

Fundamental movement skills and physical activity of children in low-income families

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Abstract

The purpose of the study was to determine the level of physical activity and basic movement skills in low-income families. The method used in this study is a quantitative descriptive method through surveys. The study sample included 32 children aged \pm 9 years, consisting of 19 boys and 13 girls from low-income families. Sampling techniques use purposive sampling. The instruments used in the study were the population income category, the 2nd Edition Test of Gross Motor Development (TGMD), and the Instrument Physical Activities Questionnaire (IPAQ). The results showed that children in low-income families tend to have a body mass index underweight (thin), and basic movement skills are lacking. But in physical activity, boys tend to be moderate, and children tend to be low (low). This study is expected to be data on physical activity and basic movement skills in children from low-income families to be followed up through various activity programs in schools.

Keywords: family income, basic motion skills, and physical activity.

INTRODUCTION

Basic movement skills are important in the development of a person's movement. These basic movement skills will affect various physical activities in the future. Fundamental movement skills (FMS) are the basic movements and motor skills necessary to participate in various physical activities. Generally, at the age of 6 years, the basic movement is controlled by children (Gallahue, Ozmun, & Goodway, 2012). Growth and development cannot be separated. Weight growth and the development of basic movement skills will affect each other. Excess body mass indexes have a negative effect on sprint skill levels.

Age groups and genders also affect mastery of basic movement skills. This information is important in understanding how age, gender, and weight status can affect children as they develop in school and affect the

development of basic skills (Bryant, Duncan, & Birch, 2014). It's also an opportunity for children to be and feel physically competent needs to happen early on in their school or preschool life (Williams et al., 2012).

Physical activity in school, especially in learning tailors, should be designed to contribute to the child. The results showed a relationship of basic movement skills with child health. There is also a positive relationship between basic levels of movement skills and physical activity and fitness. In addition, it was also found the best relationship between basic movement skills with weight (Hardy, Espinel, Reinten-Reynolds, Zask, & Okely, 2012). The prevalence of obesity in children and adolescents from low-income families in the United States has been significant concern over the past 20 years. A major contributor to this problem is the lack of physical activity (Vidoni & Ignico, 2011). Research in Indonesia shows significant results between nutritional status with basic movement skills, especially locomotor (Antoni & Bakhtiar, 2019).

The school environment and the family's socioeconomic status were found to be factors that affect the child's motor skills (Sumarno, Stephani, & Wibowo, 2018). Socioeconomic status has a direct positive effect on early childhood nutritional status. The family's socioeconomic status, including income, education, and family work, will have a direct impact on the nutritional status of the child. Children whose nutritional status is poorer come from children who come from low-income families and parents with low education (Anita & Myrnawati, 2016). Research (Astuti & Irdawati, 2011) concluded that socioeconomic factors are one of the real factors that result in malnutrition, poor housing conditions and environmental sanitation, unavailability of clean water, and the presence of infectious diseases. Overall factors can affect the daily provision of food, including the menu and the amount for each family. As indicated by low household incomes, low socioeconomic status can limit access to adequate food, especially for older children. Parents and caregivers may need dietary guidelines to ensure the quantity and quality of adequate home-cooked food supply and foster healthy eating habits in children (Shariff et al., 2015). In addition, there is a

meaningful relationship between economic status and nutritional status. Families have less income, and it can be interpreted that to buy food needs, nutritional conditions for families are also less good (Helina, 2016). Due to the low quality of nutrition and its adverse effects, especially on communities with low socioeconomic status and villagers, the quality of nutrition, especially in the poor, must be improved with appropriate interventions to reduce disparities in the community (Amini, 2021). Low-income households buy less healthy food compared to high-income households. Food purchase patterns can mediate income differences in food intake quality (French, Tangney, Crane, Wang, & Appelhans, 2019).

Research (Martin & McCullagh, 2011) found that adolescents spend time in front of the television and computers, resulting in physical activity and obesity. Excessive and irresponsible use of children will cause them to become less mobile to stabilize other negative impacts. A physical activity carried out on an ongoing basis can positively impact children. Through this variety of physical activities, various things can develop, one of which is basic movement skills. Basic motion skills are essential to the skills of each branch. Basic motor skills are an important factor for a child's participation in organized physical activities and physical activity performed in leisure (Balaban, 2018). The development of adequate basic movement skills during childhood can result in more varied physical activity participation, thus leading to a lower risk of obesity behavior (Gu, 2016). By having basic movement skills early on, children will likely participate in various physical activities towards an active lifestyle and avoid diseases caused by lack of movement.

Age, gender, physical activity, and preschool-based programs are positive determinants of FMS in preschool-aged children (Iivonen & Sääkslahti, 2014). The social-ecological correlation of basic movement skills in children is multidimensional and complex and varies according to specific skill types at the child, family, and environmental levels. Longitudinal research is needed to determine the relationship between the correlations highlighted in this study and basic motion skills (Zeng, Johnson,

[Boles, & Bellows, 2019a](#)). The study aims to uncover basic movement skills and physical activity in low-income families.

METHOD

The research method used in the study is a correlational descriptive method between low-income families with fundamental movement skills and physical activity. With a population of 3rd-grade elementary school students in Cluster IV of Ciwidey with the sample involved in this study, Bandung Subdistrict amounted to 32 people who came from families with low-income categories. To get research data, the author performs several steps. The first step is to determine the classification of children based on their family income. To obtain data based on low-income categories, the authors used questionnaires given to students filled based on parental income. Sampling technique using purposive sampling with a total of 32 people. This study was conducted in Bandung subdistrict with a sample involved in this study of 32 people from families with low-income categories. Quantitative data analysis using SPSS 20. To get research data, the author performs several steps. The first step is to determine the classification of children based on their family income. The instrument used is a category of payment of the population with criteria ([Alvara Research Center, 2017](#)) as follows:

Table 1. Population Income Category

Category	Income /days (\$)	Income /days (Rp)
<i>Elite</i>	>20\$	> Rp. 288.400
<i>Midle-Up</i>	11\$-20\$	Rp. 158.620 – Rp. 288.400
<i>Midle</i>	5\$-10\$	Rp. 71.200 – Rp. 144.200
<i>Midle-Low</i>	2\$-4\$	Rp. 28.480 – Rp. 56.960
<i>Poor</i>	<2\$	< Rp. 28.480

The second step, to measure basic motion skills using instrument Test of Gross Motor Development (TGMD) 2 from ([Ulrick, 2000](#)). This instrument is a locomotor test: run, gallop, slide, leap, horizontal jump, and hop. The running test is conducted at a distance of 20 meters in an empty barrier area using a funnel. Gallop tests are performed at a distance of 10 meters. The hop test is done with a distance of 5 meters. The leap test is conducted with a distance of 8 meters. Horizontal jump tests are conducted with a distance of 5 meters, and slide tests are carried out with 10 meters.

As well as object control tests are: Striking a Stationary Ball, Stationary Dribble, catch, kick, Overhand Throw, and Underhand Ball. Measure basic motion skills using instrument Test of Gross Motor Development (TGMD) 2 from (Ulrick, 2000). This instrument is a locomotor test: run, gallop, slide, leap, horizontal jump, and hop. The running test is conducted at a distance of 20 meters in an empty area of the barrier using a funnel. Gallop tests are performed at a distance of 10 meters. The hop test is done with a distance of 5 meters. The leap test is conducted with a distance of 8 meters. Horizontal jump tests are conducted with a distance of 5 meters, and slide tests are carried out with 10 meters. As well object control tests are: Striking a Stationary Ball, Stationary Dribble, catch, kick, Overhand Throw, and Underhand Ball. The striking of a stationary ball test is done by hitting a ball placed on a pole adjusted to the child's height. Stationary dribble tests are performed by bouncing the ball to the floor in place with a ball appropriate for the child's age. The catch test is carried out on catching a plastic ball with a diameter of 10 cm thrown at a distance of 5 meters. The kick test is done by kicking a ball diameter of 25 cm. The overhand throw test is done by throwing a tennis ball as much as the child, and the underhand throw test is done by rolling a softball ball.

To measure the physical activity of the instrument used, Step Three is a notes instrument, which is a questionnaire that refers to The International Physical Activity Questionnaire (IPAQ). IPAQ is divided into two versions, namely long form and short form (IPAQ, 2005). The recommended version for national monitoring is a short-form version that contains questions regarding physical activity over the past 7 days (Craig et al., 2003; Cleland et al., 2018). his version provides information about three levels of physical activity intensity: a) walking, b) moderate, and c) vigorous. The MET (Metabolic Equivalent of Task) indicator is used to measure the power of physical activity.

Metabolic equivalents of task (MET) are multiples of resting metabolism that reflect the metabolic rate during exercise. Standard MET is defined as 3.5ml/min/kg (Tompuri, 2015). Based on IPAQ data processing

and analysis guidelines, METs for walking activities are 3.3/min, moderate 4/minute, and high 8/minute. MET-minutes are calculated by multiplying METs by the time (duration of carrying out activities in units of minutes) for a day or a week. Met-minutes will be converted into three categories of physical activity, namely low, moderate, and high. Table 2 describes the division of categories of physical activity levels according to (The International Council of Sport Science and Physical Education, 2010).

Table 2. Criteria for Category Physical Activity (IPAQ)Table

Number	Category	Criteria
1	Low	<ul style="list-style-type: none"> ▪ No activity is reported OR ▪ Some activity is reported but not enough to meet Categories 2 or 3
2	Moderate	<ul style="list-style-type: none"> ▪ 3 or more days of vigorous activity of at least 20 minutes per day OR ▪ 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day OR ▪ 5 or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-minutes/week.
3	High	<ul style="list-style-type: none"> ▪ vigorous-intensity activity on at least 3 days achieving a minimum Total physical activity of at least 1500 MET-minutes/week OR ▪ 7 or more days of any combination of walking, moderate- or vigorous-intensity activities accumulating at least 3000 MET-minutes/week

Data is collected through three instruments and data processing using SPSS 21.

RESULT

The results showed physical activity with fundamental movement skills in low economic families. The following table shows the results of each variable:

Table 3. Description of data on Sex Differences, Basic Motion Skills and Physical Activity

Variable	Sum			Man			Women		
	n	Average	Inequality	n	Average	Inequality	n	Average	Inequality
Family Income	32	Rp. 23.562,5	Rp. 5417,63	-	-	-	-	-	-
Background	32	9,93	0,38	19	9,87	0,35	13	10,03	0,40
Age	32	13,85	0,71		13,77	0,63		13,98	0,79
BMI									
Basic Motion	32	71,61	5,59	19	69,74	4,99	13	74,58	5,19
Physical Activity (IPAQ)	32	595,52 Mets/Week	73,14	19	612,89 Mets/Week	70,25	13	568,00 Mets/Week	69,09

Table 3 shows a description of the children's data in low-income families. Children in low-income families have an average age of ± 9.93

years with an average age of men ± 9.87 years and women ± 10.03 years. Table 3 shows a description of the children's data in low-income families. Children in low-income families have an average age of ± 9.93 years with an average age of men ± 9.87 years and women ± 10.03 years. In addition, the Body Mass Index shows 13.85, which means that all children are at an "underweight" weight condition. In addition, the average boy showed 13.77 and girls 13.98. The results of basic motion skills showed 71.61, which means the fundamental movement skills of children in families are not able to be in the category of "less" in both men (69.74) and women (74.58). Similarly, physical activity measured through the IPAQ Instrument showed a 595.52 Mets / week, which is a low category. However, the average in boys showed 612.89 Mets/week of "moderate" activity. In contrast, women who showed 568.00 Mets / week have a category of "low."

DISCUSSION

The results showed that the whole children did not have a difference that was too far in the Body Mass Index. They tend to have underweight weight. Less activity and nutritional intake make children in low-income families less likely to be thin. According to (Devi, 2010) parents' type of work and education is the dominant factor with nutritional status this occurs in low-income communities. In addition, (Kasumayanti et al., 2020) Indonesians who tend to be substandard become one of the triggers of malnutrition, and the poor experience it the most. (Sebataraja, Oenzil, & Asterina, 2014). The nutritional status of children is also related to the family's economic level, the level of education of the father and mother, and the number of children in the family. The socio-ecological correlations associated with a child's basic motion skills are multidimensional and differ by skill category at the child, family, and environmental level (Zeng, Johnson, Boles, & Bellows, 2019b). Using a meta-analysis, this study is the first to show a positive relationship between basic motion skills, moderate-to-vigorous physical activity (MVPA), and total physical activity (TPA) in the early years of childhood, suggesting that the relationship begins at an early age (Jones et al., 2020). Research (Syifa Pramudita Faddila, Laras Ratu

[Khalida, Uus Mohammad Darul Fadli, & Aji Tuhagana, 2020](#)) shows that almost 1/4 of children aged 10-12 years in Indonesia are in families with more than enough socioeconomics. This shows that is one of the factors that cause children in low-income families to tend to be thin.

Furthermore, children's fundamental movement skills in low-income families have fewer basic movement skills. The results showed 71.61 who were in the lesser category. This happens because, although all children benefit from participating in physical design activities in school, children in low socioeconomic populations may have soft motor skills. This occurs because every child will benefit from a physical activity done in school. However, children in a low economy may have low motor skills. This is due to their opportunity to participate in sports and recreational activities before and after school ([Lampard, Jurkowski, Lawson, & Davison, 2013](#)). ([Morley, Till, Ogilvie, & Turner, 2015](#)) reveals that social status affects motor skills. High socioeconomic status generally has high motor skills compared to low socioeconomic status. Early childhood development is influenced by various factors, including the socio-economic status of parents, playgrounds both in school and the community environment ([Stephan, Sumarno, & Wibowo, 2018](#)).

The average physical activity in boys showed 612.89 Mets/week in "moderate" activity. Moderate activity in question is boys doing 5 days or more with a combination of physical activity walking, moderate-intensity activity, or vigorous-intensity that reaches at least 600 Mets / week. This happens because boys play more than girls, who show 568.00ets / week in the category of "low." This means that girls do not do a physical activity but do not reach ipaq categories level 1 and 2 (see table 2). Women tend to be more passive and only do homework. Adolescent boys are more motivated to participate in organized physical activity due to psychological factors (feelings of pleasure, interest, and want to be fit) and social factors (support of family or friends); While women are more interested in disorganized physical activity due to psychological factors alone (interest, want to be fit, and without competition) ([Lerner, Burns, & de Róiste, 2011](#)). Adolescent

boys' participation is more dominant than women's in physical activity. This happens because teenage boys have more motives. In line with the results of research that shows that girls who have "low" results. In line with the results of research that shows that girls who have "low" results. (Balaban, 2018) showed a low to moderate correlation between moderate to vigorous physical activity and locomotor motor skills among the total sample and between vigorous physical activity and object control skills in a sample of boys. This is in line with the research results that show boys tend to have higher basic movement skills.

The study results (Grant, Young, & Wu, 2015) showed that physical activity in girls tends to be less, so it needs further treatment. Individual, social, and school variables are the most prominent things to include in physical activity interventions for adolescent girls. Boys' physical activity has a high category when compared to girls. This lack of physical activity results in less basic movement skills in girls. (Kokštejn, Musálek, & Tufano, 2017) Explains that environmental and socio-cultural factors in preschool boys generally outperform girls in terms of fundamental movement skills. Girls spend more time in language skills, literacy, art, and fine motor activities. While boys in a number of different ball games and gross motor activities. (Ahmed, Ho, Al-Haramlah, & Mataruna-Dos-Santos, 2020) They found significant differences between gender in fitness, health factors, and social status. This shows that boys have a higher physical activity level than girls. In addition, (Raswin, 2014) suggested that the culture of a society in Indonesia tends to educate girls with different treatment from men. as reflected in the pattern of upbringing in the family environment. This treatment reached the general public. This is one of the causes of women having low physical activity.

The limitation in this study is that there are still at least participants involved in the study because it is still in the Covid-19 pandemic. In addition, this study has not been directly linked between socioeconomic and fundamental movement skills. Future research is expected to reveal the impact of socioeconomic, physical activity on fundamental movement skills

directly and the design of activities tailored to the economic level so that all circles' basic movement skills are evenly distributed.

CONCLUSION

The results showed that children in low-income families tend to have a thin body mass index (underweight), and fundamental movement skills are lacking. However, in this study, boys had moderate physical activity, and girls had low physical activity. Physical activity programs need to be designed by schools to improve physical activity and fundamental movement skills, especially for children in low-income families. In addition, the role of schools and parents is also needed in improving the basic movement and physical activity of children. It is seen that children in low-income families tend to have a deficiency in the body mass index, basic skills related to physical activity that tends to moderate downward.

REFERENCE

- Ahmed, M. D., Ho, W. K. Y., Al-Haramlah, A., & Mataruna-Dos-Santos, L. J. (2020). Motivation to participate in physical activity and sports: Age transition and gender differences among India's adolescents. *Cogent Psychology*, 7(1). <https://doi.org/10.1080/23311908.2020.1798633>
- Alvara Research Center. (2017). Jumlah Kelas Menengah Indonesia 2016. Retrieved from <https://alvara-strategic.com/data-talk-jumlah-kelas-menengah-indonesia-2016/>
- Amini, M. (2021). The Effect of Socio-Economic Status on Food Quality in West of Iran. *Rewsearch Square*. <https://doi.org/DOI:https://doi.org/10.21203/rs.3.rs-141402/v1>
- Anita, & Myrnawati. (2016). Pengaruh Pengetahuan Gizi, Status Sosial Ekonomi, Gaya Hidup Dan Pola Makan Terhadap Status Gizi Anak. *Jurnal Pendidikan Usia Dini*, 10(2), 213–232.
- Antoni, R., & Bakhtiar, S. (2019). Hubungan Status Gizi Terhadap Keterampilan Gerak Dasar Lokomotor di Sekolah Dasar. *Jurnal JPDO*, 2(8), 21–27.
- Astuti, R. K., & Irdawati. (2011). Hubungan Antara Status Sosial Ekonomi Keluarga Dengan Status Gizi Anak Usia Sekolah Di SDN Godog I. *Publikasi Ilmiah Universitas Muhammadiyah Surakarta (UMS)*, 4(2), 104–113. Retrieved from <https://publikasiilmiah.ums.ac.id/handle/11617/3630>
- Balaban, V. (2018). The Relationship between Objectively Measured

- Physical Activity and Fundamental Motor Skills in 8 to 11 Years Old Children from the Czech Republic. *Montenegrin Journal of Sports Science and Medicine*, 7(2), 1–6. <https://doi.org/10.26773/mjssm.180902>
- Bryant, E. S., Duncan, M. J., & Birch, S. L. (2014). Fundamental movement skills and weight status in British primary school children. *European Journal of Sport Science*, 14(7), 730–736. <https://doi.org/10.1080/17461391.2013.870232>
- Cleland, C., Ferguson, S., Ellis, G., & Hunter, R. F. (2018). Validity of the International Physical Activity Questionnaire (IPAQ) for assessing moderate-to-vigorous physical activity and sedentary behaviour of older adults in the United Kingdom. *BMC Medical Research Methodology*, 18(1), 1–12. <https://doi.org/10.1186/s12874-018-0642-3>
- Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., ... Oja, P. (2003). International physical activity questionnaire: 12-Country reliability and validity. *Medicine and Science in Sports and Exercise*, 35(8), 1381–1395. <https://doi.org/10.1249/01.MSS.0000078924.61453.FB>
- Devi, M. (2010). Analisis Faktor-Faktor yang Berpengaruh terhadap Status Gizi Balita di Pedesaan. *Teknologi Dan Kejuruan*, 19(3), 420–423. <https://doi.org/10.1590/s0101-20611999000300022>
- French, S. A., Tangney, C. C., Crane, M. M., Wang, Y., & Appelhans, B. M. (2019). Nutrition quality of food purchases varies by household income: The SHoPPER study. *BMC Public Health*, 19(1), 1–7. <https://doi.org/10.1186/s12889-019-6546-2>
- Gallahue, D. L., Ozmun, J. C., & Goodway, J. D. (2012). *Understanding motor development: Infants, children, adolescents, adults* (7th ed.). McGraw-Hill.
- Grant, E. M., Young, D. R., & Wu, T. T. (2015). Predictors for physical activity in adolescent girls using statistical shrinkage techniques for hierarchical longitudinal mixed effects models. *PLoS ONE*, 10(4), 1–15. <https://doi.org/10.1371/journal.pone.0125431>
- Gu, X. (2016). Fundamental motor skill, physical activity, and sedentary behavior in socioeconomically disadvantaged kindergarteners. *Psychology, Health and Medicine*, 21(7), 871–881. <https://doi.org/10.1080/13548506.2015.1125007>
- Hardy, L. L., Espinel, P., Reinten-Reynolds, T., Zask, A., & Okely, A. D. (2012). Prevalence and Correlates of Low Fundamental Movement Skill Competency in Children. *Pediatrics*, 130(2), e390–e398. <https://doi.org/10.1542/peds.2012-0345>
- Helina, S. (2016). Hubungan Status Gizi Dengan Pola Asuh Dan Sosial Ekonomi Keluarga Balita Di Puskesmas Kecamatan Padang Utara. *Jurnal Ibu Dan Anak*, 1(2). Retrieved from <http://jurnal.pkr.ac.id/index.php/JIA/article/view/3>

- livonen, S., & Sääkslahti, A. K. (2014). Preschool children's fundamental motor skills: A review of significant determinants. *Early Child Development and Care*, 184(7), 1107–1126. <https://doi.org/10.1080/03004430.2013.837897>
- IPAQ. (2005). Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ).
- Jones, D., Innerd, A., Giles, E. L., & Azevedo, L. B. (2020). Association between fundamental motor skills and physical activity in the early years: A systematic review and meta-analysis. *Journal of Sport and Health Science*, 9(6), 542–552. <https://doi.org/10.1016/j.jshs.2020.03.001>
- Kasumayanti, E., Aulia, M., Studi, P., Keperawatan, S., Pahlawan, U., & Tambusai, T. (2020). Hubungan Pendapatan Keluarga Dengan Status Gizi Balita Di Desa Tambang Wilayah Kerja Puskesmas Tambang Kabupaten Kampar Tahun 2019. *Jurnal Ners*, 4(1), 7–12. Retrieved from <http://journal.universitaspahlawan.ac.id/index.php/ners>
- Kokštejn, J., Musálek, M., & Tufano, J. J. (2017). Are sex differences in fundamental motor skills uniform throughout the entire preschool period? *PLoS ONE*, 12(4), 1–10. <https://doi.org/10.1371/journal.pone.0176556>
- Lampard, A. M., Jurkowski, J. M., Lawson, H. A., & Davison, K. K. (2013). Family ecological predictors of physical activity parenting in low-income families. *Behavioral Medicine*, 39(4), 97–103. <https://doi.org/10.1080/08964289.2013.802215>
- Lerner, J., Burns, C., & de Róiste, Á. (2011). Correlates of Physical Activity among College Students. *Recreational Sports Journal*, 35(2), 95–106. <https://doi.org/10.1123/rsj.35.2.95>
- Martin, P., & McCullagh, J. (2011). Physical education & outdoor education: Complementary but discrete disciplines. *Asia-Pacific Journal of Health, Sport and Physical Education*, 2(1), 67–78. <https://doi.org/10.1080/18377122.2011.9730344>
- Morley, D., Till, K., Ogilvie, P., & Turner, G. (2015). Influences of gender and socioeconomic status on the motor proficiency of children in the UK. *Human Movement Science*, 44, 150–156. <https://doi.org/10.1016/j.humov.2015.08.022>
- Raswin. (2014). Perbandingan perempuan dalam olahraga di Indonesia dengan negara Colombia. *Jurnal Ilmu Keolahragaan*, 13(2), 38–44.
- Sebataraja, L. R., Oenzil, F., & Asterina, A. (2014). Hubungan Status Gizi dengan Status Sosial Ekonomi Keluarga Murid Sekolah Dasar di Daerah Pusat dan Pinggiran Kota Padang Lisbet Rimelfhi Sebataraja. *Jurnal Kesehatan Andalas*, 3(2), 182–187. <https://doi.org/10.25077/jka.v3i2.81>
- Shariff, Z. M., Lin, K. G., Sariman, S., Lee, H. S., Siew, C. Y., Yusof, B. N.

- M., ... Mohamad, M. (2015). The relationship between household income and dietary intakes of 1-10 year old urban Malaysian. *Nutrition Research and Practice*, 9(3), 278–287. <https://doi.org/10.4162/nrp.2015.9.3.278>
- Stephan, M. R., Sumarno, Ig., & Wibowo, R. (2018). Early Childhood Motor Development and Parent Socio-economic Status. *Jurnal Pendidikan Jasmani Olahraga*, 3(1), 122–128. Retrieved from <http://ejournal.upi.edu/index.php/penjas/index>
- 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>
- Syifa Pramudita Faddila, Laras Ratu Khalida, Uus Mohammad Darul Fadli, & Aji Tuhagana. (2020). Peran Sosial Ekonomi Keluarga Dalam Menanggulangi Kesehatan Anak Di Indonesia. *Jurnal Manajemen & Bisnis Kreatif*, 6(1), 59–71. <https://doi.org/10.36805/manajemen.v6i1.1189>
- The International Council of Sport Science and Physical Education. (2010). *International Position Statement on Physical Education*.
- Tompuri, T. T. (2015). Metabolic equivalents of task are confounded by adiposity, which disturbs objective measurement of physical activity. *Frontiers in Physiology*, 6(Aug), 1–6. <https://doi.org/10.3389/fphys.2015.00226>
- Ulrick, D. A. (2000). *Test of Gross Motor Development 2*.
- Vidoni, C., & Ignico, A. (2011). Promoting physical activity during early childhood. *Early Child Development and Care*, 181(9), 1261–1269. <https://doi.org/10.1080/03004430.2010.523786>
- Williams, B.-L., Temple, V. A., Bell, R. I., Greyling, L., Naylor, P.-J., LeGear, M., & Sloan, E. (2012). A window of opportunity? Motor skills and perceptions of competence of children in Kindergarten. *International Journal of Behavioral Nutrition and Physical Activity*, 9(1), 29. <https://doi.org/10.1186/1479-5868-9-29>
- Zeng, N., Johnson, S. L., Boles, R. E., & Bellows, L. L. (2019a). Social-ecological correlates of fundamental movement skills in young children. *Journal of Sport and Health Science*, 00. <https://doi.org/10.1016/j.jshs.2019.01.001>
- Zeng, N., Johnson, S. L., Boles, R. E., & Bellows, L. L. (2019b). Social-ecological correlates of fundamental movement skills in young children. *Journal of Sport and Health Science*, 8(2), 122–129. <https://doi.org/10.1016/j.jshs.2019.01.001>