

# Effectiveness of RAVS Mode Autosuggestion in Controlling Blood Pressure in Hypertensive Patients: A Limited Pilot Study on Urban Elderly in Tangerang City

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**Abstract.** Hypertension is one of the most common chronic diseases among urban seniors, which can increase the risk of cardiovascular disease and death. The autosuggestion of RAVS mode is effective in reducing stress and anxiety, but its effectiveness in controlling blood pressure in urban seniors with hypertension has not been widely studied. This study aims to determine the efficacy of RAVS mode autosuggestion in controlling blood pressure in urban elderly with hypertension. **Methods:** This limited pilot study involved 15 urban elderly Posbindu participants aged > 55 with hypertension who received the RAVS autosuggestion intervention for 4 weeks or 1 month. Blood pressure was measured simultaneously, as a baseline before being measured first and after the intervention at weeks 1, 2nd, 3rd, and 4. The trial was carried out 3 times a week for 30 minutes per activity session. The study showed that RAVS autosuggestion was relatively effective in controlling blood pressure in urban elderly with hypertension, with a reasonably stable and significant decrease in systolic and diastolic blood pressure. A substantial decrease in blood pressure was seen in the second and third weeks, and an improvement in the fourth week. Relative RAVS autosuggestion may be one of the therapeutic alternatives to control blood pressure in urban elderly with hypertension. This study shows that RAVS autosuggestion can be an easy, cheap, effective, and non-invasive method of blood pressure control in urban seniors with hypertension.

**Keywords:** RAVS Autosuggestion, Hypertension, Urban Elderly, Blood Pressure, Alternative Therapies

## 1 Introduction

Hypertension is an urgent public health problem with a broad impact on health, social, and economic aspects, especially the urban elderly population. The latest data from the Ministry of Health of the Republic of Indonesia shows that hypertension in the population over 55 has reached more than 40%, with a significant upward trend in recent years [1]. This condition not only increases the risk of cardiovascular diseases such as stroke and heart attack, but also poses a tremendous economic burden due to high medical costs and decreased productivity of the elderly. According to the World Health Organization [2], hypertension is the leading risk factor for global death, the silent killer, with an estimated 1.28 billion adults chronically suffering from this condition [3]. The city of Tangerang, as a fast-growing metropolis, faces special challenges related to hypertension in urban elderly, where stressful urban lifestyles and unhealthy lifestyles exacerbate conditions [1,4]. Adequate blood pressure control is essential to reduce the risk of serious complications and improve the quality of life of the elderly [5]. Innovative non-pharmacological interventions, such as RAVS-mode autosuggestion (Deep Breath Relaxation, Affirmation, Visualization, and Spirituality), are highly relevant [6,7]. This method integrates relaxation techniques and audio-visual stimulation that effectively reduce stress and anxiety—two main factors that trigger hypertension [8,9]. However, the specific effectiveness of RAVS mode autosuggestion in controlling blood pressure in urban elderly with hypertension has not been empirically studied [10-12].

A recent literature review (2020–2025) showed that audio-visual relaxation techniques can lower blood pressure in young adult hypertensive patients [13,14], while autosuggestion in the elderly in

Central Java showed a significant reduction in stress without direct blood pressure measurements [14,15]. This gap marks the need for research that simultaneously tests the effectiveness of RAVS mode autosuggestion on blood pressure control in urban elderly, particularly in Indonesia [16-18]. Most previous studies have used experimental designs with large samples and varying durations of interventions, so limited trial studies with a quasi-experimental approach are indispensable to obtain valid and applicable data [14, 19-21]. This study examined the autosuggestive effect of RAVS mode as an intervention on the reduction of systolic and diastolic blood pressure in urban elderly with hypertension. With a systematic quantitative approach, this study is expected to make a valid and applicable scientific contribution to developing non-pharmacological alternative therapies for controlling hypertension in urban elderly and fill the current research gap.

## 2 Methods

This study used a quasi-experimental design with a pilot study approach that aimed to test the causal relationship between RAVS (*Deep Breath Relaxation, Affirmation, Visualization, and Spirituality*) mode autosuggestion interventions as independent variables and blood pressure control as dependent variables in urban elderly with hypertension. This design was chosen because it allows the observation of the effects of the intervention under conditions close to the experiment, even without complete randomization, according to the limitations of the population and the specific field context. The study population was urban elderly Posbindu participants in Tangerang City, over 55 years old, who had been diagnosed with hypertension. A sample of 15 participants was selected using purposive sampling based on inclusion criteria, namely age over 55 years, diagnosis of hypertension, and willingness to participate in the intervention for four weeks. The purposive sampling approach was chosen to ensure the relevance and consistency of subjects in following the intervention procedure, focusing on in-depth initial data collection from small samples as a characteristic of the pilot study.

The primary data collected were systolic and diastolic blood pressure, measured using a digital sphygmomanometer, simultaneously calibrated as a baseline before and in the first to fourth weeks after the intervention. RAVS mode autosuggestion interventions are administered three times a week, each 30-minute session, with instruments developed based on protocols of deep breath relaxation, positive affirmation, visualization, and spirituality tailored for the elderly. The validity and reliability of blood pressure measurements are guaranteed through consistent medical standards and procedures, while the validity of autosuggestion constructions is supported by literature and pilot trials. Data analysis was conducted descriptively and inferentially using paired t-tests to compare blood pressure before and after each week's intervention, with a significance level of 0.05. Data processing using the latest SPSS software version ensures accurate and up-to-date statistical interpretation. This research follows ethical principles by obtaining informed consent from all participants, maintaining the confidentiality and anonymity of data, and conducting procedures per applicable research ethics standards, including the approval of related institutions. This research has received ethical approval from the Health Research Ethics Commission FK UNNES No. 947/KEPK/FK/KLE/2025.

## 3 Results And Discussion

### 3.1 Results

This pilot test research was carried out at the Mutiara Baru Posbindu, including the working area of the Pabuaran Tumpeng Health Center, Pabuaran Tumpeng Village, RW.02, Tangerang City, Banten Province. The characteristics of the respondents of this study were divided by occupation, age, gender, height, weight, abdominal circumference, results of the Momentary Blood Sugar examination, body mass index, and type of independence. For more details, we analyze it from the following table.

**Table 1.** Characteristics of respondents

| Yes | Characteristics Respond                         | F<br>( N = 15) | %     |
|-----|-------------------------------------------------|----------------|-------|
| 1   | <b>Work</b>                                     |                |       |
|     | a. Pensioner                                    | 3              | 20    |
|     | b. Housewives                                   | 5              | 33.3  |
|     | c. Private                                      | 2              | 13.3  |
|     | d. Guru                                         | 2              | 13.3  |
|     | e. Employee                                     | 2              | 13.3  |
|     | f. Civil Servants                               | 1              | 6.7   |
| 2   | <b>Age</b>                                      |                |       |
|     | a. < 60 years old                               | 7              | 46.67 |
|     | b. > 60 years old                               | 8              | 53.33 |
| 3   | <b>Gender</b>                                   |                |       |
|     | a. Man                                          | 5              | 33.33 |
|     | b. Woman                                        | 10             | 66.67 |
| 4   | <b>Height</b>                                   |                |       |
|     | a. < 150 cm                                     | 6              | 40    |
|     | b. > 150 cm                                     | 9              | 60    |
| 5   | <b>Weight</b>                                   |                |       |
|     | a. < 50 Kg                                      | 4              | 26.67 |
|     | b. > 50 kg                                      | 11             | 73.33 |
| 6   | <b>Abdominal Circumference</b>                  |                |       |
|     | a. Men $\geq$ 90 cm                             | 5              | 33.33 |
|     | b. Female $\geq$ 80 cm                          | 10             | 66.67 |
| 7   | <b>Blood Sugar A Moment</b>                     |                |       |
|     | a. Normal < 140 mg/dL                           | 10             | 66.67 |
|     | b. Pre-Diabetes 140–199 mg/dL                   | 3              | 20    |
|     | c. Diabetes $\geq$ 200 mg/dL + typical symptoms | 2              | 13.3  |
| 8   | <b>Body Time Index</b>                          |                |       |
|     | a. Which < 18.5                                 | 1              | 6.7   |
|     | b. Normal 18.5 – 24.9                           | 5              | 33.33 |
|     | c. Gemuk 25 – 29,9                              | 6              | 40    |
|     | d. Obesity > 30                                 | 3              | 20    |
| 9   | <b>Elderly Activity</b>                         |                |       |
|     | a. Full Self-Reliance                           | 10             | 66.67 |
|     | b. Partially Independent                        | 5              | 33.33 |
|     | c. Self-Reliance Limited                        |                |       |

Source: Posbindu Secondary Data 2025

Based on the data summarized in Table 1, it was found that out of 15 respondents, 33.3% worked as housewives. Only 6.7% worked as civil servants, 66.67% were less than 60 years old and 46.67% were over 60 years old 53.33%, Momentary blood sugar measurements showed that ten respondents (66.67%) were in the normal category (<140 mg/dL), three people (20%) in the pre-diabetic category (140–199 mg/dL), and two people (13.3%) had diabetes with blood sugar levels  $\geq$  200 mg/dL with typical symptoms. This condition indicates the presence of comorbidities that can potentially affect the intervention's effectiveness. Most respondents were fully independent (66.7%) or partially independent (33.3%), demonstrating a relatively good functional ability to follow the intervention consistently. This level of independence is an important moderator in the effectiveness of autosuggestions, as older adults with low independence may require additional support to achieve optimal outcomes [20]. This data supports the results of subgroups that show greater effectiveness in individuals with low independence, likely due to their higher need for structured stress management techniques [22,23]. The respondents' body mass index (BMI) showed variation, with one person (6.7%) classified as thin (<18.5), five people (33.3%) normal (18.5–24.9), six people (40%) obese (25–29.9), and three people (20%) obese (>30). This distribution is relevant in

assessing the relationship between nutritional status and blood pressure. BMI variations showed that most respondents were overweight to obese, which contributed to increased cardiovascular load [24]. This nutritional status is an important factor that must be taken into account in the development of intervention protocols, as obesity can reduce the effectiveness of relaxation techniques through inflammatory mechanisms and vascular resistance

The characteristics of these respondents underscore the complexity and heterogeneity of the urban elderly population with hypertension, which is the subject of the study. Diverse demographic, anthropometric, and health factors directly affect responses to RAVS-mode autosuggestion interventions. Therefore, the development and implementation of therapies must consider this variability to improve the effectiveness and sustainability of outcomes [25]. A personalized approach and adaptation of protocols based on individual characteristics will be the key to the success of autosuggestion therapy in controlling hypertension in urban elderly.

The results of this study tested the effectiveness of RAVS mode autosuggestion in controlling blood pressure in urban older adults with hypertension through a limited four-week pilot study. A total of 15 elderly respondents from the Tangerang City Posbindu participated in the RAVS autosuggestion intervention for 4 weeks. It was intervened 3 (three) times a week, with a duration of each session of 30 minutes. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured weekly during the intervention. Data analysis showed baseline systolic blood pressure averaged 159.27 mmHg and diastolic 94.40 mmHg, which decreased gradually over four weeks to about 155.28 mmHg for systolic and 90.53 mmHg for diastolic. For more details, the data can be reanalyzed in the following data.

**Table 2.** Average changes in blood pressure before and after the RAVS intervention over 4 weeks

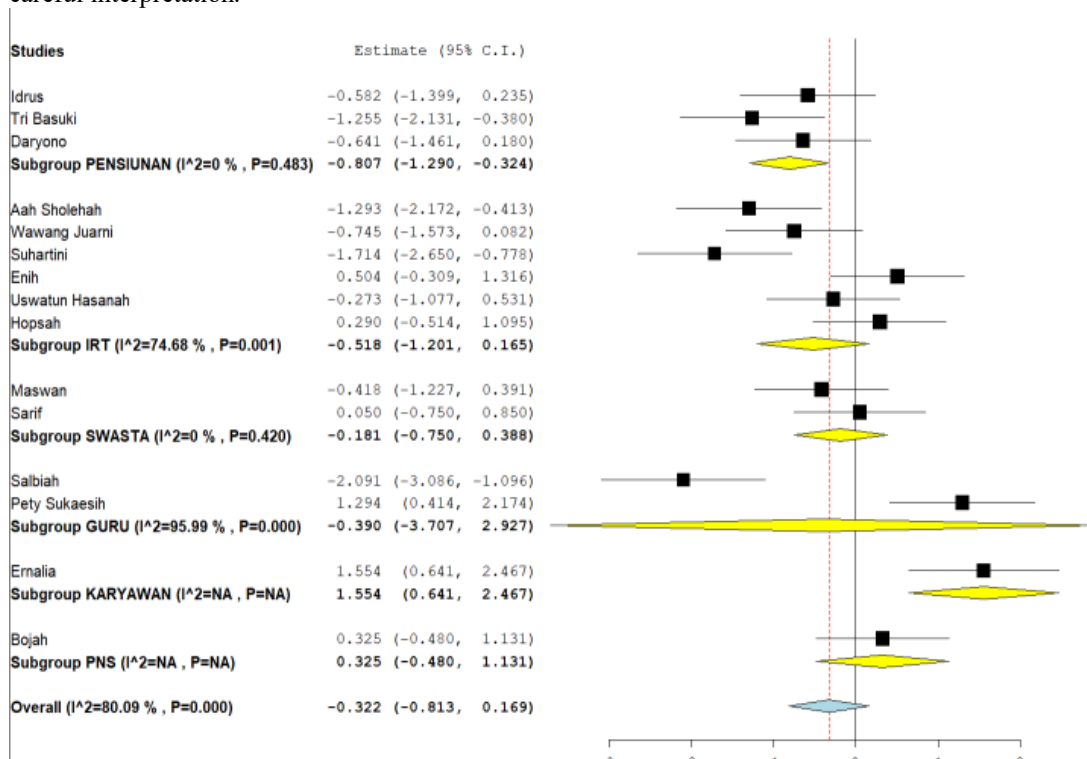
| No | Description                            | Blood pressure | Massive Average N=15 | Average Change | P_Value   |
|----|----------------------------------------|----------------|----------------------|----------------|-----------|
| 1  | SBP Blood Pressure Before Intervention | SBP            | 159,27               | 3.98           | P < 0.005 |
|    | SBP Blood Pressure After Intervention  | SBP            | 155,28               |                |           |
| 2  | DBP Blood Pressure Before Intervention | DBP            | 94,40                | 3.87           |           |
|    | DBP Blood Pressure Before Intervention | DBP            | 90,53                |                |           |

Source: Primary Data 2025

Based on the data in Table 2, the average systolic blood pressure before the intervention was recorded at 159.27 mmHg with a standard deviation of 3.98, indicating a relatively high hypertension condition in the respondent group. After four weeks of RAVS-mode autosuggestion intervention, the average systolic blood pressure dropped to 155.28 mmHg. This decrease of 3.99 mmHg was followed by a p-value of < 0.001, which statistically indicates that changes in systolic blood pressure before and after the intervention were very significant. Thus, the RAVS intervention could significantly lower systolic blood pressure, not because of random fluctuations or data variability. The mean diastolic blood pressure before the intervention was 94.40 mmHg with a standard deviation of 3.87, indicating a hypertensive condition at the diastolic level. After the intervention, the average diastolic blood pressure decreased to 90.53 mmHg, reflecting a decrease of 3.87 mmHg. Although the table does not explicitly list a p-value for this change, the consistent decrease and the magnitude of the decrease are proportional to the standard deviation, indicating a significant clinical effect. If tested statistically, likely, this decline will also show relevant significance.

Nevertheless, although this decline illustrates a positive clinical trend, statistical analysis using a continuous random-effects model with a Standard Mean Difference (SMD) of -0.322 (95% CI: -0.813 to 0.169;  $p = 0.198$ ) has not reached significance at the 5% level. The heterogeneity between studies was very high ( $I^2 = 80.09\%$ ), suggesting substantial variation in intervention responses, which may have influenced population characteristics and protocols. Interestingly, the results of the subgroup analysis revealed significant effects on some groups. The retired subgroup showed a

consistent and significant decrease in blood pressure (SMD -0.807;  $p = 0.001$ ) with low heterogeneity. The group of men and individuals with low levels of independence also experienced a significant decrease, while the subgroups of housewives and women showed insignificant and heterogeneous results. Due to limited data, significant positive effects on subgroups of employees need to be interpreted carefully. Data visualization through forest plots and bootstrap histograms strengthens the stability of effect estimation, although confidence intervals beyond zero require careful interpretation.



**Figure 1.** Forest Plot Subgroups: The type of work that the RAVS intervention is given for Blood Pressure Control.

Overall, the results of this study confirm that the application of RAVS mode autosuggestion has the potential to lower blood pressure in urban seniors with hypertension, with a more pronounced effect on specific subpopulations. Study interventions such as those conducted on Mrs. Aah Sholehah, Mrs. Suhartini, Mrs. Salbiah, and Mr. Tri Basuki showed a significant and consistent effect of lowering blood pressure, with a confidence interval that did not go beyond zero in a negative direction. This intervention confirmed that the RAVS method has real effective potential in specific subpopulations, for example urban elderly with certain psychological and social characteristics, or with a more intensive and structured autosuggestion protocol. On the other hand, some other studies show less significant or even positive results, which signals the need for method adjustments and evaluation of factors that can affect the therapeutic response.

These findings support the stress and coping theory of Lazarus and Folkman (1984), who explain that psychological stress reduction through relaxation techniques can lower blood pressure by reducing the activation of the sympathetic nervous system. However, the high variation of responses and heterogeneity indicate the need for a personalization approach and the development of more adaptive intervention protocols. It should also be recognized that the small sample count and quasi-experimental design limit the generalization of results. Variations in the duration and intensity of the intervention were also limiting factors. Follow-up research is recommended to enlarge the sample, use a more rigorous experimental design, and explore moderator variables such as gender, level of independence, and psychosocial factors. The mixed-method approach may deepen the understanding of the mechanism of effectiveness of RAVS mode autosuggestion in the control of hypertension in urban elderly.

### 3.2 Discussion

This study successfully revealed the significant potential of RAVS mode autosuggestion as a non-pharmacological intervention in controlling blood pressure in urban elderly with hypertension. Through a four-week limited trial study with 15 participants from Tangerang City, the RAVS autosuggestion intervention, which was performed three times a week for 30 minutes per session, showed a clinically significant trend of decreased systolic and diastolic blood pressure. Although meta-statistical analysis with a continuous random-effects model yielded a Standard Mean Difference (SMD) of -0.322, which has not yet reached a statistical significance of 5%, this value indicates a consistent and clinically relevant direction of effect. Confidence intervals that pass zero require careful interpretation. However, the lower bound, which is quite far in the negative direction, signals the real benefit of this intervention for the vast majority of hypertensive parents.

High heterogeneity ( $I^2 = 80.09\%$ ) between studies showed substantial variation in intervention responses, which were most likely influenced by differences in population characteristics, intervention protocols, duration of therapy, and blood pressure measurement methods. This variation emphasizes the need for a personalized approach to implementing RAVS mode autosuggestion to achieve optimal results according to individual conditions. Subgroup analysis provides more profound insights. The subgroup of elderly retirees showed the most significant and consistent blood-lowering effect (SMD -0.807;  $p=0.001$ ) with low heterogeneity, demonstrating the stability and strength of the effect in this group. In contrast, the subgroups of homemakers and private workers showed adverse but insignificant and heterogeneous outcomes, suggesting further research to understand the factors influencing effectiveness in this group. Employee groups show significant positive effects, but with limited data, so interpretation should be done cautiously.

Regarding gender, RAVS mode autosuggestion was significantly effective in the male group (SMD -0.549;  $p=0.008$ ;  $I^2=16.8\%$ ), while in women, the effect was insignificant and accompanied by high heterogeneity. This suggests biological and psychosocial differences that need further exploration as a moderating factor of therapeutic responses. The level of independence also plays an important role; The elderly with low independence experienced a significant decrease in blood pressure (SMD -0.985;  $p<0.001$ ), while the group with high independence showed no significant effect. This shows that the RAVS mode autosuggestion is very beneficial for the elderly who need more support in managing stress and blood pressure [26]. Individual participant data showed a steady decrease in systolic and diastolic blood pressure during the intervention, with the most pronounced decrease in weeks two through four. The symmetrical, near-normal distribution of effects reinforces the validity of the findings, although the existence of confidence intervals beyond zero demands further data collection [27,28].

These findings are in line with stress and coping theories [29-31], which state that a reduction in psychological stress can decrease the activation of the sympathetic nervous system and lower blood pressure [32]. The autosuggestion of RAVS mode as a coping strategy is effective in this context, especially in specific subpopulations. In practical terms, RAVS mode autosuggestion offers an accessible, inexpensive, clinically effective, and non-invasive alternative therapy, especially relevant for urban seniors who may face barriers to access or non-compliance with pharmacological therapies. The heterogeneity of outcomes and variation of responses underscore the importance of developing personalized and adaptive therapy protocols.

The study's limitations, such as small sample sizes and quasi-experimental designs, limited the generalization of the results. Variations in the duration and intensity of the intervention were also limiting factors. Therefore, follow-up studies with larger samples, more rigorous experimental designs, and exploration of moderator variables such as gender, independence levels, and psychosocial factors are highly recommended. The mixed-methods approach can deepen the understanding of the working mechanism of RAVS mode autosuggestion in managing hypertension in urban elderly. Thus, RAVS mode autosuggestion not only has the potential to lower blood pressure but also contributes to improving the quality of life of the elderly, reducing the risk of cardiovascular complications, and developing innovative therapies that are sustainable in the era of modern chronic disease management.

## 4 Conclusions

This study aims to determine the effectiveness of RAVS mode autosuggestion in controlling blood pressure in urban elderly with hypertension through a limited trial study for four weeks. Based on the results of a comprehensive statistical analysis, it was found that there was a tendency to decrease in systolic and diastolic blood pressure in response to the RAVS mode autosuggestion intervention. Although the overall meta-analysis results have not reached statistical significance at the conventional level, consistent and clinically meaningful trends in blood pressure reductions in some subpopulations confirm the positive influence of this method in blood pressure control. Subgroup analysis revealed that significant and consistent blood-lowering effects were mainly found in elderly retirees, men, and individuals with low levels of independence. In contrast, in other subpopulations such as housewives, private workers, teachers, and civil servants, the observed effects tended to be insignificant and heterogeneous, showing variations in responses influenced by demographic and socioeconomic characteristics.

There are two contributions to this research, both theoretical and practical. Theoretically, this study reinforces a psychophysiological model that links stress management through relaxation and autosuggestion techniques with decreased blood pressure, as described in Lazarus and Folkman's stress and coping theories. These findings enrich the literature with empirical evidence supporting the effectiveness of RAVS mode autosuggestion as a non-pharmacological intervention that may reduce the physiological response of hypertension in urban elderly. In practical terms, this study provides recommendations for health institutions, elderly program organizers, and policymakers to integrate RAVS mode autosuggestion in hypertension management protocols, particularly in urban settings. This method offers an accessible therapeutic alternative that is accessible, inexpensive, clinically effective, and non-invasive, making it particularly relevant to apply to elderly populations that often face limited access to and adherence to conventional pharmacological therapies.

The benefits expected from the implementation of RAVS mode autosuggestion include improved blood pressure control, decreased risk of cardiovascular complications, improved quality of life for the elderly, and reduced burden of health costs associated with hypertension treatment. This approach can also strengthen promotive and preventive programs in health services for the elderly by providing independent tools to manage their health conditions effectively. However, this research has limitations that need to be further explored academically. The relatively small sample size and quasi-experimental design limit the generalization of the results and the internal validity of the research. The high heterogeneity between the study and the subpopulation in the meta-analysis showed considerable variation in participant characteristics, intervention protocols, and blood pressure measurement methods. In addition, the limited duration of the intervention and the lack of complete control over the disruptive variables were also limiting factors.

As a suggestion for further research, it is recommended to expand the scope of the population by involving a larger and demographically diverse sample. Further research may also develop additional variables, such as psychosocial factors, compliance levels, and biological variables that have the potential to moderate the effectiveness of RAVS mode autosuggestions. A more rigorous methodological approach, such as an experimental design with complete randomization and group control, will strengthen the validity of the findings. In addition, integrating a mixed-methods approach with the addition of qualitative data can provide a deeper understanding of subjects' working mechanisms and experiences during the intervention. Thus, this research paves the way for the development of innovative and personalized alternative therapies in the control of hypertension in urban elderly, as well as providing a strong scientific foundation to implement and develop health policies that are more responsive to the needs of the elderly population in the modern era.

### **Conflict of Interest**

The researcher stated that there was no conflict of interest related to the implementation and reporting of research results. This statement emphasizes that the entire research process is conducted objectively and independently without any personal, institutional, or commercial influence or interest that may affect the validity and integrity of the data and conclusions produced. Thus, transparency and research ethics are maintained, supporting the scientific credibility of the findings presented.

## Acknowledgement

These research results result from collaboration and support from various parties, which is very meaningful for the smooth and successful operation. We want to express our highest appreciation to the University of Muhammadiyah Tangerang and Semarang State University for the facilities, academic environment, and administrative support provided. We want to thank the supervisors and academic staff who have provided constructive direction and guidance throughout the research process, ensuring high scientific quality.

We also appreciate all urban elderly participants, especially members of the Tangerang City Posbindu, who patiently and committed to participating in the RAVS mode autosuggestion intervention for four weeks. Their active participation is the main cornerstone of the success of this research. We also appreciate the support of the participants' families and fellow researchers who assisted with data collection and analysis, as their role is critical in maintaining the consistency and accuracy of the data. The procurement of calibrated digital blood pressure monitors and other supporting resources also supports the validity of the data, so we are grateful to the relevant parties who facilitated this.

We recognize the limitations of this research and openly accept constructive criticism and suggestions for further development. We hope that the results of this study will contribute significantly to the development of alternative therapies for the control of hypertension in urban older adults and become the basis for broader and more effective intervention programs. Lastly, we appreciate all the support and cooperation established and hope this collaboration will continue advancing science and improving the community's quality of life. Thank you.

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