125 - RELATIONSHIP BETWEEN THE PERCEPTIONS OF EFFORT HYPERTROPHY TRAINING

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Introduction

The measurement of force in training is a very important aspect, both in the initial phase and during its progression. The way to do it can vary depending on the type of force that intends to measure, the equipment available and precision they offer and the muscle or muscle group assessed. In the case of weight training and equipment, the most common is the measurement of strength through repetition maximum tests (RM). According Kramer and Fleck (1999), RM "is the maximum number of repetitions per series that can perform with a certain load, using correct technique".

According to Fleck and Kraemer (1999), maximal strength tests have been widely used and suggested in works on strength training.

Order to develop a strength training efficiently some variables inherent to the training must be observed. he most important variables are: choice of exercise and equipment, order of exercises, volume and intensity of the exercises, repetitions and weights, workout frequency range (between sets and exercises), breath control (Uchida et al, 2003; Bacurau; Navarro; Uchida, 2005).

According to Uchida (2003) lists the following objectives for the practitioners of this type of training: muscle hypertrophy (which uses 6-12 repetitions with load between 67% and 85% of 1RM) maximum muscular strength or pure (with less than 6 repeats and load exceeding 85% of 1RM), muscular power (with variable repetition generally inferiors 10 and high and moderate loads of 30% to 90% of 1RM) and muscular endurance (with repetitions between 15-50 and loads of less than 65% of 1RM), with these numbers may vary slightly, depending on the author, or the goals to be achieved are directly related to the percentage of 1RM.

However, physical activity not only has a physical component. Knowledge of the physiological changes of components and emotions (psychological), occurring when a person performs a physical exercise is an important way to understand the psycho-biological characteristics of this person (Borg, 2000).

Whereas the Effort Subjective Perception is an indicator for obtaining the degree of physical effort, thus it is important to know the level of effort that is being held in a particular activity or exercise.

Importantly, the physical education professional should prescribe programs with physical exercises that respect the biological individuality and have an appropriate workload, through appropriate methods to assess the intensity as it is the main key to the constant search of the desired results.

People who participate in a strength training program expect the program to produce some benefits, such as increased strength, increased muscle size, improved exercise performance, muscle growth and decrease body fat. A well planned and executed consciously strength training program can produce all these benefits.

Both the fitness practitioner and pleasure as the athlete hope to achieve gains in strength or muscle size (muscle hypertrophy) with a strength training program. To (Fleck and Kramer, 1999) very different types of resistance modes (isokinetic exercises, variable resistance and isometric exercises, for example) can produce gains in strength. In addition, very different training systems (series of combinations, repetitions and loads) can produce significant increases in strength as the system continues to present an effective training stimulus to the muscle.

The effectiveness of a specific type of strength training mode or system depends on its correct use within the overall prescribing exercises or training program. The main goal of hypertrophy training is causing significant chemical changes in the muscle needed to build muscle. Unfortunately, for some bodybuilders, increase muscle mass is often the result of increased fluid - plasma in the muscle, rather than the thickening of the muscle fiber contractile elements (Bompa, 2000).

In other words, the increase of muscle is the result of some bodily fluids change for the exercising muscle, and not increasing the size of the muscle fiber. Therefore, in some cases, force is not proportional to its size, a problem that can be corrected with the application of the concept of training periodization.

There are some factors that influence muscle hypertrophy as tension and metabolic overload: overload tension causes myofibrillar hypertrophy due to the increased content of contractile proteins in myofibrils, providing the increase in the number and size of myofibrils. This is primarily due to training with heavy loads (Guedes, 2008).

The metabolic overload that causes the sarcoplasmic hypertrophy is defined by Guedes (2008), as the increase in creatine phosphate, glycogen and water which occurs due to prolonged contraction, which suggests high repetitions and / or short intervals. However, the maximum hypertrophy will be reached when we can balance high weight, high reps and short intervals in order to provide simultaneously or alternately within the periodization of the training process, the tension overload and metabolic concludes Guedes (2008).

> Law No. 1 - Before developing muscle strength develops joint flexibility. Law No. 2 - Before developing muscle strength develops the tendons. Heavy loads and premature lack of a longer period for adapting because some individuals, not very healthy way, develop a specific muscle group without prior strengthen the support system. Law No. 3 - Before developing members develops the trunk. All trunk muscles function as a unit that provides stabilization movements of arms and legs (Bompa, 2000, p.27).

To this end, Dantas (1995) proposes six principles for the development of training, including: Principle of Biological Individuality, The Principle of Adaptation, The principle of overload, the principle of continuity, the principle of Volume-intensity Interdependence and principle of specificity.

According to Tubino (1984), "is called individuality biological phenomenon that explains the variability between elements of the same type, which means that there are people like each other".

Adaptation is the most universal law of life. Biological adaptations present as structural and functional changes in almost all systems. Under "biological adaptations in sport" means the changes of organs and functional systems, which appear as a result of psychological, physical or sports activities (Weineck, 1991).

Stop the overload principle, according to Dantas (1995): "Immediately after the application of a load, there is a

recovery of the body to establish homeostasis".

The principle of continuity is connected to the adaptation, for continuity over time is critical to the body gradually adapt. To Tubino (1984), these two assumptions explain the so-called principle of continuity.

The principle of volume-intensity interdependence is closely linked to the overhead because the increase in workloads is one of the factors that improve performance. This increase will occur by volume account and because of the intensity.

And the final principle according to Dantas (1995) is,

> The principle of specificity is one that requires, as an essential point, that training should be mounted on specific requirements of sporting performance in terms of intervening physical, dominant energy system, body segment and psychomotor coordination used.

A concept related to fatigue and stress is exercise intensity. Exercise intensity is interpreted in many different ways. You can receive a physical meaning, based on the stimulus, and defined by physical measurements such as strength, work and energy, torque, speed. It can also be interpreted physiologically, in absolute terms and VO2 max or relative values such as heart rate. A third possibility is to assess exercise intensity in terms of subjective determinations of intensity ratios, as the perception of the individual. This method provides an individualized measure of exercise intensity.

The need for a special scale that could be used for the perceived exertion and also to other sensory perceptions, including pain, became increasingly apparent. Thus, several methodological studies were initiated and finally led to CR10 Borg scale.

Repeat tests, as they are known, it is based on what happens strong correlation between resistance and strength (Queiroga, 2005). These features allow for more security when evaluated so that the joints and tendons are prepared to overload training.

There are many ways to prescribe the ideal training load. A popular and simple way to determine the workload is the one repetition maximum test (1-RM) or maximum load test, which is the maximum load that can be raised by only once in a full motion (Pereira; Gomes , 2003). In view of these considerations, this study aimed to analyze the perception of effort in relation to the goal of hypertrophy training.

Methodological Procedures

This research was initially the theoretical and bibliographical nature and later the field, descriptive and quantitative. Given the nature of research, we opted for the preparation of submaximal test developed by Brzycki (1993) and Stress Perception Scale test by Borg (2000).

Fifty males apparently healthy (25.14 ± 5.9 years; weight 77.06 ± 9.3 kg; height, 1.75 ± 0.1 cm), strength training practitioners on a regular basis 3 4 sessions per week participated in the study. All subjects were informed about the procedures adopted for the tests and signed the Term of Free and Clear.

The exercises selected for the implementation of this study were the bench press and leg press. Before performing the test itself subjects performed a series of heating 10 repetitions with approximately 50% load set for this test. After two minutes of rest the test was started. Subjects were instructed to those who try to perform as many repetitions as possible until you configure a functional inability to overcome the resistance offered.

In the test Borg CR10 Scale, this scale tells you what the level of perception regarding certain tribute. As you can see the scale part of "absolutely nothing" and reaches "absolute maximum". "Extremely strong -. Dmax" (10) is such a strong sense of right attribute as the most intense perception already experienced by any previous occasion. We use the scale as follows: observing the verbal expressions. Then the choice of a number. If the perception corresponds to "very weak," say the value 1, it is 3 and so on.

Data were collected in the gym Fitness World, located at Rua Dilson Funaro, No. 166 - Bairro Ulysses Guimarães, in the city of Joinville-SC.

Results and Discussion

For the analysis and interpretation of data obtained descriptive statistics with central tendency and dispersion measurements was used. The Kolmogorov-Smirnov test showed no normality between the variables investigated, opting for well by non-parametric tests. The comparative samples are given by the Wilcoxon-Mann-Whitney independent samples, a significance level of p0.05. The Friedman test for association between the investigated data.

Table 1. Characterization of the male sample, submitted using the scale of perceived exertion and resistance training hypertrophy.

Variable	Male n= 50 X ± SD
Age (anos)	25,14±5,9
Wheigth(Kg)	77,6±9,3
Size (m)	1,75±0,1

X= média, SD= standard deviation

In table 1 you can see the characteristics of the studied group.

Bompa (2000) shows us that the main objective of hypertrophy training is causing significant chemical changes in the muscle for gains in muscle mass. In this sense it is necessary to train in ideal area for these gains. Table 2 presents the perceived exertion scale (PES) showing that the subjective perception must be between 14-16, from a scale of 6-20. "The proper selection of training intensity is the" key "to the success of exercise prescription" (Marins and Giannichi, 2003, pg. 210).

Intensity Classification Stress Per ception Scale		
Scale	%VO2reserve %CF reserve	% 1RM
< 10	< 20	<30
10-11	20-39	30-49
12-13	40-59	50-69
14-16	60-84	70-84
17-19	=85	>85
20	100	100

Source: Nieman (2011).

Only by using the correct charge is a strength training program could achieve success with athletes (Fleck, Kraemer,

1999).

Table 3 Comparison of training intensity using the perceived exertion scale (PES) related real relative load trained (%) among strength training apprentices in order to muscle hypertrophy

Exercises	1RM (PES) n= 50 X ± SD	1RM (Real) n= 50 X ± SD	? (%)	*p*
Bench press (%)	68,7±0,11	52,3±0,11	-16,4% (-23,9%)	0,01
Leg-press 45 ° (%)	65,7±0,11	53,0±0,11	-12,7%(-19,3%)	0,01

X mean,

SD standard deviation,

∆ (%)Absolute and relative difference,

p Wilcoxon-Mann-Withney test to independent samples, p<0,05.

Table 3 compares the PES with% 1RM and demonstrates that for the bench press was no difference (p <0.05) between the perception and the real trained -16.4% (-23.9%).

To exercise leg press 45, there were differences (p <0.05) between the perception and the real trained -19.3% (-19.3%). So much for the PES, and to% 1RM, the subjects were in training supports for muscular endurance (ME), intensity below the goal of hypertrophy.

The resistance training zones for power (90% -100% 1-RM) hypertrophy (70-85% 1-RM) and resistance (40-65% 1-RM) are recommended, but since they are in a broader context, considering all the important variables for the prescription of strength training. For Azevedo et al. (2009) the same finding strength for leg-press, demonstrated below that of hypertrophy training, with significant differences (p <0.05) between the perception and the real trained -12.7% (-19.3%). The training was in muscular endurance.

The resistance refers to the length of time that the individual can perform work with certain intensity. The main limiting factor, and at the same time affects the performance is fatigue. The resistance depends on many factors, such as speed, muscle strength, the technical skills to perform the physiological movements economically and psychological state when performing a working (Bompa, 2002). In the case of bodybuilding is important to note that resistance training can be called strength endurance. The work is anaerobic because it uses the rich phosphates in energy (ATP and phosphocreatine) and glycolysis as energy sources for the realization of muscle contraction. The weight training is considered aerobic used when the load is less than 30% of 1-RM (Silvestre, 2012).

For a resistance training program, the muscular endurance, which is recommended to be used at various times, especially at the beginning of periodization, because with this training is possible for the individual to become more tolerant to the demands imposed by resistance exercises, as well as preparing joints and muscles for larger overloads.

Table 4 Frequency analyses of the subjects who perceived or not perceived exertion scale (PES) to force in relation to real trained relative load (%) in order to muscle hypertrophy

	Yes fx (%)	No fx (%)	?(%)
Bench press	26(52%)	24(48%)	2(8%)
Leg-press 45 °	33(66%)	17(34%)	16(48%)

fx(%) absolute and relative frequency.

Table 4 presents the analysis of the bench press 26 (52%) subjects who understood the scale (PES) and 24 (48%) who did not understand. For the leg-press exercise 33 (66%) understood the scale and 17 (34%) did not understand. It must be considered that approximately 10% of people do not properly interpret the scale as a range effort (ACSM, 1999) cited. The subject of relationship that did not understand the scale surpassed presented in the literature.

The methodological procedure of the proposed scale consists of factors such as simplicity, low operating cost, little expertise, minimal instruction for your application as well as can avoid the apparent risk of musculoskeletal injury present in other measures. It points out the importance of scale (PES) to the desired results, but there was a lack of knowledge and information in bodybuilding gyms, where selected individuals do not use the hypertrophy training load intensity recommended for the purpose.

Of Fleck and Kramer (2006) agreement 20 series of 1RM in the squat, produce slight increase of growth hormone (GH), 10 sets of 10 reps with 70% 1-RM. multiple protocols series produce increased GH series unique in both sexes.

The authors state study the importance of intensity due to the secretion of anabolic hormones important for increasing muscle mass. According Uchida et. al (2003), each practitioner's strength training has a purpose and a biological individuality, which reacts differently to training, thus making it important to your individual prescription order to achieve the specific goal of every practicing efficiently and safely. Within each goal there is a different training intensity when not controlling this intensity or work is outside the purpose of the practitioner will simply not be reached (Kraemer et al., 2002).

Conclusions

Based on this study, we conclude that there is a possibility to be able to use the subjective sensation of effort in strength training, the justified on the data presented here; it is observed that the practitioners did not understand the scale according to the 1-RM test and his training was not consistent intensity goal.

Considering that the subjective perception of effort is an indicator for the achievement of the physical exertion level and also important to know the level of effort that is being held in a particular activity serves as a parameter for prescribing and monitoring the intensity of workouts. Note the importance of using the scale as the academies generally unaware of this method of work.

Therefore we can say that there are many variables that influence the scale according to the 1-RM test, such as lack of knowledge of the procedures used in the academies as well as physical education professional experience is essential at the time of dosing not only loads total of the training session, but the applicability and biological individuality of each practitioner.

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RELATIONSHIP BETWEEN THE PERCEPTIONS OF EFFORT HYPERTROPHY TRAINING

ABSTRACT

The objective of this study was to analyze the perception of effort in relation to the goal of hypertrophy training. 50 male individuals were selected practitioners in hypertrophy training, an average of 25.14 ± 5.9 years and at least six months of practice. The exercises were bench press and leg press 45 °. We used scale exertion and submaximal test of strength. The results show that the bench press was no difference (p <0.05) between the perception and the real trained -16.4% (-23.9%) and to exercise leg press 45 ° difference (p <0.05) between the perception and the real trained -19.3% (-19.3%). So much for the EPE (Stress Perception Scale), and for% 1RM, the subjects were in training supports for muscular endurance (RML), intensity below the goal of hypertrophy. In the analysis of the bench press 26 (52%) subjects understood the scale (EPE) and 24 (48%) did not understand. To exercise leg press 33 (66%) understood the scale and 17 (34%) did not understand. We conclude that the practitioners did not understand the scale according to the 1RM test and that his training was not consistent intensity goal.

KEYWORDS: Intensity, Hypertrophy Training, Stress Perception Scale

RELATION ENTRE LA PERCEPTION DE L'EFFORT À LA FORMATION HYPERTROPHIE

RÉSUMÉ

Le but de cette étude était d'analyser la perception de l'effort par rapport à l'objectif de la formation de l'hypertrophie. 50 individus de sexe masculin ont été choisis dans la formation des praticiens de l'hypertrophie, une moyenne de 25,14 ± 5,9 ans et au moins six mois de pratique. Les exercices étaient banc de presse et presse jambes à 45 °. Nous avons utilisé un effort à grande échelle et le test sous-maximal de force. Les résultats montrent que la presse banc avait pas de différence (p <0,05) entre la perception et la réalité formé -16,4% (-23,9%) et à exercer la pression de jambe 45 ° de différence (p <0,05) entre la perception et la réalité formé -19,3% (-19,3%). Voilà pour l'PSS (perception du stress Scale), et pour% 1RM, les sujets étaient à l'entraînement supports pour l'endurance musculaire (EM), l'intensité en dessous de l'objectif de l'hypertrophie. Dans l'analyse de la presse banc 26 (52%) des sujets compris l'échelle (PSS) et 24 (48%) ne comprenaient pas. Pour exercer presse jambe 33 (66%) ont compris l'ampleur et 17 (34%) ne comprenaient pas. Il a été conclu que les pratiquants ne comprennent pas l'ampleur selon le test 1RM et que sa formation n'a pas été objectif d'intensité constante.

MOTS-CLÉS: la force, l'hypertrophie de l'échelle de perception de l'effort.

RELACIÓN ENTRE LA PERCEPCIÓN DEL ESFUERZO DE LA ENTRENAMIENTO DE HIPERTROFIA

RESUMEN

El objetivo de este estudio fue analizar la percepción del esfuerzo en relación con el objetivo del entrenamiento de hipertrofia. 50 individuos masculinos fueron seleccionados los profesionales en entrenamiento de hipertrofia, un promedio de 25.14 ± 5,9 años y al menos seis meses de práctica. Los ejercicios fueron press de banca y prensa de piernas 45 °. Utilizamos el esfuerzo escala y prueba submáxima de fuerza. Los resultados muestran que el press de banca hubo diferencias (p <0,05) entre la percepción y la realidad entrenado -16,4% (-23,9%) y ejercer presión de piernas 45 ° diferencia (p <0,05) entre la percepción y la realidad entrenado -19,3% (-19,3%). Esto en cuanto a la EPE (estrés Percepción Scale), y para el% de 1RM, los sujetos se encontraban en formación apoya a la resistencia muscular (RML), la intensidad por debajo de la meta de la hipertrofia. En el análisis de la prensa de banco 26 (52%) sujetos comprendieron la escala (EPE) y 24 (48%) no. Llegamos a la conclusión de que los practicantes no entendían la escala según el test de 1RM y que su formación no era el objetivo de intensidad constante.

PALABRAS CLAVE: fuerza, hipertrofia, la escala de esfuerzo percibido.

RELAÇÃO ENTRE A PERCEPÇÃO DE ESFORÇO AO TREINAMENTO DE HIPERTROFIA

RESUMO

O objetivo deste estudo foi analisar a percepção do esforço em relação ao objetivo do treinamento de hipertrofia. Foram selecionados 50 indivíduos do gênero masculino, praticantes no treinamento de hipertrofia, média de 25,14 ± 5,9 anos sendo no mínimo de seis meses de prática. Os exercícios utilizados foram supino livre e leg press 45°. Utilizou-se escala subjetiva de esforço e teste submáximo de força. Os resultados demonstram que o supino livre houve diferença (p<0,05) entre a percepção e o real treinado -16,4% (-23,9%) e para o exercício de leg press 45°, houve diferença (p<0,05) entre a percepção e o real treinado -19,3% (-19,3%). Tanto para a EPE (Escala de Percepção de Esforço), quanto para %1RM, os sujeitos se encontravam em treinamento compatível para resistência muscular localizada (RML), intensidade inferior ao objetivo de hipertrofia. Na análise do exercício supino 26(52%) os sujeitos compreenderam a escala (EPE) e 24(48%) não compreenderam. Para o exercício leg press 33(66%) compreenderam a escala e 17(34%) não compreenderam. Concluiu-se que os praticantes não compreenderam a escala de acordo com o teste de 1RM e que seu treinamento não estava coerente a intensidade do objetivo.

PALAVRAS-CHAVE: Intensidade, hipertrofia, escala de percepção de esforço.