89 - EXPIRATION YEAR ACTIVE FAVORS CONCENTRIC

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INTRODUCTION

The knowledge of respiratory physiology is critical for the development of specific exercises in relation to the human body. Hereby leather scientific, it is known that normal inspiration is the process of muscle contraction of the diaphragm which promotes the entry of air into the lungs by the difference in pressure of the internal environment to the external environment. While only a normal expiration the diaphragm back to its original position, thereby expelling the air out of the lungs (GALVAN, 2007). Thus, when it is performed a forced expiration is a contraction of the accessory muscles of expiration, especially the abdominals, which provide greater stability to the spine and center of gravity of the individual (GASTALDI, 2008; PEREIRA, 2012).

During exercises in the gym, you can perform various types of motions, including concentric, rated as the action of moving the limbs of the body through muscle shortening, which results in decreasing the angle between the segments, unlike the eccentric movement classified as increasing the angle of those responsible for the longitudinal extent of muscle fibers even in a state of muscle contraction (SOUZA, 2012).

By associating with the movement expiration concentric contraction of the muscle groups of the body will be greater (CAMPOS, 2008). Studies show that breathing techniques associated with exercise beneficially regarding thoracoabdominal mechanics, since the best capitation improves oxygen to the muscles of the body, thereby promoting greater stability during exercise (COSTA, 2003; GASTALDI, 2008).

So arose the hypothesis that active respiration provides better results for individuals device users stimulating muscle hypertrophy. The aim of this study was to investigate the effect of active breathing exercises during the concentric phase, involving the forced expiration with the efficiency of concentric movement.

MATERIALS AND METHODS

This research classified as transverse, quantitative, descriptive and applied, was approved by the Ethics and Research (CEP) of the Center for Higher Education of Campos Gerais (CESCAGE) under number 1008/CEP held in a gym in the city of Ponta Grossa - PR. We included 51 bodybuilders who performed exercises in appliances - Breastplate and Flying Extender, this four were excluded for not completing the whole procedure of data collection, so the sample was composed of 47 volunteers, 25 females and 22 sex male, with a mean age of 29.5 (± 12.08) years.

We collected data on age, body weight and height, plus a host of information obtained with the help of questionnaires.

Initially the volunteers performed specific exercises to strengthen the quadriceps and pectoralis major as they were accustomed. The weight of the devices ranged from 9 to 125 Kg in Flying Chest and 5 to 130 Kg in Extender. Then it was first applied questionnaire that can be observed in Table 1:

I Questionnaire			
1	Have you been oriented on breathing in academia who attends ?	Yes	No
2	Do you realize what an inspiration during movement ?	Concentric	Eccentric
3	You perform a lapse during which movement?	Concentric	Eccentric
4	You apnea during which stay in motion ?	Concentric	Eccentric
5	Do you have trouble breathing?	Yes	No

Table 1: First questionnaire to research volunteers before exercise.
Source: Author Self (2012)

After the volunteers received guidance and supervision of the researcher on the active expiration during the concentric phase of the exercise, they performed three repetitions of each exercise, but associated with active expiration.

Further, the second questionnaire was applied, followed by the questions outlined in Table 2:

II Questionnaire			
1	You felt difficulty in performing the expiration in the concentric phas e of the exercise ?	Yes	No
2	Do you feel any difference in movement associated with breathing ? What? (U.L.)	Yes	No
3	Do you feel any difference in movement associated with breathing? What ? (L.L.)	Yes	No
4	You felt abdominal contraction during expiration ?	Yes	No
5	You would use this type of breath during physical activity in appliances ?	Yes	No

Table 2: According to questionnaire research volunteers after exercise.
Source: Author Self (2012)

For data analysis were performed and descriptive statistics were performed steps of the KDD process, using the Task KDD classification for the problem of prediction, using the techniques of Data Mining Decision Tree (J.48 algorithm).

RESULTS

The results are shown below in Table 1, where are the averages and standard deviation values for age, height, body mass, body mass index (BMI) and the usual load of volunteers appliances strengthening the pectoralis major muscle and quadriceps.

Table 1: Features, anthropometric description of the sample and load on devices and Flying Chest Extender

Descriptive Statistics		Age (Years)	Height (m)	Body Mass (kg)	BMI (kg/m²)	On the unit load (kg)	
						Pectoral Flying	Extender
-	Average	29,54	1,73	70,57	23,54	41,07	8,67
	Standard deviation	12,08	0,09	14,35	3,58	33,43	5,19
Female	Average	31,08	1,66	60,72	21,99	16,52	6,48
	Standard deviation	12,92	0,05	9,33	3,13	5,98	3,90
Male	Average	27,71	1,80	82,29	25,38	70,29	11,29
	Standard deviation	11,01	0,07	9,67	3,24	28,67	5,40

Regarding the weight of members that significant differences exist between their standard deviations, we used the parametric test "T Student with Welch correction" and noting that men have a higher weight in absolute units (Flying and Extender) ($p < 0.001$).

Table 2: Descriptive analysis for dichotomous questions

Questions	YES	NO	Total
	%		
Have you ever been walked in on her breath at the gym ?	28,26	71,74	100
Any respiratory problem ?	17,39	82,61	
You felt difficulty in performing the expiration in the concentric phase ?	13,04	86,96	
The concentric movement associated with the expiration was lighter ? (Upper Limb)	73,91	26,09	
The concentric movement associated with the expiration was lighter ? (Lower Limb)	73,91	26,09	
You felt abdominal contraction during expiration ?	78,26	21,74	
You place an expiration in concentric movement ?	28,26	71,74	
You perform an inspiration in the concentric movement ?	45,65	54,35	
You remain in apnea during exercise ?	26,09	73,91	

The Table 3 presents models to describe the results presented in response to facilitation concentric movement of the upper limbs, when coupled with active expiration:

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You would use this type of breath during physical activity = YES
Have you ever been walked in on her breath at the gym? = NO
The concentric movement associated with the expiration was lighter? Lower Limb = NO
  Gender = F: YES (3.0)
  Gender = M: NO (3.0)
The concentric movement associated with the expiration was lighter? Lower Limb = YES: YES
(26.0)
Have you ever been walked in on her breath at the gym? = YES
| Height <= 1.68 Height: YES (4.0)
| Height> 1.68: NO (7.0/1.0)
You would use this type of breath during physical activity = NO: NO (3.0)
Summary === ===
Correctly Classified Instances 45 97.8261%
Incorrectly Classified Instances 1 2.1739%
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Table 3: Decision Tree Model for the question: The concentric movement of the upper limbs associated with expiration was lighter?

Source: Author Self (2012)

From the combination of these variables can predict the response evaluated as 97.83% accuracy on the issue: "The concentric movement of the upper limbs associated with expiration was lighter ? ".

The Table 4 shows the models to describe the results presented in response to facilitation concentric movement of the lower limbs, when coupled with active expiration:

You would use this type of breath during physical activity? = YES
The concentric movement associated with the expiration was lighter? Upper Limb = YES
Weight <= 47: NON (2.0)
Weight> 47: YES (32.0/2.0)
The concentric movement associated with the expiration was lighter? Upper Limb = NO
Have you ever been walked in on her breath at the gym? = NO: NO (3.0)
Have you ever been walked in on her breath at the gym? = YES: YES (6.0/2.0)
You would use this type of breath during physical activity? = NO: NO (3.0)
Summary === ===
Correctly Classified Instances 42 91.3043%
Instances Incorrectly Classified 4 8.6957%

Table 4: Decision Tree Model for the question: The concentric movement associated with the expiration was lighter? (Lower Limb)

Source: Author Self (2012)

By combining these variables is also possible to predict the response evaluated as 91.30% of accuracy regarding the issue: "The concentric movement associated with the expiration was lighter in Lower Limb?"

DISCUSSION

The present study showed that females accounted for the majority of the sample (54.35%), a fact explained by body image dissatisfaction subsidized by the media and sociocultural factors (SILVA, 2011), but these results are so contrary to the results presented by (Lippo, 2010) which states that women are less active than men.

By applying the Student t test to check the difference between the sexes, no significant differences p = 0.35. It was also observed that men (Male) on average are taller and heavier than women (Women) thus presenting a higher BMI, data which go against the results presented by (SILVA, 2010).

The results showed that most of the volunteers were never instructed on breathing within the academy, a fact explained by the lag of work aimed at the area (SOUZA, 2012). It was also found that approximately 75% of volunteers reported ease in performing a lapse during the concentric movement and during its implementation exercise was lighter, a fact explained by the contraction of accessory muscles active during expiration (COSTA, 2003) where approximately 80% of the sample felt abdominal contraction, thereby providing greater stability and maximize contraction member required. A study by (GASTALDIAC, 2008) showed the effectiveness of using active breathing, leading to research participants an improvement of respiratory muscles and increase lung capacity.

It was also observed that the percentage of the sample that carries an expiration in the concentric phase was very small, representing less than 30% of the volunteers rated, ie, most participants do not practice the forced expiration associated with the concentric movement, subsidized by this result (SOUZA, 2012) commented that the lack of information on the part of professionals.

Of the total respondents, less than 30% had temporary suspension of breathing while performing a specific exercise for both the concentric movement and for the eccentric, second (BENETTI, 2011) apnea causes increased muscle contraction, especially the abdominal muscles and pelvic floor but does not provide adequate pulmonary ventilation during exercise.

According to the decision tree model, we observed the binding of responses reported by volunteers with what the literature says, because: "If the participant reports that utilize this type of breathing associated with the concentric movement, which means he had the feeling that the exercise became lighter when associated with active expiration in both limbs, hence the participant felt the contraction of the abdominal muscles. " These results agree with the statement (PEREIRA, 2010), which says that contractions of the abdominal muscles provide greater stability of the spine, thus emphasizing the greater effectiveness of the exercise.

CONCLUSION

It was confirmed in this study that guidance on the breath within the academies is outdated, a fact that can not be justified by the understanding of respiration by Physical Educators or even the lack of specific studies related to the field.

It also became clear that the concentric movement associated with the expiration of the year, primarily related to the exercise apparatus, is a factor that contributes to the improvement of the movement of the subjects, where they reported the exercise facility and improved breathing, regardless of sex or age. Given these observations, we conclude that breathing techniques used in association with exercise can accomplish the rather specific movement and provide greater stability for the individual contributing to improving cardiorespiratory.

Therefore, as shot, we must disseminate the importance of studies like this, since, together with presentation of such results to the academies, followed by guidelines to professionals and practitioners of physical activity may be stimulated with greater benefits to the body , and a better quality of services offered by academies and the like.

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EXPIRATION YEAR ACTIVE FAVORS CONCENTRIC

ABSTRACT

Guidance on the breath within the academies during the concentric movements associated with the expiration of the exercise is increasingly scarce. Given this reality, the present study consisted of a prospective, descriptive and applied quantitative character, with the objective of evaluating the efficacy of active expiration associated with the concentric movement. The sample consisted of 47 volunteers, 25 females and 22 males with a mean age of 29.5 (± 12.08) years, bodybuilders. Data collection was based on a questionnaire, administered before and after the implementation of two specific physical exercises for strengthening the pectoralis major muscle and the quadriceps muscle group. Initially the volunteers performed the exercises the way they were used and then were instructed to carry them to the expiration active in the concentric phase. Of the total sample 71.74% reported not having received guidance on the part of the academy, as the realization of breath during the exercises, and 73.91% reported having more ease in performing those with active expiration. Another important observation was that 78.26% of the sample signaled the sensation of abdominal contraction during the execution of the exercises associated with active expiration. It was concluded that the performance of active expiration may contribute to the development of an optimization exercise and even, indirectly, stimulate contraction of the abdominal muscles.

KEYWORDS: Exercises, Muscle contraction, breathing.

ANNÉE D'EXPIRATION ACTIF FAVORISE CONCENTRIQUE

RÉSUMÉ

Lignes directrices sur la respiration dans les académies au cours des mouvements concentriques associés à l'expiration de l'exercice est de plus en plus rares. Compte tenu de cette réalité, la présente étude a consisté en une étude prospective, descriptive et quantitative caractère appliqué, avec l'objectif d'évaluer l'efficacité de l'expiration active associée au mouvement concentrique. L'échantillon était composé de 47 volontaires, 25 femmes et 22 hommes avec un âge moyen de 29,5 (± 12.08) ans, les culturistes. La collecte des données a été basée sur un questionnaire, administré avant et après la mise en œuvre de deux des exercices physiques pour renforcer le muscle grand pectoral et le groupe musculaire du quadriceps. Au départ, les bénévoles effectué les exercices de la façon dont ils ont été utilisés et ont été invités à les porter à l'expiration active dans la phase concentrique. De l'échantillon total 71,74% ont déclaré ne pas avoir reçu des conseils de la part de l'académie, comme la réalisation de la respiration pendant les exercices, et 73,91% ont déclaré avoir plus de facilité dans l'exécution de ceux avec expiration active. Une autre observation importante est que 78,26% de l'échantillon a marqué la sensation de contraction abdominale lors de l'exécution des exercices liés à expiration active. Il a été conclu que la performance de l'expiration active peut contribuer à l'élaboration d'un exercice d'optimisation et même, indirectement, stimuler la contraction des muscles abdominaux.

MOTS-CLÉS: Exercices, la contraction musculaire, la respiration.

EJERCICIO DE RESPIRACIÓN ACTIVE FAVORES CONCENTRIC

RESUMEN

Orientación sobre la respiración en las academias durante los movimientos concéntricos asociados con la expiración del ejercicio es cada vez más escasa. Ante esta realidad, el presente estudio consistió en un carácter prospectivo, cuantitativo descriptivo y aplicado, con el objetivo de evaluar la eficacia de la espiración activa asociada con el movimiento concéntrico. La muestra está formada por 47 voluntarios, 25 mujeres y 22 varones, con una edad media de 29,5 (± 12.08) años, los culturistas. La recolección de datos se basó en un cuestionario, administrado antes y después de la ejecución de dos ejercicios físicos específicos para fortalecer el músculo pectoral mayor y el grupo muscular del cuádriceps. Inicialmente, los voluntarios realizaron los ejercicios de la forma en que se utiliza y luego se les instruyó para llevarlas a la expiración activa en la fase concéntrica. De la muestra total 71,74% manifestaron no haber recibido orientación por parte de la academia, como la realización de la respiración durante los ejercicios, y 73,91% reportó tener más facilidad en la realización de aquellos con vencimiento activa. Otra observación importante fue que 78,26% de la muestra indicó la sensación de contracción abdominal durante la ejecución de los ejercicios asociados con la expiración activa. Se concluyó que el rendimiento de expiración activa puede contribuir al desarrollo de un ejercicio de optimización e incluso, indirectamente, estimulan la contracción de los músculos abdominales.

PALABRAS CLAVE: Ejercicios, la contracción muscular, la respiración.

EXPIRAÇÃO ATIVA FAVORECE EXERCÍCIO CONCÊNTRICO

RESUMO

A orientação sobre a respiração dentro das academias, durante os movimentos concêntricos do exercício associados à expiração, está cada vez mais escassa. Diante dessa realidade, o presente trabalho consistiu em uma pesquisa prospectiva, aplicada e descritiva de caráter quantitativo, com o objetivo de avaliar a eficácia da expiração ativa associada ao movimento concêntrico. A amostra foi composta por 47 voluntários, 25 do sexo feminino e 22 do sexo masculino, com idade média de 29,5 (± 12,08) anos, praticantes de musculação. A coleta dos dados teve por base um questionário dirigido, aplicado antes e depois da realização de dois exercícios físicos específicos para fortalecimento do músculo peitoral maior e do grupo muscular do quadríceps. Inicialmente os voluntários realizaram os exercícios da forma como estavam habituados e em seguida foram orientados a realizá-los com a expiração ativa na fase concêntrica. Do total da amostra 71,74% relataram não ter recebido orientações, por parte da academia, quanto à realização da respiração durante a prática dos exercícios, e 73,91% declararam ter mais facilidade na realização desses com a expiração ativa. Outra observação importante foi que 78,26% da amostra sinalizaram a sensação de contração abdominal durante a execução dos exercícios associados à expiração ativa. Concluiu-se, que a realização da expiração ativa pode contribuir para uma otimização no desenvolvimento do exercício e ainda que, indiretamente, estimular a contração da musculatura abdominal.

PALAVRAS CHAVE: Exercícios, Contração muscular, Respiração.