



Olahraga Hidup Baru (ORHIBA): Lowering Anxiety Level and Blood Pressure of Hypertensive Elderly

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ABSTRACT

Effort to control blood pressure in the hypertensive elderly during pandemic have not been optimal. The limitation of physical distancing also creates a new problem for elderly, namely anxiety. The purpose of this study was to determine the effect of ORHIBA on the level of anxiety and blood pressure in the elderly hypertensive elderly during the pandemic. This study used a quantitative approach with a quasi-experimental pre-post test design with control group. The sampling technique used is purposive sampling by setting inclusion and exclusion criteria. The sample size obtained is 64 people (32 per group). Data were collected for four weeks and the frequency of intervention was twice a week. Blood pressure variable were not normally distributed. So that both variables were tested with the Wilcoxon test for paired data and the Mann-Whitney test for unpaired data. The results obtained are that there is an effect of ORHIBA on the level of anxiety (p value 0.001), systolic blood pressure (p value 0.001, and diastolic blood pressure (0.001) in the hypertensive elderly. These results can be used as a reference in providing nursing care for hypertensive elderly during the pandemic to continue to undergo physical exercise even though individually at home.

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ABSTRAK

Upaya pengontrolan tekanan darah lansia hipertensi di masa pandemi COVID-19 belum optimal. Adanya pembatasan kontak fisik juga menimbulkan masalah baru pada lansia, yaitu kecemasan. Tujuan penelitian ini adalah untuk mengetahui pengaruh latihan fisik ORHIBA terhadap tingkat kecemasan dan tekanan darah lansia hipertensi dalam masa pandemi. Penelitian ini menggunakan pendekatan kuantitatif dengan desain quasi experimental pre-post test with control group. Teknik sampling yang digunakan adalah purposive sampling dengan menetapkan kriteria inklusi dan eksklusif. Besar sampel yang didapatkan adalah 64 orang (32 orang per kelompok). Pengambilan data dilakukan selama empat minggu dan dengan frekuensi pemberian intervensi dua kali seminggu. Variabel tekanan darah tidak berdistribusi normal. Sehingga kedua variabel diuji dengan uji Wilcoxon untuk data berpasangan dan uji Mann-Whitney untuk data tidak berpasangan. Hasil yang didapatkan adalah terdapat pengaruh latihan fisik ORHIBA terhadap tingkat kecemasan (p value 0,001), tekanan darah sistolik (p value 0,001, dan tekanan darah diastolik (0,001) lansia hipertensi. Hasil ini dapat dijadikan acuan dalam memberikan asuhan keperawatan bagi lansia hipertensi selama masa pandemi agar tetap menjalani latihan fisik walaupun secara individu di rumah.

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INTRODUCTION

Hypertensive elderly is one of the vulnerable groups in the COVID-19 pandemic. The elderly experience a decline in physical aspects as a result of the aging process (Miller, 2012). Center for Diseases Control and Preventive (CDC) in 2020 revealed that a person's risk of experiencing severe COVID-19 increases with age. In addition to the age factor, several studies also show that comorbid diseases can increase the severity of the condition when a person is infected with the SARS-CoV-2 virus. Previous studies have also linked hypertension to an almost 2,5-fold increased risk of increased severity and death. This effect is mainly associated with patients aged 60 years and over (Lippi, Wong, & Henry, 2020).

The activities of the *Posyandu* for the elderly were temporarily stopped which then caused several problems for the hypertensive elderly (Tutpai, Unja, & Nura, 2021). A previous study stated that the most common health problem in the elderly during the pandemic was hypertension (37,1%) which was dominated by the elderly with anxiety (69,45%). (Kusumaningtyas, 2021). Anxiety is also a predictor of depression so that interventions that improve the psychological health of the elderly are very important (Yildirim, Işık, & Aylaz, 2021).

Psychological problems have the potential to affect blood pressure fluctuations in the elderly with hypertension (Puzserova & Bernatova, 2016). Meanwhile, the health achievement target for the hypertensive elderly is controlled blood pressure. Complications that can occur if blood pressure is not controlled are catastrophic diseases such as stroke, kidney disease, and other chronic diseases (Anshari, 2020). Hospitalization for the elderly due to complications due to hypertension is a challenge in itself because the main focus of health services at this time is dealing with the pandemic. In addition, the risk of nosocomial infection is also very high if the hypertensive elderly who has complications must undergo hospital treatment (Mohamadi, Goodarzi, Aryannejad, Fattahi, & Alizadeh-khoei, 2020). So, the blood pressure of the hypertensive elderly should be controlled during this pandemic.

Efforts to control blood pressure should ideally not only be done pharmacologically, but supported by non-pharmacological interventions. One of the most important interventions to control blood pressure but rarely carried out during a pandemic by the elderly is physical exercise (Goethals et al., 2020). Based on the results of a preliminary study on ten elderly people in Tabanan Regency, it was found that before the pandemic, physical exercise that was often done in groups was elderly gymnastics. Elderly exercise is felt to only affect the physical aspect and is difficult to apply independently at home. There is one new type of physical exercise that has been applied to the elderly, namely ORHIBA (New Life Exercise). Previous research stated that the elderly group who routinely did ORHIBA physically and psychologically healthier even though they had hypertension or other chronic diseases (Purnamayanti, Dewi, & Bukian, 2021). So, this exercise not only affects the physical aspect, but also the psychological aspect of the elderly.

This exercise has never been published scientifically for the hypertensive elderly, especially during a pandemic. This is an aspect of the novelty of the research, so that researchers are interested in conducting further study. The purpose of this study was to determine the effect of ORHIBA on the level of anxiety and blood pressure of hypertensive elderly during the pandemic.

METHOD

Participant characteristics and research design

The population in this study were all elderly people with hypertension in Tabanan Regency in 2022. The sampling technique in this study used purposive sampling. The inclusion criteria were the elderly who were recorded in the Kerambitan II Public Health Center report as elderly diagnosed with hypertension and receiving standard antihypertensive drugs from the Public Health Center, the elderly who were able to stand, and the elderly who were able to communicate in Balinese and/or Indonesian. Meanwhile, the exclusion criteria in this study were the elderly who were isolated from COVID-19, and the elderly who had fractures in the upper and lower extremity areas. This study will use a quantitative approach with a quasi-experimental pre-post test design with control group design.

Sampling procedures

The sampling used was purposive sampling, namely the elderly with hypertension who were recorded at the Kerambitan II Public Health Center and met all the inclusion criteria. This research was conducted without including the name of the respondents. The researcher also made sure that there were no elements of violence and things that could hurt the respondents. The researcher is responsible for assisting the respondent to reach the nearest health facility and bears all forms of loss incurred if something dangerous happens to the respondent. During the intervention, there were no events that endangered the respondent. Respondents were also given an explanation of the research objectives and procedures, and if they agreed, respondents could sign an informed consent or give a thumbprint without coercion.

Sample size, power, and precision

The sample size in this study was determined by the formula for the mean approach of two unpaired populations, namely (Grace, Shanmugam, & Gowri, 2017):

$$n = 2 \left[\frac{(Z\alpha + Z\beta)S}{x_1 - x_2} \right]^2 \quad (1)$$
$$n = 2 \left[\frac{(1,96 + 0,842)8,4597}{139,50 - 130,66} \right]^2$$
$$n = 14,38$$

Researchers use design effects in minimizing the error rate, namely the design effect in sampling is worth 2 so that it is obtained $2 \times 14,38 = 28,76$ respondents. Then, the shortage of samples due to drop-out is anticipated by increasing the estimated sample size, namely by the formula:

$$n' = \frac{28,76}{1 - 0,1}$$
$$n' = 31,95 = 32 \text{ respondents per group}$$

Measures and covariates

The research procedure begins with the administrative stage by conducting a research ethics test, administering a research recommendation letter, and obtaining a research permit. In addition, the lead researcher prepared an ORHIBA video and conducted apperception with the entire research team. Furthermore, the technical procedure was carried out by collecting preliminary data (pre-test) on the variables of anxiety level and blood pressure in the respondents in the

intervention and control groups. The ORHIBA intervention was given to the intervention group for four weeks with a frequency of twice a week according to previous studies (Arini, 2018). The intervention was carried out door to door, researchers used level 1 personal protective equipment, kept a minimum distance of 2 meters, and equipped themselves with hand washing facilities. Meanwhile, the control group continued to take antihypertensive drugs. The final data collection (post-test) was carried out at the end of the fourth week in both groups. The ORHIBA video was given to the control group after all the data had been collected to maintain the principle of fairness in the study.

Measurement of blood pressure variables was carried out with a digital sphygmomanometer. Meanwhile, the variable level of anxiety using a questionnaire. The questionnaire used was the Geriatric Anxiety Inventory (GAI). This questionnaire consists of 20 questions using a response option format agree or disagree. The maximum score is 20, with the highest score indicating a high level of anxiety. Test the validity of the questionnaire obtained the results of the calculated r value of 20 statements is $0,495 > 0,361$ so that all question items are valid. In addition, the results of the reliability test obtained the value of Cronbach = $0,766 > 0,6$ then the 20 items were declared reliable (Suwarningsih,

2018). This questionnaire has also been widely used by previous research in Indonesia which has been published in scientific journals (Nurhayati, Susumaningrum, Rasni, Susanto, & Kholida, 2020; Sari & Hidayatullah, 2020).

Data analysis

The data that has been collected was analyzed with the help of a computer program (SPSS) with univariate and bivariate methods. The results of the data normality test by Kolmogorov-Smirnov on systolic and diastolic blood pressure variables were found to be not normally distributed. Thus, the tests chosen were Mann-Whitney for unpaired data and Wilcoxon for paired data. In addition, the anxiety level variable was also analyzed using the Mann-Whitney test for unpaired data and Wilcoxon for paired data.

RESULTS AND DISCUSSION

Some of the tables below present the results of the research used to answer the objectives of this study.

Table 1
Description of Respondents Gender, Family History, Body Mass Index, and Anxiety Level Levels (n=64)

Variable	Intervention Group		Control Group		Total
	f	%	f	%	
Gender					
Male	15	46,9	14	43,8	29
Female	17	53,1	18	56,3	35
Family History					
None	15	46,9	15	46,9	30
Exist	17	53,1	17	53,1	34
Body Mass Index					
Normal	16	50,0	15	46,9	31
Overweight	16	50,0	17	53,1	33
Anxiety Level					
Pre-Test					
Light anxiety	24	75,0	25	78,1	49
Medium anxiety	8	25,0	7	21,9	15
Post-Test					
No anxiety	22	68,8	1	3,1	23
Light anxiety	10	31,3	25	78,1	35
Medium anxiety	0	0	6	18,8	6

Table 1 shows that the majority of respondents in both groups are female and have a family history of hypertension. In addition, the proportion of respondents with a fat body mass index is the same as a normal body mass index. The proportion of anxiety levels in the two groups is majority in

the category of mild anxiety. Meanwhile, after the intervention there were differences in the proportions, namely the majority in the no anxiety category in the intervention group and mild anxiety in the control group.

Table 2
Description of Respondents Age and Blood Pressure (n=64)

Variable	Intervention Group		Control Group	
	Median (SD)	Min-Max	Median (SD)	Min-Max
Age	67,0 (11,5)	60,0-97,0	67,0 (11,5)	60,0-97,0
Systolic Blood Pressure				
Pre-Test	144,5 (13,46)	130,0-190,0	140,0 (11,5)	128,0-180,0
Post-Test	130,0 (13,98)	110,0-180,0	142,0 (10,9)	130,0-180,0
Diastolic Blood Pressure				
Pre-Test	89,0 (8,19)	70,0-104,0	88,0 (5,9)	78,0-99,0
Post-Test	80,0 (7,26)	68,0-98,0	89,0 (5,8)	80,0-98,0

Table 2 describes that the mean age of respondents in the intervention and control groups is relatively the same. The median of systolic and diastolic blood pressure in the intervention group was relatively decreased. Meanwhile, the control group experienced an increase.

Tabel 3
Analysis of the Effect of ORHIBA on Systolic Blood Pressure in the Hypertensive Elderly (n=64)

Variabel	Intervention Group	Control Group
Differences in Systolic Blood Pressure Before and After Intervention in Each Group		
Z	-4,943	-1,755
P value	0,001*	0,079
Differences in the Difference in Systolic Blood Pressure Between the Intervention and Control Groups Before and After the Intervention		
Mean Rank	48,48	16,52
Sum of Rank	1551,50	528,50
Z	-7,062	
P value	0,001*	

* $p < 0,05$

Table 3 describes the results of the bivariate systolic blood pressure test in this study. The significance value was seen from paired and unpaired data, before and after the intervention was given. There was a significant difference in the intervention group before and after the intervention (p value of 0,001). However, there was no significant difference in the control group before and after the intervention (p value of 0,079). In addition, there was a significant difference in systolic blood pressure between the intervention group and the control group after the intervention (p value of 0,001).

Tabel 4 Analysis of the Effect of ORHIBA on Diastolic Blood Pressure in the Hypertensive Elderly (n=64)

Variable	Intervention Group	Control Group
Differences in Diastolic Blood Pressure Before and After Intervention in Each Group		
Z	-4,718	-1,410
P value	0,001*	0,159
Differences in the Difference in Diastolic Blood Pressure Between the Intervention and Control Groups Before and After the Intervention		
Mean Rank	47,19	17,81
Sum of Rank	1510,00	570,00
Z	-6,438	
P value	0,001*	

* $p < 0,05$

Table 4 describes the results of the bivariate diastolic blood pressure test in this study. There was a significant difference in the intervention group before and after the intervention (p value of 0,001). However, there was no significant difference in the control group before and after the intervention (p value of 0,159). In addition, there was a significant difference in the difference in diastolic blood pressure between the intervention group and the control group after being given the intervention (p value of 0,001)

Table 5
Analysis of the Effect of ORHIBA on Anxiety Level in Hypertensive Elderly (n=64)

Variabel	Kelompok Intervensi	Kelompok Kontrol
Differences in Anxiety Level Before and After Intervention in Each Group		
Z	-5,477	-1,414
P value	0,001*	0,157
Differences in Anxiety Level between the Intervention and Control Groups Before and After the Intervention		
Mean Rank	21,06	43,94
Sum of Rank	674,00	1406,00
Z	-5,531	
P value	0,001*	

* $p < 0,05$

Table 5 describes the results of the bivariate test of anxiety levels in this study. There was a significant difference in the intervention group before and after the intervention (p value of 0,001). However, there was no significant difference in the control group before and after the intervention (p value of 0,157). In addition, there was a significant difference in the level of anxiety between the intervention group and the control group after the intervention was given (p value of 0,001).

DISCUSSION

Karakteristik Responden

Age is one of the factors studied in present study. Several studies state that age is correlated with the incidence of hypertension. With age, the risk of cardiovascular disease also increases (Currie dan Delles, 2018; Miller, 2012). James and Ortiz (2014) states that those aged 60 years and over are more at risk of developing cardiovascular problems. This is a result of changes in organ systems, namely thickening of the artery walls or arteriosclerosis (Chrysant & Chrysant, 2014; Miller, 2012). Gender is also a variable studied in this study. The results of this study found that the majority of respondents were female. The high prevalence of hypertension in elderly women is influenced by hormonal fluctuations compared to men in the life cycle (Wenger et al., 2018). Menopause is the strongest nonmodifiable risk factor for hypertension in women (Weyer, Dunlap, & Shah, 2016). This is because postmenopausal women have estrogen deficiency. Estrogen deficiency is a contributor to high blood pressure by 65% (Yulistina, Deliana, & Rustiana, 2017). So, someone who is 60 years old and over and is a woman has a fairly high vulnerability to hypertension.

Another result obtained in this present study is that most of the respondents have a family history of hypertension. Hereditary factors are one of the uncontrollable factors in hypertension that contribute at least 20% to 50% of blood pressure (Abebe, Berhane, Worku, & Getachew, 2015; Atinyi et al., 2017). Pathophysiologically, a person with a family history of hypertension experiences changes in the vascular endothelium as a result of a deficiency in the production of nitric oxide and vasodilators, causing vasoconstriction of blood vessels (Endeshaw, Abebe, Bedimo, & Asrat, 2016). In addition, another factor studied in this study is body mass index. Half of the respondents in this study had a body mass index in the fat category. Body mass index factor has a

significant relationship with hypertension (Patnaik, Paul, Pattnaik, & Sahu, 2017; Seifu, Hussein, Ibrahim, & Sigale, 2017). Olack et al. (2015) stated that the most people who have hypertension are someone with a body mass index in the fat category. So, in addition to the elderly with female sex, the presence of a family history and a body mass index above normal are also the susceptibility of the elderly to suffer from hypertension.

The Effect of ORHIBA on the Lowering of Blood Pressure in the Elderly with Hypertension

The results of this study indicate that there is a decrease in systolic and diastolic blood pressure in the elderly with hypertension after being given the ORHIBA physical exercise intervention. This is evidenced by the difference in the median of systolic and diastolic blood pressure in the intervention group before and after being given ORHIBA physical exercise. In addition, there was a significant difference in systolic and diastolic blood pressure between the intervention and control groups before and after ORHIBA physical exercise.

The results of this study are in line with several previous research results which state that physical exercise has positive implications for the blood pressure of the elderly. Herrod et al. (2018) mentioned that the elderly who were routinely given traditional physical exercise for three months experienced a decrease in systolic blood pressure of about 5 mmHg and diastolic by 3 mmHg. Besides that, Ruangthai and Phoemsaphawee (2019) also mentioned that physical exercise had an effect on blood pressure and antioxidant capacity of elderly with hypertension. Barili et al. (2018) also mentioned that aerobic exercise has an effect on blood flow restriction in elderly women with hypertension. Regular physical exercise is also said to help activate Nuclear Respiratory Factor 2 (Nrf2) in the myocardium as well as various tissue damage (Moccia et al., 2020). Hypertensive elderly experience chronic systemic inflammation so it is necessary to do physical exercise to stimulate the work of Nrf2 so that it can repair damaged tissue.

The new life exercise is a physical exercise based on the power of spirituality by uniting the divine energy to improve health. This exercise is popular in Bali for the population with chronic diseases including the elderly population (Arini, 2018). There are 24 movements for one ORHIBA training session. Activities related to spirituality can be seen in the movement of reflecting energy. In addition, the combination of breathing exercises, stretching, and rotation repeatedly and rhythmically can increase the vital capacity of the lungs and optimize the mitochondria to produce energy. This exercise only takes 3-10 minutes for one training session. The duration of twice a week has been able to affect the quality of life of the elderly (Arini, 2018; Purnamayanti et al., 2021). This physical exercise was chosen as an intervention in the current study because there have been no previous studies that have applied this exercise to the elderly with hypertension, especially in the blood pressure variable.

ORHIBA exercise was effective in significantly lowering the blood pressure of the hypertensive elderly during the COVID-19 pandemic. This phenomenon is in line with one of the nursing theories, namely Roy's adaptation model which states that a person needs intervention to cope with situations that change from normal circumstances, which in this case is a pandemic situation (Alligood, 2014). Based on the results of this study which is supported by several previous research results, ORHIBA exercise can optimize the strengthening of coping regulators for elderly hypertension

during the COVID-19 pandemic, especially in the mechanism of lowering blood pressure.

The Effect of ORHIBA on Reducing Anxiety Levels in Hypertensive Elderly

The results of the current study also showed that there was a significant decrease in the anxiety level in the hypertensive elderly after being given ORHIBA exercise. This result is evidenced by the percentage change in the intervention group between before and after ORHIBA exercise in the category of higher anxiety level to lower anxiety level. This indicates that this intervention is effective in reducing anxiety level in the elderly with hypertension during the pandemic.

The results of the present study are supported by several previous research results. Callow *et al.* (2020) stated that exercise can reduce anxiety and depression. Ejiri, Kawai, Kera, Ihara, and Fujiwara (2021) also mentioned that one alternative to improve the psychosocial welfare of the elderly who undergo a stay-at-home period is physical exercise. One of the types used by the elderly is dancing. Aliberti and Raiola (2021) stated that the elderly who regularly dance can avoid depression. The elderly feel themselves more valuable, satisfied, interested in activities, happy mood, and perceive that their life is extraordinary after undergoing physical dance training. Besides that, Murukesu, Kaur, Singh, Shahar, and Subramani-am (2021) also mentioned that physical exercise makes the elderly feel a more meaningful and valued life.

ORHIBA exercise also affects a person's mental health. Purnamayanti et al. (2021) stated that the highest social support was found in the group given ORHIBA physical exercise compared to other groups. Besides that, Arini (2018) mentioned that ORHIBA exercise had a significant effect on the quality of life of elderly women who had gone through menopause. However, some previous research results have not examined the effect of ORHIBA exercise on the anxiety level in the elderly. This is the novelty aspect of the current research.

The influence of ORHIBA exercise on the anxiety level of the hypertensive elderly is also described as an adaptive coping mechanism by Roy's theory. Hypertensive elderly can feel a lower level of anxiety after getting ORHIBA exercise. So, this intervention is able to strengthen the coping regulator and cognator of the elderly with hypertension so that the expected output can be achieved. The integrative output with Roy's theory is controlling blood pressure and decreasing anxiety level in the elderly with hypertension during the COVID-19 pandemic.

LIMITATION OF THE STUDY

One of the limitations in this study is that this intervention is not carried out in groups due to the COVID-19 condition which requires physical distancing. Thus, the social aspect of the ORHIBA intervention was not obtained optimally by the hypertensive elderly.

CONCLUSIONS AND SUGGESTIONS

The results of this study indicate that both groups of respondents are mostly female and have a family history of

hypertension. Moreover, the body mass index category is relatively the same between the normal and obese categories. In addition, the ages of the two groups of respondents are the same. The results of this study also showed that ORHIBA exercise can significantly reduce anxiety levels and blood pressure in the hypertensive elderly. This is evidenced by the significance value and the difference in the mean value of all variables between the pre-test and post-test. The results of this study are expected to be a reference for community health nurses to develop nursing care for the hypertensive elderly during the pandemic. In addition, these results are expected to stimulate further research related to other types of physical exercise that are relevant for hypertensive elderly during the pandemic. Researchers also hope for elderly families with hypertension to facilitate the elderly to keep exercising actively by playing ORHIBA video at their respective homes.

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ETHICAL CONSIDERATIONS

This research has passed the ethical test with the ethical approval number 086/EA/KEPK-BUB-2022 on May 30, 2022.

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Conflict of Interest Statement

There is no conflict of interest in this research.

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