Effect of learning methods and arm muscle strength on learning outcomes handstand

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Abstract

The background of this research is that regular physical activity is inseparable from the improvement of students' psychomotor, cognitive, and affective. Handstand skills are fundamental to a floor gymnast. The purpose of this study was to see the effect of the learning method (partial and whole) and arm muscle strength on the learning outcomes of floor exercise handstands. This study used method a 2 x 2 by level group design. This research was conducted on students of SMAN 1 Cimalaka. The results of the study show a=0,05, there is an influence of learning methods and arm muscle strength together on the learning outcomes of floor exercise handstands.

Keywords: Handstand Learning Outcomes, Arm Muscle Strength, Learning Methods.

INTRODUCTION

Physical education involves the relationship between teachers, students, and skills that aim to increase the potential that is related to regular physical activity and is inseparable from improving students' psychomotor, cognitive, and affective (Budiman et al., 2018). According to (Omar, 2020) learning outcomes are "as a change in behavior in a person that can be observed and measured in the form of knowledge, attitudes, and skills. This change can be interpreted as an increase and better development before those who did not know became aware. Meanwhile, according to (Mas, 2017) learning outcomes "are student achievement as a whole which is an indicator of competence and the degree of change in the behavior concerned". (Mas, 2008) Competencies that must be mastered by students need to be stated in such a way that they can be assessed as a form of student learning outcomes that refer to direct experience.

Learning outcomes are an achievement that students get after carrying out the teaching and learning process (Budi et al., 2021), both from the values and data that the teacher has collected. which aims to determine the extent to which students improve their learning. Learning outcomes can also determine the development of students' skills in physical education whether they have met the criteria or have not met the criteria, whether the learning strategies and methods are appropriate or not appropriate.

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55

Learning methods that are lacking in physical education in schools are one of the obstacles that affect the teaching and learning process of good students, therefore physical education teachers are required to always think creatively, innovate, in empowering and optimizing learning in schools (Francisko & Puspitawati, 2013; Hadyansah, 2021). Not a few students are less interested or do not like the physical education material delivered by the teacher, because the learning method used is not appropriate and does not attract students' attention.

In determining good learning the teacher must be able to read student characteristics, learning methods, media, and muscle formation in carrying out optimal sports. Because with that, the teaching material or material presented can be realized properly and correctly. Moreover, supported by the will and enthusiasm of these students. Learning methods and muscle strength also affect the ongoing process of teaching and learning because with the presence of strength, students are able to carry out appropriate motor movements and reach the realm of education, namely cognitive, affective, and psychomotor.

Floor gymnastics is a sport that uses a floor or mat which is carried out in a room or field with posture and muscle strength in the body to carry out the movements . Floor exercises are performed on a mat, usually measuring 12 x 12m. The series of gymnastic movements must start from the composition of light, medium, heavy, and acrobatic movements, and contain movements of agility, balance, flexibility, etc. Male gymnasts perform within 70 seconds and female gymnasts perform accompanied by music within 90 seconds. Movements that emphasize energy should be done slowly and remain static for at least 3 seconds. Gymnastic skills, especially on the floor, are generally characterized by tumbling and acrobatic movements.

The movement in floor exercise is a forward roll (forward roll), roll back (backward roll), tiger jump (tiger jump), elastic wrist (handstand transfer), cartwheels, squat jumps, swivel arm jumps (round off), stretch your arms back (flak flak), rolling knee balance (squat roll), skipping, standing with head (headstand), can (use), candle stance, forward somersault (Summer vault), backwards salto (Back Summer vault), elastic roll (roll kiep), jump fish (snuck).

Handstand is one of the gymnastic materials in which mastery of a series of motion skills is carried out sequentially. Movement skills handstand obtained from various prefix movements. (Mahendra, 2001) Prefix inhandstand starting from the initial attitude, the initial movement, the movement when standing with the hands, the final attitude. According to Mahendra,Handstand is the skill of maintaining body position by relying on both arms. This movement begins by resting both feet forward and putting the other leg

back while extending both arms to the floor to rest (Lubis & Acha, 2018). Because in learninghandstand not only the strength of the arm muscles but also the need for learning methods to get optimal learning results.

In the findings in the field by researchers, when learning floor gymnastics, many students are unable to master it due to low muscle strength and fitness. And less richness of movement that is in his body. This is an obstacle to the teaching and learning process, especially floor gymnastics material, namely handstand. Because handstand relying on both hands, this movement is very difficult, let alone doing it alone without the help of an effective and appropriate learning method other than the strength of the arm muscles themselves.

Selection of learning methods for movementhandstand this is quite complicated because the endurance and balance of the body and hands must be controlled in orderhandstand possible to do. The learning method used must be adapted to the abilities of students, so the part and whole methods as learning are more appropriate by doing it repeatedly so that learning outcomeshandstand can be achieved and in accordance with the expected goals. Rahayu explained his opinion regarding the definition of the part method, which is the method used when dealing with these movements, usually the teacher will divide the task into small parts (according to the basic technique). Each of these parts is trained one by one according to the order of the basic techniques and then put together after all the parts are mastered so that they become one complete skill (Mahendra, 2001). Meanwhile (Shahabuddin et al., 2020) defines the overall training method, namely the overall training method is an overall training development conditioned by activity material and objectives and the specificity of the motion task and based on the training principles conveyed. Of the two methods the researchers combined the methods drill part and drill thoroughly to achieve the goal of learning floor gymnastics.

METHOD

This study aims to obtain an overview of the differences in the effect of the independent variables on the dependent variable. There are two independent variables in this study, namely learning methods and arm muscle strength. As the dependent variable is the result of learning floor exercise handstand. The population in this study amounted to 44 students. to determine the study population, researchers used techniquesrandom sampling, so that the sample in this study were 44 people. The research was conducted at SMAN 1 Cimalaka. The research was conducted for 2 (two) months in May and June 2018.

The design carried out in this study isby level 2 x 2, taking into account the possibility of a moderator variable that will influence learning outcomeshandstand gymnastics. The research variables consist of three research variables, including the independent variable or also called the experimental variable, namely the learning method section (A_1) and overall (A_2). The moderate variable used in this study was high arm muscle strength (B_1) and low arm muscle strength (B_2). Meanwhile, the dependent variable is learning outcomes handstand gymnastics. To obtain the correct analysis results, all of these variables were included in the research design. The correlation of research variables can be seen in the designby level 2 x 2 in the table below.

Table 1. Table of Research DesignTreatment by Level design 2x2

Arm Muscle Strength	Learning methods	
	Section Method (A_1)	Overall Method (A_2)
Height (B_1)	A_1B_1	A_2B_1
Low (B_2)	A_1B_2	A_2B_2

The instruments used in this study were arm muscle strength tests and learning achievement testshandstand gymnastics. Arm muscle strength test that divides student groups with high and low abilities. While the learning outcomes testhandstand which will be calculated later.

RESULTS AND DISCUSSION

Result

Data obtained from 44 students divided into four groups are described with the aim of knowing the characteristics of learning outcomeshandstand in groups of students who have high and low muscle strength who are given different treatment in the form of partial and whole training methods. The description of the data can be seen in Table 2 as follows.

Table 2. Summary of Research Results

Muscle Strength	Method					
		Overall (A2)		Section (A1)		Total
Height (B1)	Σ	= 538	Σ	= 652	Σ	=1190
	$\underline{X}$	= 48,91	$\underline{X}$	= 59,27	$\underline{X}$	= 54,09
	s	= 1,973	s	= 2,102	s	= 5,665
	Min	= 46	Min	= 56	Min	= 46
	Max	= 53	Max	= 63	Max	= 63

Rendah (B2)	Σ	= 524	Σ	= 1176	Σ	= 897
	$\underline{X}$	= 47,64	$\underline{X}$	= 53,45	$\underline{X}$	= 40,77
	s	= 1,804	s	= 6,254	s	= 7,387
	Min	= 45	Min	= 45	Min	= 30
	Max	= 50	Max	= 63	Max	= 50

The results of this study indicate that there are differences in learning outcomes handstand floor gymnastics students who learn with the whole method with parts. In addition, muscle strength has an influence on learning outcomeshandstand gymnastics. The results of the data analysis that has been carried out, put forward several things as follows.

Discussion

Differences in Learning OutcomesHandstand Between the Overall Training Method (A1) and the Part Training Method (A2)

Handstand is the subject of gymnastics given in high school.Handstand is the skill of maintaining body position by relying on both arms. This movement begins by resting both feet forward and putting the other leg back while extending both arms to the floor to rest. In this research, two training methods were applied, namely method whole and partial training. Both of these methods aim to improve abilityhandstand whose size is the value of learning outcomeshandstand.

In the overall method, students are given instructionhandstand from start to finish at once. Not divided into parts of certain movement stages. Whereas in the sectional method, students are taught from the easiest to the most difficult sections gradually.Handstand is part of floor gymnastics where the movements have their own characteristics and order. Therefore, the use of whole and part methods can be applied in practicehandstand. This section discusses which method gives better results. This study divided the sample into two other groups, namely those with strong and weak arm muscles. On the part of the group applied the part and whole method. Here, a comparison of learning outcomeshandstand what is done is to involve all groups of arm muscle strength.

The ANAVA test results show that there are differences in learning outcomeshandstand significant difference between the part and whole methods (F_h= 331,56 > F_t = 4.08). Average learning outcomeshandstand the partial method (53.45) is greater than the overall method (41.41), and the standard deviation of the partial method (6.254) is smaller than the overall method (8.028). That is, the partial method provides higher and more homogeneous learning outcomes than the overall method. These results are due to the method of dividing lessons into certain parts and taught from the easiest to the most difficult. The part training method provides motion exercises or movement skills into simpler parts or units of motion. The most difficult sections, of course, are taught in more

detail and with more repetitions than the easiest sections. Gradual mastery of movement from movement unit 1, movement unit 2, and so on. When all the movement units are mastered, then do the movements/movement skills as a whole as a unit. This exercise must be done repeatedly and with proper supervision and correction. Therefore, students are able to master sequenced movements.handstand well.

These results are in line with research conducted by Ari Subarkah who reported that the partial training method was better than the overall training method. (SUGIANTO, 2018) *Interaction Between Exercise Methods With Arm Muscle Strength On Learning OutcomesHandstand*

The interaction indicates that there are differences in the results caused by the training method and the strength of the arm muscles. This section discusses the interaction between partial and overall training methods with high and low arm muscle strength. Movementhandstand using the hand as a focus so it will be affected by muscle strength. Strong muscles will make it easier to balance.

The test results show that there is a significant interaction between training methods and arm muscle strength ($F_h = 6,46 > F_t = 4.08$). The average line of the part training method has a higher slope than the whole. A very strong interaction is indicated by the intersection of the interaction plot lines, but a line showing a pattern like this indicates a fairly strong interaction.

The success of the method is also influenced by muscle strength. If the muscles are strong, even using the overall training method will still give good results. But if the muscles are weak, then the partial method of training can give slightly better results than the whole method. Based on these descriptions it can be seen that the method and muscle strength are capablestimulate study successhandstand especially in the application of the training method section.

The results of this study are in line with the research that has been conducted by Adi Wijayanto. In this study it was concluded that there was an interaction effect between learning methods and kinesthetic perception on learning outcomeslay up basketball. Even though the cases are different, this research has similarities with this research, namely examining the effect of arm muscle strength on learning outcomessport.

Differences in Learning OutcomesHandstand between Whole and Part Training Methods in High Strength Arm Muscle Groups (A1B1 and A2B1)

In the group of students who had high arm muscle strength, there was a difference between students who received the part training method and the overall training method. In this group, the average of students who received the part training method was 59.27

while the overall training method was 48.91. The average part training method is higher than the overall training method, meaning that the part method is better than the overall method when used in groups of students who have high muscle strength. In addition, by looking at the minimum and maximum values, it can be seen that the minimum value of A2B1 is higher than the minimum value of A1B1 and the maximum value of A2B1 is higher than the maximum value of A2B1. It can be seen that in groups of students with high arm muscle strength, the part training method gives much better results. .

The advantage of the part training method over the whole training method is because this method provides training in stages. Students who have strong arm muscles can follow the exercise very well. While the overall exercise, even though both have strong muscles, but techniquehandstand probably not studied in as much detail as the exercise method section. Based on the results of this analysis and discussion it can be concluded that the hypothesis which states that learning outcomes handstand In the group of students with high arm muscle strength, the partial training method gave better results than the overall training method.

Differences in Learning OutcomesHandstand between Whole and Part Training Methods in the Low Arm Muscle Strength Group (A1B2 and A2B2)

In the group of students who had low arm muscle strength, there was a difference between students who received the part training method and the overall training method. In this group, the average of students who received the part training method was 47.64 while the overall training method was 33.91. The average part training method is higher than the overall training method, meaning that the part method is better than the overall method when used in groups of students who have low muscle strength. In addition, by looking at the minimum and maximum values, it can be seen that the minimum value of A2B1 is higher than the minimum value of A1B1 and the maximum value of A2B1 is higher than the maximum value of A2B1. It can be seen that in groups of students with low arm muscle strength, the part training method gives much better results. .

Thus, the hypothesis which states that in the group of students with low arm muscle strength the part training method is better than the whole part training method is proven true.

CONCLUSION

Based on the results of hypothesis testing, the results of this study can be concluded that there are differences in learning outcomeshandstand significant difference between the part and whole methods. Second, there is a significant interaction between training methods

and arm muscle strength. Third, learning outcomeshandstand In the group of students with high arm muscle strength, the partial training method gave better results than the overall training method. Fourth, the group of students with low arm muscle strength, the part training method is better than the whole part training method is proven to be true.

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