

The Resistant Training Effect for the Endurance and Strength of Muscular
Athletes: A One-Group of Pre-test and Post-test Study

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Background Study

Muscle strength training can be performed using the resistant training methods. Resistant training is a systematic exercise by utilizing load or weight as a device to expand the quality of muscle strength function in order to get a better physical condition, to intercept an injury and to achieve health purposes [4]. Resistant training is possible using weights from one's own weight (i.e. internal weights) or using external weights, which are free weights such as dumbbells, barbells, or gym machines. The forms of exercise that are most widely used in internal weights for instance are squat jumps, sit-up, sit-ups, or jumping jack. When utilizing external weights, that are many choices in relation to the goal of the training. There are several methods that are often used when doing resistant training, such as super sets, compound sets, set systems, set blocks, tri sets, giant sets, pro sets, pyramid, and circuit resistant training systems.

Material and Method

with the pyramid system on muscle strength of leg, back, grip strength, and pull and push strength of Ikor student class of 2013. Data measurements were carried out twice, which is before treatment (pretest) and after treatment (posttest). The research data were made in the form of descriptive analysis with the aim to encourage the demonstration of the research.

Descriptive analysis of research data includes a description of the minimum, maximum, mean, median, modus and standard deviation of each research data. The results of the descriptive analysis of this sub-research data can be seen in Table 1.

Next, Paired Sample of *t*-test is used to test the hypothesis, which is "Resistant training with the pyramid system on the muscle strength of the leg, back, grip strength, and pull and push strength of Ikor student class of 2013 has a significant effect". The results of data analysis for testing the hypothesis of leg muscle strength is shown in Table 2.

Table 2: *T*-Test Results for Leg Muscle Strength Data

Test	Mean	<i>t</i> -value	<i>P</i>	Expl.
Pretest	211.59	2.836	0.018	Sig.
Posttest	227.32			

Source: Primary data processed

Result

Table 1: Results of Descriptive Analysis

Data	Min.	Max.	Mean	Median	Modus	Std. Dev
Leg muscle strength (pretest)	146.00	265.00	211.59	216.50	179.00	44.70
Leg muscle strength (posttest)	180.00	278.00	227.32	225.50	270.00	37.14
Back muscle strength (pretest)	79.00	115.00	97.64	98.50	79.00	11.77
Back muscle strength (posttest)	106.50	136.00	119.27	115.50	106.50	10.92
Right grip (pretest)	35.00	46.00	29.89	38.10	36.20	3.90
Right grip (posttest)	34.50	47.90	42.27	42.30	34.50	3.67
Left grip (pretest)	29.10	44.90	36.07	34.10	29.10	5.12
Left grip (posttest)	32.80	48.50	39.92	40.90	32.80	5.02
Pull (pretest)	10.00	33.00	25.64	26.00	30.00	6.83
Pull (posttest)	16.00	36.00	27.73	27.00	24.00	6.08
Push (pretest)	12.00	30.00	22.00	22.00	22.00	4.75
Push (posttest)	14.00	32.00	24.45	25.00	22.00	4.48

The results of the analysis of *t*-test showed that *t*-value of 2.836 with a significance value of 0.018. Because the significance value of 0.018 is smaller than 0.05 ($p < 0.05$), it can be concluded that there are significant differences in leg muscle strength during pretest and posttest. This result can be interpreted as a significant effect of resistant training with the pyramid system on muscle strength of leg muscle strength of Ikor student class of 2013, so that the hypothesis of this study can be accepted.

Next, the results of data analysis for testing the hypothesis of back muscle strength is shown in Table 3.

Table 3: T-Test Results for Back Muscle Strength Data

Test	Mean	t-value	P	Expl.
Pretest	97.64	13.670	0.000	Sig.
Posttest	119.27			

Source: Primary data processed

smaller than 0.05 ($p < 0.05$), it can be concluded that there is a significant difference in the right grip strength during pretest and posttest. This result can be interpreted as a significant effect of resistant training with the pyramid system on the right grip strength of Ikor student class of 2013, so that the hypothesis of this study can be accepted.

Next, the results of data analysis for testing the hypothesis of left grip strength is shown in Table 5.

Table 5: T-Test Results for Left Grip Strength

Test	Mean	t-value	P	Expl.
Pretest	36.07	5.613	0.000	Sig.
Posttest	39.92			

Source: Primary data processed

The results of the analysis of *t*-test showed that *t*-value of of 5.613 with a significance value of 0.000. Because the significance value of 0.000 is smaller than 0.05 ($p < 0.05$), it can be concluded that there is a significant difference in the left grip