

## The Effect of Physical Training and Soccer Skills Intervention on the Fitness and Skills of Children with Mild Intellectual Disabilities

Vistor Syapri Maulana<sup>1\*</sup>, Sumaryanti<sup>2</sup>, Atikah Rahayu<sup>3</sup> and Eggy Nur Arfiansyah<sup>4</sup>

1,2,3,4.Department of Sport Science, Faculty of Sport and Health Sciences,  
Universitas Negeri Yogyakarta, Yogyakarta, Indonesia.

\*Corresponding Author Email: vistorsyapri@uny.ac.id

### Abstract

This study aims to determine whether combining physical training with the technical components of dribbling, shooting, and throw-in in five-a-side football positively impacts cardiorespiratory fitness while also improving these technical components in students with intellectual disabilities at SLB N I Bantul. This research employed a pre-experimental design (One-Group Pretest-Posttest Design) involving 30 students with mild intellectual disabilities. The instruments used in this study include the Multistage Fitness Test (MFT) to assess cardiorespiratory fitness and skill tests from the Special Olympics to evaluate dribbling, shooting, and throw-in techniques. The collected data were analyzed using descriptive and inferential statistics. Pretest and posttest scores were compared, with differences analyzed using a t-test. The results indicate a significant effect of the combined physical and technical training model on cardiorespiratory fitness and football skills in children with mild intellectual disabilities. The Multistage Fitness Test yielded a significance value of  $0.001 < 0.05$ , while the significance values for the dribbling, shooting, and throw-in tests were  $0.001 < 0.05$ ,  $0.000 < 0.05$ , and  $0.01 < 0.05$ , respectively. These findings suggest that integrating physical and technical training enhances both fitness and technical skills in football. This study implies that combining physical and technical training is needed to create more varied exercises and achieve optimal results. Based on the findings and discussion, it can be concluded that the combination of physical training and technical components, including dribbling, shooting, and throw-in, has a significant impact on cardiorespiratory fitness and soccer skills in children with mild intellectual disabilities at SLB N Bantul. This study is expected to serve as a valuable reference for educators, coaches, and students with intellectual disabilities in designing and implementing training programs that integrate modified physical and technical exercises to enhance both physical activity and soccer performance in children with intellectual disabilities.

**Keywords:** *Football, Physical Training, Technique, Intellectual Disability.*

### INTRODUCTION

Children with intellectual disabilities generally have lower physical fitness levels than their non-disabled peers of the same age<sup>[1,2,3]</sup>. Lower physical fitness scores are attributed to a less active lifestyle<sup>[1,4,5]</sup>, limited cognitive abilities and short attention spans<sup>[6]</sup>, motor development limitations and impairments<sup>[6,7,8]</sup>, and a lack of motivation to perform at their best during tests<sup>[9]</sup>. Traditionally, physical fitness improvement has been approached through stand-alone exercises such as gymnastics, cycling, and running, while technical skill training has been conducted separately using a drill-based method for dribbling, shooting, and throw-in techniques. However, children with intellectual disabilities are easily distracted and struggle with maintaining focus, necessitating a training method that aligns with their characteristics and effectively achieves learning goals. A preliminary study conducted through a questionnaire

distributed to MGMP SLB teachers across Yogyakarta revealed that teachers still require instructional methods to enhance physical fitness. Additionally, they need appropriate physical fitness assessment instruments to measure the fitness levels of students with intellectual disabilities. This study integrates physical training with technical components, specifically dribbling, shooting, and throw-in techniques in five-a-side football. This approach is chosen because children enjoy playing football, making it suitable for their characteristics. The training program includes various modifications to ensure engagement and effectiveness. Implementing this approach is crucial for developing an efficient and effective method to enhance both cardiorespiratory fitness and football skills in students at SLB N I Bantul. The objective of this study is to determine whether combining physical training with dribbling, shooting, and throw-in techniques in five-a-side football positively impacts both cardiorespiratory fitness and technical skills in students with intellectual disabilities at SLB N I Bantul.

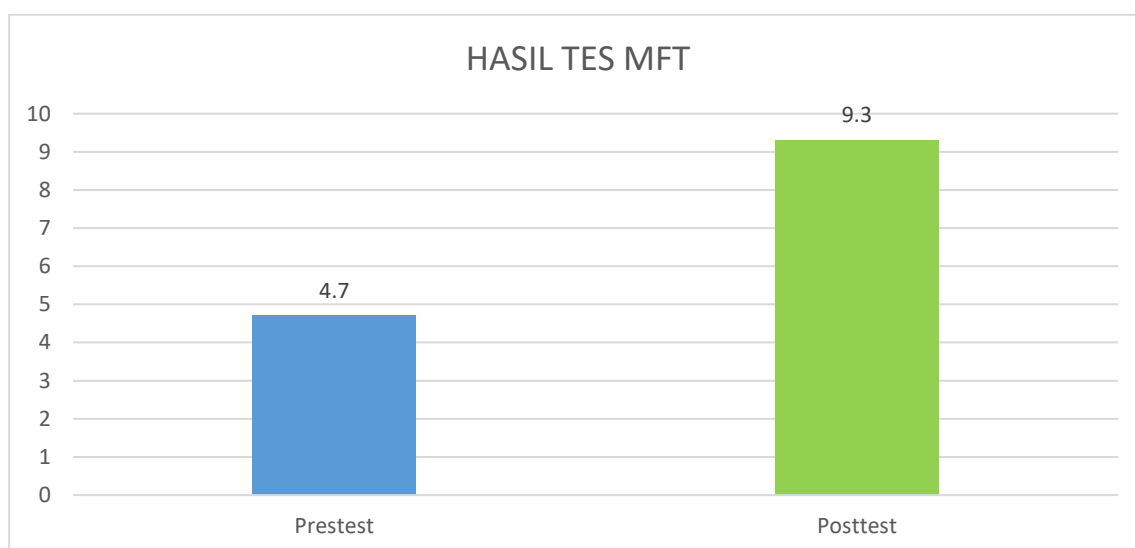
## MATERIAL AND METHODS

This study employs a pre-experimental method with a one-group pretest-posttest design. The research sample consisted of 30 students from SLB N Bantul. Before the training program, participants completed an initial test prior to the eight weeks training, followed by a posttest. The program included three main exercises: 1). dribbling for a distance of 15 meters. 2). shooting from a distance of 6 meters. 3). throw-in exercise, which involved a 4-meter run followed by a two-handed overhead throw. The throw-in exercise was repeated progressively, starting with 5 repetitions in the first week, increasing to 6 repetitions in the second week, 7 repetitions in the third and fourth weeks, 8 repetitions in the fifth and sixth weeks, and 9 repetitions in the seventh and eighth weeks. These exercises were performed sequentially and continuously using the circuit training method. In this study using physical fitness test instruments for students with mild intellectual disabilities specifically for cardiorespiratory using the MFT Test (Multistage Fitness Test) and for the Components of dribbling, Shooting and Throw in technical skills with individual skill tests from Special Olympics.

### Data Analysis Technique

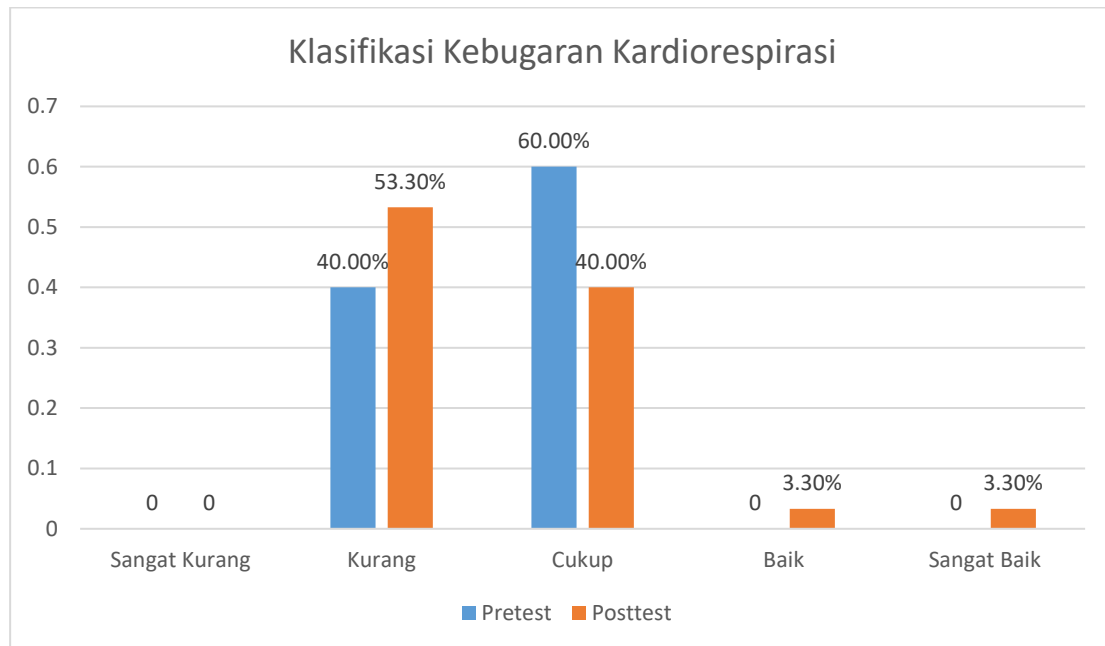
Data were analyzed using a paired sample t-test with IBM SPSS version 26.

## RESULT

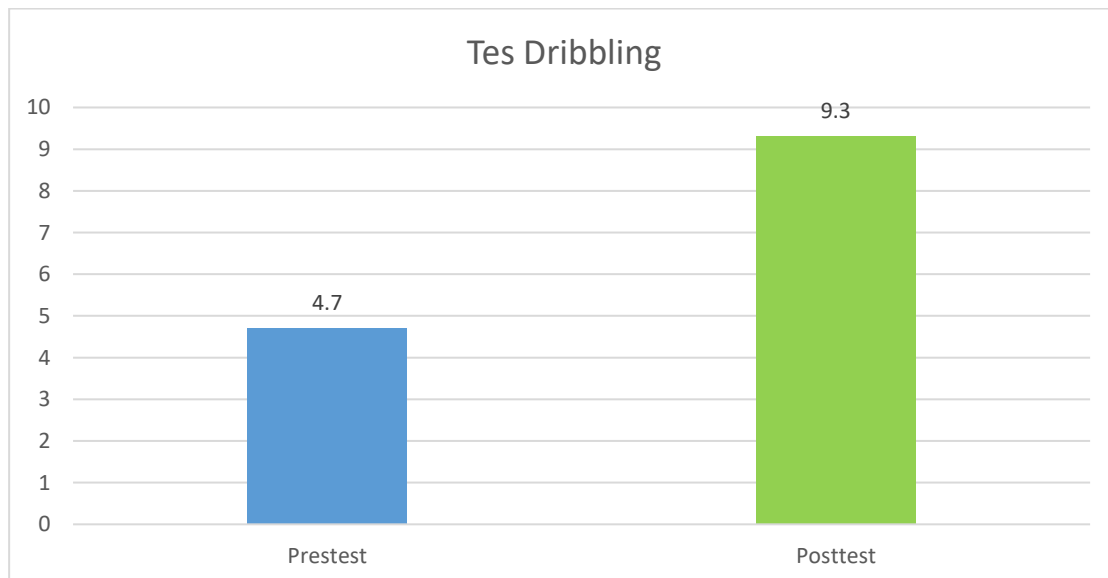


The description of the average results can be outlined as follows:

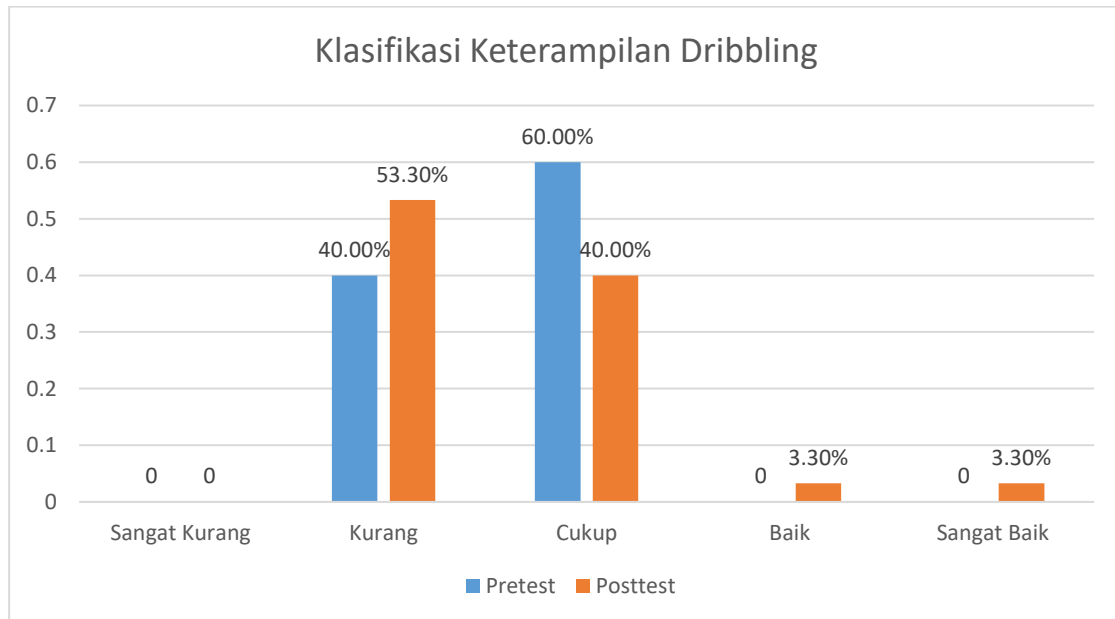
The data shows that the pretest score for the cardiovascular fitness component, measured through the multistage test, was 26.15 ml/kg/min, classified as very low. Meanwhile, the posttest score increased to 38.5 ml/kg/min, categorized as moderate. This indicates an improvement in cardiovascular fitness. Meanwhile, the distribution of classification data from the MFT test conducted can be seen in the following graph.



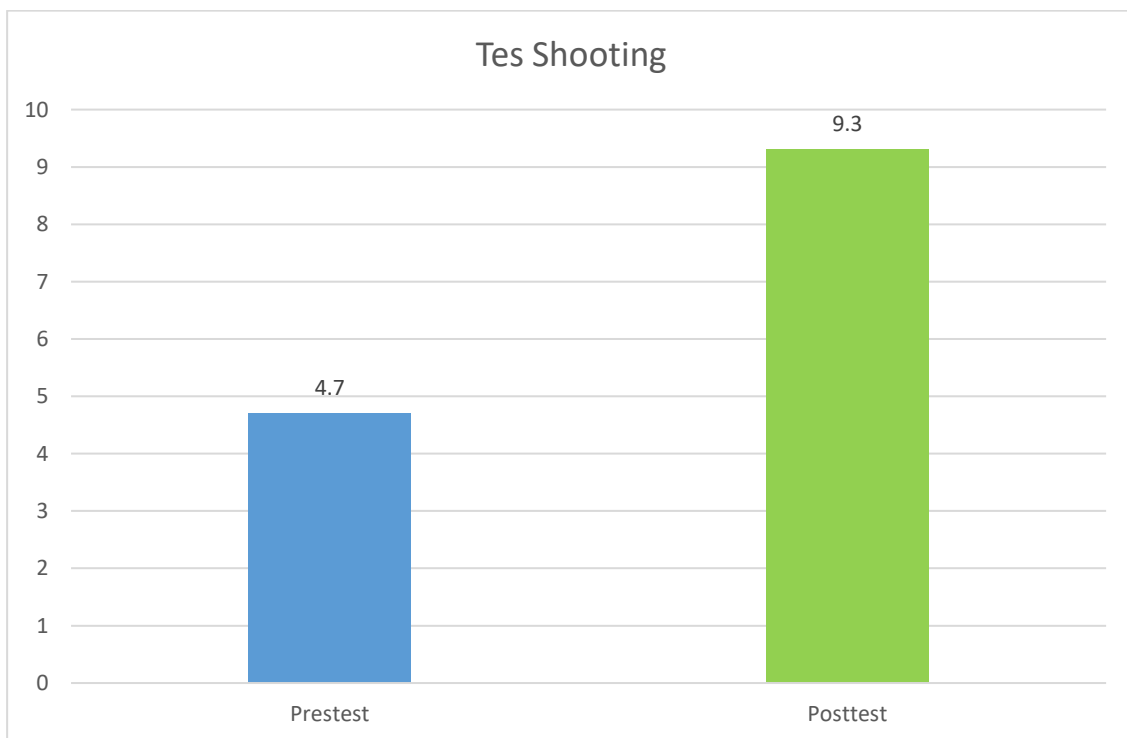
Then, the average results from the dribbling test can be seen in the following bar chart.



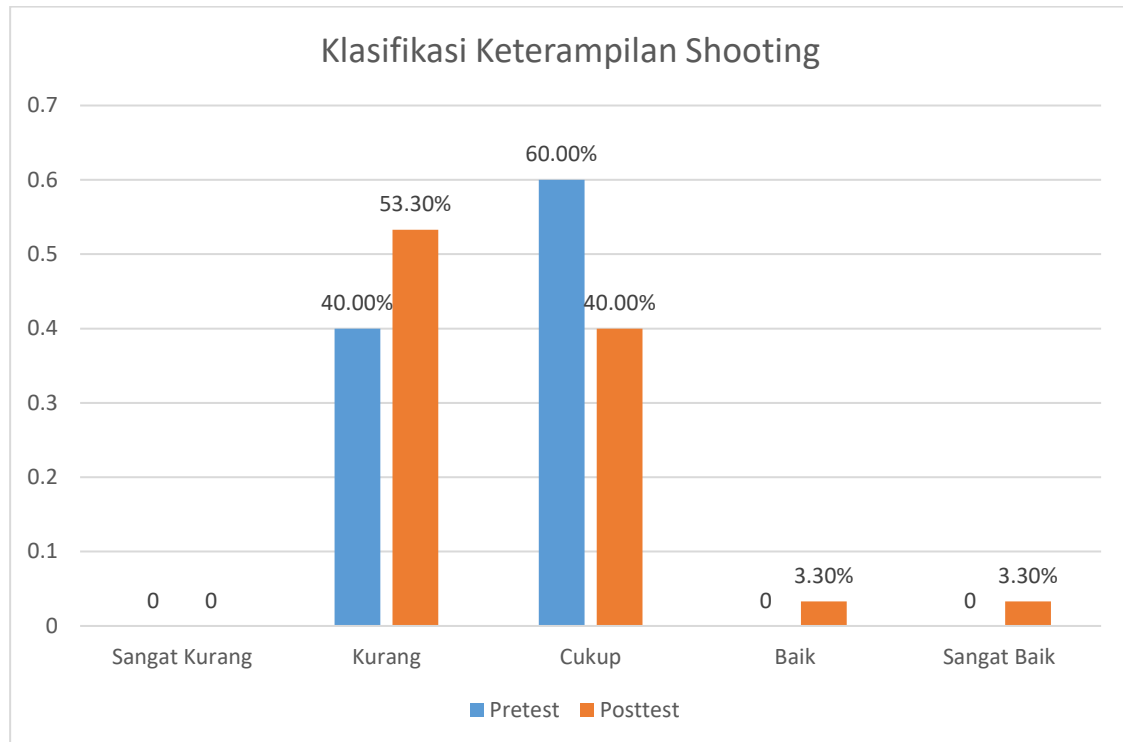
From the data above, the pretest score for the dribbling skill component, measured through the dribbling test, was 48.3 seconds, classified as low. Meanwhile, the posttest score improved to 38.5 seconds, categorized as moderate. This indicates an improvement in the dribbling variable. The distribution of classification data from the dribbling test conducted can be seen in the following graph.



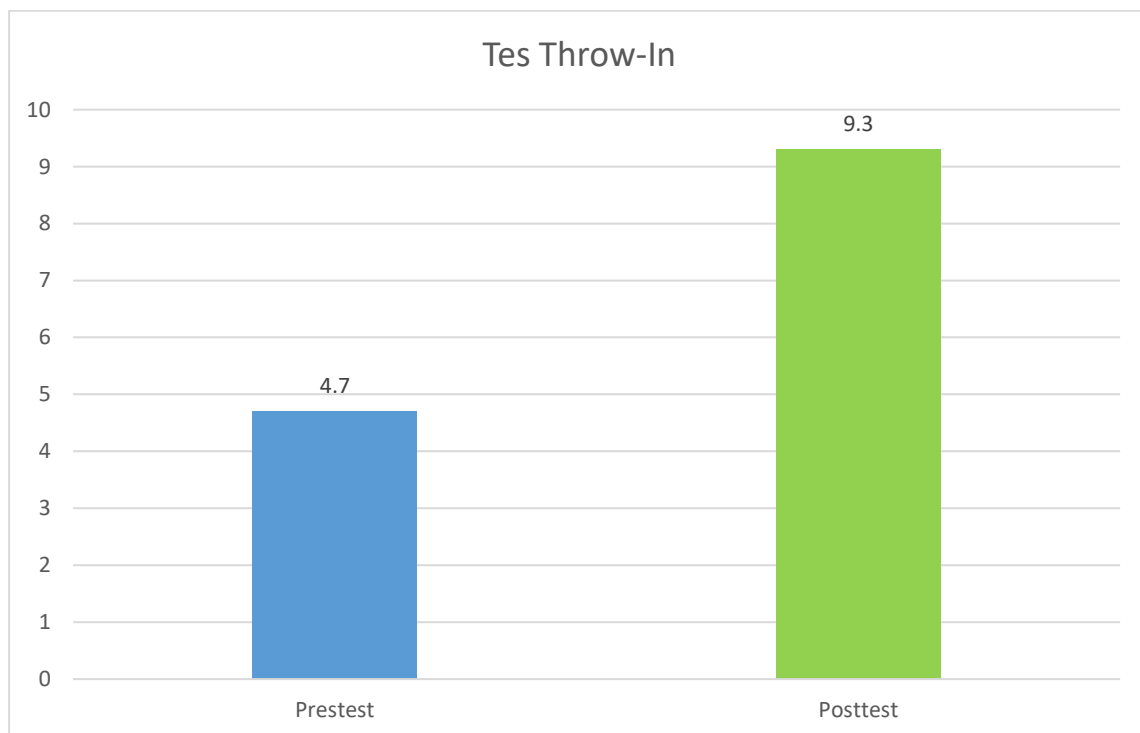
Then, the average results from the shooting test can be seen in the following bar chart.



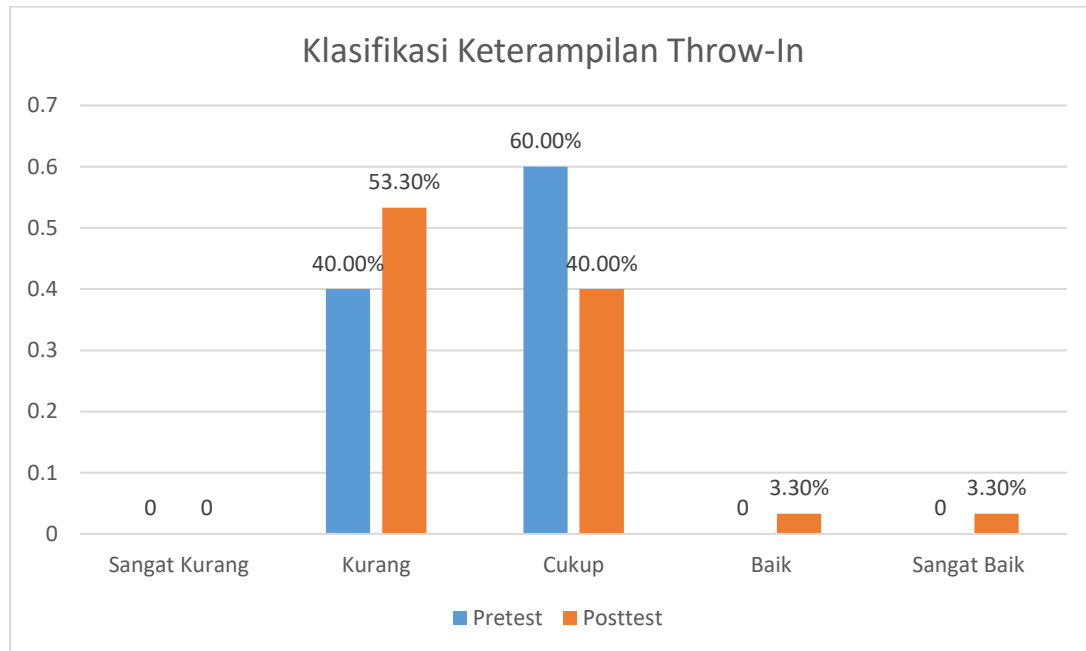
From the data above, the pretest score for the shooting component, measured through the shooting test, was 3.4, classified as low. Meanwhile, the posttest score increased to 10.3, categorized as moderate. This indicates an improvement in the shooting variable. The distribution of classification data from the shooting test conducted can be seen in the following graph.



The results of the throw-in test are presented in the following bar chart.



The data above shows that the pre-test score for the ball-throwing skill component (measured through the throw-in test) was 4.7 meters. Meanwhile, the post-test score was 9.3 meters, categorized as moderate. This indicates an improvement in the throw-in variable. The distribution of classification data from the throw-in test can be observed in the following graph.



The effects of the exercise program are presented in the following table.

**Table 1: Results of the Paired Sample T-Test**

Variabel	Hasil Test		Sig.	Keterangan
	Pre	Post		
Daya Tahan Kardiovaskular (ml/kg/min)	26,15 ± 4,3	38,5 ± 1,7	0,001	Ada Pengaruh
Dribbling (detik)	48,3 ± 6,0	38,5 ± 6,3	0,000	Ada Pengaruh
Shooting	3,4 ± 1,6	10,3 ± 4,3	0,001	Ada Pengaruh
Throw-in (m)	4,7 ± 2,3	9,3 ± 3,2	0,01	Ada Pengaruh

The results of the Paired Sample T-Test presented in the table above indicate a significance value of 0.001 for Cardiovascular Endurance, 0.000 for Dribbling, 0.001 for Shooting, and 0.01 for Throw-In. Since all significance values are less than 0.05, it can be concluded that the combination model of physical exercise and technical training has a significant effect on cardiorespiratory fitness and soccer playing techniques in children with mild intellectual disabilities.

## DISCUSSION

This study aims to examine whether physical training combined with dribbling, shooting, and throw-in technique training in soccer has an impact on improving cardiorespiratory fitness as well as enhancing the technical components of dribbling, shooting, and throw-in skills in soccer. The study focuses on students with intellectual disabilities at SLB N 1 Bantul. In a previous study, Baran et al. (2012) examined the effects of the Special Olympics Unified Program on anthropometric measurements, physical fitness, and soccer skills among adolescent male athletes with and without intellectual disabilities. The findings indicated that both athletes with disabilities and their non-disabled counterparts achieved significantly higher scores in most physical fitness and soccer skill assessments compared to a similar group that did not receive specialized training. Currently, there is limited research on intervention programs aimed at enhancing physical fitness and soccer skills in adults with intellectual disabilities. Consequently, it can be inferred that the physical activity levels of adults with

intellectual disabilities are below the national average. Furthermore, within this population, regular exercise is associated with a lower body mass index (BMI).

By combining physical and technical training, students are expected to experience improvements in both physical aspects, particularly  $\text{VO}_2\text{max}$ , and fundamental soccer skills. The effective implementation of this integrated training method requires careful consideration of the appropriate training dosage. The findings of this study indicate a significant improvement in soccer skills among students with intellectual disabilities before and after the intervention. These results align with the study by Baran et al. (2013), which demonstrated that an integrated soccer training program led to significant enhancements in soccer performance. The development of soccer skills necessitates a combination of various physical fitness components, including lower limb strength, cardiovascular endurance, balance, coordination, and motor control.

These findings have important practical implications. First, they highlight the necessity of prioritizing exercise programs that integrate both physical and technical training. Second, they emphasize the significance of physical and technical training in enhancing soccer performance for individuals with intellectual disabilities. Additionally, it is essential to consider specific strategies for modifying training programs to ensure greater variation and efficiency.

## CONCLUSIONS

Based on the findings and discussion, it can be concluded that the combination of physical training and technical components, including dribbling, shooting, and throw-in, has a significant impact on cardiorespiratory fitness and soccer skills in children with mild intellectual disabilities at SLB N Bantul. This study is expected to serve as a valuable reference for educators, coaches, and students with intellectual disabilities in designing and implementing training programs that integrate modified physical and technical exercises to enhance both physical activity and soccer performance in children with intellectual disabilities.

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## Reference

- 1) Pitetti & Boneh, 1995; Van De Vliet et.al., 2006; Skowron' ski, Horvat, Nocera, Roswal, & Croce, 2009
- 2) Van De Vliet, P., Rintala, P., Fro'jd, K., Verellen, J., Van Houtte, S., Daly, D. J., et al. (2006). Physical fitness profile of elite athletes with intellectual disability. *Scandinavian Journal of Medicine and Science in Sports*, 16(6), 417–425. Retrieved from [www.scopus.com](http://www.scopus.com)
- 3) Skowron'ski, W., Horvat, M., Nocera, J., Roswal, G., & Croce, R. (2009). Eurofit special: European fitness battery score variation among individuals with intellectual disabilities. *Adapted Physical Activity Quarterly*, 26(1), 54–67 Retrieved from [www.scopus.com](http://www.scopus.com).

- 4) Bickum, D. (1995). *The history of graded exercise testing in cardiac rehabilitation*. Oregon: Microform Publication.
- 5) Lotan, M., Isakov, E., Kessel, S., & Merrick, J. (2004). Physical fitness and functional ability of children with intellectual disability: Effects of a short-term daily treadmill intervention. *The Scientific World Journal*, 4, 449–457.  
<http://dx.doi.org/10.1100/tsw.2004.97>
- 6) Vuijk, P. J., Hartman, E., Scherder, E., & Visscher, C. (2010). Motor performance of children with mild intellectual disability and borderline intellectual functioning. *Journal of Intellectual Disability Research*, 54, 955–965.  
<https://doi.org/10.1111/j.1365-2788.2010.01318.x>
- 7) Frey, G. C., Chow, B. (2006). Relationship between BMI, physical fitness, and motor skills in youth with mild intellectual disabilities. *International Journal of Obesity*, 30, 861–867. <http://dx.doi.org/10.1038/sj.ijo.0803196>
- 8) Westendorp, M., Houwen, S., Hartman, E., & Visscher, C. (2011). Are gross motor skills and sports participation related in children with intellectual disabilities?. *Research in Developmental Disabilities*, 32, 1147–1153.  
<https://doi.org/10.1016/j.ridd.2011.01.009>
- 9) Halle, J. W., Gabler-Halle, D., & Chung, Y. B. (1999). Effects of a peer mediated aerobic conditioning program on fitness levels of youth with mental retardation: Two systematic replications. *Mental Retardation*, 37(6), 435–448.  
[https://doi.org/10.1352/0047-6765\(1999\)037<0435:eoapac>2.0.co;2](https://doi.org/10.1352/0047-6765(1999)037<0435:eoapac>2.0.co;2)
- 10) Gremeaux, V., Gayda, M., Lepers, R., & Sosner, P. (2012). Maturitas. *Maturitas*, 73(4), 312–317. <https://doi.org/10.1016/j.maturitas.2012.09.012>
- 11) Lieberman, D. E. (2015). Is Exercise Really Medicine ? An Evolutionary Perspective, 313–319.
- 12) Oberg, E. (2007). Physical Activity Prescription : Our Best Medicine, 6(5), 18–22.
- 13) Billinger, S. A., Boyne, P., Coughenour, E., Dunning, K., & Mattlage, A. (2015). Does Aerobic Exercise and the FITT Principle Fit into Stroke Recovery ?  
<https://doi.org/10.1007/s11910-014-0519-8>
- 14) Ammann, Bernadette C.; Knols, Ruud H.; Baschung, Pierrette; de Bie, Rob A.; de Bruin, Eling D., J. (2014). Application of principles of exercise training in subacute and chronic stroke survivors: a systematic review, 0–11.
- 15) Baker, D.G., Nash, W.P., Litz, B.T. et.al. (2012). Predictors of risk and resilience for posttraumatic stress disorder among ground combat Marines: methods of the Marine Resiliency Study. *Preventing Chronic Disease*. 9: 97.  
<https://doi.org/10.5888/pcd9.110134>
- 16) Wahjoedi. (2001). *Landasan Evaluasi Pendidikan Jasmani*. Jakarta: Raja Grafindo Jakarta. [21,22].
- 17) Lutan, Rusli. (2002). *Menuju Sehat dan Bugar*. Jakarta: Depdiknas.
- 18) Suharjana. (2013). *Kebugaran Jasmani*. Yogyakarta: Jogja Global Media.



- 19) Karim, Faizati. (2002). *Panduan Kesehatan Olahraga Bagi Petugas Kesehatan*. Jakarta: Tim Departemen Kesehatan
- 20) Wiarto, Giri. (2015). *Panduan Berolahraga untuk Kesehatan dan Kebugaran*. Yogyakarta: Graha Ilmu.
- 21) Suharjana. (2008). *Pendidikan Kebugaran Jasmani*. Pedoman Kuliah. Yogyakarta: FIK UNY.
- 22) Shamoro, D., & Mondal, S. (2014). Comparative Relationship of Selected Physical Fitness Variables among Different College Student of Mekelle University Ethiopia Africa. *Journal of Physical Education, Fitness and Sports*. 3 (14). 2277:5477.
- 23) Intellectual Disability Rights Service. (2009). *Introduction to Intellectual Disability*. IDRS: Sydney.
- 24) Kemis., Ati Rosnawati. (2013). *Pendidikan Anak Berkebutuhan Khusus Tuna grahita*. Bandung: PT. Luxima Metro Media.
- 25) Bangsbo, J., Hansen, P. R., Dvorak, J. and Krustup, P. (2015). Recreational football for disease prevention and treatment in untrained men: a narrative review examining cardiovascular health, lipid profile, body composition, muscle strength and functional capacity. *Br J Sport Med*. 2015 May; 49(9): 568-576, doi: 10.1136/bjsport-2015-094781
- 26) Baran F, Aktop A, Özer D, Nalbant S, Ağlamış E, Barak S, Hutzler Y. The effects of a Special Olympics Unified Sports Soccer training program on anthropometry, physical fitness and skilled performance in Special Olympics soccer athletes and non-disabled partners. *Res Dev Disabil*. 2013 Jan;34(1):695-709. doi: 10.1016/j.ridd.2012.10.003.