



## **THE MOZAIC EFFECT ON THE IMPROVEMENT OF FINE MOTOR SKILLS OF 3-4 YEARS OLD CHILDREN IN INTEGRATED HEALTH CARE CENTER, THE WORKING AREA OF PUBLIC HEALTH CENTER WAENA JAYAPURA CITY.**

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ABSTRACT	Keywords
<p>The Child development speed is unique; it varies due to the child's nature and its stimulants. Lack of stimulants will affect late fine motoric development of children. Data from the Waena Health Center inform, 190 toddlers have impaired fine motor development.</p> <p>This research objective wants to determine the effect of mosaic techniques on the enhancement of fine motor skills in children aged 3-4 years at Integrated Health Care Waena, Jayapura City. A quantitative descriptive research was done with <i>Two Group Pretest-Posttest Group Design</i>. The instruments used were; Developmental Pre-Screening Questionnaire (KPSP) and the mosaic technique observation sheet.</p> <p>The results before the mosaic technique showed in intervention group, had dubious fine motor skills (55.6%) and 16.6% deviant, whereas in the control group had dubious fine motor skills (83.3%) and 5.6% deviant. After using mosaic technique, intervention group increase (77.8%) and small part doubted (22.2%).</p> <p>The average score of intervention group after mosaic technique was 8, while control group was 7.1 with independent t-test, statistical test at a significance value of 95% (<math>\alpha = 0.05</math>) obtained p-value 0.042 or <math>p &lt; \alpha</math> (0.05), thus mosaic technique had effect improving fine motor skills in children at the Integrated Health Care Waena, Jayapura City.</p>	<p><b>Mozaik Technique, Fine motor skill, children age 3-4 tahun</b></p>

## **INTRODUCTION**

Toddlers (children 0-5 years) is a laying period for the development of several aspects of the development of children's abilities, namely motor, language, social, and independence development. Developmental delays experienced by

toddlers can have a serious impact in the future (Maryunani, 2013).

In 2018, *World Health Organizations* shows that there is a delay in fine motor development in children under five with an index of 54.7%, the highest in parts of Africa and parts of countries with food security problems, while the results of the Indonesian National Basic Health

Research in 2018, reported that the total development index for children aged 36-59 months reached 88.3%. The lowest child development is the development of children's literacy or intelligence (fine motor skills), which is as much as 64.6%. The development of children from 34 provinces in Indonesia, Papua province is the second-lowest province after Central Sulawesi (76%), which is 74.8% (Ministry of Health RI, 2018). In reducing the impaired fine motoric development of children, the government has launched early detection towards growth and development in every health center throughout Indonesia. However, until now the coverage of early detection of growth and development has not been maximizing.

Fine motor skills are movements that involve the small muscles and the coordination between the eyes and hands. Motor development is strongly influenced by the brain organ which commands what movements to do (Istiqomah & Khotimah, 2017). Fine motor development of children will be more optimized if the environment in which the children grow and develop supports them to move freely; In addition to the stimulation given by parents can help achieve optimal fine motor development.

Parents should recognize any danger signs at the deadline for achieving fine motor development in toddlers. Each developmental stage requires stimulation for the development of mental and motor skills. Deviations in fine motor development without getting adequate self-development are likely to end in disabilities. Fine motor skills can be done with a variety of activities that involve muscles and nerves that are much smaller and more detailed, which can be done through paper crumpling, writing, drawing, sticking, and so on.

One of the strategies that can be done in developing the fine motor skills of toddlers is the mosaic technique (Sulastri,

2015). Mosaic is the art of creating a certain image or pattern which is made by attaching small materials / elements of the same type either material or shape and size which are arranged closely together on a plane. Mosaic skills are a technique of sticking to a pattern that has been provided (Muharrar & Verayanti, 2013).

Research conducted by Sitepu (2016), in Raudhatul Athfal Nurul Huda, Sunggal Subdistrict, Deli Serdang Regency, revealed that there was an increase in children's fine motor skills through mosaic techniques, which in the initial conditions was 31.25%, increasing to 82.50%. A reinforced by research by Ullinuha (2019), in children group at RA Masjid Al-Azhar Permata Puri that the fine motor skills of children before the development intervention were 40% and increased by 93.3% after being given mosaic technique intervention.

In 2019, based on data from the Public Health Center Waena which has 19 Integrated Health Care units, stimulation of early detection and early intervention of toddlers' development was carried out using a pre-developmental screening questionnaire for under-five children, out of 846 children under five, 123 children (14.5%) experienced fine motor development disorders. From January to August 2020, out of 987 children fewer than five, was found that 190 children (19.2%) had impaired fine motor development (Waena Health Center Toddler Cohort Register, 2020).

Observation by researchers at three Integrated Healthcare Center with the cadres resulting in stimulation has never been done to help overcome the impaired fine motor development in these toddlers and most parents have never provided mosaic techniques to stimulate their child's development.

Lack of fine motor development in toddlers and the absence of stimulation

provided by parents in improving the fine motor development of toddlers, made researchers interested in applying mosaic techniques in overcoming the problem of delay disorders. The purpose of this study was to determine the effect of mosaic techniques on improving fine motor skills of children aged 3-4 years in Integrated Health Care Center, the working area of Public Health Center Waena, Jayapura City.

## METHOD

This type of research is a quasi experiment with a *Two Group Pretest-Posttest Group Design*. There are two groups in which the intervention group and the control group which randomly selected. In which, both of the group will be given the *pre test* (measured fine motor skill), then the intervention group will be given the mosaic technique and the control group will be only given the treatment according to the Public Health Center SOP standard, then both groups were given a post test (measured their fine motor skills again).

This research was conducted at Integrated Healthcare Center in the Work Area of Public Health Center Waena, Jayapura City from September to December 2020. The population in this study were all children aged 3-4 years who experienced delays in fine motor development at 17 Integrated Health Care Center at Public Health Care Waena as many 190 children.

The sample size was calculated using the Sovlin formula (Notoatmodjo, 2012) so that a sample of 36 respondents was obtained. The sampling technique used purposive sampling, which is based on certain considerations, namely children aged 3-4 years, experiencing delays in fine motor development, the child is in good health and there are no mental disabilities. The sample was then divided into two groups, 18 respondents in the intervention group and 18 respondents in the control group in which the

group was divided based on the lottery that the researcher had made.

The instrument that the author uses in this study is the Pre-Development Screening Questionnaire (KPSP) recommended by the Ministry of Health of the Republic of Indonesia (2013), to assess the fine motor skills of children aged 3-4 years, besides that the author also uses a mosaic technique observation sheet on the development of fine skills. conducted during the study. Secondary data collection was obtained from the Jayapura City Health Office and the Public Health Center Waena. The materials used in the mosaic technique are patterns / pictures and red beans that will be attached to the pattern / image.

Univariate data analysis was carried out to produce a frequency distribution of respondent characteristics including age, gender and history of birth weight, fine motor skills before and after the intervention of mosaic techniques, while bivariate analysis was performed using *independent statistical t test*.

This research has received ethics permission from the Health Research Ethics Commission of the Jayapura Health Ministry's Poltek Number 048 / KEPK-J / VII / 2020.

## RESULTS

### Respondent Characteristic

**Table 1. Frequency Distribution Characteristics of Child Respondents aged 3-4 years at Integrated Health Center in Waena, Jayapura City, 2020.**

Characteristic	Intervention Group		Control Group	
	n	%	n	%
Age				
3 years	12	66,7	12	66,7
4 years	6	33,3	6	33,3
Sex				
Boy	9	50	9	50

Girl	9	50	9	50
Birth Weight				
BBLR	2	11,1	3	16,7
Normal	16	88,9	15	83,3
Tribe				
Papua	10	55,6	9	50
Non Papua	8	44,4	9	50
Total	18	100	18	100

Table 1 shows that the intervention group of the 36 child respondents aged 3-5 years in the Integrated Health Center Waena, Jayapura City, most were 3 years old, namely 12 respondents (66.7%), 9 respondents (50%) and 9 female respondents (50%), 16 respondents (88.9%) normal birth weight and 10 respondents (55.6%) came from the Papuan ethnic group. Whereas in the control group most of them were 3 years old, namely 12 respondents (66.7%), male 9 respondents (50%) and female 9 respondents (50%), normal birth weight 15 respondents (83.3%) and came from the Papuan ethnic group 9 respondents (50%) and non-Papuan 9 respondents (50%).

#### **Fine motor skills of children aged 3-4 years before doing Mosaic Technique at Integrated Health Center in the working area of Public Health Care Waena, Jayapura City**

**Table 2. Distribution of Fine Motor Skills for Children aged 3-4 years before Mosaic Techniques are performed at the Integrated Health Center in the working area of Public Health Care Waena, Jayapura City**

Fine Motor Skills(Pre)	Intervention Group		Control Group	
	n	%	n	%
Appropriate	5	27,8	2	11,1
Doubt	10	55,6	15	83,3
Deviate	3	16,6	1	5,6
Total	18	100	18	100

Table 2, shows that of the 36 child respondents aged 3-5 years before the mosaic technique was carried out at

Integrated Health Center, the work area of the Public Health Center Waena, Jayapura City, most of the intervention group had dubious fine motor skills, namely 10 respondents (55.6%) and a small proportion were deviant, namely 3 respondents (16.6%). Whereas in the control group most of them had dubious fine motor skills, namely 15 respondents (83.3%) and a small proportion were deviant, namely 1 respondent (5.6%).

#### **Fine motor skills of children aged 3-4 years after doing Mosaic Technique at Integrated Health Center in the working area of Public Health Care Waena, Jayapura City**

**Table 3. Distribution of Fine Motor Skills for Children aged 3-4 years before Mosaic Techniques are performed at the Integrated Health Center in the working area of Public Health Care Waena, Jayapura City**

Fine Motor Skills (Post)	Intervention Group	
	n	%
Appropriate	14	77,8
Doubt	4	22,2
Deviate	0	0
Total	18	100

Table 3 shows that of the 18 child respondents aged 3-5 years after mosaic technique was carried out at Integrated Health Center, the work area of the Public Health Center Waena, Jayapura City, the majority of the intervention group had fine motor skills according to 14 respondents (77.8%) and a few doubted, namely 4 respondents (22.2%).

#### **The Effect of Mosaic Techniques on the Improvement of Fine Motor Skills for Children aged 3-4 years at Integrated Health Center in the working area of Public Health Care Waena, Jayapura City**

**Tabel 4. The Effect of Mosaic Techniques on the Improvement of Fine Motor Skills for**

**Children aged 3-4 years at, Integrated Health Center in the working area of Public Health Care Waena, Jayapura City 2020**

Effective ness	$\Delta X$ Me an	$\Delta X$ Stand ard Deviat ion	Mean Differe nce	<i>p</i> - val ue
Interventi on	8 7,1	1,1375 9	0,9166 7	0,0 42
Control		1.4476 1		

Table 4 shows the average score of improving fine motor skills in the intervention group after giving mosaic technique with a score of 8, while in the control group with an average score of 7.1 with an average difference of 0.91667. The results of the independent t test statistical test at a significance value of 95% ( $\alpha = 0.05$ ) obtained p-value 0.042 or  $p < \alpha$  (0.05), thus there is an effect of mosaic techniques on improving fine motor skills of children aged 3-4 years at the Integrated Health Center in the working area of Public Health Care Waena, Jayapura City.

## DISCUSSION

### Respondent Characteristic

The results showed that most respondents in the intervention group and in the control group were at the age of 3 years, namely 24 respondents (66.7%) and a small proportion were 12 respondents (33.3%). Children aged 3 years with fine motor development according to 8.3%, doubted 79.2% and 12.5% deviated. Children aged 4 years with fine motor development according to 41.7%, doubted 50% and 8.3% deviated. This shows that the fine motor development of children according to age is still low.

This study is in line with the research of Indraswari (2012), in Agam

Regency where it was found that the fine motor skills of children aged 3-4 years were still low. Several factors cause delayed fine motoric development, including the absence of learning opportunities in children, excessive parental protection, lack of motivation in children themselves and lack of stimulation provided by parents (Marmi & Raharjo, 2013).

Researchers assume that the lack of fine motoric development of children is due to the fact that parents do not provide developmental stimulation to children due to the parents' busy work and household maintenance, so that they have less free time which can actually be done if the timing is right.

The results showed that most respondents in the intervention group and in the control group were male, namely 18 respondents (50%) and 18 female respondents (50%) respectively. Children who are male with fine motor development according to 27.8%, doubted 61.1% and 11.1% deviated. Whereas for female children with fine motor development according to 11.1%, doubting 77.8% and 11.1% deviating, where the child could not hold objects using both fingers, the child could not outline according to the picture given. This is due to the lack of stimulation provided by the parents, so that gender does not show any differences in fine motor development depending on the stimulation provided by the parents.

This study is in line with research by Vitamami (2013), which found that fine motor skills based on gender have the same chance of developing well if stimulated by their parents.

Researchers assume that there is no difference between sex and women, because they have the same activities, so the important role of parents in providing stimulation in child development is determined by the parents themselves.



The results showed that respondents in the intervention group and in the control group with normal birth weight were 31 respondents (86.1%) and with low birth weight (LBW) 5 respondents (13.9%). Children born with LBW with fine motor development according to none, doubted 40% and as much as 60% deviated. Meanwhile, children born with normal weight with fine motor development according to 22.6%, doubted 74.2% and deviated 3.2%. This shows that children born with LBW deviate more than children born with normal weight.

According to Marmi & Rahardjo (2013), factors that cause impaired fine motor development can be caused by brain damage at birth or post-birth conditions that do not allow a child to develop motor skills. However, it is undeniable that these delays often occur due to the lack of stimulation provided by the parents.

Researchers assume that children born with low birth weight lead to a number of inadequate development of organs in the body, especially in the brain, so that it can interfere with the child's fine motor skills.

The results showed that the ethnic groups of respondents in the intervention group and in the control group were parents of Papuan fathers, namely 19 respondents (52.8%) and 17 respondents in the Non-Papuan category (47.2%). Children, who came from the Papuan ethnic group with fine motor development according to 26.3%, doubted 63.2% and as much as 10.5% deviated. Meanwhile, those from non-Papuan ethnic groups with appropriate fine motoric development were 11.8%, doubting 76.5% and 11.8% deviating. This is because more children from Papuan tribes do not work compared to children from non-Papuan tribes, where their mothers are found to be working more, so they do not provide developmental stimulation for their children.

Sumarno (2018) states that working mothers have very little chance of having children with normal fine motor development, which in theory says that the presence of mothers in the household environment will have a major influence on child development. Mothers who do not work will have plenty of time and opportunity at home to stimulate, pay attention, and motivate children to perform limited motor development tasks.

Researchers assume that children 3-4 years old who experience problems with fine motor development are hampered due to several factors, namely nutritional factors, parenting patterns and stimulation that play a role. As for what the mother needs to do to improve fine motor development by providing sufficient stimulation, one of which is the mosaic technique.

#### **Fine motor skills of children aged 3-4 years before and after the Mosaic technique is at Integrated Health Center, the work area of the Public Health Center Waena, Jayapura City.**

The results showed that children aged 3-4 years before the mosaic technique were found to have fine motor skills, namely 5 respondents were appropriate (27.8%), 10 respondents were doubtful (55.6%) and as many as 3 respondents were deviant (16.7%). ). This shows that the fine motor skills of children according to their age are still low, where most of the fine motor skills of children are questionable and a small proportion of them have deviations.

This can be seen when children are given stimulation according to age development. It seems that the child is still not optimal in the technique of holding (squeezing) on his fingers and sticking green beans on the given line, where there is a lack of coordinating the eyes and hands, the name of the child is still less focused when

instructed and their eyes and hands do not focus on drawing and outline.

This research is in line with research conducted by Istiqomah (2017), in the group of 3-4 years in Surabaya, which found that most children have dubious development of fine motor skills. This is due to the lack of parental stimulation of child development tasks. In addition, in Zeng's (2016) study on fine motoric development of children in China, it was found that the lack of physical activity of children, especially in stimulation games, led to underdeveloped children's development.

The mosaic technique is an option, can be used to improve children's fine motor development. According to Muharrar & Verayanti (2013), mosaics are pictures or decorations or certain patterns that are made by attaching similar small materials / elements (material, shape, and size) arranged closely together on a plane. Researchers assume that the mosaic technique uses small pieces, usually known as tesserae, which are used to create patterns or images, so that it becomes a game that stimulates children to improve their fine motor skills.

The results showed that, after intervention with the provision of mosaic techniques, it was found that there was an increase in children's fine motor skills, in which fine motor skills were appropriate, namely 14 children (77.8%) and 4 children (22.2%) doubted. This is in line with Restiyani's research (2018), in Gadingrejo District, Pringsewu Regency that after children are given intervention through games of mosaic techniques, children will increase their fine motor skills according to age development.

According to Leung's research in Hong Kong (2015), it was found that the improvement of children's fine motor skills had been improved through the role of teachers in fostering parents in stimulating

their children, including by providing game techniques including mosaic techniques.

Actions taken in this study are through mosaic techniques. Researchers used materials in the form of green beans and HVS paper media to attach the mosaic material using glue, with the mosaic technique it is hoped that it can improve the child's fine motor skills, such as training the finger muscles so that children can pick up small objects easily and their fingers will become flexible, besides that mosaic techniques can develop children's creativity, develop children's imagination and increase a high sense of art in children.

The materials that the researchers use in this mosaic technique are materials that are easy to obtain, the steps of the activity are very easy for children to understand, where the child will try to mix the ingredients of green bean seeds with other shapes, combine green and yellow paper so that it will help the child. in training children's concentration, patience and thoroughness, training the level of children's patience, and making children become independent individuals.

This research is in line with research conducted by Arifah (2014), which in his research said that the purpose of making mosaic engineering drawings using various materials such as triangles, rectangles, circles and others, among others, can develop children's imagination, develop children's creativity, train child patience, and develop aesthetics and beauty.

When the mosaic activity was carried out by the child, the researcher gave a reward in the form of praise so that the child became enthusiastic and willing to do mosaic techniques and could complete the activity on their own. Where the child's curiosity will make him enthusiastic. For children aged 3-4 years, mosaic technique is a fun game activity because children are invited to get to know a lot of geometric

shapes and seeds. The researcher assumes that with the mosaic technique that is carried out, it can develop hand-eye coordination and muscle control, teach independence, self-control and coordination of movements.

**The Effect of Mosaic Techniques on the Improvement of Fine Motor Skills for Children aged 3-4 years at Integrated Health Center, the work area of the Public Health Center Waena, Jayapura City.**

The results showed that the final score of fine motor skills improvement in the intervention group after the mosaic technique was given with a score of 8, while in the control group with an average score of 7.1 with an average difference of 0.91667. The results of the independent t test statistical test at a significance value of 95% ( $\alpha = 0.05$ ) obtained a p-value of 0.042 or  $p < \alpha (0.05)$ , it can be said that there is an effect of mosaic techniques on improving fine motor skills of children aged 3-4 year at Integrated Health Center, the work area of the Public Health Center Waena, Jayapura City. This shows that the mosaic technique can effectively improve the fine motility ability of children aged 3-4 years.

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This research is also in line with research conducted by Istiqomah (2017), which uses mosaic techniques to have a significant effect on improving children's fine motor skills, which is said to be an activity in the form of pinching and sticking geometric pieces together before and after given treatment.

Deghan research (2019) in Iran found that there is a correlation between playing skills and fine motor skills in typical children, namely the better the child's fine motor skills. More developed social skills lead to higher levels of social maturity, more efficient independent skills and better academic achievement in children. In McDonald (2018), a study in Australia found that there was a significant positive relationship between fine motor skills which was significant between motor skill components, especially upper extremity coordination and speed and agility, along with the overall gross motor ability score.

Researchers assume that the use of mosaics in children aged 3-4 years will improve fine motor skills in children if they are always trained continuously. This activity will make children accustomed to moving their hands when holding pieces of paper, taking pieces of paper, applying glue, and sticking them to the basic image, so that the movement of the fingers will be more flexible. Children who are optimal in development, skilled and mastering motoric movements will have a healthy physique.

This mosaic art activity to improve the fine motor skills of children aged 3-4 years really helps children reach the optimal stage of fine motor development, where they will practice learning independently. Where from the research data, many children who after doing mosaic techniques, are motivated to repeat the mosaic activities again. In principle, child development is one of them is continuous learning, starting with building an understanding of something, exploring



the environment and rediscovering a concept, this is in accordance with what has been done by researchers where this research takes place continuously for approximately 6 days of meetings.

## CONCLUSIONS

In stimulating the fine motoric development of children, mosaic techniques can be used, in which in this study there is an effect of mosaic techniques on improving fine motor skills of children aged 3-4 years at Integrated Health Care in the Public Health Care Waena area, Jayapura City (p-value 0.042). Suggestions for Integrated Health Care Center in the work area of Waena, Jayapura City, is to further increase the provision of stimulation to children, so that regular stimulation can prevent delays in children's fine motor development and officers and cadres can provide information to parents about providing stimulation in child development.

## REFERENCES

- Arifah, R. (2014). *Mengembangkan Kemampuan Motorik Halus Melalui Teknik Mozaik Pada Anak Kelompok A di TK ABA Khadijah Bangunjiwo Timur Kasihan Bantul*. Yogyakarta: Yogyakarta University.
- Dehghan, L., Mirzakhani, N., Rezaee, M., & Tabatabaee, M. (2017). The relationship between fine motor skills and social development and maturation. *Iranian Rehabilitation Journal*, 15(4), 407–414. <https://doi.org/10.29252/nrip.irj.15.4.407>
- Indraswari, L. (2012). Peningkatan Perkembangan Motorik Halus Anak Usia Dini Melalui Kegiatan Mozaik Di Taman Kanak-Kanak Pembina Agam. *Jurnal Pesona PAUD*, 1(1–13).
- Istiqomah, L., & Khotimah, N. (2017). *Pengaruh Kegiatan Mozaik Terhadap Kemampuan Keterampilan Motorik Halus Pada Anak Kelompok B TK Aisyiyah Bustanul Athfal 3 Surabaya PG-PAUD*, Fakultas Ilmu Pendidikan, Universitas Negeri Surabaya.
- Kemenkes RI, 2018. *Haisl Utama Riset Kesehatan Dasar Nasional*. Balitbang Kemenkes RI, Jakarta.
- Leung, C., H. (2015). Teacher beliefs and practices of kindergarten teachers in Hong Kong. *Australasian Journal of Early Childhood*.
- Mcdonald, K. (2018). Relationships between Motor Proficiency and Academic Performance in Mathematics and Reading in School-Aged Children and Adolescents: A Systematic Review. *International Journal of Environmental Research and Public Health*.
- Marmi., & Rahardjo. (2013). *Ilmu Kesehatan Neonatus, Bayi, Balita dan Anak Pra Sekolah*. Pustaka Pelajar, Jakarta.
- Maryunani. (2013). *Perawatan Anak Sakit*, EGC, Jakarta, hal 35-36, 76-78
- Muharrar, S., & Verayanti, S. (2013). *Kreasi Kolase, Montase, dan Mozaik Sederhana*. Jakarta: Esensi.
- Register Kohor Balita Public Health Center Waena. (2020)
- Restiyani. (2018). Pengembangan Motorik Halus Anak Melalui Teknik Mozaik Pada Kelompok B Taman Kanak-Kanak At Tawakal, Kecamatan Gadingrejo Kabupaten Pringsewu. Fakultas Tarbiyah Dan Keguruan Universitas Islam Negeri Raden Intan Lampung

- Sitepu, J. M., & Janita, S. R. (2016). Meningkatkan Kemampuan Motorik Halus Anak Melalui Teknik Mozaik Di Raudhatul Athfal Nurul Huda Kecamatan Sunggal Kabupaten Deli Serdang. *Intiqad: Jurnal Agama Dan Pendidikan Islam*, 8(2), 73–83. <https://doi.org/10.30596/intiqad.v8i2.729>
- Sulastri, A.,T. (2015). *Pengembangan Kemampuan Motorik Halus Melalui Kegiatan Mozaik Pada Anak Kelompok B Di TK Pamardisiwi Muja-Muju Yogyakarta*. Universitas Negeri Yogyakarta
- Sumarno, G., Stephani, M. R., & Wibowo, R. (2018). Keterampilan Motorik Kasar dan Halus Anak Usia Dini Usia 4-5 Tahun pada Kelompok Sosial Ekonomi Status Orang Tua Tingkat Menengah. *TEGAR: Journal of Teaching Physical Education in Elementary School*, 2(1), 60. <https://doi.org/10.17509/tegar.v2i1.16273>
- Ullinuha, IH.(2019). *Upaya Meningkatkan Kemampuan Motorik Halus Melalui Kegiatan Kolase Pada Anak Kelompok A di Ra Masjid Al-Azhar Permata Puri Semarang Tahun Ajaran 2018/2019*. Universitas Islam Negeri Walisongo Semarang 2019.
- Vitamami, laili. (2013). Peningkatan Kemampuan Motorik Halus Dengan Finger Painting Pada Kelompok A2 Ra Babussalam Krian Sidoarjo. *Paud Teratai*, 2(2).
- Zeng, N. (2016). Review Article Effects of Physical Activity on Motor Skills and Cognitive Development in Early Childhood: A Systematic Review Hindawi BioMed Research International Volume 2017, Article ID 2760716, 13 pages <https://doi.org/10.1155/2017/2760716>