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A Study on the Analysis of Fundamental Motor Skills and Physical Activity Among Elementary School Students

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ABSTRACT

Elementary school students gross motor skills and physical activity are crucial in shaping healthy lifestyles and children's physical development. Purpose: To describe gross motor skills and physical activity and ascertain the relationship between these variables. The research design employed in this study is an analytical observational approach utilizing a cross-sectional method. It involved 128 students selected through purposive sampling. The instruments used were (1) a gross motor skills assessment tool with a CVR value of 1, construct validity of 1, and reliability tested via test-retest method yielding α=0.708, and (2) the Physical Activity Questionnaire for Older Children (PAQ-C) with a reliability test result of α=0.84. Data analysis was conducted using descriptive techniques with percentages and Pearson correlation tests. There is a significant relationship between gross motor skills and physical activity variables. The value of (p) is 0.000 < 0.05. The correlation coefficient (r) of 0.682 > 0.176 indicates a strong relationship between the two variables. This study elucidates a significant relationship between gross motor skills and physical activity among elementary school students. These findings provide an essential impetus for teachers and parents to enhance their attention to children's physical fitness. Intervention measures targeting the enhancement of physical activity and the development of gross motor skills should be prioritized

Keywords: Fundamental motor skills; physical activity; elementary school

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INTRODUCTION

Elementary school students' gross motor skills and physical activity are crucial in shaping healthy lifestyles and children's physical development (Abdullah & Amri, 2018; Bolger et al., 2021). This phenomenon has garnered increasing attention, particularly regarding children's fitness. It is well-established that adequate physical activity among elementary school students significantly contributes to physical health, body mass index, mental well-being, and gross motor development (Movia et al., 2022; Piñeiro-Cossio et al., 2021; Weiss, 2020; Wibowo et al., 2022). Gross motor skills, encompassing abilities such as running, jumping, and throwing, enable children to participate actively in various physical activities and sports (Dapp et al., 2021; Sari & Izzah, 2021). Despite extensive research in this field, the general populace does not fully understand aspects.

One phenomenon widely acknowledged is the modern lifestyle trend leading to decreased physical activity levels among elementary school students (Nugraheni et al., 2021). Children spend more time indoors and are less engaged in active physical activities with the increasing use of technology, such as gadgets and social media. This

has been associated with an increased risk of health problems, such as obesity and heart disease, and a decline in gross motor skills among children (Anderson & Durstine, 2019; Hamer & Stamatakis, 2013; O'Brien et al., 2018). Furthermore, environmental factors, such as inadequate sports facilities in schools or surrounding communities, can also pose barriers to adequate physical activity participation (Elfina, 2022; Haydarov et al., 2020; Wibowo et al., 2023). Although many findings exist regarding the relationship between physical activity and gross motor skills among elementary school students, there are still aspects not fully understood. For example, further research is needed to understand how specific factors, such as social and cultural environments, the influence of modern technology, and school policies related to physical education, affect physical activity and the development of gross motor skills in children. Additionally, more in-depth research is required to understand the complex relationship between physical activity and gross motor skills and the potential moderating role of other variables, such as age and gender.

The issues of physical activity and gross motor skills among elementary school students have significant long-term implications for children's health and well-being (Barghchi et al., 2009; Haydarov et al., 2020; Siswanto & Hidayati, 2020). This problem impacts physical health and can affect other aspects of children's development, such as their social and emotional abilities (Bidzan-Bluma & Lipowska, 2018). The lack of physical activity at an early age can also shape unhealthy behavior patterns and increase the risk of chronic diseases (Bertuol et al., 2022). Therefore, it is crucial to understand the interplay between physical activity and gross motor skills and identify effective intervention strategies to address these issues.

Based on the preliminary study conducted in Salatiga, many elementary school students still need more motor skills, and no specific monitoring is related to their gross motor skills. A similar situation exists regarding the level of physical activity and the selection of Salatiga, which are several strong reasons influencing the research location. Firstly, Salatiga is a representative city with a diverse population of elementary school students. This allows researchers to obtain a representative sample and generalize findings to a broader population. Additionally, Salatiga also presents a variety of environmental, social, and economic conditions that enable the study of the influence of these variables on physical activity and gross motor skills.

Furthermore, collaboration with relevant stakeholders in Salatiga can facilitate the data collection and provide better access to facilities and resources needed for the research. The research problem of this study is to investigate the gross motor skills and level of physical activity among elementary school students in Salatiga, as well as to understand the relationship between these two variables. The main objective of this research is to describe gross motor skills and physical activity and to determine the relationship between gross motor skills variables and physical activity among elementary school students.

METHOD

The type of research used to describe and determine the relationship between gross motor skills and physical activity variables is observational analytical with a cross-sectional approach. This study involved two elementary schools in Salatiga, comprising students from grades 1 to 3, with 128 respondents. The sampling technique employed purposive sampling, with inclusion criteria being elementary school students from

grades 1 to 3, having a healthy physical condition and willing to participate as research subjects. The exclusion criteria included students willing to be respondents, attending school, and not sick. The instruments used in this study were (1) a gross motor skills instrument specifically designed for elementary school students in grades 1 to 3, with an age classification of 7-9 years. The instrument consisted of 11 motion components with a content validity ratio (CVR) of 1, a total construct validity of 1, and a reliability of 0.708 using the test-retest method. (2) The Physical Activity Questionnaire for Older Children (PAQ-C) (Kowalski et al., 1997).

The instrument was adapted to the characteristics of elementary school students with a reliability test result of α = 0.84. Data collection was conducted by testing the gross motor skills of each student who became a research subject. Afterward, students were guided to fill out the PAQ-C questionnaire with the assistance of teachers after the purpose and method of filling out the questionnaire with nine questions were thoroughly explained. The data analysis technique in this study used descriptive analysis with percentages and Pearson correlation tests to examine the relationship between variables.

RESULTS

The data interpretation in this research outcome comprises a description of the percentage distribution of fundamental motor skills and the level of physical activity among elementary school students, as well as the presentation of data regarding the relationship between the two variables. These data can be observed in the following table:

Table 1. Frequency Distribution of Gross Motor Skills

Category	Amount	Percentage
Very poor	12	9,3%
poor	60	46,8%
Fair	35	27,3%
Good	14	10,9%
Excellent	7	5,4%

In the category of physical activity and gross motor skills among elementary school students, the assessment results indicate that most students received assessments in the "Poor" and "Very Poor" categories, with percentages of 46.8% and 9.3%, respectively. This indicates that most students have levels of physical activity and gross motor skills that still need improvement. Additionally, some students received assessments in the "Fair" category, with a 27.3% percentage indicating relatively good progress but still requiring further improvement. As for the "Good" and "Excellent" categories, the number of students receiving these assessments is relatively small, at 10.9% and 5.4% respectively. This suggests that only a tiny proportion of students have levels of physical activity and gross motor skills that are already good or very good. Therefore, these results indicate the need for more attention to improving elementary school students' physical activity and gross motor skills.

Table 2. Frequency Distribution of Physical Activity

Category	Amount	Percentage
Very poor	17	13,2%
poor	48	37,5%
Fair	43	33,5%
Good	12	9,3%
Excellent	8	6,2%

In assessing physical activity among elementary school students, the data indicates that most students received assessments in the "Poor" and "Very Poor" categories, with percentages of 37.5% and 13.2%, respectively. This suggests that most students have levels of physical activity and gross motor skills that still need improvement. Additionally, some students received assessments in the "Fair" category, with a 33.5% percentage indicating reasonable progress but still requiring further attention. As for the "Good" and "Excellent" categories, the number of students receiving these assessments is tiny, at 9.3% and 6.2%, respectively. This indicates that only a tiny proportion of students have reached a level of physical activity and gross motor skills that are considered good or excellent. Consequently, these findings underscore the importance of education and interventions to enhance elementary school students' physical activity and gross motor skills.

Table 3. Pearson Correlation Test

Variable	Physical activity
Gross motor skills	p = 0,000
	r = 0,682

Based on the results of the statistical analysis, there is a significant relationship between the variables of gross motor skills and physical activity among the research subjects. The significance value (p) obtained is 0.000 < 0.05, indicating that this relationship is not by chance. Furthermore, the correlation coefficient (r) of 0.682 > 0.176 indicates a strong relationship between these two variables. Thus, these findings affirm that the better the gross motor skills, the higher the physical activity participation among the research subjects, and vice versa. Therefore, educators and parents must recognize the importance of physical activity in fostering the development of gross motor skills among elementary school students as fundamental to a healthy lifestyle.

DISCUSSION

Discussing these research findings highlights several crucial insights regarding elementary school students' gross motor skills and physical activity. The data indicate that most students are assessed to have levels of physical activity and gross motor skills that still need improvement. These results align with previous research indicating a low prevalence of physical activity and insufficient gross motor skills among children in various countries (Guthold et al., 2018, 2020). Only a tiny percentage of children worldwide meet the daily physical activity recommendations set by the World Health Organization. Furthermore, the correlation analysis results show a significant relationship between gross motor skills and physical activity among elementary school students. These findings support previous research indicating that better gross motor

skills correlate positively with higher physical activity levels in children (Field & Temple, 2017; Laukkanen et al., 2014).

The research findings indicate that children with better gross motor skills tend to be more physically active than those with lower motor skills (Barnett et al., 2016). Although the relationship between physical activity and gross motor skills has been confirmed, further research is needed to understand the mechanisms and influencing factors. The results suggest that factors such as the physical environment, genetics, and motor experiences may play a crucial role in the development of gross motor skills in children (Barnett et al., 2019; Özal et al., 2020). From a practical standpoint, these research findings have significant implications for educators, parents, and policymakers in efforts to enhance elementary school students' physical health and gross motor development. Intervention measures to improve physical activity and gross motor skill development should be prioritized within school and community environments. Additionally, integrating fun and physically oriented educational programs into school curricula can help enhance student participation in physical activities. Through collaboration among educators, parents, and communities, it is hoped that supportive environments for children's overall physical development and health can be fostered.

While this research provides valuable insights into the relationship between physical activity and gross motor skills among elementary school students, several limitations must be considered. Firstly, the study was conducted with a limited sample size, focusing only on elementary school students in Salatiga. Hence, the findings must be more generalizable to the broader population of elementary school students. As a result, the generalization of these findings should be approached cautiously, considering the diversity that may exist among student populations elsewhere. Secondly, subjective measurement methods in assessing physical activity and gross motor skills, such as questionnaires and teacher assessments, may introduce observer and evaluation biases. Although efforts have been made to minimize bias using instruments with established reliability, there may still be variability among raters that could affect the research outcomes.

Furthermore, as this study is cross-sectional, it is impossible to conclude the cause-effect relationship between physical activity and gross motor skills. To further understand the dynamics of the relationship between these variables, longitudinal or experimental research may be needed to explore the impact of interventions or changes in physical activity on the development of gross motor skills. Additionally, despite efforts to control for variables that may influence research outcomes, unidentified factors could affect the relationship between physical activity and gross motor skills. For example, environmental factors, dietary habits, or levels of physical activity outside of school may significantly influence the research outcomes. Finally, this study only examines the relationship between two variables, namely physical activity and gross motor skills, without considering other factors that may contribute to students' physical health and gross motor development. Therefore, for a more comprehensive understanding, further research could expand the scope of examined variables and consider broader factors.

CONCLUSION

This study elucidates a significant relationship between gross motor skills and physical activity among elementary school students. Although most students were assessed to have gross motor skills and physical activity levels that need improvement, these findings provide an essential impetus for teachers and parents to enhance their attention to children's physical fitness. Intervention measures targeting the enhancement of physical activity and the development of gross motor skills should be prioritized.

CONFLICT OF INTEREST

The autors declare no conflifct of interest

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REFERENCES

Abdullah, B., & Amri, S. (2018). Effects of Traditional Games on Age Equivalent Scores of Locomotor and Manipulative Skills among Early Stage School Children. *International Journal of Academic Research in Business and Social Sciences*, *8*(12). https://doi.org/10.6007/IJARBSS/v8-i12/5001

Anderson, E., & Durstine, J. L. (2019). Physical activity, exercise, and chronic diseases: A brief review. *Sports Medicine and Health Science*, *1*(1), 3–10. https://doi.org/10.1016/j.smhs.2019.08.006

Barghchi, M., Bt Omar, D., & Salleh Ama, M. (2009). Sports Facilities Development and Urban Generation. *Journal of Social Sciences*, *5*(4), 460–465. https://doi.org/10.3844/jssp.2009.460.465

Barnett, L. M., Hnatiuk, J. A., Salmon, J., & Hesketh, K. D. (2019). Modifiable factors which predict children's gross motor competence: a prospective cohort study. *International Journal of Behavioral Nutrition and Physical Activity*, *16*(1), 129. https://doi.org/10.1186/s12966-019-0888-0

Barnett, L. M., Lai, S. K., Veldman, S. L. C., Hardy, L. L., Cliff, D. P., Morgan, P. J., Zask, A., Lubans, D. R., Shultz, S. P., Ridgers, N. D., Rush, E., Brown, H. L., & Okely, A. D. (2016). Correlates of Gross Motor Competence in Children and Adolescents: A Systematic Review and Meta-Analysis. *Sports Medicine*, *46*(11), 1663–1688. https://doi.org/10.1007/s40279-016-0495-z

Bertuol, C., Tozetto, W. R., Streb, A. R., & Del Duca, G. F. (2022). Combined relationship of physical inactivity and sedentary behaviour with the prevalence of noncommunicable chronic diseases: data from 52,675 Brazilian adults and elderly. *European Journal of Sport Science*, *22*(4), 617–626. https://doi.org/10.1080/17461391.2021.1880646

Bidzan-Bluma, I., & Lipowska, M. (2018). Physical Activity and Cognitive Functioning of Children: A Systematic Review. *International Journal of Environmental Research and Public Health*, *15*(4), 800. https://doi.org/10.3390/ijerph15040800

Bolger, L. E., Bolger, L. A., O'Neill, C., Coughlan, E., O'Brien, W., Lacey, S., Burns, C., & Bardid, F. (2021). Global levels of fundamental motor skills in children: A systematic review. *Journal of Sports Sciences*, *39*(7), 717–753. https://doi.org/10.1080/02640414.2020.1841405

Dapp, L. C., Gashaj, V., & Roebers, C. M. (2021). Physical activity and motor skills in children: A differentiated approach. *Psychology of Sport and Exercise*, *54*, 101916. https://doi.org/10.1016/j.psychsport.2021.101916

Elfina, E. (2022). Enrichment: Journal of Management is Licensed under a Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0) Enrichment: Journal of Management The Importance of Facilities and Infrastructure Management in School. In *Enrichment: Journal of Management* (Vol. 12, Issue 2).

Field, S., & Temple, V. (2017). The Relationship between Fundamental Motor Skill Proficiency and Participation in Organized Sports and Active Recreation in Middle Childhood. *Sports*, *5*(2), 43. https://doi.org/10.3390/sports5020043

Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2018). Worldwide trends in insufficient physical activity from 2001 to 2016: a pooled analysis of 358 population-based surveys with 1·9 million participants. *The Lancet Global Health*, *6*(10), e1077–e1086. https://doi.org/10.1016/S2214-109X(18)30357-7

Guthold, R., Stevens, G. A., Riley, L. M., & Bull, F. C. (2020). Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1·6 million participants. *The Lancet Child & Adolescent Health*, *4*(1), 23–35. https://doi.org/10.1016/S2352-4642(19)30323-2

Hamer, M., & Stamatakis, E. (2013). Screen-Based Sedentary Behavior, Physical Activity, and Muscle Strength in the English Longitudinal Study of Ageing. *PLoS ONE*, *8*(6), e66222. https://doi.org/10.1371/journal.pone.0066222

Haydarov, N. H., Azimov, B. F., & Halimov, F. E. (2020). *Increasing The Efficiency Of Using Sports Facilities Of Educational Institutions Of Sports*. 459–465. https://doi.org/10.15405/epsbs.2020.10.03.52

Kowalski, K. C., Crocker, P. R. E., & Faulkner, R. A. (1997). Validation of the Physical Activity Questionnaire for Older Children. *Pediatric Exercise Science*, *9*(2), 174–186. https://doi.org/10.1123/pes.9.2.174

Laukkanen, A., Pesola, A., Havu, M., Sääkslahti, A., & Finni, T. (2014). Relationship between habitual physical activity and gross motor skills is multifaceted in 5- to 8-year-old children. *Scandinavian Journal of Medicine & Science in Sports*, *24*(2). https://doi.org/10.1111/sms.12116

Movia, M., Macher, S., Antony, G., Zeuschner, V., Wamprechtsamer, G., delle Grazie, J., Simi, H., & Fuchs-Neuhold, B. (2022). Health Impact Assessment (HIA) of a Daily Physical Activity Unit in Schools: Focus on Children and Adolescents in Austria Up to the 8th Grade. *International Journal of Environmental Research and Public Health*, *19*(11), 6428. https://doi.org/10.3390/ijerph19116428

Nugraheni, H., Murwani, R., Shaluhiyah, Z., & Widjanarko, B. (2021). Physical activity and sedentary life of students. *Annals of Tropical Medicine & Public Health*, *24*(01). https://doi.org/10.36295/ASRO.2021.24155

O'Brien, W., Issartel, J., & Belton, S. (2018). Relationship between Physical Activity, Screen Time and Weight Status among Young Adolescents. *Sports*, *6*(3), 57. https://doi.org/10.3390/sports6030057

Özal, C., Bayoğlu, B., Karahan, S., Günel, M. K., & Anlar, B. (2020). Gross motor development of preschool children: effects of socioeconomic status and maternal education. *The Turkish Journal of Pediatrics*, *62*(1), 10. https://doi.org/10.24953/turkjped.2020.01.002

Piñeiro-Cossio, J., Fernández-Martínez, A., Nuviala, A., & Pérez-Ordás, R. (2021). Psychological Wellbeing in Physical Education and School Sports: A Systematic Review. *International Journal of Environmental Research and Public Health*, *18*(3), 864. https://doi.org/10.3390/ijerph18030864

Sari, E. P., & Izzah, O. N. (2021). The improvement of gross motor development on pre-school through playing throw and catch ball. *Nurse and Holistic Care*, *1*(1), 7–13. https://doi.org/10.33086/nhc.v1i1.2002

Siswanto, E., & Hidayati, D. (2020). Management indicators of good infrastructure facilities to improve school quality. *International Journal of Educational Management and Innovation*, *1*(1), 69. https://doi.org/10.12928/ijemi.v1i1.1516

Weiss, M. R. (2020). Motor Skill Development and Youth Physical Activity: A Social Psychological Perspective. *Journal of Motor Learning and Development*, *8*(2), 315–344. https://doi.org/10.1123/jmld.2020-0009

Wibowo, C., Messakh, S. T., & Tarigan, R. A. (2023). The meaning of recreational sports for modern society as a lifestyle to stay active and fit. *Journal Of Sport Education (JOPE)*, *6*(1), 1. https://doi.org/10.31258/jope.6.1.1-18

Wibowo, C., Triandhini, R. R., Setiawan, R., & Nopiyanto, Y. E. (2022). The relationship between physical activity and diet on Body Mass Index of elementary school students. *Altius: Jurnal Ilmu Olahraga Dan Kesehatan*, *11*(2), 241–252. https://doi.org/10.36706/altius.v11i2.19068