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THE EFFECT OF TRAINING METHOD AND BALANCE ON SKILL OF WEIGHT LIFTHING SNATCH
The Experimental Study for Students at Faculty of Sport Science State University of Manado

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ABSTRACT

The experimental study is aimed to find out comparison of the effect of two training methods upon skills of snatch. The training method consists of both weight and plyometric training method. This research also aimed to find out interaction between training method and balance toward skill of snatch. The balance consists of both high and low balance. This research was carried out in Faculty of Sport Science, State University of Manado, in the academic year of 2012/2013. The experimental method using factorial design 2x2. The sample consisted of 40 students divided into four groups, each consisting of 10 students. The analyzing techniques of data were two-way analyses of variance (ANOVA) and further continued by Tukey test at α= .05 level significance. The result of this research shows that (1) in general, skill of snatch using weight training method is higher than those using plyometric training method, (2) for high balance using weight training method is higher than those plyometric training method, (3) for low balance using weight training and plyometric training method are not different at α= .05 level significance, (4) there is interaction between training method and balance toward skill of weight lifting snatch.

***Keywords**: method training; balance; skill; snatch.*

Sport advancement in Indonesia requires skillful and physically and mentally healthy Indonesians to reach achievements in sport. Those achievements in sport are regulated in Laws of Republic of Indonesia No 3 Year 2005 regarding National Sport System stating that sport coaching system has to be done through three pillars i.e. sport education, sporting achievement, and recreational sport.

In Faculty of Sport Science of State University of Manado, Manado, there are many talented students who need more attention to develop their potential in weight lifting. In developing their weight lifting potential, they often use the wrong technique in doing snatch skill. In performing the snatch skill, they are not too capable in finishing one series of movement pattern as one thorough performance in snatch skill.

Skills are specific knowledge, ability and responsibility. Knowledge is something planted in someone's memory, for example movement patterns that he/she often performs or masters. Magil (1998:7) said that skill is a word frequently used to indicate a responsibility having one specific objective. Refer to Densudadi (blogspot.com, 2013), snatch lifting is lifting weight from floor to over head, both hands are straight over head, with squad position after the barbell and the bar are at rest and then stand perfectly for a few seconds. Then drop the barbell onto the

platform. Tamas Ajan (1072:40) said that snatch lifting is a series of skill that must be done powerfully and gradually and started with position of start, pull, lift, drop and rising.

According to Vorob'ev (1989:18) snatch skill means a lifter's skill to lift a bar by using two hands started with position of start, pull, drop under the bar quickly and powerfully, maintain the balance, and then rise well and then drop the bar correctly. The result is the score in seven series of position of snatch lifting. Snatch skill according to PB PABBSI (1989:8) is someone's ability to lift a bar with wide hand from floor or platform until the barbell reaches over head with straight two hands in one lift.

Students of Faculty of Sport Science of State University of Manado have not performed the best snatch skills because of their average physical component. The physical component mentioned above means balance. In doing the snatch, students often have some difficulties in movement pattern. Generally, balance is defined as someone's ability to maintain body system, both in static and dynamic positions. According to Sajoto (1988:58), balance is someone's ability to control his or her muscle nerve organ when he or she is performing fast movement with changes in point weight location both in static and dynamic movements.

Balance affects snatch skill. Training method according to Boompa (1990:3) is a long term activity done systematically based on someone's ability to form physiological and psychological ability in doing training. This becomes the main focus to improve performance. Training method is knowledge or an understanding of how to work or train systematically, repetitively, in a long period, to achieve certain objective maximally. James Tangkudung (2006:50) proposed that training method is a way to improve training. The word method is used for options of activity material.

The activity material is weight training method and plyometric training method. Both training methods aim to improve something planned. Weight training method is used to improve power and pace. As stated by Faigenbaum (2009:6) that weight training is a special conditioning method using progressive training from various resistive weight and training modalities designed to improve muscle fitness.

Meanwhile, plyometric training method is an effort to fulfill the improvement of physical components, if patterned. That statement is supported by Faigenbaum's theory (2009:6) stating that plyometric is a power training method consisting of jumping, skipping and throwing in one series of activity.

To support the theories used in this research, the writer needs to present the relevant results of research related to research variables. The result of the research of Abidin, a student of State University of Makassar, with the title "the effect of training method and bar flexibility towards long jump skill" is that there is a significant difference between plyometric training method and weight training method towards students' long jump skill.

Based on problem and theory above, the writer is interested in finding out the effect of balance and training method towards snatch skill of students of State University of Manado. The objectives of this research are: 1) Snatch skill difference among students trained by using weight training method and plyometric training method; 2) Interaction between balance and training method towards snatch skill; 3) Snatch skill difference to high balance trained by using weight training method and

plyometric training method; 4) Snatch skill difference to low balance trained by using weight training method and plyometric training method.

METHOD

The method that will be used in this study is experimental method with factorial design 2X2. The research design is as follows:

Table 1. Factorial Design 2 X 2

Balance \ **Training Method**	**Weight (A1)**	**Plyometric (A2)**
High (B1)	A1 B1	A2 B1
Low (B2)	A1 B2	A2 B2
Total	A1	A2

Explanation:
A1B1 = The group of weight training method at high balance level
A2B1 = The group of plyometric training method at high balance level
A1B2 = The group of weight training method at low balance level
A2B2 = The group of plyometric training method at low balance level
A1 = Weight training method
A2 = Plyometric training method

Research variable consists of 2 free variables, namely: (1) weight training method and (2) plyometric training method. One category variable consists of two levels namely high balance and low balance with one dependent variable namely snatch skill.

Reachable population chosen is third semester male students at Faculty of Sport Science in the academic year of 2012/2013, which has completed T/P Weight Lifting Subject. Meanwhile, the number of sample of this study is 40 people. In order to divide them into four cells, the group of high balance for both training methods uses Matching Ordinal Pairing (MOP) technique (Djaali, 2010).

Data are analyzed using analyses of variance (ANAVA) with factorial design 2 X 2. Testing is done at significance level α (alfa) 0,05. The requirement needed in analyses of variance is normality testing by using lilliefors testing, homogeneity testing, Bartlet testing, and continued by Tukey testing.

RESULTS

The summary of n, x, values for every treatment and testing of normality testing of snatch skill score data is given in the following table:

Table 2. The Summary of x and s Value Calculation Result of Research Result Data

Balance	Training Method			
	Weight		Plyometric	
High	N	= 10	n	= 10
	$\sum X$	= 1023	$\sum X$	= 897
	$\sum X^2$	= 104745	$\sum X^2$	= 83204

	$\overline{X}$	= 102.3	$\overline{X}$	= 89.7
	S	= 3.19	s	= 6.62
Low	N	= 10	n	= 10
	$\sum X$	= 858	$\sum X$	= 891
	$\sum X^2$	= 74150	$\sum X^2$	= 79817
	$\overline{X}$	= 85.8	$\overline{X}$	= 89.1
	S	= 7.61	s	= 6.90
T o t a l	N	= 20	n	= 20
	$\sum X$	= 1881	$\sum X$	= 1788
	$\sum X^2$	= 178895	$\sum X^2$	= 160590
	$\overline{X}$	= 94.05	$\overline{X}$	= 89.40
	S	= 10.23	s	= 6.25

To test homogeneity of snatch skill data in each treatment group, Bartlett testing is given at significance level α = 0.05. The testing result gives an indication that the value of X^2_{count} = 6.53 smaller than the value of X^2_{table} = 7.81 so that it is concluded that four tested data groups comes from population with homogeneous variance.

By passing the testing of normality and homogeneity of research result data, the requirement of analyses of variance (ANAVA) is fulfilled. The calculation of Anava is summarized in the following table 3.

Table 3. The Summary of Anava 2x2 Calculation Result

Variance Source	**Dk**	**JK**	**KT**	**F_o**	**F_{table} 0,05**
Treatment Average	1	336539,03			
Treatment					
A (Training Method)	1	216,225	216.22	5.69*	4,11
B (Balance)	1	731,025	731.03	19.25*	4,11
AB (Interaction)	1	632,02	632.02	16.65*	4,11
Experiment Error	36	1366,7	37.9639		
Total	40	339485			

Explanation:

- : Significance at Level α = 0.05

Dk : degree of freedom
JK : total of quadrate
KT : average of quadrate total
F_o : value of F observation
F_t : value of F table

1. Total difference of the effect of weight training method and plyometric training method on the result of snatch skill

Based on the result of Anava calculation, it can be seen that F observation between columns (FA) = 5.69, is in fact bigger than F table, namely 4.11 (F0 = 5,69 > Ft = 4.11), so that H_O is refused and H1 is accepted. It can be concluded that in total there is a significant difference between the effect of weight training method and plyometric training method on the result of snatch skill. In another word, snatch

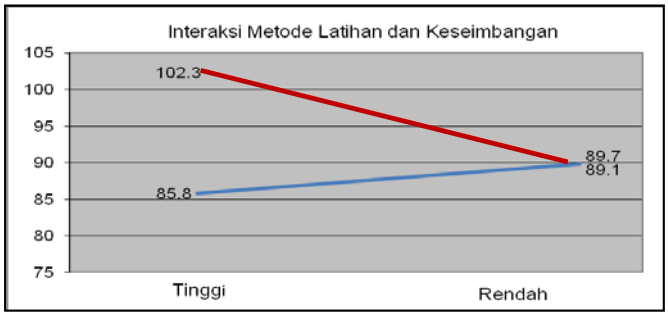
skill as a result of using weight training ($\overline{X}$ = 90,05 and s = 10.23) is better than snatch skill as a result of using plyometric training method ($\overline{X}$ = 89,45 and s = 6.19).

2. Interaction between training method and balance towards the result of snatch skill.

The summary of analyses of variance calculation result describes value of F_{count} interaction (FAB) = 16.65 and F_{table} = 4.11. It appears that $F_{count} > F_{table}$, so that it is stated that the achievement of snatch skill level is influenced by the interaction between training method and balance.

Data of research result shows the average score of snatch skill result of high balance group trained by weight training method which is 102.3 and the average score of low balance group is 85.8. The average score of snatch skill of high balance group trained by plyometric training method is 89,7 and the average score of snatch skill of low balance group is 89,1.

Therefore, hypothesis of the second research stating that there is an interaction between training method and balance towards the result of snatch skill is proven. It can be seen from the following picture.



Explanation:
A_1 = Weight training method
A_2 = Plyometric training method

Picture 1. Interaction betwen training method and balance

3. Different effect that for students with high balance, weight training method is better than plyometric training method towards the result of snatch skill

Table 4. The summary of Tukey Testing Calculation Result

No.	Compared groups	Q_{count}	Q_{table} α = 0,05	Explanation
1	P_1 and P_2	5,97	3,79	Significant

The result of calculation using Tukey testing shows value of Q_{count} = 5,97 bigger than Q_{table} = 3.79 at significant level α = 0,05. Thus, null hypothesis (Ho) is refused and alternative hypothesis (H1) is accepted, which means that snatch skill for high balance group trained by weight training method ($\overline{X}$ = 102,3 dan s = 3,19) is higher than those trained by lyometric training method ($\overline{X}$ = 89,7 dan s = 5,88). Hypothesis of third study states that for high balance group, weight training method is higher than plyometric training method towards the tested snatch skill.

4. Different effect that for students with low balance, plyometric training method is better than weight training method towards the result of snatch skill

Table 5. The Summary of Tukey Testing Calculation Result

No.	Compared groups	Q_{count}	Q_{table} α = 0,05	Explanation
1	P_4 and P_3	1,56	3,79	Significant

Based on table 5, it is shown that the value of Q_{count} (Q_h) = 1,56 is smaller that the value of Q_{tabel} = 3.79 at significant level α = 0,05. Therefore, null hypothesis (Ho) is accepted and alternative hyothesis (H1) is refused, which means that the results of snatch skill for low balance group trained by plyometric training method ($\overline{X}$ = 89,1 and s = 6,90) and group trained by weight training method ($\overline{X}$ = 85,8 dan s = 7,69) do not show significant difference at α = 0,05 level. The fourth research hypothesis states that for low balance group, plyometric training method is better than weight training method towards the result of snatch skill.

DISCUSSION

Based on the result of implemented hyothesis testing, the points are discussed as follows:

First Hypothesis: The result of hyothesis testing proves that in total students who exercise using weight training method have higher result than those using plyometric training method. In this case, it can be stated that to achieve the purpose namely the result of snatch skill, the use of weight training method is more effective than plyometric training method.

In its implementation, weight training method is done by increasing training weight step by step, which is increased progressively after the trained parts of body have adapted to the given training. In the implementation of that weight training method, the tools that can improve student's physical condition, such as, strength, explosive power, and speed are used. The result of giving weight in the training done effectively without causing muscle injury or too much muscle stiffness is that the stability of strength increases, maintained in performing a set of movements which support student's skill.

Effectiveness of that weight training method is also supported by the balance related to speed, strenght, and explosive power, so that it contributes to the set of movements of snatch skill, with stages of start, first pull, second pull, high pull, drop under the bar, rising, and bar is steady over the head. The contribution will be seen in each set of movements, hence it will help students to do snatch skill, which is considered new but complicated to do. In the movements of snatch skill, there are many difficult and dynamic movements, such as, in start position which importantly requires angle between knee and ankle, with the placement of handle on the bar, coordination of strength from the legs to the arms. The set of movement surely requires high balance.

Meanwhile, plyometric training method is a training method aimed to improve strength and speed using internal weight as training weight. The implementation of

this plyometric training is done with the movements that can produce explosive power. The adaptation of plyometric training weight which only uses internal weight takes time to improve strength in producing explosive power as needed in snatch skill.

Based on the explanation on weight training method and plyometric training method by using balance, each improves snatch skill. However, the better one in terms of improvement is weight training method. Weight training method is one forms of training to improve strength, explosive power, and muscle endurance, so that it is believed that weight training method gives good impact in improving snatch skill. The strength of giving weight training method is directly related to giving external weight which appropriate with snatch skill.

Second hypothesis: The result of analyses of variance 2x2, about interaction between training method and balance towards the result of skill shows that the value of F_{count} interaction (FAB) = 16.65 and F_{table} = 4.11. This interaction suggests that weight training method applied for students with high balance is compared to plyometric training method: A1B1 > A2B1. Conversely, plyometric training method is more appropriate to apply for students for low balance compared to weight training method; A2B2 > A1B2. It is supported by the further result which compares weight training method with high balance to plyometric training method for high balance; A1B1:A2B1 (P1:P2), the result Q_{count} = 5,97 is bigger than the value of Q_{table} = 3.79. In another Word, the effectiveness of weight training method for high balance ($\overline{X}$ = 102,3 dan s = 3,19) is higher than plyometric training method ($\overline{X}$ = 89,7 and s = 5,88). Plyometric training method for low balance and weight training method for low balance; A2B2: A1B2 (P4 : P3), the result of Q_{count} = 1,56 smaller than Q_{table} = 3.79. In another Word, the effectiveness of plyometric training method for low balance ($\overline{X}$ = 89,1 dan s = 6,90) is better than weight training method ($\overline{X}$ = 85,8 and s = 7,69).

Therefore, it can be concluded that for students with high balance, if they want to improve the result of snatch skill, they are suggested to use weight training method, and conversely for students with low balance, if they want to improve the result of snatch skill, they are suggested to use plyometric training method.

Third hypothesis: It is said that both training methods have the same purpose, namely to improve snatch skill, but each has differences in the implementation. Weight training method in its implementation gives direct adaptation towards the characteristic in snatch skill, which means that the weight in snatch skill has conformity with the giving of weight training method internally.

For students with high balance, the training is a training which is given treatment through half squat jump, back extension, incline press, toe raise, and sit up. Thus, the given training requires balance in various sets of movement, for example, in the application of half squat jump, starting from taking position, to the end of set of movement requiring high balance. Other weight training methods also experience and require the same thing, which means balance is very important in completing movement pattern in each characteristic.

Therefore, based on the discussion of research result, it can be recommended that for students with high balance, weight training method, weight training method is more appropriate to apply in training snatch skill.

Forth Hypothesis: It is said that both training methods have the same purpose, namely to improve the result of snatch skill, but each of them has differences in terms

of implementation. Plyometric training method works fast in terms of movement application because the principle of this training is to be explosive.

For students with low balance, the training is a training which gives treatment through stadium hops, rim jumph, multiple box to box jumph, and dephth jumph. Therefore, the given training requires balance in various sets of movement done. Because every set works fast, the movement must be done quickly and simultaneously so that it can produce explosive power or in another word there is produced a very strong contraction as a response to dynamic weighting or muscle stretching involved when contraction happens. The stretching occurring suddenly before muscle has another contraction enables muscles to achieve maximum strength in a short time. In such a way, training by applying plyometric training method for students with low balance must be done carefully in order not to cause negative impact, such as, muscle injury when doing snatch skill.

The findings indicate that balance needs to be considered in developing snatch skill in weight lifting. It is known that weight lifting sport, especially for snatch type, requires sufficient balance to do movement coordinating phase. The balance in this study involves physical component coordination, such as, strength, speed, and explosive power. Arm strength and leg strength as a prop to hold the weight, when doing lifting in weight lifing snatch skill. It also applies for speed and explosive power to accelerate movement so that barbell position is over head. In another word, balance aspect is needed to involve in order to improve snitch skill of weight lifting which is able to coordinate the set of movement and other supporting physical components.

It means that based on the discussion of research result, it can be recommended for students with low balance that plyometric training method is more appropriate to apply in order to exercise on snatch skill. If there is an improvement in balance, they can try weight training method until they can do set of movement conditioning, which in the end will have a potential to improve snatch skill.

In this research, there is found an obstacle as students also attend classes regularly both to learn theories and sport practice. The obstacle may create mistake or student's less fit physical condition.

CONCLUSION

Generally, weight training method is better than pyometric training method towards the result of snatch skill. There is an interaction between training method and balance towards the result of snatch skill. For students with high balance, weight training method is better than plyometric training method in terms of its effect on snatch skill. For students with low balance level, plyometric training method is better than weight training method in terms of its effect on snatch skill.

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