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DEVELOPMENT OF PLYOMETRIC BOX EXERCISE MODEL TO INCREASE VOLLEYBALL SPIKER LIMB POWER

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Abstract This research uses development research methods Research & Development (R&D) from Borg and Gall. The samples used in this study were 20 members of the volleyball extracurricular activity at SMA NEGERI 1 CIWARU. In this research and development it produces a training model plyometric box exercise which has been validated, tested and repaired. The results of this research and development are data about values pretest posttest and a questionnaire using SPSS IBM 25 for windows with a significant level of 0.05. The results of this study indicate that the increase plyometric box exercise by 5%, namely from the initial test of 77.1% and the final test of 82.00%. From the results of the research that has been done, it can be concluded that with the training model plyometric box exercise can be developed and applied in the training process. Apart from that with the training model plyometric box exercise that has been developed, evidence is obtained that there is a significant increase shown in the results of the test data results pretest, posttest. there is a difference between before and after the training model treatment plyometric box exercise. Based on these results can be used as a training model plyometric box exercise as well as being the output product of a training model plyometric box exercise.

Keywords: development; rnd, exercise limb; spiker; volley ball



INTRODUCTION

Physical education is basically an integral part of the overall education system, aimed at developing aspects of health, physical fitness, critical thinking skills, emotional stability, social skills, reasoning and moral action through physical activity and sports. One of the sports carried out by coaching is volleyball. Volleyball is one of the most popular sports in the world. Because it is in great demand by all circles ranging from the age of children, adolescents, adults and even the elderly. Volleyball now does not have to be played by men but women can also play it.

Volleyball is a very popular sport, and according to experts today Volleyball is listed as a sport that ranks second most famous in the world. Similarly in Indonesia, volleyball is a sport that has been socialized both in schools, government and private institutions, universities and in the general public. According to Endang Pratiwi (2020: 2) the game Volleyball has become a sport that is known by all levels of society to the world, this is because volleyball has been widely competed. It turns out that this volleyball game is a combination of several big ball games put together, namely: basketball,

baseball, and handball (*handball*). But this sport was originally not called volleyball, but was named *mintonette*. Technique in the game of Volleyball is a very important factor. Mastery of basic volleyball techniques and a good physical condition is not easy. It needs hard training that starts early. If the basic techniques are well possessed, you will be able to play volleyball well too. This is natural for every athlete from various sports.

Large leg muscles will produce maximum jumps. A volleyball player is required to have the highest possible jump to spike. Muchlisa (2017: 4) Leg Muscles are the ability of a muscle or group of leg muscles to overcome load resistance or at high speed in one complete movement. Thus, with large leg muscles, a *spiker* will reach the ball higher that is fed high above the net when hitting the ball. Not infrequently in volleyball game techniques students ignore the power technique of spiker limbs in volleyball games, even though this is very influential when doing spikes we can be as high as possible. From this description, the researcher wants to develop a *plyometric box exercise* model to increase the power of volleyball spiker

limbs in aesthetic students at SMA Negeri 1 Ciwaru.

METHOD

Research on the development of the upper passing exercise model using the research and development model (*Research and Development*) from Borg and Gall (1983: 775) which consists of ten steps, namely: Research and information collecting, Planning, Develop preliminary form of product, Preliminary field testing, Main product revision, Main field testing, Operational product revision, Operational field testing, Final product revision, Dissemination and implementation.

The research design used in this study is research and development. Procedural research and development design. This research leads to the description of the steps taken in producing products in the form of training models and supporting devices. The research approach used in this study is qualitative and quantitative approach. This research design formed "*one group pre-test and post test design*".

A population is a complete set of units or individuals whose characteristics one wants to know. The number of individuals or elements that are members of a population is referred

to as population size. The population in this study was all volleyball extracurricular students at SMA Negeri 1 Ciwaru which amounted to 30 students consisting of 20 male participants and 10 female students.

According to Sugiyono (2010: 118) "the sample is a portion of the number and character that the population has". This study used all 20 students who participated in extracurricular volleyball at SMA Negeri 1 Ciwaru. Where all of them will be given a pretest measuring the explosive power of the leg muscles before treatment. According to Dr. Ali Maksun (2012: 60) Purposive Sampling or sample aims is a sampling technique whose characteristics or characteristics are known in advance based on the characteristics or characteristics of the population. Sample criteria are determined by the researcher himself in accordance with the research objectives. Based on the explanation above, the sample was 20 male extracurricular volleyball students at SMA Negeri 1 Ciwaru.

RESULT AND DISCUSSION

a. Normality Test

The normality test in this study uses the *One Sample Kolmogorov Smirnov Test method*, with a significant

level used as a rule to accept or reject testing on the normal or not of a data distribution, namely $\alpha = 0.05$. To facilitate calculations in testing, researchers use the help of SPSS software Version 2.6

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		20
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	8.13132345
Most Extreme Differences	Absolute	.122
	Positive	.122
	Negative	-.117
Test Statistic		.122
Asymp. Sig. (2-tailed)		.200 ^{c,d}

- a. Test distribution is Normal.
- b. Calculated from data.
- c. Lilliefors Significance Correction.
- d. This is a lower bound of the true significance.

Based on the results of the Normality Test, it is known that the significance value is $0.200 > 0.05$, so it can be concluded that the residual value is normally distributed.

b. Homogeneity Test

The homogeneity test in this study uses the one-way anova method, with a significant level used as a rule to accept or reject testing on the normal or absence of a data distribution, namely $\alpha = 0.05$.

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
PRETEST	Based on Mean	1.651	3	15	.220
	Based on Median	1.179	3	15	.351
	Based on Median and with adjusted df	1.179	3	13.992	.353
	Based on trimmed mean	1.684	3	15	.213

ANOVA

PRETEST					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	401.190	4	100.298	1.629	.219
Within Groups	923.810	15	61.587		
Total	1325.000	19			

To facilitate calculations in testing, researchers use the help of SPSS Version 2.6 software.

Based on the results of the homogeneity test, it is known that the significance value is $0.468 > 0.05$, it can be concluded that H_0 is accepted, meaning that the pretest data is homogeneous.

c. Hypothesis Test

Hypothesis testing was conducted to determine whether there was an influence of the mental imagery training model on volleyball extracurricular participants at SMA Negeri 1 Ciwaru. in this study using the Paired Sample T-Test using SPSS 26 For Windows.

Paired Samples Test

	Mean	n	Paired Differences				t	df	Sig. (2-tailed)
			Std. Deviation	Std. Error	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair pretest - 1 posttest	37.50	12.513	2.798	-43.356	-31.644	13.40	19	.000	
	0					2			

Significance (2-tailed) $0.000 < 0.05$ indicates a significant difference between the initial variable and the final variable. This shows that there is a significant influence on the difference in treatment given to each variable.

DISCUSSION

This study produced a plyometric box exercise model that has been tested and improved. The data above can be described as there are differences before and after using plyometric box exercise in extracurricular volleyball SMA NEGERI 1 Ciwaru. This can be seen from the Posttest > Pretest results, which are $237.5 > 275$. Thus this plyometric box exercise model can improve skills in performing volleyball stepping height.

Plyometric box exercise In sports activities can be used during the exercise period, that is, carried out during plyometric box exercise, competition and rehabilitation. Plyometric box exercise if done with the right program can be useful to prepare participants to perform a movement, style, or way of reacting.

plyometric box exercise It can help athletes to create a true picture of the difficulties and problems that athletes may face during training and competition. As is known, athletes often create an unreal picture of themselves and consider their technique to be inferior. The effect is that athletes are not confident and feel excessive anxiety so that the movements they do are not perfect and on target.

CONCLUSION

This study was conducted to determine the effect between independent variables, namely the effect of plyometric box exercise on the dependent variable, namely to increase the power of the volleyball spiker limbs. Based on the results of data analysis, it can be concluded that there is a significant influence between the application of the plyometric box exercise model development exercise to increase volleyball spiker limb power in extracurricular students at SMA Negeri 1 Ciwaru and there is a significant increase in vertical jump ability after treatment.

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