

The Effect of Weight Training Using Inner-Load Outer-Load on the Process of Developing Chest Muscles in Fitness Members in the City of Kupang

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Abstract

The results of the study showed that training with Inner load and outer load had different effects. The results of the t-test calculations with the upper chest load are 2.48 and below 4.05 while the load training outer load is at the upper chest 3.80 and the lower part is 5.06. With a significance level of $\alpha =$ with $db = 11-1 = 10$ obtained $t(0.975)(10) = 2.18$. By looking at the calculation between t count with t table, this research shows that there is a significant effect between training using Inner load and Outer load in the process of developing chest muscle.

Keywords: *Inner-Load, Outer-Load, Chest Muscles, Weight Training*

Introduction

Why do researchers want to know the effect of inner load and outer load, with the same function, namely in the pectoral muscle? According to a survey of fitness members, overall, they prefer or are interested in forming muscle in the chest, namely in the *pectoralis* muscles.

For resistance exercises, the specific warm-up may consist of calisthenics and dynamic flexibility exercises and progression into light weight training sets. For sprint, plyometric, and agility training, the specific warm-up may consist of low-intensity drills and progression to high-intensity drills. (Nicholas Ratamess 2012: 166) The forms of exercise for chest muscle shape are

Inner load and outer load. Both forms of weight training use two different weights but have the same function and purpose to improve the general muscle fitness and chest muscles in particular.

Development and record training programmes are directed towards specific elements of fitness and/or the requirements of specific playing positions. (Penney, Dawn (Ed.)2005: 64). Certain training patterns can improve fitness elements and also increase muscle development.

Strengthens your shoulders and chest muscles while challenging your total body stability (shoulders, hips, and core), (Karter, Karen, Andy Mogg 2007: 83). This exercise also benefits not only the chest muscles but also the shoulder (anterior deltoid), also forming the arm that will increase.

Training plans are developed for every age, gender and ability. They're broken down into Phase I and Phase II. Each level has its own specific exercise plan and duration, and each level builds on the previous one to help you to reach your goal (Stewart, Brett 2011:8). The training techniques that need to be noticed or need to be learned, starting with the simplest, are training from light to complex loads with a heavy burden, and how the burden of loading is needed. When people first practice and begin to feel lightening of the initial load, weight must be added to the load gradually.

In running a weight training program, a person must at least do the exercises three times a week to produce maximum muscle strength, especially for athletes. They've since experienced the incredible benefits weight training provides, such as increased muscle strength and endurance, stronger bones, definition, and leaner bodies. Being strong and having more fat-free mass is important for health as wellbeing as well as for aesthetics. Strong is the new skinny! Weight training is exercise that adds resistance to the body's natural movements to make those

movements more difficult and to construct muscles that are bigger and stronger (Lewis, Irene, Mc Cormick 2012:4).

According to the opinion above, the types of loads have types of groups, namely: Load and Outer Load which have the same function to develop or form chest muscles. An essential component in any training regimen is recovery, literally meaning rest. It is while your body is resting that it adapts and strengthens, ready to be overloaded again during the next training session (Bridle, Bob (Ed.) 2011:156).

Strength testing can be done safely and efficiently using various methods. The risk of injury for the athlete is minimal because he/she is not in the weight room lifting a maximal load (Reynaud, Cecile 2011 :12). It is said that to test maximum strength, injury risk must be remembered. The trainer must know the condition of the athlete or the trainee, not to let others know about whatever the athlete gives.

Strengthening the chest and arms in unison with the abdominal region plays a major role in body balance between the upper and lower body. The basic rule for all chest exercises is the narrower the hand position and movement, the greater the triceps contribution and the lesser the chest contribution; conversely, the wider the hand or movement angle position, the greater the chest contribution and the lesser the triceps contribution (Paul Collins 2011: 110). The basis for the balance of the body lies in the upper muscles, chest muscles, arms and abdomen. So, for push ups and weight training for the chest is very suitable for this research.

It is suggested that the decline of manufacturing has coincided with ‘the rise of gym culture and weight-training as popular activities for working class men’ (Edwards 2006:157). In addition the ‘technologies of fitness’ (Pronger 2002), initially a preserve of the middle classes, has been incorporated into a general orientation towards maintenance of the physical body

(Significantly, as Edwards In Ian Welland (2009: 12). From this quote, it can be argued that weight training is a popular exercise for many people, as is the case with physical training.

Molecular mechanisms implicated in muscle building constitute the theme of the fourth section. Molecular and cellular underpinnings of muscle growth, repair and preservation are discussed with reference to how they may influence physical performance. Intracellular signalling mechanisms underly tissue growth and adaptations are reviewed with the aim of identifying key hubs of regulation of exercise performance. For example, the emerging significance of nitric oxide in exercise performance and muscle building is discussed in this section. (Bagchi, Debasis, Sreejayan Nair, Chandan K. Sen, 2013 :15).

Exercises performed on unstable surfaces not only increases core muscle activity but also limb muscle activity and co-contractions (agonists and antagonists together). Triceps and deltoid muscle activities were increased when push-ups and chest presses were performed under unstable conditions (Marshall and Murphy 2006a, 2006b, In Jeffrey M Wilardson (Ed.) 2014:34). From the quotation above, it is explained that push up activity on uneven surfaces increases muscle activity so that it can fasten the muscles quickly. The energy drain is also larger on uneven surfaces, however this study is focused on exercising muscles, so it is recommended to use a flat place for push up exercises.

When you move your body on a daily basis and add some core strengthening exercises, the pressure from your growing belly is relieved because your breathing becomes easier. (Chabut, LaReine 2008: 229). Eight training is done by someone to get muscle fitness in general through the medium of training with the goal to obtain maximum energy and produce large muscles. Using good breathing techniques can prevent you from losing consciousness which can endanger your safety. When determining grip there are two things that must be considered,

namely the type of grip used, where and to what extent both hands hold the bar. The training provided must be quite heavy and must be carried out repeatedly with a high enough intensity

Increases in the work threshold, increases the level of fitness and sport preparation (Davies, Coach 2002: 167). We know that in general we are able to adjust to various exercises and challenges that are heavier than the burdens that we encounter every day. In the performance of the achievement, you must always practice with a heavy burden that you can manage at the time. In other words one must always try to practice with the workload on the threshold of sensitivity stimulation.

After each repetition, erase any flaw detected so that the next repetition will be even smoother. If you perform a total of 20 repetitions of snatches in a workout, your twentieth repetition should be the one most efficiently performed. That is productivity. If fatigue (of mind or body) is setting in by the twentieth, it is better to quit snatching, because you begin to fail in refining your technique. (Tsatsouline, Pavel, and John Easy 2011: 85). Repetition is a replication of the force that undertaken, and each replication is called a set.

By looking at the background above, the researchers concluded that both of these weights had an influence on the development of chest muscles in fitness with weight training.

Materials and methods

Sites and time of research

The research and data collection was carried out in the city of Kupang in the CHAR'S GYM, Oebobo Kupang water branch. The data was collected over approximately 2 months, from February to April 2014.



Data collection technique

The analysis method of the data used is statistical analysis with the M-S pattern. Research is conducted with one main objective, namely answering research questions to reveal natural phenomena. The researcher formulates the hypothesis, collects data, processes data, makes analysis and interpretations.

Data collection procedure

Close interaction between research and practice is important to enable proposals developed in research to be tested and adjusted so that they can work in practice, and to enable researchers to understand the problems, puzzles, and constraints of the operational environment, (National Research Council, 2003:25). The main purpose of this research is to form hypotheses, collect data, process data, make analysis, interpret, analyze data into an easy-to-read format.

In carrying out the exercise program, the population was divided into two groups: 11 people exercised with inner load (push ups) and 11 people exercised with outer-load (barbells). The Outer-Load training program is the first to warm up for 15 minutes, and then enters the core material, namely lifting a barbell weighing 6 kilos and then adding weight until a final weight of 16kg is achieved.

The grip to lift a barbell can be either wider or narrower than standard. The narrower the grip, the more inclined the middle the forearms are at the bottom, the sooner the elbows stop traveling down as the bar touches the chest, and therefore the shorter the range of motion around the shoulder, even though the bar travels farther at the top. Further, the less angle the humerus covers as it travels down, the less work the chest muscles do; the greater the angle with the elbows open up, the more work the triceps do (Rippetoe, Mark, Lon Kilgore, 2006:313).

The Inner-Load training program first warms up for 15 minutes and then enter the core material. The initial 1-10 push ups and continues to increase the amount of push ups, finally reaching a last repetition of 75 push ups. The implementation steps for all samples are called one by one according to the order list that has been compiled at the time of sample selection.

This section discusses those training principles, highlights pertinent recent research, and provides recommendations on how to design different types of training programs (National Strength and Conditioning Association 2008:379).

The sample called standing name is ready to weigh, after the sample is ready the chest circumference is measured in the pre-test. Group determination is done by chest circumference from the largest sample the smallest, in matching with the MS pattern (Matched by the subject with the cue pattern). After that, two groups were formed; the training groups with inner and outer loads. The training program was run properly and correctly according to the instructor's instructions. Finally post-testing was done.

Data analysis

When the treatment is completed, it ends with the final test and the descriptive statistical calculation data is obtained. Then the data is processed by data analysis, namely by a short equation tested with a significance level of 0.5 and degrees of freedom (df) N-1.

Furthermore, the data obtained will be analyzed by statistical techniques using work tables, to prepare statistical table calculations with the M-S pattern. Then after using the statistical table, it is solved by t-test.

The formula used is

$$t = \frac{MD}{\sqrt{\frac{\sum d^2}{N(N-1)}}}$$

with:

MD : *Mean defference* or the mean of the control group and the experimental group..

ΣD : whole *deviation* from the mean *difference*.

N : Number of subjects (Sutrisno Hadi, 1988, 445)(Sutrisno, 1987)

To find the mean deviation or MD by formula D:

$$MD = \frac{\Sigma D}{N}$$

with:

ΣD : whole *deviation* from the mean *difference*

N : Number of pairs

If the t value, obtained from statistical calculations, is equal to or greater than the value of the t table, then the null hypothesis is rejected. If the value of t, obtained from a statistical calculation, is smaller than the t table, then the null hypothesis is accepted.

Results and discussion

For groups with **outer-load, measuring upper chest circumference**; the test results before and after carrying out the training program, were 90.83 (before) and 91.85 (after). The mode (middle values) were 75.04 (before) and 75.09 (after); with the median (numbers that are likely to appear) are 91.07 (before) and 92.03 (after). The minimum results were 75.04 (before) and 75.09 (after) while the maximum results were 103 (before) and 105.1 (after).

For groups with **outer-load, measuring lower chest circumference**; the test results before and after carrying out the training program, were 88.02 (before) and 88.80 (after) while

the mode (middle value) is 83 (before) and 76.01 (after) with the median (the number of possibilities that often appears) is 88.01 (before) 88.06 (after); minimum results are 74 (before) and 76.01 (after) while the maximum results are 102.1 (before) and 103.05 (after).

For groups with **inner-load, measuring upper chest circumference**; the tests before and after implementing the training program with Inner load are 87.73 (before) and 89.79 (after) while the mode (middle value) is 86 (before) and 76.38 (after); with the median (probability number that often appears) amounting to 86 (before) and 76.38 (after) the minimum results are 74 (before) and 76.38 (after); while the maximum results are 102 (before) and 104.08 (after).

For groups with **inner-load, measuring lower chest circumference**; the test results before and after carrying out the training program with an are respectively 85.46 and 88.76 while the mode (middle value) is 86 and 73.6 with the median ((possible numbers that often appear) of 86 and 89.04 the minimum results are 72.08 and 73.6 while the maximum results are 99 and 101.

Hypothesis test

The outer load group had chest circumference measured before and after implementing the exercise program. Based on the calculation results obtained by the value of t count 3.80 at $\alpha = 5\%$ with $db = 11 - 1 = 10$ obtained $t(0.975)(10) = 2.18$. Based on the results of the calculation, the value of the t count is 5.06 at $\alpha = 5\%$ with $db = 11 - 1 = 10$ obtained by $t(0.975)(10) = 2.18$.

The Inner load group was loaded in the upper and lower chest circles before and after implementing the exercise program. Based on the calculation results obtained by the value of the t count of 2.48 At $\alpha = 5\%$ with $db = 11 - 1 = 10$ obtained $t(0.975)(10) = 2.18$. Based on the results of the calculation obtained the value of the t count of 4.05 at $\alpha = 5\%$ with $db = 11 - 1 = 10$ obtained $t(0.975)(10) = 2.18$.

From the results of the calculation, all t count values > t table. This means that there are differences in the effect of weight training exercises using Inner-load and Outer-load, on the process of developing chest muscles, both in the upper and lower parts.

Based on the t-test it can be concluded that the results of a comparison of the results of the upper and lower chest circumference using the outer-load weight training obtained a greater t-test value compared to using the Inner-load weight training. This means that weight training using Outer Load gives better results compared to using Inner load.

Discussion

Based on the results of the study it was found that there was an effect of weight training with Inner-load and Outer-load on the process of developing chest muscles. The muscles become stronger, so they can have a greater workload and will show a reduction in fatigue and increased strength. The body will adjust to the pressures due to weight training, if the exercises are carried out regularly and the intensity of the exercise gradually increases in sufficient time. Our training process must consider the principles of practice so that we can get maximum results, especially in muscle fitness exercises (Core Strength 2009:15).

The body will adjust to the pressures due to weight training if the exercises are carried out regularly and the intensity of the exercise gradually increases in sufficient time. Our training process must consider the principles of practice so that we can get maximum results, especially in muscle fitness exercises.

The calculation results show that using weight training Inner load and Outer load has an effect. However, Outer Load makes more of a contribution to the enlargement of the chest muscles, than using the Inner load method.

Conclusion

Based on the results of the calculation of research data and discussion, it is known that there is an influence. There is the effect of weight training by using the inner load is obtained by the value of the t count of 4.05 at $\alpha = 5\%$ with $df = 11-1 = 10$ obtained $t_{(0.975)}(10) = 2.18$, and the Outer load is obtained by the t count of 5.06 at $\alpha = 5\%$ with $df = 11 - 1 = 10$ obtained by $t_{(0.975)}(10) = 2.18$; for the process of developing chest muscles in Char fitness members, s GYM in Oebobo Air Branch, Kupang City.

Based on the t-test above, it can be concluded that the results of the comparison test on the results of the upper and lower chest circumference using the Outer Load are greater in value. This means that weight training using Outer Load gives better results than using Inner-loads.

The group with weight training Outer load on the upper chest circumference before and after exercise

	Before	After
N Valid	11	11
missing	0	0
mean	90.8345	91.8527
Median	91.7	92.0300
Mode	75.04a	75.09a
Minimum	75.04	75.09
Maximum	103.00	105.10
Sum	999.18	1010.38

Groups with Outer-load burden on lower chest circumference before and after exercise

	Before	After
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Valid	11	11
Missing	0	0
Mean	88.0282	88.8009
Median	88.0100	88.0600
Mode	83.00a	76.01a
Minimum	74.00	76.01
Maximum	102.10	103.05
Sum	968.31	976.81

Group with burden of load loaded on upper chest circumference before exercise

	Before	After
N Valid	11	11
Mising	0	0
Mean	87.7300	89.7964
Median	86.0000	90.0600
Mode	86.00	76.38a
Minimum	74.00	76.38
Maximum	102.00	104.08
Sum	965.03	987.76

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