.

#### - Breathing in ballet

To Sampaio (2001) is important ballet be considered not only an art, a sport with more general and specific training, contributing to a body knowledge, with physical demands that go great together: strength, power, flexibility, cardiorespiratory fitness and neuromuscular coordination.

Ballet in the correct application of breathing can effectively collaborate to work, where every time you open your arms is important to inspire and expire when you close them, getting a clearer coordination, helping to understand the movement. Poor breathing causes substantial declines in quality of dance, because the wear of the dancer becomes larger due to the tension of muscles and increasing the imbalance.

Before the technique is essential to understand the movement from the inside out, without separating the body of the mind. Conscious breathing is essential in this process, making it ideal flow without letting it suspend it or block it to have a significant improvement in the quality of the dance, the other physical exercises and quality of life (Dantas, 2003).

#### - Balance at the ballet

Balance is a skill much in demand for classical dancer, achieved with technique and training. The balancing requires the development of body alignment, ie, a good posture; requiring strength, stamina and good muscle, tone from all specific jobs where every deviation from the ideal position of your body should match the effort of recovery (FAIR, 1998).

As Gallahue & Ozmun (2005) balance is the ability of an individual to keep unchanged the posture of your body, when it is placed in various positions. The stability implies the ability to control body movements that value in the balance. And, when analyzed from the perspective of equilibrium always involves the stability element.

The three types of balance in ballet are paramount, such as static balance (EB) working isometric strength, muscular endurance and flexibility (FAIR, 1998). An example of static equilibrium is the arabesque position, defined as one of the key positions in ballet.

Coded by Blasis, the arabesque is known since the eighteenth century, being conducted with the body profile, to try to create the longest possible line relying only on one leg while the other is extended behind a right angle (90 °) or above, in sneakers half tip or toe shoes, with arms in various positions harmonics. Especially the 1st arabesque on pointe, that besides the body be kept upright, supported on one leg in a vertical position, one that is extended at a right angle to the supporting leg; your shoulders are kept straight in the direction with the same arm of the supporting leg stretched forward and with her palm down the line. The fingers are in line with the center of the space between the eyes and the rear arm is slightly lowered, so that both arms are straight-shaped or "L" (an arm in the front and one side) (Pavlova, 2000).

The dynamic equilibrium (DB) is used all the time, whether for work in half an edge or tip, either by exercise of pirouettes and jumps. The example of dynamic equilibrium is highlighted in *échappé*, French term meaning movement or slipping away, where there is a symmetrical displacement of both feet, starting from a closed to an open position. Highlighting *Échappé Sur Les pointes*, ie the escape is performed on toe shoes, which is set in the implementation of the 5th *échappé* starting position (position of feet is held in front of one another with the anterior region of one foot lying with the back of the other foot) in *demi-plié* (small knee flexion) spreading her legs for the 2nd position (open side) at the tip. The foot should slip quickly to open at the same time and same position. Upon reaching the open position, the knees should remain rigid. Then, the dancer then back to 5th position *demi-plié* (Pavlova, 2000).

In Leal (1998), the recovered balance (RB) is proportionally linked to dynamic, defined as the ability to recover the posture of the dancer at the end of some movement; following the example of the end of *Échappé Sur Les Pointes*.

### 2. METHODOLOGY

To obtain results that are based on work on "Changes in Lung Function in Different Conditions of Equilibrium in



statistical differences in these parameters between different equilibrium conditions.

For the parameter of inspiratory reserve volume, it can be seen in Table 03 that rejects the null hypothesis and accept the alternative hypothesis, concluding that the type of equilibrium interferes with statistical significance in the parameter in question. Therefore, there was a significant decrease in dynamic equilibrium between the parameter and the recovered balance.

As Mc Ardle et al (1998) state that some of the pulmonary function measurements are sensitive indicators of obstructive lung diseases; but in normal people doing some kind of training measurements are of little use in the sense of predicting fitness or exercise performance where the values fall into the normal range, as the parameters of VC, RR, VE, VRE, CI CV and the three equilibrium conditions rose the null hypothesis, ie, when the dancers performed the test, the inspired or expired volume during the respiratory cycles were almost unchanged in equilibrium conditions, came up with this, issues ballet that remains in the inspired air lock; logo for the execution of the movements the dancers store air. As the ballet presents intermittent levels of moderate to intense activity, responses to lung function are related.

Example: To make a static equilibrium, the dancers performed the 1st arabesque, he was not running from a dance poses or as large in terms of choreography, so it would be presenting energy expenditure. The dancers just had positioned themselves and aid their arms, which contributed to better support and the use of the breath to be little required. Differentiating itself from a stage performance that would take into account the emotional factor and the increased demand for air referent. According to the descriptions of Sampaio (1997), when making an arabesque the important thing is to create the longest possible line, so there should be a back muscle work muscles relating to this region, can resist the physical fitness and maintain a greater support in facilitating execution performance balance. The subjects had good muscle, from its physical constraints tone and so performed the exercise without much requirement of pulmonary function due to the contribution of the back support.

During the dynamic balance and retrieved, the parameters for these Échappé Sur Les pointes, little or no ordered, maximum expiratory volume after maximal inhalation (CV) and a maximum current at the end of expiration expiration (ERV), i.e., exercise was being measured was not necessary for a great force exhalation to the air that was just stored, calling into question again the air lock.

However, the inspiratory reserve volume showed a degree of significance; in which the dancers to perform the Échappé Sur Les Pointes and retrieved in a dynamic equilibrium, obtained a decrease in maximal inspiration at the end of a current inspiration, that is, the kind of balance interfered with the ability to inspire and trying a higher entry air in the lungs would result in loss of balance.

Many dancers in performances of dynamic and recovered to reach equilibrium state of fatigue by developing extremely exhausting movements due suspend or block your breath, not going to work together and even before running a good technique is crucial to understand the movements and physical abilities requested.

Research subjects showed changes in their results most of VRI, why not counted with the aid of arms or as support nor the breathing process, ie open arms inspire and close arms expires.

According to Sampaio (2001) it is possible to compare the results because accomplish Échappé Sur Les Pointes stability decreases due to perform in pointe shoes, in which the body is erect, increasing the anterior-posterior angle of the foot relative to gravity due be reduced under a support base, creating more muscular effort exceeding normal ranges of motion and increasing the effort to support.

#### 4. CLOSING REMARKS

Given the results of this study aimed to understand the factors that were the "Changes in Lung Function in Different Conditions of Equilibrium in Classical Dancers" reached the following conclusions are: staged static, dynamic and recovered balances for relations parameters as VC, ERV, IC, VC, VE and RR significance was low, ie, the chance to draw the balance with the use of these measures lung was zero at that point considering the processes performed in the tests, the dancers garnered a number of enough to demand that the respiratory system was ordering the executions of the exercises, and how important and influential factor in the process where the classical dancers were tested, with the subjects without emotional influences, such as a contest or submission of an air spectacle.

Also yielded a significant event in the VRI parameter in dynamic equilibrium stages and recovered representing a shortfall in demand for air for a maximum inspiration due to a normal inspiration; therefore, it is understood that the inspired air is usually not enough to keep breathing movements in dynamic and recovered equilibrium, and that an attempt to capture inspired in their maximum degree air occur loss of balance.

During the research some questions were resolved, but the study of ballet is vast and many issues need to be studied and questioned, as the biological needs and physiological responses to specific forms of ballet, which include factors like choreography, impact, cadence, variations of limb movements (positions of the arms and legs) and can be related to physical fitness, kinesiology, biomechanics, nutrition, psychology, among others. Basis of study which are depth, contribute to the dancers, teachers, scholars and researchers in the area of these branches.

It is with great pleasure that I present this study to be not only the source, but a search that brings information in order to raise questions, encouraging the pursuit of further studies to deepen and contribution in performance and performance of the dancers.

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#### CHANGES IN LUNG FUNCTION IN DIFFERENT CONDITIONS OF EQUILIBRIUM IN CLASSICAL DANCERS.

##### ABSTRACT

The study "Changes in Lung Function in different conditions of Equilibrium in Classical Dancers", aimed to analyze the influence of the processes of breathing phases in balance and support the dancer. For this research we carried out a field study

was quantitative, aiming the performance of pulmonary function and quality with the purpose of improving the performance of the dancers in class and in spectacles; and the process of data collection obtained with classical dancers from two schools of the city of Bethlehem, aged 17-26 years and ballet practice time between 12 and 19 years; with the spirometer measures lung instrument were verified through Spirometry testing in the Laboratory of Exercise Physiology from the Fisioclínica/ UNAMA, in order to obtain tidal volume, expiratory reserve volume, inspiratory reserve volume, inspiratory capacity, minute volume, respiratory rate and vital capacity in different positions in the classical equilibrium conditions. He introduced us hypotheses outcomes null and alternative hypotheses, which raised questions about the existence of the air lock when the dancers dance to set up a classic pose or to continue the movement. Concluding that certain lung measures influence on breathing and performance of classical dancer. During some research questions were identified and resolved; however, the study and research in relation to the ballet is still very broad and many issues need to be questioned, tested and studied, fostering the growth of research in this area and contributing to greater acquisition and spread of knowledge.

**KEYWORDS:** Classical ballerina. Breath. Balance

#### **CHANGEMENTS DANS LA FONCTION LUNG DANS DIFFERENTES CONDITIONS D'EQUILIBRE DANSEURS CLASSIQUES.**

##### **RÉSUMÉ**

L'étude modifications de la fonction pulmonaire dans différentes conditions d'équilibre danseurs classiques, visant à analyser l'influence des processus de phases de respiration dans l'équilibre et soutenir la danseuse. Pour cette recherche, nous avons réalisé une étude de terrain a été quantitative, visant la performance de la fonction pulmonaire et la qualité dans le but d'améliorer la performance des danseurs en classe et à lunettes; et le processus de collecte de données obtenues avec des danseurs classiques de deux écoles de la ville de Bethléem, âgés de 17-26 ans et le temps de pratique de ballet entre 12 et 19 ans; avec l'instrument de poumon de spiromètre mesure a été vérifiée par des tests de spirométrie dans le laboratoire de physiologie de l'exercice de l'Université de Fisioclínica Amazon / UNAMA, afin d'obtenir le volume courant, volume de réserve expiratoire, le volume de réserve inspiratoire, la capacité inspiratoire, volume par minute, la fréquence respiratoire et la capacité vitale dans des positions différentes dans les conditions d'équilibre classiques. Il a présenté les résultats nous hypothèses hypothèses nulle et alternative, qui ont soulevé des questions quant à l'existence de la serrure de l'air lorsque les danseurs dansent à mettre en place une pose classique ou de poursuivre le mouvement. Concluant que certaines mesures du poumon influence sur la respiration et la performance de la danseuse classique. Au cours de certaines questions de recherche ont été identifiés et résolus; Cependant, l'étude et la recherche en ce qui concerne le ballet est encore très large et de nombreuses questions doivent être remis en question, testé et étudié, en favorisant la croissance de la recherche dans ce domaine et de contribuer à une plus grande acquisition et la diffusion des connaissances.

**MOTS-CLÉS:** ballerine classique. Souffle. balance

#### **CAMBIOS EN FUNCIÓN PULMONAR EN DIFERENTES CONDICIONES DE EQUILIBRIO EN BAILARINES CLÁSICOS.**

##### **RESUMEN**

El estudio "Los cambios en la función pulmonar en diferentes condiciones de equilibrio en bailarines clásicos, tuvo como objetivo analizar la influencia de los procesos de las fases de respiración en equilibrio y apoyar a la bailarina. Para esta investigación se realizó un estudio de campo fue cuantitativo, con el objetivo de la realización de la función pulmonar y la calidad con el propósito de mejorar el desempeño de los bailarines en clase y en los espectáculos; y el proceso de recolección de datos obtenidos con bailarines clásicos de dos escuelas de la ciudad de Belén, de entre 17 a 26 años y el tiempo de práctica de ballet entre 12 y 19 años; con el instrumento de pulmón espirómetro mide fueron verificadas a través de pruebas de espirometría en el Laboratorio de Fisiología del Ejercicio de la Universidad de Fisioclínica Amazonas / UNAMA, con el fin de obtener el volumen corriente, volumen de reserva expiratorio, volumen de reserva inspiratoria, capacidad inspiratoria, volumen minuto, la frecuencia respiratoria y la capacidad vital en diferentes posiciones en las condiciones de equilibrio clásicos. Introdujo nosotros hipótesis los resultados hipótesis nula y alternativa, que plantearon preguntas acerca de la existencia de la esclusa de aire cuando los bailarines bailan para establecer una pose clásica o para continuar el movimiento. Concluyendo que determinadas medidas pulmonares influencia en la respiración y el rendimiento de bailarina clásica. Durante algunas de las preguntas de investigación fueron identificados y resueltos; Sin embargo, el estudio y la investigación en relación con el ballet sigue siendo muy amplia y muchas cuestiones necesitan ser cuestionado, probado y estudiado, fomentar el crecimiento de la investigación en este ámbito y contribuir a una mayor adquisición y difusión del conocimiento.

**PALABRAS CLAVE:** Bailarina clásica. Aliento. Equilibrio

#### **ALTERAÇÕES NA FUNÇÃO PULMONAR NAS DIFERENTES CONDIÇÕES DE EQUILÍBRIO EM BAILARINAS CLÁSSICAS.**

##### **RESUMO**

A pesquisa "Alterações na Função Pulmonar nas diferentes condições de Equilíbrio em Bailarinas Clássicas, teve como objetivo analisar a influência dos processos da respiração em fases de equilíbrio e sustentação da bailarina. Para essa pesquisa realizou-se um estudo de campo do tipo quantitativo, visando o desempenho das funções pulmonares e qualitativo com intuito de melhorar a performance das bailarinas nas aulas e nos espetáculos; sendo o processo da coleta dos dados obtidas com bailarinas clássicas de duas escolas da cidade de Belém, com idades entre 17 a 26 anos e tempo de prática de ballet entre 12 a 19 anos; foram verificadas medidas pulmonares com o instrumento Espirômetro, através do teste de Espirometria no Laboratório de Fisiologia do Exercício da Fisioclínica da Universidade da Amazônia/ Unama, com intuito de obter o volume corrente, volume de reserva expiratório, volume de reserva inspiratória, capacidade inspiratória, volume minuto, frequência respiratória e capacidade vital em diferentes posições clássicas nas condições de equilíbrio. Apresentou-se nos resultados hipóteses nulas e hipóteses alternativas, o que gerou questionamentos sobre a existência do bloqueio de ar quando as bailarinas dançam para configurar um pose clássica ou para dar continuidade ao movimento. Concluindo que determinadas medidas pulmonares influencia na respiração e no desempenho da bailarina clássica. Durante a pesquisa alguns questionamentos foram identificados e solucionados; no entanto, o estudo e a pesquisa no que se refere ao ballet ainda é muito amplo e muitos temas necessitam ser questionados, testados e estudados, fomentando o crescimento da investigação nessa área e contribuindo para uma maior aquisição e propagação do conhecimento.

**PALAVRAS-CHAVE:** Bailarina clássica. Respiração. Equilíbrio