

Stimulation of Children's Gross Motor Development through Gross Motor Skill Carpets

Neli Sunarni¹, Resna Litasari¹, Elis Roslianti¹
¹STIKes Muhammadiyah Ciamis, Indonesia

Article Info

Keywords :

Stimulation, Gross Motor Skills,
Carpet Gross Motor Skills

Corresponding Author :

Neli Sunarni

E-mail : nelisunarni13@gmail.com

ABSTRACT

Introduction & Objective: Neonatal anemia is a common health problem, particularly in developing countries, and contributes to increased morbidity and mortality in infants. One effective intervention that can be implemented immediately after birth is delayed cord clamping, which involves delaying the clamping of the umbilical cord for 1–3 minutes to allow for blood transfusion from the placenta to the infant. This practice is associated with increased hemoglobin levels in newborns.

Method: This study is a literature review analyzing seven selected research articles published between 2019 and 2024, from both national and international journals. Inclusion criteria included experimental or quasi-experimental studies evaluating the effects of delayed cord clamping on hemoglobin levels and newborns. Data were analyzed narratively and comparatively. **Result:** All analyzed studies showed that delayed umbilical cord clamping has a positive impact on increasing hemoglobin levels and the hematological status of newborns. Newborns who underwent delayed umbilical cord clamping had higher hemoglobin, hematocrit, and iron stores compared to those who had their umbilical cord clamped earlier. Some studies also noted improved blood pressure stability and organ perfusion, particularly in preterm infants. **Conclusion:** Delayed cord clamping is a simple, safe, and effective intervention that can increase hemoglobin levels and improve the hematological status of newborn infants. The routine implementation of delayed cord clamping should be considered in delivery protocols as a preventive measure against neonatal anemia.

DOI: <https://doi.org/10.56359/igj.v4i2.734>



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

Introduction

The future of a nation will be determined by the success of children in achieving optimal growth and development. The period from when the fetus is in the womb until the child is two years old is an important period and is a golden opportunity. Good nutrition, good health status, correct parenting and appropriate stimulation will help children grow healthily and be able to achieve their optimal abilities so that they can contribute better to society. Good stimulation will stimulate the toddler's brain so that the development of movement, speech and language skills, socialization and independence in toddlers takes place optimally according to the child's age (Encep Sudirjo, 2018; Kementerian Kesehatan RI, 2019; Soetjiningsih, 2012)

The incidence of developmental delays generally occurs around 10% in children throughout the world. Meanwhile, the global incidence of developmental delays in 2013 is estimated to be almost 1-3% in children aged < 5 years (Suwarba et al., 2016). The results of research in West Java in 2010, of 978 children under five, 7% of children experienced developmental delays (Hadi Ashar, 2010). Delays in gross motor development can also be caused by chronic disease, birth weight, nutritional status of toddlers, child order (Arumsari et al., 2015; Sahara et al., 2021). Development requires stimulation carried out by the family, for example providing toys, socializing children, involving the mother and other family members in the child's activities.

This stimulation is one of the factors that influences the quality of a child's growth and development. One of the things that needs to be stimulated is gross motor skills. Gross motor skills are aspects related to a child's ability to carry out movements and body postures involving large muscles such as sitting, standing, walking, running, jumping, tiptoeing and so on (Arifiyanti et al., 2019; Kementerian Kesehatan RI, 2019; Khadizah, 2020; Mahyumi Rantina, Hasmalena, 2021; Mukhlisa & Kurnia, 2020; Rahmawati et al., 2019). Several things that can influence children's gross motor stimulation include family factors, environmental factors, teacher factors and educational media. Educational media that can be used to stimulate children's gross motor skills is by using a gross motor skills carpet. This carpet is an educational game tool to train children's gross motor skills. Several studies show that gross motor rugs are effective as a means of stimulating children's gross motor skills (Anggraeni & Na'imah, 2022; Arifiyanti et al., 2019; Kurniati & Sopiah, 2021; Wiranti & Mawarti, 2018). Gross motor stimulation in children according to age can be done by walking in a straight line, running back and forth, moving a ball, jumping on one leg and two legs, throwing objects, jumping carrying objects, tiptoeing and running (Agustina, 2016; Fajarwati et al., n.d.; Ngaisah et al., 2023).

Objective

The aim of this research is to determine the development of children's gross motor skills before and after being given intervention with an educational game tool in the form of a gross motor skills carpet.

Method

This type of research is quantitative with a pre-experimental method with one group pre-test and posttest (Sugiyono, 2017). This research aims to determine the development of children's gross motor skills using the Gross Motor Skill carpet. The research was conducted at TK ABA (Aisyah Bustanul Athfal) in Ciamis starting from July-August 2023, with measurement times three times, namely pretest in the first week and posttest in weeks one, two and three, the intervention was carried out once a week for 3 weeks. . This research was tested through pretest activities regarding children's ability to perform gross motor skills. Then after knowing the pretest results, treatment was carried out by providing stimulation using the Gross Motor Skill carpet. Next, the children were tested again in the posttest activity.

TABLE 1. Research Design

<i>Pre test</i>	<i>Intervensi</i>	<i>Pos test</i>
O1	X	O2

Information:

X: Intervention (providing gross motor stimulation to children through Gross Motor Skill carpets)

O1: Initial test before intervention is given

O2: Final test after intervention is given

The population in this study was children aged 3-5 years in TK ABA (Aisyah Bustanul Athfal), totaling 12 children. Inclusion criteria: children aged 3-4 years, children in good health and following directions. Exclusion criteria for children experiencing illness. The sampling technique uses purposive sampling. The instruments in this research used educational game tools in the form of Gross Motor Skill carpets and gross motor development questionnaires which had been tested for validity and reliability. The data collection technique for this research is in the form of observation, pretest and posttest. The analysis in this research was carried out in stages, starting with a data normality test carried out from the results of the pretest posttest using the Shapiro Wilk test with data decision criteria in a computerized normality test, namely if the significance value was >0.05 then the data was normally distributed, a repeated ANOVA test was carried out, if the value significance is 0.05, then the data is declared homogeneous, then data analysis techniques are carried out using a difference test (t-test). The difference test is used to measure the results of the pretest and posttest (Ni Wayan Rasmini, 2023).

Results

The implementation of the research begins with the planning stage, namely the preparation of a lesson plan in stimulating children's gross motor development using a gross motor skill carpet made as in Figure 1.

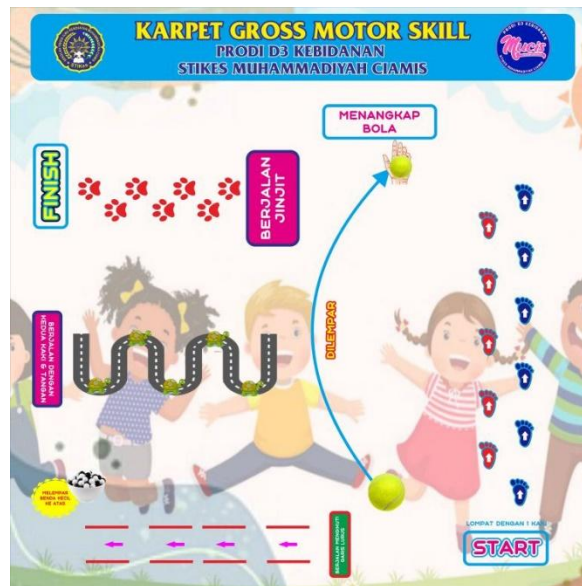


FIGURE 1. Karper Gross Motor Skill

The next stage of stimulation was carried out for 3 weeks with implementation time once a week. Implementation of the intervention through kindergarten teachers who instruct the game to children accompanied by singing songs so that children are more enthusiastic. The children took turns performing movements according to those in the gross motor skill carpet picture. The movements instructed by the teacher include jumping, catching the ball, walking along the line, throwing small objects up, imitating walking animals, green-red lights (green light: walking on tiptoe, red light: stop). When children carry out instructions, observations are made by checking the gross motor assessment instrument for 36-48 months of age.

This study involved 12 ABA kindergarten students, with the following child characteristics.

TABLE 2. Characteristics of Respondents

Variable	N	%
<i>Gender</i>		
Male	9	75
Female	3	25
<i>Age</i>		
3 years	1	8
3,5 years	1	8
4 years	10	84

Based on the table above, the characteristics of respondents with male gender are 9 people (75%) and female as many as 3 people (25%). Age 3 years as many as 1 person (8%), 3.5 years as many as 1 person (8%) and age 4 years as many as 10 people (84%).

TABLE 3. Gross Motor Score Before Intervention

Score	N	%
100	8	66,7
83	2	16,7
67	1	8,3
33	2	8,3

Based on the table above before the intervention, it was found that the gross motor development of children with a value of 100 was 8 people (66.7%), a value of 83 was 2 people (16.7%), a value of 67 was 1 person (8.3%) and a value of 33 was 1 person (8.3%).

TABLE 4. Gross Motor Value After Intervention

Score	N	%
100	10	83,3
83	2	16,7

Based on the table above, after the intervention, gross motor development was obtained with a value of 100 as many as 10 people and a value of 83 (83.3%) as many as 2 people (16.7%).

TABLE 5. Average Difference between Pretest and Posttest Intervention Results

Score	Mean	Std. Deviation	Std. Error Mean	CI 95%		t	df	Sig. (2-tailed)
				Lower	Upper			
Pretest - Posttest	-1.16667	0.38925	0.11237	-1.41398	-0.91935	-10.383	11	0.000

Based on the table above, it shows that the Sig. (2-tailed) is 0.000 less than 0.05, so it can be concluded that there is a difference in the average results of the pretest and posttest gross motor intervention.

Discussion

Development refers to the increasing complexity of body structures and functions in areas such as gross motor skills, fine motor skills, speech and language, as well as socialization and independence (Ministry of Health of the Republic of Indonesia, 2019). Gross motor skills involve a child's ability to perform movements and postures that engage large muscle groups, such as sitting, standing, and similar activities. Gross motor skills are a critical aspect that supports early childhood

development. These skills require proper stimulation aimed at enhancing motor abilities, improving coordination, developing physical capability, and building self-confidence.

Stimulation was carried out using a Gross Motor Skill Carpet, a self-made medium designed by the researcher to suit the movement abilities of children aged 3–4 years. This media can be utilized by teachers as a variation in gross motor activities for children.

Based on the research findings, 84% of the children involved were 4 years old, with 75% being boys and 25% girls. This age is considered optimal for gross motor development, as children are in a phase of intense physical exploration and possess growing cognitive capacity to follow instructions. Children at this age are more responsive to motor stimulation through visual and track-based media. Four-year-olds also have the sensorimotor capacity to enhance coordination, balance, and locomotor skills when given systematic and exploratory movement-based exercises.

Before the intervention, the majority of children (66.7%) achieved a score of 100 in gross motor assessment, though a few scored lower – 33 and 67 (each 8.3%). After the intervention, there was a significant improvement, with 83.3% of children scoring 100 and the remaining 16.7% scoring 83. No child scored low after the intervention. This significant improvement shows that structured, enjoyable, and movement-oriented stimulation can optimize gross motor skills in early childhood.

Statistical analysis using paired sample t-test yielded a Sig. (2-tailed) value of 0.000 (<0.05), indicating a significant difference between gross motor skill scores before and after the intervention. This confirms the effectiveness of the gross motor skill carpet in stimulating children's gross motor development. The carpet serves as a tool for activities like jumping, catching balls, walking along a straight line, throwing small objects upward, and playing "green light-red light" (tiptoeing when the teacher says "green light," and stopping when they say "red light"). This research aligns with a study by Mengyuan Bai (2024), which found that active play-based interventions significantly improve basic gross motor skills in children, such as jumping, running, and maintaining posture. It also supports findings by Wang and Zhou (2024), which concluded that motor skill programs based on structured design are more effective than regular physical activities in enhancing gross motor skills in preschool-aged children.

Conclusion

The gross motor skill carpet can be an affordable, effective, and practical teaching aid for both teachers and parents, especially for stimulating gross motor skills in children aged 3–4 years.

Acknowledgement

The author would like to thank all parties who contributed to the completion of this research.

References

- Agustina, M. D. (2016). Tingkat Perkembangan Motorik Kasar Pada Anak Tk Kelompok B (5-6 Tahun) Se-Gugus 2 Kecamatan Panjatan Kulon Progo Yogyakarta Skripsi. *Applied Microbiology and Biotechnology*, 85(1), 2071–2079.
- Anggraeni, D., & Na'imah, N. (2022). Strategi Stimulasi Perkembangan Motorik Kasar Anak Usia Dini Melalui Maze Karpet Covid-19. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, 6(4), 2553–2563. <https://doi.org/10.31004/obsesi.v6i4.2103>
- Arifiyanti, N., Fitriana, R., Kusmiyati, R., Sari, N. K., & Usriah, S. (2019). Motorik Kasar Anak Usia Dini. *Jurnal Al-Athfal*, 2(2), 36–44.
- Arumsari, D. R., Faizi, M., Nuswanto, D., & Utami, S. (2015). Faktor risiko yang berhubungan dengan keterlambatan perkembangan global pada balita. *Bimabi*, 3(2), 7–14.
- Encep Sudirjo, M. N. A. (2018). *Pertumbuhan dan Perkembangan Motorik Konsep Perkembangan dan Pertumbuhan Fisik dan Gerak Manusia*. UPI Sumedang Press.
- Fajarwati, A., Arini, I., Anak, P., Dini, U., & Rangkasbitung, U. S. (n.d.). *Model Pembelajaran Berbasis Lokomotor dalam Peningkatan Keterampilan Motorik Kasar Anak Usia 5-6 Tahun*. 4(1), 317–324.
- Hadi Ashar, L. L. (2010). Hambatan Perkembangan Anak Balita di Daerah Endemik GAKI. *MGMI*, 10(3).
- Kementerian Kesehatan RI. (2019). *Pedoman Pelaksanaan SDITK Anak di Pelayanan Kesehatan Dasar*.
- Khadizah, N. A. (2020). *Perkembangan Fisik Motorik Anak Usia Dini*. Premadamedia Group.
- Kurniati, A., & Sopiha, S. (2021). Stimulasi Pengembangan Motorik Kasar Anak Usia Dini Melalui Permainan Papan Titian. *ASGHAR : Journal of Children Studies*, 1(1), 11–21. <https://doi.org/10.28918/asghar.v1i1.4173>
- Mahyumi Rantina, Hasmalena, Y. K. N. (2021). *Buku Panduan Stimulasi dan Deteksi Dini Tumbuh Kembang Anak (0-6) Tahun*. Edu Publisher.
- Mengyuan Bai, et al. (2024). The effect of planned active play on the fundamental movement skills of preschool children. *Human Movement Science*, 96.
- Mukhlisa, N., & Kurnia, selia dwi. (2020). Penerapan permainan papan titian dalam mengembangkan motorik kasar pada anak usia dini. *Educhild*, 2(1), 65–75.
- Ngaisah, N. C., Janah, A. I., & Azizah, S. N. (2023). *Permainan Tradisional Engklek sebagai Mengembangkan Motorik Kasar Anak Tunagrahita Upaya*. 4(1), 74–85. <https://doi.org/10.37985/murhum.v4i1.159>
- Ni Wayan Rasmini. (2023). *Buku Ajar Statistik Pendidikan*. Pusat Pengembangan Pendidikan dan Penelitian Indonesia.
- Rahmawati, M., Afifulloh, M., & Lismanda, Y. F. (2019). Upaya Meningkatkan Kemampuan Motorik Kasar Melalui Permainan Tradisional Pada Anak Kelompok B RA An-Nur Tunjungtirto Kecamatan Singosari Kabupaten Malang.

Dewantara: *Jurnal Pendidikan Islam Anak Usia Dini*, 1(2), 1-14.
<http://www.riset.unisma.ac.id/index.php/jd/article/view/3241>

Sahara, Z. I., Muslihin, H. Y., & Mulyana, E. H. (2021). Studi Kasus Keterlambatan Perkembangan Motorik Kasar pada Anak Usia Dini di Taam Futuhal Arifin. *Jurnal PAUD Agapedia*, 5 (1)(1), 124-128.

Soetjningsih. (2012). *Tumbuh Kembang Anak*. Penerbit Buku Kedokteran EGC.

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R & D*. Alfabeta.

Suwarba, I. G. N., Widodo, D. P., & Handryastuti, R. S. (2016). Profil Klinis dan Etiologi Pasien Keterlambatan Perkembangan Global di Rumah Sakit Cipto Mangunkusumo Jakarta. *Sari Pediatri*, 10(4), 255.
<https://doi.org/10.14238/sp10.4.2008.255-61>

Wiranti, D. A., & Mawarti, D. A. (2018). Keefektifan Permainan Engklek Dalam Mengembangkan Kemampuan Motorik Kasar Anak Usia Dini. *Refleksi Edukatika : Jurnal Ilmiah Kependidikan*, 9(1). <https://doi.org/10.24176/re.v9i1.2810>

Xinchen Wang, B. Z. (2024). Motor development-focused exercise training enhances gross motor skills more effectively than ordinary physical activity in healthy preschool children: an updated meta-analysis. *BMC Public Health*, 12.