



# The Contribution of Flexibility, Power, Endurance on The Results of the 100 Meters Run

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**Abstract.** The purpose of this study was to determine whether the physical condition component factors also contribute to students who come from different characteristics, namely athletes (outside athletics) and non-athletes. This type of research is correlational research. The research was conducted in one of the universities in Jabodetabek (Jakarta, Bogor, Depok, Tangerang and Bekasi) during June-July 2023. The sample taken was 30 people with purposive sample technique (students who did not come from athletic athletes). The collecting data technique used the Sit and React test (flexibility), 3 Hop - R&L (power), Balke 15 minutes (endurance). Hypothesis testing uses regression analysis tests which are carried out in two stages, namely simple regression analysis and multiple regression analysis. Research Results Flexibility, Power, and Endurance (for each variable and together) do not significantly affect the results of the 100 meters run of students who do not come from athletic athletes. Physical components can be proposed as a reference in terms of searching and or selecting prospective athletes in the future, but the high ability of physical components must be in line with the basic techniques, mentality, and strategies that an athlete carries out, to then be tested and trained through training activities and a series of experiences competing / competing.

**Keywords:** Flexibility, Power, Endurance, 100 Meters Run

## 1 Introduction

Claimed by many parties as the oldest sport in the world, so it is called the mother of sport, athletics is the sport that is most often competed and or almost certainly competed in every multi-sport event locally or in national, regional or international scale. For this reason, if various kinds of constructive information and dynamic knowledge will always be needed by athletic sports coaches. In other words, various contributions of scientific information and thoughts related to athletics will always be awaited by readers and enthusiasts. Reflecting on one dimension that consistently organises athletic sports coaching, namely universities that have faculties and / or study programmes in

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the field of sports, that at the beginning of each lecture athletic sports along with gymnastics and swimming (aquatic activities) are always mandatory courses. Related to this, it is quite relevant to present up to date information related to athletic sports in order to produce the development of the athletic learning process, and that by parties outside the college as a source of information in order to succeed in athletic sports coaching. One of the match numbers in athletics and even considered as a prima donna number is the 100 meters short distance run (*sprint*). Running short distances (*sprints*), one of which is running 100 meters, requires elements of excellent physical condition, so that they are able to exert all their strength from the start to the finish line, the second factor that must be considered is the mechanism of motion. [1].

Athletics has factors that influence the achievement of optimal performance, starting from posture, physical condition, movement mechanism skills, strategy and psychology. [2] [3]. In the concept of sports training, the first thing that must be considered is to improve the movement mechanism, after that developing the physical components that support the movement mechanism. [4], [5], [6]. Physical condition factors such as flexibility, power, endurance have long been considered as predictors of the performance of a person's 100 meters running speed. Contralateral pelvic drop and hip adduction were positively correlated to ankle eversion and step cadence [7]. Acceleration phases require additional mechanical and metabolic power, over and above that for running at constant velocity [8]. The endurance training program improved running performance and did not significantly change the oxidative stress (OS) and antioxidant markers in untrained men. [9]. Furthermore, which is another important point to know, whether the factor of physical condition components also contributes to students who nota bene come from different characteristics, namely athletes (outside athletics) and non-athletes. The proof should be a reference to the urgency and novelty of this research.

## 2 Method

This type of research is correlational research. Correlational research is a study conducted with the aim of knowing the relationship between variables [10]. The research was conducted at one of the universities in Jakarta, Bogor, Depok, Tangerang and Bekasi during June-July 2023. The research population must have the same or almost the same characteristics, the population in this study are students at one of the universities in Jakarta, Bogor, Depok, Tangerang and Bekasi who take athletic courses. The sample taken or used in this study amounted to 30 people with purposive sample technique or in this case based on certain criteria, the criteria are "students who are not from among athletic athletes". The data collection technique in this study is the physical component, namely Sit and React (reliability 0.92 and test validity classified as validity phase) to determine flexibility [11]. 3 Hop - R&L (reliability 0.94 and test validity classified as validity phase) to determine power [12]. Balke 15 minutes (validity 0.98 and reliability 0.85) to determine endurance [13]. The collected data were analyzed using descriptive analysis, such as mean value, standard deviation, minimum value, and maximum value. Prerequisite tests and hypothesis testing were conducted. Hypothesis

testing uses a regression analysis test which is carried out in two stages, namely simple regression analysis and multiple regression analysis to calculate the contribution of each independent variable and together to the dependent variable. Followed by analysis to determine the prediction or regression equation between the independent variable and the dependent variable. The entire analysis in the study will be assisted by the IBM SPSS version 26 program.

### 3 Result

The data obtained in this study are Sit and React test data to determine flexibility, 3 Hop R&L to determine power, Balke 15 minutes to determine endurance, measurement of height and weight, and the results of running 100 meters. Before data analysis is carried out, it is necessary to test the normal distribution or data normality test as a requirement for regression analysis. The results of the data normality analysis can be seen in the summary of Table 1, below:

**Table 1.** Data normality analysis

Variables	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk			A	Description
	Statistic	df	Sig.	Statistic	df	Sig.		
Sit and react	0,114	30	,200*	0,958	30	0,279	0,05	Accepted
Tripple Hop	0,155	30	0,064	0,961	30	0,331		Accepted
Balke 15 minutes	0,141	30	0,134	0,932	30	0,056		Accepted
100M Run Result	0,114	30	,200*	0,952	30	0,186		Accepted

After the data normality test is carried out as a requirement for conducting regression analysis, and the data is considered normally distributed, then proceed with the Hypothesis test. The results of the hypothesis test summary are summarized in Table 2, below:

**Table 2.** The results of the hypothesis test

Hypothesis	N	R	RS	Sig
a. Results of simple regression analysis of flexibility on 100 meters running results	30	0,114 <sup>a</sup>	0,013	0,547
b. Results of simple regression analysis of power on the results of the 100-metre run		0,296 <sup>a</sup>	0,088	0,112
c. Results of simple regression analysis of endurance on 100 meters running results		0,258 <sup>a</sup>	0,066	0,169
d. Results of multiple regression analysis of flexibility, power, endurance, body weight, height on the results of running 100 meters		0,643 <sup>a</sup>	0,413	0,134

Flexibility does not significantly affect the results of running 100 metres, seen in table 3, that the Sig value with a significance level of  $0.547 > \alpha$  probability value of 0.05. For the R square value (coefficient of determination) 0.013, this means that flexibility affects the results of running 100 meters by 0.13% while the rest ( $100\% - 0.13\% = 99.87\%$ ) is caused by other causes. The value (R) 0.114<sup>a</sup> can be interpreted that the relationship that occurs in the very low category.

Power does not significantly affect the results of running 100 meters, seen in table 3, that the Sig value with a significance level of  $0.112 > \alpha$  probability value of 0.05. For the R square value (coefficient of determination) 0.088, this means that power affects the results of running 100 meters by 0.88% while the rest ( $100\% - 0.88\% = 99.12\%$ ) is caused by other causes. The value (R) 0.296<sup>a</sup> can be interpreted that the relationship that occurs in the very low category.

Endurance does not significantly affect the results of running 100 meters, seen in table 3, that the Sig value with a significance level of  $0.169 > \alpha$  probability value of 0.05. For the R square value (coefficient of determination) 0.066, this means that endurance affects the results of running 100 meters by 0.66% while the rest ( $100\% - 0.66\% = 99.34\%$ ) is caused by other causes. The value (R) 0.258<sup>a</sup> can be interpreted that the relationship that occurs in the very low category.

Flexibility, Power, and Endurance together do not significantly affect the results of running 100 metres, seen in table 3, that the Sig value of the significance level is  $0.134 > \alpha$  probability value of 0.05. For the R square value (coefficient of determination) 0.190, this means that Flexibility, Power, and Endurance together affect the results of running 100 meters by 19% while the rest ( $100\% - 19\% = 81\%$ ) is caused by other causes. The value (R) 0.436<sup>a</sup> can be interpreted that the relationship that occurs in the low category.

## 4 Discussion

The overall results of simple and multiple regression analysis tests to calculate the contribution of each independent variable and together to the dependent variable. Shows that Flexibility, Power, and Endurance (for each variable and together) do not significantly affect the 100 meters running results of students who do not come from athletic athletes. Our findings are in line with the results of research that also uses samples that are not from athletic athletes running 100 meters and or other short distance (sprint) running numbers. There is no significant relationship between physical components (leg muscle explosive power) and the results of 100 meters sprints of junior high school students [14]. There is no significant contribution between physical components (leg strength) and the results of 100 meters sprints of junior high school students [15]. The results of our findings are not in line with research using athletic athletes running 100 meters and or other short distance (sprint) running numbers. There is a significant contribution between physical components and the results of 100 meters sprint running in athletes running 100 meters [16], [17], [18]. Interpretation of the research results that we find to then become a significant novelty and or benefit, that the components theoretically and based on various scientific research results have a very significant

contribution to the results of running the 100 meters sprint, especially for athletic athletes running 100 meters and or other short distance running numbers (sprints), but do not necessarily have the same meaning for non-athletic athletes running 100 meters and or short distance running numbers (sprints). These findings can be used as a reference in explaining the opinion that when the size of the physical component is the same then what determines is the basic technique of an athlete, when the size of the physical component and the basic technique are the same then what determines is the mentality of an athlete, when the size of the physical component, basic technique, and mentality are the same then what determines the next is the tactics and strategies that an athlete runs [19], [20]. Likewise, the opinion that the physical components, basic techniques, mentality, and strategies carried out by an athlete are predictors of success and achievement, predictors that are only through ordinary tests / tests outside of real competitions / competitions sometimes do not represent the results of athletes' achievements in the field [21]. This means that the physical component can be submitted as a reference in terms of searching and or selecting prospective athletes in the future, but the high ability of the physical component must be in line with the basic techniques, mentality, and strategies carried out by an athlete, to then be tested and trained through training activities and a series of experiences competing / competing.

## 5 Conclusion

Flexibility, Power, and Endurance (for each variable and together) do not significantly affect the results of running 100 meters of students who do not come from athletic athletes. The contribution of thoughts that can be used as a reference for fostering the results of the 100 meters sprint is that the physical component can be proposed as a reference in terms of searching for and or selecting prospective athletes in the future, but the high ability of the physical component must be in line with the basic techniques, mentality, and strategies carried out by an athlete, to then be tested and trained through training activities and a series of experiences competing / competing.

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