

THE EFFECTIVENESS OF BUTTERFLY PEA (*CLITORIA TERNATEA*) TEA CONSUMPTION IN REDUCING BLOOD PRESSURE AMONG ELDERLY PATIENTS WITH HYPERTENSION

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Abstract

Hypertension is one of the major health problems among the elderly, which poses a high risk of cardiovascular complications. Non-pharmacological interventions such as the consumption of butterfly pea tea (*Clitoria ternatea*) are considered to have potential in lowering blood pressure. This study aimed to examine the effectiveness of butterfly pea tea in reducing blood pressure among elderly patients with hypertension at the Posyandu Lansia in Mabur. This research employed a pre-experimental design with a one-group pretest-posttest approach. A total of 30 elderly respondents with hypertension participated in the study and were given 200 ml of butterfly pea tea daily for seven consecutive days. Blood pressure measurements were taken before and after the intervention and analyzed using the paired *t*-test. The results revealed a significant decrease in both systolic and diastolic blood pressure. The average systolic pressure decreased by 13.0 mmHg, from 152.3 mmHg to 139.3 mmHg, while the diastolic pressure decreased by 8.03 mmHg, from 93.3 mmHg to 85.27 mmHg. Statistical analysis showed a *p*-value of 0.000 ($p < 0.05$), indicating that butterfly pea tea is effective in reducing blood pressure among elderly patients with hypertension.

Keywords: hypertension, elderly, butterfly pea tea, *Clitoria ternatea*, blood pressure

Abstrak

Hipertensi merupakan salah satu masalah kesehatan utama pada lansia yang berisiko menimbulkan komplikasi kardiovaskular. Upaya non-farmakologis seperti mengonsumsi teh bunga telang (*Clitoria ternatea*) dinilai berpotensi membantu menurunkan tekanan darah. Penelitian ini bertujuan untuk mengetahui efektivitas konsumsi teh bunga telang terhadap penurunan tekanan darah pada lansia penderita hipertensi di Posyandu Lansia Kelurahan Mabur. Penelitian menggunakan desain *pre-experimental* dengan pendekatan *one group pretest-posttest*. Responden penelitian berjumlah 30 orang lansia hipertensi yang diberikan intervensi berupa teh bunga telang sebanyak 200 ml per hari selama tujuh hari. Data tekanan darah diukur sebelum dan sesudah intervensi, kemudian dianalisis menggunakan *dan uji t berpasangan*. Hasil penelitian menunjukkan adanya penurunan signifikan pada tekanan darah sistolik dan diastolik. Rata-rata tekanan darah sistolik menurun sebesar 13.0 mmHg, dari 152.3 mmHg menjadi 139.3 mmHg, sedangkan tekanan darah diastolik menurun sebesar 8.03 mmHg, dari 93.3 mmHg menjadi 85.27 mmHg. Uji statistik menunjukkan nilai $p = 0.000$ ($p < 0.05$), sehingga dapat disimpulkan bahwa teh bunga telang efektif menurunkan tekanan darah pada lansia penderita hipertensi.

Kata kunci: hipertensi, lansia, teh bunga telang, *Clitoria ternatea*, tekanan darah

PENDAHULUAN

Posyandu for the elderly is a community-based health service strategy that aims to improve the health status and quality of life of the elderly through promotive and preventive activities. These activities include early detection of health problems, increasing knowledge, and maintaining the physical, psychological, and social functions of the elderly. Posyandu targets pre-elderly (45–59 years), elderly (≥ 60 years), and high-risk elderly (≥ 70 years or elderly with chronic diseases) (Ministry of Health of the Republic of Indonesia, 2021). Posyandu plays a crucial role because it can reach community groups that often have limited access to formal health services.

One of the most common health problems found in the elderly is hypertension. The WHO (2021) defines hypertension as a condition where systolic blood pressure is ≥ 140 mmHg and/or diastolic blood pressure is ≥ 90 mmHg. This condition is known as *a silent killer* because it often shows no symptoms until it causes serious complications, such as heart disease, kidney disease, or stroke (Aprilia et al., 2023; Suryadi et al., 2024). The global prevalence of hypertension is estimated at 22% of the population, with two-thirds of cases occurring in low- to middle-income countries (Ministry of Health, 2019). In Indonesia, the prevalence of hypertension in those aged ≥ 18 years is 34.1%, with an estimated 63 million cases (Riskesmas, 2018).

The causes of hypertension can be divided into non-modifiable factors, such as age, gender, and family history, and modifiable factors, such as obesity, smoking, alcohol consumption, excessive salt intake, and lack of physical activity (Sulasmi et al., 2023). Uncontrolled hypertension can lead to various complications, including kidney failure, heart failure, and stroke, which significantly impact the quality of life of the elderly.

Hypertension can be controlled with pharmacological and non-pharmacological therapies. Pharmacological therapies, such as antihypertensive medications, are effective but can potentially cause side effects if used long-term. Non-pharmacological alternatives, such as adopting a healthy lifestyle and

utilizing herbal plants, are gaining popularity due to their safety, affordability, and ease of implementation. One herbal plant with significant potential is the butterfly pea flower (*Clitoria ternatea*), which grows abundantly in tropical regions, including Indonesia.

Butterfly pea flowers contain various active compounds, including flavonoids, anthocyanins, saponins, and tannins, which function as antioxidants, anti-inflammatory agents, and antihypertensives (Handito et al., 2022). Anthocyanins in butterfly pea flowers can ward off free radicals and reduce oxidative stress, a mechanism involved in the pathogenesis of hypertension (Sulaiman & Sangging, 2024). Butterfly pea flower tea is a simple and widely accepted form of consumption because it only needs to be brewed like regular tea.

Several studies have demonstrated the positive effects of butterfly pea tea in lowering blood pressure. Aprilia (2023) reported a significant decrease in blood pressure in elderly people after consuming butterfly pea tea in Bantul, while Marwanto (2022) demonstrated a decrease in systolic and diastolic blood pressure in employees of the Yogyakarta Ministry of Health Polytechnic of Health. However, most previous studies were limited to small sample sizes, short intervention periods, and had not been widely conducted at the primary care level, such as the elderly integrated health post (Posyandu). Therefore, this study was conducted to explore the effectiveness of butterfly pea tea in reducing blood pressure in hypertension sufferers at the Elderly Integrated Health Post (Posyandu Lansia) in Mabar Village, Medan Deli District, Medan City. This study is expected to provide additional scientific evidence regarding the potential of butterfly pea tea as a simple, inexpensive, non-pharmacological therapy that can be applied in community-based health services.

Method

This study used a quasi-experimental design with a *one-group pretest–posttest approach* to evaluate the effectiveness of butterfly pea flower tea on lowering blood pressure in elderly people with hypertension. The study was conducted at the Elderly Community Health Post (Posyandu Lansia) in Mabar Village, Medan Deli District, in April 2024.

The study population comprised residents visiting the elderly health post (Posyandu), with *purposive sampling used*. Inclusion criteria included respondents aged ≥ 45 years, having blood pressure ≥ 140 mmHg, not currently taking antihypertensive medication, and being willing to participate in the study. A total of 30 respondents were selected.

The independent variable was the administration of butterfly pea flower tea (*Clitoria ternatea*), while the dependent variable was the respondents' blood pressure. Butterfly pea flower tea was administered at 200 mL/day for 7 days. Blood pressure was measured using a digital sphygmomanometer before and after the intervention. Data were collected through blood pressure measurements and analyzed using a *paired sample t-test* with SPSS. A p-value < 0.05 was set as the significance limit to determine any differences in blood pressure before and after the intervention.

Results and Discussion

Research result

4.1.1 Blood Pressure Data

This blood pressure data is data obtained from blood pressure measurements before and after administration of butterfly pea flower tea (*Clitoria ternatea*) using a digital tensiometer at the elderly health post in Mabar Village.

1. Blood pressure before consuming butterfly pea flower tea (*Clitoria ternatea*)

Based on the research results, the results of the frequency distribution of respondents based on blood pressure before consuming butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu, Mabar Village, were as follows.

Table 4.1 Distribution of respondents' frequency based on systolic blood pressure before consuming butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu, Mabar Village

Systolic Blood Pressure	Frequency	Percentage (%)
Normal High	1	3.3%
Grade 1 Hypertensi	26	86.7%
Grade 2 Hypertensi	3	10.0%
Total	30	100%

Table 4.1 shows that most respondents had systolic blood pressure before consuming butterfly pea flower tea (*Clitoria ternatea*) which was mild hypertension (140-159 mmHg) as many as 26 people (86.7%).

Table 4.2 Distribution of respondents' frequency based on diastolic blood pressure before consuming butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu, Mabar Village

Diastolic Blood Pressure	Frequency	Percentage (%)
Grade 1 Hypertension	27	90.0%
Grade 2 Hypertension	3	10.0%
Total	30	100%

Table 4.2 shows that most respondents had diastolic blood pressure before consuming butterfly pea flower tea (*Clitoria ternatea*) which was mild hypertension (90 - 99 mmHg), namely 27 people (90.0%).

2. Blood pressure after consuming butterfly pea flower tea (*Clitoria ternatea*)

Based on the research results, the results of the frequency distribution of respondents based on blood pressure after consuming butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu, Mabar Village, were as follows.

Table 4.3 Frequency distribution of respondents based on systolic blood pressure after consuming butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu in Mabar Village

Systolic Blood Pressure	Frequency	Presentation (%)
Normal High	16	53.3%
Grade 1 Hypertension	14	46.7%
Total	30	100%

Based on Table 4.3, almost half of the respondents showed that their systolic blood pressure after consuming butterfly pea flower tea (*Clitoria ternatea*) was in the normal hypertension range (130 - 139 mmHg) as many as 16 people (53.3%).

Table 4.4 Distribution of respondent frequency based on diastolic blood pressure after consuming butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu, Mabar Village

Diastolic Blood Pressure	Frequency	Persentase (%)
Normal	13	43,3%
Normal High	16	53,3%
Grade 1 Hypertension	1	3,3%
Total	30	100%

Based on Table 4.4 above, it shows that almost half of them had diastolic blood pressure after consuming butterfly pea flower tea (*Clitoria ternatea*), namely high normal (85-89 mmHg) as many as 16 people (53.3%).

3. Frequency distribution of the effect of consuming butterfly pea flower tea (*Clitoria ternatea*) on reducing blood pressure at the Elderly Posyandu in Mabar Village

Based on the research results, the distribution of blood pressure frequency was obtained before and after giving butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu, Mabar Village.

Table 4.5 Distribution of systolic blood pressure frequency before and after administration of butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu, Mabar Village

Diastolic Blood Pressure	Frequency	Presentation (%)
Hypertension Grade 1 to High Normal	14	46.7%
Hypertension Grade 1 to Hypertension Grade 1	12	40.0%
Hypertension Grade 2 to Hypertension Grade 1	2	6.7%
Hypertension Grade 2 to High Normal	2	6.7%
Total	30	100%

Paired t-statistic test results P = 0.000

Seen from table 4.5, it is known that systolic blood pressure before and after consuming butterfly pea flower tea (*Clitoria ternatea*) with the category Hypertension Grade 2 (160-179 mmHg) to High Normal (130-139 mmHg) as many as 2 respondents (6.7%). The results of the statistical test with the Paired t-test show that the $p = 0.000$ and $\alpha < 0.05$, so H1 is accepted, this means that there is an effect of consuming butterfly pea flower tea (*Clitoria ternatea*) on reducing systolic blood pressure at the Elderly Posyandu, Mabar Village.

Table 4.6 Distribution of diastolic blood pressure frequency before and after administration of butterfly pea flower tea (*Clitoria ternatea*) at the Elderly Posyandu, Mabar Village

Tekanan Darah	Frekuensi	Presentasi (%)
Diastolik		
Hipertensi Derajat 1 ke Normal	10	33,3%
Hipertensi Derajat 1 ke Normal Tinggi	16	53,3%
Hipertensi Derajat 1 ke Hipertensi Derajat 1 Normal Tinggi ke Normal	1	3,3%
Total	30	100%
Hasil Uji Statistik t paired P = 0,000		

Based on Table 4.6, it is known that diastolic blood pressure before and after consuming butterfly pea flower tea (*Clitoria ternatea*) with grade 1 hypertension category became normal for 10 respondents (33.3%). The results of the statistical test with the Paired sample t-test showed a p -value = 0.000 ($p < 0.05$) so that H1 was accepted, this means that there is an effect of consuming butterfly pea flower tea (*Clitoria ternatea*) on reducing diastolic blood pressure at the Elderly Posyandu, Mabar Village.

Discussion

Blood Pressure After Consuming Butterfly Pea Tea (*Clitoria ternatea*)

Participants from the Mabar Village Elderly Posyandu (Posyandu Lansia) consist of three age groups: pre-elderly (aged 45–59), elderly (aged 60 and above), and high-risk elderly, namely those aged 70 and above. The pre-elderly group is an individual who

is entering the transition period towards old age and is beginning to experience physiological changes that have the potential to affect health status. The elderly group includes individuals who have generally experienced a decline in organ function and immune system, thus requiring routine health monitoring. Meanwhile, high-risk elderly are an elderly group that is more susceptible to degenerative diseases and health complications, thus requiring more intensive health attention and intervention. These three groups are the targets of health monitoring and development activities at the Posyandu Lansia to improve quality of life and prevent the emergence of more serious health problems.

Based on the results of the study after consuming butterfly pea flower tea (*Clitoria ternatea*) showed that half of them had high normal hypertension systolic blood pressure (130-139 mmHg) as many as 16 people (53.3%) and almost half had high normal hypertension diastolic blood pressure (85-89 mmHg) as many as 16 people (53.3%). According to researchers, butterfly pea flower tea (*Clitoria ternatea*) drunk every morning for seven days lowered blood pressure in respondents. This is due to its antioxidant content which functions as an antihypertensive. According to (Marpaung, 2020) butterfly pea flowers (*Clitoria ternatea*) are known to have many health benefits, such as *antioxidants, anti-inflammatory, antidiabetic, anti-obesity, antihyperlipidemic, anticancer, analgesic, hepatoprotective, anti-asthmatic, antimicrobial, flavonoid, and anthocyanin*. According to researchers, respondents' blood pressure was able to decrease by up to 40 mmHg because respondents had a strong desire to be able to reduce their high blood pressure, so respondents regularly consumed butterfly pea flower tea.

4.2.2 The Effect of Consuming Butterfly Pea Flower Tea (*Clitoria ternatea*) on Reducing Blood Pressure in Elderly Patients with Hypertension at the Elderly Posyandu in Mabar Village

From the research results, it is known that systolic blood pressure before and after consuming butterfly pea flower tea (*Clitoria ternatea*) with the category of Grade 2 Hypertension (160-179 mmHg) to High Normal (130-139 mmHg) as many as 2 respondents (6.7%), as well as diastolic blood pressure before and after consuming butterfly pea flower tea (*Clitoria ternatea*) with the category Hypertension Grade 1

(90-99 mmHg) to Normal (80-84 mmHg) as many as 10 respondents (33.3%). The results of the statistical test using the paired t test showed a p-value of $0.000 < 0.05$ for systolic blood pressure and a p-value of $0.000 < 0.05$ for diastolic blood pressure, so H1 was accepted, meaning there is an effect of consuming butterfly pea flower tea (*Clitoria ternatea*) on reducing blood pressure in elderly people with hypertension.

Based on the results of the study "Effectiveness of Giving Butterfly Pea Flower Tea (*Clitoria ternatea*) on Reducing Blood Pressure in the Elderly Posyandu in Mabar Village" showed that there was a significant decrease in both systolic and diastolic blood pressure after giving butterfly pea flower tea for seven days. The average decrease in systolic blood pressure before the intervention was 152.3 mmHg, and after the intervention it became 139.3 mmHg. This shows an average decrease of 13.0 mmHg. The average diastolic blood pressure before the intervention was 93.3 mmHg, and after the intervention it became 85.27 mmHg, with an average decrease of 8.03 mmHg.

The results of this study are in line with research by Marwanto (2022) which showed that administering butterfly pea flower tea (*Clitoria ternatea*) significantly reduced systolic and diastolic blood pressure in employees of the Yogyakarta Ministry of Health Polytechnic. The average systolic blood pressure decreased from 137.48 ± 10.47 mmHg to 125.91 ± 14.22 mmHg, and diastolic blood pressure from 88.48 ± 6.36 mmHg to 82.04 ± 7.93 mmHg. The results of the statistical test showed a p value = 0.000 for systolic and p = 0.001 for diastolic, which indicates a significant decrease in blood pressure after the intervention.

The results of this study are also in line with Aprillia's (2023) study entitled the effect of butterfly pea flower tea (*Clitoria ternatea*) on reducing blood pressure in elderly with hypertension in Gilangharjo village, Pandak, Bantul, Yogyakarta, it was concluded that the average frequency of blood pressure before the intervention was 106.11 with a mean difference of 4.74 while the frequency of blood pressure after the intervention obtained an average value of 101.37 with a mean difference of 4.74. After conducting a significance test using the paired t test, it can be concluded that there is an effect of giving butterfly pea flower tea on reducing blood pressure in elderly with hypertension in Gilangharjo village, Pandak, Bantul, Yogyakarta (p = 0.000 < 0.05).

According to researchers, elderly people's blood pressure can decrease because respondents regularly consume 200ml of butterfly pea flower tea (*Clitoria ternatea*) for seven days. According to (Hariadi et al., 2022), butterfly pea flower (*Clitoria ternatea* L.) is one of the plants that helps lower blood pressure due to its high antioxidant content, including saponins and flavonoids, which are compounds that function to treat hypertension. (Maaliki et al., 2019) *Flavonoids* are a diverse group of bioactive *polyphenol compounds* found in many food plants and herbs. Regular consumption of flavonoids has a cardiovascular protective effect and can reduce the onset or development of various cardiovascular diseases, especially hypertension.

Conclusion

The results of this study prove that consuming butterfly pea flower tea (*Clitoria ternatea*) for seven days has a significant effect on reducing blood pressure in elderly people with hypertension at the Elderly Posyandu in Mabar Village. The average decrease in systolic blood pressure was 13.0 mmHg, from 152.3 mmHg before the intervention to 139.3 mmHg after the intervention. Meanwhile, diastolic blood pressure decreased by an average of 8.03 mmHg, from 93.3 mmHg before the intervention to 85.27 mmHg after the intervention. The results of the *paired t-test* showed a p value <0.05, which indicates that the difference is statistically significant.

These findings strengthen empirical evidence that butterfly pea flower tea can be used as an alternative non-pharmacological intervention to control high blood pressure, particularly in the elderly who are vulnerable to complications of hypertension. The flavonoid and antioxidant content of butterfly pea flowers plays a key role in the blood pressure-lowering mechanism by providing cardiovascular protection. Therefore, regular consumption of butterfly pea flower tea has the potential to support hypertension prevention and management in the elderly.

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