

TRAINING METHODS MACHINE BENCH PRESS AND BARBELLE WEIGHT BENCH PRESS ON THE SIDEWAY (ORTHODOX) BULLET REPUTATION ABILITY IN VIEW FROM ARM MUSCLE POWERNiko Setyo Hutomo^{1*}, Teguh Santosa², Joko Sulistyono³¹Universitas Tunas Pembangunan Surakarta (UTP), Indonesia²Universitas Tunas Pembangunan Surakarta (UTP), Indonesia³Universitas Tunas Pembangunan Surakarta (UTP), Indonesia*e-mail: niko.hutomo@gmail.com

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Abstract

Training methods the machine bench press and barbell weight bench press on the ability of the sideways style shot put (orthodox), (2) the differences in the ability of the sideways style shot put (orthodox) between students who have power high and low arm muscles, (3) the effect of the interaction between training methods and arm muscle power on the sideways force shot put ability (orthodox).

The research method used was an experimental method with a 2 x 2 factorial design. The research sample was the athletic extracurricular male students of Mojolaban 1 Junior High School. The sample size used in this study was 28 students, which was obtained by purposive sampling. The data analysis technique in this study used ANOVA. Before testing with ANOVA, the data analysis prerequisite test was first used by using the sample normality test (Lilliefors with $\alpha = 0.05\%$) and the homogeneity test of variance (Bartlett with $\alpha = 0.05\%$).

Based on the results of the analysis, the following conclusions can be drawn: (1) There is a significant effect between the machine bench press and barbell weight bench press on the ability to shoot sideways (orthodox) style, $F_{count} = 4.2147 > F_{table} = 4.11$. training method the machine bench press is better than the barbell weight bench press on the ability of the sideways style shot put (orthodox), (2) There is a significant effect between high arm muscle power and low arm muscle power on the sideways style shot put ability (orthodox), $F_{count} = 8.0751 > F_{table} = 4.11$. The ability of the sideways style shot put (orthodox) in students who have high arm muscle power is better than those who have low arm muscle power, (3) There is a significant interaction between training methods and arm muscle power on the ability of the sideways style shot put (orthodox)., $F_{count} = 87.6120 > F_{table} = 4.11$. Students who have high arm muscle power are more suitable if given the machine bench press. Students who have low arm muscle power are more suitable if given the barbell weight bench press.

Keywords: Bench Press Machine, Barbell Weight Bench Press, Arm Muscle Power, Sideways Style Shot Shot (Orthodox)

INTRODUCTION

Sports are all systematic activities to encourage, foster, and develop physical, spiritual, and social potential (Halim & Indriarsa, 2013). Sport is also an activity that is mostly carried out by the community, its current existence is no longer underestimated but has become part of people's lives, both parents, teenagers and children. Sport has meaning not only for health, but also as education, and even aims for achievement (Bangun, 2016). High achievement is achieved not only because of the athlete's talent but external factors, namely training. Practice is a very important factor in efforts to hone these talents to the maximum. The goals that a person will achieve by doing sports activities vary. Many types of sports that can be selected in sports activities. The choice of sport depends on the interests of each individual.

Shot put is a branch of athletics that is currently developing in Indonesian society. Shot put is part of the throwing number which has its own characteristics, namely bullets are not thrown but are repelled or pushed from the shoulder with one hand. Shot put is an athletic event that does not involve accuracy, so throwing distance is the main goal (Lengkana, 2016). Shot put is an athletic event that is carried out individually so that it requires a skill from each individual which contains several elements of the physical condition that must be required in shot put such as strength, endurance, coordination, balance, explosive power, and so on other (Saputri et al., 2016; Ulum, 2013). In addition to the elements of physical condition, a shot put athlete must also master various basic techniques in shot put.

According to (Muhtar & Irawati, 2009) the basic techniques that must be mastered by players include: (1) the technique of holding an iron ball with three kinds, firstly one hand grips the bullet firmly with a certain stretch, the second technique is by gripping the fingers more tightly together, the last is by holding the bullet the splay finger holds the bullet but the little finger is positioned behind the iron ball; (2) the technique of positioning the bullet sheet on the shoulder with the position of the hand holding the bullet directed to the neck above the shoulder. The elbow position should also be open; (3) the technique of throwing an iron ball or shot put, namely when the bullet is ready for the technique in question, the body tends to bend backwards and immediately throws the iron ball after it is ready to take a few steps forward. The throwing angle does not exceed 45 degrees so that the throw is declared valid. The stages in shot put have different levels of complexity and complexity, from easy skills to increasingly difficult skills, and from simple skills to complex skills. In order to do a repulsion properly, systematic, continuous training efforts and directed coaching are needed. As a demand for a form of coaching that is clearly directed, it can be seen in the systematic preparation of programs, selection of appropriate training, intensive implementation and evaluation of activities from coaches and trainers (Muryadi, 2017).

Public Junior High School 1 Mojolaban is a public junior high school in Sukoharjo Regency, located in Mojolaban District. Public Junior High School 1 Mojolaban has several extracurriculars, one of which is an athletics extracurricular which aims to prepare athletes to be sent to the POPDA event. In this study, the men's shot put extracurricular was taken. The achievements of the men's shot put team at Public Junior High School 1 Mojolaban were in 10th place. Based on the observations of the researchers in the observation, the implementation of physical exercise is not paid enough attention by the trainers or by extracurricular coaches, so that the athlete's power is not good. The exercise is only to warm up, warm up using the ball, and continue directly to practice repulsion using bullets without being accompanied by balanced physical exercise to support the achievement of increased power in students. This causes students to be less than optimal in carrying out sideways style shot put and students often experience difficulties in repulsion and failure in repulsion as in pushing is still weak so that sometimes the bullet does not reach the intended target. The element of power in shot put is needed so that physical training is needed to increase power, especially arm muscle power. Weight training can be an alternative to increase arm muscle power. Weight training is an exercise that is carried out systematically using weights as a means of increasing muscle power to improve the athlete's physical condition (Yachsie et al., 2021). There are two weighted exercises that can be applied, namely machine bench press and barbell weight bench press exercises (Andika, 2022). The machine bench press is one of the most popular exercises using a machine or tool to train the upper body. Meanwhile, the free weight bench press is a strength training using a barbell and dumbbell with a predetermined load, which is carried out using a special bench, namely a bench press muscles pectoral (pectoralis major, pectoralis minor) and also forming the shoulder muscles (anterior deltoid) and forming the back of the upper arm (triceps) (Baechle, 2000).

Success in the sideways style shot put is a student factor. Differences in ability mainly occur due to different physical qualities. In line with this, the factors that influence the sideways style shot put training process are : (1) internal conditions; and (2) external conditions. Internal conditions include factors that exist in individuals, or other attributes that distinguish one student from another. One of the internal condition factors is physical ability. Physical ability is related to arm muscle power which affects student performance both in skill movement exercises and in competitions. Thus it can be said that good arm muscle power is a requirement in an effort to achieve maximum achievement for students in sideways style shot put training. The difference in arm muscle power can be divided into two, namely high arm muscle power and low arm muscle power. Differences in arm muscle power that exist in athletes must be considered as a determining factor in the achievement of sideways style shot put. Differences in athletes in terms of arm muscle power will be a very important consideration in determining weighted training according to the character of each student so that they can achieve optimal training results according to their potential.

Based on the background of the problems stated above, this research is entitled "The Influence of the Machine Bench Press and Barbell Weight Bench Press on the Sideways Force (Orthodox) Bullet Rejecting Ability in View of Arm Muscle Power (Experimental Study on Extracurricular Athletics for School Boys) Public Junior High School 1 Mojolaban)".

Arm muscle power is needed in shot put, to increase muscle power, an effective method can use weight training because with this method the intensity of loading can be measured and adjusted according to the desired training goals (Primayanti, 2011). According to (Juntara, 2019) weight training is exercise that is carried out systematically by using weights as a tool to increase muscle power in order to improve the athlete's physical condition, prevent injury or for health purposes. Weight training can use your own body weight, or use free weights such as *dumbbells*, *barbells*, *orgym* (Zamroni & Sulistyarto, 2016). Exercise with your own body weight is more suitable for building endurance and muscle strength. Forms of exercise that are widely used include *chin-ups*, *push-ups*, *sit-ups* or *back-ups*. While exercises using free weights are more suitable for experienced participants. Weight training with free weights can make it easier for athletes (trainees) to achieve muscle power (Nasrulloh et al., 2018).

Weight training has two physiological bases that can develop strength to the fullest. First, the training program must be based on the principle of *Specific Adaptation to Imposed Demands* (SAID). This principle states that training should be specific, in accordance with the objectives to be achieved. If you want to increase power, then the training program meets the requirements for it. By adhering to the SAID principle, it is hoped that the effect of the exercise can be felt to the fullest. Therefore, the amount of training load given must be acceptable to the practicing body. Second, that training must be given with the principle of *overload*. This principle will ensure that the systems in the body that carry out the exercise receive an increasing amount of pressure, and are given it gradually over a certain period of time. Moreover, if it is not given in stages, the power component will not be able to reach the potential stage according to the maximum power function.

METHODS

The research method used in this research is an experimental method using a 2x2 factorial design. According to Sudjana (2002: 148) factorial experiments are experiments in which almost or all levels of a factor are combined or crossed with all levels of each other factor in the experiment.

Table 1. Research Design Framework

Weighted Training (A)	Attribute Variables	Arm Muscle Power (B)	
	Variable Manipulative	High (b1)	Low (b2)
	Exercise <i>Machine Bench Press</i> (a1)	a1b1	a1b2
	Exercise <i>Barbell Weight Bench Press</i> (a2)	a2b1	a2b2

Description:

1. a1b1 : a group of students who have high arm muscle power are trained using *a bench press machine*.
2. a2b1 : a group of students who have high arm muscle power are trained using *a barbell weight bench press*.
3. a1b2 : a group of students who have low arm muscle power are trained using *a bench press machine*.
4. a2b2 : a group of students who have low arm muscle power are trained using *a barbell weight bench press*.

In order to gain confidence that the sideways force is the result of the treatment, it can be generalized to the existing population.

FINDINGS AND DISCUSSION

The results of this study provides a further interpretation of the results of the data analysis that have been presented. Based on the hypothesis testing, two groups of analysis conclusions have been produced, namely: (a) there is a significant difference in influence between the main research factors (b) there is a significant interaction between the main factors in the form of two-factor interaction. The conclusions of the analysis group can be further explained as follows :

1. Differences in Effect Between the Machine Bench Press and Barbell Weight Bench Press on the Ability to Reject Sideways Style (Orthodox)

Training method the machine bench press and the group of students who received the exercise method barbell weight bench press to increase sideways (orthodox) shot put ability. training method, machine bench press they had a better increase in the ability of the sideways style shot put (orthodox) compared to the group of students who received the barbell weight bench press. The shot put exercise with a sideways style (orthodox) with a bench press machine has advantages in terms of the use of the

tool which already has a supporting bar to maintain balance when lifted, so it doesn't wobble. There is no need for the help of the fitness trainer in lifting the bar, the trainer only supervises, corrects and gives the correct directions for doing the exercises. Meanwhile, the drawback of the orthodox shot put exercise using a bench press machine is that when lifting the bar it feels heavy because the bar is already balanced.

From the figures generated in the data analysis, it shows that the average percentage increase in the ability of the sideways force shot put (orthodox) produced by the machine bench press is 0.126 higher than that with the barbell weight bench press.

2. Differences in Sideways Force Shot Putting Ability (Orthodox) Between Students Who Have High and Low Arm Muscle Power

Based on the second hypothesis testing it turns out that there is a significant difference in effect between groups of students with high arm muscle power and low arm muscle power on the sideways force shot put ability (orthodox). In the group of students with high arm muscle power, the increase in the ability of the sideways (orthodox) shot put was higher than the group of students with low arm muscle power. In the group of students with high arm muscle power, the potential is higher than students who have low arm muscle power. Arm muscle power is a modality for performing sideways (orthodox) shot put ability exercises.

Arm muscle power is the underlying ability of a person's motion. Arm muscle power is a very important element for students, because student arm muscle power is the basis for the formation of student skills. Arm muscle power can support the success of achieving sideways (orthodox) shot put ability by controlling the technical movements that are carried out to be more accurate. Students who have high arm muscle power have the ability to more quickly master the ability of the sideways style shot put (orthodox) than students who have low arm muscle power before being given training method treatment. Successful achievement of sideways style shot put ability (orthodox) influenced by the ability of students to carry out movements in an integrated and harmonious manner.

From the figures generated in the data analysis, it was shown that the average comparison of the increase in the sideways force (orthodox) shot put ability in students who had high arm muscle power was 0.175 which was higher than the group of students who had low arm muscle power.

CONCLUSION

Based on the research results and the results of data analysis that has been done, the following conclusions can be obtained :

1. There is a significant difference in the effect of training methods with machine bench press and barbell weight bench press in increasing the ability of the sideways style shot put (orthodox).

Training method the machine bench press is better than the barbell weight bench press in increasing the ability of the sideways style shot put (orthodox). Comparison of the average percentage increase in the ability of the sideways style shot put (orthodox) produced by the machine bench press is 0.126 higher than that with the barbell weight bench press. The machine bench press has a better improvement than the barbell weight bench press, with an average increase of 0.629 and 0.502, respectively.

2. There is a significant difference in the effect of high arm muscle power and low arm muscle power on the sideways force (orthodox) shot put ability, $F_{count} = 8.0751 > F_{table} = 4.11$. The increase in the ability of the sideways style shot put (orthodox) in students who have high arm muscle power is better than those who have low arm muscle power.
3. There is a significant interaction between training methods and arm muscle power on the ability to shoot sideways (orthodox), $F_{count} = 87.6120 > F_{table} = 4.11$.
 - a. Students who have high arm muscle power are more suitable if given an exercise method with a bench press machine. Students who have high arm muscle power with the machine bench press have an increase in their ability to shoot sideways (orthodox) style of 1.004 which is better than students with high arm muscle power and receive treatment with the barbell weight bench press of 0.301.
 - b. Students who have low arm muscle power are more suitable if they are given a training method with a barbell weight bench press. Students who have low arm muscle power with the barbell weight bench press have an increase in the ability of the sideways style shot put (orthodox) of 0.703 which is better than students with low arm muscle power and received the machine bench press of 0.253.

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