

Improvement The Learning Outcomes of Physical Fitness in Explosive Strength of The Lower Limb Muscles Through The Modification of The Traditional Sack Race Game for Class X-4 Students at SMAN 9 Malang

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ABSTRACT

Tujuan penelitian ini adalah untuk meningkatkan hasil belajar kebugaran fisik, khususnya pada aspek daya ledak otot kaki di kalangan siswa kelas X-4 SMA Negeri 9 Malang melalui metode permainan tradisional balap karung. Penelitian Aksi Kelas (KAR) ini dilakukan dalam dua siklus, terdiri dari tahapan perencanaan, pelaksanaan aksi, observasi, dan refleksi, yang dilaksanakan selama 2 siklus dengan 1 pertemuan di setiap siklus. Hasil penelitian menunjukkan peningkatan hasil belajar kebugaran fisik pada aspek daya ledak otot kaki dari pra-siklus ke siklus pertama, dan terus meningkat pada siklus kedua. Hasil observasi awal menunjukkan persentase 54%, yang kemudian menghasilkan tindakan pada siklus 1 dengan persentase 65%, diikuti siklus 2 dengan persentase 76%. Metode permainan tradisional balap karung telah terbukti efektif sebagai media pembelajaran yang memberikan stimulasi, tolok ukur, dan motivasi bagi siswa untuk melakukan gerakan lompat vertikal secara lebih efektif. Modifikasi ini menciptakan lingkungan belajar yang lebih menyenangkan dan efektif, sehingga meningkatkan hasil belajar lompat jauh siswa.

The purpose of this research is to improve the learning outcomes of physical fitness, specifically in the aspect of leg muscle explosiveness among the students of class X-4 at SMA Negeri 9 Malang through the traditional game method of sack racing. This Classroom Action Research (CAR) was conducted in two cycles, consisting of stages of planning, action implementation, observation, and reflection, carried out over 2 cycles with 1 meeting in each cycle. The results of the study indicate an improvement in physical fitness learning outcomes in terms of leg muscle explosiveness from the pre-cycle to the first cycle, and it continued to increase in the second cycle. The initial observation results showed a percentage of 54%, leading to actions taken in cycle 1 with a resulting percentage of 65%, followed by cycle 2 with a resulting percentage of 76%. The traditional sack race game method has proven to be effective as a learning medium that provides stimulation, benchmarks, and motivation for students to perform vertical jumping movements more effectively. This modification creates a more enjoyable and effective learning environment, thereby enhancing the students' long jump learning outcomes.



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INTRODUCTION

Physical education is an inseparable element of the overall education system. Therefore, its implementation needs to be directed towards achieving the predetermined goals. The objectives of

physical education not only focus on improving health and physical fitness but also encompass the development of critical thinking skills, emotional stability, and social abilities. Physical fitness is often defined as the body's capacity to efficiently adjust the functions of its organs within physiological limits to environmental conditions and/or physical work without causing undue fatigue (Maulana, 2024).

Physical fitness is the capacity of a person's body to carry out daily physical activities effectively without quickly becoming fatigued, while still having reserve energy for additional activities. According to (Lengkana & Muhtar, 2021), physical fitness is a general state of health and well-being, and more specifically, the ability to engage in sports aspects and daily activities. Meanwhile, according to

(Lengkana, 2021), physical fitness refers to the ability and readiness of the body to perform activities or tasks in order to enhance productivity without causing excessive fatigue or disruption. This state of fitness plays a crucial role in supporting overall health. One component of physical fitness is the explosiveness of the leg muscles. The explosiveness of the leg muscles aims to test an individual's ability to jump as far or as high as possible.

Traditional games are passed down through generations via verbal communication. One of the distinctive features of children's traditional games is their ancient origins. According to Nurwansyah & Sumarsono (2022), traditional games are cultural heritage that derives from local wisdom, encompassing various educational values. In their implementation, these games have the ability to evoke feelings of joy, happiness, and cheerfulness among the children participating in them. Explosiveness is the ability of an individual to exert maximum force (Oktariana, 2020). From the results of the physical fitness test mentioned above, it can be concluded that the explosive power of the leg muscles is the lowest among other aspects, including strength and coordination, with a percentage of 54%. Currently, teachers or educators serve as facilitators for students by presenting variations and modifications in Physical Education and Health (PJOK) learning. In order to enhance endurance and muscle strength, appropriate training or exercise patterns tailored to the needs of the students are required (Suryadi, 2022). This is done to increase students' enthusiasm and interest in participating in the learning process. By presenting modifications that are engaging and diverse, students will be more motivated, thereby creating a conducive and enjoyable learning environment. One activity that can be undertaken to enhance the explosive strength of the leg muscles, build students' spirit, and strengthen their social relationships is through the traditional game of sack racing. Therefore, sack racing becomes a practical method that can be used both as a training exercise and to strengthen the explosive strength of the leg muscles.

Table 1. data from the initial observation results of physical fitness

Skor	Klasifikasi	Daya Ledak	Daya Ledak X bobot	Kekuatan Otot Perut	Kekuatan Otot Perut X bobot	Koordinasi	Koordinasi X bobot
5	Baik sekali	3	15	19	95	7	35
4	Baik	2	8	7	28	9	36
3	Sedang	11	33	5	15	13	39
2	Kurang	15	30	1	2	3	6
1	Sangat Kurang	1	1	0	0	0	0
Jumlah		32	87	32	140	32	116
Persentase		54%		88%		73%	
Skor Maksimal		160		160		160	
Kategori		Kurang		Baik		Baik	

METHODS

This research employs the Classroom Action Research (CAR) method, which is conducted in two cycles, with the aim of observing the improvement in learning outcomes and student engagement in physical fitness education, specifically focusing on leg muscle explosiveness through the

implementation of the traditional sack race game. This study utilizes a quantitative approach with a pre test and post-test design as a method for measuring changes or improvements in results after the intervention is administered. The research involves the students of class X-4 at SMA Negeri 9 Malang as the population, consisting of 32 students. The research procedure is carried out in two cycles, namely Cycle I and Cycle II. Each cycle includes the stages of planning, action implementation, peer observation, and reflection. The execution of Cycle II is based on the reflective results from Cycle I, with the objective of further maximizing the achievement of students' physical fitness learning outcomes.

In the planning stage, the researcher designs physical fitness learning focusing on leg muscle explosiveness using the traditional sack race game method. Observational actions are conducted to observe and record the implementation of the learning process and its impact on students' leg muscle explosiveness ability. Subsequently, action reflection is utilized to analyze the observation results and plan improvements for the next cycle.

Table 2. assessment instrument table

No	Nama	L/P	Raihan Tegak	Raihan Lompatan 1	Raihan Lompatan 1	Selisih Jarak Lompatan
1						
2						
3						

RESULT AND DISCUSSION

Result

Among the three aspects of physical fitness, namely strength, coordination, and explosive power, there is one aspect that is assessed as lacking, which is the explosive strength of the leg muscles. In the results of the vertical jump test, there are 3 students who achieved a 'good' category, 2 students achieved a 'fair' category, 11 students achieved an 'average' category, 15 students received a 'poor' category, and 1 student received a 'very poor' category. Therefore, the class percentage is indicated at 54.4%. After the students were given the treatment in the form of the traditional sack race game, 2 students were classified as excellent, 6 students as good, 22 students as moderate, and 2 students as poor. The students have shown improvement in their explosive strength of the leg muscles, but further enhancement is still needed as the class percentage remains at 65%.

Table 3. data result from cycle 1

Skor	Klasifikasi	Frekuensi	Frekuensi X Bobot	Persentase
5	Baik Sekali	6	30	19%
4	Baik	15	60	38%
3	Sedang	9	27	17%
2	Kurang	2	4	3%
1	Sangat Kurang	0	0	0%
	Jumlah	32	121	75.6%
	Skor Maks	160		
	Persentase	75.6%		
	Kategori	Baik		

In this action, the treatment given to the students is almost the same as in the first cycle, with the only addition in the second cycle being variations of games while still utilizing traditional sack race games and various other games. After the students were given treatment in the form of traditional sack racing games and various other games, there were 6 students who received an excellent category, 15 students who received a good category, 9 students who received a moderate category, and 2 students who received a poor category. Students have demonstrated an improvement in their explosive leg muscle capabilities, with the class percentage indicating 75.6%. Table 4 data result from cycle 2.

Skor	Klasifikasi	Frekuensi	Frekuensi X Bobot	Persentase
5	Baik Sekali	6	30	19%
4	Baik	15	60	38%
3	Sedang	9	27	17%
2	Kurang	2	4	3%
1	Sangat Kurang	0	0	0%
Jumlah		32	121	75.6%
Skor Maks		160		
Persentase		75.6%		
Kategori		Baik		

Discussion

As a follow-up to the results of this research, Physical Education, Sports, and Health learning on the subject of physical fitness can be further developed. The physical aspects of fitness, such as endurance, strength, speed, explosive muscle, agility, flexibility, balance, reaction time and coordination, make it a complex topic (Bakti, 2024).

In the aspect of leg muscle explosiveness, there is a need for modifications in learning media/tools to create motivation, references, and stimulation for students to feel more enjoyment and happiness while performing leg muscle explosiveness movements, the results of which are derived from the vertical jump practice at school. Leg muscle power refers to a group of leg muscles that are utilized to perform explosive movements when jumping (Isabella, 2021). Because sometimes the teaching models are less engaging in the material on physical fitness in the aspect of explosiveness, it is hoped that by introducing the traditional game of sack racing, their stimulation and perspectives can be transformed, ultimately aiming to improve students' jumping results in vertical jump practices. Explosive strength training and its different combinations on lower limbs can significantly improve the physical fitness (Zhang & Wang, 2023).

The explosiveness of the leg muscles is included in the material of physical fitness; therefore, students should be able to perform the vertical jump movement well. Based on research results, the explosiveness of the leg muscles in female volleyball players in the sports science program shows that the majority of vertical jumps fall into the very good category, indicating that measuring the strength of the leg muscles is highly relevant to vertical jump performance (Suwuh, 2024). Jump rope and sack racing activities are provided to students with the aim of enhancing the working ability of the leg muscles (Waldo et al., 2025). Explosiveness in sports is one

of the components that must be possessed in several sports disciplines (Hermanzoni, 2020).

Physical Education and Health learning requires and greatly benefits from variation and modification to create enjoyment and happiness, as well as to enhance student motivation to stay active. This is evidenced by the use of learning media in the form of traditional sack race games in the physical fitness material, specifically in the aspect of leg muscle explosiveness, which has shown an increase in the number of students reaching proficiency. The Play4Fit training model, which is a combination of jump rope, hopscotch, and sack races, has been found to enhance muscle strength, particularly in terms of leg muscle explosiveness (Bile, 2021). Providing specialized training to improve flexibility, balance, and leg muscle strength is essential for enhancing athletes' serving abilities, with one such method being traditional sack race games (Akbar, 2021). Explosive strength can be defined as the ability to produce maximum force as soon as possible, and it represents an essential factor in activities where it is necessary to increase the acceleration of the body mass, the mass of specific body parts, or of an external object (Radulović, 2022).

CONCLUSION

Based on the results of research conducted in class X-4 at SMA Negeri 9 Malang, it can be concluded that the use of modified traditional sack racing games effectively enhances the explosive strength of students' leg muscles and increases their enthusiasm in participating in physical fitness

education. Through an enjoyable, collaborative, and varied approach, this learning model stimulates students to actively move, maintain proper posture, and train the explosive strength of their leg muscles. The learning outcomes data indicate a significant improvement in students' explosive strength capabilities, reflected in the increase of the average score and the percentage of completeness

in learning outcomes; the initial data showed only a 54.4% class completeness rate, but after the implementation of the modified games, the completeness increased to 65% in the first cycle, and ultimately reached 75.6% in the second cycle.

In addition to influencing improvements in physical learning outcomes, this learning model has also successfully created a more enjoyable and constructive learning environment, as students appear more motivated, enthusiastic, and capable of working effectively in teams. Therefore, the modification of the traditional sack race is worthy of being regarded as an innovative alternative in physical education, particularly to enhance aspects of physical fitness, especially in terms of leg muscle explosiveness, while simultaneously fostering positive values in the student learning process at school.

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