

THE EFFECT OF ARM AND SHOULDER MUSCLE STRENGTH TRAINING MODELS ON LEARNING OUTCOMES OF SHOT PUT: AN EXPERIMENTAL STUDY ON PHYSICAL EDUCATION OF MIDDLE SCHOOL STUDENTS

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SUMMARY

The problem in this study is the lack of arm and shoulder muscle strength training on the results of high school student shot put. This study aims to determine how much influence the arm and shoulder muscle strength training model has on the results of the shot put in high school students (SMK). The research participants were students of class XI SMK Negeri Rambah Samo, Rokan Hulu Regency. Participants were selected using a purposive sampling technique, amounting to 18 vocational students with an age range of 17-19 years ($M = 18.2$; $SD = 0.8$). This research is using the experimental method. The test instrument is shot put and data analysis using t -test statistics. The results of the study explained that the arm and shoulder muscle strength training model had the same effect on the results of students' throws. The results of statistical calculations show that the posttest t -count of the experimental group's arm and shoulder muscle strength is -0.11 , where the t -count is smaller than t -table $9-0.11 < 2.06$, so the conclusion is that arm muscle strength training and shoulder muscle strength have the same effect on increasing shot throws. students. Therefore, arm muscle strength training and shoulder muscle strength are as good as increasing student shot put results.

Keywords: teaching and learning, latihan kekuatan, otot lengan dan bahu, atletik, tolak peluru, siswa SMK

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INTRODUCTION

Education is a forum for creating quality human resources (Burhaein, 2017b; Mulyadi & Nikon, 2019; Phytanza, Burhaein, Sukoco, & Ghautama, 2018). Education can prosper everyone's life. Education covers various aspects of community life, one of which is sports activities (Indah & Mulyadi, 2019; Phytanza & Burhaein, 2020; Purnomo, Tomoliyus, & Burhaein, 2019). Education is developed through sports education which is carried out at the school level, from elementary to middle school, high school to tertiary education.

One of the learning materials taught to students is athletic sports (Agans & Geldhof, 2012; Mustofa, Mansur, & Burhaein, 2019). Athletic sports are the parent of various sports activities because in athletics there are basic movements of sports activities, including walking, running, jumping, throwing, shot, and catching. Athletic sports consist of several race numbers including street numbers, running, jumping, throwing, and shot numbers.

In the reject number, one of the materials taught is shot put. Shot put is a sport that tests the strength to repel the bullet as far as possible, namely pushing the bullet with one hand only, which also requires speed and body coordination to create maximum power when pushing /repelling/shot the put/bullet. (Burhaein, 2017a; Mulyadi & Indah, 2019). Perform the technique of shooting down without prefix and with the prefix. With the prefix, one of them uses the orthodox (sideways) force. Orthodox (sideways) force bullet repelling is a way of repelling bullets with a sideways body position in repelling.

Shot put is also a sport that is quite dangerous in its implementation because the equipment used is bullets or iron balls. This put is a solid and intact material, made of iron, brass, or hard metal and filled with lead or other material (Agans & Geldhof, 2012; Rudd et al., 2015). If it hits any part of the body, it will cause severe or fatal injury for the continuity of the organ's function. For this reason, learning to shoot bullets needs extra guidance and supervision by the teacher.

Learning to shoot bullets can run well, supported by the availability of tools/facilities, especially bullets. However, the limited availability of bullets in schools has an impact on the course of the shot put learning. To overcome this, teachers must have creativity in modifying learning tools/facilities/models of learning. Modification of training model tools/facilities is an attempt to provide tools that resemble the shape, size, and weight of the original ones (Mulyadi & Indah, 2018; Phytanza & Burhaein, 2019; Pramantik & Burhaein, 2019).

The modification/training model of this tool can be used as a substitute or support for the original tool in learning activities (Ardian, Suharjana, & Burhaein,

2019; Mustofa et al., 2019; Phytanza et al., 2018). In learning to shoot bullets, the teacher can modify/model training for the bullet tools with rubber/plastic balls or make bullets by themselves. That way, learning continues even though the availability of original tools is very limited. Also, the modification of the tools provides opportunities for students to be more active in taking part in learning because they hold each tool without waiting for their turn to shoot the bullets.

Researchers' observations on class XI high school (SMK) Rambah Samo students in Rokan Hulu Regency when learning to shoot bullets. The ability of students to shoot bullets still has weaknesses which can be seen from the mastery of the wrong technique, namely that many students do not push to repel bullets but are thrown downwards. This is due to the lack of training models performed by students to stimulate the ability to repel the bullets.

The training is not motivated by the lack of bullets when doing the learning, so students have to wait their turn to shoot bullets. Also, teachers do not provide conducive teaching, which only provides direction globally without providing corrections to student movements. Besides that, the teacher does not do model exercises. modification of tools due to the limited means of repelling bullets in schools. With so easily it causes boredom in students carrying out learning. The above problems raise the research question "Is there an effect of the arm and shoulder muscle strength training model on the results of vocational student bullets?".

METHOD

Participant

This research was conducted at SMK Negeri Rambah Samo, Rokan Hulu Regency. Participants were selected using purposive sampling technique (Etikan & Bala, 2017), amounting to 18 vocational students aged 17-19 years ($M = 18.2$; $SD = 0.8$). The criteria for the selected participants were: (1) active students in class XI at SMK Negeri Rambah Samo, Rokan Hulu Regency (2) students who took part in athletic learning with the shot put numbers (3) students were willing to undergo pretest & posttest and take part in the treatment program for 8 times (treatment program).

Research Methods and Data Collection Technique

This research uses a short type of experiment with a method, namely quasi-experiment (pretend experiment) so-called because this type of experiment does not meet the requirements such as an experimental method that can be said to be scientifically following certain rules. (Fraenkel, Wallen, & Hyun, 2012). This

means that this study provides treatment of arm and shoulder muscle strength training to the results of the XI grade students of SMK Negeri Rambah Samo, Rokan Hulu Regency. The research that is carried out is more well-directed, so a research design is needed, namely starting from the preliminary data collection (pretest) of student bullets. Furthermore, given treatment regarding arm and shoulder muscle strength training according to the training program. After being given the treatment, the final data (posttest) was taken from the student's shot.

Data Analysis

Data analysis techniques for this study used a quantitative approach. Data analysis used t -test statistics to analyze the results of the pretest and posttest. Analysis of research data is used to answer a hypothesis:

Ho: There is an effect of the arm and shoulder muscle strength training model on the results of vocational student bullets.

H1: There is no effect of the arm and shoulder muscle strength training model on the results of SMK students' shot put.

RESULT AND DISCUSSION

The results of the study explained that the arm and shoulder muscle strength training model had the same effect on the results of students' throws. The results of statistical calculations show that the posttest t -count of the experimental group's arm and shoulder muscle strength is -0.11, where the t -count is smaller than t table $9-0.11 < 2.06$), so the conclusion is that arm muscle strength training and shoulder muscle strength have the same effect on increasing shot throws. students. Then seen from the pretest data average value of 5.78 increased to an average posttest value of 6.30. It means that the students' pretest and posttest increased by 0.52, so Ho was accepted. This means that there is an effect of the arm and shoulder muscle strength training model on the results of SMK students' shots.

For a greater increase in the expected results from the implementation of the shot put, it is necessary to pay attention to the principles of the training to be applied. The principle of training is the basis of training that is applied so that training achieves the expected results. The basic principles in training are (1) the principle of overload, (2) components of the work system, (3) differences in training, (4) balance of fitness components related to health, (5) principle of overload and sustainable, (6) safety guidelines in health-related fitness coaching (Bompa, 1996; Hakim, Ambardini, Nugroho, & Burhaein, 2018).

The above statement suggests that one of the principles of training is the principle of excessive and sustainable loads. Further explanation, that training load is all forms of demands and stimuli given to athletes in training that can cause

training effects (Bompa, 1996; Graham & Milne, 2003). The demands and stimuli referred to can be physical and mental. This means an increase in training load will provide an increase in the training material to be achieved.

Paying attention to the increase in training load is one of the determinants of training changes that will be achieved according to the standards of training objectives. If there is no increase in training load, students are not challenged to stimulate their abilities. Because the exercises carried out by students are felt to be light and below their abilities. Increasing training load can be emphasized on the addition of the form of motion performed and the repetition of each movement, both in terms of number and time of implementation.

The improvement in the results of the shot put was also supported by the motivation of students in participating in training activities. Student motivation is good enough to participate in training activities because the results obtained also determine the value of physical education (Armour, Sandford, & Duncombe, 2012; Naul & Hardman, 2002; Purnomo et al., 2019). However, the limited availability of facilities and infrastructure becomes an obstacle in carrying out training activities. However, it can be overcome by the teacher modifying the tools/facilities. Modification of tools/facilities will support the smooth implementation of training activities in achieving training objectives.

CONCLUSIONS

Based on the results of the study, it was concluded that there was an effect of arm and shoulder muscle strength training on the results of the XI grade students of SMK Negeri Rambah Samo Rokan Hulu Regency.

It is suggested to sports teachers to improve their shooting skills to use the arm and shoulder muscle strength training model. To practice strength skills, it is recommended that sports teachers and coaches use variation training.

To readers who are interested in this research and want to reexamine it so that it is carried out in a flatter scope, a better program, and a good treatment time in the morning or evening. And also can see several other variables that have not been considered by researchers.

Conflict of Interest

The author states there is no conflict of interest.

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УТИЦАЈ ПРОГРАМА ТРЕНИНГА СНАГЕ МИШИЋА РУКУ И МИШИЋА РАМЕНОГ ПОЈАСА НА ИСХОДЕ УЧЕЊА БАЦАЊА КУГЛЕ: ЕКСПЕРИМЕНТАЛНА СТУДИЈА У ФИЗИЧКОМ ВАСПИТАЊУ УЧЕНИКА СРЕДЊИХ ШКОЛА

САЖЕТАК

Проблем ове студије представља утицај тренинга снаге мишића руку и мишића раменог појаса на резултате у бацању кугле код средњошколаца. Циљ овог истраживања је да се утврди колики утицај имају програми тренинга снаге мишића руку и мишића раменог појаса на резултате бацања кугле код ученика средњих школа. Узорак испитаника су чинили ученици 11. разреда „Negeri Rambah Samo“ школе у индонежанској области Rokan Hulu. Методом пригодног узорка изабрано је 18 ученика занатског смера узраста од 17-19 година ($M = 18.2$; $SD = 0.8$). Примењен је експериментални метод. Мерена је остварена даљина у бацању кугле, као мерни инструмент, а разлике су израчунате применом t теста. Резултати студије су показали да су модели тренинга снаге мишића руку и снаге мишића раменог појаса имали исти ефекат на резултате бацања кугле код ученика. Резултати статистичке обраде података показују да је вредност посттеста t -count експерименталне групе - 0.11, где је вредност t -count мања од вредности t -table $9-0.11 < 2.06$, па је закључак да програмирани тренинзи снаге мишића руку и снаге мишића раменог појаса имају исти ефекат на повећање даљине бацања кугле код ученика. Стога су тренинзи снаге мишића руке и снаге мишића рамена једнако ефикасни код повећавања резултата у бацању кугле код ученика средњих школа.

Кључне речи: учење и обучавање, програми тренинга снаге, бацање кугле, средњошколци.

ВЛИЯНИЕ МОДЕЛЕЙ ТРЕНИРОВКИ СИЛЫ МЫШЦ РУК И ПЛЕЧ НА РЕЗУЛЬТАТЫ ОБУЧЕНИЯ ТОЛКАНИЮ ЯДРА: ЭКСПЕРИМЕНТАЛЬНОЕ ИССЛЕДОВАНИЕ ПО ФИЗИЧЕСКОМУ ВОСПИТАНИЮ УЧАЩИХСЯ СРЕДНЕЙ ШКОЛЫ

АННОТАЦИЯ

Данное исследование посвящено проблеме недостаточной тренировки силы мышц рук и плеч старшеклассников на результаты по толканию ядра. Это исследование направлено на определение того, какое влияние оказывает модель тренировки силы мышц рук и плеч старшеклассников (СМК) на результаты толкания ими ядра. Участниками исследования выступили ученики XI класса СМК Негери Рамбах Само, Рокан Хулу Редженси. Участников отбирали с помощью метода целенаправленной выборки и в исследовании приняли участие 18 учащихся профессиональных учебных заведений в возрасте от 17 до 19 лет ($M = 18,2$; $SD = 0,8$). В данном исследовании используется экспериментальный метод. Тестирование предполагало толкание ядра и анализ данных с использованием статистики t-критерия. Результаты исследования показали, что модель силовой тренировки мышц как рук, так и плеч одинаково влияло на результаты бросков студентов. Результаты статистических расчетов показывают, что посттестовый t-показатель силы мышц руки и плеча экспериментальной группы составляет $-0,11$, где t-показатель меньше, чем t-таблица $9-0,11 < 2,06$), поэтому можно сделать вывод, что силовые тренировки мышц руки и мышц плеча одинаково влияют на увеличение количества бросков учащихся. Таким образом, тренировка силы мышц рук и мышц плеч эффективна и благотворно влияет на улучшение результатов школьников по толканию ядра.

Ключевые слова: преподавание и обучение, латихан кекуатан, ототленганданбаху, атлетик, толакпелуру, учащиеся СМК.

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