

The Effect of Game-Based Circuit Training on Improving Basic Manipulative Movement Skills among Extracurricular Students at SDN 5 Malaka

Muhammad Anshor¹, *Aminullah², Muhsan³

*Corresponding Author: Aminullah, e-mail: aminullah@undikma.ac.id

¹Physical Education and Health Study Program, Faculty of Sport, Health, and Community Sciences, Universitas Pendidikan Mandalika, Mataram, Indonesia

Abstract

Objectives: This study aimed to determine the effect of game-based circuit training on improving students' basic manipulative movement skills in extracurricular activities at SDN 5 Malaka.

Materials and Methods: This study used a quantitative experimental method with a one-group pretest-posttest design. The sample consisted of 10 male students who actively participated in extracurricular activities and were selected using purposive sampling. The instrument used was the Test of Gross Motor Development-2 (TGMD-2), modified into game-based object-control activities. The treatment was conducted for six weeks, with three training sessions per week. Data were analyzed using the Shapiro-Wilk normality test and paired sample t-test.

Results: The results showed a significant improvement in students' basic manipulative movement skills after the game-based circuit training intervention. The mean pretest score was 26.5, while the mean posttest score increased to 41.6. The paired sample t-test showed a significant difference between pretest and posttest scores, with $t = -21.378$ and $\text{Sig. (2-tailed)} = 0.000 < 0.05$. These findings indicate that the intervention significantly improved students' manipulative movement skills.

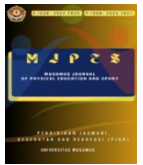
Conclusions: Game-based circuit training had a positive and significant effect on improving the basic manipulative movement skills of extracurricular students at SDN 5 Malaka. This training model can be used as an effective, structured, and enjoyable approach to develop elementary school students' object-control skills.

Keywords: game-based circuit training, manipulative movement, object control, elementary students, extracurricular activities

Introduction

Physical education plays an important role in developing students' physical, cognitive, social, and emotional potential. One of the main objectives of physical education is to develop students' fundamental movement skills as the basis for more complex motor abilities. Fundamental movements generally include locomotor, non-locomotor, and manipulative movements.

Among these movement categories, manipulative movement is considered one of the most complex because it involves eye-hand and eye-foot coordination, as well as the ability to control objects. Manipulative skills include throwing, catching, kicking, hitting, dribbling, and bouncing. These skills are important for elementary school students because they serve as the foundation for various sports and physical activities.



Initial observations at SDN 5 Malaka showed that several students who participated in extracurricular activities still experienced difficulties in performing manipulative movements correctly. This condition indicates the need for a training method that is appropriate for elementary school students, namely a method that is structured, varied, enjoyable, and based on play activities.

One training method that can be applied is circuit training. Circuit training consists of several exercise stations performed sequentially with specific movement tasks. According to Morgan and Adamson, as cited in Budiwanto (2012), circuit training can improve physical fitness components and motor skills comprehensively. Harsono (2018) also stated that circuit training is a structured training method consisting of several stations designed to improve physical and movement abilities.

When circuit training is combined with games, the training process becomes more enjoyable and suitable for children's characteristics. Game-based physical activities can increase motivation, active participation, and learning experience. Masjida (2011) emphasized that game-based physical education helps students understand movements through direct experience in a less stressful learning environment.

Therefore, this study aimed to analyze the effect of game-based circuit training on improving basic manipulative movement skills among extracurricular students at SDN 5 Malaka.

Materials and Methods

Study Design

This study used a quantitative experimental method with a one-group pretest-posttest design. This design was used to compare students' manipulative movement skills before and after receiving the treatment.

Pretest	Treatment	Posttest
O1	X	O2

Description:

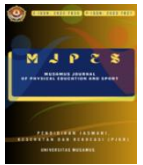
O1 = Pretest of basic manipulative movement skills

X = Game-based circuit training

O2 = Posttest of basic manipulative movement skills

Participants

The participants were extracurricular students at SDN 5 Malaka. The sample consisted of 10 male students who actively participated in extracurricular activities. The sample was selected using purposive sampling.



Instrument

The instrument used in this study was the Test of Gross Motor Development-2 (TGMD-2), focusing on the object-control aspect. The test was modified into game-based activities to measure students' basic manipulative movement skills, including throwing, catching, kicking, hitting, and other object-control movements.

Training Program

The intervention was conducted for six weeks, with a frequency of three sessions per week, for a total of 18 training sessions. Each session consisted of three stages: warm-up, main activity, and cool-down. The main activity used game-based circuit training with several stations focusing on manipulative movement skills.

Statistical Analysis

The data were analyzed using descriptive statistics, the Shapiro–Wilk normality test, and the paired sample t-test. The Shapiro–Wilk test was used because the sample size was less than 50. The paired sample t-test was used to determine the difference between pretest and posttest scores. Statistical analysis was conducted using SPSS.

Results

Descriptive Statistics

The descriptive results showed an improvement in students' basic manipulative movement skills after the intervention.

Table 1. Mean Pretest and Posttest Scores

Test	Number of Students	Total Score	Mean Score
Pretest	10	265	26.5
Posttest	10	416	41.6

The mean score increased from 26.5 in the pretest to 41.6 in the posttest. This indicates that students' manipulative movement skills improved after participating in game-based circuit training.

Frequency Distribution of Pretest Scores

Table 2. Frequency Distribution of Pretest Scores

Category	Frequency	Percentage
Very High	0	0%
High	3	30%
Moderate	4	40%
Low	2	20%
Very Low	1	10%

The pretest results showed that most students were in the moderate category. The lowest score was 18, while the highest score was 32.

Frequency Distribution of Posttest Scores

Table 3. Frequency Distribution of Posttest Scores

Category	Frequency	Percentage
Very High	0	0%
High	4	40%
Moderate	4	40%
Low	0	0%
Very Low	2	20%

The posttest results showed improvement in students' scores. The lowest score increased to 36, while the highest score reached 46.

Normality Test

Table 4. Shapiro–Wilk Normality Test

Variable	Statistic	df	Sig.
Pretest	0.900	10	0.222
Posttest	0.909	10	0.276

The normality test showed that both pretest and posttest data were normally distributed because the significance values were greater than 0.05.



Paired Sample t-test

Table 5. Paired Sample t-test Results

Pair	Mean Difference	Std. Deviation	t	df	Sig. (2-tailed)
Pretest–Posttest	-15.100	2.234	-21.378		0.000

The paired sample t-test showed a significant difference between pretest and posttest scores, with Sig. (2-tailed) = 0.000 < 0.05. This means that game-based circuit training had a significant effect on improving students' basic manipulative movement skills.

Discussion

The results of this study showed that game-based circuit training significantly improved the basic manipulative movement skills of extracurricular students at SDN 5 Malaka. This improvement was indicated by the increase in the mean score from 26.5 in the pretest to 41.6 in the posttest.

The significant improvement occurred because game-based circuit training provided students with repeated, varied, and enjoyable movement experiences. Through several exercise stations, students had opportunities to practice manipulative movements such as throwing, catching, kicking, hitting, and controlling objects. These repeated activities helped improve coordination, movement control, and object-control ability.

This finding is consistent with Morgan and Adamson, as cited in Budiwanto (2012), who stated that circuit training is effective for improving physical fitness and motor skills because it provides systematic and varied training stimuli. The structure of circuit training allows students to perform different movement tasks in sequence, which can stimulate both physical and motor development.

The results also support Harsono (2018), who explained that circuit training is a training method consisting of several stations designed to improve physical and movement abilities. In the present study, the circuit training model was adapted into game-based activities, making it more suitable for elementary school students. This adaptation helped students participate more actively and enjoy the training process.

The use of a game-based approach also contributed to the improvement of students' manipulative movement skills. Masjida (2011) stated that game-based physical education can improve students' motivation and movement understanding because students learn through direct experience in an enjoyable atmosphere. This is relevant to the present study, where students were more motivated to perform movement tasks because the training was presented in the form of games.

Furthermore, Dlis (2021) emphasized that manipulative movement skills require coordination and object control, such as throwing, catching, kicking, hitting, and bouncing. Therefore, the improvement



found in this study indicates that the training program successfully provided appropriate movement stimuli for developing these skills.

Overall, the findings suggest that game-based circuit training can be an effective method for improving manipulative movement skills in elementary school extracurricular activities. This method is not only structured and measurable but also enjoyable and appropriate for children's developmental characteristics.

Conclusions

This study concluded that game-based circuit training had a positive and significant effect on improving the basic manipulative movement skills of extracurricular students at SDN 5 Malaka. The six-week intervention increased students' mean score from 26.5 to 41.6, and the paired sample t-test showed a significant difference between pretest and posttest scores.

Game-based circuit training can therefore be recommended as an effective training method for physical education teachers and extracurricular coaches. This approach provides structured, varied, and enjoyable movement activities that support the development of elementary school students' manipulative movement skills.

Referencess