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JURNAL MASTER PENJAS & OLAHRAGA
Volume 7 | Issue 2 | October 2026 | pp. 1018-1024
p-ISSN: 2725-5660 | e-ISSN: 2722-1202
https://jmpo.stkippasundan.ac.id/index.php/jmpo

The Effect of Rhythmic Movement Activities Using Sticks on Students' Flexibility

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Abstrac: Flexibility is an important component of physical fitness that supports movement efficiency and injury prevention. This study aimed to determine the effect of rhythmic movement activities using sticks on students' flexibility. A quantitative pre-experimental method with a one-group pretest–posttest design was employed. The sample consisted of 33 ninth-grade students selected through purposive sampling. Flexibility was measured using the Shoulder Flexibility Test before and after the intervention. Data were analyzed using descriptive statistics, a normality test, and a paired-samples t-test at a significance level of 0.05. The results showed an improvement in flexibility, with the mean score decreasing from 25.27 cm in the pretest to 16.24 cm in the posttest. The paired-samples t-test yielded a t-value of 14.103 and a significance value of 0.000 ($p < 0.05$), indicating a significant difference between pretest and posttest scores. Therefore, rhythmic movement activities using sticks effectively improve students' flexibility.

Keyword: Flexibility, Rhythmic Movement, Stick Media, Student

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ISSN 2721-5660 (Cetak)
ISSN 2722-1202 (Online)

How to cite this article (APA):
Alfayat, M. A., Ahmad Haffiyandi, R., Erliana, M., & Indah, E. P. (2026). The Effect of Rhythmic Movement Activities Using Sticks on Students' Flexibility. *Jurnal Master Penjas & Olahraga*, *7*(2), 1018–1024. https://doi.org/10.37742/jmpo.v7i2.221

Article History:

Submitted : June 2026	Revised : June, 2026	Accepted : July, 2026	Published : July, 2026

INTRODUCTION

Physical Education, Sports, and Health (PESH) is an essential component of the educational process that promotes students' holistic development through structured physical activities. Beyond improving motor skills, physical education contributes to physical fitness, cognitive development, social interaction, and character building. Fundamental movement skills and physical fitness components developed through school-based physical education play an important role in supporting lifelong participation in physical activity and healthy lifestyles (Jimenez et al., 2023). Among the various components of physical fitness, flexibility is particularly important because it contributes to movement efficiency, physical performance, and injury prevention during both daily and sports-related activities (Herstiani & Anam, 2024).

Flexibility is especially crucial during adolescence, a period characterized by rapid growth and musculoskeletal development. Research has shown that adequate flexibility is positively associated with motor competence and movement performance among adolescents (Huhtiniemi & Jaakkola, 2024). Furthermore, reduced flexibility may increase the risk of musculoskeletal problems and movement limitations during physical activities (Pinto et al., 2024). School-based flexibility exercises and movement programs have also been reported to help maintain flexibility and prevent musculoskeletal disorders in growing children (Ohtaka et al., 2024). Therefore, the development of flexibility should be considered an important objective within physical education programs. Flexibility plays a crucial role during adolescence, a period characterized by rapid physical growth and development. Adequate flexibility enables students to perform a wide range of movements with greater ease, maintain proper posture, improve movement coordination, and reduce the likelihood of musculoskeletal injuries. In contrast, limited flexibility may restrict joint range of motion, making it more difficult for students to participate effectively in physical activities and sports. Consequently, the development of flexibility should be considered a priority within school-based physical education programs (Raehan et al., 2026).

Preliminary observations conducted at SMP Negeri 1 Gambut revealed that many students experienced difficulties when performing stretching exercises, particularly those involving the shoulders, back, and hip regions. These limitations were evident during activities requiring arm swings, trunk bending, and full-body stretching movements. Furthermore, classroom instruction relied primarily on conventional demonstration methods with minimal use of instructional media. As a result, student engagement was often limited, and learning activities tended to become repetitive and less stimulating. These findings are consistent with previous studies suggesting that insufficient flexibility among students is often associated with a lack of varied physical activities and instructional approaches that fail to encourage active participation (Abdullah et al., 2020). Such conditions highlight the need for innovative teaching strategies that not only provide physical training but also create enjoyable and meaningful learning experiences. An engaging learning environment may increase students' motivation to participate actively and maximize the benefits of physical education programs.

One instructional approach that has the potential to address this issue is rhythmic movement activities using stick media. This learning method combines elements of music, coordination, balance, and flexibility within a sequence of structured movements. The integration of rhythmic movement can create a more enjoyable learning atmosphere while encouraging students to perform stretching exercises repeatedly without experiencing boredom. In addition, the use of sticks as instructional media helps students maintain proper movement alignment, increase stretching range, and improve body positioning during exercise sessions (Faridah & Nugroho, 2022).

Previous research has demonstrated that the incorporation of learning media into physical education instruction can enhance motor skill development and increase students' learning motivation (Putri et al., 2023). Similarly, studies have reported that rhythmic movement activities contribute positively to the improvement of coordination and movement quality by promoting active participation in learning tasks (Siregar et al., 2024). Furthermore, rhythm-based exercise programs have been recognized as suitable for contemporary physical education practices because they emphasize student-centered learning and direct engagement in physical activities (Kurnia, 2025).

Despite these potential benefits, empirical evidence regarding the effectiveness of rhythmic movement activities using stick media for improving flexibility among junior high school students remains limited. Existing studies have primarily focused on outcomes such as coordination, motor skills, or learning motivation, while relatively little attention has been given to flexibility as a physical fitness component. This gap in the literature highlights the need for further investigation into the role of rhythmic movement and instructional media in enhancing students' flexibility.

Therefore, this study aims to examine the effect of rhythmic movement activities using stick media on the flexibility of students at SMP Negeri 1 Gambut. The findings are expected to provide an innovative alternative for physical education instruction and contribute to the growing body of knowledge regarding the use of instructional media to improve physical fitness components, particularly flexibility, among junior high school students.

METHOD

Research Design

This study employed a quantitative approach using a pre-experimental design to examine the effect of rhythmic movement activities using stick media on students' flexibility. The research used a One-Group Pretest–Posttest Design, in which participants were measured before and after the intervention. This design was applied to determine changes in flexibility by comparing pretest and posttest scores.

Participants

The study was conducted at SMP Negeri 1 Gambut during the second semester of the 2025/2026 academic year. The population consisted of 670 students. The sample included 33 students from Class IX-B, selected using purposive sampling. This technique was used because the participants met the required criteria and were considered appropriate for the intervention.

Instruments

The instrument used in this study was the Shoulder Flexibility Test, which measures shoulder flexibility in centimeters. This test was chosen due to its simplicity and its ability to effectively assess joint mobility and muscle flexibility. The test was administered twice, before and after the intervention, to evaluate changes in students' flexibility levels.

Research Procedures

The study involved two variables: rhythmic movement activities using stick media as the independent variable and students' flexibility as the dependent variable. The intervention consisted of rhythmic movement exercises accompanied by music and supported by stick media. The sticks were used to assist students in performing stretching movements more accurately, maintaining proper body posture, and improving range of motion. The intervention was carried out in four sessions. A pretest was conducted before the intervention, followed by the treatment sessions, and a posttest was administered at the end of the program to measure improvement.

Data Analysis

Data were analyzed using descriptive and inferential statistics with IBM SPSS Statistics software. Descriptive analysis included mean, minimum score, maximum score, and standard deviation. A Shapiro–Wilk test was used to assess data normality, with a significance value above 0.05 indicating normal distribution. After the normality assumption was met, a paired-samples t-test was conducted at a 0.05 significance level to determine whether there was a significant difference between pretest and posttest scores.

RESULT

Descriptive Statistics

Table 1. Descriptive Statistics of Flexibility Scores

Variable	N	Minimum	Maximum	Mean	SD
Pretest	33	11	41	25.27	7.455
Posttest	33	7	25	16.24	5.629

Table 1 presents the descriptive statistics of students' flexibility scores before and after the intervention. The results show that the mean score decreased from 25.27 cm in the pretest to 16.24 cm in the posttest. Since lower scores on the Shoulder Flexibility Test indicate better flexibility, this reduction reflects an improvement in students' flexibility. The mean difference between the two measurements was 9.03 cm, suggesting that the rhythmic movement activities using stick media had a positive effect on flexibility development. In addition, the decrease in the standard deviation from 7.455 to 5.629 indicates that students' flexibility scores became more consistent following the intervention.

Assumption Testing

Table 2. Results of the Shapiro–Wilk Normality Test

Variable	Sig.
Pretest	0.449
Posttest	0.052

Before conducting hypothesis testing, assumption tests were carried out to ensure the suitability of parametric analysis. A normality test was performed using the Shapiro–Wilk test. As shown in Table 2, the significance values for the pretest (0.449) and posttest (0.052) were greater than 0.05, indicating that the data were normally distributed. In addition, a homogeneity of variance test was conducted using Levene's Test. The results showed a significance value greater than 0.05, indicating that the variance of the pretest and posttest data was homogeneous. These findings confirm that the data met the assumptions required for parametric statistical analysis. Therefore, a paired-samples t-test was considered appropriate to examine differences between pretest and posttest scores.

Hypothesis Testing

Table 3. Results of the Paired-Samples t-Test

Comparison	Mean Difference	t	df	Sig. (2-tailed)
Pretest – Posttest	9.030	14.103	32	0.000

To determine whether the intervention produced a significant improvement in flexibility, a paired-samples t-test was conducted. As presented in Table 3, the analysis yielded a mean difference of 9.030 cm, with a t-value of 14.103 and 32 degrees of freedom. The significance value was 0.000, which was lower than the predetermined alpha level of 0.05. Therefore, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_a) was accepted. These results indicate a statistically significant difference between the pretest and posttest flexibility scores. Consequently, rhythmic movement activities using stick media were found to be effective in improving the flexibility of students at SMP Negeri 1 Gambut.

DISCUSSION

The findings of this study indicate that the implementation of rhythmic movement activities assisted by stick media was effective in improving the flexibility of students at SMP Negeri 1 Gambut. This improvement was reflected in the results of the Shoulder Flexibility Test, where the mean score decreased from 25.27 cm in the pretest to 16.24 cm in the posttest, resulting in an improvement of 9.03 cm. Since lower scores on this test represent better flexibility levels, the

reduction in the average score demonstrates a positive effect of the intervention on students' flexibility.

Observations conducted during the study revealed that, prior to the intervention, many students experienced difficulties in performing stretching movements through a full range of motion. These limitations were evident when students attempted activities involving shoulder rotation, arm elevation, and multidirectional stretching movements. Such conditions were associated not only with inadequate flexibility levels but also with previous learning experiences that mainly relied on conventional instructional approaches without the support of learning media. As a result, students tended to participate less actively and were exposed to limited movement variations. Following the implementation of rhythmic movement exercises using stick media, students displayed greater participation, improved movement coordination, and higher enthusiasm throughout the learning process.

Flexibility refers to the capacity of muscles and joints to move effectively through their maximum range of motion, which contributes to efficient physical performance and reduces the risk of injury (Raehan et al., 2026). Regular stretching and movement exercises can enhance the elasticity of muscles and connective tissues, thereby improving overall movement capability. In the present study, rhythmic movement activities provided repeated stretching stimuli through structured movement patterns, allowing students' bodies to gradually adapt to increased ranges of motion. The use of stick media played a significant role in supporting the learning process by helping students maintain proper body alignment and understand the intended movement directions more clearly. The presence of the stick enabled students to perform stretching exercises with better control, balance, and movement accuracy. Consequently, the learning process became more effective than conventional approaches that depended solely on verbal explanations and demonstrations. According to Faridah and Nugroho (2022), the integration of instructional media into rhythmic movement learning can enhance learning quality by creating more active, directed, and meaningful learning experiences.

Beyond its physical benefits, rhythmic movement activities also contributed to a more enjoyable learning environment through the incorporation of music. Musical accompaniment increased students' motivation and engagement, encouraging them to participate consistently in each stage of the exercise program. Repeated movement practice conducted in a supportive and enjoyable atmosphere provided students with opportunities to develop their motor abilities without perceiving the activities as burdensome. The results of this study are consistent with the findings of Abdullah et al., (2020), who reported that media-based rhythmic gymnastics learning models can improve students' movement activity through more varied and interactive instructional approaches. Similarly, Kusuma et al. (2025) found that rhythmic gymnastics contributes positively to physical fitness, motor development, and student creativity because it involves planned and enjoyable physical activities.

The present findings also support the study conducted by Putri et al. (2023), which demonstrated that rhythmic gymnastics training facilitates the development of fundamental movement skills through systematic and repetitive practice. Furthermore, Siregar et al. (2024) suggested that rhythmic movement activities contribute not only to motor skill enhancement but also to improved concentration and student engagement during learning activities. Likewise, Kurnia (2025) emphasized that fitness programs based on rhythmic gymnastics are effective in developing components of physical fitness, particularly flexibility, due to the integration of coordination, balance, and muscle stretching within a unified activity framework. Supporting these findings, several recent studies provide additional evidence. Lee et al. (2021) reported that structured school-based physical activity programs significantly improve joint mobility and flexibility in adolescents. Xing & Wu (2025) found that coordinated rhythmic exercises enhance postural control and movement efficiency in secondary school students. Meanwhile, Tunrayo et al. (2021) demonstrated that the integration of simple training aids in physical education classes increases student engagement and physical performance outcomes, particularly in flexibility-related tasks.

A distinctive aspect of this study compared with previous research lies in the incorporation of stick media within rhythmic movement activities and the specific assessment of flexibility

using the Shoulder Flexibility Test. This approach provided students with a more concrete learning experience, enabling them to understand movement patterns more effectively, perform stretching exercises with proper technique, and achieve greater improvements in flexibility.

Overall, the findings suggest that rhythmic movement activities assisted by stick media represent an effective physical education strategy for enhancing students' flexibility at SMP Negeri 1 Gambut. In addition to improving physical performance, this instructional approach creates a more engaging, interactive, and participatory learning environment. Therefore, it may serve as a valuable alternative for implementing physical fitness learning programs in school settings.

CONCLUSION

Overall, the findings indicate that rhythmic movement activities assisted by stick media are effective in improving students' shoulder flexibility at SMP Negeri 1 Gambut. The intervention not only enhances physical performance but also fosters a more engaging, interactive, and participatory learning environment in Physical Education, Sports, and Health (PJOK). Thus, it can be considered a practical and innovative alternative for supporting physical fitness instruction in school settings. Based on the results, it can be concluded that the objective of this study to examine the effect of rhythmic movement learning using stick media on students' shoulder flexibility has been achieved. The significant improvement between pretest and posttest scores demonstrates that this approach effectively supports joint mobility, muscle stretching, and body coordination, which are essential components of flexibility development.

Furthermore, the use of stick media contributes to higher student engagement and motivation during learning activities. The combination of rhythmic movement and simple instructional media creates an enjoyable learning atmosphere that encourages active participation and reduces boredom commonly associated with conventional flexibility training. For future research, it is recommended that this learning model be applied to other physical fitness components such as balance, coordination, agility, and muscular endurance. Future studies should also involve larger and more diverse samples from different educational levels to improve generalizability. In addition, extending the duration and frequency of the intervention may provide deeper insights into its long-term effectiveness. These efforts are expected to support the development of more innovative and evidence-based physical education practices.

ACKNOWLEDGEMENT

The author would like to express sincere gratitude to the Head of SMP Negeri 1 Gambut for granting permission to conduct this research. Appreciation is also extended to the Physical Education teacher and all students who participated as research subjects for their cooperation during the data collection process. The author also thanks the academic advisors for their valuable guidance and support throughout the completion of this study. Their contributions have been instrumental in the successful completion of this research.

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