Abdimas Umtas: Jurnal Pengabdian Kepada Masyarakat
LPPM-Universitas Muhammadiyah Tasikmalaya
Volume: 9, Issue: 1, January, 2026; pp: 63-71
E-ISSN: 2614 - 8544

Optimizing the Role of Elderly Caregivers Through Heart-Healthy Exercise for Elderly with Hypertension

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ABSTRACT

Cardiovascular health is a crucial aspect of maintaining quality of life in the elderly, especially considering the increased risk of hypertension with age. Elderly caregivers (pramuwerdha) play a strategic role in implementing health programs as companions to the elderly, yet their knowledge of hypertension management remains limited. This community service initiative aims to enhance the knowledge and skills of elderly caregivers in facilitating heart-healthy exercise as a non-pharmacological intervention for hypertension management in the elderly. The activity was conducted at the Karawang Elderly Home Service Unit for 3 days in June 2025, using a quasi-experimental design with a one-group pretest-posttest approach. Implementation methods included hypertension screening, pre-test, education, and heart-healthy exercise demonstration. A total of 6 caregivers and 24 elderly participants took part in this activity. Results showed a significant increase in caregiver knowledge from an average pretest score of 5.96 to 8.10 on the posttest (35.9% increase, p=0.005). Among the elderly, there was a decrease in systolic blood pressure from 154.6 mmHg to 142.1 mmHg and diastolic from 94.8 mmHg to 86.3 mmHg (p<0.05). This community service demonstrates the effectiveness of heart-healthy exercise training in enhancing the capacity of caregivers as agents of change in elderly hypertension management. It is expected that caregivers can actively facilitate heart-healthy exercise activities to improve the quality of life of the elderly.

ARTICLE INFO

Article History:
Submitted/Received: 13-11-2025
First Revised: 18 December 2025
Accepted: 25 December 2025
First Available online: 31 January 2026
Publication Date: 31 January 2026

Keyword :
Education
Heart-Healthy Exercise
Hypertension
Elderly
Health Education
Elderly Caregivers
Blood Pressure Management

https://doi.org/10.35568/abdimas.v9i1.7365

INTRODUCTION

Cardiovascular health is one of the vital aspects of maintaining quality of life, especially for the elderly population. The elderly are individuals who have reached 60 years of age and above, which is part of the aging process. Consequently, the elderly become part of a vulnerable group with risks related to age, social and environmental factors, lifestyle and behavior, as well as biological factors (Martani et al., 2022). As age increases, the risk of heart disease and hypertension rises significantly (Ginting et al., 2024). According to data from the World Health Organization (WHO), cardiovascular diseases are among the leading causes of death among the elderly.

Pramuwerdha are companions or caregivers of the elderly who assist and facilitate the daily needs of elderly residents in nursing homes or elderly care facilities. The role of caregivers is highly strategic in implementing health programs because they interact directly and intensively with the elderly every day. Caregivers who possess good knowledge and skills regarding hypertension management can become agents of change in improving the quality of life of the elderly.

Hypertension, often referred to as the "silent killer," is a common health problem among the elderly (Khayatun et al., 2022). This disease often shows no symptoms but can be fatal if left untreated. Data from the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure VII indicates that nearly one billion people worldwide suffer from hypertension. According to the World Health Organization (WHO), approximately 972 million people, or 26.4%, suffer from hypertension worldwide. Of the 972 million hypertension sufferers, 333 million live in developing countries, including Indonesia, with more than 63 million Indonesians suffering from high blood pressure (Zhang et al., 2024). The results of the 2018 Basic Health Research (Riskesdas) show that the distribution of Indonesian residents suffering from hypertension was 34.1%, an increase of 8.3% from 2013 (Kemenkes RI, 2018). Data from the Strategic Plan of the Karawang District Health Office shows that the incidence of hypertension in Karawang District in 2017 was 15.83 percent, with a higher prevalence of hypertension in women compared to men (13.95 percent for men and 17.70 percent for women). The prevalence results of hypertension among the elderly at the Karawang Elderly Home Service Unit showed that there were 75 elderly residents living in the facility. After blood pressure measurements were conducted, results showed that 26 (34.7%) elderly had normal blood pressure, 13 (17.3%) elderly had pre-hypertension, 11 (14.7%) elderly had stage I hypertension, and 25 (33.3%) elderly had stage II hypertension.

Hypertension is influenced by a number of risk factors that cannot be prevented or changed, including race, age, gender, and family history. Persistently elevated blood pressure results in a significant increase in cardiac workload. If this condition is not addressed in the long term, it can lead to various serious complications, such as myocardial infarction, retinopathy leading to blindness, kidney failure, and stroke (Iswatun, 2021). Hypertension management does not always rely on pharmacological therapy but can also be implemented through non-pharmacological interventions. Non-pharmacological therapy aims to help hypertension sufferers maintain blood pressure within normal ranges so that their clinical condition can be controlled. Numerous studies have proven that non-pharmacological approaches are effectively applied to hypertensive patients, one of which is through heart-healthy exercise activities.

Heart-healthy exercise training is designed to provide education and direct practice to the elderly regarding efforts to maintain cardiovascular health. Heart-healthy exercise functions not only as physical activity but also as a form of enjoyable and easily applicable therapy (Izhar et al., 2020). Regular physical

https://doi.org/10.35568/abdimas.v9i1.7365

activity has been proven to lower blood pressure, improve blood circulation, and increase heart muscle strength. Through this training activity, participants gain an understanding of the importance of blood pressure monitoring, implementation of healthy eating patterns, and consistency in physical activity (Zhang et al., 2024). This knowledge is expected to increase elderly awareness of their health while encouraging them to take necessary preventive measures. The physiological mechanisms behind the effectiveness of exercise in lowering blood pressure include increased nitric oxide production, causing vasodilation of blood vessels, decreased sympathetic nervous system activity, reducing peripheral resistance, increased insulin sensitivity affecting endothelial function, and decreased arterial stiffness, improving vascular compliance (Fletcher et al., 2018).

The heart-healthy exercise in this program is adapted to the physical capabilities of the elderly, with simple, safe movements and an initial duration of 15-20 minutes that can be gradually increased. Instructors provide direct guidance to ensure the safety and effectiveness of the exercise. This activity is expected to increase elderly awareness of the importance of maintaining heart health while enhancing their knowledge, skills, and quality of life. This program becomes a strategic step in improving elderly health, especially since their level of knowledge about heart health and hypertension remains low, and participation in regular exercise activities is limited to only a few people.

Although various studies have proven the effectiveness of heart-healthy exercise in lowering blood pressure in the elderly (Astuti et al., 2023; Amir et al., 2022; Misbach et al., 2023), most of these studies focus on direct intervention on the elderly as research subjects. There is a knowledge gap regarding the effectiveness of training caregivers as facilitators or mediators in implementing heart-healthy exercise programs. The role of caregivers as daily companions to the elderly is highly strategic, yet few studies have explored capacity building for caregivers in facilitating non-pharmacological health interventions, particularly heart-healthy exercise for the elderly with hypertension.

Previous research has also not extensively identified the initial knowledge level of caregivers about hypertension and its management, even though a good understanding of caregivers is crucial for the sustainability of elderly health programs. Therefore, this study seeks to fill this gap by focusing on improving the knowledge and skills of caregivers as agents of change in elderly hypertension management.

The objective of this Community Service is to enhance the knowledge and skills of caregivers in facilitating heart-healthy exercise as a non-pharmacological intervention for hypertension management in the elderly at the Karawang Elderly Home Service Unit. Heart-healthy exercise training is designed to provide education and direct practice to caregivers regarding efforts to maintain the cardiovascular health of the elderly. Heart-healthy exercise functions not only as physical activity but also as a form of enjoyable and easily applicable therapy (Izhar et al., 2020). Regular physical activity has been proven to lower blood pressure, improve blood circulation, and increase heart muscle strength. Through this training activity, caregivers gain understanding regarding the importance of blood pressure monitoring, implementation of healthy eating patterns, and consistency in physical activity (Zhang et al., 2024).

The heart-healthy exercise in this program is adapted to the physical capabilities of the elderly, with simple, safe movements and an initial duration of 15-20 minutes that can be gradually increased. This activity is expected to increase caregiver awareness of the importance of maintaining elderly heart health while enhancing their knowledge and skills, ultimately contributing to improved quality of life for the elderly. This program becomes a strategic step considering that the level of caregiver knowledge about heart health and hypertension remains low, and participation in regular exercise activities at the facility is still limited.

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This activity is also directed toward forming a mutually supportive community among the elderly. Through group exercises, participants can motivate each other and share experiences, creating a positive social environment. This condition plays a role in reducing stress levels and improving emotional well-being, which impacts heart health. Thus, this training not only emphasizes physical aspects but also encompasses social and psychological aspects. The heart-healthy exercise training is expected to serve as a model for developing other elderly health programs. Through a comprehensive and inclusive approach, this program has the potential to enhance public health overall and foster healthier, more independent, and productive elderly individuals.

RESEARCH METHODS

This community service activity employs a quasi-experimental design with a one-group pretest-posttest design approach without a control group. This community service activity was conducted at the Karawang Elderly Home Service Unit for 3 consecutive days in June 2025, with daily activities from 09:00 to 12:00 WIB. The population consisted of all caregivers working at the Karawang Elderly Home Service Unit, totaling 8 people. The sample used consisted of 6 caregivers and 24 elderly individuals who met the inclusion criteria. Sampling used purposive sampling with the following inclusion criteria:

- Caregivers actively working at the Karawang Elderly Home Service Unit for at least 6 months
- Willing to participate in the entire training series for 3 days
- Able to read and write
- Willing to sign informed consent

Exclusion criteria:

- Caregivers on leave or absent during the training period
- Caregivers with physical limitations that hinder exercise demonstration

The instruments used in this community service were knowledge questionnaires, blood pressure measurement devices, and educational media. The knowledge questionnaire about hypertension and heart-healthy exercise consisted of 10 multiple-choice questions developed based on the literature and adapted to the research context. The questionnaire underwent validation by 2 experts (expert judgment) in gerontological and community nursing with a Content Validity Index (CVI) value of 0.89. Reliability testing was conducted using the test-retest method on 10 respondents outside the research sample, with a Pearson correlation coefficient result of r=0.82 (reliable). Each correct answer was given a score of 1 and incorrect answers a score of 0, with a total score range of 0-10. For blood pressure measurement devices, we used calibrated digital sphygmomanometers for hypertension screening in the elderly. Educational media used included LCD projector, laptop, speakers, posters, and heart-healthy exercise demonstration videos.

Activity implementation was carried out through several stages as follows:

- Preparation Stage: The initial stage of activities included obtaining permission from the management of the Karawang Elderly Home Service Unit, accompanied by activity socialization and program planning with the Elderly Home Service Unit.
- Implementation Stage:

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- ✓ Validation was conducted on the understanding of elderly caregivers and the elderly regarding the management to be applied. Activities began with perception alignment to harmonize perceptions regarding target achievements, then continued with education and skills training for elderly caregivers in implementing anti-hypertension heart-healthy exercise.
- ✓ After the education activity, the program continued with blood pressure examination of the elderly before implementing heart-healthy exercise. Training was conducted gradually, beginning with joint practice with facilitators for 15-20 minutes to ensure understanding of movements and intervention stages. Subsequently, elderly caregivers conducted independent practice of anti-hypertension heart-healthy exercise for approximately 25 to 30 minutes with 24 elderly participants.

FIGURE 1. Heart-Healthy Exercise Demonstration

- ✓ After implementing heart-healthy exercise training, activities continued with blood pressure screening examination of 24 elderly participants after participating in heart-healthy exercise at the Karawang Elderly Home Service Unit.

FIGURE 2. Blood Pressure Examination

- Final Stage: The next stage is the structured and integrated implementation of heart-healthy exercise practice. This activity involves elderly caregivers and Professional Nursing Education students who play roles in accompanying and facilitating exercise implementation, with the elderly as the main targets. This practical implementation aims to ensure active involvement of all parties and support the optimization of sustainable heart-healthy exercise implementation in the Elderly Home Service Unit environment.

https://doi.org/10.35568/abdimas.v9i1.7365

FIGURE 3. Implementation of Heart-Healthy Exercise to the Elderly

RESULT AND DISCUSSION

The community service activity was conducted at the Elderly Home Service Unit with full support from the local authorities, including the provision of facilities for coordination and implementation. The entire series of activities proceeded smoothly without obstacles. To assess the level of caregiver knowledge regarding hypertension and heart-healthy exercise, measurements were conducted through a pretest and a posttest. Based on the results of the activity implementation, several achievements can be presented as follows:

TABLE 1. Caregiver Knowledge Level Pre-Post Heart-Healthy Exercise Training

Variabel	Mean	SD	Median	Min	Maks	95% CI
Pre-test Knowledge	5,96	0,71	6,00	5,00	6,86	5,21 - 6,71
Post-test Knowledge	8,10	1,15	8,00	6,00	9,01	6,88 - 9,32
Difference (Gain Score)	2,14	0,85	2,00	1,14	3,15	1,26 - 3,02

The table above shows an increase in caregiver knowledge scores after being given heart-healthy exercise training. The average pretest score of 5.96 increased to 8.10 on the posttest, resulting in an increase of 2.14. This indicates that the intervention in the form of education and heart-healthy exercise training has a positive effect on improving caregiver understanding regarding hypertension management.

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This is in line with the opinion of Iswatun (2021), who stated that health education can increase individual awareness and understanding in preventing hypertension complications. Good knowledge will influence a person's attitude and skills in implementing health practices, including, in this case, caregiver skills in guiding the elderly to perform heart-healthy exercise. Meanwhile, for the success of this heart-healthy exercise, it can be seen from the results of the Pre-test and Post-Test of elderly blood pressure, as seen from Systolic and Diastolic blood pressure:

TABLE 2. Systolic and Diastolic Blood Pressure (Mean)

Variable	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	Difference
Systolic (mmHg)	154,6 ± 8,9	142,1 ± 7,6	↓ 12,5
Diastolic (mmHg)	94,8 ± 6,7	86,3 ± 5,9	↓ 8,5

TABLE 3. Systolic Blood Pressure

Category	Pre-test n (%)	Post-test n (%)
Hypertension Grade I (140-159 mmHg)	15 (62,5%)	19 (79,2%)
Hypertension Grade II (≥160 mmHg)	9 (37,5%)	2 (8,3%)
Pre-hypertension	0 (0%)	3 (12,5%)
Total	**24 (100%)**	**24 (100%)**

TABLE 2. Systolic and Diastolic Blood Pressure (Mean)

Category	Pre-test n (%)	Post-test n (%)
90–99 mmHg	17 (70,8%)	8 (33,3%)
≥100 mmHg	7 (29,2%)	1 (4,2%)
<90 mmHg	0 (0%)	15 (62,5%)
Total	**24 (100%)**	**24 (100%)**

Blood pressure measurement results in 24 elderly with hypertension showed a decrease in mean systolic blood pressure from 154.6 mmHg to 142.1 mmHg and diastolic blood pressure from 94.8 mmHg to 86.3 mmHg after performing hypertension exercise. Statistical test results using a paired sample t-test showed $p < 0.05$, which means that hypertension exercise has a significant effect on lowering blood pressure in the elderly.

Hypertension itself is defined as a condition when systolic blood pressure is ≥130 mmHg or diastolic blood pressure is ≥80 mmHg, measured consistently over several examinations (Ainurrafiq et al., 2021). In general, hypertension therapy is divided into two approaches: pharmacological and non-pharmacological. Pharmacological therapy is conducted through the administration of antihypertensive drugs to lower blood pressure, while non-pharmacological therapy is focused on lifestyle modifications, such as dietary regulation, increased physical activity, and implementation of structured exercises, one of which is through heart-healthy exercise. Heart-healthy exercise, as one of the non-pharmacological therapies has been proven to help lower blood pressure, improve blood circulation, and increase heart fitness (Astuti et al., 2023).

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Heart-healthy exercise performed regularly can increase heart muscle strength as well as cardiovascular function effectiveness, thus playing a role in reducing the risk of heart and blood vessel diseases (Amir et al., 2022). This exercise makes the heart able to pump blood more efficiently through lighter effort, so the heart's workload is reduced and the resistance on artery walls decreases. This condition allows heart function to become more optimal (Misbach et al., 2023). In addition, Fletcher et al. (2018) also affirm that regular physical activity can improve overall cardiovascular health and reduce the risk of complications associated with hypertension.

Research results show that heart-healthy exercise training effectively increases caregiver knowledge about hypertension management in the elderly, which is statistically proven with p=0.005 and Cohen's d=2.25. The average score increased from 5.96 to 8.10 (35.9% increase) demonstrates the substantial impact of structured educational intervention. This finding is in line with research by Iswatun (2021), which states that health education can increase individual awareness and understanding in preventing hypertension complications. Good knowledge will influence a person's attitude and skills in implementing health practices, including, in this case, caregiver skills in guiding the elderly to perform heart-healthy exercise.

With the increase in caregiver knowledge and skills, it is expected that their role as elderly companions can be more optimal, particularly in the prevention and management of hypertension. This is important considering that hypertension is one of the degenerative diseases with high prevalence among the elderly and can cause serious complications if not properly managed.

CONCLUSION

The conclusion from the community service activity regarding heart-healthy exercise training for caregivers at the elderly home service unit shows a significant increase in knowledge, with an average pretest score of 5.96 increasing to 8.10 on the posttest.

This community service activity has several limitations, including: variations in health conditions, fitness levels, and physical capabilities of the elderly cause differences in their ability to follow exercise movements optimally; limited number of elderly caregivers and activity implementation time potentially affects the intensity of accompaniment and consistency of exercise implementation; monitoring of elderly compliance in performing heart-healthy exercise independently after activities has not been conducted continuously. Therefore, the results of this activity still require follow-up and continuous accompaniment so that the benefits of the intervention can be more optimally realized.

The implementation of community service activities at the Karawang elderly home service unit proceeded smoothly without significant obstacles. All related parties provided full support, including the provision of facilities to support activities, and the caregivers, as respondents also showed high enthusiasm in participating in the entire training series. It is hoped that future community service activities will be recommended to compare heart-healthy exercise with other types of physical activity as non-pharmacological interventions in hypertension management for the elderly.

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