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Cluster analysis using the physical condition endurance method for archery sports

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Abstract

The development of archery achievements in Indonesia so far has not been able to reach the limits of the Olympics and the development of achievements in Indonesia only focuses on the national level and on the Asian scale due to several factors, including the lack of infrastructure for archery because the infrastructure includes a fairly large field, for example the field. football or red soil whose ground must be level. As well as management which is still less focused on developing archers in the regions, especially in Indonesia. There is a lot of archery in Indonesia that needs to be addressed both in terms of management and infrastructure, including in areas that lack knowledge of sport science and good management, with the existence of sport science in Indonesia and good management of sports, especially archery in Indonesia, this can change aspects of archery. the lack of achievement becomes the number of achievements so that archery in Indonesia can compete in the Olympic championship and gain good achievements. With this method of physical condition exercise, it can be used properly and correctly to add insight into the media used. The method used is using cluster analysis using the Physical Condition Endurance Method for Archery.

1. INTRODUCTION

The development of archery achievements in Indonesia until now has not been able to reach the Olympic level and the development of achievements (Ihsan et al., 2018). In Indonesia, it only focuses on the national level and the Asian scale due to several factors, including the lack of infrastructure (Abdi et al., 2016). In archery, infrastructure facilities include a fairly large field, for example a soccer field or red soil whose land must be flat. As well as management management that is still less focused on developing archer seeds in the regions, especially in Indonesia (Abdi et al., 2016). An athlete is a person who participates in planned, measured, and recorded sports activities in order to achieve success. A goal achieved to the best of one's ability is called achievement. To achieve high-level performance, all aspects of physical, technical, tactical, and mental conditioning must be trained and programmed systematically and in a planned manner (Sepriani et al., 2021).

Unfortunately, the mental development of athletes is often neglected and underutilized compared to other aspects, resulting in athletes being less able to manage problems that can interfere with their success (Li & Ding, 2021). Counseling can help athletes manage their problems properly and achieve peak performance (Lee et al., 2019). The focus of sports counseling services includes the athlete's mental readiness, motivation, and peak performance. Counseling will be provided following the principles of confidentiality, voluntariness and openness, independence, modernity, and normativeness (Sepriani et al., 2021). The uniqueness, potential, and problems that hinder the development of an athlete's achievement can be minimized with counseling services so that athletes can perform optimally. Explosive power is a combination of strength and speed that is realized in the form of muscle ability (Mirzayi et al., 2021). This explosive power contributes to high speed, this explosive power affects the components of physical condition by directing maximum strength in the shortest possible time

(Ihsan et al., 2018). Therefore, this explosive power greatly influences the aspect of physical condition, namely the goal of doing maximum body work so that the body automatically moves maximally. Endurance is a small physical exercise where the body's activity works regularly, be it jogging and push-ups (Id et al., 2022). Sit ups and small sports, be it brisk walking for minutes or hours.

So that endurance is maintained, and muscle work and small muscle ability can be active with a long-time intensity (Ihsan et al., 2018). So that muscle mass is able to work for a long time and overcome fatigue due to irregular workload. Flexibility is one of the physical conditions that can be done statically and dynamically, flexibility here has many benefits, namely reducing minor or severe injuries due to excessive sports activities (Kueh & Kuan, 2021). Flexibility here is a component of one of the physical training methods carried out before activities (Indrawati, 2017). Balance is a physical method that is carried out by maintaining a form of gravity in a certain position by using several body movements including the feet or hands which are used to connect to each other (Putra & S, 2020). Connecting Organizing Reflecting Extending (CORE) is one of the learning models based on constructivism (Naviri et al., 2020). In order for the CORE learning model to run well and achieve the expected goals, it is necessary to carry out a learning approach that supports the CORE learning model, one of which is the scientific approach (Stenling et al., 2015).

2. METHOD

This method is applied with the cluster analysis method using the physical condition endurance method for the archery sport. This study examines the training method as cluster analysis data and collaborates with physical condition biomotors.

3. RESULTS AND DISCUSSION

Table 1. Table Anova

ANOVA						
	Cluster		Error			
	Mean Square	df	Mean Square	df	F	Sig.
Performan	.000	2	.000	4	.	.
Kelentukan	255.214	2	25.250	4	10.107	.027
DT_OtotLengan	76.339	2	41.188	4	1.853	.269
Core	286.964	2	8.875	4	32.334	.003
Akurasi	31.089	2	25.313	4	1.228	.384

All instruments have a Sig value (<0.05), which means that all instruments can be used to differentiate each cluster.

Table 2. Table Anova

Cluster Membership			
Case Number	VAR00001	Cluster	Distance
1	Nama	1	7.945
2	MG	2	8.155
3	ST	3	.000
4	VR	2	8.155
5	TY	1	7.492
6	OT	1	8.581
7	MA	1	8.754
8	AG	.	.

The results of a cluster analysis can reveal distinct groups of archers, each with unique physical characteristics. For example, one cluster may consist of archers with high cardiovascular endurance but lower muscular strength, while another cluster may show the opposite trend. Understanding these clusters allows coaches to identify which physical attributes are most beneficial for different types of archers, whether competing in target or field archery.

Number of Cases in each Cluster		
Cluster	1	4.000
	2	2.000
	3	1.000
Valid		7.000
Missing		1.000

Output Analysis = Cluster 1 = 4 Respondents, Cluster 2 = 2 Respondents and Cluster 3 = 1 Respondent.

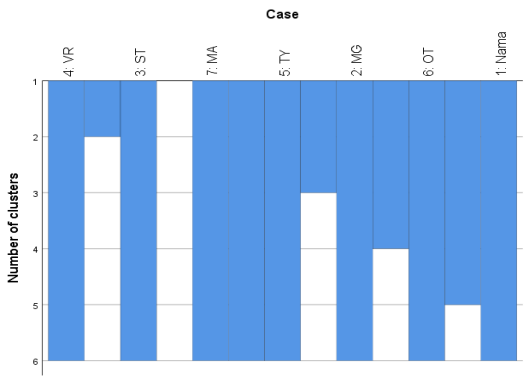

Figure 1. Performance, Flexibility, Arm Muscle Endurance, Core, Accuracy

Discussion

The development of archery achievements in Indonesia until now has not been able to reach the Olympic level and the development of achievements in Indonesia has only focused on the national level and the Asian scale due to several factors, including the lack of infrastructure for archery because the infrastructure includes a fairly large field, for example a soccer field or red soil whose land must be flat (Abdi et al., 2016). As well as management that is still less focused on developing archery seeds in the regions, especially in Indonesia (Ihsan et al., 2018). Reviewed from the biomotor aspect, the physical condition of archery athletes is still not good until now, be it performance, flexibility, arm muscle endurance, balance, core and aerobic endurance. One aspect of this physical condition greatly influences (Naviri et al., 2020). From the statement above, it can be concluded that through this achievement it is not easy and the program must be run as well as possible. With this, the cluster analysis method using the physical condition endurance method for the sport of archery can help regional, national and international coaches (Abdi et al., 2016). With the existence of this physical condition training method, it can be used properly and correctly to increase insight into the media used (Stenling et al., 2015). The implications of this analysis are significant for training and development in archery. By recognizing the specific endurance profiles of different clusters, coaches can design personalized

training regimens that focus on improving strengths and addressing weaknesses in each group. For example, archers in the high endurance cluster may benefit from strength training to improve their overall stability, while those in the strength-focused cluster may need to integrate more cardiovascular training to improve their stamina during competition.

4. CONCLUSION

Archery in Indonesia has many things that need to be fixed, both in terms of management and infrastructure, including in areas with minimal knowledge of sport science and good management, so with the existence of sport science in Indonesia and good management, sports, especially archery in Indonesia, can change aspects from lack of achievement to many achievements so that archery in Indonesia can compete in the Olympics and achieve good achievements. The method used is using cluster analysis using the Physical Condition Endurance Method for Archery Sport.

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Thank you for reading this article. Hopefully, in this publication, there will be a lot of research that needs to be developed, especially in archery.

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