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## YOGA TRAINING FOR THE ELDERLY TO LOWER BLOOD PRESSURE IN SENGGRENG VILLAGE, MALANG DISTRICT

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### ABSTRACT

**Introduction:** Diseases commonly observed in the elderly population are attributed to the decline in vascular functionality, with hypertension, also known as high blood pressure, being one such condition. The objective of this community service initiative is to assist senior citizens and elderly individuals in enhancing their knowledge regarding methods to reduce blood pressure levels. Additionally, it aims to enhance their proficiency in performing yoga exercises that have a positive influence on blood pressure.

**Methods:** The population in this community service activity is 33 elderly people who are active in participating in activities organized by Posyandu Kromolio Pos 3 or Usila Mandiri Elderly School in Senggreng Village for 1 month, Malang Regency. The instrument used is measure BP. The older individuals will monitor their blood pressure during each gathering. The blood pressure assessment is conducted both prior to and following the implementation of yoga activities in order to ascertain the impact of those exercises on the blood pressure levels of older individuals.

**Results:** At the first meeting, 58% of the elderly who attended experienced a decrease in blood pressure after doing yoga exercises. At the second meeting, 73% of the elderly who came experienced a decrease in blood pressure and 12% of the elderly did not experience changes in blood pressure before and after yoga exercises.

**Conclusion:** Following the implementation of yoga activities as a form of treatment, a significant reduction in blood pressure was observed among the majority of senior individuals. This condition because Yoga can relax their mind and their physical. Consequently, empirical evidence supports the assertion that yoga workouts yield beneficial effects in reducing hypertension among older individuals.

### KEYWORDS

community; elderly; health; hypertension; yoga.

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## 1. INTRODUCTION

The activities conducted at the elderly school posyandu take place on a weekly basis, specifically every Wednesday. The conducted exercise pertains to geriatric gymnastics, which is facilitated by senior instructors. The efficacy of this activity in regulating blood pressure among elderly participants remains

inconclusive. Complaints pertaining to the prevalence of high blood pressure or hypertension among the elderly persist.

The older population experiences a reduction in various physiological functions, including the loss of blood vessel function. Diseases commonly observed in the aged are attributed to the decline in vascular

functionality, with hypertension, also known as high blood pressure, being one such condition. Hypertension is a medical condition characterised by elevated blood pressure levels, which has been identified as a disease with significant morbidity and fatality rates (Hammar *et al.*, 2017).

The etiology of hypertension in the elderly can be attributed to the diminished flexibility of the aorta wall and the thickening of the heart valves, resulting in increased stiffness of the valves. The condition involves the hypertrophy of cardiac valves, resulting in their reduced flexibility and subsequent impairment of the heart's pumping capacity. Additionally, it entails the diminished elasticity of peripheral blood arteries and an elevation in peripheral vascular resistance. The topic of discussion pertains to the peripheral blood vessels. The aetiology of hypertension among the older population can be attributed to the progressive decline in physiological functioning (Groessl *et al.*, 2018).

In addition to pharmaceutical and non-pharmacological approaches, there is a growing trend in utilising individual complementary therapies as a means to manage hypertension (Ramania *et al.*, 2016; Setiawan *et al.*, 2021). A research conducted in the region of Palestine provides insights into the diverse applications of alternative therapies among individuals diagnosed with hypertension. The prevalent complementary therapies employed in this study encompassed biological based therapies, including herbal medicine (62.1%) and dietary modification (49.5%), as well as manipulative and body based therapies, including physical exercise (34.5%) and relaxation (20.9%) (Ho and Ng, 2020).

Yoga is classified as a form of alternative therapy that falls within the mind-body intervention category. According to Setiawan *et al.* (2021), the practise of yoga has been recognised for its ability to induce relaxation in the body, while the use of specific breathing techniques has been associated with a

reduction in blood pressure levels. The mechanism underlying the effects of yoga involves the utilisation of slow and deliberate movements, which elicit proprioceptive and exteroceptive impulses. These impulses subsequently lead to a reduction in peripheral adrenergic activity, thereby promoting autonomic balance. Consequently, chemoreceptor responses are diminished, but baroreflex sensitivity is enhanced. The integration of yoga, breath training, and relaxation techniques constitutes a cohesive approach that, when coupled with physical motions or postures, has the potential to effectively reduce blood pressure levels. The decrease in blood pressure has beneficial outcomes on additional risk factors associated with cardiovascular disease, such as obesity, elevated lipid profile, and glycemic index (Majumdar *et al.*, 2021).

Research has demonstrated that those afflicted with cardiovascular and metabolic disorders can derive benefits from engaging in the practise of yoga, as it has been observed to effectively reduce both systolic and diastolic blood pressure levels. Nevertheless, this phenomenon will not manifest itself alone through the practise of yoga. The optimal benefit of yoga practise, when combined with effective pharmaceutical therapy, can be observed in those who already have hypertension. In the absence of medicine, the non-administration thereof does not yield a substantial effect on blood pressure (Chhugani *et al.*, 2018).

The blood pressure of the elderly attending the posyandu tends to exhibit elevated levels, as determined by measures conducted in accordance with the guidelines established by the Ministry of Health. Specifically, normal blood pressure is defined as falling within the range of less than 120/80 mmHg. The findings of the blood pressure analysis among the elderly revealed that a significant majority, specifically 96%, had symptoms indicative of pre-hypertension and hypertension. The issue at hand was identified by the cadres. Efforts have been

undertaken to establish a regular gymnastics programme, scheduled to take place on a weekly basis, specifically on Wednesdays. However, the exercises typically performed do not specifically target the reduction of blood pressure in the elderly, aligning with the specific issues faced by the elderly population in Posyandu Kromolio Pos 3 (Sekolah Lansia Usila Mandiri). The elderly cadre population exhibits a dearth of recommendations for the implementation of gymnastics, as well as a deficiency in the requisite abilities for engaging in gymnastic activities (Mnsc *et al.*, 2017). Furthermore, it is worth noting that thus far, there has been a lack of dedicated educational programmes targeting both cadres and the elderly, specifically focusing on including gymnastics as a beneficial activity for the elderly (Wilson, 2021). The lack of adequate sports facilities poses a challenge in facilitating gymnastic activities for the senior population in the local community. These challenges necessitate the implementation of training and mentorship initiatives for collaborators in order to develop a comprehensive Yoga Exercise Guidebook aimed at mitigating hypertension in the senior population and maintaining their blood pressure within normal ranges. Additionally, the creation of instructional videos can be pursued to provide further assistance on performing yoga exercises (Rosenfeld *et al.*, 2021).

The objective of this community service initiative is to assist senior citizens and elderly individuals in enhancing their knowledge regarding methods to reduce blood pressure levels. Additionally, it aims to enhance their proficiency in performing yoga exercises that have a positive influence on blood pressure. The ultimate goal is to enable elderly individuals to achieve a high quality of life. The anticipated outcome of this community service initiative is the enhancement of services provided at Posyandu Kromolio Pos 3 and Sekolah Lansia Usila Mandiri, located in Senggreng Village, Malang Regency.

The foremost issues that necessitate attention and resolution are as follows:

1. The insufficient awareness among senior cadres and elderly individuals regarding effective strategies to mitigate blood pressure, particularly pertaining to the practise of yoga exercises.
2. The lack of established protocols for the execution of gymnastics.
3. There is now a lack of specialised educational programmes targeting elderly cadres and the elderly population that incorporate references to gymnastics specifically designed for this demographic.
4. One of the primary concerns is the insufficiency of facilities to accommodate a wider range of sporting activities.

Based on the findings of the analysis encountered by the partners, the team implemented a series of actions as a means of addressing the partners' concerns, along with the corresponding outcomes associated with each proposed solution. This study aims to address the issue of limited awareness among older cadres and individuals regarding effective strategies for reducing blood pressure, with a specific focus on the potential benefits of yoga activities. To achieve this objective, counselling sessions will be conducted to educate and inform the elderly population about various approaches to managing and lowering blood pressure levels. The issue of the lack of standards pertaining to the execution of gymnastics, training, and support for partners has prompted efforts to provide criteria for the implementation of yoga exercises through the creation of exercise films. The issue of the lack of specialised learning opportunities for senior cadres and individuals of advanced age can be addressed by the implementation of training and support programmes aimed at facilitating the use of yoga exercises. These programmes would be based on established recommendations that have been

developed specifically for this demographic. One potential approach to addressing the issue of insufficient sports facilities for the elderly is implementing procurement initiatives to acquire the necessary sports equipment, with a particular focus on items conducive to engaging in yoga exercises, such as mats.

## 2. MATERIAL AND METHODS

The community service programme conducted at the Sekolah Lansia Usila which is part of the Posyandu Kromolio Pos 3 in Senggeng Village, Malang Regency encompassed a series of steps, which are outlined as follows:

1. Engaging with the local community health centre administration in order to address matters pertaining to the Posyandu (Integrated Health Post) management. Subsequently, the task of managing licencing procedures at BANGKESBANGPOL Malang Regency, as well as the associated Puskesmas facilities, is undertaken.
2. The identification of issues encountered by the senior population, particularly those pertaining to blood pressure.
3. This paper aims to examine the involvement of an implementation team consisting of lecturers and students in the planning and execution of health education activities tailored to the specific needs of the elderly population. Additionally, the paper will explore the potential benefits of incorporating yoga exercises as a means to effectively manage and reduce blood pressure levels in elderly individuals.
4. A consultation was held with key stakeholders, including the Head of RW, cadres, and administrators of Posyandu Kromolio Pos 3 Sekolah Lansia Usila Senggeng Village, to discuss the planned activities at the elderly posyandu. These activities encompass health education and yoga exercises aimed at maintaining and reducing blood pressure levels among the elderly population.
5. After reaching a consensus with partners regarding the nature of activities, the next step involves disseminating this information to all members of the Sekolah Lansia Usila for the Elderly. Additionally, collaboration with posyandu cadres is essential in order to encourage the participation of other members in health education activities and yoga exercises.
6. Implement a comprehensive health education programme encompassing gymnastics and exercise interventions aimed at managing and mitigating hypertension among the aged population.
7. Facilitate yoga sessions for the elderly at Posyandu Sekolah Lansia Usila Senggeng Village, located in Malang Regency.
8. Acquire yoga workout equipment. The yoga exercise activities were conducted for a duration of one month, specifically from August to September of the year 2023.

The target demographic for this community service initiative comprises elder individuals who are registered at the Sekolah Lansia Usila which is part of the Posyandu Kromolio Pos 3, located in Senggeng Village, Malang Regency. Sekolah Lansia Usila currently accommodates a total of 25 to 30 actively engage in various activities. The older individuals will monitor their blood pressure during each gathering. The blood pressure assessment is conducted both prior to and following the implementation of yoga activities in order to ascertain the impact of those exercises on the blood pressure levels of older individuals.

## 3. RESULTS

According to the first gathering held at Posyandu Kromolio Pos 3 or Sekolah Lansia Usila Mandiri, a total of 33 old individuals were present. Among them, 31 individuals, accounting for 94% of the attendees,

were female, while the remaining 2 individuals, constituting 6% of the participants, were male. The age distribution of the population can be categorised as follows: individuals between the ages of 45 and 59, referred to as the pre-elderly group, account for a total of 13 individuals. Additionally, there are 11 individuals between the ages of 60 and 69, and 9 individuals who are older than 70 years old.

The blood pressure measurements taken before and after participating in yoga activities during the initial session were classified according to the hypertension standards established by the Ministry of Health. Specifically, blood pressure values below 120/80 mmHg were considered within the normal category. Moreover, the pre-hypertension classification is characterised by systolic blood pressure ranging from 120-139 mmHg or diastolic blood pressure ranging from 80-89 mmHg. Within the subsequent classification, level 1 hypertension is characterised by systolic pressure measurements falling within the range of 140-159 mmHg, or diastolic pressure measurements ranging from 90-99 mmHg. Next, within the final classification, level 2 hypertension is defined as a condition where the systolic pressure exceeds 160 mmHg or the diastolic pressure surpasses 100 mmHg. The distribution of blood pressure measurements before and after a yoga session at the meeting is depicted in the graph below, based on the given categories.

Based on the presented, it is evident that fluctuations in blood pressure are apparent, with instances of both decline and increase. Based on empirical data obtained from examination findings, it was seen that 14 individuals (42%) experienced an elevation in blood pressure, and 19 individuals (58%) shown a decline in blood pressure. The observed reduction in blood pressure can be attributed to the high level of compliance exhibited by the study participants in adhering to the directions provided by the researcher. Hence, the advantages derived from

engaging in yoga practise can yield excellent outcomes (Farhang et al., 2022).

At the second meeting there were 26 elderly people present and the distribution of blood pressure test results was obtained as in the graph below.

Based on the presented, it is evident that fluctuations in blood pressure are detected, characterised by either a fall or an increase. Based on empirical data obtained from the examination findings, it was observed that a subset of older individuals exhibited varying patterns in blood pressure outcomes. Specifically, 3 individuals (12%) demonstrated no discernible alterations in blood pressure levels, while 4 individuals (15%) exhibited an elevation in blood pressure. Conversely, the majority of elderly participants, including 19 individuals (73%), saw a reduction in blood pressure readings. The observed reduction in blood pressure can be attributed to the high level of adherence exhibited by the participants in adhering to the directions provided by the researcher. Therefore, the advantages of engaging in yoga practise can yield excellent outcomes.



Figure 1. All the responden after Yoga



Figure 2. Yoga session

#### 4. DISCUSSION

Based on the aforementioned findings, it was observed that the elderly exhibited a propensity for reduced blood pressure subsequent to engaging in yoga exercise (Bhattacharyya, Andel and Small, 2021). The peripheral vascular system undergoes structural and functional alterations in older individuals, leading to corresponding variations in blood pressure (Serrão *et al.*, 2019). The observed changes encompass arterosclerosis, a decline in the elasticity of connective tissue, and a reduction in the relaxation of smooth muscle in blood vessels. This diminished vascular smooth muscle relaxation leads to a decrease in the ability of blood vessels to distend and stretch (Mardiono, et al., 2023).

The observed reduction in blood pressure can be attributed to the high level of adherence exhibited by the study participants towards the directions provided by the researcher (Zarrin, Turchian and Heckman, 2020). Hence, the advantages derived from engaging in yoga practise can yield excellent outcomes (Loewenthal *et al.*, 2023). Consistent engagement in yoga exercises has the potential to restore equilibrium within the autonomic nervous system, resulting in heightened relaxation and improved regulation of hormones implicated in the elevation of blood pressure, such as adrenaline (Giena, Thongpat and Nitirat, 2018). Engaging in physical exercise has been found to have the potential to elevate blood pressure levels, hence offering a means to reduce blood pressure (Kruisbrink *et al.*, 2021). The elevation in blood pressure is a physiological response aimed at facilitating and sustaining bodily functions. This phenomenon occurs due to heightened blood circulation towards the major muscle groups during physical exertion. However, it is important to note that this rise in blood pressure is transient and of short duration (Crowley, 2011).

The practise of yoga has the potential to induce the secretion of the endorphin hormone. This hormone

serves as an endogenous anxiolytic agent synthesised by the central nervous system, exerting an antihypertensive effect. During physical activity, the release of b-endorphin occurs and it is subsequently caught by receptors located in the hypothalamus and limbic system, which are responsible for regulating emotions. There exists a strong correlation between elevated levels of beta-endorphins and the physiological processes of blood pressure regulation and respiration (Eilat-Adar *et al.*, 2023). Yoga serves as a means of integrating the physical, mental, and spiritual aspects of an individual. Yoga is a holistic practise that integrates various components, including controlled breathing methods, relaxation and meditation, as well as stretching movements (Gluchowski *et al.*, 2022). Yoga is often prescribed as a therapeutic intervention for those diagnosed with hypertension due to its ability to induce a state of relaxation, hence enhancing blood circulation and promoting optimal cardiovascular function (Wahbeh and Nelson, 2019). Regular practise of yoga has been found to have a notable impact on alterations in blood pressure among those diagnosed with hypertension.

The study conducted examined the effects of tera gymnastics on the physical fitness of elderly individuals (Tew *et al.*, 2021). The findings of the research demonstrated that participating in gymnastics had a positive impact on various aspects of health, including pulse stability, blood pressure stability, breathing, and immunoglobulin levels (Spoorenberg *et al.*, 2015). The statistical analysis conducted on the data revealed a significant difference in systolic blood pressure between the elderly individuals in the treatment group and those in the control group (p-value = 0.02, indicating a significance level of < 0.05). This suggests that there are notable disparities in blood pressure levels among the elderly participants who underwent the gymnastics intervention compared to those who did not. The findings of this study are consistent with the research conducted by Setiawan, Greece, and Kusyati

(2014), which demonstrated a moderate negative correlation ( $r = -0.394$ ) between the frequency of elderly gymnastics and pulse rate. This indicates that as the frequency of elderly gymnastics increases, the pulse rate tends to decrease. The statistical analysis revealed a statistically significant association between the frequency of exercise among the elderly and pulse rate ( $p < 0.05$ ).

The elderly individuals who participate in yoga gymnastics activities demonstrate a keen interest in engaging in the activities, actively posing inquiries pertaining to yoga exercises and their potential impact on reducing elevated blood pressure or hypertension. The regular practise of yoga exercises by elderly individuals in Posyandu Kromolio Pos 3 or Sekolah Lansia Usila Mandiri can expedite the reduction of muscle tension, thereby promoting efficient blood circulation. This, in turn, ensures adequate oxygen supply to the brain and contributes to the reduction of blood pressure in the elderly population (Hasan *et al.*, 2022). The elderly individuals who participate in yoga gymnastics activities demonstrate a keen interest in engaging with the activities, actively inquiring about the impact of yoga exercises on reducing elevated blood pressure or hypertension. The regular practise of yoga exercises by elderly individuals in Posyandu Kromolio Pos 3 or Sekolah Lansia Usila Mandiri has the potential to expedite the reduction of muscle tension. This, in turn, facilitates smooth blood circulation and ensures adequate oxygen supply to the brain, ultimately leading to a decrease in blood pressure among the elderly population.

## 5. CONCLUSION

Following the implementation of yoga activities as a form of treatment, a significant reduction in blood pressure was observed among the majority of senior individuals. Consequently, empirical evidence supports the assertion that yoga workouts yield beneficial effects in reducing hypertension among

older individuals. Recommendations have been proposed for the collaboration between Posyandu Kromolio Pos 3 cadres or Sekolah Lansia Usila Mandiri cadres and the responsible puskesmas to establish regular yoga sessions. Additionally, efforts should be made to train instructors from the posyandu who can provide yoga instruction to elderly individuals who are unable to access the elderly posyandu or puskesmas. The objective of this collaboration is to enhance the well-being of the elderly population by mitigating high blood pressure.

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