151 - SUBJECTIVE PERCEPTION OF EFFORT DURING THE APPLICATION OF THE TEST OF 1RM USING FACIAL SCALE

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Introduction

The basic principles of the training related to the improvement of the strength dated of thousand of years, and the comment of that the increase of strength profit was associated with the increase of the size of the muscle was made almost the one hundred years ago. In America in the beginning of the decade of 1840, the survey of lifting weights had beginning as a sport for exhibition and was carried through for "strong men" who showed its bravery in parties or spectacles itinerants. Since then the exercise with weights was added as an important form of training to improve the physical conditioning. The strength training has as one of its objectives the maintenance of the lean body mass, as an important variable in the maintenance of the energy balance during all life (McARDLE; KATCH; KATCH, 1998; POWERS; HOWLEY, 2000).

The strength training, also known as training with weights or training with loads, became one of the known forms of exercise, to improve the physical training of the athlete as to improve the physical conditioning of non-athlete. The increasing number of gym centers with resources for the training with weights confirms the popularity of this form of physical conditioning (FLECK; KRAEMER, 1999).

In accordance with Polito et al. (2003) the resistance training is a safe form to increase the muscular strenght in any age, in healthful people or individuals with cardiovascular problems. However, some information as, the percentage of a maximum repetition (%1RM) and the subjective perception of effort (RPE), in different situations of training still are enough. Such information would be useful in the prescription of the activity as much as in the choice of the exercise.

During the development of the programs training, some procedures for prescription are used in the control of the training, and mainly, in the control of the intensity of the exercise (ACSM, 2003). In this direction the RPE is distinguished for its agility and easy applicability (COSTA et al., 2004).

The control of the intensity of effort in works always was a concern for the professionals in Physical Education, and is a trustworthy way for prescription and monitored of loads of the trainings, with low cost and easy applicability (MOURA et al., 2003). The concept of perceived effort was introduced in the end of the decade of 50 for Borg and Dahlstron (MOURA et al., 2003). The content and meaning of the perceived effort basically are gotten by the common sense, personal experiences and empirical studies. Experiences in situations as effort, fatigue, lack of air, pains in the worked muscles, sensations of heat, are good experiences that help to understand the concept of perceived effort (BORG, 2000).

Another common measurement in tests of graduated physical effort is the Classification of Subjective Effort of Borg (Scale RPE of Borg). The punctuations of this scale are good pointers of subjective effort during a test of physical effort or a session of exercise. This is useful to know when the individual is close to the exhaustion, and the values can be used in the prescription to the intensity of exercise (POWERS; HOWLEY, 2000). As the fact of RPE Scale of Borg punctuated the numerical intensity of the effort for verbal expressions and codes, its use can suffer a limitation in its applicability when they deal with groups (children, illiterates and half-illiterates) whose cognitive capacity makes difficult the understanding it.

The present study used Scale of Faces (modified - COSTA, 2004) during the application of the test of 1RM, as the objective to offer a plus instrument to serves to assist the professionals of Physical Education in the assembly of programs of strength training.

Objective

To make the correlation between the percentages of a maximum repetition (1RM) and the scale of faces and to consider a direct relation between loads of work in resistance exercises (RE) and percentage of 1RM through the RPE. Identify the maximum load of each volunteer in two tests of 1RM: carried through with superior members in the straight supine in Smith Machine; carried through with lower limbs in the flexor table. To characterize the effort subjectively perceived by means of the use of Scale of Faces in each one of the attempts to reach the 1RM load.

Methodology

The present study has as methodology a correlacional descriptive research, having as characteristic to observe, to register, to analyze, to describe and to correlate facts or phenomenon without manipulating them, looking for to discover with precision the frequency where a phenomenon occurs and its relation with other factors (MATTOS; ROSSETO JÚNIOR; BLECHER, 2004).

This research was composed for 12 volunteers, all of the masculine gender, age between 18 and 30 years old that were trained in resistance exercise for at least six months, inhabitants of the city of Rio de Janeiro.

Also for being well-known that the RT practitioners, mainly of the masculine sort, to practice proportionally more exercises for superior members, and the correlation using the percentages of load of 1RM with scale of faces can have been sub estimated.

Before the initiating the 1RM tests the volunteers had been submitted to answer the questionnaire of Par-Q and anamneses. The use of the questionnaire of Physical Activity Readiness Questionnaire (Par-Q) is important before the accomplishment of any physical activity to know if the practitioner of physical exercises is apt or not, and if not must search medical orientation to know that type of physical activity more is adjusted for it (POLLOCK; WILMORE, 1993).

The collection of data was divided in 2 visits.

In the first visit had been presented to the volunteers the types of exercise to do and were made an adaptation of the same ones. In the same day the measures of stature had been surveyed, body mass, and measurements the coetaneous fatness.

The anthropometrics procedures had been used with intention to characterize the volunteer's morphology. It was calculated the BMI, Body Mass Index (Quetelet, 1857 apud Hespanha, 2005), the percentage of fatness and the lean body mass. To get the percentage of fatness it was used the Protocol of Pollock of three folds was used (1993).

The second visit occurred after 48 hours of the first one. In this second stage the volunteers had done the 1RM test and had answered Scale of Faces. All the tests had been done in an academy located in the north zone in Rio de Janeiro city.

The individuals done the test of 1RM in the exercises supine straight in Smith and the flex table. Both the exercises had been carried through in machine of the Buik equipment.

The protocol used in the 1RM test consisted of a heating of ten repetitions with 40% of the estimate of 1RM, after that an interval of one minute with light stretching. Later, a heating of five repetitions with moderate weight was done (80% of the

estimate of 1RM) being given to an interval of three minutes after the execution of it. After this interval the weight was increased so that, the first attempt was done to determine the maximum force. The attempts are of in maximum five with proportional intervals, being validated always that one where the executants surpassed the load with the appropriate technique (ACSM, 2003).

The same procedures had been followed for the exercises in the flexor table. Between attempts in the supine and in the flexor table the volunteers had had 5 minutes of rest.

Results

When realized the statistics analysis using for normalization the non-parametric test of Komogorov-Smirnov, getting the following results: KS = 0,907 with sig. p = 0,383 that he was > 0,05, that it denoted that the distribution does not differ from the normal distribution. This form the related (percentile of 1RM load) can be dealt with the methods of the inferential statistics with the parametric instruments in the context of superior members.

In the test of superior members the founded values had been R=0,755, being R^2 = 0,569 and EPE (error estimate standard) = 0.0591 or 5,9%. Or either, the mathematical Model presented predictive significance with sig.p < 0.001 when submitted to the test of the ANOVA.

The Model studied the relations having as base that: the dependent variable in the study was the Percentage of Load that the Superior Members had been submitted and the independent variable in this case were the Subjective Perception of Effort identified for the volunteers by means of Scale of Faces (in the mathematical analysis the numerical correspondent of 1 to 9).

The equation gotten for superior members was:

% Load = [[0,635 + 0,037 x Face] ± 0,059] x 100

When realized the analysis statistics using for normalized the non-parametric test of Komogorov-Smirnov, getting the following results: - KS = 1,026 with sig. p = 0,243 (p> 0,05), what denotes that the distribution does not differ from the normal distribution. In this form the related variable can be treated by the methods of the inferential statistics with the parametric instruments in the context of inferior member. The found results for inferior members had been: R=0,861, being R^2 = 0,742 and EPE = 0,0575 or 5,8%. Or either, the mathematical model presented predictive significance with sig. p < 0.001 when submitted to the ANOVA test.

The Model studied the relations having as base that: the dependent variable in the study was the Percentage of Load of the lower limbs had been submitted and the independent variable in this in case that it were the Subjective Perception of Effort identified for the volunteers by means of Scale of Faces (in it analyzes mathematics used the numerical correspondent of 1 to 9).

The equation gotten for inferior members was:

% Load = [[0,302 + 0,077 x Face] ± 0,058] x 100

Conclusion

From the present study it can be correlated the percentages of the attempts of the tests of 1 RM, as much for superior members as for lower limbs, But mathematically it was possible to establish an high correlation between 70% of 1 RM with the RPE using the Scale of Faces. The difficulty of if initiating with loads, in percentile terms, above of 70% inhabited in the fact of the indications how much to the inference of 1ª load therefore, according to ACSM (2003) the tests must only have 5 attempts what it generates on the part of the investigator a disposal in initiating with high loads, in contrary case, the possibility not to achieve the maximum load and the fatigue is most likely.

Recommended that more studies are realized through different groups, different sorts, aged, time of practical and with lower initial loads of testing, preferential, below of 70% to propitiate the obtaining of other correlations as also including other equations.

Also it would be recommendable that the values for inferior members are higher preventing to sub estimated the results. Interesting also it would be the study of the relation of Scale of Faces with concurrent activities.

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SUBJECTIVE PERCEPTION OF EFFORT DURING THE APPLICATION OF THE TEST OF 1RM USING FACIAL SCALE

Abstract:
The present research was a descriptive form with correlation delineation and objectified to identify through the attempts used for the accomplishment of the test of a maximum repetition (T1RM) if it had correlation between the percentages of load of attempts in this test with the subjective perception of effort (PSE) when answered by the volunteers using Facial Scale. The study assisted with 12 volunteers between 18 and 30 years old that practice power training three times per week for least the six months during 60 minutes. The results obtained were a correlation between the subjective perception of effort, Facial Scale, and the percentages of the 1RM test from 70% of the maximum capacity of work, express by the maximum kilogram. The treatment of for the regression analysis was based on the procedures of Stepwise Correlations observing itself to a level of significance of $p < 0,05$, for the acceptance of parametric procedure. Before, we applied Komogrorov-Smirnov's Non-parametric test with the results for superior members of: - KS = 0,907 with sig. p = 0,383 that was > 0,05 for superior member, and KS = 1,026 with sig. p = 0,243 also > 0,50 for inferior members. After the normalization, it can be conclude into two predictable equations one for superior members and one for inferior members, that when it is used they allow to predict how much of the percentage of the maximum load the individual would reach in the 1 RM test from the subjective punctuation in facial scale that the same it selected.
Key-Words: Subjective perception of Effort; Test of 1RM; Scale of Faces

PERCEPTION D'EFFORT SUBJECTIF PENDANT L'APPLICATION DE L'ESSAI DE 1RM SCALEkey EMPLOYANT FACIAL

Abrégé : La recherche actuelle était une forme descriptive avec la délinéation de corrélation et objectified pour identifier par les tentatives utilisées pour l'accomplissement de l'essai d'une répétition maximum (T1RM) si elle avait la corrélation entre les pourcentages de la charge des tentatives dans cet essai avec la perception subjective de l'effort (PSE) une fois répondue par les volontaires en utilisant la balance faciale. L'étude a aidé avec 12 volontaires entre 18 et 30 ans de qui pratiquent la puissance formant trois fois par semaine pour le moindre les six mois pendant 60 minutes. Les résultats obtenus étaient une corrélation entre la perception subjective de l'effort, balance faciale, et les pourcentages de l'essai de 1RM de 70% de la capacité maximum de travail, exprès par le kilogramme maximum. Le traitement de pour l'analyse de régression a été basé sur les procédures des corrélations par étapes s'observant à un niveau d'importance de p 0.05 pour le membre supérieur, et - KS = 1.026 avec des sig. p = 0.243 aussi 0.50 pour les membres inférieurs. Après la normalisation, il peut être concluent dans deux équations prévisibles une pour les membres supérieurs et une pour les membres inférieurs, qui quand on l'emploie ils laissent prévoir quelle quantité de pourcentage de la charge maximum l'individu atteindrait dans le 1 essai de RM de la ponctuation subjective dans la balance faciale que le même il a choisie.
Mots-clés : Perception subjective d'effort ; Essai de 1RM ; Balance des visages

PERCEPCIóN SUBJETIVA DEL ESFUERZO DURANTE LA APLICACIóN DEL 1RM TESTE UTILIZANDO LA ESCALA DE FACES

Esta pesquisa fue descriptiva con delineamiento correlacional y tuvo como objetivo identificar a través de las tentativas utilizadas para la realización de un test de una repetición máxima (T1RM) si había correlación entre los porcentajes de carga de las tentativas de este con la percepción subjetiva del esfuerzo (PSE) cuando respondida por los sujetos utilizando la Escala de Faces. El estudio contó con 12 voluntarios en las edades entre 18 y 30 años practicantes de entrenamiento de fuerza por lo menos ha seis meses tres veces por semana durante 60 minutos. Los resultados obtenidos fueron una correlación entre PSE, Escala de Faces, y porcentajes del teste de 1RM a partir de 70% da la capacidad máxima del trabajo expresa a través de la **quilagem** máxima. El tratamiento para el análisis de la regresión fue baseada en los procedimientos de Stepwise Correlations observado a través de un nivel de significativo $p < 0,05$ para la aceptación de los procedimientos paramétricos. Antes de ser aplicado el test No paramétrico de Komogorov-Smirnov, obtuvimos los siguientes resultados: - KS = 0,907 con sig. p = 0,383 que fue > 0,05, para miembros superiores e - KS = 1,026 con sig. p = 0,243 también > 0,05, para miembros inferiores. Después de la normalización se puede llegar a las dos ecuaciones pronosticadas una para miembros superiores e una para miembros inferiores, que cuando usadas permiten predecir a cuanto el porcentaje de la carga máxima el individuo alcanzaría en el teste de 1RM a partir de una puntuación subjetiva en la Escala de Faces que el mismo seleccionaba.
Palabras-Clave: Percepción Subjetiva del Esfuerzo; Test de 1RM; Escala de Faces

CORRELAÇÃO ENTRE A ESCALA DE FACES E O TESTE DE UMA REPETIÇÃO MÁXIMA PROPOSTA DE EQUAÇÃO DE PREDIÇÃO

Resumo: A presente pesquisa foi do tipo descritiva com delineamento correlacional e objetivou identificar através das tentativas utilizadas para a realização do teste de uma repetição máxima (T1RM) se havia correlação entre os percentuais de carga das tentativas deste teste com a percepção subjetiva de esforço (PSE) quando respondida pelos sujeitos utilizando a Escala de Faces. O estudo contou com 12 voluntários na faixa etária compreendida entre 18 e 30 anos praticantes de treinamento de força a pelo menos seis meses três vezes por semana durante 60 minutos. Os resultados obtidos foram uma correlação entre PSE, Escala de Faces, e percentuais do teste de 1RM a partir de 70% da capacidade máxima de trabalho, expressa pela quilagem máxima. O tratamento dos para a análise de regressão baseou-se nos procedimentos de Stepwise Correlations observando-se um nível de significância $p < 0,05$ para aceitação dos procedimentos paramétricos. Antes aplicamos o teste Não paramétrico de Komogorov-Smirnov, obtendo-se os seguintes resultados: KS = 0,907 com sig. p = 0,383 que foi > 0,05, para membros superiores e KS = 1,026 com sig. p = 0,243 também > 0,05, para membros inferiores. Após a normatização pode-se chegar aos resultados finais quais sejam, duas equações preditivas. Uma, para membros superiores e uma para membros inferiores que, quando usadas permitem predizer a quanto do percentual da carga máxima o indivíduo alcançaria no teste de 1RM a partir da pontuação subjetiva na Escala de Faces que o mesmo selecionava.