

Effectiveness of *Poco-Poco* Exercise on Elderly's Cholesterol Levels: A Preliminary Study

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Abstract: Elderly is a condition where people will lose the ability of tissues to improve themselves and lose their immune power against infections that result in decreased function of muscle tissue such as the heart. The highest cause of cardiovascular disease is high cholesterol levels in the blood. One solution to deal with cholesterol problems in the elderly is by doing exercise. Poco-Poco is an aerobic exercise where the continuity of movement involves muscle groups that contract and can lower blood fat levels, so the danger of deposition of fat in blood vessel walls can be reduced. This preliminary study aimed to identify the effect of poco-poco exercise on cholesterol levels in the elderly. This research used pre-experimental method with one group pretest and posttest design to 15 elderly people in Medan. Instruments used for data retrieval are guideline and glucometer. Data analysis used was Wilcoxon test with p value 0,001 ($\alpha < 0, 05$). This research indicates that there is significant effect of poco-poco exercise on cholesterol levels in elderly. Further research can apply the poco-poco exercise at least two times a week for long time period in elderly as one of alternative way in lowering cholesterol.

1 INTRODUCTION

Elderly is a condition where humans will lose their immunity to infection, which results in a decrease in the function of muscle tissue to the function of body organs such as the heart, liver, brain and kidneys. One of the effects of a decline in heart organ function is the deposition of atherosclerotic substances that can cause changes in blood vessel elasticity (Mayasari, 2016). The prevalence of disease experienced by elderly between musculoskeletal (61.4%) and cardiovascular diseases (51.1%) was experienced by more elderly men compared to elderly women (Tjokoprawiro, 2015). One of the highest causes of cardiovascular disease is high abnormal cholesterol levels (Arisman, 2014).

The Government of Healthy Living Movement Program is a choice in realizing a better community health status. The goal is to raise awareness in the community in preventing disease by exercising regularly, eating nutritious foods, and regular health checks to control blood pressure, blood sugar levels, and cholesterol levels in the body. This program will save more costs when compared to treating. Exercise is any body movement carried out by the frame so as to produce energy. In the elderly body movements and physical activity decreased. Aging normally occurs in a

person's body composition including decreased body mass, basal metabolism, protein reserves, and water reserves. Reduced muscle strength due to loss of muscle mass, level of activity and exercise patterns can affect muscle strength which will result in slowing performance of daily activities.

This poco-poco exercise has advantages compared to other exercises and can be classified as aerobic exercise because of continuity and involves many groups of muscles that contract. Looking at the burden or intensity of training that is quite large owned by poco-poco exercises, it can be said that this exercises can be equated with line dance from Bali in terms of the effect it has on some physiological parameters of the body (Saputra, 2015). Poco-poco gymnastics has several advantages. First, movement rhythm is easy to remember. If we rarely exercise, poco-poco is a good choice because it does not drain our body too much. Second, movement of poco-poco is not difficult because it consists of complex movements with moderate difficulty. Third, this exercise increase the elasticity of blood vessels, so that it can reduce the possibility of rupture of vessels if blood pressure rises and blood circulation will be more perfect to take, circulate, and use oxygen. Fourth, poco-poco exercise can reduce levels of fat in the blood, such as cholesterol

and triglyceride, so the danger of deposition of fat in the walls of blood vessels can be reduced. Last, this exercise make us more love the country. One of our patriotic forms of nation and state is poco-poco dancing.

Besides being healthy, we also appreciate the work of our own nation. Observations show that judging from the loading on the heart, poco-poco exercises have advantages compared to other gymnastics and can be classified as aerobic exercise because they can train muscle strength and blood circulation to be more perfect in taking, circulating, and using oxygen. Seeing the considerable burden or intensity of exercise that is owned by poco-poco gymnastics, it can be said that this exercise can be compared with Line dance from Bali in terms of its effects on several physiological parameters of the body.

Arif (2015) stated that there were four weeks of poco-poco exercise effect on HDL levels in elderly people in Manado. Decrease in blood cholesterol levels in the elderly group given physical activity therapy in Suwarsi's (2017) study in Yogyakarta stated that the provision of physical activity therapy can reduce blood cholesterol levels in the elderly. On this basis, researchers conducted preliminary study to prove the effect of poco-poco exercise with a decrease in cholesterol levels in the elderly with hypercholesterolemia in Medan.

2 METHODS

This preliminary study used pre-experimental design, to find a causal relationship with the existence of research involvement in manipulating the independent variables (Nursalam, 2014). Researchers used the design of one group pre-post test design (Polit and Beck, 2010). The number of respondents in this study were 15 and the inclusion criteria were, age >60 years, cholesterol levels > 200 mg/dl, no musculoskeletal disorders and other chronic diseases, not receiving any cholesterol therapy.

Table 1: Cholesterol level before and after intervention poco-poco exercise in the elderly.

Cholesterol Level (mg/dl)	Pre-intervention				Post- Intervention			
	f (n)	%	Mean	SD	f(n)	%	Mean	SD
Normal (<200)	-	-	-	-	8	53,3	213.20	19.432
Borderline (200-240)	9	60	237.93	15.476	7	46,7		
High (>240)	6	40			-	-	-	-

Table 2: The results of Wilcoxon sign rank test effect of exercise: poco-poco on cholesterol levels in the elderly.

Respondents	N	Mean	Median	SD	Min-Max	CI 95%	P value
Pre-intervention	15	237.93	230.00	15.476	220-262	229.36-246.50	0.001
Post-intervention	15	213.20	198.00	19.432	195- 240	202.44-223.96	

The instrument used was video exercise: poco-poco, a standard guide adopted from the Nusantara Community 2016 (see appendix), a new glucometer set with the Easy Touch brand and an observation sheet.

After obtaining ethical clearance from the Santa Elisabeth Medan Nursing College Health Ethics Committee, the researchers determined the respondents. Prospective respondents first explained about the purpose and intervention of the research and the benefits for them. Then the prospective respondents who agreed to sign the informed consent sheet and were willing to follow the poco-poco exercise intervention for one month.

The researcher also coaching with health workers at the research location in equating the perception of the procedure exercise: poco-poco. The researcher explains the work procedure before giving the exercise: poco-poco. Respondents are encouraged to fast for 9 hours before measuring cholesterol levels. After the pre-intervention cholesterol level was measured, the respondents followed exercise: poco-poco with researchers and staff including 35 minutes of warming up, core and cooling down. This exercise is carried out 2 times a week during March 2018. On the last day before training, respondents were again advised to fast before measurement of blood cholesterol levels post intervention.

3 FINDINGS

Respondents who participated in the study consisted of elderly people aged 60-69 years, women, Protestant and married, Batak Toba tribes, and had the last high school education. Data shows that all respondents had high cholesterol levels > 200 mg/ dl before being given exercise: poco-poco. After the intervention data was obtained that as many as 8 respondents experienced a decrease in normal cholesterol levels (53.3%) as in table 1 below.

Table 1 shows data that as many as 15 respondents who have high cholesterol levels are worth 100% before being given exercise: poco-poco. Cholesterol blood was measured by using glucometer during the first meeting with the respondents. Then they was doing exercise: poco-poco during one month. After that, researchers measured cholesterol of blood again post exercise. We found as many as 8 respondents experienced normal cholesterol levels after being given exercise: poco-poco (53.3%).

After all data has been collected from all respondents, an analysis is performed using computer statistical program tools. The results of the normality test showed that the data were not normally distributed so the researchers used the Wilcoxon sign rank test as in table 2.

Table 2 shows that 15 respondents obtained the mean cholesterol level of respondents before exercise: poco-poco was 237.93, with a standard deviation of 15.476. While the average cholesterol level after exercise: poco-poco is 213.20, with a standard deviation of 19.432. Thus there are differences in mean cholesterol levels in respondents before and after exercise: poco-poco intervention. The results of the Wilcoxon Sign Rank Test statistical test show that the value of $p = 0.001$ where ($\alpha < 0.05$), which means that giving exercise: poco-poco affects cholesterol levels in the elderly.

4 DISCUSSION

Before giving the exercise, poco-poco intervention, researchers measured cholesterol levels using a glucometer with results of borderline cholesterol levels (200-240 mg / dl) and excessive (> 240 mg / dl). Increased cholesterol levels can be affected by a decrease in physical activity caused by a decrease in the musculoskeletal system in carrying out daily activities with increasing age, limb muscle strength below is reduced by 40% between the ages of 30-80 years. This disorder causes interference in the form of swelling, pain, joint stiffness, limited joint motion, road disturbances, and limited activities (Padila, 2013). Another cause that triggers an increase in cholesterol levels in the blood, is diet, activity and age. Increased fat consumption by 100 mg / day can increase total cholesterol by 2-3 mg/dl (Suwarsi, 2017).

Older age is also one of the factors that can cause an increase in cholesterol. Aging age is usually followed by a decrease in physical activity which results in decreased numbers of basal metabolites and increased fat tissue, due to the activity of several

types of hormones (such as insulin, growth hormone, and androgens). A decrease of hormone causes a decrease in lean fat while an increase in other hormone activity increases fat mass. The older a person, the less the ability or activity of the ldl receptor, causing low density lipid blood to increase and accelerate the occurrence of clogged arteries.

Elderly women have cholesterol 2-6 times greater than men. This is because in elderly women had a decrease post menopause estrogen. At post menopause, women experience a decrease in estrogen and thus have a high risk of heart disease (Miller, 2017). Increased cholesterol levels in the elderly in Medan can be caused by various factors, one of which is age, gender and ethnicity. Elderly people aged > 60 years are prone to increased cholesterol and are experienced by all sexes, namely men and women. Besides that cultural tribes such as the Batakese can also affect the elderly experiencing increased cholesterol where they prefers to consume foods such as meat which contains high cholesterol.

After giving exercise poco-poco for four weeks, the elderly who had high cholesterol levels, obtained 8 elderly (53.3%) included in the normal cholesterol category and 7 elderly (46.7%) had blood cholesterol in the borderline category. There are many factors that cause an increase in cholesterol in the blood, one of which is a lack of physical activity. A physical activity result in energy expenditure that is proportional to muscle work and is associated with health benefits. The more physical activity carried out every day, the greater the daily energy expenditure resulting in a reduction in weight and fat, this can reduce the amount of cholesterol, resulting in changes in cholesterol transfer in the blood (Utami, 2013).

Exercise poco-poco which is carried out regularly is an initial effort to control and overcome the increase in blood cholesterol levels in the elderly. Exercise poco-poco is carried out and taught twice a week for 4 weeks with duration of 35 minutes for the respondent, and then the cholesterol level is measured again. This exercise is very easy for the elderly to do with the movements of the exercise poco-poco is not difficult and easy to remember because it consists of complex movements with moderate difficulty.

In addition, it can be done in groups that allow for social interaction. The movement used in this gymnastics is quite accommodating, the song rhythm is good, and the movements are easy for everyone, even the old people to follow because they include movements in every sport such as

badminton, volleyball and footballs. This poco-poco exercise can also be done in various places with a flat and hard surface. Poco-poco is useful in increasing the elasticity of blood vessels, so as to reduce the possibility of rupture of vessels if blood pressure rises and muscles and blood circulation will be more perfect to take, circulate, and use oxygen and can reduce blood fat levels, for example cholesterol and triglyceride, so the danger of deposition of fat in the walls of blood vessels can be reduced (Ria, 2016).

Arif (2015) stated that exercise: poco-poco was effective in increasing HDL cholesterol levels which could affect the decrease in total cholesterol levels in the blood after being done twice a weeks for four weeks. Poco-poco has been able to reduce cholesterol levels in the elderly. This is evidenced by a decrease in cholesterol levels in the elderly who previously had borderline cholesterol levels to an optimal level. A healthy diet, low in fat and rich in fiber will be very beneficial in maintaining healthy cholesterol levels. No more than 25 and 35% of the total daily calories must come from fat; saturated fat should be calculated at less than 7 percent of this amount. To reduce LDL cholesterol and increase HDL, it is recommended to eat foods high in fiber. High HDL levels will flow in the blood throughout the body and bring LDL to the liver to be removed so there is a decrease in LDL levels that can affect total cholesterol levels in the blood (Soleha, 2012).

The decrease in cholesterol levels in the elderly is caused by several factors, namely the seriousness of the elderly in following exercise: poco-poco and the frequency of exercise carried out by the elderly. Exercise frequency, which is carried out continuously, and the seriousness of the elderly in exercising characterized by the sweat coming out so that there was a maximum burning of energy, which can reduce cholesterol levels.

The results of the Wilcoxon statistical test showed that the results of $p = 0.001 < \alpha 0.05$, which means there is a significant effect between Exercise: Poco-Poco on cholesterol levels in the elderly. Statistically shows the effect of exercise: poco-poco on cholesterol levels in the elderly with OR = 21.52, which means a decrease in cholesterol 21.52 times compared to respondents who did not exercise: poco-poco. Regular physical activity can increase HDL and reduce cholesterol, LDL, triglycerides (Miller, 2017). Lipid profile in the blood is affected by several enzyme activities in fat tissue and muscle will increase with increasing activity. Therefore, if a person lacks physical activity, the activity of the lipoprotein lipase enzyme will not increase so that it

will not reduce LDL levels and blood cholesterol levels (Sugeha, 2013).

Increased activity of lipoprotein lipase causes HDL in the body to transport excess cholesterol from the body (Ali, 2013). Saputri (2014) stated that there was an effect of aerobic exercise on total cholesterol levels in the blood. Non-pharmacological counter measures against high total cholesterol by doing aerobic exercise. Aerobic exercise given to respondents was done in three stages, namely, heating, core movement, and cooling. Warming is done by jogging in place, folding hands, and head facing right and left, down alternately with eight counts. The light core movement with modern dance involves the upper extremities and lower extremities. While cooling by breathing slowly, exhale and followed by hand and stomach movements. Sugeha (2013) also said that with elderly exercises could increase HDL levels and reduce LDL levels.

Preliminary study that was conducted in Medan shows a decrease in cholesterol levels in the elderly which is better than previously carried out exercise: poco-poco. Cholesterol reduction in the elderly is caused by the frequency of exercises that is done twice a week and the seriousness of the respondent in exercising to the maximum.

5 CONCLUSION

Research conducted in Medan shows a decrease in cholesterol levels in the elderly which is better than previously carried out exercise intervention: poco-poco. The results of the Wilcoxon statistical test showed that the results of $p = 0.001 < \alpha 0.05$, which means there is a significant effect between Exercise: Poco-Poco on cholesterol levels in the elderly. It was suggested that health workers especially in community have to continue poco-poco exercise twice a week for long time period to maintain cholesterol levels of the elderly and minimize the occurrence of hypercholesterolemia complication. Further research is needed to measure significancy of this exercise reduce cholesterol blood levels with bigger samples.

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APPENDIX

Poco-poco Exercise Guideline

<p>A</p>	<p>Material DVD set of Poco-poco Nusantara 2016 Tape Speaker Microphone Vital sign set</p>
<p>B</p>	<p>Assessment Vital sign measurement Assess health history Observe indication and contraindication for exercise</p>
<p>C</p>	<p>Warming up</p> <p>Figure 1: Walk in place while swing your hands back and forth alternately with a count of 2X8</p>  <p>Figure 2: Step up 4 times then clap once, then step back 4 times back then applause once (do it with 2X8 count)</p>  <p>Figure 3: Step 1 time forward and lift both hands with the palm position in front (Do it with a count of 2X8)</p>
<p>D</p>	 <p>Stretching Figure 4: Step 1 backward and lower your hands with your palm in front (Do it with a count of 2X8)</p>






<p>E</p>	<p>Exercise</p>  <p>Figure 5: Walk in place while swinging your hands back and forth alternately</p>  <p>Figure 6: Step 2 times to the right and 2 times to the left while holding your finger and bending your elbow</p>  <p>Figure 7: Step 1 step back, the right hand is lifted parallel to the neck, the left hand is raised straight then the second hands swung forward and backward (do 4X8 in all directions).</p>  <p>Figure 8: Step 2 times right and 2 times left with the body position slightly bent and both hands stretched down</p> 
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Figure 9: Step 2 times to the right while swinging your right hand forward and twice to the left while swinging your left hand forward



Figure 10: Right leg backs up one step and position the right side of the body with the position of both hands swinging backwards (with the position of the hand preparing to punch)



Figure 11: Walk in place while swinging your hands forward and back and forth with a count of 4X8



Figure 12: Step 1 time right with your right hand swung from behind to the front parallel to right hip (like demonstrating badminton games)



Figure 13: Right foot backs 1 step behind the left hand swing 1x in a circle, steps 2 times forward with the position of the head flexed and both hands straight and swing forward. Do as much as 4X8 (in all

directions of the wind.



Figure 14: Step 2 times to the right and left with the position of the left hand raised down parallel to the abdomen then the right hand is held down along the stomach (demonstrating hitting the basketball)





Figure 15: Walk in place while swinging your hands forward and back and forth with a count of 4X8



Figure 16: Step 2X to the right, the right hand is aligned parallel to the right shoulder (palm above) and the left hand holds the left ear, and vice versa



Figure 17: Right foot backs 1 step, hands are lowered parallel to the abdomen. Then step 1x right, your body slightly bent and both hands straightened down until it reaches below the knee

F	Cooling Down  <p>Figure 18: Walk in place while swinging your hands back and forth alternately with a count of 2X8</p>  <p>Figure 19: Step 4 times then clap once. Next step 4 times back then clap once.</p>
G	Evaluation Vital sign measurement Documentation