

THE EFFECT OF PLAY ACTIVITIES AND MOTIVATION ON CHILDREN'S BASIC MOVEMENT SKILLS: FACTORIAL EXPERIMENTAL DESIGN

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DOI: [10.5281/zenodo.11195365](https://doi.org/10.5281/zenodo.11195365)

Abstract

Delay in basic movements in early childhood is a challenge that must be resolved by sports practitioners. This study aims to describe how the relationship between play and motivation for children's basic movements, by implementing an experimental model approach, participants who are sampled are children who are still in elementary school or aged 11.09 ± 0.73 years. Data were collected using a training motivation questionnaire and Scott motor ability test consisting of basketball throw, 4 sec.dash, wall pass and standing Broad jump, and data were analyzed using two-way factorial ANOVA test. The results of this study reported that the average basic movement scores of groups A1 and A2 were 39.05 ± 2.23 and 38.09 ± 1.85 . For groups B1 and B2, the averages were 39.32 ± 2.12 and 37.82 ± 1.79 . The average basic movement scores of groups A1B1 and A2B1 were 40.45 ± 1.44 and 37.64 ± 2.01 . Meanwhile, A1B2 and A2B2 were 38.00 ± 2.13 and 38.18 ± 1.61 . Slightly lower averages were shown by groups B2 and A2B1, where the averages were 37.82 and 37.64. This shows that the average A1B1 group had the highest average increase compared to the other treatment groups, this finding is important to look at, informing children's basic movement skills in the form of exercises.

Keywords: Children, Basic Movement, Motivation, Games.

INTRODUCTION

Basic motor skills provide the foundation for sports skills and physical activity (Newell, 2020; Raudsepp & Päll, 2006; Szabo, 2021). This includes motor control and object control. Children's basic motor skills develop in the early years and continue to develop until the end of childhood (Jones et al., 2020; Sutapa et al., 2021). These basic motor skills play an important role in almost every aspect of daily life (Javaid et al., 2021; Rowald et al., 2022). Basic movements should be taught to children between the ages of two and seven (Niemistö et al., 2020; Sari, Kurniawan, et al., 2023; Selviani et al., 2024; Welis et al., 2024). At this age, different movement patterns need to be taught as basic movements do not develop naturally (Indika et al., 2023; Komaini et al., 2021; Sabatino et al., 2021; Sari, Bafirman, et al., 2023). Therefore, basic movements need to be taught and given tasks that are appropriate for the child's developmental status (Cahyo Adi Kistoro et al., 2021; Newell, 2020; Ruba & Pollak, 2020). These basic movements are influenced by many factors, including economic, biological, and environmental factors that can hinder the development of basic movements in children (Garner et al., 2021; Sari & Muchlis, 2022).

Basic movement has a positive impact on health and personality, including fitness, nutritional status, physical and mental academic achievement (Candra et al., 2023; Stults-Kolehmainen, 2023). However, in many countries such as the UK and Ireland,

children's basic movement skills are still low due to the lack of physical activity among them (Niemistö et al., 2020). According to previous studies, about 6-13% of children have difficulties in basic movement skills (García-Hermoso et al., 2020).

If children's motor development is not understood and addressed early, this can result in delays in motor development in the child's future (Brian et al., 2020; Otajonovna et al., 2022). It is also important to understand that children's motivation can vary, with some children having low motivation to learn and others having high motivation (Irkinovich, 2022). As a teacher, it is important to be able to understand and pay attention to these children. A suitable approach to these children involves playing through activities such as using equipment and playing without equipment. Games that involve equipment are usually favored by children, such as throwing and catching, while play without equipment tends to involve running and jumping (Hassani et al., 2022; Leonhardt & Overå, 2021; Qasrawi et al., 2020).

By conducting this research, the aim is to explain how play activities and motivation can influence children's basic movement skills, as well as the extent of their influence on children's basic movement skills. The importance of this is the basis for the researcher to carry out this study.

METHODS

Study Design

This research is an experimental research with two-way factorial ANOVA test. The game method (A) consists of two training groups, namely the mirror game group (A1) and the geroboak sodor game group (A2). Meanwhile, training motivation (B) consisted of high (B1) and low (B2) training motivation groups. As presented in table 1, the study involved 4 treatment groups, the mirror jumping game group with high and low training motivation (A1B1 and A1B2). Then, the sodor cart game group with high and low training motivation (A2B1 and A2B2).

Table 1: Two-way Factorial ANOVA Design

Training Motivation (B)	Game Group (A)	
	Lompat Cermin (A1)	Gobak Sodor (A2)
High (B1)	A1B1	A2B1
Low (B2)	A1B2	A2B2
Total	A1	A2

Note, Dependent Variable: children's basic movement skills

Participants

A total of 44 learners participated in this study, who were recruited randomly. These participants were elementary school students using purposive sampling technique. Participants were at the concrete operation stage of thinking and understood the instructions given by the teacher. Participants have stated to comply with the rules and participate voluntarily through a written agreement. Participants were 11.09 ± 0.73 years old, 26.50 ± 2.16 kg body weight, 112 ± 6.79 cm height, and 21.21 ± 2.07 BMI.

Procedure

Treatment Group Distribution

The basic movement skills test was conducted by dividing the groups using a two-way factorial ANOVA design. This test was conducted before the mirror jumping game and

the Gobak sodor game. The initial test consisted of 88 participants, after that considering that the level of thinking is already at the stage of concrete operations and already understands the instructions given by the teacher, therefore the researcher chose students who were in grade V. Furthermore, of these 44 samples were given a practicing motivation test to divide into high and low motivation groups after which they were divided into 4 groups of 11 people. As presented in Figure 1 and Table 2.

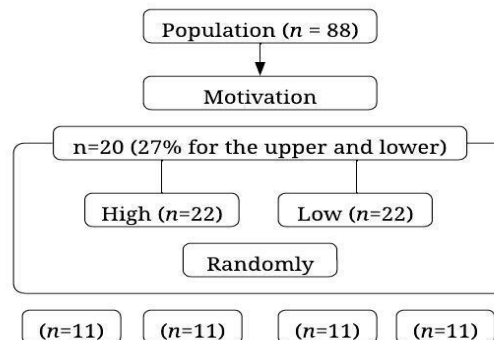


Figure 1: Procedure for Group Division

Tabel 2: Number of Participants for Each Group

Training Motivation (B)	Game Group (A)				
	Lompat Cermin (A1)	N	Gobak Sodor (A2)	N	Total (n)
High (B1)	A1B1	11	A2B1	11	22
Low (B2)	A1B2	11	A2B2	11	22
Total	A1	22	A2	16	44

Operational Definition

In order for this research to have the same interpretation of the terms used, it is necessary to give an explanation and limit the terms. The terms can be stated as follows:

- 1). Children's basic movement skills are the performance of students in doing basketball throw, 4 sec.dash, wall pass and standing broad jump which are measured by their respective units.
- 2). Motivation to practice is the score of students' answers to the questionnaire motivation to practice using a Likert scale.
- 3). The game approach is a learning approach that uses mirror jumping games and Gobak sodor.

The mirror jumping game is a game that is in accordance with the characteristics of basic jumping movements that refer to the implementation techniques and principles. Then the Gobak sodor game is a game of blocking the opponent to reach the finish line. This game is played by two teams of three people each.

Research Instruments

The instrument of this research is to use a questionnaire of motivation to practice and Scott motor ability test which consists of basketball throw, 4 sec.dash, wall pass and standing Broad jump. Basketball throw to measure arm muscle power, 4 sec.dash is useful for measuring running speed, wall pass to measure coordination between eyes and hands, standing Broad jump to measure a person's leg muscle power.

Statistical Analysis

Descriptive analysis was used to characterize the data of each treatment group. While the normality test was analyzed based on the standard residual value, homogeneity was analyzed using Levene's test. Then, a two-way factorial ANOVA test was used to analyze the difference in effect. This study also conducted Tukey's follow-up test to analyze significantly different groups or better results on motor skills. All data in this study were analyzed using the IBM SPSS statistical program.

RESULTS

The results of this study reported the average basic movement scores of groups A1 and A2 were 39.05 ± 2.23 and 38.09 ± 1.85 . For groups B1 and B2, the averages were 39.32 ± 2.12 and 37.82 ± 1.79 . The average basic movement scores of groups A1B1 and A2B1 were 40.45 ± 1.44 and 37.64 ± 2.01 . Meanwhile, A1B2 and A2B2 were 38.00 ± 2.13 and 38.18 ± 1.61 . Slightly lower averages were shown by groups B2 and A2B1, where the averages were 37.82 and 37.64. This shows that the average of the A1B1 group has the highest average increase compared to the other treatment groups (Data presented in Table 3 and Figure 2). While Table 4 shows the results of the normality and homogeneity test of the data which shows that the data is normal and homogeneous ($P > 0.05$).

Tabel 3: The Results of the Lokomotor of Each Treatment Group

Group	n	Min	Max	M ± SD
A1	22	35	43	39,05 ± 2,23
A2	22	35	42	38,09 ± 1,85
B1	22	35	43	39,32 ± 2,12
B2	22	35	42	37,82 ± 1,79
A1B1	11	39	43	40,45 ± 1,44
A2B1	11	35	42	37,64 ± 2,01
A1B2	11	35	42	38,00 ± 2,13
A2B2	11	36	41	38,18 ± 1,61

Note- The dependent variable is Basic Movement, "A1" is a game of lompat cermin, "A2" is a game of gobak sodor, "B1" is high motivation, "B2" is low motivation, "A1B1" is the game lompat cermin and high motivation, "A2B1" is the game Gobak sodor and high motivation, "A1B2" is the game lompat cermin and low motivation, "A2B2" is the game Gobak sodor and low motivation.

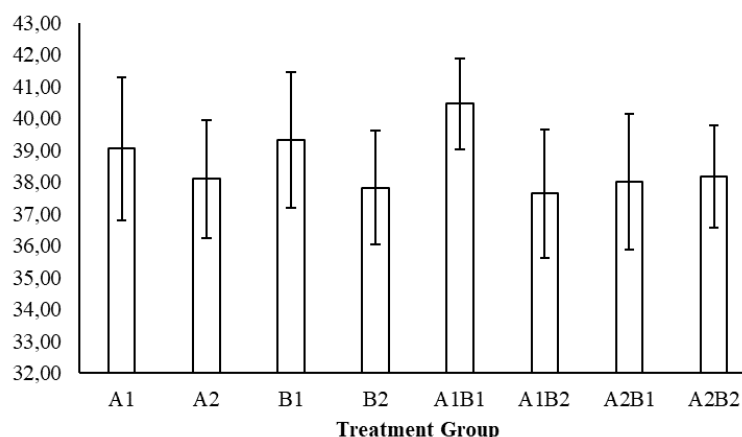


Figure 2: Average Basic Movement of Children in Each Group

Table 4: Normality and Homogeneity Test

Normality Test						Homogeneity Test		
Kolmogorof-Smirnov			Shapiro-Wilk			Levene's		
Statistik	df	p	Statistik	df	p	df1	df2	p
0,159	44	0,07	0,943	44	0,31	3	40	0,564

Notes: Data is normally distributed and homogeneous if ($p > 0.05$)

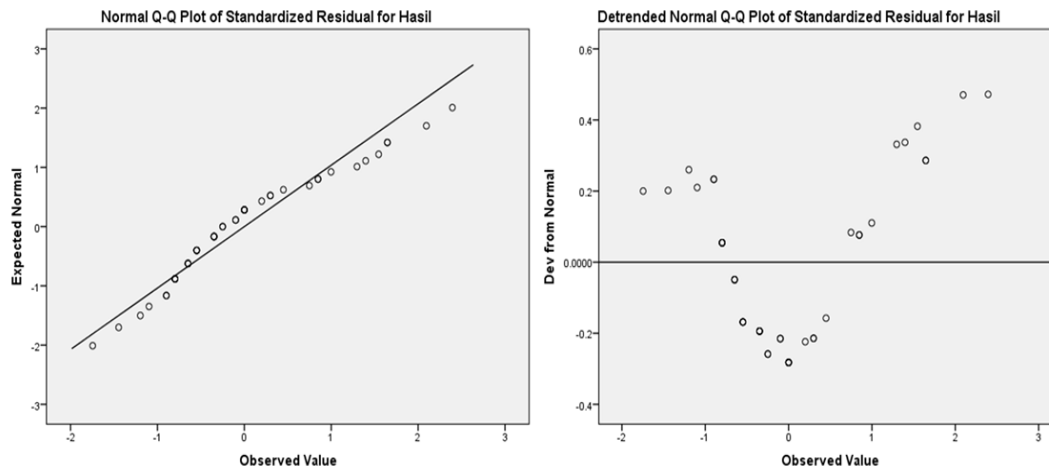


Figure 3: a) Normality Plot Graph, b) Downward Plot Graph

Table 4 below presents the results of the two-way ANOVA test. The table shows that the basic movement results of children in groups A1 and A2 ($P < 0.05$) and groups B1 and B2 ($P < 0.05$) are significantly different. Figure 4 adds that there is a significant interaction between groups A and B ($P < 0.05$). To determine which treatment group has a better effect on children's basic movements, a further test was conducted using the Tukey test. As presented in Table 5, Tukey's further test analysis showed that group A1 was better than group A2 ($P < 0.05$) in improving children's basic movements. This is evidenced by the average of $39.05 > 38.09$. Similarly, the results of children's basic movements in group B1 are better than group B2 ($P < 0.05$), which is indicated by an average of $39.32 > 37.82$. The basic movements of children in group A1B1 were the highest and much better than group A2B1 ($P < 0.05$). The average is $40.45 > 37.64$. Then the results of children's basic movements in group A1B2 are not significantly different from group A2B2 ($P > 0.05$), as evidenced by an average of $38.00 < 38.18$.

Table 5: Two-way Factorial ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Corrected Model	53.886	3	17.962	5.406	0.003
Intercept	65.205	1	65.205	19.736	0
Game_A	10.023	1	10.023	3.016	0.05
Motivation_B	24.75	1	24.75	7.449	0.009
Game_A * Motivation_B	19.114	1	19.114	5.752	0.021
Error	132.909	40	3.323		
Total	65.637.000	44			
Corrected Total	186.795	43			

Notes: The dependent variable was children's basic movements, "Games" - there was a significant difference between groups A1 and A2 ($P < 0.05$), "Motivation" - there was

a significant difference between groups B1 and B2 ($P < 0.05$), "Games*Motivation" - there was a significant interaction between groups A and B ($P < 0.05$).

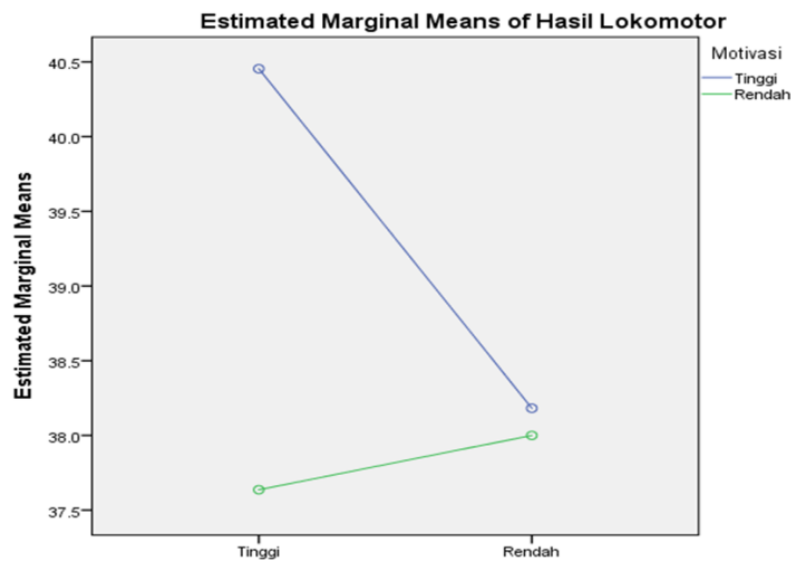


Figure 4: Interaction between Play Activities and Motivation

Tabel 6: Tukey's Test

Compared Group	Tukey's	P	Conclusion
A1 dan A2	2,27	0,028	Significant
B1 dan B2	2,245	0,015	Significant
A1B1 dan A1B2	2,82	0,004	Significant
A2B1 dan A2B2	0,18	0,995	Not Significant

DISCUSSION

With the research data obtained and analyzed using the factorial anova approach, it can be seen that the basic movement skills of children "A1 and A2 are significant", "B1 and B2 are significant", "A1B1 and A2B1 are significant", but there is no "A1B2 and A2B2 are not significant". This can be noted in the group of low training models and low motivation to practice to be understood for the application of games in children offered in this study such as the application games of lompat cermin and Gobak sodor of the two games lompat cermin more effective than the game Gobak sodor, motivation is also an element that improves children's motor skills with high motivation, children can do a more enjoyable exercise model, unlike children who have low motivation, children are less enthusiastic in carrying out the exercise model.

Play is a good thing to apply to children, by playing children can explore various kinds of experiences, the liveliness of children playing menajdi one form of physical activity of children during the game by playing children can develop physical, cognitive and social skills. (Behnamnia et al., 2020; López-Faicán & Jaen, 2020).

Previous studies have shown that outdoor play can improve children's motor skills, health and physical fitness. This study suggests that providing play activities is preferable to conventional learning for 9-10 year olds (Komaini, 2022). Economic conditions, play activities, and nutritional conditions have a significant impact on children's motor skills. (Dankiw et al., 2020; Rahman A & Chandrasekaran, 2021; Valadi & Gabbard, 2020). The basic motor skills of boys and girls are actually the

same, but after they enter adolescence, girls' basic motor skills tend to decrease compared to boys (Matos et al., 2022; Webster et al., 2021).

From the results of the research conducted, we conclude that it is important to pay attention to children's basic movement skills, especially in terms of exercise type and motivation. Children with high motivation tend to prefer to do exercises such as *lompat cermin* and *gobak sodor*, but the results showed that children were better at doing *lompat cermin* exercises than *gobak sodor*. Therefore, we recommend that *lompat cermin* exercises are more suitable for children with both high and low motivation.

CONCLUSIONS

This study concluded that the form of the game needs to be considered (*lompat cermin* and *Gobak Sodor*) because it can provide optimal basic movement skills results. In accordance with these findings, the results of basic movement skills given the form of the game with the *lompat cermin* game are better than the *gobak sodor* game (39.05 < 38.09). After that, this study found an interaction between game form and motivation. The results of basic movement skills given a game form with a *lompat cermin* game are better than the *Gobak sodor* exercise for high training motivation (40.45 > 37.64). The results of basic movement skills given a game form with a *lompat cermin* game were not better than the *Gobak sodor* exercise for low training motivation (38.00 > 38.18). This finding is important because it provides information about basic movement skills in the form of exercises that may be useful for fitness instructors, sports practitioners, and athletes in improving basic movement skills. Further research is needed involving other forms of exercise and related factors in exercise, the number of samples with trained categories, and longer treatment time. and athletes in improving basic movement skills.

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