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The Relationship Between Arm Strength and Balance and the Ability to Perform Candle Poses in Floor Gymnastics

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A. Conception and design of the study; **B.** Acquisition of data; **C.** Analysis and interpretation of data; **D.** Manuscript preparation; **E.** Obtaining funding

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ABSTRACT

This study aims to determine the relationship between arm strength and balance with the ability to do candle posture in floor gymnastics of students of SD Inpres Kassi-Kassi Makassar, Tana Toraja Regency. This research is a type of descriptive research. The population of this study is all students of SD Inpres Kassi-Kassi Makassar with a total of 60 male students who were randomly sampled. The data analysis technique used is a correlation analysis technique using the SPSS Version 11.00 system at a significant level of 95% or $\alpha = 0.05$. Based on the results of data analysis, this study concludes that: There is a significant relationship between arm strength and the ability to perform candle postures in floor gymnastics, (ro = 0.381 with a probability level of (0.000) < $\alpha = 0.05$); There was a significant relationship between balance and the ability to perform a candle posture in floor gymnastics, (ro = 0.630 with a probability of (0.000) < $\alpha = 0.05$); There was a significant relationship between arm strength and balance and the ability to do a candle pose in floor gymnastics (Ro = 0.633 with a probability level of (0.000) < $\alpha = 0.05$).

Keywords : Arm strength; Balance; Candle Attitude; Gymnastics.

INTRODUCTION

The growth and development of physical, intellectual, social, and spiritual-moral aspects are also the goals contained in sports coaching towards improving achievement (Kurnita, 2018). Physical education provided in elementary schools from grade one to grade six is an educational activity oriented to sports movements (Kurniawan & Hartati, 2016) which is prepared in the curriculum for each level of education, including the grade level, has goals to be achieved such as the development of affective, cognitive, and psychomotor or motor aspects (Hammado & Sahabuddin, 2019), so that it can be used to support the implementation of education, such as the ability to sit for hours receiving lessons in class (Syahrial, 2015). Apart from that, other aspects that need to be developed through physical education are intellectual, social and spiritual-moral aspects (Sahabuddin, Hakim, & Bismar, 2020). Even more than that, preparing students starting from an early age has the potential to excel in education (Muliadi et al., 2020).

The implementation of physical education in elementary schools is when the teachers carry out educational practices that adhere to educational gifts or with the nature of play (Hanafi et al., 2022). The educational atmosphere is seen in the form of stimulation or the provision of learning experiences (Sahabuddin, Ayoebi, et al., 2022). Educational learning experiences are divided into several groups, Rusli Lutan (1991) divides them into four, as follows: "formation of movement, formation of achievements, social formation, and growth".

The formation of movement is related to the desire of students to move, recognize the possibility of their movement, and enrich their movement ability (Afni et al., 2018). The formation of achievements, in this case, prepares students to develop their abilities starting from an early age towards coaching achievement improvement (Herman Chaniago et al., 2024), including developing spiritual mental elements, forming the right attitude towards the values contained in daily life and sports (Jamilah & Nugraheni, 2017). Social formation involves the development of children to recognize and accept the rules of common norms, learn to cooperate, take responsibility, recognize the abilities of friends or others as individuals and have a sense of community life (Yugianto, 2018). Growth concerns help to improve children's growth by overcoming various obstacles to the growth of students (Sahabuddin, Sudirman, et al., 2022). Thus, there will be an increase in health, and physical freshness, including the ability to be responsible for one's own health and healthy living habits (Sahabuddin, Hakim, & Syahruddin, 2020).

One of the sports contained in the physical education curriculum in elementary schools (SD) is floor gymnastics with candle attitude lesson material. Floor gymnastics was developed for elementary school students, in addition to providing benefits and physical education goals, it is also useful as a coaching towards improving achievement (Nisa & Suwardi, 2019). The sports branch of floor gymnastics consists of many movements. The first movement to become a subject in the curriculum includes the candle attitude movement. This movement is also widely used in floor gymnastics in a series of movements. Therefore, it is identified to be taught as the main subject matter (Sulistyowati, 2020).

Floor gymnastics skills, especially candlestick movements, can only be achieved through the process of learning these movements (Rindawan & Mulyajaya, 2016). In the process of learning Lanati gymnastics skills, in addition to movement techniques, it needs to be supported by these components, including strength, speed, flexibility, balance, endurance, repulsion, reaction, coordination and agility (Asri et al., 2022). Not all of these elements of movement ability affect a particular movement, such as the candle attitude movement in floor gymnastics (Mikel & Ismaya, 2023). So certain elements can be predicted as components of physical freshness that have to do with the movement of the candle attitude in floor gymnastics. The components of physical freshness in question include abdominal muscle strength, arm strength and body balance (Aliriad, 2021).

The strength of the arm is part of the superior extremities. The strength of the arm in question is the strength of the triceps and biceps muscles whose movement is axial to the elbow joint (articulatio cubiti) (Asri et al., 2021). The strength of this arm is expected to play a role in performing floor gymnastics movements (candle attitude). In the candle posture movement, what is the role of the two arms in supporting the body of both legs when in a straight state (Tresnowati et al., 2021)?

Body balance is very necessary for floor gymnastics sports, especially candle attitude movements (Yunita et al., 2023). When both legs are lifted so that they are straight and last for a predetermined time, of course, students must be able to maintain their body balance (Pertiwi et al., 2021).

METHODS

The research design or research design used in this study is correlational. The population in this study is all students of SD Inpres Kassi-Kassi Makassar. The sample used was 60 male students in grades IV, V, and VI of SD Inpres Kassi-Kassi Makassar. The data collected in this study include Tests of arm strength, body balance, and the ability to perform a candle posture on floor exercises. The data obtained through the research test instrument will be analyzed with a computer system in the SPSS Version 21.00 program at a significant level of 95% or α = 0.05.

RESULTS AND DISCUSSION

Result

Descriptive analysis of research data consisting of test scores of arm strength and balance with the ability to perform a candle attitude can be seen in the summary of the results of the descriptive analysis listed in the table.

Table 1.
The results of the descriptive analysis of arm strength and balance data with candle attitudes.

Statistical Hypothesis	Arm strength	Balance	Candle Attitude
N	60	60	60
∑X	923	4551	469,50
μ	15,3833	75,85	7,8250
Sd	2,81697	8,86399	0,83780
Min	10	55	6,50
Max	21	98	10,00
Range	11	43	3,50

Research data to be analyzed statistically must meet the requirements for analysis. For this reason, after the data on arm strength and balance with the ability to perform a candle attitude in this study are collected, before statistical analysis is carried out for hypothesis testing, a requirement test is first carried out, namely normality with the Kolmogorov-Simirnov Test. The calculation results can be seen in the following summary table:

Table 2.
Data normality test results

It	Variable	K – SZ	Probability	α	Information
1	Arm strength	1,194	0,116	0,05	Usual
2	Balance	1,137	0,150	0,05	Usual
3	Candlestick attitude ability	1,121	0,181	0,05	Usual

Correlation analysis was carried out to determine the relationship between each independent variable and the bound variable. The correlation analysis used was a single correlation (r) and double correlation (R) analysis at a significant level of 95%. The results of the analysis are listed in the following table:

Table 3.
Results of correlation and regression analysis

Hypothesis	N	r/R	Rs	F	Sig.
Correlation of arm strength with the ability to do a candle stance	60	0,381	0,145	-	0,000

Correlation of balance with the ability to do candlestick posture	60	0,630	0,397	-	0,000
Correlation between arm strength and balance with the ability to do a candlestick stance	60	0,632	0,399	18,929	0,000

There is a relationship between arm strength and the ability to perform a candle pose.

Based on the results of the test analysis of the correlation of arm strength data with the ability to perform a candle attitude. A correlation value (r0) = 0.381 was obtained with a probability level of 0.000 < α = 0.05, for the determination coefficient value = 0.145. This means that 14.5% of the ability to do a candlestick posture is explained by the strength of the arm in SD Inpres Kassi-Kassi Makassar students. While the rest (100% - 14.5% = 85.5%) is explained by other causes. So Ho was rejected and H1 was accepted. Thus, there is a significant relationship between arm strength and the ability to perform candle postures in students of SD Inpres Kassi-Kassi Makassar.

There is a relationship of balance with the ability to do candlestick gestures.

Based on the results of the test analysis, the correlation of balance data with the ability to perform candlestick attitudes. A correlation value (r0) = 0.630 was obtained with a Probability level of 0.000 < α = 0.05, for the determination coefficient value = 0.397. This means that 39.7% of the ability to do a candlestick attitude is explained by the balance in SD Inpres Kassi-Kassi Makassar students. While the rest (100% - 39.7% = 60.3%) is explained by other causes. So Ho was rejected and H1 was accepted. Thus, there is a significant relationship of balance with the ability to do candlestick attitudes in students of SD Inpres Kassi-Kassi Makassar.

There is a relationship between arm strength and balance and the ability to perform a candle pose.

Based on the results of the test regression analysis of arm strength and balance data with the ability to do a candle attitude. A regression value (R0) = 0.632 was obtained with a Probability level of 0.000 < α = 0.05, for the R Square value (coefficient of determination) = 0.399. This means that 39.9% of the ability to do a candle pose is explained by arm strength and balance in SD Inpres Kassi-Kassi Makassar students. While the rest (100% - 39.9% = 60.1%) is explained by other causes. From the ANOVA test or F test, the F count was 18.929 with a significance level of 0.000. Since the probability (0.000) is much smaller than 0.05, the regression model can be used to predict the ability to perform a candlestick attitude (applicable to the population in which the sample is taken). So Ho is rejected and H1 is accepted or coefficient regression is significant, or arm strength and balance have a significant effect on the ability to perform a candlestick attitude. Thus, there is a significant relationship between arm strength and balance and the ability to do candlestick postures in students of SD Inpres Kassi-Kassi Makassar.

Discussion

There was a significant relationship between arm strength and the ability to perform candle postures in the floor gymnastics of SD Inpres Kassi-Kassi Makassar students. It is evident from the results of the analysis that the observation correlation value is greater than the correlation value of the table. This proves that this relationship exists because there is

a connection between the lillin's gesture and the strength of the arm. Of the several candle gesture movements, one of them is the movement of supporting the waist to straighten the body and legs. At that time there is a static (isometric) movement in the elgan, and the muscles that work are the biceps and triceps brachi. But the more dominant is the triceps brachi muscle. Then when doing push-ups, the muscles that work are triceps brachi. Thus, there is a similarity in muscle contraction when the hands support the waist by doing push-ups. For this reason, it can be concluded that there is a significant relationship between arm strength and the ability to perform candle postures in floor gymnastics. This gives the idea that push-ups can be predicted against the ability of the candle attitude in floor gymnastics.

There was a significant relationship between body balance and the ability to do candle postures in the floor gymnastics of SD Inpres Kassi-Kassi Makassar students. It is evident from the results of the analysis that the observation correlation value is greater than the correlation value of the table. This proves that there is this relationship because there is a relationship between the movement of the candle attitude and the balance of the body. Several series of candle attitude movements, one of them is the movement of lifting both legs straight up until it forms a candlestick posture and lasts for a specified time. At that time, the role of balance is very necessary. To be able to survive the candlestick stance by not moving requires balance, especially dynamic balance. Thus, it can be concluded that there is a significant relationship between body balance and the ability to perform candlestick movements. This gives the idea that dynamic equilibrium can be predicted against the ability of the candlestick attitude.

There was a significant relationship between arm strength and body balance on the ability to do candle posture in the floor gymnastics of SD Inpres Kassi-Kassi Makassar students. It is evident from the results of the analysis that the observation correlation value is greater than the correlation value of the table. This proves that the movement of the candle posture requires the strength of the arms to hold the body and both legs after being straightened upwards. From the analysis of the movement of doing the candle pose in floor gymnastics, it is clear that physical elements are needed to play the main role in the movement of doing the candle pose. Besides that, in the movement of doing a candle attitude, this body balance is very needed. When lifting both legs straight up, requires dynamic balance, meaning that regularly and rhythmically both legs move upwards in a straight line, then continue with both hands supporting the waist. This movement can lose balance because there is a movement of raising both legs in a straight state, especially if the movement is done several times.

Thus, the two components, namely arm strength and balance, are very helpful in doing a candlestick stance on the floor senma. For this reason, it is necessary to pay attention to both components so that gymnasts can have them.

CONCLUSION

Following the results of the hypothesis testing analysis based on the proposed problem, the following conclusions can be drawn:

1. There was a significant relationship between arm strength and the ability to perform candle attitudes of SD Inpres Kassi-Kassi Makassar students.
2. There was a significant relationship between body balance and the ability to perform candle attitudes of students of SD Inpres Kassi-Kassi Makassar.

3. There was a significant relationship between arm strength and body balance on the ability to do candle posture in the floor gymnastics of SD Inpres Kassi-Kassi Makassar students.

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