



The Effect of Origami Weaving Stimulation on the Fine Motor Skills of Children Aged 4-6 Years

Vinka Griselda Dhermawan^{1*}, Dini Mariani², Novi Enis Rosuliana³

¹⁻³Department of Nursing, Poltekkes Kemenkes Tasikmalaya, Indonesia

Abstract

Background: Fine motor development in early childhood plays a vital role in preparing children for academic activities and daily independence. Delays in this area can affect a child's confidence and self-reliance. **Aims:** To examine the effect of weaving stimulation using origami techniques on improving fine motor skills in children aged 4–6 years. **Methods:** A pre-experimental one-group *pretest-posttest* design was employed, involving 31 children selected through total sampling from a kindergarten in Tasikmalaya. The intervention consisted of two 60-minute sessions focused on origami-based weaving activities designed to train hand-eye coordination, finger movement precision, and independence. The assessment instrument was a fine motor observation sheet developed by the researcher based on 10 indicators of early childhood development, using an interval scale of 1–4. **Results:** Statistical analysis showed a significant difference between *pretest* scores (mean 25.13 ± 1.54) and *posttest* scores (mean 36.77 ± 1.28), as indicated by the Wilcoxon Signed Rank Test ($Z = -4.876$; $p = 0.000$). **Conclusion:** These findings suggest that origami weaving stimulation is an effective and enjoyable approach to enhancing fine motor skills in young children. The study recommends integrating similar activities into early childhood education programs as a practical and engaging developmental stimulus.

Keywords: fine motor skills, early childhood, weaving, origami, developmental stimulation

Article Info:

Received: 2025-07-08 | Revised: 2025-07-15 | Approved: 2025-07-26 | Published: 2025-07-28

J. Sport. Nurs. Med. Health (JSNMH)

eISSN: xxxx-xxxx | pISSN: xxxx-xxxx

*Corresponding author:

Vinka Griselda Dhermawan

Department of Nursing, Poltekkes Kemenkes Tasikmalaya, Indonesia

Email: vinkagriseldaa@gmail.com

This is an Open Access article distributed under the terms of the [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/), which allows others to remix, tweak, and build upon the work non-commercially as long as the original work is properly cited. The new creations are not necessarily licensed under the identical terms.

Cite this as: Dhermawan, V. G., Mariani, D., & Rosuliana, N. E. (2025). The Effect of Origami Weaving Stimulation on the Fine Motor Skills of Children Aged 4–6 Years. *Journal of Sports Nursing, Medical, And Health*, 1(01). Retrieved from <https://journal.pubsains.com/index.php/sportnursmedhealth/article/view/288>

© The Author(s) 2025

Introduction

Fine motor development is a crucial aspect during the golden age of children aged 4 to 6 years, as it plays a significant role in preparing them for academic activities and daily life. Unfortunately, data from the Health Department indicate that approximately 14.7% of children experience delays in fine motor development (Puspita & Umar, 2020), which may affect their self-confidence and independence.

Appropriate stimulation is essential to support children's fine motor development. One form of creative stimulation is weaving activities using origami techniques. Previous studies have shown that origami is effective in enhancing fine motor skills (Puspitasari et al., 2019; Ifalahma et al., 2023); however, these studies generally employed only simple folding techniques rather than the more complex weaving techniques.

A preliminary study conducted at the UPI Tasikmalaya Laboratory Kindergarten revealed that origami weaving activities are no longer implemented, despite some children displaying difficulties with manual dexterity. This activity is believed to more effectively train hand–eye coordination and finger flexibility compared to collage or simple folding tasks (Putriani et al., 2022).

Based on this background, the present study aims to examine the effect of origami weaving stimulation on improving fine motor skills in children aged 4 to 6 years. The research employs a pre-experimental one-group pretest–posttest design, using fine motor observation as the measurement instrument.

Methods

This study employed a quantitative approach with a pre-experimental one-group pretest–posttest design. The sample consisted of 31 children aged 4 to 6 years, selected using a total sampling technique from the population of a kindergarten managed by a higher education institution in Tasikmalaya. Children who completed all stages of the intervention and were able to follow simple instructions were included as participants. The intervention involved origami weaving stimulation, delivered in two sessions of 60 minutes each, aimed at enhancing fine motor skills such as hand–eye coordination, finger movement precision, and child independence.

The instrument used was a fine motor skills assessment sheet developed by the researchers based on 10 early childhood development indicators. Each indicator was rated on a 4-point interval scale, with total scores ranging from 10 to 40. Validity testing confirmed that all items were valid ($r > 0.60$), and reliability testing yielded a Cronbach's Alpha value of 0.973. Data collection was carried out in three stages: pretest, intervention, and posttest. Statistical analysis was performed to examine differences in fine motor skill scores before and after the intervention. Ethical approval for this study was granted by the Health Research Ethics Commission of Poltekkes Kemenkes Tasikmalaya (Approval number: DP.04.03/F.XXVI.20/KEPK/65/2025), dated 3 March 2025.

Results

1. Participant Characteristics

Based on Table 1, it was found that among the 31 children who participated in the study, the majority were 6 years old, totaling 16 children (51.6%), while the remaining 15 children (48.4%) were 5 years old. Most of the participants were male, with 20 children (64.5%), whereas female participants accounted for 11 children.

Table 1. Frequency Distribution of Participant Characteristics (n=31)

Age	Frequency (n)	Percentage (%)
5 Years Old	15	48,4 %
6 Years Old	16	51,6 %
Gender		
Male	20	64,5 %
Female	11	35,5 %
Total	31	100 %

2. Fine Motor Development Before and After Intervention

Based on Table 2, the average score of fine motor skills in children aged 4–6 years before receiving origami weaving stimulation was 25.13 ± 1.54 , with a score range of 23–28 and a 95% confidence interval of 24.56–25.70. The average fine motor skill score of children after receiving the intervention was 36.77 ± 1.28 , with a score range of 34–39 and a 95% confidence interval of 36.30–37.24.

Table 2. Descriptive Statistics of Fine Motor Skill Scores Before Intervention

Intervention	Mean	SD	Min	Max	95% CI
Pre-test	25,13	1,544	23	28	24,56 – 25,70
Posttest	36,77	1,283	34	39	36,30 – 37,24

3. Analysis of Score Differences Before and After Intervention

Based on the Wilcoxon Signed Ranks Test presented in Table 4, a Z value of -4.876 was obtained with a significance level of 0.000. These results indicate a significant difference between fine motor skill scores before and after receiving origami weaving stimulation.

Table 4. Intervensi Wilcoxon Test Results on Fine Motor Skills Scores Before and After the Intervention

Keterangan	N	Z	Asymp. Sig. (2-tailed)
Nilai	31	-4,876	0,000

Discussion

This study demonstrates that origami weaving stimulation has a positive impact on the improvement of fine motor skills in children aged 4 to 6 years. These results are consistent with the research objective, which aimed to evaluate changes in fine motor skills before and after the intervention. Respondent characteristics based on age indicate that most children were between 5 and 6 years old. This age range represents a critical developmental period, during which children exhibit optimal readiness to receive fine motor skill stimulation. Previous studies have reported that at this age, hand and finger coordination are sufficiently developed, enabling children to complete tasks such as folding, pasting, or weaving (Khairi, 2018; Ifalagma et al., 2023). This aligns with the current findings, which show that all children experienced improvements after participating in origami weaving activities.

Gender did not have a significant influence on the final outcomes. Both boys and girls demonstrated similar levels of improvement. This finding underscores that the success of stimulation is more determined by the quality of the approach and the child's engagement during the activity process rather than biological differences. Although prior literature suggests that girls tend to develop fine motor skills faster than boys (Faber et al., 2024), the present study indicates that an engaging and enjoyable approach can bridge this gap.

Children's fine motor skills prior to stimulation were categorized as developing as expected. However, some children encountered difficulties with indicators related to visual-motor coordination, such as cutting and arranging weaving patterns. Following the intervention, the majority of children showed improvements, reaching a very good development category. This confirms that origami weaving is an effective form of stimulation, as it involves not only hand movements but also requires precision, concentration, and pattern comprehension.

These findings are reinforced by previous research demonstrating that weaving or origami activities enhance fine muscle function, strengthen eye-hand coordination, and foster persistence and creativity in children (Wirdayanti et al., 2024; Anisyah et al., 2022). This study contributes additionally by combining weaving and folding activities into a single engaging task sequence. Children were not only asked to follow instructions but also given space for creativity, such as decorating their woven products according to their imagination. This enriches the stimulation children receive and positively impacts their holistic development.

The differences in scores before and after the intervention presented in this study provide evidence that age-appropriate, enjoyable, and practical learning methods can yield significant results. Besides improving fine motor skills, activities like origami weaving have the potential to enhance the ability to follow instructions, complete tasks independently, and boost children's self-confidence.

The implications of these results reinforce the role of community nurses and early childhood educators in designing appropriate developmental stimulation programs. Origami weaving activities can be adopted as an alternative teaching method in early childhood

education centers, such as PAUD or kindergartens, due to their proven applicability and effectiveness. Furthermore, these activities can help children develop foundational skills necessary for school readiness, such as writing and using writing tools.

Nonetheless, this study has several limitations. First, the pre-experimental design without a control group necessitates caution when generalizing the results. Second, the research was conducted at a single educational institution with a supportive learning environment, thus the findings may not reflect conditions in other kindergartens. Third, although observation-based assessments were conducted systematically and using validated instruments, they still carry a potential for subjectivity.

Despite these limitations, this study provides a strong indication of the potential benefits of origami weaving activities in supporting children's growth and development. Further research with broader scope and more rigorous experimental designs is highly recommended to strengthen the scientific evidence regarding the effectiveness of this intervention.

Conclusion

This study demonstrates that origami weaving stimulation has a significant effect on improving fine motor skills in children aged 4 to 6 years at the UPI Tasikmalaya Pilot Kindergarten. Prior to the intervention, most children were categorized as Developing as Expected, with primary challenges in hand-eye coordination and the ability to cut circular patterns. After receiving origami weaving stimulation, all children showed improvement and were categorized as Developing Very Well. This activity was proven to enhance skills such as pattern imitation, precise paper placement, and the ability to complete tasks independently and in a structured manner. Therefore, origami weaving can be considered an enjoyable and effective alternative stimulation to support fine motor development in early childhood.

Further research is recommended to explore the effects of origami weaving stimulation on other developmental aspects, such as cognitive, language, and socio-emotional abilities. Additionally, employing an experimental design with a control group could provide deeper analytical strength and broader generalizability.

Conflicts of Interest

Generated from the conflict of interest forms by each author.

Funding Sources

This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Acknowledgment

The author thanks the teachers and children of TK Lab. Percontohan UPI Tasikmalaya for their participation and support during the research process.

References

- Anisyah, D. R., Sumardi, S., & Muslihin, H. Y. (2022). Peningkatan kemampuan motorik halus melalui kegiatan menganyam dengan media loose parts pada anak usia dini di TK Bias Sidamulya. *Jurnal Paud Agapedia*, 6(2), 173–182.
- Faber, L., Schoemaker, M. M., Derikx, D. F. A. A., Schelven, H. S., Hartman, E., & Houwen, S. (2024). Qualitative age-related changes in fine motor skill performance among 3- to 6-year-old typically developing children. *Human Movement Science*, 93(November 2023), 103169. <https://doi.org/10.1016/j.humov.2023.103169>
- Ifalahma, D., Asri, N. K. H., Arini, L. D. D., & Wulansari, M. A. (2023). Metode bermain origami meningkatkan kemampuan motorik halus anak usia dini. *Prosiding Seminar Informasi Kesehatan Nasional (SIKESNAS)*, 401–406.
- Khairi, H. (2018). Karakteristik perkembangan anak usia dini dari 0–6 tahun. *Jurnal Warna*, 2(2), 15–28.
- Puspita, L., & Umar, M. Y. (2020). Perkembangan motorik kasar dan motorik halus ditinjau dari pengetahuan ibu tentang pertumbuhan dan perkembangan anak usia 4–5 tahun. *Wellness and Healthy Magazine*, 2(1), 121–126.
- Puspitasari, D., Sofia, A., & Anggraini, G. F. (2019). Pengaruh kegiatan bermain origami terhadap kemampuan motorik halus anak usia dini. *Jurnal Pendidikan Anak*, 5(2), 77–86.
- Putriani, N. G. A. N., Arini, N. M., & Wiguna, I. B. A. A. (2022). Strategi pengembangan kreativitas anak usia dini dalam menganyam dengan media origami. *Pratama Widya: Jurnal Pendidikan Anak Usia Dini*, 7(2), 163–170. <https://doi.org/10.25078/pw.v7i2.1740>
- Wirdayanti, M., Sari, Y., & Dhafet, M. N. A. (2024). Meningkatkan kemampuan motorik halus anak melalui kegiatan menganyam menggunakan kertas origami di kelompok B TK Arsyah Belajar Kabupaten Bombana. *Jurnal Riset Golden Age PAUD UHO*, 7(2), 200–209.