



Effect of Bench Press Exercise and Triceps Strength Bullet Rejection Ability to be Reviewed from the Flexibility of the Togok to FIK UNM Makassar Students

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Abstract

Fiction UNM Makassar student. The design used in this study is an experimental method using a 2x2 factorial design. This method is a test (validation) that is testing the effect of one or more variables on other variables. Factorial design is a research design by modifying the post-test-only control or pretest-posttest control group and the researcher adds other variables. The results of the research through hypothesis testing show that $F_{arithmetic}$ between columns (FA) = 26,444, looks bigger than $F_{table} = 4.113$, it appears that $F_{count} > F_{table}$ or P-value = $0.000 < 0.05$ so H_0 rejected and H_1 accepted. Thus it can be concluded that overall there is a significant difference in the effect between bench press training and triceps strength on O'Brien's shot put ability to FIK UNM Makassar Students. F_{count} interaction (FAB) = 163.155 and $F_{table} = 4.113$, it appears that $F_{count} > F_{table}$ or P-value = $0.000 < 0.05$, so H_0 rejected and H_1 accepted. In other words, it can be stated that the achievement of the O'Brien style shot put ability is influenced by the interaction between the training method and the flexibility of the togok.



INTRODUCTION

Starting from motion and human movement then develops into a behavior that is meaningful and has a specific purpose. The form of activity is closely related to human behavior and the review will be broader and deeper, this is because humans have various potentials compared to other creatures. Physical education plays an important role in fostering and developing both individuals and groups in supporting physical and spiritual growth and development (Gunawan, 2013)

(Davieri et al., 2022). This quality improvement can be realized through sports as part of education, health and recreation, as well as sports achievements (Dewi & Verawati, 2021). Sport according to (Supriadi et al., 2022) is a body exercise carried out by a group/individual in carrying out movements. (Imran Akhmad, 2022) Sports are movements that are carried out systematically that have the beauty of motion. Sport has been found in all aspects of life, such as industry, economy, education, and so on (Wismiarti, 2020). From the various objectives above, attention is focused on achievement sports.

Today's athletics is a sport that is quite popular in our society, this is evidenced by the enthusiasm of the community in participating in competitions that are often held both at the regional and national levels. They participated as participants in athletic competitions in various numbers and as spectators in the competition. Athletics is also a subject taught in schools (Mustafa & Dwiyo, 2020). As participants in the competition, they have different motivations. There are those who have the motivation to achieve sports, there are also those who have the motivation to channel hobbies or just participate in enlivening the athletic competition, as spectators they provide encouragement and moral support.

The development of athletics in the country is also marked by the number of athletic clubs under the auspices of PASI (Bahagia, 2012). These clubs compete with each other in fostering their athletes to excel in sports, especially athletics. Athletics comes from the Greek word *athlon* or *athlum*. These two words contain the meaning of competition, competition, struggle and struggle (Zikrur Rahmat, 2015).

Athletics is one of the most popular sports in South Sulawesi in general and Makassar in particular. This sport has long developed from cities to remote villages, and can be done by various age levels, both boys and girls. This is because the tools needed/used are easy to obtain and inexpensive. This sport almost requires physical components such as; speed, strength, explosive power, balance, flexibility, agility, coordination without neglecting other physical components. Athletic sports are divided into several numbers including; street number, running number, jump number and throw number. The throwing numbers contested are discus throwing, javelin throwing and shot put and hammer throwing.

According to (Gustian et al., 2019), athletics has three numbers, namely: (1) walking and running numbers, (2) jumping numbers, and (3) throwing numbers. The shot put is part of the throwing number, this number has its own characteristics, namely the bullet is not thrown but is rejected or pushed from the shoulder with one hand (Waloyo, n.d.) The purpose of repelling or pushing the bullet is to produce the maximum repulsion (Nurtamami, 2022). Generating a long repulsion on the bullet requires several supporting aspects, namely technical, physical, and mental aspects.

In doing a shot put, the arm is the main source of repulsion. The development of the arm in doing repulsion

is a must that needs special training (Hendi Gunawan, 2013). The purpose of the shot put is to do a repulsion by using maximum force to reach a long distance of repulsion.

Observing the analysis of the pattern of shot put, what needs to be a point of attention is when turning the stick in the direction of repulsion and when repelling the bullet. That is, in doing shot put, possession of elements of physical ability, arm strength and flexibility of the togok is very necessary without neglecting other physical elements needed in shot put. To increase the strength of the arm muscles, the author tries to apply two forms of arm exercises which are expected to increase the repulsion in the sport of shot put. The two forms of exercise in question are bench press and triceps strength. Bench Press is a power or energy lifting device that is used extensively in strenuous exercise that intends to shape the body, and is a type of fitness exercise for the growth of chest and arm muscles (Nurtamami, 2022)

Medicine ball and bench press exercises have a more significant effect (Davieri et al., 2022). Bench press is a form of physical condition exercise using external weights in the form of barbells carried out by standing and pushing straight ahead repeatedly and systematically, increasing the load gradually by taking into account the element of individualization (Karundeng et al., 2021). Bench press exercises are carried out by putting weight on the body using barbells and medicine balls, with the aim of increasing strength, power, and muscle endurance (Prabowo, 2016). (Latuheru, 2019) Triceps strength is a form of physical condition exercise that also uses external weights in the form of dumbbells which is also done by standing and pushing straight up repeatedly and systematically, the load is increased gradually by taking into account the individualization factor.

Looking at the movement patterns of the two forms of exercise above, the two forms of physical condition training have similarities and differences both in terms of implementation and loading. In this research proposal, the author wants to involve the flexibility of the togok because it determines the rotation of the body facing the direction of repulsion. The togok variable is considered as a strength variable which is the variable in the study (Samodra, 2021).

The flexibility of the togok in relation to the pattern of the shot put is seen when the athlete makes a repulsion, there is a turning movement of the togok to the side of the body until the body faces the direction of repulsion and serves as a movement control repelling the bullet so that the repulsion does not go outside the line of repulsion angle. (Ricardo Valentino Latuheru, 2019) Explains that flexibility is the maximum level of ability in the joint space of motion. Observing the explanation above, the researcher wants to try to examine two forms of physical condition exercise in terms of the flexibility of the togok which will see its effect on increasing the ability to put bullets in athletics for FIK UNM Makassar students. Shot put is a branch of athletic learning which in general is learning athletics which is less attractive to students (Ambarwati et al., 2017) This is in line with research conducted by (Sundari, 2019), (Ambarwati et al., 2017) (Ansori, 2013)

Based on the observations of the researchers, the athletic performance of the shot put number of FIK UNM Makassar students is still not good, because there are still many basic techniques, especially the shot put number that the coach needs to pay attention to for his athletes. A shot put athlete does not only have strength, but also needs the strength of a stake (Karundeng et al., 2021). From the observations of researchers at each athletic

championship held in Makassar City and South Sulawesi Province, FIK UNM Makassar students in terms of technical mastery still have not shown the desired results so that the expected achievements have not been realized.

Starting from the problem above, the author is interested in conducting a study with the title: "The effect of bench press and triceps strength training on the ability to put up bullets in terms of togok flexibility in FIK UNM Makassar students".

METHODS

The type of research carried out is experimental research. Experiments are the only research method that can truly test hypotheses about causal relationships. The sampling technique is the total population, which is where all the population is sampled because the population is limited. After the samples were obtained, then an initial test of the togok flexibility results was carried out and then the initial test results were divided into two groups of 20 students each taken 27% of the total population of each group, then a high togok flexibility group and a low togok flexibility group were formed. From the results of the division of these groups, rearranged according to rank and then divided into two balanced groups, each consisting of 10 students in each group. The design used in this study is an experimental method using a 2x2 factorial design, this method is a test (validation) that is testing the effect of one or more variables on other variables. Factorial design is a research design by modifying the post-test-only control or pretest-posttest control group and the researcher adds other variables. The 2x2 factorial design can be seen in table 1 as follows:

Table 1. 2x2 Factorial Design

Exercise Method (A) Stubborn Flexibility (B)	Exercise Method Bench Press (A1)	Training Method Triceps Strength (A2)
High Stool Flexibility (B1)	A2B1 <	A1B1
Low Skewer Flexibility (B2)	A1B2 >	A2B2
Total	A1 >	A2

Description:

- A1B1 = Bench training method press with high togok flexibility group.
- A2B1 = Triceps strength with high shoulder flexibility group
Bench training method press with low shoulder flexibility group
- A2B2 = Strength with low togok flexibility group
- A1 = Press exercise method
- A2 = training method Triceps strength

The data analysis technique was adapted to the research questions and hypotheses. The questions and hypotheses proposed in this study are in accordance with descriptive and inferential analysis. The data collected will be analyzed statistics descriptive for the purposes of testing research hypotheses. The descriptions that will be used in the study are as follows: statistics Descriptive, providing an overview of the mean (mean), standard deviation (SD), minimum and maximum values. And test for normality and test for homogeneity of each variable. Inferential statistics, testing research hypotheses using ANOVA analysis (factorial 2 x 2) at a significant level of 95% or 0.05, statistical data analysis used in general using a computer system in the SPSS version 20 program.

RESULT

The first stage before the analysis is carried out statistically, first the data is analyzed whether it meets the requirements of the analysis. So that the data from the initial test (pretest) and the final test (posttest) were tested using concise statistics, the data normality test and data homogeneity test aimed to determine whether the data were normally distributed and whether the samples used came from the same population.

Based on the summary of the results of the descriptive analysis of the data, it can be described as follows:

- a. The results of the descriptive data of the bench press on the O'Brien style shot put ability in FIK UNM Makassar students, from 10 samples obtained a total value of 58.61 meters. The average value obtained is 5.8610 meters with a standard deviation of 0.36744 and a variance value of 0.135. For the range value obtained 1.14 meters from a minimum value of 5.19 meters and a maximum value of 6.33 meters.
- b. The results of descriptive data on bench press with low togok flexibility on the O'Brien style shot put ability in FIK UNM Makassar students, from 10 samples, a total score of 76.87 meters was obtained. The average value obtained is 7.6870 meters with a standard deviation of 0.22206 and a variance value of 0.049. For the range value obtained 0.68 meters from a minimum value of 7.35 meters and a maximum value of 8.03 meters.
- c. The results of descriptive data on triceps strength training on high togok flexibility on O'Brien style shot put ability in FIK UNM Makassar students, from 10 samples obtained a total value of 67.15 meters. The average value obtained is 6.7150 meters with a standard deviation of

0.34478 and a variance value of 0.119. For the range value obtained 1.19 meters from a minimum value of 5.99 meters and a maximum value of 7.18 meters.

- d. The results of descriptive data on triceps strength training with low togok flexibility on the O'Brien style shot put ability in FIK UNM Makassar students, from 10 samples obtained a total value of 56.82 meters. The average value obtained is 5.6820 meters with a standard deviation of 0.44474 and a variance value of 0.198. For the range value obtained 1.22 meters from a minimum value of 5.09 meters and a maximum value of 6.31 meters.

After doing a descriptive analysis to meet the test requirements of the analysis, then the normality test is carried out. The normality test can be seen in Table 2 as follows.

Table 2. Normality Test Results

Statistical	Kolmogorov Smirnov		0.05	Group
	Key	Exercise		
high bench press knee flexibility	0.203	0.200	0.05	Normal
exercise bench press Low knee flexibility	0.142	0.200	0.05	Normal
exercise Triceps strength flexibility	P	0.200	knee	Normal
Exercise triceps strength low togok flexibility	0.200	0.05	Normal	Hypothesis

Testing

For further hypothesis testing, data processing is done using SPSS version 20 For Windows. The results obtained Analysis of Variance as follows:

Table 3. Summary of the results of anova calculation 2 x 2

Source of Variation	Dk	JK	KT	F _{calculated}	F _{table}	P-value
Average	1	1682,858				
A (Exercise Method)	1	3,312	3,312	26,444	4,112	0.000
B (Togok flexibility)	1	1,572	1,572	12,552	4,113	0,001
A* B (Interaction)	1	20,435	20,435	163,155	4,113	0.000
Experimental Error	36	4,509	0,125			
Total	40	1712,685				

Summary Average

Table 4. Summary of Exercise Bench Press Exercise Triceps Strength

Sample Group	Average	Standard Deviation	N
A1B1	5.8610	0.36744	10
A1B2	7.6870	0.22206	10
Total	6.7740	0.98222	20
A2B1	6.7150	0.34478	10
A2B2	5,6820	0.44474	10
Total	6,1985	0.65636	20

Information:

- A₁B₁ : The sample group with high togok flexibility is trained with bench press.
- A₁B₂ : A sample group that has low knee flexibility trained with bench press
- A₂B₁ : The sample group with high shoulder flexibility trained with triceps strength
- A₂B₂ : The sample group having low shoulder flexibility trained with triceps strength

DISCUSSION

Based on the test results of all hypotheses that have been carried out in the hypothesis testing section, then it can be stated that:

Application of Bench Press Exercises Than Triceps Strength Against O'Brien Style Bullet Rejection Ability in FIK UNM Makassar Students.

The results of the calculation of the 2 x 2 analysis of variance regarding the difference in effectiveness between the two training methods as a whole, namely F_{count} between columns (FA) = 26.444 looks bigger than $F_{table} = 4.113$, it appears that $F_{count} > F_{table}$, or P-value = 0.000 < 0.05. By looking at other results, the O'Brien style shot put ability using the bench press with an average value = 6.7740 and standard deviation = 0.98222 was compared with the results of the O'Brien style shot put ability using triceps strength with the average value = 6.1985 and standard deviation = 0.65636, it is concluded that overall bench press is better than the triceps strength on the results of the O'Brien style shot put ability in FIK UNM Makassar students.

Exercises Bench press and triceps strength have been known since and are often widely used. Both the bench press exercise method and the triceps strength have the same goal. Where the bench press to improve the ability of the O'Brien style shot put by the implementation is 1) Loads on the chest with both hands holding barbell shoulder width apart, 2) The attitude of both legs in line and open approximately shoulder width apart, 3) Push the barbell up until your arms are straight, then lower the barbell back down to your chest. exercise bench press in this study was to increase power of the muscles of the upper body, namely: deltoid, upper pectoralis major, trapezius, latissimus dorsi, and triceps, all of which function to move the arms in repelling bullets.

While triceps strength in terms of implementation, namely 1) take the desired position can stand or sit on a bench, lift one dumbbell with both hands. Palms cupped on the upper dumbbell disc.

Lift dumbbells above your head until your arms are straight up. 2) Keep the upper arm at the side of the head and not move when doing the movement. Lower dumbbells behind your head until your elbows are bent. Then lift the dumbbells to their original position. 3) Inhale as you lower the weight from the dumbbell above your head until your elbows are bent and the dumbbells are behind your head. Exhale behind as you lift the weight from the dumbbell position your head until it is lifted straight above your head. The purpose triceps strength using dumbbell triceps extension in this study was to increase the strength of the upper body muscles, namely, the deltoid, upper pectoralis major, trapezius, latissimus dorsi, and triceps, all of which function to move the arm in repulsion.

Based on the explanation above, the bench press is better than the triceps strength method, because the bench press moves directly to the core in the exercise, while the triceps strength can increase the strength and endurance of the arm muscles. Thus, based on the results of the study, it can be recommended that the bench press is more suitable to be applied in improving the O'Brien style shot put ability.

The Interaction Between Training Methods and Stubborn Flexibility Against O'Brien Style Bullet Repelling Ability in FIK UNM Makassar Students

From the results of the 2 x 2 analysis of variance, regarding the interaction between bench press exercises, triceps strength and stick flexibility on the O'Brien style shot put ability, it shows that $F_{\text{count}} = 163.155 > F_{\text{table}} = 4.113$ or $P\text{-value} = 0.000 < 0.05$. This interaction illustrates that the triceps strength exercise method bench press ($A2B1 > A1B1$ and $A1B2 > A2B2$). This is due to the results of the Tukey test which compares the

bench press with high togok flexibility and the triceps strength ($A1B1: A2B1$), the results of $P\text{-value} = 0.000 < 0.05$. In other words, the effectiveness of the triceps strength with high togok flexibility (mean = 6.7150 and standard deviation = 0.34478) is better than the bench press (mean = 5.8610 and standard deviation = 0, 36744) While the bench press with low knee flexibility and triceps strength with low shoulder flexibility ($A1B2: A2B2$), the results of $P\text{-value} = 0.000 < 0.05$. In other words, the effectiveness of the bench press with shoulder flexibility low (mean = 7.6870 and standard deviation = 0.22206) is better than the triceps strength (mean = 5.6820 and standard deviation = 0.44474). $A \times B$). This means that the training method and flexibility of the togok jointly have an effect on increasing the ability of the O'Brien style shot put.

The group of students with high flexibility of togok who were trained using triceps strength obtained better results in O'Brien's shot put ability compared to a group of students with the same togok flexibility and trained using bench press. The group of students with low togok flexibility who was trained using the bench press obtained better results in the O'Brien style shot put ability compared to the group of students with low togok flexibility who was trained using triceps strength. This shows that the effect of bench press training and triceps strength is related to the flexibility of the togok of students participating in the O'Brien style shot put ability.

Putting a bullet is a form of pushing or pushing a round tool (bullet) with a certain weight made of metal, which is carried out from the shoulder with one hand to reach the maximum distance. The following is an explanation of the interaction (relationship) of the bench press exercise method, the triceps strength and togok flexibility training method on the O'Brien style shot put

ability. arm muscle strength, and power. Although it has high and low stick flexibility, it has a positive interaction in increasing the O'Brien style shot put ability. In accordance with the results of the analysis above, these two training methods have an interaction, where both these training methods can affect the athlete's O'Brien style shot put ability after being given training in accordance with the principles of training. Thus, it can be concluded that students who have high togok flexibility who want to improve their O'Brien style shot put should use the triceps strength, while low togok flexibility if they want to improve their O'Brien style shot put should be trained using the bench press.

Application of Triceps Strength Better Than Bench Press on O'Brien Force Bullet Repelling Ability in High Togok Flexibility Ability in FIK UNM Makassar Students

This is evidenced by the Tukey test, the triceps strength that has high togok flexibility (A2B1) is better compared to the bench press which has high togok flexibility (A1B1), the result is $P\text{-value} = 0.000 < 0.005$. In other words, the sample group with high togok flexibility, the effectiveness of the triceps strength (mean = 6.7150) was better than the bench press (mean = 5.8610). Both bench press exercises and triceps strength have the same goal, namely to improve the O'Brien style shot put ability. For this reason, these two exercises are suitable for improving the O'Brien style shot put, because it is one of the main supporting factors in improving the O'Brien style shot put ability. But these two exercises also each have differences in terms of implementation. Exercise method bench press in its implementation is 1) Loads on the chest with both hands holding barbell shoulder width apart, 2) The attitude of

both legs in line and about shoulder width apart, 3) Pushing the barbell up until the arms are straight, then lowering back barbell on chest. exercise bench press in this study was to increase power of the muscles of the upper body, namely: deltoid, upper pectoralis major, trapezius, latissimus dorsi, and triceps, all of which function to move the arms in repelling bullets.

While triceps strength in terms of implementation, namely 1) take the desired position can stand or sit on a bench, lift one dumbbell with both hands. Palms cupped on the upper dumbbell disc. Lift dumbbells above your head until your arms are straight up. 2) Keep the upper arm at the side of the head and not move when doing the movement. Lower dumbbells behind your head until your elbows are bent. Then lift the dumbbells to their original position. 3) Inhale as you lower the weight from the dumbbell above your head until your elbows are bent and the dumbbells are behind your head. Exhale behind as you lift the weight from the dumbbell position your head until it is lifted straight above your head. The purpose triceps strength using dumbbell triceps extension in this study was to increase the strength of the upper body muscles, namely, the deltoid, upper pectoralis major, trapezius, latissimus dorsi, and triceps, all of which function to move the arm in repulsion.

It can be seen that after being given these two exercises and the O'Brien style shot put ability test, the average value of the sample group trained using the triceps strength was better than the sample group trained using the bench press, although both This group has high (same) flexibility, because the triceps strength has been directly involved in core training, which is in accordance with the movement during archery. While the bench press only increases power arm. Thus, based on the above discussion, it

can be recommended that for students who have high togok flexibility, the triceps strength applied to improve the O'Brien style shot put ability.

The Application of Bench Press Better Than Triceps Strength on O'Brien Style Bullet Repelling Ability in Low Togok Flexibility in FIK UNM Makassar Students

This is evidenced by the results of the Tukey test, the bench press that has low togok flexibility (A1B2) is more good compared to the triceps strength which has togok flexibility (A2B2), the result P-value = 0.000 <0.05. Training method bench press (mean = 7.6870) is better than the triceps strength (mean = 5.6820). Both the bench press exercise method and the triceps strength have the same goal, namely to improve the O'Brien style shot put ability. For this reason, these two exercises are suitable for improving the O'Brien style shot put, because it is one of the main supporting factors in improving the O'Brien style shot put ability. But these two exercises also each have differences in terms of implementation. Exercise method bench press in its implementation is 1) Loads on the chest with both hands holding barbell shoulder width apart, 2) The attitude of both legs in line and about shoulder width apart, 3) Pushing the barbell up until the arms are straight, then lowering back barbell on chest. exercise bench press in this study was to increase power of the muscles of the upper body, namely: deltoid, upper pectoralis major, trapezius, latissimus dorsi, and triceps, all of which function to move the arms in repelling bullets.

While triceps strength in terms of implementation, namely 1) take the desired position can stand or sit on a bench, lift one dumbbell with both hands. Palms cupped on the upper dumbbell disc. Lift dumbbells above your head

until your arms are straight up. 2) Keep the upper arm at the side of the head and not move when doing the movement. Lower dumbbells behind your head until your elbows are bent. Then lift the dumbbells to their original position. 3) Inhale when lowering the weight from the dumbbell above your head until your elbows are bent and the dumbbells are behind your head. Exhale behind as you lift the weight from the dumbbell position your head until it is lifted straight above your head. The purpose of triceps strength using dumbbell triceps extension exercises in this study was to increase the strength of the upper body muscles, namely, the deltoid, upper pectoralis major, trapezius, latissimus dorsi, and triceps, all of which function to move the arms in repulsion.

It can be seen that after being given these two exercises and in the O'Brien style shot put ability test, the average value of the sample group trained using the bench press exercise method was better than the sample group trained using the triceps strength training method, although both this group has a low (same) flexibility of the togoku, because students have low flexibility of the togoku, the athlete needs an exercise that is not too difficult but can improve the ability of the O'Brien style shot put.

With this, based on the discussion above, it can be recommended that for students who have low togok flexibility, the bench press exercise method is suitable to be applied in improving the ability of O'Brien style shot put.

CONCLUSION

Based on the results of the research and discussion that have been stated, it can be concluded that the following conclusions can be drawn:

1. There is an effect of bench press exercise and triceps strength

training on the O'Brien style shot put ability in FIK UNM Makassar students..

2. There is an interaction between the training method and the flexibility of the stick on the O'Brien style shot put ability in FIK UNM Makassar students
3. There is a difference in the O'Brien style shot put ability between high togok flexibility using bench press exercises and triceps strength training in FIK UNM Makassar students.
4. There is a difference in the O'Brien style shot put ability between low togok flexibility using bench press exercises and triceps strength training in FIK UNM Makassar students.

From the discussion above, it can be concluded that soccer learning media can be applied properly based on Android. The system can be accessed through devices that use the Android operating system anywhere and anytime so that users can access the learning media portable.

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REFERENCES

- Ambarwati, D. R., Widiastuti, W., & Pradityana, K. (2017). Pengaruh daya ledak otot lengan, kelentukan panggul, dan koordinasi terhadap keterampilan tolak peluru gaya O'Brien. *Jurnal Keolahragaan*, 5(2), 207.
<https://doi.org/10.21831/jk.v5i2.14918>
- Ansori. (2013). Hubungan Kekuatan Lengan, Kekuatan Otot Perut, dan Kekuatan Otot Tungkai dengan Kemampuan Tolak Peluru pada Siswa Kelas IX Putra MTs. Negeri model Sorong. *Jurnal Pendidikan*, 1(2), 1–5.
- Bahagia, Y. (2012). Pembelajaran Atletik. *Pembelajaran Atletik*, Departemen Pendidikan Nasional.
- Davieri, G. R. E., Mulyana, D., Rismayadi, A., & Pitriani, P. (2022). Pengaruh Latihan Pliometrik Medicine Ball dan Latihan Dumbell Terhadap Power Otot Lengan dalam Olahraga Bola Basket. *Physical Activity Journal*, 3(2), 161.
<https://doi.org/10.20884/1.paju.2022.3.2.5531>
- Dewi, R., & Verawati, I. (2021). The Effect of Manipulative Games to Improve Fundamental Motor Skills in Elementary School Students. *International Journal of Education in Mathematics, Science and Technology*, 10(1), 24–37.
<https://doi.org/10.46328/ijemst.2163>
- Gustian, U., Supriatna, E., & Purnomo, E. (2019). Efektifitas modifikasi permainan tradisional dalam pengembangan physical literacy anak taman kanak-kanak Effectiveness of traditional game modified to develop a physical literacy in preschool student. *Jurnal Keolahragaan*, 7(1), 23–33.
- Hendi G. (2013). Pengaruh Latihan Kelentukan Togok Terhadap Kemampuan Roll Depan Pada Senam Lantai. *Jurnal Pendidikan Dan Pembelajaran*, 2(7), 1–11.
- Imran A, S. H. R. D. A. S. (2022). The Effects of Learning Strategies on Senior High School Students' Motivation and Learning Outcomes of Overhead Passing in Volleyball. *International Journal of Education in Mathematics, Science and Technology*, 10(2), 512–527.
<https://doi.org/10.46328/IJEMST.2291>

- Karundeng, A., Makadada, F. A., & Malonda, J. R. (2021). Pengaruh Power Lengan Kemampuan Tolak Pelurucabang Olahraga Atletik Siswa Sma Negeri 9 Manado. *Jurnal Pendidikan Kesehatan Dan Rekreasi UNIMA*, 02(02), 13–17.
- Mustafa, P. S., & Dwiyoogo, W. D. (2020). Kurikulum Pendidikan Jasmani, Olahraga, dan Kesehatan di Indonesia Abad 21. *JARTIKA Jurnal Riset Teknologi Dan Inovasi Pendidikan*, 3(2), 422–438. <https://doi.org/10.36765/jartika.v3i2.268>
- Nurtamami. (2022). Pengaruh Sistem Latihan Piramida Terhadap Kekuatan Angkatan Repetisi Maksimal Bench Press Pada Member Pemula Fitness.
- Prabowo, B. Y. (2016). Pengaruh latihan bench press dan motivasi terhadap kemampuan tolak peluru. *Jurnal Keolahragaan*, 4(2), 135. <https://doi.org/10.21831/jk.v4i2.10891>
- Ricardo V. L. (2019). Hubungan Antara Kelentukan Togok, Keseimbangan Badan, Dan Daya Ledak Tungkai Dengan Kemampuan Lompat Jauh.
- Samodra, Y. T. J. (2021). Analisis Kesamaan Antara Kekuatan Tungkai dan Togok. *Musamus Journal of Physical Education and Sport (MJPES)*, 3(02), 116-124.
- Sundari, A. (2019). Perbandingan metode latihan dan power otot lengan terhadap hasil tolak peluru. *JORPRES (Jurnal Olahraga Prestasi)*, 15(1), 47–56.
- Supriadi, A., Mesnan, M., Akhmad, I., Dewi, R., & Suprayitno, S. (2022). The Effect of Learning Manipulative Skills Using Ball Thrower Learning Media on the Ability to Throw and Catch the Ball in Elementary School Students. *International Journal of Education in Mathematics, Science and Technology*, 10(3), 590–603. <https://doi.org/10.46328/ijemst.2441>
- Wismiarti, H. (2020). Pengaruh Kekuatan Otot Lengan Dan Daya Ledak Otot Tungkai Terhadap Kemampuan Smash Bolavoli. *Jurnal Patriot*, 2(2), 654–668.