

**THE EFFECT OF ANDRIE WONGSO HEALTH, ENTHUSIASTIC AND HAPPY GYMNASTIC FOR THE ELDERLY KNEE JOINT PAIN IN TEMBALANG, SEMARANG, INDONESIA**

**Fery handayani, BagoesWidjanarko and Suroto Suroto**

Faculty of Public Health, Magister Health Promotion, Universitas Diponegoro, Semarang

**ABSTRACT**

As people grow older, their ability, need and life quality will change. Being old is an undeniable certainty, but to be old and stay active and productive requires an effort of every individual. One form of activity that can be done to make an elderly to be productive is by doing some body movements. There are various movements in the form of gymnastics have been created with various purposes. One of the examples is Andrie Wongso Health, Enthusiastic and Happygymnastics. This research was conducted on the respondents aged 45-79 at Wana Mukti Gymnastic Center, Bumi Asri Elderly Integrated Health Post and Samiaji Gymnastic Center, Tembalang Sub-district, Semarang. The objective of this study is to find out whether Andrie Wongso Health, Enthusiastic and Happy gymnastic training affects the changes in knee joint pain. The number of respondents used in this study consists of 50 members of the control group and 50 members of the treatment groups. They are analyzed by using the Quasi-Experiment design. The assessment of pain level of the respondents is carried out in the beginning, middle and after the training takes place. Based on the training program, the result is obtained descriptively.

**KEYWORDS:** Andrie Wongso gymnastics, Elderly, Knee joint pain

**INTRODUCTION**

Non-pharmacological therapy is one of the therapies that is able to reduce joint pain. One of the examples is conservative therapy which includes the use of joint range motion exercises and gymnastics. Andrie Wongso Health, Enthusiastic and Happygymnastics is a gymnastics that is created with movements that are dynamic and easy to follow. As we knew, most elderly people experience a lot of activity disruption, such as a problem due to knee joint pain.(Suparta 2017)

The Bureau of Census of the United States states that in Indonesia, in the period of 1990 - 2025 there will be an increasing number of elderly people by 41.4%, assuming that in 2020 it will reach 30 million of elderly.(Putra 2016) National socio-economic survey data in 2015 showed that Indonesia had a total of 21.5 million elderly people or around 8.43% of the total population. The increasing number of life expectancy of the community should be balanced with good health conditions.(ratnawati emmelia, 2017) The increasing number of life expectancy can be seen in terms of positive and negative ways. Positively, the increasing number of life expectancy can motivate the elderly to live in an active and productive way. The growth of the elderly population in Indonesia in 2017 reached 9.03% of the total population.(Kemenkes RI 2017) The World Health Organization

(WHO) sets the age limit for elderly people into four levels; middle-aged (45 - 59 years), advanced aged (60 - 74 years), elderly aged (75 - 90) years and very old aged (over 90 years).(Siti Maryam, et all 2012)

Elderly is a period when people are facing a phase of gradual degeneration that occurs both psychologically and physiologically. In order to maintain and improve the health condition, an adaptation is needed. One of the activities that can be done in maintaining health is by doing exercises that of course are adjusted to the physical strength of the elderly.(Dkk 2012)In Tembalang sub-district, Semarang City, the number of population based on age is mentioned as follows; population of people aged 45 - 49 is 7.1%, aged 50 - 54 is 6.1%, aged 55 - 59 is 4.5%, aged 60 - 64 is 3.5%, age 65 years and over as much as 5%. The total number of elderly in Tembalang sub-district in 2017 according to the Population and Civil Registry Service data for the age limit of 45 - 65 years old and above is 0.9% of the total population.(Semarang n.d.) One of the health problems that is often experienced by the elderly is knee joint pain, which is a musculoskeletal problem and disorders of the bone due to disability and degenerative changes. According to a study in Ghana, Nigeria 60% of adults are affected by the knee joint Osteo Arthritis.(Bello, Crankson, and Adegoke 2014)The number of prevalence of joint disease based on the diagnosis of health workers in Indonesia is 11.9% with the highest prevalence in Bali 19.3% followed by Aceh 18.3%, West Java 17.5%, Papua 15.4% and Prevalence of joint disease based on symptoms in Indonesia as much as 24.7% with the highest prevalence in East Nusa Tenggara 33.1%, followed by West Java 32.1% and Bali 30%, while the prevalence of joint disease in Central Java is 11.2%.(Penelitian and Pengembangan 2013) This condition can cause long-lasting pain and stiffness in the joints, which can permanently stop the joints function. The imperfect joint function can limit the physical activity of the elderly, so they might experience a decrease in the quality of life, namely a lack of physical activity. This condition can trigger a risk factor for various diseases in the elderly population.(Sitinjak, Hastuti, and Nurfianti 2016) The new health paradigm in defining health states that the true health means health with a state of well-being, both physically and socially. One indicator of being active and productive is the body flexibility according to age and fitness.( Soekidjonotoadmojo, 2009)

A new approach in health promotion includes strengthening community activities and improving individual skills in maintaining health. In an article mentioning that the routine activities of traditional Chinese movements are able to reduce knee joint pain.(Zhang et al. 2017) It is emphasized that the presence of activities that are continuously transferred to the knee joint can reduce the pain that occurs or is felt. In this study, Andrie Wongso as the initiator and creator of Andrie Wongso Health, Enthusiastic and Happy gymnastics, shares and teaches this gymnastic in the community in several regions as a movement aimed at improving public health, including reducing joint pain in the knee. The elderly complaint of pain in the knee joint is a very common thing in the community. According to the Basic Health Research 2018, the prevalence of joint pain is included as the top 10 non-contagious diseases in Indonesia with a total percentage of 11.2%.(Kemenkes RI 2018) The importance of improving the health of the elderly with high life expectancy and the

existence of Andrie Wongso Health, Enthusiastic and Happy gymnastic training as a form of body movement, attract the researchers to know the effects of Andrie Wongso Health, Enthusiastic and Happy gymnastic movements against knee joint pain at the Bumi Asri Elderly Integrated Health Post, Mukti Sehat Gymnastic Center and PWRI(Pensiunan Werdatama Republik Indonesia) Samiaji Gymnastic Center.

The Elderly Integrated Health Post and those gymnastic centers are places where the elderly take a part in various activities up to the provincial level. They often attend various held contests and receive various awards in order to improve their life quality. This study aims to measure or analyze the effect of Andrie Wongso Health, Enthusiastic and Happy gymnastics on reducing knee joint pain in the elderly. The purpose of this study is to classify the characteristics of the elderly based on age, education, occupation and gender to determine the level of joint pain and the influence of Andrie Wongso Health, Enthusiastic and Happy gymnastics on the reduction of knee joint pain in the elderly in Tembalang Sub-district, Semarang City.

## **METHODS**

This research was conducted using the quasi-experimental design which reveals the possibility of causes and effects between variables without any manipulation of the variables. The type of design that will be used is non-equivalent control group design, where there are two experimental groups given different treatments. The samples in this study were observed before being given treatment, in the middle of treatment and after the treatment was given.

To determine the decrease in the elderly knee joint pain due to the application of Andrie Wongso Health, Enthusiastic and Happy gymnastics, different treatments were carried out on the two group; experimental and control groups. Both study sample groups were given a questionnaire before the treatment, in the middle of treatment and after the treatment.

The population of this study is the elderly with knee joint pain at the Bumi Asri Elderly Integrated Health Post and Mukti Sehat Gymnastic Center, as well as PWRI Samiaji Gymnastic Center, Tembalang Sub-district, Semarang City. The sampling technique is a purposive sampling technique, where the sampling is collected based on specific goals and considerations. The number of samples is 100 people consisting of 50 people of the treatment groups and 50 people of the control group. The data obtained was managed using SPSS 17, the ANOVA test and Tukey test to see the effect of gymnastics on the respondents. There are three criteria that will be determined, namely inclusion, exclusion and dropped out criteria. The inclusion criteria include several characteristics as follows; registered elderly at Elderly Integrated Health Post Tembalang sub-district, and Mukti Sehat Gymnastic Center, aged 45-65 years in which at that ages, the elderly are still can actively communicate and do various activities and become the direct target of the Elderly Integrated Health Post, having complaints of knee joint pain, but not because of injury or collision, having ability of

reading and writing, having ability of doing activities independently and not taking anti-pain medication or Osteoarthritis in the past one week.

The exclusion criteria include several characteristics as follows; elderly with visual and sensory disorders, elderly who have neurological disabilities such as hemiplegia or hemiparesis and elderly with knee joint injuries due to accidents, traumas or collisions. The last one is called dropped out criteria, dropped out criteria refer to the samples that are dropped out in the middle or when the research process takes place. The elderly are classified as dropped out if they do not follow several rules as follows; do not complete the therapy session according to the program, do not attend gymnastics session twice in a row, have severe complaints arose during the exercise, are absent during the evaluation after the elderly gymnastic program is completed, and suffer from Osteoarthritis with complications such as shortness of breath and cardio disorders or heart problems.

**RESULTS AND DISCUSSION**

**Characteristics of the Respondents**

The number of respondents used in this study is as many as 100 respondents which are then divided into two sample groups, namely the control group and the treatment group. The control group is made of by 50 people from PWRI Samiaji Gymnastic Center. Furthermore, the members of the treatment group are derived from Wana Mukti Gymnastic Center (45 people) and additional 5 people are obtained from the members of the Asri Bumi Elderly Integrated Health Post which is located in the same neighborhood as Wana Mukti Gymnastic Center at Sambiroto village, Tembalang Sub-district. Based on the data collected, the following is the results of the analysis of characteristics of the respondents seen from their gender, age, height, weight, education and respondent's occupation that are presented descriptively.

**Table 1. Respondent’s Gender Characteristics**

Gender	Control Group		Treatment Group	
	Frequency(f)	Percentage (%)	Frequency (f)	Percentage (%)
Male	20	40	22	44
Female	30	60	28	56

Based on the analysis of gender in Table 1 above, it is mentioned that of the 50 respondents in the Control group, most of the respondents are female (60%), while the remaining 40% of respondents are male. Furthermore, in the treatment group, of the 50 respondents surveyed, the majority of respondents are female (56%), while the remaining 44% of respondents are male. In this case, gender is influenced by cultural factors in expressing pain, where women are more able to express pain than men who tend to not complain and must always be strong. Hormonal factor in women is also considered as one of the things that causes knee joint pain in the elderly.(Reni 2014)

**Table 2. Respondent’s Age Characteristics**

Age	Control Group		Treatment Group	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
< 55 years old	7	14	7	14
55 - 65 years old	18	36	28	56
> 65 years old	25	50	15	30
Total	50	100	50	100

Based on the analysis presented in Table 2, the result shows that the respondents in the control group are mostly aged >65 years (50%), while the remaining 14% of respondents are <55 years old and as many as 36% of respondents aged 55-65 years. Furthermore, in the treatment group, of the 50 respondents, the majority of respondents are 55-65 years old (56%), while the remaining 14% of respondents are <55 years old and as many as 30% of respondents are > 65 years old.

Age change is a condition where a person will experience a lot of changes, among them are changes in joints that the elderly will often have the difficulty of moving the joint in the body that often causes pain.(Peterson, 2019)

**Table 3. Respondent’s Height Characteristics**

Height	Control Group		Treatment Group	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
< 150 cm	2	4	1	2
150 - 160 cm	22	44	24	48
> 160 cm	26	52	25	50
Total	50	100	50	100

Based on the analysis presented in Table 3, the result shows that of the 50 respondents in the control group, the majority of respondents have >160 cm in height (52%), while the remaining 4% of respondents have <150 cm in height and as many as 44% of respondents have 150 - 160 cm in height. Furthermore, in the treatment group, most of the respondents have >160 cm in height (50%), while the remaining 2% of respondents have <150 cm in height and as many as 48% of respondents have 150 - 160 cm in height.

**Table 4. Respondent's Weight Characteristics**

Weight Kg	Control Group		Treatment Group	
	f	%	f	%
< 60	10	20	12	24

60 - 70	26	52	24	48
> 70	14	28	14	28
Total	50	100	50	100

Based on the analysis presented in Table 4, the result shows that of the 50 respondents in the control group, the majority of respondents have 60-70 kg in weight (52%), while the remaining 20% of respondents have <60 kg in weight and as much as 28% of respondents have <70 kg in weight. Furthermore, in the treatment group, of the 50 respondents surveyed, the majority of respondents have 60-70 kg in weight (48%), while the remaining 24% of respondents have <60 kg in weight and 28% of respondents have >70kg in weight. (Loekito, at all 2016)

**Table 5. Respondent’s Education Characteristics**

Education Level	Control Group		Treatment Group	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Junior High School	1	2	20	20
Senior High School	20	40	58	58
College	29	58	20	20
Elementary School	0	0	2	2
Total	50	100	100	100

Based on the analysis presented in Table 5, the result shows that of the 50 respondents in the control group, most of the respondents are college graduates (58%), while the remaining 2% of respondents are junior high school graduates and as many as 40% of respondents high school graduates. Furthermore, in the treatment group, most of the respondents are high school graduates (58%), while the remaining 20% of respondents are junior high school graduates, 20% of respondents are college graduates and as many as 2% of respondents are elementary school graduates.

**Table 6. Respondent’s Occupation Characteristics**

Occupation	Control Group		Treatment Group	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Housewives	12	24	21	42
Self-employed	9	18	15	30
Civil Servant Pensioners	8	16	12	24

Civil Servants	18	36	0	0
Etc.	3	6	2	4
Total	50	100	50	100

Based on the classification of the data in Table 6, the result shows that of the 50 respondents in the control group, the majority of respondents are civil servants (36%) and housewives (24%) followed by the rest self-employed 18%, civil servant pensioners 16% and others 6%. On another hand, in the treatment group, the majority of respondents are housewives (42%) followed by self-employed 30%, and as many as 24% of respondents are civil servant pensioners.

**Table 7. Description of Respondent's Pain Level**

Period	Control Group		Treatment Group	
	Mean	Std. Deviation	Mean	Std. Deviation
Pre-training	3.50	1.035	3.48	1.054
Mid-training	3.44	1.072	3.38	1.105
Post-training	3.70	1.216	2.24	1.041

Based on the analysis of the pain level of the respondents in Table 7, the result is revealed as follows. In the control group, during the pre-training, the pain level of the respondents has an average value of  $3.5 \pm 1.035$ , then in the middle of the training, the pain level decreases to  $3.44 \pm 1.072$  and again increases at the end of the training process by  $3.70 \pm 1,216$ . While in the treatment group, the average pain level of respondents at the pre-training process is  $3.48 \pm 1.054$ , then in the middle decreases to  $3.38 \pm 1.105$  and at the end of the training process, the pain level continuously decreases to  $2.24 \pm 1,041$ . Based on the explanation above, it can be seen that there is a decrease in the level of pain that is consistent on the respondents of the treatment group compared to the control group.

**Table 8. Normality and Homogeneity Test**

Sample Group	Normality Test		Homogeneity Test	
	Significance of Kolmogorov Smirnov Test	Normality	Significance of the Levene Test	Homogeneity
PRE_CONTROL	0.064	Normal	0.892	homogeneous
PRE_EXP	0.056	Normal		
MED_CONT	0.080	Normal		
MED_EXP	0.095	Normal		
POST_EXP	0.052	Normal		
POST_CONT	0.086	Normal		

The result of the normality and homogeneity test in Table 8 above indicates that all of the data that are analyzed are normally distributed and the variety of data in each group of samples is homogeneous. Thus, a two-way ANOVA test can be carried out on this research data to examine the effect of Andrie Wongso Health, Enthusiastic and Happy gymnastics on decreasing knee joint pain in the elderly in Tembalang Sub-district, Semarang City.

The hypothesis used in the two-way ANOVA test is presented as follows:

Ho: The independent variable that affects the dependent variable

Ha: The independent variable that does not affect the dependent variable.

In the ANOVA test, the acceptance and rejection decision of Ho is based on the p-value of the test results. With a significance level of 5%, if the p-value is <0.05, it indicates that Ho testing is rejected while if the p-value is >0.05, it indicates that Ho testing is accepted.

**Table 9. Anova Test Results**

Table 1. Dependent Variable: Pain Level					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	69.070 <sup>a</sup>	5	13.814	11.647	.000
Intercept	3247.230	1	3247.230	2737.842	.000
Group	19.763	1	19.763	16.663	.000
Period	15.680	2	7.840	6.610	.002
Group * Period	33.627	2	16.813	14.176	.000
Error	348.700	294	1.186		
Total	3665.000	300			
Corrected Total	417.770	299			
a. R Squared = .165 (Adjusted R Squared = .151)					

Based on the analysis presented in Table 9, it is mentioned that Group significant value has the number of 0,000 with F count of 16,663. Because the significance value obtained is <0.05, Ho is rejected, so that it is concluded that there is a significant difference between the level of pain of the respondents in the control group and in the treatment group. Furthermore, the significant value of the period is 0.002 with F count of 6.610.



Because the significance value obtained is  $<0.05$ ,  $H_0$  is rejected and it is concluded that there is a significant difference between the respondent's pain level in the pre-research stage, mid-process of the research and post-research stage.

**Table 10. Tukey Follow up Test Result Multiple Comparisons**

Dependent Variable: Pain Level							
	(I) Period	(J) Period	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Pre-Training	Middle	.0500	.13552	.928	-.2692	.3692
		After	.5800*	.13552	.000	.2608	.8992
	Mid-Training	Before	-.0500	.13552	.928	-.3692	.2692
		After	.5300*	.13552	.000	.2108	.8492
	Post-Training	Before	-.5800*	.13552	.000	-.8992	-.2608
		After	-.5300*	.13552	.000	-.8492	-.2108
Based on observed means. The error term is Mean Square (Error) = .918.							
*. The mean difference is significant at the 0.05 level.							

The level of pain of respondents in the Tukey follow-up test shows the following results. The pain level at the pre-training with the level of pain in the mid-training is not significantly different, whereas the respondent's pain level at the pre-training and post-training as well as the mid-training and post-training differs significantly. These conditions indicate that the reduction in respondents' pain level as an effect of giving AWS3 gymnastics training is only felt by respondents at the post-training stage, while at the pre-training and mid-training, the decrease in pain level is not significant.

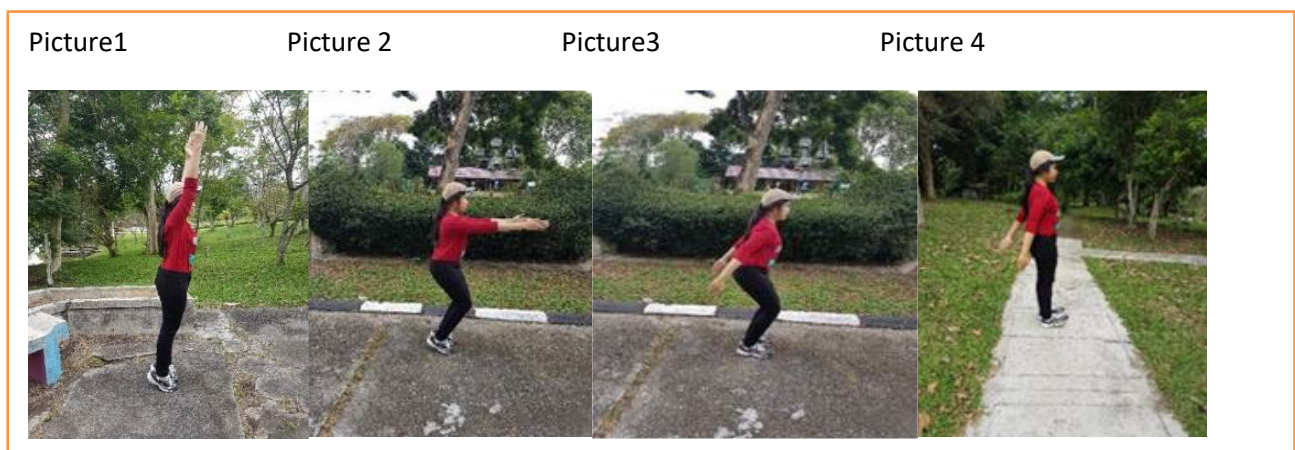
**ANDRIE WONGSO HEALTH, ENTHUSIASTIC AND HAPPYGYMNASTICS**

Andrie Wongso Health, Enthusiastic and Happy gymnastics which consists of 5 movements has a particular feature where the focus is more emphasis on the knee movements. The combination of hand stretches, head movements, and breathing control is one component where the movements are a counterweight to Andrie Wongso Health, Enthusiastic and Happy gymnastics in order to support the distribution and acceleration of blood circulation throughout the body. The respondents are not required to do the whole movement in the gymnastics section that has been taught, but they have to

follow the movement of both knees. It needs more time to make the respondents be able to follow the following movement of Andrie Wongso Health, Enthusiastic and Happygymnastics gradually.

The final result of Andrie Wongso Health, Enthusiastic and Happygymnastics will be felt if the respondents do the movement in a correct and continuous way, at least 3 times a week in 30 minutes consisting of warming up, core and cooling down. Andrie Wongso the motivator number one in Indonesia, the creator of this gymnastics, based on his experience, suggests that aside of doing 3 times a week training, the exercise also can be done alone at home with a dynamic tempo within 10 minutes every morning. However, doing gymnastic exercises that are continuous with the same movement may cause saturation.

The effect of the Andrie Wongso Health, Enthusiastic and Happygymnastics movements is the emergence of heat in the soles of feet and knees. This condition occurs due to the smooth



circulation of blood in the limbs and joints. The muscles around the knee are trained to be stronger. The Andrie Wongso Health, Enthusiastic and Happygymnastics movements which have a fulcrum on the knee and heel when both hands are swung up and down as a counterweight also aim to smooth blood circulation throughout the body.

The knee joint movement or known as Range of Motion can be done to maintain or to improve the level of perfection of the ability to move the joints normally and completely. The movement of the joints will support the acceleration of blood flow into the joint capsule. When the joints are moved, the surface of the cartilage between the two bones will rub against each other. The cartilage contains many proteoglycans which attach to hydrophilic hyaluronic acid so that the cartilage contains as much as 70-75% water. The emphasis on the cartilage will force water out of the cartilage matrix to synovial fluid which will lubricate the joint area. Furthermore, body stretching functions as an exercise to launch the circulatory system and oxygen circulation throughout the body.

## CONCLUSION

Andrie Wongso Health, Enthusiastic and Happy gymnastic training that is carried out routinely and consistently can reduce the level of joint pain in the elderly. However, the decrease in the level of pain for every individual might be different. The problem of muscles and joints in the elderly is often caused by a decrease in the musculoskeletal strength. Andrie Wongso Health, Enthusiastic and Happy gymnastic training that is carried out routinely combined with the right movements can reduce pain in the joints of the elderly. The Gymnastics must be done without forcing the body to make excessive movements because a sense of enthusiasm and pleasure is a concept to encourage someone to get maximum results of the training. The Andrie Wongso Health, Enthusiastic and Happy gymnastics exercise begins with lifting both hands straight up, body straight, followed by the position of both feet parallel to the shoulders, lifting both heels or tiptoes, then swinging both hands down, along with bending your knees forty-five degrees. After both hands are pushed down, knees are straight, all toes are lifted up and it is closed with a reverse movement of tiptoe.

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