

TYPES OF PHYSICAL ACTIVITY AND SPORTS FOR TEENS IN MAINTAINING PHYSICAL FITNESS IN LEISURE

Desy Tya Maya Ningrum¹, Herman Chaniago², Ahmad Muchlisin Natas
Pasaribu³, Yafi Velyan Mahyudi⁴

Universitas Bhayangkara Jakarta Raya^{1,3}, Universitas Negeri Jakarta^{2,4}
desy.tya@dsn.ubharajaya.ac.id¹, herman@unj.ac.id²
ahmad.muchlisin@dsn.ubharajaya.ac.id³, yafialetta11@gmail.com⁴

Abstract

This study aims to determine the types of physical activities and sports carried out by adolescents in maintaining their physical fitness outside of physical education learning at school. Especially to test the physical activity carried out without using the tool for one month with the number of meetings 10 times. The application of physical activity and exercise is carried out 2 or 3 times per week with a duration of 30 minutes. The research method used is experimental. Participants who took part in this study were 66 students consisting of 45 male students and 16 female students. Physical fitness measurements were carried out using the Yo-Yo Intermittent Endurance Test Level 2. Deeper sports participation, this study divided into outdoor sports and not using tools, both of which were associated with physical activity. The results of this study indicate that the analysis of the mean difference test in the control group obtained t_0 of 10.392 and t_{table} of 2.035 with degrees of freedom (db) 32 and $\alpha = 0.05$. The hypothesis is that there are differences in the average physical fitness of students who are not given physical activity and sports treatment. While the results of statistical analysis of the experimental group obtained t_0 of 21.582 and t_{table} 2.035 with degrees of freedom (db) 32 and $\alpha = 0.05$. The hypothesis is that there are differences in physical fitness in students who are given physical activity and sports treatment. the conclusion is that physical activity and sports support the improvement of physical fitness in adolescent students who are physically active at least once every 2-3 weeks. However, the shortcoming of this study was that it did not see what physical activities and sports the participants did outside of the treatment given.

Keywords: *physical activity; sports; physical fitness; young students*

Submitted : 14th of July 2022
Accepted : 29th of July 2022
Published : 30th of July 2022

Correspondence Author: Desy Tya Maya Ningrum, Universitas Bhayangkara Jakarta Raya, Indonesia. E-Mail: desy.tya@dsn.ubharajaya.ac.id

DOI <http://dx.doi.org/10.31851/hon.v5i2.8710> 



Jurnal Laman Olahraga Nusantara licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/).

INTRODUCTION

Physical activity is any body movement produced by skeletal muscles that require energy expenditure. Physical activity is very important for maintaining

physical, and mental health and maintaining quality of life in order to stay healthy and fit. That multiple regression models using of moderate to vigorous physical activity or vigorous physical activity were useful in predicting VO_{2max} (Cao et al., 2010). Physical activity or sport is one way to achieve physical health to achieve physical fitness. Physical activity that a person does to create physical, mental, emotional, and spiritual health. Highlight that the PE lesson provides a significant contribution to total physical activity by increasing time spent in higher intensity physical activity categories in particular (Kerr et al., 2018).

Physical activity in this case can be done in a variety of activities. In relation to physical education, learning activities are carried out through sports and sports activities that students in the all-boys school engaged in relatively high levels of Physical activity (Koh et al., 2019). The elements of fun and freshness are expected to have a positive impact on students. So that they are able to control negative mental, emotional and spiritual conditions that have the potential to interfere with daily activities. For this reason, sports activities are expected to be able to provide a new atmosphere in the midst of subject assignments that are quite stressful for students (Prastiyo & Maksum, 2013).

Physical activity is a process of physical activity, games, and sports as a means to achieve fitness (Kusnaedi, 2018). Physical activities that develop fitness, organ function, neuromuscular control, intellectual strength, and emotional control (Bangun, 2016). Physical fitness is defined as “the ability to carry out daily work with, without undue fatigue and sufficient energy, so that you can enjoy your free time. (Sutri, Isnaini Herawati, 2014). Physical fitness is influenced by a physical activity carried out with various physical activities, which vary from one individual to another depending on lifestyle and other factors such as gender, age, occupation, and others.

Physical fitness is a very important potential in supporting daily activities without feeling excessive fatigue and even being able to carry out activities afterward. The physical activity and sport are key elements for a healthy lifestyle

(Mannino et al., 2019). There is a relationship between the level of physical fitness and student learning outcomes, meaning that in general it can be said that the better the level of physical fitness, the better the academic achievement (Abduh et al., 2020). Physical fitness is the result of the work of the body's system functions that embodies an increase in the quality of life in every activity that involves physical activity.

Even light-intensity activity appears to provide benefits and is preferable, when increasing physical activity toward the desired level, will reduce the incidence of adverse events (Powell et al., 2011). In addition, doing activities that involve physical activity or exercise will affect the physical ability to maximize the oxygen that is processed in the body. If the body already has the ability to maximize oxygen consumption (Milanović et al., 2015) and being able to fulfill good nutrition or nutrition will have a significant impact on physical fitness (Nabi et al., 2015).

Based on several previous studies, it is known that there is an increase in physical fitness related to VO_{2max} through physical activity. However, it has not been explained that there is a significant increase in the activities carried out. for example (whether physical activity is carried out 1 time a week with moderate intensity, or 2 times a week with moderate intensity, or 3 times a week with moderate intensity). In addition, what kind of physical activity should be done in order to maintain physical fitness without losing free time due to fatigue. Therefore, this study will reveal the types of physical activity that are suitable for adolescents in maintaining their physical fitness.

METHOD

The research was conducted using the experimental method for 10 trial meetings. Types of physical activity and sport that are carried out without using equipment include aerobic exercise such as (running in place, jumping jacks, high knee, squat, lunges, ski jumps, mountain climbing, lateral steps, squat double punches, and step back jacks (Gardner, 2017). The application of physical activity

and sports is carried out 2 or 3 times per week for one month with a duration of 30 minutes.

Participants in this study were students with a total of 66 consisting of (45 males and 21 females). The method used in determining the sample is purposive sampling with the consideration that these participants are people who like to do physical activities and sports at least once a week outside of physical education learning at school. Measure the participants' physical fitness at the time of the pre-test and post-test consisted of a physical fitness test. Performance testing is one of the most common and important measures used in exercise science and physiology. The appropriate test should have high validity referring to the consistency of the variables measured during repeated tests under the same conditions, while validity refers to the degree of similarity between the test performance and the actual performance (Stevens & Dascombe, 2015).

Measurements can be used to monitor adaptation of endurance training. Maximum endurance performance and maximal oxygen uptake were measured over 8 weeks of exercise. The submaximal running test consists of two 6-minute stages at 70 and 80% maximum heart rate (HRmax) and a 3-minute stage at 90% HRmax, followed by a 2-minute recovery stage to measure post-workout (Vesterinen et al., 2017). The test carried out in this study for all participants was Yo-Yo Intermittent Endurance Test Level 2 (Gibson et al., 2020). Analysis of the data used is using SPSS.

RESULT AND DISCUSSION

Before carrying out a statistical analysis of the mean difference test, it is necessary to test the prerequisites for normality and homogeneity of variance first. The results of the normality and homogeneity tests are as follows.

Table 1. Normality Analysis of Control and Experimental Group Data

Group		Lo	L-table	Decision
Control	Pre-test	0,2164	0,161	Normal
	Post-test	0,1211	0,161	Normal
Experimental	Pre-test	0,1541	0,161	Normal
	Post-tes	0,1517	0,161	Normal

Table 2. Analysis of Homogeneity of Control and Experimental Group Data

db	33	33	66
S^2	13,936	11,719	25,655
Log S^2	1,144	1,008	
db Log S^2	36,612	32,256	68,868
db(S^2)	445,953	375,000	820,953

Based on Tables 1 and 2, it was obtained that the pre-test and post-test scores of the control and experimental groups were normally distributed. While the homogeneity of variance is known that $X^2 4,726 < X_{tabel} 5,99$, thus the data of both experimental and control groups have homogeneous variance. The results of the study after the prerequisite tests for normality and homogeneity will be presented in Tables 3 and 4.

Table 3. Results of Pre-Test and Post-Test Physical Fitness Control Group

Score	Pre-test		Score	Post-test	
	Absolute Frequency	Relative Frequency (%)		Absolute Frequency	Relative Frequency (%)
38,3 - 40,3	8	24,24	39,5 – 41,5	10	30,30
41,3 - 43,3	6	18,18	42,5 – 44,5	5	15,15
44,3 - 46,3	11	33,33	46,5 – 48,5	10	30,30
47,3 - 50,1	8	24,24	49,5 – 51,5	8	24,24
Amount	33	100	Amount	33	100
Mean	43,9061		Mean	44,97	
SD	3,3601		SD	3,73	
Variance	11,2900		Variance	13,94	

Table 4. Results of Pre-Test and Post-Test Physical Fitness Experiment Group

Score	Pre-test		Score	Post-test	
	Absolute Frequency	Relative Frequency (%)		Absolute Frequency	Relative Frequency (%)
38,5 - 39,5	11	33,33	40,5 - 41,5	8	24,24



Score	Pre-test		Score	Post-test	
	Absolute Frequency	Relative Frequency (%)		Absolute Frequency	Relative Frequency (%)
40,5 - 41,5	7	21,21	42,5 - 43,5	5	15,15
42,5 - 43,5	4	12,12	44,5 - 45,5	9	27,27
43,5 - 44,5	7	21,21	46,5 - 47,5	5	15,15
45,5 - 46,5	1	3,03	48,5 - 49,5	2	6,06
47,5 - 48,5	3	9,09	50,5 - 51,5	4	12,12
Amount	33	100	Amount	33	100
Mean	41,89		Mean	44,9	
SD	3,10		SD	3,42	
Variance	9,60		Variance	11,72	

Based on the statistical analysis of the results of the pre-test and post-test analysis of the mean difference test in the control group, it was obtained t_0 of 10.392 and t_{table} of 2.035 with 32 degrees of freedom (db) and $\alpha = 0.05$. Thus, $t_0 = 10.392 > t_{table} = 2.035$ or H_0 is rejected. The hypothesis is that there is an average difference between the pre-test and the final physical fitness test for students who are not given physical activity and sport. While the results of statistical analysis of the experimental group obtained t_0 of 21.582 and t_{table} 2.035 with degrees of freedom (db) 32 and $\alpha = 0.05$. Thus, $t_0 = 21.582 > t_{table} = 2.035$ or H_0 is rejected. The hypothesis is that there is an average difference between the pre-test and the final physical fitness test on students who are given physical activity and sport treatment. The results of the analysis of the difference in the mean of the pre-test and post-test of physical fitness in the control and experimental groups are shown in table 5 below.

Table 5. Statistical Analysis of Physical Fitness Control and Experiment Group

Group		Mean	N	Std Deviation	t_0	t-table
Control	Pre-test	43,90	33	3,36	10,392	2,035
	Post-test	44,97	33	3,73		
Experiment	Pre-test	41,891	33	3,09	21,582	2,035
	Post-test	44,9	33	3,42		

This study contributes to the limited literature relating to the impact of domain-specific physical activity and sport on students. This finding provides an assessment of the level of absorption of physical and sports activities carried out by students outside of school and extracurricular sports. It's not just the overall trend that can overwhelm individuals from participating in a particular sport. These results highlight sports that have the potential to recruit participants and identify sports activities to target in an effort to promote physical activity and sports in students. Moreover, it determines the reasons for the change in sports participation, invaluable evidence for informing strategies and promoting physical activity and sport.

The current findings support previous research that found sports participation in youth to be a predictor of future physical activity (Basterfield et al., 2011) (Tammelin et al., 2003) (Telama et al., 2006). Walking and cycling to school should be encouraged, as regular is associated with higher levels of physical activity and thus, may contribute to a healthy and active lifestyle (Yang et al., 2014). Higher levels of physical activity in adolescence have been reported in those who participate in organized sports, although the decline in sports activity is greater relative to those who do not participate in sports in early adolescence. (Walters et al., 2009). For a deeper analysis of sports participation, this study divides it into outdoor and non-equipment sports which are both associated with physical activity, but there are studies that suggest that sport throughout adolescence can offer mental health benefits (Taliaferro et al., 2011). Overall, the results of research related to physical activity and sport showed better than ordinary activities. Because physical activity and exercise are carried out independently of the school environment, it may have a greater capacity. The majority of the participants in this study were of school age, which could minimize the potential difference between the two indicators between physical activity and sport. Of note, living in an urban area positively predicts decreased physical activity in adulthood in women, but not in men.

The findings of this study contrast with the findings of (Yang et al., 2014), who reported that an active life course in youth was prospectively associated with physical activity in adulthood. Elsewhere, it was not associated with longitudinal changes in leisure-time physical activity (Dumith et al., 2012a). Other research states that social, family, biological, behavioural and environmental factors exert an important role in the physical activity change among youngsters as they move into adolescence (Dumith et al., 2012b). This domain of physical activity is often erratic and susceptible to changes from external factors from each individual which can explain the differences in results from different contexts not only related to physical fitness. Physical activity promotion strategies should include youth sports, consider what sports appeal to youth, and address reasons for doing (Hardie Murphy et al., 2017).

In this study, no evidence was found showing that physical education associated with physical activity and exercise longitudinally can positively affect students' physical fitness after adulthood. Another study found ambiguous results and showed male students aged 9-12 years predicting total weekly leisure time physical activity; however, no association was found for female students. In addition, physical education did not predict later physical activity in female students. The important differences in physical activity patterns according to sex and economic status, as well as a significant decline in time spent in moderate-to-vigorous physical activity with increasing age (Bielemann et al., 2013). Not surprisingly, leisure activity, i.e. exercise, which was under participant control, was a significant predictor of active behavior related to physical activity and exercise later in life. Individuals who choose to allocate some of their time to active participation in physical activity and sport on a regular basis are more likely to continue to allocate their time in the future. Gender and fundamental movement skill subdomain may influence the relationship between fundamental movement skills and physical activity in children (Cliff et al., 2009) fundamental movement skills also relationship with habitual physical activity (Fisher et al., 2015).

Participation in sport in particular increases the probability of a higher level of physical activity in later life (Telama et al., 2013).

CONCLUSION

The results of this study support the conclusion that physical activity and sports support the improvement of physical fitness in adolescent students who are physically active at least once every 2-3 weeks. However, the shortcoming of this study was that it did not see what physical activities and sports the participants did outside of the treatment given. So further research is recommended to control the activities of participants after treatment during the study. In addition, the results of physical fitness between female and male students with increasing age will decrease or increase in adolescence, it needs further investigation.

REFERENCES

- Abduh, I., Agusman, M., & Tadulako, U. (2020). *Analisis Hubungan Tingkat Kesegaran Jasmani terhadap Hasil Belajar Siswa*. 5, 75–82.
- Bangun, S. Y. (2016). Peran Pendidikan Jasmani Dan Olahraga Pada Lembaga Pendidikandi Indonesia. *Publikasi Pendidikan*, 6(3). <https://doi.org/10.26858/publikan.v6i3.2270>
- Basterfield, L., Adamson, A. J., Frary, J. K., Parkinson, K. N., Pearce, M. S., & Reilly, J. J. (2011). Longitudinal study of physical activity and sedentary behavior in children. *Pediatrics*, 127(1). <https://doi.org/10.1542/peds.2010-1935>
- Bielemann, R. M., Cascaes, A. M., Reichert, F. F., Domingues, M. R., & Gigante, D. P. (2013). Objectively measured physical activity in children from a southern brazilian city: A population-based study. *Journal of Physical Activity and Health*, 10(8), 1145–1152. <https://doi.org/10.1123/jpah.10.8.1145>
- Cao, Z. B., Miyatake, N., Higuchi, M., Miyachi, M., Ishikawa-Takata, K., & Tabata, I. (2010). Predicting $\dot{V}O_2$ max with an objectively measured physical activity in Japanese Women. *Medicine and Science in Sports and Exercise*, 42(1), 179–186. <https://doi.org/10.1249/MSS.0b013e3181af238d>
- Cliff, D. P., Okely, A. D., Smith, L. M., & McKeen, K. (2009). Relationships between fundamental movement skills and objectively measured physical activity in preschool children. *Pediatric Exercise Science*, 21(4), 436–449. <https://doi.org/10.1123/pes.21.4.436>
- Dumith, S. C., Gigante, D. P., Domingues, M. R., Hallal, P. C., Menezes, A. M. B., & Kohl, H. W. (2012a). A longitudinal evaluation of physical activity in

- Brazilian adolescents: Tracking, change and predictors. *Pediatric Exercise Science*, 24(1), 58–71. <https://doi.org/10.1123/pes.24.1.58>
- Dumith, S. C., Gigante, D. P., Domingues, M. R., Hallal, P. C., Menezes, A. M. B., & Kohl, H. W. (2012b). Predictors of physical activity change during adolescence: A 3-5-year follow-up. *Public Health Nutrition*, 15(12), 2237–2245. <https://doi.org/10.1017/S1368980012000948>
- Fisher, A., Reilly, J. J., Kelly, L. A., Montgomery, C., Williamson, A., Paton, J. Y., & Grant, S. (2015). Fundamental movement skills and habitual physical activity in young children. *Medicine and Science in Sports and Exercise*, 37(4), 684–688. <https://doi.org/10.1249/01.MSS.0000159138.48107.7D>
- Gardner, H. (2017). *Physical literacy on the move: games for developing confidence and competence in physical activity*.
- Gibson, N., Easton, C., Williams, M., McCunn, R., & Gibson, N. V. (2020). Reliability and Validity of a 6-Minute Yo-Yo Intermittent Endurance Test Level 2 in Subelite Part Time Male Soccer Players. *Journal of Strength and Conditioning Research*, Publish Ah. <https://doi.org/10.1519/jsc.00000000000003641>
- Hardie Murphy, M., Rowe, D. A., & Woods, C. B. (2017). Impact of physical activity domains on subsequent physical activity in youth: a 5-year longitudinal study. *Journal of Sports Sciences*, 35(3), 262–268. <https://doi.org/10.1080/02640414.2016.1161219>
- Kerr, C., Smith, L., Charman, S., Harvey, S., Savory, L., Fairclough, S., & Govus, A. (2018). Physical education contributes to total physical activity levels and predominantly in higher intensity physical activity categories. *European Physical Education Review*, 24(2), 152–164. <https://doi.org/10.1177/1356336X16672127>
- Koh, K. T., George Lam, C. S., Regina Lim, S. H., & Sam, K. L. (2019). Physical activity patterns and factors that facilitate or hinder exercise among adolescents in an all-boys school. *European Physical Education Review*, 25(2), 456–473. <https://doi.org/10.1177/1356336X17744520>
- Kusnaedi, R. (2018). *Tingkat Aktivitas Jasmani Terhadap Kecerdasan Emosional Pada Remaja Di Sma Muhammadiyah 1 Semarang*.
- Mannino, G., Giunta, S., Montefiori, V., Tamanza, G., Iacolino, C., Novara, C., Rita, P., La Fiura, G., & Bernardone, A. (2019). Healthy Lifestyle, Well-being, Physical Activity, Sport, and Scholastic/academic Performance: Interactions and Connections. *World Futures*, 75(7), 462–479. <https://doi.org/10.1080/02604027.2019.1654772>
- Milanović, Z., Pantelić, S., Sporiš, G., Mohr, M., & Krstrup, P. (2015). Health-

- related physical fitness in healthy untrained men: Effects on VO₂max, jump performance and flexibility of soccer and moderate-intensity continuous running. *PLoS ONE*, 10(8). <https://doi.org/10.1371/journal.pone.0135319>
- Nabi, T., Rafiq, N., & Qayoom, O. (2015). Assessment of Cardiovascular Fitness [VO₂Maxx] among Medical Students by Queens College Step Test. *International Journal of Biomedical And Advance Research*, 05(01), 418–421. <http://ijbar.ssjournals.com/index.php/journal/article/view/580/1035>
- Powell, K. E., Paluch, A. E., & Blair, S. N. (2011). Physical activity for health: What kind? how much? how intense? on top of what? *Annual Review of Public Health*, 32, 349–365. <https://doi.org/10.1146/annurev-publhealth-031210-101151>
- Prastiyo, N. A., & Maksum, A. (2013). Korelasi antara aktivitas olahraga dengan tingkat stres yang dialami siswa kelas XI Jurusan Busana Butik SMKN 8 Surabaya. *Jurnal Pendidikan Olahraga Dan Kesehatan*, 01(01), 234–239.
- Stevens, C. J., & Dascombe, B. J. (2015). The Reliability and Validity of Protocols for the Assessment of Endurance Sports Performance: An Updated Review. *Measurement in Physical Education and Exercise Science*, 19(4), 177–185. <https://doi.org/10.1080/1091367X.2015.1062381>
- Sutri, Isnaini Herawati, and D. K. (2014). *Hubungan Aktifitas Fisik dengan Kesegaran Jasmani pada Remaja Puasa*. Universitas Muhammadiyah Surakarta.
- Taliaferro, L. A., Eisenberg, M. E., Johnson, K. E., Nelson, T. F., & Neumark-Sztainer, D. (2011). Sport participation during adolescence and suicide ideation and attempts. *International Journal of Adolescent Medicine and Health*, 23(1), 3–10. <https://doi.org/10.1515/IJAMH.2011.002>
- Tammelin, T., Näyhä, S., Hills, A. P., & Järvelin, M. R. (2003). Adolescent participation in sports and adult physical activity. *American Journal of Preventive Medicine*, 24(1), 22–28. [https://doi.org/10.1016/S0749-3797\(02\)00575-5](https://doi.org/10.1016/S0749-3797(02)00575-5)
- Telama, R., Yang, X., Hirvensalo, M., & Raitakari, O. (2006). Participation in organized youth sport as a predictor of adult physical activity: A 21-year longitudinal study. *Pediatric Exercise Science*, 18(1), 76–88. <https://doi.org/10.1123/pes.18.1.76>
- Telama, R., Yang, X., Laakso, L., & Viikari, J. (2013). Physical activity in childhood and adolescence as predictor of physical activity in young adulthood. *American Journal of Preventive Medicine*, 13(4), 317–323. [https://doi.org/10.1016/s0749-3797\(18\)30182-x](https://doi.org/10.1016/s0749-3797(18)30182-x)
- Vesterinen, V., Nummela, A., Laine, T., Hynynen, E., Mikkola, J., & Häkkinen, K.

- (2017). A submaximal running test with postexercise cardiac autonomic and neuromuscular function in monitoring endurance training adaptation. *Journal of Strength and Conditioning Research*, 31(1), 233–243. <https://doi.org/10.1519/JSC.0000000000001458>
- Walters, S., Barr-Anderson, D. J., Wall, M., & Neumark-Sztainer, D. (2009). Does Participation in Organized Sports Predict Future Physical Activity for Adolescents from Diverse Economic Backgrounds? *Journal of Adolescent Health*, 44(3), 268–274. <https://doi.org/10.1016/j.jadohealth.2008.08.011>
- Yang, X., Telama, R., Hirvensalo, M., Tammelin, T., Viikari, J. S. A., & Raitakari, O. T. (2014). Active commuting from youth to adulthood and as a predictor of physical activity in early midlife: The Young Finns Study. *Preventive Medicine*, 59(1), 5–11. <https://doi.org/10.1016/j.ypmed.2013.10.019>