Jurnal Pendidikan Jasmani Indonesia
Volume 22, Issue 1, 2026, 13-23
Available online: https://journal.uny.ac.id/index.php/jpji

The influence of physical fitness degree and understanding of the concept of fitness on the quality of physical education sports and health learning

Jonas Solissa[1], **Yellia Tomasoa**[1*], **Mariana Ditboya Hukubun**[1], **Vicktor H R Apitulley**[1], **Tedi Purbangkara**[2]

[1] Faculty of Teacher Training and Education, Pattimura University, Indonesia,
[2] Faculty of Teacher Training and Education, Singaperbangsa University, Indonesia
*Corresponding Author. Email: yelliatomasoa9@gmail.com

Received: 4 September 2025; Revised: 27 December 2025; Accepted: 8 January 2026

Abstrak: Penelitian ini bertujuan untuk menganalisis pengaruh derajat kebugaran jasmani dan pemahaman konsep kebugaran jasmani terhadap mutu pembelajaran pendidikan jasmani, olahraga, dan kesehatan (PJOK). Penelitian ini menggunakan pendekatan kuantitatif dengan metode survei dan desain korelasional. Penelitian resimental pendidikan jasmani ini menggunakan desain korelasi ganda. Derajat kebugaran jasmani diukur menggunakan tes lari 12 menit (Cooper Test), pemahaman konsep kebugaran jasmani diukur melalui angket, dan mutu pembelajaran PJOK diukur melalui angket siswa. Sampel dalam penelitian ini adalah guru pendidikan jasmani di sekolah menengah pertama dan 30 siswa yang diambil secara acak. Di Kota Ambon, 30 siswa diambil dengan teknik analisis data purposive sampling menggunakan analisis regresi berganda. Hasil penelitian menunjukkan bahwa derajat kebugaran jasmani berpengaruh signifikan terhadap mutu pembelajaran PJOK ($F = 7{,}945$; $t = 2{,}819$; $p = 0{,}009$; $R^2 = 0{,}221$). Sebaliknya, pemahaman konsep kebugaran jasmani tidak berpengaruh signifikan terhadap mutu pembelajaran PJOK ($t = 0{,}535$; $p = 0{,}597$). Kesimpulan penelitian ini menunjukkan bahwa kebugaran jasmani guru berperan penting dalam meningkatkan mutu pembelajaran PJOK, sedangkan pemahaman konsep kebugaran jasmani belum menunjukkan pengaruh yang signifikan.
Kata kunci: Derajat kebugaran, Pemahaman konsep, Kualitas pembelajaran.

Abstract: *This study aims to analyze the influence of physical fitness level and understanding of physical fitness concepts on the quality of learning in physical education, sports, and health (PJOK). This study employs a quantitative approach, utilizing a survey method and correlational design. This physical education regimen study uses a multiple correlation design. The level of physical fitness was assessed using a 12-minute run test (Cooper Test). Understanding of physical fitness concepts was measured through a questionnaire, and the quality of PJOK learning was evaluated through a student questionnaire. The sample in this study consisted of a physical education teacher from a junior high school and 30 randomly selected students. In Ambon City, 30 students were selected using purposive sampling and data analysis techniques, including multiple regression analysis. The results showed that the level of physical fitness had a significant effect on the quality of PJOK learning ($F = 7.945$, $t = 2.819$, $p = 0.009$, $R^2 = 0.221$). In contrast, understanding of physical fitness concepts did not have a significant effect on the quality of PJOK learning ($t = 0.535$; $p = 0.597$). The conclusion of this study reveals that teachers' physical fitness plays a crucial role in enhancing the quality of PJOK learning, whereas understanding the concept of physical fitness has not shown a significant influence.*
Keywords: *Degree of fitness, Concept Understanding, Quality of learning*

How to Cite: Solissa, J., Tomasoa, Y., Hukubun, M. D., Apitulley, V. H. R., & Purbangkara, T. (2026). The influence of physical fitness degree and understanding of the concept of fitness on the quality of physical education sports and health learning. *Jurnal Pendidikan Jasmani Indonesia, 22*(1), 13-23. https://doi.org/10.21831/jpji.v22i1.87870

INTRODUCTION

Research on "The Influence of Physical Fitness Level and Understanding of Fitness Concepts on the Quality of Physical Education Learning for Sports and Health" is an interesting and important topic(Shukshina et al., 2021). As teachers, physical fitness and students' understanding of fitness are vital to optimal learning outcomes(Mamurov et al., 2020). Students' physical fitness levels significantly

https://doi.org/10.21831/jpji.v22i1.87870

impact their ability to engage in physical activities during learning. Students with a good fitness level tend to be more active, energetic, and able to complete movement tasks better (Granero-Jiménez et al., 2022). On the other hand, students with low fitness will experience physical education-related difficulties and fatigue more quickly; thus, physical education enhances the learning process(Obidovna & Sulaymonovich, 2022).

Although various previous studies have examined the relationship between physical fitness and aspects of physical education learning, most studies have focused on students and positioned physical fitness as a variable linked to academic learning outcomes or student participation(Nosko et al., 2020). Research specifically examining the role of physical education teachers' physical fitness on learning quality is still relatively limited, particularly in the context of physical education in junior high schools. Furthermore, studies on understanding the concept of physical fitness generally emphasize the theoretical importance of the conceptual aspect; however, there is little empirical research examining the direct influence of this conceptual understanding on the quality of physical education learning(Kljajević et al., 2022).

Furthermore, most previous studies have examined the variables of physical fitness and understanding of the concept of physical fitness separately, thus failing to provide a comprehensive picture of their simultaneous contribution to the quality of physical education learning(D. Li et al., 2021). Furthermore, research within the local Indonesian context, particularly in eastern regions such as Ambon City, is still minimal. Therefore, research is needed that empirically examines the influence of physical fitness levels and understanding of the concept of physical fitness simultaneously on the quality of physical education learning. This can provide both theoretical and practical contributions to the development of quality physical education learning in Indonesia(Hambali et al., 2024).

Students' understanding of the fitness concept is also essential(Kolokoltsev et al., 2021). If students understand physical fitness, its benefits, and how to improve it, they will be more motivated to participate actively in physical education learning. A good understanding will encourage students to adopt a healthy and active lifestyle and engage in physical education actively. Physical education and access to information in the current digital era enable students to obtain various information about physical fitness(X. Li et al., 2022). However, not all the information they get is valid and accurate. Therefore, the role of physical education teachers is vital in ensuring that students have a correct and comprehensive understanding of fitness concepts (Anisimov, Buriak, and Laktionova 2022).

Previous studies have examined physical education concepts related to physical fitness and understanding the concept of fitness(McGuine et al., 2021). For example, some studies examine the relationship between physical fitness levels and student academic achievement. However, there is still little research on physical education that explicitly examines the influence of these two factors on the quality of learning in physical education, sports, and health(Shearer et al., 2021). These limitations of previous research serve as the basis for further research(Young et al., 2021). By comprehensively examining how the level of physical fitness and understanding of fitness concepts influence the quality of physical education learning, useful findings can be obtained to develop more effective learning practices(O'Connor & Penney, 2021).

This research will also examine the latest relevant theories, such as achievement motivation theory, active learning theory, and motor skill development theory(Caterini et al., 2020). By integrating various theoretical physical education courses, a more comprehensive understanding of the factors influencing the quality of physical education learning can be obtained(Dimitri et al., 2020). One of the gaps this research aims to fill is the lack of understanding of how the level of physical fitness and knowledge of the concept of fitness influence the quality of learning. Most previous studies have only examined the influence of each factor separately(Ortega et al., 2023).

This research will also explore how student characteristics, such as age, gender, and socioeconomic background, can impact the relationship between fitness levels, conceptual understanding, and the quality of learning, thereby understanding the complexity of the factors involved in the physical education learning process(Carl et al., 2022). In addition, this research will explore learning strategies that can enhance the quality of physical education learning by considering the impact of students' level of physical fitness and their understanding of the concept of fitness (Lin et al., 2020). These findings can provide practical insights for teachers in designing more effective learning experiences.

ISSN 0216-1699 (print) | 2581-2300 (online)

In Indonesia's education context, this research is also highly relevant. As a country with diverse demographic and socio-economic characteristics, understanding the factors that influence the quality of physical education learning is essential to improve the overall quality of education(Brooke-Wavell et al., 2022). This research will employ a quantitative approach, utilizing survey methods and regression analysis, to investigate the impact of physical fitness levels and understanding of fitness concepts on the quality of learning(Cho et al., 2020). Data will be collected through fitness tests, concept understanding questionnaires, and teacher assessments of learning quality (Ardern et al., 2022).

This research will also involve interviews with teachers and students to obtain more in-depth information regarding the factors that influence the quality of learning(Nugroho et al., 2021). Observations of the learning process will also be conducted to gain a more comprehensive understanding of the learning process. The results of this research can provide both theoretical and practical contributions (Anderson & Parr, 2012). Theoretically, this research will enrich our understanding of the complexity of factors that influence the quality of physical education learning(Buecker et al., 2021). Research findings can provide valuable input for teachers and stakeholders in designing more effective learning experiences.

In physical education, this research can also encourage efforts to enhance physical fitness and deepen students' understanding of fitness concepts. With good physical education and adequate fitness support, students will be more motivated to adopt a healthy and active lifestyle. This research will also provide physical education opportunities for further study by exploring other factors that influence the quality of physical education learning, such as teacher physical education expertise, availability of facilities and infrastructure, and government policy support(Carl et al., 2020).

This research will also provide an overview of physical fitness and an understanding of fitness concepts among students today. This information can serve as the basis for developing fitness improvement programs and enhancing a more comprehensive understanding of fitness concepts (Wassenaar et al., 2021). In addition, this research will also analyze differences in student characteristics, such as gender, socio-economic background, fitness levels, understanding of concepts, and the quality of learning. Understanding students' diverse needs and challenges is essential(Mahindru et al., 2023).

In its implementation, this research will involve various stakeholders, including physical education teachers, schools, and related educational agencies. Collaboration and good communication will be beneficial in disseminating research findings and implementing them effectively. Overall, this research is a comprehensive effort to understand and improve the quality of sports and health physical education learning. Considering essential factors such as physical fitness and understanding the concept of fitness can significantly contribute to the development of education and health in Indonesia.

METHODS

This study employed a quantitative approach, utilizing a survey method and correlational design. This design was chosen to determine the relationship and influence between the independent variables, namely the level of physical fitness (X_1) and understanding of the concept of physical fitness (X_2), on the dependent variable, namely the quality of Physical Education, Sports, and Health (PJOK) learning (Y). The population in this study was all PJOK teachers at junior high schools (SMP) in Ambon City. The sampling technique used was purposive sampling, considering that PJOK teachers are spread across several schools and sub-districts and therefore have an equal chance of being selected. The sample size for this study was 30 PJOK teachers, with 30 students from each teacher participating as respondents to assess the quality of PJOK learning. This sample size was deemed adequate for correlational and linear regression analyses in educational research.

Research Instruments

Data collection was conducted using several instruments, namely:

1. Physical Fitness Degree Instrument (X_1)
   The physical fitness level of physical education teachers was measured using a 12-minute run test (Cooper Test). Test results were expressed as the distance covered in a 12-minute run, then converted into physical fitness categories based on applicable norms.

ISSN 0216-1699 (print) | 2581-2300 (online)

2. Physical Fitness Concept Understanding Instrument (X_2)
   The understanding of the concept of physical fitness was measured using a closed-ended questionnaire developed based on indicators of understanding the concept, including the definition of physical fitness, the benefits of physical fitness, the components of physical fitness, and the principles of physical fitness training. The questionnaire was structured using a Likert scale with five answer alternatives.
3. Physical Education Learning Quality Instrument (Y)
   The quality of physical education learning was assessed using a student assessment questionnaire that covered aspects of lesson planning, implementation, classroom management, the use of methods and media, and learning evaluation. This instrument also used a Likert scale.

Before use, the questionnaire instrument underwent content validation and reliability testing to ensure its suitability for measuring the research variables.

Data Collection Procedure

Data collection was conducted in several stages:

1. Administering physical fitness tests to physical education teachers using the Cooper Test,
2. Distributing questionnaires assessing the concept of physical fitness to physical education teachers, and
3. Distributing questionnaires assessing the quality of physical education learning to students taught by the teachers included in the study sample.

All data were collected directly under the researcher's supervision to minimize measurement error.

Data Analysis Techniques

The data obtained were analyzed using descriptive and inferential statistics. Descriptive analysis was used to describe the characteristics of each variable, including minimum, maximum, mean, standard deviation, and frequency distribution.

Inferential analysis was conducted using multiple linear regression to test:

1. The effect of physical fitness level on the quality of physical health and fitness learning,
2. The effect of understanding physical fitness concepts on the quality of physical health and fitness learning, and
3. The simultaneous effect of physical fitness level and understanding physical fitness concepts on the quality of physical health and fitness learning.

All statistical tests were conducted using SPSS version 24 at a significance level of $\alpha = 0.05$.

RESULT AND DISCUSSION

Results

The frequency distribution data of the degree of physical fitness and understanding of the concept of fitness on the quality of physical education learning are as follows:

Degree of Physical Fitness

The results of the measurement of the degree of physical fitness yielded a score range of 18 to 63, with the lowest score and the highest score. The results of the calculation yielded a calculated average of 49.23, a median of 52, a mean of 52, 6 classes, and an interval class length of 8. Standard deviation = 9.287 and = 86.254. The following is the relative frequency distribution table.

Table 1. Relative Frequency Distribution of Fitness Levels

Interval Value	Frequency	f (Relative)
18 - 25	2	6,67%
26 - 33	0	0
34 - 41	1	3,33%
42 - 49	9	30%
50 - 57	16	53,33%
58 - 65	2	6,67
	N= 30	100%

ISSN 0216-1699 (print) | 2581-2300 (online)

It can be seen in Figure 1 that the degree of physical fitness among physical education teachers who obtained a low score of 6.67 percent was represented by two respondents. Ten respondents who were in the middle scored 33.33% in physical education, and 18 respondents scored above the average score of 60% in physical education. The degree of physical fitness in physical education teachers can be seen in the form of the following histogram:

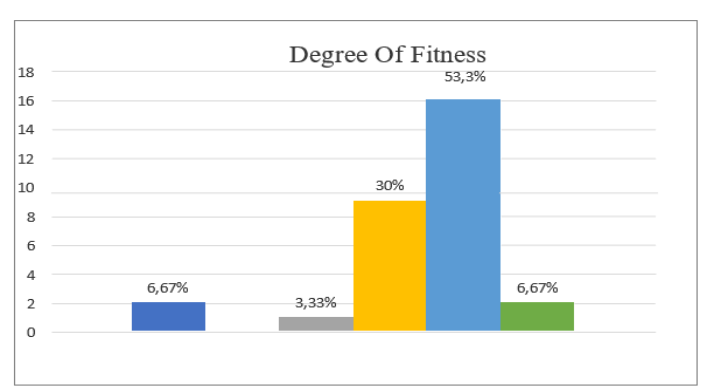

Figure 1. Histogram of Fitness Degree

Understanding the concept of fitness

Data on understanding the concept of fitness yielded a score of 117, with a highest score of 201. The calculated results obtained are as follows: mean = 154.33, median = 150.50, mode = 147, number of classes = 6, and length of interval class = 14. Standard deviation = 17.329 and variance = 300.299. The following relative frequency distribution table:

Table 2. Frequency Distribution of Understanding the Concept of Soldiering

Interval Value	Frequency	f (Relative)
117 - 130	2	6,67%
131 - 144	4	13,33%
145 - 158	13	43,33%
159 - 166	4	13.33%
167 - 180	5	16,67%
181 - 194	2	6,67
	N= 30	100%

Understanding the concept of fitness in physical education teachers who get a low score of 20 physical education r cent is 6 respondents. And 17 respondents who were in the middle scored 56.66 physical education r cent and 7 respondents scored above average by 23.33 physical education r cent. The distribution can be seen in the form of the following histogram:

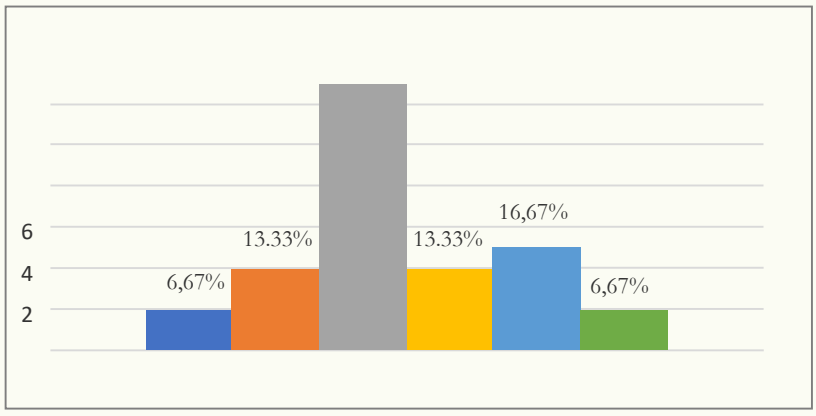

Figure 2. Histogram of understanding of the concept of fitness

ISSN 0216-1699 (print) | 2581-2300 (online)

Learning Quality in Physical education, Sport and Health

The data on the quality of physical education learning obtained the lowest score of 146 and the highest score of 178. The calculated results obtained are as follows: mean 159.37, median 157.50, mode 157, number of classes 6, and length of interval class 5. The standard deviation of 8.311 and variance = is 69.068. The relative frequency distribution can be seen in the following table:

Table 3. Frequency Distribution of Learning Quality of Physical education

Interval Value	Frequency	f (Relative)
146 - 150	5	16,67%
151 - 155	6	20%
156 - 160	6	20%
161 - 165	6	20%
166 - 170	5	16,67%
171 - 175	2	6,67
	N= 30	100%

The Effect of Physical Fitness Degree and Understanding of Fitness Concepts on the Quality of Physical Education Learning

After testing the data through computing SPSS version 24 with a validity level of 0.5 then it can be described in Table 4, as follows.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.470[a]	.221	.193	7.465	1.036

a. Predictors: (Constant), X1

b. Dephysical education ndent Variable: Y

According to Table 4, the R Square is 22.1 physical education r cent and the standard error is 7.465 with a Durbin Watson value of 1.036.

Tabel 5. Coefficientsa

Unstandardized Coefficients				Standardized Coefficients	t	Sig.
	Model	B	Std. Error	Beta		
1	(Constant)	189.576	10.804		17.547	000
	X1	-1.269	.450	-.470	-2.819	.009

Based on variable X1, namely the degree of physical fitness, the F value is = 7.945, t value = 2.819 and p sig = 0.09. Because the p-value is 0.09 > 0.05, there is a significant influence between the quality of physical education learning and the degree of physical fitness. Because the p-value is 0.09 > 0.05, it can be stated that there is a significant influence between the quality of physical education learning and the degree of physical fitness, as shown by the ANOVA analysis. This can be seen in the following table:

Table 6. ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	442.727	1	442.727	7.945	. 009[b]
	Residual	1560.239	28	55.723		
	Total	2002.967	29			

a. Dephysical education ndent Variable: Y

b. Predictors: (Constant), X1

ISSN 0216-1699 (print) | 2581-2300 (online)

While the X2 variable, namely the understanding of the concept of fitness to the quality of physical education learning, the value of t = 0.535 with a 5% significance of 0.597. If the Durbin Watson value is 1.036> the significance level p-value 0.05, it can be stated that there is no influence between the understanding of the concept of fitness and the quality of physical education learning at school. Data analysis can be seen in the following table:

Table 7. Excluded Variables

Model		Beta In	T	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	X2	-.094[b]	-.535	597	-.102	.919

a. Dephysical education ndent Variable: Y
b. Predictors in the Model: (Constant), X1

Based on the results of the analysis carried out, there is a correlation between the degree of physical fitness and the quality of physical education learning by physical education teachers in Ambon City in 2019. The characteristics of a physical education teacher include a degree of fitness

Good physical fitness is evident in resistance to disease, strong muscular and cardiopulmonary endurance, and a proportional body composition. These characteristics demonstrate that a physical education teacher can effectively carry out daily activities; physical education is closely related to the preparation, implementation, and post-implementation of learning at school. Additionally, physical education teachers will still have sufficient energy reserves to engage in self-development activities that support their professional growth.

Physical education teachers are often required to perform skill demonstrations of various movement patterns and basic silver skills. This can only be done when a teacher has good fitness qualities. This explanation illustrates that a physical education teacher who is overweight or obese will likely experience physical education-related difficulties, such as when performing a forward roll demonstration in gymnastics activities. In addition to physical work, physical education teachers are also faced with thinking work, which requires good concentration in its implementation. Good concentration is only obtained if there are no various disturbances in the organs and systems of the body's work. In this case, with a reasonable degree of fitness, the quality of physical education learning carried out by physical education teachers will also be good. In other words, there can be an influence on the degree of physical fitness and quality of physical education learning for physical education teachers in Ambon City in 2019.

Understanding the fitness concept does not affect the quality of physical education learning in schools; instead, it underpins what material (both conceptual and practical) is presented to learners and how the material is designed to be delivered. According to (Siddall et al., 2022), understanding concepts is essential for practical learning activities. Physical education teachers who understand the concept of fitness are those who comprehend the fitness-related aspects of supporting science, physical education content standards, learning management concepts, and professional development.

Designing an effective learning process must also be based on sound principles. How material is delivered, the methods chosen, and the tools used to convey knowledge and skills must also be based on these concepts. No less important, assessing the success of learning also needs to be based on the basic concept of choosing the form and physical education of assessment techniques on how to carry out processing and reporting.

Discussion

The analysis results show that the physical fitness level of PE teachers has a significant influence on the quality of learning, with an F value of 7.945, t = 2.819, and p = 0.009, accounting for 22.1% of the variance ($R^2 = 0.221$). This finding aligns with the first research objective, which was to examine the effect of physical fitness on the quality of PE learning. Descriptive data indicate that most teachers fall into the moderate to high fitness category, which empirically correlates with improved learning quality. Theoretically, good physical condition enables teachers to be more active, responsive, and consistent in managing movement-based learning activities.

ISSN 0216-1699 (print) | 2581-2300 (online)

The significant influence of physical fitness on learning quality can be attributed to the characteristics of PE learning, which require the demonstration of skills, management of physical activity, and endurance on the part of teachers during the learning process. Teachers with good physical fitness have higher physical work capacity and concentration, enabling them to demonstrate correct movement patterns, maintain learning intensity, and create a dynamic learning environment. This finding supports the theory of physical readiness and active learning, which emphasizes that the quality of learning interactions is strongly influenced by the physical condition of educators, particularly in practical subjects.

In contrast, the analysis results showed that understanding the concept of physical fitness had no significant effect on the quality of physical education (PJOK) learning, with a t-value of 0.535 and a p-value of 0.597. This finding addresses the second research objective and suggests that cognitive mastery of concepts does not have a direct impact on learning quality. Descriptive data indicate that, although most teachers possess moderate to high conceptual understanding, this is not significantly reflected in the variation in learning quality as assessed by students. This indicates a gap between conceptual knowledge and the implementation of learning in the field.

The insignificant effect of understanding the concept of physical fitness can be attributed to the characteristics of PJOK as an applied and practice-oriented learning approach, where learning effectiveness is primarily determined by the teacher's demonstrative abilities, classroom management, and physical involvement. In this context, conceptual understanding serves as a basis for planning, but is not the dominant factor directly experienced by students in the learning process. Other factors, such as teaching methods, media use, teacher creativity, and the condition of infrastructure, likely contribute more to learning quality than conceptual aspects alone.

CONCLUSION

Based on the research results, the level of physical fitness of Physical Education, Sports, and Health teachers has a significant influence on the quality of physical education, sports, and health instruction. Teachers with good physical fitness can conduct instruction more effectively, both in demonstrating movement skills and managing students' physical activity, and in maintaining the intensity and quality of instruction. This finding confirms that physical fitness is a crucial factor supporting the effectiveness of Physical Education, Sports, and Health instruction in schools.

Furthermore, the research results indicate that understanding the concept of physical fitness does not significantly influence the quality of Physical Education, Sports, and Health instruction. This suggests that theoretical mastery of concepts does not necessarily have a direct impact on the quality of instruction if physical abilities and practical teaching skills do not complement it. In the context of applied, movement-oriented Physical Education, Sports, and Health instruction, the physical fitness aspect of teachers appears to be more dominant than conceptual understanding alone.

Overall, this research suggests that efforts to enhance the quality of Physical Education, Sports, and Health instruction should be complemented by improvements in teacher physical fitness, alongside the strengthening of other pedagogical and professional competencies. Physical fitness development programs for Physical Education, Sports, and Health teachers require attention from schools and policymakers. Further research is recommended to examine other factors that could influence the quality of Physical Education, Sports, and Health instruction, such as teaching methods, media use, facilities and infrastructure, and teacher motivation and pedagogical competence..

ACKNOWLEDGMENT

I sincerely thank the Physical Education and Health Education Study Program, Faculty of Teacher Training and Education at UNPATTI Ambon, for their invaluable support and assistance throughout this research. I also thank the physical education teachers and students in Ambon City, who generously participated in the study and provided essential data for this research. Physical education. Special thanks are extended to the financial supporters whose contributions made this study possible, covering the costs of data collection and analysis. I am deeply grateful to my advisors for their expert guidance and constructive feedback, which were crucial in shaping the study. Lastly, I would like to acknowledge the

ISSN 0216-1699 (print) | 2581-2300 (online)

encouragement and support of my family and friends, whose understanding and patience were pivotal throughout the research process.

REFERENCES

Anderson, M. K., & Parr, G. P. (2012). Foundations of athletic training: Prevention, assessment, and management: Fifth edition. In *Foundations of Athletic Training: Prevention, Assessment, and Management: Fifth Edition* (pp. 1–982). Lippincott Williams &Wilkins. https://toc.library.ethz.ch/objects/pdf/z01_978-0-7817-8445-0_01.pdf

Ardern, C. L., Büttner, F., Andrade, R., Weir, A., & ... (2022). … medicine, musculoskeletal rehabilitation and sports science fields: the PERSiST (implementing Prisma in Exercise, Rehabilitation, Sport medicine and SporTs …. *British Journal of Sports …*. https://bjsm.bmj.com/content/56/4/175.abstract%0Ahttps://bjsm.bmj.com/content/bjsports/56/4/175.full.pdf

Brooke-Wavell, K., Skelton, D. A., Barker, K. L., Clark, E. M., De Biase, S., Arnold, S., Paskins, Z., Robinson, K. R., Lewis, R. M., Tobias, J. H., Ward, K. A., Whitney, J., & Leyland, S. (2022). Strong, steady and straight: UK consensus statement on physical activity and exercise for osteoporosis. *British Journal of Sports Medicine*, *56*(15), 837–846. https://doi.org/10.1136/bjsports-2021-104634

Buecker, S., Simacek, T., Ingwersen, B., Terwiel, S., & Simonsmeier, B. A. (2021). Physical activity and subjective well-being in healthy individuals: a meta-analytic review. *Health Psychology Review*, *15*(4), 574–592. https://doi.org/10.1080/17437199.2020.1760728

Carl, J., Barratt, J., Wanner, P., Töpfer, C., Cairney, J., & Pfeifer, K. (2022). The Effectiveness of Physical Literacy Interventions: A Systematic Review with Meta-Analysis. In *Sports Medicine* (Vol. 52, Issue 12, pp. 2965–2999). Springer. https://doi.org/10.1007/s40279-022-01738-4

Carl, J., Sudeck, G., Geidl, W., Schultz, K., & Pfeifer, K. (2020). Competencies for a Healthy Physically Active Lifestyle—Validation of an Integrative Model. *Research Quarterly for Exercise and Sport*, 1–15. https://doi.org/10.1080/02701367.2020.1752885

Caterini, J. E., Campisi, E. S., & Cifra, B. (2020). Physical Activity Promotion in Pediatric Congenital Heart Disease: Are We Running Late? *Canadian Journal of Cardiology*, *36*(9), 1406–1416. https://doi.org/10.1016/j.cjca.2020.07.003

Cho, H., Chi, C., & Chiu, W. (2020). Understanding sustained usage of health and fitness apps: Incorporating the technology acceptance model with the investment model. *Technology in Society*, *63*. https://doi.org/10.1016/j.techsoc.2020.101429

Dimitri, P., Joshi, K., & Jones, N. (2020). Moving more: physical activity and its positive effects on long term conditions in children and young people. *Archives of Disease in Childhood*, *105*(11), 1035–1040. https://doi.org/10.1136/archdischild-2019-318017

Granero-Jiménez, J., López-Rodríguez, M. M., Dobarrio-Sanz, I., & Cortés-Rodríguez, A. E. (2022). Influence of Physical Exercise on Psychological Well-Being of Young Adults: A Quantitative Study. In *International Journal of Environmental Research and Public Health* (Vol. 19, Issue 7). mdpi.com. https://doi.org/10.3390/ijerph19074282

Hambali, S., Hardi, V. J., Supriyanti, D., Pristiawati, A., Verianti, G., & Ockta, Y. (2024). Sport Monopoly Games: A Physical Education Learning for Physical Fitness Student. In *Journal of Education, Teaching, and Learning* (Vol. 9, Issue 1, pp. 29–34). learntechlib.org. https://www.learntechlib.org/p/224771/article_224771.pdf

Kljajević, V., Stanković, M., Đorđević, D., Trkulja-Petković, D., Jovanović, R., Plazibat, K., Oršolić, M., Čurić, M., & Sporiš, G. (2022). Physical activity and physical fitness among university students—A systematic review. In *International Journal of Environmental Research and Public Health* (Vol. 19, Issue 1). mdpi.com. https://doi.org/10.3390/ijerph19010158

Kolokoltsev, M., Ambartsumyan, R., Gryaznykh, A., Kraynik, V., Makeeva, V., Tonoyan, K., Romanova, E., Savchenkov, A., Mischenko, N., & Vrachinskaya, T. (2021). Physical activity

ISSN 0216-1699 (print) | 2581-2300 (online)

amount influence over suboptimal health status. *Journal of Physical Education and Sport*, *21*(1), 381–387. https://doi.org/10.7752/jpes.2021.01037

Li, D., Yi, C., & Gu, Y. (2021). Research on College Physical Education and Sports Training Based on Virtual Reality Technology. In *Mathematical Problems in Engineering* (Vol. 2021). Wiley Online Library. https://doi.org/10.1155/2021/6625529

Li, X., Yu, H., & Yang, N. (2022). Author Correction: The mediating role of resilience in the effects of physical exercise on college students' negative emotions during the COVID-19 epidemic (Scientific Reports, (2021), 11, 1, (24510), 10.1038/s41598-021-04336-y). In *Scientific Reports* (Vol. 12, Issue 1). nature.com. https://doi.org/10.1038/s41598-022-05430-5

Lin, Y. T., Chen, M. C., Ho, C. C., & Lee, T. S. (2020). Relationships among leisure physical activity, sedentary lifestyle, physical fitness, and happiness in adults 65 years or older in Taiwan. In *International Journal of Environmental Research and Public Health* (Vol. 17, Issue 14, pp. 1–12). mdpi.com. https://doi.org/10.3390/ijerph17145235

Mahindru, A., Patil, P., & Agrawal, V. (2023). Role of Physical Activity on Mental Health and Well-Being: A Review. In *Cureus*. ncbi.nlm.nih.gov. https://doi.org/10.7759/cureus.33475

Mamurov, B., Mamanazarov, A., Abdullaev, K., Davronov, I., Davronov, N., & Kobiljonov, K. (2020). Acmeological Approach to the Formation of Healthy Lifestyle Among University Students. *... Congress Society of ...*. https://doi.org/10.2991/aebmr.k.200318.043

McGuine, T. A., Biese, K. M., Petrovska, L., Hetzel, S. J., Reardon, C., Kliethermes, S., Bell, D. R., Brooks, A., & Watson, A. M. (2021). Mental health, physical activity, and quality of life of us adolescent athletes during COVID-19-related school closures and sport cancellations: A study of 13 000 athletes. *Journal of Athletic Training*, *56*(1), 11–19. https://doi.org/10.4085/1062-6050-0478.20

Nosko, M., Mekhed, O., Rvabchenko, S., Ivantsova, O., Denysovets, I., Griban, G., Prysyazhniuk, S., Oleniev, D., Kolesnyk, N., & Tkachenko, P. (2020). The Influence of the Teacher's Social and Pedagogical Activities on the Health-Promoting Competence of Youth. In *International Journal of Applied Exercise Physiology* (Vol. 9, Issue 9, pp. 18–28). eprints.zu.edu.ua. http://eprints.zu.edu.ua/36335/1/vol.9.9 – копія.pdf

Nugroho, S., Nasrulloh, A., Karyono, T. H., Dwihandaka, R., & Pratama, K. W. (2021). Effect of intensity and interval levels of trapping circuit training on the physical condition of badminton players. In *Journal of Physical Education and Sport* (Vol. 21, pp. 1981–1987). efsupit.ro. https://doi.org/10.7752/jpes.2021.s3252

O'Connor, J., & Penney, D. (2021). Informal sport and curriculum futures: An investigation of the knowledge, skills and understandings for participation and the possibilities for physical education. *European Physical Education Review*, *27*(1), 3–26. https://doi.org/10.1177/1356336X20915937

Obidovna, D. Z., & Sulaymonovich, D. S. (2022). Physical activity and its impact on human health and longevity. In *Достижения Науки И Образования* (Issue 2 (82), pp. 120–126). cyberleninka.ru. https://cyberleninka.ru/article/n/physical-activity-and-its-impact-on-human-health-and-longevity

Ortega, F. B., Leskošek, B., Blagus, R., Gil-Cosano, J. J., Mäestu, J., Tomkinson, G. R., Ruiz, J. R., Mäestu, E., Starc, G., Milanovic, I., Tammelin, T. H., Sorić, M., Scheuer, C., Carraro, A., Kaj, M., Csányi, T., Sardinha, L. B., Lenoir, M., Emeljanovas, A., … Jurak, G. (2023). European fitness landscape for children and adolescents: updated reference values, fitness maps and country rankings based on nearly 8 million test results from 34 countries gathered by the FitBack network. *British Journal of Sports Medicine*, *57*(5), 299–310. https://doi.org/10.1136/bjsports-2022-106176

Shearer, C., Goss, H. R., Boddy, L. M., Knowles, Z. R., Durden-Myers, E. J., & Foweather, L. (2021). Assessments Related to the Physical, Affective and Cognitive Domains of Physical Literacy Amongst Children Aged 7–11.9 Years: A Systematic Review. In *Sports Medicine - Open* (Vol. 7, Issue 1). Springer. https://doi.org/10.1186/s40798-021-00324-8

ISSN 0216-1699 (print) | 2581-2300 (online)

Shukshina, L. V., Nizamutdinova, S. M., Mamedov, A. A., Kidinov, A. V., Litvinov, A. V., Lvova, E. N., & Sudakova, Y. E. (2021). Psychophysiological and sport activity of the student youth as an indicator and determinant of health-preserving culture development. In *Journal of Human Sport and Exercise* (Vol. 16, Issue Proc4). rua.ua.es. https://doi.org/10.14198/jhse.2021.16.Proc4.44

Siddall, B., Ram, A., Jones, M. D., Booth, J., Perriman, D., & Summers, S. J. (2022). Short-term impact of combining pain neuroscience education with exercise for chronic musculoskeletal pain: A systematic review and meta-analysis. *Pain*, *163*(1), E20–E30. https://doi.org/10.1097/j.pain.0000000000002308

Wassenaar, T. M., Wheatley, C. M., Beale, N., Nichols, T., Salvan, P., Meaney, A., Atherton, K., Diaz-Ordaz, K., Dawes, H., & Johansen-Berg, H. (2021). The effect of a one-year vigorous physical activity intervention on fitness, cognitive performance and mental health in young adolescents: The Fit to Study cluster randomised controlled trial. In *International Journal of Behavioral Nutrition and Physical Activity* (Vol. 18, Issue 1). Springer. https://doi.org/10.1186/s12966-021-01113-y

Young, L., O'Connor, J., Alfrey, L., & Penney, D. (2021). Assessing physical literacy in health and physical education. *Curriculum Studies in Health and Physical Education*, *12*(2), 156–179. https://doi.org/10.1080/25742981.2020.1810582

ISSN 0216-1699 (print) | 2581-2300 (online)