The Influence of Physical Fitness Gymnastics 2017 and Indonesian Jaya Gymnastics toward Flexibility and Endurance

Suharti[1], Nurhasan[2], OceWiriawan[2]

[1)] Universitas PGRI AdiBuana, Surabaya, Indonesia, 60234

[2)] UniversitasNegeri Surabaya, Surabaya, Indonesia, 60213

***Corresponding author:** Suhartisuharti, Physical Education, Universitas PGRI AdiBuana Surabaya, Jl. DukuhMenanggal XII Surabaya, 60234. Email: atikpko@gmail.com

Abstract. SenamKebugaranJasmani2017 (Physical Fitness Gymnastics 2017) or SKJ 2017 andSenam Indonesia Jaya (Indonesian Jaya Gymnastics)or SIJ are a series of gymnastic movements that have been determined aimed at improving or maintaining one's physical fitness. Physical fitness includes several fitness components namely flexibility and endurance. Flexibility is the extent of motion of one joint or several joints. (Sukadiyanto, 2011: 139). While endurance is a condition of the body that is able to work for a long period without experiencing excessive fatigue after completing work. (Christina, 2013: 120).This research used quasi-experimental design and was under quantitative paradigm in which the research was designed to utilize the pretest-posttest groups. Data collection techniques were tests and measurements in which theflexibility tests were done by touching thetoe using'Sit and Reach' tool, whereas the endurance tests employed the Multy Stage Fitness Test (MSFT).
The findings showed that there were influences of SKJ 2017 exercises on flexibility and endurance, there was an influence of Indonesian Jaya Gymnastics exercises on flexibility and there was no influence of Indonesian Jaya Gymnastics exercises on endurance.

Keywords: Physical Fitness Gymnastics, Indonesian Jaya Gymnastics, Flexibility, Endurance

How to cite this article: Suharti, Nurhasan, OceW (2019): The influence of physical fitness gymnastics 2017 and Indonesian Jaya gymnastics toward flexibility and endurance, Ann Trop & Public Health; 22(11): S325. DOI: http://doi.org/10.36295/ASRO.2019.221119

1. INTRODUCTION

Having a fit body is everyone's dream. A healthy body does not mean it has good fitness, while a fit body has a much better health. The term 'healthy' according to WHO is only about physically healthy condition, mentallyhealthy condition, and sociallyhealthy condition. However, being fit is one's condition that can still do additional activities or that still has a reserve of energy after doing all-day activities without going through a state of exhaustion (Muthohir, 2013). There are many ways to get fitness, for example by having exercises. There are some varieties of having simple exercises such as walking, jogging, swimming, running, and doing gymnastics. Gymnastics is divided into two, namely performance gymnastics and fitness gymnastics. Performance gymnastics consists of artistic gymnastics and rhythmic gymnastics, while fitness gymnastics is based on SKJ 2017 gymnastics, healthy heart gymnastics, Indonesian Jaya gymnastics, Scout gymnastics, Jula-Juli gymnastics, and many others. Fitness gymnastics is preferably chosen because it is cheap and easy to do (Nurhasan, 2011). This gymnastics will give good results to improve body fitness especially for flexibility and endurance when routine trainings are carried out regularly and thoroughly.Components of physical fitness related to healthinvolve

cardiovascular endurance, body composition, physical strength, and muscle endurance. Whereas components related to skills involve flexibility, balance, coordination, speed, strength, speed of reaction. During this time a lot of new gymnastics is created, but it had deviated from the main rule that gymnastics was created to get more physical fitness, but in actual fact, some kinds of gymnastics are made as a means of recreation. Trutfully, to make a gymnastics movements should consider the components of physical fitness in order to achieve the principle purpose namely gymnastics for body fitness. 2017 physical fitness gymnastics or what it is often called SKJ 2017 is still relatively new and it was made by the gymnastics community that has been appointed or trusted by KEMENEGPORA to set up fitness gymnastics that aimed at improving the fitness of the Indonesian people.SKJ 2017 and SIJ gymnastics (Senam Indonesia Jaya) have almost the same music beat character, that is, the two kinds of gymnastics are categorized as the low impact gymnastics because the beats are slow and can be followed by all ages, in which the duration of SKJ 2017from the beginning to the end is 14 minutes 56 seconds. Whereas the duration of SIJis 14 minutes 13 seconds. So if the total beats of SKJ music calculated from the beginning to the end are 1,016 per minute. Whereas in the total beats of Indonesian Jaya Gymnastics music from the beginning to the end of 909 per minute.SKJ and SIJ gymnastics are two kinds of gymnastics made by the Indonesian government with the same goal, that is, to improve fitness and to preventilness. Both of them have the same characters and purposes of motion in muscle function, blood circulation and breathing. Even, both of them have the same duration, which is approximately 14 minutes from the beginning to the end. Therefore, I am interested in giving training to students of Universitas PGRI AdiBuana Surabaya (called Unipa Surabaya) with the aim of improving their fitness, especially in improving flexibility and endurance.

2. MATERIAL AND METHODS

This research is quasi-experimental research, and isdesigned by randomized control group pretest-posttest design:

SKJ	R = O1	X1	O2	
SIJ	R = O1	X2	O2	
Control	R = O1	-	O2	

Fig. 3.1 Research Design. (*Maksum, 2012: 100*)

Notes:
O1 = *Pretest*
X1 = *Treatment* of SKJ
X2 = *Treatment* of SIJ
O2 = *Posttest*

Population and Sample

Population is a comprehensive collection of objects that become the attention of researchers. The population in this research is the2017 students of Sport Coaching Education Department of UnipaSurabaya.The amount of population was 130 students, consists of 4 classes consisting of classes A, B, C, and D, and be able to become a subject , while the research sample was 65 students and the sample was chosen by random sampling method. The selected sample was divided into three groups in which group A consists of 22 students received SKJ 2017 treatment, group B consists of 22 students received SIJ treatment, and group C consists of 21 students used as control.

Place and Time Of Research

The place of this research was conducted at Gelora Hasta Brata,Universitas of PGRI AdiBuana, Jl. DukuhMenanggal XII Surabaya. It took 2 months or 8 weeks in conducting this research or taking the data. The training schedules of the research were 3 times a week and they were done on Monday, Wednesday and Friday.

Instrument Of The Research

Data collection techniques of this research are tests and measurements. The flexibility tests utilizeSit and Reach tool, that is, a tool used to reach the toe, while the endurance tests utilize the Multy Stage Fitness Test (Bleep Test).

Data Analysis Techniques

Data obtained from the tests and measurements are tested using the T-test, Manova (Multivariate analysis of variance test) and Chi-Square. In relation to the T-test, different samples were applied to indicate that the data distribution compared comes from two different groups. The data of the two groups were then analyzed using a T-test based on the different samples.

Table. 1. Normality test for pretest danposttestdata on flexibility and endurance values

Normality Test

Variable	Group	Test	Z	*P-Value*	*Alpha*	Note
Flexibility	SKJ	*Pre*	0.395	0.998	0.05	Normal
		Post	0.343	1.000	0.05	Normal
	SIJ	*Pre*	0.737	0.648	0.05	Normal
		Post	0.893	0.402	0.05	Normal
	control	*Pre*	0.489	0.971	0.05	Normal
		Post	0.562	0.911	0.05	Normal
Endurance	SKJ	*Pre*	0.687	0.733	0.05	Normal
		Post	0.582	0.887	0.05	Normal
	SIJ	*Pre*	1.155	0.138	0.05	Normal
		Post	0.952	0.325	0.05	Normal
	control	*Pre*	0.878	0.424	0.05	Normal
		Post	1.120	0.163	0.05	Normal

Note: Data distribution is said to be normal if p-value is bigger than alpha, the alpha value is 0.05

From the table above, it can be explained that in each group, the values of flexibility and endurance are normal because the p-value is bigger than 0.05. This means that data can be analyzed using the dependent t-test and Manovawhichserveto test the significant difference between the pretest-posttest among the groups. Tests were conducted on each type of dependent variable in the experimental and control groups.

Homogeneity Test

Variabel	Group	F	*p-value*	*Alpha*	Note
Flexibility	SKJ – SIJ – Control	0.448	0.641	0.05	Homogeneous
Endurance	SKJ – SIJ – Control	0.003	0.997	0.05	Homogeneous

Table.2. Homogeneity test for data on durability and endurance for each group

Note: the variant is said to be the same (homogeneous) if p-valueis bigger than alpha, the alpha value used is 0.05

Based on the table above, the values of flexibility and endurance in each group are said to be the same (homogeneous) because of p-value> Alpha (alpha value = 0.05). This means that these data can be continued on the analysis of Manova

Dependent t Test of Pretest and Posttest Values

Table.3. Dependent t test of pretest-posttest of flexibility and endurance values

Variable	Group	Test	*Mean*	T		*p-value*	Statement
Flexibility	SKJ	*Pre*	11.14	6.899	———	0.000	Significant
		Post	13.17				
	SIJ	*Pre*	8.59	3.743	———	0.001	Significant
		Post	10.29				
	Control	*Pre*	11.33	2.118	———	0.047	Not Significant
		Post	13.80				
Endurance	SKJ	*Pre*	21.11	7.209	———	0.000	Significant
		Post	22.47				
	SIJ	*Pre*	21.67	1.898	———	0.071	Not Significant
		Post	22.20				
	Control	*Pre*	22.02	0.755	———	0.459	Not Significant
		Post	22.11				

Note: there is a significant difference of pretest and posttest values if p-value is less than alpha. The alpha value used is 0.05.

Based on the table above, it is explained that there is a significant influence of the flexibility values of SKJ group for the pretest and posttest, as evidenced by the value of t count 68.99 and the p-value 0.000. The mean valueof pretest is 11.14 and the mean value of posttest is 13.17. If the p-value is bigger than alpha (0.05), then it is concluded that the data are significant. If the flexibility value of the p-value (0.000) is less than alpha (0.05), then

there is a significant influence.There is a significant influence of the flexibility values of SIJ group for the pretest and posttest, as evidenced by the value of t count of 3.743 and the p-value is 0.001. The mean values for pretest is 8.59 and the mean value for posttest is 10.29. If the p-value is less than alpha (0.05), then it is concluded that the data are significant. On the flexibility values, the p-value (0.001) is bigger than alpha 0.05, then there is a significant influence.There is no a significant influence of the flexibility values of control group for pretest and posttest, as evidenced by the value of t count of 2.118 and the p-value is 0.047. The mean valuefor pretest is 11.33 and the mean value for posttest is 13.80. If the p-value is less than alpha (0.05), then it is concluded that the data are significant. On the value of the p-value (0.047) is bigger than alpha 0.05, then there is no significant influence.There is a significant influence of the endurance values of SKJ group for pretest and posttest, as evidenced by the value of t count of 7.209 and the value of p-value is 0.000. The mean value for pretest is 21.11 and the mean value of posttest is 22.47. If the p-value is less than alpha (0.05), then it is concluded that the data are significant. On the endurance value, p-value (0.000) is bigger than 0.05, then there is a significant influence.There is no a significant influence on the endurance values of SKJ group for pretest and posttest, as evidenced by the value of t count of 1.898 and the p-value is 0.071. The value for pretest is 21.67 and the value for posttest is 22.20. If the p-value is less than alpha (0.05), then it is concluded that the data are significant. On the endurance value, p-value (0.071) is bigger than 0.05, then there is a significant influence.There is no a significant influence on endurance values of control group for pretest and posttest, as evidenced by t count of 0.755 and p-value 0.459. The mean value for pretest is 22.02 and the mean value for posttest is 22.11. If p-value is less than alpha (0.05), then it is concluded that the data are significant. On the endurance value, p-value (0.459) is bigger than alpha 0.05, then there is no a significant influence.

Manova Test

Tabel.4.the Results of Hypothesis Test byManova

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	Flexibility	90.864[a]	2	45.432	.995	.375[a]
	Endurance	1.519[b]	2	.760	.384	.683[b]
Intercept	Flexibility	8981.539	1	8981.539	196.731	.000
	Endurance	32199.271	1	32199.271	16266.319	.000
Group	Flexibility	90.864	2	45.432	.995	.375
	Endurance	1.519	2	45.432	.995	.375[a]
Error	Flexibility	2830.535	2	.760	.384	
	Endurance	122.729	1	8981.539	196.731	
Total	Flexibility	11906.040	2		16266.319	
	Endurance	32345.600	2		.995	
Corrected Total	Flexibility	2921.399	1		.384	
	Endurance	124.249	1			

a. R Squared = .031 (Adjusted R Squared = .000)

b. R Squared = .012 (Adjusted R Squared = -.020)

Based on the table above, it can be explained that there are no significant differences in the flexibility and endurance values in all groups, namely SKJ, SIJ and control groups. It can be evidenced that in the

flexibiltyvariable, the sig value 0.220 is bigger than 0.05 and in the durability variable, the sig value 0.683 is less than 0.05.

Manova Advanced Test*Post Hoc Test*

Table.5. the Results of Disparity Test of Endurance Values among the Groups by *Post-Hoc Test.*

Variables	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	Statement
Flexibility	**SKJ**	SIJ	2.87	2.037	.491	Equal
		Control	1.36	2.061	1.000	Equal
	SIJ	SKJ	-2.87	2.037	.491	Equal
		Control	-1.51	2.061	1.000	Equal
	Control	SKJ	-1.36	2.061	1.000	Equal
		SIJ	1.51	2.061	1.000	Equal
Endurance	**SKJ**	SIJ	.273	.4242	1.000	Equal
		Control	.358	.4292	1.000	Equal
	SIJ	SKJ	-.273	.4242	1.000	Equal
		Control	.086	.4292	1.000	Equal
	Control	SKJ	-.358	.4292	1.000	Equal
		SIJ	-.086	.4292	1.000	Equal

Note: there is significant difference of flexibility and endurance values among the groups if *p-value/ Sig.* is less than 0.05

Based on the table above, it can be concluded that there were no significant differences amongthe three groups. It was evidenced by the flexibiltyand endurance values of SKJ, SIJ and control groups, that is, the *sig*values are bigger than 0.05. It means that there were no differences among the three groups.Therefore, the conclusion is that there areno differences among the groups seen from the flexibility and endurance variables in which the *sig* values of all the groups are bigger than 0.05.

3. RESULTS

The influence of 2017 SKJ ExercisesonFlexibilty Improvement

The results of empirical testing using t test *Paired Sample Test* showed that the implementation of the pretest and posttest in SKJ group of flexibility tests gave a significant improvement. According to Marwoto (2008: 1) the benefits of exercising gymnastic movements aim to improve the body joints and flexibility, to improve the postureand beauty of motions and to improve the body health. So, by looking at the explanationthat gymnastic exercises can improve the joint flexibility, then, the SKJ gymnastics that anatomically leads more to the joints of the knees, wrists, shoulders and legs has a significant influence on flexibility.In its implementations, SKJ exercises consist of heating, core and cooling movements. Anatomically, the systemic movements of SKJ exercises lead to the flexibility, starting from the flexibility of the hands, wrists, shoulders, necks, waists,

backsand legs. The core movements that lead to the flexibility occur in static heating and dynamic heating movements. At the core session, the flexibility movements are in the core 1-5, namely movements A and B, and in the cooling movements, the flexibilty movements can be found in the static movements, that is, the flattening of the hands, wrists , necks and legs.

The Influence of 2017 SKJ Exercises on Endurance Improvement

The testing results usingt*Paired Sample Test* showed that the implementation of the pretest and posttest of endurance for the SKJ group showed a significant improvement. This can be seen from the results of the pretest-posttest that the endurance values increase after getting the training / treatment. This is due to the duration of training in SKJ 2017 is longer than SIJ gymnastics, because every exercise, the endurance ofcentral nervous system is always trying to overcome fatigue, with the aim that a person is still able to do work for a longer period of time. Thus, endurance training will improve the ability of the nerve center to accept the training loads. Increasing the strenght of central nervous system is one of the goals of training, because exercises with long duration will gradually increase the body endurance (Sukadiyanto, 2011: 64). The biomotor durability components are generally used as one of the guidelines to determine the physical fitness level of sportsmen. Kamajaya (2013) stated that SKJ gymnastics is able to increase durability andRusdiyanto (2016)statedin the result of his research that SKJ gymnastics has an influence in increasing durability. Moreover, the other opinion asserted thatthe heart and lungs become more efficient with aerobic exercises and endurance capacity increases (Wilmore, 1994: 15).

The Influence of SIJ Exercises on Flexibility Improvement

The empirical test results using *t Paired Sample Test* showed that the implementation of the pretest and posttest of flexibility forthe SIJ group showed a significant improvement in the flexibility value. This can be seen from the results of the pretest-posttest. According to Brianmac (2000) the good grade of flexibilty for ages 16-19 years is 7.0-11.9cm. Therefore, it can be assumed that the students' flexibility in the SIJ group has increased significantly because their flexibility reached a good grade and even some of them exceeded more than that. According to Sukadiyanto (2011: 137) one who wants to have high flexibility must know two things that are interconnected with each other, namely between flexibility and spasticity. Flexibility is closely related to the state between the bones and joints, while spasticity is closely related to the state between the elasticity of the muscles, tendons, ligaments, and joints when doing movements.

The Influence of SIJ Gymnastics on the Endurance Increase

The results of t test of Paired Sample Test were found that the implementation of the endurance pretest and posttest of the SIJ group did not get maximum results because this movement in SIJ gymnastics had many variations of movement, so the treatment participants were unable to follow the gymnastic movements correctly. It can be seen from the result of the endurance pretest-posttest value is below 35.0, while according to Kenneth H. Cooper, the value of Vo2Max which is ideal for men is 42.1 to 52. It means that on average they are said to be unfit. Therefore, this research answers that SIJ gymnasticsdo not have a significant influence on endurance.

4. DISCUSSION

There is a significant influence of gymnastics exercises of SKJ 2017 on the flexibility increase of sports Coaching Education students of unipa Surabaya with the sig value 0,000 <0.05.There is a significant influence of gymnastics exercises of SKJ 2017 on the endurance increase of Sports Coaching Education students of unipasurabaya with the sig value 0,000 <0.05.There is a significant influence of SIJ exercises on the flexibiltyincrease of Sports Coaching Education students of unipa Surabaya with the sig value 0.001 <0.05.There is no significant influence of SIJ exercise on the endurance increase of Sports Coaching Education students of unipa Surabaya with the sig value 0.071> 0.05.

5. ACKNOWLEDGEMENTS

I express my gratitudes to the ICHS Purwokerto committee for facilitating the seminar, and my gratitutes also go to Prof. Dr. Nurhasan, M.Kes as Promoter and Dr. OceWiriawanM.Kes as Co-Promoter, with full of patience, helped and guided me to complete this journal.

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