82 - STRENGTH OF HOLD FOR INDIVIDUALS PALMAR BODYBUILDERS

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INTRODUCTION

Resistance exercises are used as an effective means to increase muscle strength and improvement of functional status in all idades1. They mark for accurate use of overloading in training prescription for the purpose of improving physical performance associated with increased strength and power muscular2.

Dias et al.3 says strength training is one of the most widely practiced physical exercise by individuals of both sexes, different ages and different fitness levels. Thus, to promote and maintain health and functional independence, Haskell et al. 4 recommend strength training as part of a physical fitness program for any age. However, it is worth noting that the full understanding of definitions, principles and methods for prescribing a routine resistance exercise are of paramount importance for the safe and effective prescribing. So the physical education professional needs foundations enabling it to adjust, interpret laws and judge the strength training so as to meet the objectives of their praticantes5.

Among such components of strength training, intensity, or load used in a particular year are some of the variables most importantes6. Within the evaluation process of force and motion of the hand. The hand is an organ that is involved in virtually all our activities of daily living, thus presenting a variety of functions for your perfect funcionamento7. For the assessment of muscle strength is used as a dynamometer instrumentation, which is the measurement of isometric force, which involves the use of force to an immovable object. The muscle contracts, remaining under constant voltage for a short time interval, this time is usually about 10 seconds, which would be enough to verify the values and the time over which existed força8.

The grip strength is not simply a measure of the strength of the hand or even limited to the assessment of the upper limb. It has many different clinical applications and is used, for example, as an indicator of total body strength, and in this sense is employed in física10-12 fitness tests. Thus, this knowledge becomes important for professionals working with assessment, rehabilitation and prescription exercícios13. The importance of measuring grip strength is to provide an objective index of the functional integrity of the upper limbs, the activities of gripping and manipulating objects with force application, common in the daily sports, working world and even in the daily lives of all the pessoas9.

METHODOLOGY

CHARACTERISTICS OF RESEARCH AND STUDY PARTICIPANTS

The present study was developed through quasi-experimental format, considering that experimental research is to determine an object of study, select the variables that would be able to influence it, define the forms of control and observation of the effects that the variable independently produced directly in the dependent variable.

The selection of respondents was intentional character, and was composed of 20 individuals, aged 20 to 35 years of practicing bodybuilding, training regularly 3 times a week and the time of more than four years practice. This group gave rise to two groups, 10 males and 10 females.

MATERIALS AND METHODS

For analysis of grip strength dynamometer Takei® Mechanical Manual which measures the strength depending on the amount of tension produced, capable 0-100 kg / f (per kilogram force), previously calibrated was used. The protocol used was Adams23. Participants succeeded in evaluating the following position: standing with one leg in front of the other and using their dominant hand to perform the motor act of handgrip, while the other hand is random side of the body, ie, the elbow was maintained in full extension and the shoulder was positioned at 180 ° of flexion.

It is noteworthy that to start applying force to the handgrip participants should expect the verbal command of the observer (researcher) which was done in two stages: at first it was spoken "primes" and after 3 seconds, the assessor said the word "already", between time points, was given an interval of sixty seconds. "Data collection took place in two sessions, the first evaluation the subjects performed the handgrip test and the second test was performed after 12 weeks of training with a minimum frequency of three times per week.

DATA ANALYSIS

To characterize the study participants and collected data descriptive statistics were performed. To compare the grip strength of the dominant and nondominant hand the "Student t" test was used (independent). To compare the pre- and post-test (dependent) "Student t 'test with a significance level of $p < 0.05$ was used.

RESULTS AND DISCUSSION

Tables 1, 2 and 3 provide descriptive statistics comparing the results obtained from analysis of grip force (PMF) of the dominant and non-dominant limb of individuals practicing bodybuilding.

Table 1 - Comparison of mean (X) and standard deviation (s) of handgrip strength (FPP) of the dominant limb (MD) and non dominant (MND) male and female pre-test.

Pré				
Masculino				p
MD(Kg)		MND(Kg)		
$\bar{x}$	s	$\bar{x}$	s	0,403
57,30	10,36	55,95	10,85	

Pré				
Feminino				p
MD(Kg)		MND(Kg)		
$\bar{x}$	s	$\bar{x}$	s	0,318
29,75	4,54	29,10	5,16	

From Table 1, we can identify the male than the average of FPP MD was 57.30 kg, however the MND was 55.95 kg, these values show that men have higher levels of strength in MD, but when held the statistical analysis showed a statistically significant difference. In women, the average PPF was 29.75 kg in MD and MND average value was 29.10 kg, ie, women also have higher levels of strength in MD, however no significant difference between them. Still in Table 1 shows the prevalence of FPP in men compared to women, including the predominance of FPP is higher in both MD and in MND.

Corroborating this study, Godoy et al.15 the authors concluded that grip strength is greater in men than in women in all age groups and both sides, even independent of occupation. Caporrino et al.16 carried out the largest population study ever developed in Brazil. Were 800 healthy subjects of both sexes, with ages ranging from 20 to 59 years, all evaluated for FPP using the dynamometer Jamar®. Concluded that FPP was higher for males compared with females at all ages studied, both for the dominant and non-dominant sides.

Table 2 - Comparison of mean () and standard deviation (s) of handgrip strength (FPP) of the dominant limb (MD) and nondominant (MND) male and female post-test.

Pós				
Masculino				p
MD(Kg)		MND(Kg)		
$\bar{x}$	s	$\bar{x}$	s	0,076
56,85	11,34	53,80	10,35	
Pós				
Feminino				p
MD(Kg)		MND(Kg)		
$\bar{x}$	s	$\bar{x}$	s	0,788
29,45	5,53	29,70	6,02	

Analyzing Table 2, it was observed that the average of the FPP MD males was 56.85 kg, however the average MND was 53.80 kg. These results show that the post-test males obtained FPP lower values both in MD and in the MND. However when there was the statistical analysis comparing MD and MND at posttest did not obtain statistically significant difference. Already women showed slightly larger than males progression, the average MD was 29.45 kg and 29.70 kg of MND was, so there is at posttest increased levels of strength of the MND women, but did not show a significant difference between them.

It is believed that this decrease in force male on both sides is related to the training method, the target and the emphasis of the training of the individual, since a training model was not established at the beginning of the survey to each participant the study. In women, the MND showed higher values than the FPP MD, although not statistically significant. Although women have been expected to be any decrease in force, because during the study, 6 of the 10 participants made it clear that the priority was the lower limbs. When meeting with Barbosa17 study, the author reports that women have a greater decline in PPF in relation to men. But each purpose requires the use of different types of training, with different intensities, volumes, speed of movement execution, sets, rest intervals between sets and exercises, and recovery periods between treinos18.

According to work done by Barbosa et al.19 studying resistance training found a significant increase in isotonic muscle strength in all muscles worked, and the percentage increases varied with exercise. When testing the handgrip resulted in a significant increase despite not having specific training for the muscles involved in grip, but these muscles were activated by other exercises. Strength increases are slow and can reach 1-3% per week with moderate workouts and heavier workouts 4-5% per week. The rate of increase tends to decrease or stabilize when the power comes close to their genetic potential máximo20.

So for every practitioner of bodybuilding, there should be differentiated training, and the selection of the method is on the direction of the potential effect achieved and this should be in accordance with the effect previously planejado18.

Table 3 - Comparison of mean () and standard deviation (s) of handgrip strength (FPP) of the dominant limb (MD) and nondominant (MND) male and female Pre and Post-Test.

		Pré		Pós		p
		$\bar{x}$	s	$\bar{x}$	s	
Masculino	MD(Kg)	57,30	10,36	56,85	11,34	0,715
	MND(Kg)	55,95	10,85	53,80	10,35	0,104
Feminino	MD(Kg)	29,75	4,54	29,45	5,53	0,741
	MND(Kg)	29,10	5,16	29,70	6,02	0,538

From Table 3 are the results of pre- and post-testing of variables. Can identify the male than the average MD of FPP in the pretest was 57.30 kg already in the post-test was 56.85 kg so there is a decrease in strength. The same occurred in MND where the average pre-test was 55.95 kg and 53.80 kg posttest, however once held the statistical analysis showed a statistically significant difference. In women, the average MD of FPP in the pretest was 29.75 kg in the post-test was 29.45 kg and there is also a decrease in strength. However the average PPF of MND in the pretest was 29.10 kg, since the post-test was 29.70 kg there was an increase in strength, but did not demonstrate a statistically significant difference between pre and post -test. According Figueiredo21.

According to work done by In cel et al.22 most right-handed individuals has on average 10% more strength in the dominant hand, while claims this is the same for both hands, with the strongest non-dominant hand 50% of cases. According to figures obtained by them, the dominant hand is significantly stronger in the group of right-handed, but is not as significant among those who use the left hand. This is certainly due to the fact that we live in a society organized for righties, where clumsy are forced to adapt and consequently exercise non dominant hand, raising the average performance of the right hand.

The weight remains on the increase of a specific performance, has as main purpose the development of strength that includes regular use of free weights, machines, body weight and other equipment. It is generally accepted that strength training causes increased muscle mass, gain muscle strength and power as well as being useful as físico18 increment.

FINAL THOUGHTS

This study showed that FPP practitioners bodybuilding individuals both male and female, compared MD and MND no significant difference between the sides. According to the findings of this study we can conclude that there is considerable progression of MND FPP at posttest, that for females, while for males there was no progression but a decline in the strength of both sides in both MD and in the MND.

And this may be the short interval between the pre- and post-test occurred due to non-specificity and periodization of training. The evaluation of this valance can assist in developing training that could be an important strategy for improving performance. It is suggested that further studies with larger numbers and control variables in longitudinal studies be conducted.

REFERENCES

1. Rhea MR; Alvar BA; Burkett LN; Ball SD. A meta-analysis to determine the dose response for strength development. Medicine Science Sports Exercise, Vol. 35, p. 456- 464, 2003.

2. J Souza et al. Mathematical Model For Predicting Maximum Force Of The Leg Press 45th In Men. Brazilian Journal of Biomotricity, v. 5, no. 1, p. 53-63, 2011 (ISSN 1981-6324).

3. Days RMR et al. Influence of the familiarization for assessing levels of muscular strength in 1-RM testing process. Brazilian Journal of Sports Medicine, vol. 11, p. 34-38, 2005.

4. WL Haskell et al. Physical Activity and Public Health: Updated Recommendation for Adults from the American College of Sports Medicine and the American Heart Association. Medicine Science Sports Exercise, Vol. 39, p. 1423-1434, 2007.

5. Simon JRF et al. 1 RM test and prescription of resistance exercise. Moving file, v. 2, p. 55-63, 2006.

6. Fleck SJ; Kraemer WJ. Fundamentals of muscle strength training. Porto Alegre: Editora Artmed 2006.

7. Pardini JRAG. Hand rehabilitation. St. Paula. Ed. Atheneu 2006.

8. Borges et al JNG. Comparative study of maximal isometric grip force in different sports. Revista Brasileira Cineantopometria and Human Performance. 2009, 11 (3): 292-98.

9. Moreira D; Alvarez R. Measurement of grip strength in patients with leprosy treated in outpatient clinics. Arch Ciênc Health Unipar, 6 (3): 107-113, 2002.

10. Balogum JA et al. Grip strength: effects of testing posture and elbow position. Arch Phys Med Rehabil. 1991; 72: 280-283.

11. Durward BR et al. Functional human movement: measurement and analysis. 1. ed., St. Paul, Manole, 2001.

12. Napier J. The prehensile movements of human hand. J Bone Joint Surg. 1956; 38: 902-913.

13. Brown LE; Weir JP. ASEP Procedures recommendation I: accurate assessment of muscular strength and power. Journal of Exercise Physiology, vol. 44, p. 1-21, 2001.

14. Bompa TO. Training principles. Periodization: theory and methodology of training. 4 edition. Phorte. São Paulo; p. 42. 2009.

15. JRP Godoy et al. Clamping force of handgrip using the Jamar dynamometer: a literature review. Efdeportes.com digital magazine. Year 10, n. 79. 2004.

16. Caporrino FA et al. Population study of handgrip strength with JAMAR dynamometer. Brazilian Journal of Orthopedics. V. 33, n.2. 1998.

17. The Barbosa et al. Functional limitation of Brazilian elderly age and gender Differences: save data from survey. Cad Public Health, v.21, n.4, p.1177-1185 July-August 2005.

18. Uchida MC et al. Operating weight: a theoretical and practical approach to strength training. 2.ed. - Sao Paulo: Phorte 2004.

19. AR Barbosa et al. Effects of a program of resistance training on muscle strength in older women. Brazilian Journal of Physical Activity and Health, v.5, n.3, p.12-20, 2000.

20. BJ Sharkey. Muscular capacity. In: Physical Fitness and Health. Porto Alegre: Ed Artmed.. p.141-202, 1998.

21. IM Figueiredo et al. Grip strength testing using the Jamar dynamometer. Physiological Acta 2007 pag. 104-110.

22. Incel, NA et al. Grip strength: effect of hand dominance. Singapoure med. Journal, 43 (5): 234-7, 2002.

23. ADAMS GM Exercise Physiology - Laboratory Manual. 2nd ed. WCB, 1994.

STRENGTH OF HOLD FOR INDIVIDUALS PALMAR BODYBUILDERS

ABSTRACT

The objective of the present study was to evaluate the palmar prehension force between dominant and non-dominant hand of bodybuilders. Participated in the study 20 individuals, aged between 20 to 35 years bodybuilders, training regularly 3 times a week. For analysis of the palmar prehension force was used the dynamometer Takei ® Manual Mechanical measuring the strength depending on the amount of tension produced, with a capacity of 0 to 100 KP (kilogram force) previously calibrated. For comparison analysis between grip force of dominant and non-dominant hand pre and post-test was used the t Student "test with a significance level of p 0.05. You can identify the males average FPP of dominant hand (MD) in pre-test was 57.30 Kg at post-test was 56.85 Kg and a decrease in strength. The same occurred in non dominant hand (MND) where the pre-test average was 55.95 Kg and post-test 53.80 Kg, however when we performed the statistical analysis was not statistically significant. In the female the average MD FPP in the pre-test was 29.75 Kg, at post-test was 29.45 Kg there is a decrease in strength. However the average FPP of MND in the pre-test was 29.10 Kg, already in the post-test was of 29.70 Kg was observed an increase in strength, but not demonstrated no statistically significant difference between pre and post-tests. It is concluded that, in the present study the FPP of individuals male bodybuilders and female, compared MD and MND there was no significant difference between the sides.

KEYWORDS: grasping, bodybuilding, predominance.

FORCE DE MAINTIEN POUR PARTICULIERS BODYBUILDERS PALMAIRES

RÉSUMÉ

L'objectif de cette étude était de comparer la force de préhension entre la main dominante et non dominante de personnes pratiquant la musculation. Participants à l'étude étaient 20 personnes pratiquant le culturisme, âgé de formation 20-35 ans régulièrement 3 fois par semaine. Pour l'analyse de la force de préhension manuelle Takei® mécanique dynamomètre qui mesure la force en fonction de la valeur de la tension produite, capable de 0 à 100 kg / f (par kilogramme force), préalablement étalonné a été utilisé. Pour une analyse de comparaison entre la force de préhension de la main dominante de pré et non-dominante et post-test "t de Student" avec un niveau de p <0,05 test de signification. Peut identifier le mâle que la force moyenne d'adhérence (CMR) de la main dominante (MD) dans le pré-test a été 57,30 kg déjà dans le post-test a été 56,85 kg si il ya une

diminution de force. A été de même dans la main non-dominante (MND) où le pré-test moyen était de 55,95 kg et 53,80 kg post-test, mais quand a effectué l'analyse statistique a montré une différence statistiquement significative. Chez les femmes, la moyenne de MD FPP dans le pré-test était 29,75 kg dans le post-test a été 29,45 kg et il ya aussi une diminution de la force. Toutefois, le PPF moyenne de la DMN dans le pré-test était 29,10 kg, depuis le post-test était de 29,70 kg, on a une augmentation de la force, mais n'a pas démontré une différence statistiquement significative entre avant et après -test. Nous concluons que, dans cette étude, la FPP Médecins individus culturisme MD et MND aucune différence significative mâle et femelle, contre entre les parties.

MOTS-CLÉS: Grips, musculation, prédominance.

FUERZA DE RETENCIÓN PARA PERSONAS CULTURISTAS PALMARES

RESUMEN

El objetivo de este estudio fue comparar la fuerza de agarre entre la mano dominante y no dominante de los individuos que practican el culturismo. Los participantes del estudio fueron 20 las personas que practican el culturismo, edad 20 a 35 años de entrenamiento regularmente 3 veces a la semana. Para el análisis de dinamómetro la fuerza de agarre Manual Takei® mecánico que mide la fuerza en función de la cantidad de tensión producida, capaz 0-100 kg / m (por kilogramo fuerza), se utilizó previamente calibrado. Para el análisis de comparación entre la fuerza de agarre de la mano dominante pre y no dominante y después de la prueba de la "t de Student" con un nivel de significación de p <0,05 prueba. Puede identificar el macho que la fuerza promedio de agarre (PMF) de la mano dominante (MD) en el pre-test fue 57,30 kg ya en el post-test fue 56,85 kg por lo que hay una disminución de fuerza. Lo mismo ocurrió en la mano no dominante (MND), donde el pre-test promedio fue de 55,95 kg y 53,80 kg posterior a la prueba, sin embargo, cuando se realizó el análisis estadístico mostró una diferencia estadísticamente significativa. En las mujeres, el MD promedio de FPP en el pre-test fue 29,75 kg en el post-test fue 29,45 kg y también hay una disminución de la fuerza. Sin embargo, el PPF promedio de MND en el pre-test fue 29,10 kg, desde el post-test fue 29,70 kg hubo un incremento en la fuerza, pero no demostró una diferencia estadísticamente significativa entre el pre y post - test. Llegamos a la conclusión de que en este estudio la FPP practicantes individuos culturismo diferencia no significativa masculino y femenino, en comparación MD y MND entre los lados.

PALABRAS CLAVE: Puños, culturismo, predominio.

FORÇA DE PREENSÃO PALMAR DE INDIVÍDUOS PRATICANTES DE MUSCULAÇÃO

RESUMO

O objetivo do presente estudo foi comparar a força de preensão palmar entre mão dominante e não dominante de indivíduos praticantes de musculação. Participaram do estudo 20 indivíduos praticantes de musculação, com idade compreendida entre 20 a 35 anos, treinando regularmente 3 vezes por semana. Para análise da força de preensão palmar foi utilizado o dinamômetro Takei® Mecânico Manual que mede a força em função da quantidade de tensão produzida, com capacidade de 0 a 100 Kg/f (quilograma por força), previamente calibrado. Para análise de comparação entre a força de preensão da mão dominante e não dominante pré e pós-teste foi utilizado o teste “t de Student” com nível de significância de p < 0,05. Pode-se identificar no sexo masculino que a média da força de preensão palmar (FPP) da mão dominante (MD) no pré-teste foi de 57,30 Kg já no pós-teste foi de 56,85 Kg havendo assim um decréscimo da força. O mesmo ocorreu na mão não dominante (MND) onde a média no pré-teste foi de 55,95 Kg e no pós-teste 53,80 Kg, no entanto quando se realizou a análise estatística não obteve diferença estatisticamente significativa. Já no sexo feminino a média da FPP da MD no pré-teste foi de 29,75 Kg, no pós-teste foi de 29,45 Kg havendo também um decréscimo da força. Contudo a média da FPP da MND no pré-teste foi de 29,10 Kg, já no pós-teste foi de 29,70 Kg observou-se um aumento de força, porém não demonstraram haver diferença estatisticamente significativa entre o pré e o pós-teste. Conclui-se que, no presente estudo a FPP de indivíduos praticantes de musculação do sexo masculino e do sexo feminino, quando comparado MD e MND não houve diferença significativa entre os lados.

PALAVRAS-CHAVE: Preensão palmar, musculação, predominância.