

The Effects of *Senam* Perkasa Indonesia on the Elderly's Lung Inspiratory Capacity

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Abstract: This article is about to discuss whether there is any effect of *Senam* Perkasa Indonesia on the elderly's lung inspiratory capacity. The author considers that there are very few people who examine this kind of gymnastic, especially when it is associated with the inspiratory capacity of elderly's lungs. This quasi experimental research was conducted with purposive sampling technique of the elderly group in Melong Asih Mandiri RW 31 Melong Village, South Cimahi Sub district and meet the inclusion criteria of 18 people in each group. The instrument used was a Spiro-ball tool, the tool that is used to measure the inspiratory capacity of a person's lungs. The results obtained were analyzed by Statistic Paired Sample T-Test and continued using Independent Simple T-Test. From the data analysis, it can be concluded that the value of the test result of the two groups (3,376), $(p) = 0.002 < 0.05$ then H_0 is rejected, which means that there is a difference in the number of elderly lung inspiratory capacity between the experimental group and the control group. In other words, the exercise of *Senam* Perkasa Indonesia has an effect on the inspiratory capacity of elderly's lung.

1 INTRODUCTION

Senam Perkasa Indonesia is one form of gymnastics, the implementation of this sport is a combination of gymnastics and breathing exercise (Perry, 1983). By doing this gymnastics, one can feel the optimal health which gradually restores the position and flexibility of the nerves and blood flow, opening the system of intelligence, sweat system, body heating system and one of them expedites the cardiovascular system. Besides that, by doing these gymnastics classified as aerobic physical activity on a regular basis can improve physical fitness. [1]

In the previous research conducted by Dewi and Tri in Saladin and Miller (1998) regular exercise of Healthy Heart Gymnastics and Ergonomics Gymnastics can effectively lower blood pressure of the elderly who suffers hypertension.

These gymnastics can be done by anyone without age restrictions, however, these gymnastics is mostly followed by the elderly. Elderly is a further stage of a life process where everyone will experience the aging process (Cote, 1995). During the aging process there will be anatomical and physical changes in the organs of the body and most of the changes that occur in the elderly are changes

in the negative direction or a decrease (Livingstone and Hubel, 1988). Decreases in old age are such as physical decrease marked by gray hair, flabby skin, slow motion, less muscle strength, changes in body fat percentage, flexibility, agility, and endurance and the onset of illnesses that cause elderly fitness to decrease (Saladin and Miller, 1998). In addition, there is also a decrease in cardiorespiratory adaptation during performing an activity and at rest or recovery (Howley and Franks, 1986).

The capacity of a person's lungs is different, age is one factor of decreased lung capacity in the elderly, "Elderly will experience a decline. Elderly experience decreased aerobic capacity at an average of 1% per year after reaching 30 years old. The decrease occurs due to several factors, namely decreased cardiac output and changing breathing function. However, if fitness can be maintained according to their age, this decline is only 0.4% per year (Astrand and Ryhming, 1954). Previously, there were no studies discussing the effect of Mighty Gymnastic on the lung inspiratory capacity of an individual, especially the elderly.

So, when viewed from the aspect of the implementation techniques, the movement and breathing techniques on the mighty gymnastics can

affect the capacity of lung inspiratory of people who do gymnastics (Goswami and Gupta, 1998). So that person will have a good fitness and will not easily get tired in doing activities because he can inhale a lot more oxygen. The test to find out the lung capacity is by performing inspiratory capacity tests using the Spiro-ball tool.

2 METHODS

2.1 Participants

Participants in this study are elderly who joined in the elderly group in Melong Asih Mandiri Rw 31, South Cimahi, Melong village, South Cimahi sub district, Cimahi city who followed *Senam Sehat Indonesia* with a population of 84 people. Characteristics of research participants are the elderly group in the age range of at least 60 years (elderly). The number of participants is as many as 36 people, consisting of 18 people in the experimental group that is a group that was given the treatment of *Senam Perkasa Indonesia* and 18 people in the control group that is not given the treatment of *Senam Perkasa Indonesia* but still doing the *Senam Sehat Indonesia* as in everyday life. The selection of participants is done by purposive sampling that is the sampling technique with the consideration that has been determined.

2.2 Procedures

This quasi experimental study used pre-test post-test non-equivalent control group design (Campbell and Stanley, 2015), where all the research sample at first did *Senam Sehat Indonesia* in the elderly group of Melong Asih Mandiri Rw 31, which was then divided into two groups, one group who was given treatment in the form of *Senam Perkasa Indonesia* and the other group that was not given that treatment but still do *Senam Sehat Indonesia* as their usual daily activity and this group served as a control group or comparison.

2.3 Instruments

To obtain data from this research, the instrument that was used is the lung inspiratory capacity test that is by using Spiro-ball tool.

3 RESULTS AND DISCUSSION

Based on the results of the calculations, the following results are obtained:

3.1 Statistic parametric paired sample T-Test Analysis

Table 1: The average equality table in each sample group.

		T	Value-sig	Decision	Remark
Pair 1	Post-test – pre-test on experimental group	-2.119	0.049 < 0.05	Ho rejected	There is difference
Pair 2	post-test– pre-test on control group	1.833	0.084 > 0.05	Ho accepted	No Difference

From the table above, it can be seen that the results of the comparison to -1 on the experimental group (SPI) = -2.119, $p = 0.049 < 0.05$ then Ho is rejected. This shows that there is an average difference in spirometer test results before doing *Senam Perkasa Indonesia* and after doing it. However, it can be seen that the test results before and after the practice of *Senam Perkasa Indonesia*, were increased slightly. This means that the result of doing *Senam Perkasa Indonesia* for 16 times meeting is only to maintain the elderly fitness, one of which is to maintain the respiratory function so that it will not less functioning. While in the control group (SSI) = 1.833, $p = 0.084 > 0.05$ then Ho accepted, it means that there is no difference in the average results of spirometer tests before and after doing *Senam Sehat Indonesia*.

3.2 Parametric Independent Sample T-Test Analysis

Table 2: Table of average comparison of the two sample groups.

	F	Sig	T	Sig. (2-tailed)	Decision	Remark
Difference (Equal variances not assumed)	4.595	.039	3.376	0.002 < 0.05	Ho rejected	There is difference

The value of t with equal variance not assumed = 3.376, with significance value (p) = 0.002 < 0.05, then Ho is rejected. So there is a difference in the amount of lung inspiratory capacity among elderly people between the experimental group and the control group. In other words, the exercise of *Senam*

Perkasa Indonesia gives a significant effect on lung inspiratory capacity of the elderly people.

When comparing the difference between the results of the posttest-pretest in both groups, it can be seen that the result was "there was a difference", it means that the treatment in the form of practicing *Senam Perkasa Indonesia* in the experimental group had an effect on the inspiratory capacity of the elderly's lungs. The difference in the intensity of each gymnastics practice can be one of the factors that affect the results of lung inspiratory capacity of the elderly, when the experimental group was doing the exercise of *Senam Perkasa Indonesia*, they were asked to control their respiration by holding their breath several times in a predetermined time which meant, controlling the number of incoming O₂, it is a way to increase the intensity of the exercise. In contrast to the control group who did *Senam Sehat Indonesia* which used more movements of reflection or massages, although this gymnastics also contains elements of breathing arrangements but no holding breath like *Senam Perkasa Indonesia*, so it can be said that the intensity is low.

The result shows that the exercise of *Senam Perkasa Indonesia* has effects on the lung inspiratory capacity of the elderly. As discussed earlier, all the *Senam Perkasa Indonesia* movements always begin with taking a deep breath so that the gymnasts can survive without breathing in a few counts. This makes the elderly are trained little by little to always try to inhale O₂ optimally. *Senam Perkasa Indonesia* can be categorized into breathing exercise like that of the inner power sports, in which the function of the respiratory system that is used as the entrance gate of O₂ must be controlled, so that air circulation (exchange of air) in lungs become obstructed. As Giriwijoyo and Zafar (2012) puts it "... *The stronger the respiratory control is, the lower the O₂ content in the blood will be, the greater the gap between the demand and the supply is, the heavier the Or-TD becomes.*" So this exercise is meant to train the body cells to keep functioning normally in the O₂ deficiency which in turn would be normal in the adequacy of O₂.

Based on the facts in the field, seeing from the posttest-pretest results, after doing Gymnastics, not all the elderly had increased lung inspiratory capacity, the were some elderly people who suffered the decline in the amount of lung capacity, it was because they were undisciplined when doing the exercise, either in terms of quality of movement or in terms of attendance.

As for another thing that researchers found out, apart from the problems that have been formulated,

is as follows: The enthusiasm of the elderly toward something new. Some elderly people can feel positive effects on their health. There was an elderly man who often suffered from a blood vessel problem. The blood circulation in the sole of his feet was not flowing well, causing a tingling sensation that inhibited his activities, but after he followed the practice of *Senam Perkasa Indonesia*, the tingling sensation that he often felt began to decrease. Then, there was another elderly man who felt dizzy when the head position was aligned with the body when lying, after he followed *Senam Perkasa Indonesia*, especially the 10th movement, which is lying helplessly movement, until in the end little by little he was able to sleep without a pillow and does not feel dizzy anymore. And the last, there was an elderly who had a knee complaint. When he made a bow movement to prostration, sometimes he felt pain or a little difficulty when getting up again, but after following the exercises of *Senam Perkasa Indonesia* in which there are many movements that use knee pedestal, little by little his complaints of his knees are reduced.

4 CONCLUSIONS

It is benefited for the elderly to exercise to maintain their fitness. One of the way is by doing *Senam Perkasa Indonesia* in which there are many movements that control the respiratory system and also very useful for the health of the elderly. Based on the results of this research, it can be concluded that doing *Senam Perkasa Indonesia* can maintain lung capacity of the elderly. In addition, these gymnastics is also very useful in addressing to some health complaints of the elderly. It is recommended that the elderly do every movement of the gymnastics optimally, one of which is in terms of correct body positioning so that they can get many positive benefits especially for the health of the elderly itself. For the gymnastics instructors, they are expected to create a more creative gymnastics training program so that the elderly participants will not feel bored and they can be more motivated in doing sports so that the productivity of elderly life will increase.

REFERENCES

Astrand, P. O., Ryhming, I., 1954. A nomogram for calculation of aerobic capacity (physical fitness) from

- pulse rate during submaximal work. *Journal of applied physiology*. 7(2), pp.218-221.
- Campbell, D. T., Stanley, J. C., 2015. *Experimental and quasi-experimental designs for research*, Ravenio Books.
- Cote, J., Saimela, J., Trudel, P., Baria, A., Russell, S., 1995. The coaching model: A grounded assessment of expert gymnastic coaches' knowledge. *Journal of sport and exercise psychology*. 17(1), pp.1-17.
- Giriwijoyo, Y. S., Zafar, S., 2012. *Ilmu Kesehatan Olahraga*, PT Remaja Rosdakarya. Bandung.
- Goswami, A., Gupta, S., 1998. Cardiovascular stress and lactate formation during gymnastic routines. *The Journal of sports medicine and physical fitness*. 38(4), pp.317-322.
- Howley, E. T., Franks, B. D., 1986. *Health/Fitness Instructor's Handbook*, Human Kinetics Publishers, Inc., Marketing Director, Box 5076. Champaign, IL.
- Livingstone, M., Hubel, D., 1988. Segregation of form, color, movement, and depth: anatomy, physiology, and perception. *Science*. 240 (4853), pp.740-749.
- Perry, J. A. C. Q. U. E. L. I. N., 1983. Anatomy and biomechanics of the shoulder in throwing, swimming, gymnastics, and tennis. *Clinics in sports medicine*. 2(2), pp.247-270.
- Saladin, K. S., Miller, L., 1998. *Anatomy & physiology*, WCB/McGraw-Hill. New York (NY).

