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The Effect of Hula Hoop Play on Gross Motor Development in Children Aged 4–5 Years at Kemala Bhayangkari 1 Kindergarten Palembang

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ABSTRACT

This research was motivated by the suboptimal gross motor development of children aged 4–5 years at Kemala Bhayangkari 1 Kindergarten, Palembang. Observations showed that many children experienced difficulties in maintaining balance, coordinating body movements, and performing physical activities requiring agility, strength, and coordination. This study aimed to determine the effect of playing hula hoop on the gross motor development of children aged 4–5 years. The research employed a quantitative approach using a pre-experimental method with a one-group pretest-posttest design. The participants consisted of 20 children enrolled at Kemala Bhayangkari 1 Kindergarten, Palembang. Data were collected through observation, tests, interviews, and documentation. The findings indicated that the average gross motor development score increased from 34.8 on the pretest to 54.7 on the posttest after the children participated in hula hoop play activities. Hypothesis testing using the t-test

revealed that the calculated t-value was 13.96, which exceeded the t-table value of 2.024 at the 5% significance level. Therefore, the alternative hypothesis (Ha) was accepted, while the null hypothesis (Ho) was rejected. These results indicate that hula hoop play has a significant positive effect on improving gross motor development in children aged 4–5 years and can be effectively implemented as a learning activity to stimulate early childhood gross motor skills.

Introduction

Early childhood is a critical period for growth and development in which children experience rapid physical, cognitive, language, social-emotional, and motor development (Purwanto & Baan, 2022). During this stage, appropriate stimulation is essential to optimize every aspect of development. Play is recognized as one of the most effective learning approaches because it provides children with meaningful experiences while encouraging active participation. Through play, children naturally develop movement skills, creativity, confidence, and social interaction (Gunawan et al., 2024; Ulfah et al., 2021; Mashuri et al., 2022). Gross motor development, which involves the coordination of large muscles to perform movements such as walking, running, jumping, balancing, and maintaining body coordination, is an important developmental domain that supports children's readiness for future learning and daily activities (Candra et al., 2023; Purwanti, 2025). Therefore, educators are expected to provide enjoyable and

developmentally appropriate learning activities that stimulate children's gross motor skills (Arningsari & Putriyanti, 2024; Rani et al., 2025; Salna et al., 2024).

Despite its importance, many preschool children still experience delays in gross motor development due to limited opportunities for active physical play. Preliminary observations conducted at Kemala Bhayangkari 1 Kindergarten, Palembang, revealed that children aged 4–5 years had difficulty maintaining balance, coordinating body movements, and performing physical activities requiring agility and muscle strength. Several children were unable to rotate a hula hoop around their waist consistently, while others struggled to coordinate body movements during hula hoop activities. These findings indicate that gross motor development has not yet reached the expected developmental standards, highlighting the need for more effective learning strategies that promote active movement through play.

According to motor development theory proposed by Gallahue and Ozmun, children's motor skills develop through continuous movement experiences and appropriate stimulation. Hurlock (1978) also emphasizes that gross motor development depends on the maturation of the nervous system, muscular strength, and opportunities to engage in physical activities. One learning activity that can effectively stimulate gross motor development is hula hoop play. This activity requires children to coordinate body movements, maintain balance, strengthen

large muscles, and improve agility while participating in enjoyable physical exercise. Previous studies have demonstrated that hula hoop activities positively contribute to children's balance, coordination, and overall gross motor performance. Based on these theoretical perspectives and the problems identified during preliminary observations, this study aims to examine the effect of hula hoop play on the gross motor development of children aged 4–5 years at Kemala Bhayangkari 1 Kindergarten, Palembang. The findings are expected to provide empirical evidence regarding the effectiveness of hula hoop play as an innovative learning activity for promoting gross motor development in early childhood education.

Several previous studies have examined the use of hula hoop activities to stimulate children's motor development, but they differ in research design, age group, and research focus. Rahmayuni and Hazizah (2020) conducted a literature study on the use of hula hoop games for developing gross motor skills in early childhood. Their analysis concluded that hula hoop activities were appropriate and efficient for stimulating gross motor development; however, the study did not provide direct experimental evidence from a specific group of children. Nabila, Karta, and Irmayani (2023) used classroom action research to improve children's physical-motor abilities through modified hula hoop play at TK Negeri Pembina Ampenan. The study reported improvement in children's motor abilities, but its classroom-

action-cycle design focused on improvement within the learning setting rather than directly testing the effect of an intervention through pretest and posttest comparison.

More recent studies have also demonstrated the potential of hula hoop-based activities. Anwar, Pramono, and Tirtaningsih (2024) developed a foot hula hoop game using a Research and Development (R&D) approach and found the game highly suitable for stimulating agility in children aged 5–6 years. The main focus of that study was product development and agility, rather than the overall gross motor development of children aged 4–5 years. Kiranti and Sit (2025) conducted classroom action research involving 10 children aged 4–5 years and found that hula hoop play improved gross motor abilities, including movement fluency and balance. However, the study used a small sample and a two-cycle classroom action research design. Fauziah, Aqobah, and Zubaida (2025) developed hula hoop-based play media for children aged 5–6 years using the ADDIE R&D model. Their study emphasized the development and validation of the media and involved trials with children, whereas the present study focuses on measuring the effect of hula hoop play on gross motor development using a quantitative pre-experimental design.

Taken together, these studies show that hula hoop activities can support children's motor development, particularly balance, agility, coordination, and movement skills. Nevertheless, a research gap

remains in studies that directly examine the effect of hula hoop play on overall gross motor development among children aged 4–5 years using a one-group pretest-posttest design in a specific early childhood education setting in Palembang. Therefore, the novelty of the present study lies in its direct measurement of changes in children's gross motor development before and after structured hula hoop play, involving 20 children aged 4–5 years at Kemala Bhayangkari 1 Kindergarten, Palembang. This design allows the study to provide empirical evidence of the change in gross motor development associated with the intervention (Santrock, 2024), complementing previous literature, classroom action research (Sudaryanti et al., 2024), and product-development studies.

Methods

This study employed a quantitative approach using a pre-experimental method with a one-group pretest-posttest design, as proposed by Sugiyono (2022). This design was selected to determine the effect of hula hoop play on children's gross motor development by comparing participants' performance before and after the intervention. The research was conducted at Kemala Bhayangkari 1 Kindergarten, Palembang, Indonesia, during the 2025/2026 academic year. The study involved 20 children aged 4–5 years enrolled in Class A. The participants were selected using total sampling because the entire

population met the research criteria and represented the characteristics required for the study.

The research instrument consisted of an observation sheet developed based on the Gross Motor Development Achievement Standards for children aged 4–5 years as stated in the Indonesian National Standard for Early Childhood Education (Permendikbud No. 137 of 2014). The instrument assessed several indicators of gross motor development, including body balance, coordination of body movements, agility, muscle strength, and the ability to follow movement instructions during hula hoop activities. Before implementation, the instrument underwent expert validation by specialists in early childhood education to ensure content validity. Instrument reliability was subsequently analyzed using Cronbach's Alpha, while item validity was examined through product-moment correlation to confirm that each indicator appropriately measured gross motor development.

Data were collected through observation, performance tests, interviews, and documentation. At the beginning of the study, children completed a pretest to determine their initial gross motor development. Following the pretest, participants received treatment through structured hula hoop play activities conducted over several learning sessions. During each session, children participated in activities such as rotating the hula hoop around the waist, jumping in and out of hoops,

moving between hoops, maintaining balance while performing movement patterns, and participating in group games designed to stimulate coordination, agility, and large muscle movement. Throughout the intervention, the researcher observed children's performance using standardized observation sheets while teachers assisted in facilitating learning activities. At the completion of the treatment period, a posttest was administered using the same assessment indicators to measure changes in children's gross motor development.

The success indicators of this study were determined by improvements in children's gross motor development scores based on the observation instrument. Performance was evaluated through children's ability to maintain balance, coordinate body movements, perform movements accurately, demonstrate agility during hula hoop activities, and follow teachers' instructions effectively. The collected data were analyzed using descriptive statistics to summarize participants' performance before and after the intervention. Prior to hypothesis testing, data normality and homogeneity were examined to ensure that statistical assumptions were satisfied. The effectiveness of the intervention was then analyzed using the paired-sample t-test at a significance level of 0.05 to determine whether there was a statistically significant difference between the pretest and posttest scores. Statistical analyses were performed using IBM SPSS Statistics, and the decision to

accept or reject the research hypothesis was based on the comparison between the calculated t-value and the critical t-value, as well as the obtained significance value.

Result and Discussions

The pretest was conducted to identify the initial gross motor development of children aged 4–5 years at Kemala Bhayangkari 1 Kindergarten, Palembang, before the implementation of hula hoop play activities. The assessment focused on children's ability to maintain balance, coordinate body movements, demonstrate agility, and perform physical activities involving large muscle groups. The pretest results were obtained from 20 children and are presented in Table 1.

Table 1. Frequency Distribution of Pretest Gross Motor Development Scores

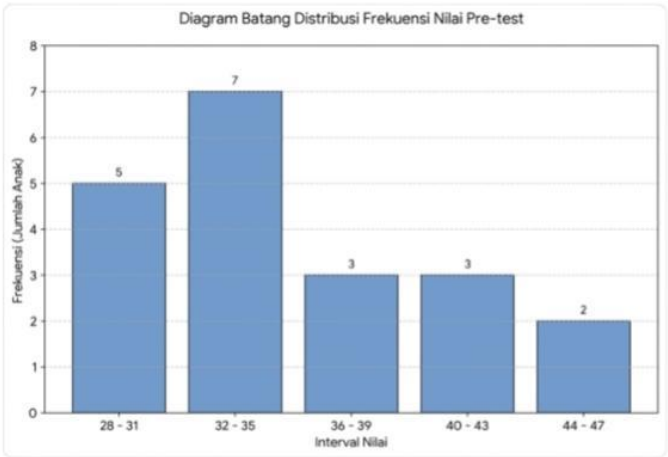
Score Interval	Frequency (f)	Midpoint (X)	f × X	Percentage
28–31	5	29.5	147.5	25%
32–35	7	33.5	234.5	35%
36–39	3	37.5	112.5	15%
40–43	3	41.5	124.5	15%
44–47	2	45.5	91.0	10%
Total	**20**	—	**710.0**	**100%**

Based on Table 1, five children (25%) obtained scores between 28 and 31, while seven children (35%) obtained scores between 32 and 35. Three children (15%) scored between 36 and 39, another three children (15%) scored between 40 and 43, and two children (10%) achieved scores between

44 and 47. These findings indicate that most children obtained scores within the lower intervals of the observed score distribution.

Based on the grouped frequency distribution, the estimated pretest mean was 35.5. This result provides an initial description of children's gross motor development before participating in the hula hoop activities. The distribution also indicates differences in gross motor performance among participants, particularly in activities requiring balance, coordination, and agility. The pretest frequency distribution is also illustrated in Figure 1.

Figure 1. Pretest Gross Motor Development Score Distribution



Following the pretest, the children participated in structured hula hoop play activities designed to stimulate gross motor development. The activities involved body coordination, balance, agility, and movements requiring the use of large muscle groups. After the intervention, a posttest was administered to determine children's gross motor development scores.

The posttest results are presented in Table 2.

Table 2. Frequency Distribution of Posttest Gross Motor Development

Scores

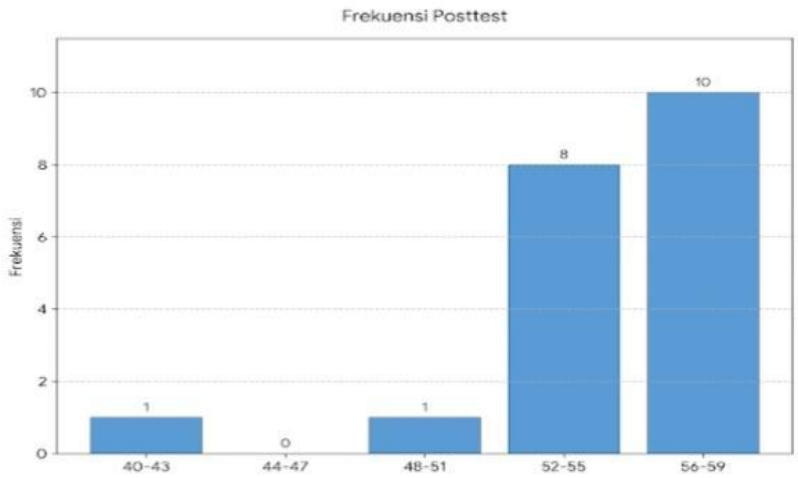
Score Interval	Frequency (f)	Midpoint (X)	f × X	Percentage
40–43	1	41.5	41.5	5%
44–47	0	45.5	0.0	0%
48–51	1	49.5	49.5	5%
52–55	8	53.5	428.0	40%
56–59	10	57.5	575.0	50%
Total	**20**	—	**1,094.0**	**100%**

Based on Table 2, one child (5%) obtained a score between 40 and 43, while no children (0%) obtained scores between 44 and 47. One child (5%) scored between 48 and 51, eight children (40%) obtained scores between 52 and 55, and ten children (50%) achieved scores between 56 and 59.

The posttest results indicate that most children achieved scores within the two highest intervals. Based on the grouped frequency distribution, the estimated posttest mean was 54.7, indicating an improvement compared with the estimated pretest mean of 35.5.

The distribution of posttest scores suggests that children's gross motor performance improved following their participation in hula hoop play activities. This improvement was reflected in the higher score distribution after the intervention. The posttest frequency distribution is illustrated in Figure 2.

Figure 2. Posttest Gross Motor Development Score Distribution



A comparison of the pretest and posttest results was conducted to describe changes in children's gross motor development following the implementation of hula hoop play activities.

Table 3. Comparison of Pretest and Posttest Gross Motor Development Scores

Assessment	**Number of Children**	**Estimated Mean**
Pretest	20	35.5
Posttest	20	54.7
Mean Difference	—	**19.2**

Note. The means and mean difference in Table 3 were estimated using the midpoints of the grouped score intervals. The exact mean difference must be confirmed using the original individual scores.

Table 3 shows that the estimated mean gross motor development score increased from 35.5 before the intervention to 54.7 after the intervention, representing an estimated increase of 19.2 points.

The results indicate a positive change in children's gross motor development scores following the implementation of hula hoop play activities. This increase suggests that physical play activities involving body movement, balance, and coordination may contribute to the development of gross motor skills in early childhood. However, the observed improvement should be interpreted within the limitations of the one-group pretest-posttest design, which does not include a comparison group.

Before the intervention, the research instrument was tested for validity using a different group of participants. The instrument trial involved 20 children aged 5–6 years from Class B2 to determine whether the assessment items were suitable for measuring gross motor development.

The validity test used product-moment correlation, with a critical correlation value (r-table) of 0.444 at the 5% significance level.

Table 4. Results of the Research Instrument Validity Test

Item	Calculated r-value	Critical r-value	Interpretation
1	0.533	0.444	Valid
2	0.544	0.444	Valid
3	0.608	0.444	Valid
4	0.559	0.444	Valid
5	0.686	0.444	Valid
6	0.455	0.444	Valid
7	0.476	0.444	Valid
8	0.451	0.444	Valid

Based on Table 4, all eight assessment items obtained calculated correlation values greater than the critical value of 0.444. Therefore, according to the validity criterion applied in this study, all assessment items met the required threshold and were retained for use in the research instrument. These findings indicate that the instrument items satisfied the reported item-validity criterion. The detailed calculations are provided in Appendix 6 of the original research report.

The reliability test was conducted to determine the internal consistency of the research instrument. The original study employed Cronbach's Alpha and used a minimum reliability criterion of 0.60. However, the reported Cronbach's Alpha coefficient was 1.1425. Since Cronbach's Alpha cannot exceed 1, this result indicates an error in the calculation or its reporting. Consequently, the instrument's reliability cannot be established from the reported coefficient. The reliability analysis must therefore be recalculated using the original item-level assessment data before a conclusion regarding the instrument's internal consistency can be drawn.

The original study examined the distribution of pretest and posttest scores using a curve-slope calculation. The reported values were 0.96 for the pretest and 0.36 for the posttest. According to the calculation procedure reported in the original manuscript, both values were interpreted as indicating normally distributed data because they were below 1.

However, these calculations do not provide sufficient statistical evidence to confirm the normality assumption required for a paired-sample

t-test. Therefore, the normality assumption should be reassessed using the individual paired-score differences, preferably through a recognized normality test such as the Shapiro–Wilk test.

The original study also reported a homogeneity test using an F-test. The calculated F-value was 1.519, while the reported critical F-value was 2.355 at the 5% significance level.

Table 5. Reported Homogeneity Test Results

Statistical Indicator	**Reported Value**
Calculated F-value	1.519
Critical F-value	2.355
Significance level	0.05
Original interpretation	Homogeneous

Since the calculated F-value was lower than the reported critical F-value, the original analysis interpreted the pretest and posttest variances as homogeneous. Nevertheless, homogeneity of variance between two independent groups is not a required assumption for a paired-sample t-test. Because the present study involved repeated measurements of the same 20 children, this test does not determine whether the paired-sample t-test assumptions have been satisfied.

Hypothesis testing was intended to determine whether children's gross motor development scores differed significantly before and after participation in hula hoop play activities.

The original manuscript reported a calculated t-value of 13.96 and a critical t-value of 2.024 at the 5% significance level. However, the reported

statistical procedure used a formula and degrees of freedom associated with independent samples rather than paired observations. Because this study employed a one-group pretest-posttest design involving the same 20 children, the appropriate parametric analysis is a paired-sample t-test, with 19 degrees of freedom.

Table 6. Reported and Required Hypothesis Testing Information

Statistical Indicator	**Result or Requirement**
Research design	One-group pretest-posttest
Number of paired observations	20
Statistical test	Paired-sample t-test
Degrees of freedom	19
Significance level	0.05
Originally reported t-value	13.96
Verification status	Requires recalculation from paired scores

The originally reported t-value of 13.96 cannot be independently verified from the grouped frequency distributions presented in the manuscript. Therefore, the statistical significance of the pretest-posttest difference should be confirmed by recalculating the paired-sample t-test using the original individual scores. Although the descriptive findings demonstrate an improvement in gross motor development scores following hula hoop play activities, confirmation of statistical significance requires the corrected hypothesis test.

Discussion

The findings of this study indicate an improvement in children's gross motor development scores following the implementation of hula hoop play activities. The estimated mean increased from 35.5 in the pretest to 54.7 in the posttest, suggesting that children demonstrated better gross motor performance after participating in the intervention.

The observed improvement is consistent with previous studies highlighting the potential of hula hoop activities to support gross motor development. Rahmayuni and Hazizah (2020) emphasized the usefulness of hula hoop play in stimulating children's gross motor abilities. Similarly, Nabila et al. (2023) reported improvements in children's physical-motor abilities through modified hula hoop activities.

Anwar et al. (2024) demonstrated the potential of a foot hula hoop game to stimulate agility in early childhood, while Kiranti and Sit (2025) reported improvements in gross motor abilities through hula hoop activities among children aged 4–5 years. Fauziah et al. (2025) also investigated the development of hula hoop-based play media to support gross motor development.

These previous findings provide relevant support for the use of hula hoop activities as a physical learning experience. In the present study, the observed improvement may be associated with children's repeated participation in activities involving balance, coordination, agility, and large muscle movement.

Unlike studies employing classroom action research or developing instructional media, the present study used a quantitative pre-experimental design to compare children's gross motor development scores before and after the intervention. This approach provides descriptive evidence of changes occurring within the same group of participants. Nevertheless, the findings should be interpreted cautiously because the study did not include a control group. Furthermore, the reported inferential statistical analysis requires verification using individual participant data.

Overall, the descriptive findings suggest that hula hoop play represents a potentially useful activity for supporting gross motor development in children aged 4–5 years. Further research using more rigorous experimental designs and verified statistical analyses is needed to strengthen conclusions regarding the effectiveness of this activity.

Conclusion

Based on the research conducted regarding the effect of hula hoop play on the gross motor development of children aged 4–5 years at Kemala Bhayangkari 1 Kindergarten in Palembang, it can be concluded that this activity has a highly significant positive impact. This is evidenced by statistical data analysis showing a calculated t-value (t-count) of 13.96, which is substantially higher than the critical t-value (t-table) of 2.024 at a 5% significance level. Since t-count > t-table, the alternative hypothesis (Ha) is accepted and the null hypothesis (Ho) is rejected; this indicates a significant effect of hula hoop play on the gross

motor development of children aged 4–5 years. The "research findings confirm that hula hoop play influences the gross motor development of children aged 4–5 years.

References

Anwar, I., Pramono, & Tirtaningsih, M. T. (2024). Foot hula hoop game: An innovative approach to stimulating agility in early childhood education. *Jurnal Pendidikan Anak Usia Dini Undiksha, 12*(2), 320–328. https://doi.org/10.23887/paud.v12i2.76524

Arningsari, M., & Putriyanti, L. (2024). Pengembangan kompetensi literasi dini pada anak usia 4–6 tahun dengan bermain KAWALI (Kartu Warna Literasi) di Kelompok Bermain Putra Dharma. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang, 10*(2), 541–549. https://doi.org/10.36989/didaktik.v10i2.3150

Candra, O., Pranoto, N. W., Ropitasari, R., Cahyono, D., Sukmawati, E., & CS, A. (2023). Peran pendidikan jasmani dalam pengembangan motorik kasar pada anak usia dini. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 7*(2), 2538–2546. https://doi.org/10.31004/obsesi.v7i2.4506

Fauziah, N., Aqobah, Q. J., & Zubaida, I. (2025). Pengembangan media bermain hula hoop untuk motorik kasar anak usia 5–6 tahun. *Journal of Sport Science and Tourism Activity, 4*(1), 23–33. https://doi.org/10.62870/josita.v4i1.32307

Gunawan, G., Masna, M., Suwika, I. P., & Imamah, Z. (2024). Upaya meningkatkan perkembangan motorik kasar anak prasekolah melalui permainan lempar tangkap bola kecil. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 8*(2), 245–254. https://doi.org/10.31004/obsesi.v8i2.5393

Hurlock, E. B. (1978). *Perkembangan anak* (Edisi ke-6, Jilid 1; M. Tjandrasa & M. Zarkasih, Penerj.). Erlangga.

Kiranti, U., & Sit, M. (2025). Meningkatkan kemampuan motorik kasar anak melalui permainan hulahoop: Studi penelitian tindakan kelas pada usia 4–5 tahun. *Journal of Education Research, 6*(2), 386–395. https://doi.org/10.37985/jer.v6i2.2339

Mashuri, H., Mappaompo, M. A., Palmizal, A., Rahman, T., Saparia, A., & Juhanis, J. (2022). Pengaruh permainan gerak dasar dengan circuit training terhadap perkembangan motorik kasar anak. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 6*(6), 6583–6593. https://doi.org/10.31004/obsesi.v6i6.2213

Nabila, A., Karta, I. W., & Irmayani, A. (2023). Meningkatkan kemampuan fisik motorik melalui permainan hula hoop modifikasi di TK Negeri Pembina Ampenan. *Jurnal Literasi dan Pembelajaran Indonesia, 3*(2), 309–312. https://jurnalfkip.samawa-university.ac.id/JLPI/article/view/615

Purwanti, A. (2025). Perkembangan motorik kasar anak usia dini melalui permainan aktivitas fisik: A literature review. *Jurnal Pendidikan Dasar dan Aktifitas Jasmani, 4*(2), 1–10. https://doi.org/10.21831/pendaki.v4i2.81295

Purwanto, D., & Baan, A. B. (2022). Pengaruh aktivitas pendidikan jasmani terhadap keterampilan motorik kasar anak usia dini. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 6*(6), 5669–5678. https://doi.org/10.31004/obsesi.v6i6.3158

Rahmayuni, N., & Hazizah, N. (2020). Penggunaan permainan hulahop dalam mengembangkan kemampuan motorik kasar anak usia dini. *Jurnal Pendidikan Tambusai, 4*(1), 535–541. https://doi.org/10.31004/jptam.v4i1.495

Rani, R., Marlina, S., Mayar, F., & Yeni, I. (2025). Pengaruh estafet hula hoop terhadap kemampuan kerjasama anak usia dini di taman kanak-kanak. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 9*(5), 1757–1766. https://doi.org/10.31004/obsesi.v9i5.7384

Salna, I., Rahmadanti, L., Sa'adah, N., Fatimah, F., Khadijah, K., & Putri, H. A. (2024). Mengembangkan sosial emosional anak usia dini melalui bermain. *Ta'rim: Jurnal Pendidikan dan Anak Usia Dini, 5*(3), 63–71. https://doi.org/10.59059/tarim.v5i3.1340

Santrock, J. W. (2024). *Child development* (16th ed.). McGraw Hill.

Sudaryanti, S., Prayitno, P., Arifiyanti, N., & Maharani, O. (2024). Pengembangan kemampuan motorik dan sosial emosional anak usia dini menggunakan permainan tradisional. *Jurnal Pendidikan Anak, 13*(1), 114–125. https://doi.org/10.21831/jpa.v13i1.387

Ulfah, A. A., Dimyati, D., & Putra, A. J. A. (2021). Analisis penerapan senam irama dalam meningkatkan kemampuan motorik kasar anak usia dini. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 5*(2), 1844–1852. https://doi.org/10.31004/obsesi.v5i2.993