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Stretching Exercise and Grip Strength on Flat Serve Tennis Skills: Experimental Study on FKOR UNS Students

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***Abstracts* - For a professional who follows tournament circuit, strong serve punches are very special capital. In reality, technically the quality of blows is often inadequate. Serve punches that are carried out are very easily returned by the opponent and also do a lot of wrong serve (fault). This experimental study aims to determine the effect of training methods, forms of exercises stretching and grip strength on the flat serve skills of tennis. This research was conducted at the Faculty of Sport of the Universitas Sebelas Maret Negeri Surakarta (UNS) in 2019. The experimental method used a 2x2x2 factorial design. The sample consisted of 80 students divided into 8 groups, each consisting of 10 students. The data analysis technique was a two-way analysis of variance (ANOVA) and continued with the Tukey test at the significance level α = 0.05. The results showed that: (1) there are significant differences between training methods overall with training methods section of the skills of serve flat tennis courts, (2) there are significant differences between the forms of exercises stretching static form of exercises stretching dynamically to a skill Served flats tennis the field, (3) there is a significant difference between the grip strength above the average grip strength below the average to the flat serve skills of tennis court. It can be concluded that the two types of training methods have different effects on the flat serve skills of tennis court when it is associated with forms of exercises stretching (static and dynamic) and the use of different grip strengths that are above average and below average.**

Keywords: training methods, forms of training, grip strength, flat serve, tennis

I. INTRODUCTION

Achievement of optimal achievements in sports is a dream for every athlete, but to achieve this it needs careful planning through a system of systematic and continuous integrated coaching. Along with the pace of national development that is ongoing until now, the development of the sector sports in Indonesia is directed to achieve the ideals of the nation, namely the formation of fully Indonesian people who are physically and mentally healthy, and skilled so that they are able to excel in sports in order to raise dignity, dignity and degrees nation. The attention of the government is directed at efforts to disseminate sports activities as a way of fostering physical and spiritual health for each member of the community. Observing this matter, the government has ratified the Law of the Republic of Indonesia Number 3 Year (2005: 1) concerning the National Sports System, that the sports guidance system must be carried out through 3 (three) pillars namely; educational sports, recreational sports, and sports achievement.

In addition to systematic coaching, facilities and infrastructure as well as the environment supporting that affect the performance of sports, factors that are not less important are physical condition, mental readiness, technical preparation and mastery of playing strategies. This is in accordance with the opinion of Tangkudung (2012: 36) which says that: The condition of a good physical condition will affect the psychological aspects the inform of increased work motivation, morale, self-confidence, accuracy and so forth. Psychologically, the physical condition also seems to have a profound effect on the environment of our activities, especially in socializing. Based on the opinion expressed by Bompa (2009: 54) that there are 4 (four) aspects of exercise training that need to be considered, namely physical preparation, technical

preparation, mental / psychological preparation and tactics and strategy preparation. All aspects or factors that have been mentioned are apparently not owned by all tennis players. There are players who only master technical skills, there are those who only have physical readiness, there are those who only have mental readiness and some who only have tactics and strategy readiness. To achieve maximum performance an athlete must master all aspects mentioned, therefore each of these factors requires special attention and treatment to achieve the desired goals. According to Tangkudung (2012: 36) that: Peak of achievement can be achieved if the training management process is passed well starting from the stage planning to the evaluation. The management process is a part of the first very important stage of an exercise aimed to optimize the performance of athletes in accordance with the target set. The peak achievement is a result direct of the body's adaptation to the type and method of training (Fu, 2018; Chadefaux, 2018).

The game of tennis has a number of basic techniques that must be mastered by players, including: Serve punches, Volley, Lob, Smash and variations other stroke such as Approach shot, Passing shot, Dropshot and Half volley (ITF, 2005: 42). For a professional who follows the tournament circuit, a serve stroke strong is a very special asset. In fact, according to observations in several tournaments, most Indonesian players were left out in the first round compared to international players. Serve failure can also result from injury to the player (Bahamonde, 2013; Elliot, 2013). It can also be caused by poor tennis racket (Baszczyński, 2016; Ferrera, 2016). But most importantly technically the quality of the punch is inadequate, especially the lack of maximum serve punches owned. The serve punch they do is very easy to return by the opponent and also do a lot of wrong serve (fault), meaning that the serve is not right on the serve box as a target.

Various training methods have been widely applied in improving the performance of players in many sports. According to Mahendra (2007: 271) in learning there are several kinds of learning methods, namely the overall method, the part method, the mixed method (whole and part), and progressive method, in research proposal the this writer wants to try to apply through 2 (two) training methods, that is; (1)method overall training, and (2) part training method. The overall training method is a method of providing training material from general to specific, such as: in practicing motion skills or serve skills in flat tennis court, then the whole form or done alone. Conversely, the section exercises method is also included that want to be applied in this study. Method training part or whole part methods is a combined method of the training method part one on one.

The purpose of this study is to see the difference in training methods. through the application of overall and part training methods in improving the skills serve of flat tennis court by involving factors stretching and strength grip. For this reason, a deeper study of the research problem is needed so that results or answers are more reliable.

II. METHODS

The method used in this study is an experimental study using a 2x2x2 factorial plan as for the design as follows:

Table 1. Factorial Design 2x2x2

Training Method / **Stretching (B)**		**Overall (A1)**		**Section (A2)**	
		Static (B1)	Dynamic (B2)	Statc (B1)	Dynamic (B2)
Grip Strength	Above Average (C1)	A1B1C1	A1B2C1	A2B1C1	A2B2C1
	Below Average (C2)	A1B1C2	A1B2C2	A2B1C2	A2B2C2
	Total	A1		A2	

Description:

A1B1C1 : The method of training a whole using a form of exercises stretching static. groups of students who have grip strength above average.

A1B1C2 : The overall training method uses a form of exercise for stretching static groups of students who have below average grip strength.

A1B2C1 : The overall training method uses a form of exercise for stretching dynamic groups of students who have above average grip strength.

A1B2C2 : The overall training method uses a form of exercise for stretching dynamic groups of students who have below average grip strength.

A2B1C1 : The section training method uses a form of exercise for stretching static groups of students who have above average grip strength.

A2B1C2 : The section training method uses a form of exercise for stretching static groups of students who have below average grip strength.

A2B2C1 : The section training method uses a form of exercise for stretching dynamic groups of students who have above average grip strength.

A2B2C2 : The section training method uses a form of exercise for stretching dynamic groups of students who have below average grip strength.

A1 : Overall training method

A2 : Part training method

B1 : stretching Static

B2 : stretching Dynamic

B1 : Grip strength above average

B2 : strength below average Grip

This research was carried out at the FKOR UNS Tennis Court. Data collection techniques in this study are: (1) For the dependent variable data obtained through 3 tests of the motion assessment of serve technique skills flat tennis field, (2) for data attribute variable obtained through the test of curvature and grip strength.

The sample in this study was obtained from an affordable population, that is students who have passed tennis courses as many as 200 students. The research sample was determined by the technique Randomized group design.

Table 2. Grouping Experiment Samples with a block system

Stretching (B)		**Training Method (A)**			
		Overall (A1)		**Section (A2)**	
		Static (B1)	Dynamic (B2)	Static (B1)	Dynamic (B2)
Grip Strength	Above Average (C1)	10	10	10	10
	Below Average (C2)	10	10	10	10
Total		20	20	20	20

This research plan held on the tennis court FPOK UNS for six weeks or 18 (eighteen) meetings with a frequency of training three times a week. The treatment methods given are the overall method and method training the part training based on each group.

The analysis techniques used in this study are as follows:

1) To test the statistical hypothesis the two-lane Variance (ANAVA) analysis technique was used 2x2x2at the significance level $\alpha = 0.05$ (Kadir, 2010: 217).

2) To test the normality of the data obtained from the learning outcomes of tennis serve skills Court used the Lilliefors test (Hasan, 2013: 286).

3) To test homogeneity using the Bartlett test (Hasan, 2013: 289).

4) If there is an interaction between the training methods and motivation on the learning outcomes of the tennis

flat serve skills, will be followed by the Tukey Test.

III. RESULTS AND DISCUSSION

Based on the experimental design in this study, there were 6 (six) groups sample that had scores on the results of a serve skills test flat on a tennis court game that needed to be described separately. The following after the presentation of table 3 is a description of scores of the serve skills test results flat in the playing field tennis of the six groups mentioned.

Table 3. Description data result test flat serve

No.	KLP	N	Range	Min.	Max.	Sum	Mean	Std. Deviation
1	A1	40	44.34	33.89	78.23	2045.34	51.1335	10.90200
2	A2	40	39.41	33.89	73.30	1973.90	49.3475	9.18314
3	B1	40	33.43	42.72	76.15	2276.97	56.9243	10.62138
4	B2	40	42.56	30.22	72.78	1846.47	46.1618	10.29003
5	C1	40	30.05	38.13	68.18	2186.09	54.6522	8.13529
6	C2	40	31.41	30.71	62.12	1814.02	45.3505	9.59355
7	A1B1C1	10	16.07	48.99	65.06	568.50	56.8500	5.25667
8	A2B1C1	10	12.42	49.05	61.47	542.23	54.2230	3.77874
9	A1B1C2	10	13.66	49.66	63.32	544.11	54.4110	4.47667
10	A2B1C2	10	11.78	46.06	57.84	514.64	51.4640	3.35061
11	A1B2C1	10	16.81	41.29	58.10	489.76	48.9760	4.51198
12	A2B2C1	10	18.64	45.04	63.68	504.70	50.4700	5.79869
13	A1B2C2	10	11.14	39.78	50.92	454.86	45.4860	3.57533
14	A2B2C2	10	12.57	36.75	49.32	428.80	42.8800	3.66810

The results of this study consisted of testing the hypothesis using a factorial design performed with variant analysis. The results of his research are as follows:

Table 4. Recapitulation of ANAVA Results in Next Stage with Tukey Test

No	Hypothesis Group are Compared	Q_{count}	Q_{table}	Sig.	Description
1	A_1 dan A_2	9,362	5,305	.000	There is a difference
2	B_1 dan B_2	9,362	5,305	.000	There is a difference
3	C_1 dan C_2	9,362	5,305	.000	There is a difference

Based on table 4, it can be concluded that the hypothesis of the eleven are overall there is a significant difference between the training methods, the form of exercises stretching and the strength of grips on serve skills flat in FKOR students UNS Surakarta both using stretching static and dynamic and using above-average grip strength and below-average grip strength. Furthermore, the results of the research can be elaborated on the discussion of each hypothesis in accordance with the theory that supports the results of this study.

After analyzing the data using the Variance Analysis approach Factorial and followed by test Tukey's of the eleven research hypotheses submitted. Research findings are the results of statistical data analysis that need to be studied further to be able to explain why there are accepted hypotheses, hypotheses that are rejected, and why there are significant interactions between curvature and

grip strength on flat serve skills.

The overall training method is better than the training method section on serve skills

Based on the results of the analysis of the test-TAKEY (Q) data differences in the overall and training section against serve skills flat, obtained differences in the average value or the value of Q-count 9.3362 and Q-table 5.305 significant difference sig (p) is smaller than 0.05 (0,000 <0.05), to be seen in the Sig column table (p) is 0,000, or the probability is well below α 0.05. So that a decision can be made that reject H0 and accept H1. So, it can be concluded that the training method overall is better than the part training method on serve skills flat.

The results of this calculation show that overall skill scores the serve flat in the training process using the overall training method are better than the section training method, in other words the use of methods different will result serve skill score flat in a in training processes different. Therefore, according to the description and discussion of the strengths of the overall training method and the part training method, the overall training method is better than the part training method to improve serve skills flat in serve training flat in tennis court games.

The form of exercises stretching static is better than the form of exercises stretching dynamic on serve skills.

Based on the results of the analysis of the Tukey test (Q) data on the differences in the form of exercises stretching static and the form of exercises stretching dynamic on serve skills flat, different mean values Q-count 9,362 and Q-table 5,305 significant difference sig (p) is smaller than 0.05 (0,000 <0.05), to be seen in the column table Sig (p) is 0,000, or the probability is far below α 0, 05. So, decision can be made that a reject H0 and accept H1. So, it can be concluded that there are differences serve skills flat in playing tennis between the training stretching static group and the training group stretching dynamic in FKOR UNS students. This proves H1 : μB1 > μB2 so that a decision can be made that reject H0 and accept H1. So it can be concluded that the serve skills flat in a group of students with a form of exercises stretching static are better than the form of exercises stretching dynamic in applying serve training materials flat at school.

The results of this calculation indicate that the overall score of skills serve flat using a form of exercises stretching static is better than the form of exercises stretching dynamic, in other words a different form of exercise will produce serve skills flat different. Therefore, in accordance with the description and discussion of the form of exercises stretching static and forms of exercises stretching dynamic, then the overall form of exercises stretching static is better than the form of exercises stretching dynamic to improve the results of serve skills flat in playing tennis.

The grip strength above average is better than the strength grip below average for serve skills.

Based on the test results of the Tukey Test (Q) data, the difference strength is in grip above average and the grip strength is below average for serve skills flat, obtained differences in the average value or Q-value of count 9,362 and Q-table of 5,305 differences the real sig (p) is smaller than 0.05 (0,000 <0.05), to be seen in the column table Sig (p) is 0,000, or the probability is far below α 0.05. So, can that a decision be made that reject H0 and accept H1. So, it can be concluded that there are differences serve skills flat in playing tennis between groups methods of the grip strength training above the average and the strength training method groups grip below the average in FKOR UNS students.

So, it can be concluded that the serve skills flat in groups of students with high grip strength are better than below grip strength average. This proves H1 : μC1 > μC2, so that a decision can be made that reject H0 and accept H1. So, it can be concluded that the serve skills flat in a group of students who have grip strength above average is better than grip strength below average.

The results of this calculation show that the overall score of the skill serve flat that uses above average grip strength is better than the below average grip strength, in other words grip strength different will result serve skills flat in different. Therefore accordingly, with the description and discussion of grip strength above average and grip strength below average, then overall grip strength above average is better than grip strength below average to increase yield servicing skills Flat in playing tennis.

IV. CONCLUSION

From the results of hypothesis testing and discussion of the results of the study, can be drawn the following conclusions:

1. There is a significant difference between the

overall method and method training the section training on the serve skills flat tennis of FKOR UNS students.

2. There is a significant difference between the forms of stretching exercises static with the form of dynamic stretching exercises for field tennis flat serve skills students FKOR UNS.
3. There is a significant difference between the grip strength above the average grip strength below the average to the serve skills flat tennis court FKOR UNS Surakarta students.

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