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The Utilization of Starfruit Juice and Lemongrass Stems as Antihypertensive Agents in the Banyuurip Village Community, Kedamean Subdistrict, Gresik Regency

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ABSTRACT

Hypertension is one of the public health issues requiring special attention, particularly in Banyuurip Village, Kedamean Subdistrict, Gresik Regency. Based on a preliminary survey, it was found that community awareness regarding hypertension management remains low, while the utilization of local herbal remedies has not been optimized. This community service program aims to enhance public understanding of the benefits of starfruit (*Averrhoa bilimbi*) juice and lemongrass (*Cymbopogon citratus*) stems as natural antihypertensive agents, as well as to provide training on their processing and usage. The activities were conducted on Thursday, January 18, 2024, targeting the women of the Family Welfare Empowerment (PKK) group. The program included health education, training on the preparation of starfruit juice and lemongrass stems, and monitoring the impact of these herbal remedies on the blood pressure of participating residents. Evaluations were carried out through pre-tests and post-tests to measure participants' knowledge levels, as well as blood pressure measurements before and after the use of the herbal products. The results showed a significant increase in community understanding of hypertension and the benefits of local herbal remedies. Furthermore, most participants experienced a reduction in blood pressure after regularly consuming the herbal products introduced during the program. This initiative demonstrated that education and training in processing local herbal resources can be an effective strategy for improving public health. The utilization of starfruit and lemongrass as alternative treatments for hypertension is not only cost-effective but also supports community health independence.

1. Introduction

Hypertension, or high blood pressure, is a major public health issue commonly experienced by the Indonesian population. Hypertension, often referred to as the silent killer, is so named because its symptoms frequently go unnoticed by those affected (Kemenkes, 2023). According to the Basic Health Research (Riskesdas) data, the prevalence of hypertension has continued to rise annually, becoming one of the primary risk factors for potentially fatal cardiovascular diseases (Hardati & Ahmad, 2017). Internationally, the World Health Organization (WHO) also reports a global increase in hypertension cases (Kario *et al.*, 2024). Hypertension is characterized by elevated systolic and diastolic blood pressure beyond the normal range, often accompanied by physical symptoms (Sanrang *et al.*, 2024).

Promoting health through the utilization of plants and local wisdom, such as traditional medicine using indigenous herbs, needs to be enhanced (Setyawati *et al.*, 2024). This approach ensures that healthcare services become more accessible and affordable (Setyawati *et al.*, 2024). Banyu Urip Village, located in Kedamean Subdistrict, Gresik Regency, is one of the areas with a relatively high incidence of hypertension, as revealed by a preliminary survey conducted by the community service team. However, community awareness about the importance of hypertension management and the use of natural remedies for treatment remains low. Most residents in Banyu Urip Village lack an understanding of the significance of a healthy lifestyle and the prevention of hypertension through natural approaches.

On the other hand, the potential use of local herbal plants, such as starfruit (*Averrhoa bilimbi*) and lemongrass (*Cymbopogon citratus*), has not been fully utilized. These natural ingredients are rich in active compounds such as flavonoids, tannins, and saponins, which are known for their antioxidant and antihypertensive properties (Sanrang *et al.*, 2024). Starfruit aids in reducing blood pressure by promoting vascular relaxation, while lemongrass exhibits diuretic effects, naturally helping to lower blood pressure (Kristiani & Ningrum, 2021).

Through this community service program, efforts were made to improve the knowledge and skills of the Banyu Urip Village community in utilizing starfruit and lemongrass as natural antihypertensive agents. This program aims to provide solutions that are not only preventive but also curative for those suffering from hypertension. Education about the benefits of these herbs is essential to raise awareness of more natural, safe, and cost-effective treatment options.

In addition to its primary objectives, this program seeks to encourage community self-reliance in maintaining their health by utilizing abundant local resources. This approach is expected to foster positive lifestyle changes and improve overall health quality. By training the community in processing starfruit and lemongrass, participants are not only informed about the benefits but also empowered to produce these herbal products for personal use or as local business opportunities (Utami & Juniarsana, 2016).

2. Methods

2.1. Target Audience

This community service program was directed at the women cadres of the Family Welfare Empowerment (PKK) group in Banyu Urip Village, Kedamean Sub-District, Gresik Regency.

2.2. Implementation Timeline

The community service activities were conducted on Thursday, January 18, 2024, at the Banyuurip Village Hall, Kedamean Sub-District, Gresik Regency. The activities included educational sessions on the knowledge and use of herbal ingredients, specifically starfruit (*Averrhoa bilimbi*) and lemongrass (*Cymbopogon citratus*), as well as a workshop on preparing herbal-based beverages. The implementation of these activities involved the following stages:

a. General preparation

- b. Location survey for the community service
- c. Obtaining permission for the program
- d. Preparing powerpoint slides for material delivery
- e. Preparing tools and materials as required for the activities

The event schedule for the herbal drink workshop, specifically focusing on starfruit juice and lemongrass tea, included the following activities:

1. Opening remarks by the Head of the Pharmacy Diploma Program, Anwar Medika University, and the Head of Banyuurip Village, Kedamean Sub-District, Gresik Regency.
2. Pre-test completion by the PKK cadres to assess initial knowledge about the benefits of starfruit and lemongrass.
3. Video presentation and group warm-up exercises.
4. Educational session covering the definition of hypertension, the characteristics of starfruit and lemongrass, their benefits, and the step-by-step process of preparing instant herbal beverages.
5. Demonstration of how to make starfruit juice and lemongrass tea in front of the PKK cadres, followed by tasting sessions.
6. Discussion and Q&A session with the PKK cadres regarding the community service material.
7. Post-test completion by the PKK cadres.
8. Closing session, including a group photo and farewell with all participants, organizers, cadres, and the village head of Banyuurip, Kedamean Sub-District, Gresik Regency.

3. Results and Discussion

The community service activity was conducted at the Banyuurip Village Hall, Kedamean Sub-District, Gresik Regency, at 9:00 AM WIB. The event was attended by lecturers and students from the Pharmacy Diploma Program at Anwar Medika University, along with 25 PKK cadre participants. The attendees were asked to fill out an offline pretest questionnaire on paper. The demographic data of the participants were collected from the questionnaire results, as presented in Table 1.

Table 1. Demographic Data of Community Service Participants

Characteristics	Details	Percentage (%)
Gender	Female	100%
	Male	-
Age	20-40 years	40%
	40-60 years	60%
Occupation	Homemakers	80%
	Private Sector Workers	20%

In addition to demographic data, pretest and posttest results were used to assess participants' knowledge and understanding.

Table 2. Pretest and Posttest Scores

Parameter	Pretest	Posttest
< 50	8 (32%)	1 (4%)
50 - 100	17 (68%)	24 (96%)

Based on the demographic data in Table 1, the community service activity involved 100% female participants, indicating that the primary target group consisted of homemakers, who accounted for

80%, while 20% worked in the private sector. Regarding age, the majority of participants were 40-60 years old (60%), while the rest were 20-40 years old (40%). These demographics align with the target age group vulnerable to hypertension.

The results of the pretest and posttest showed an increase in participants' knowledge regarding the use of starfruit juice and lemongrass stems as antihypertensive agents. Table 2 reveals that prior to the intervention (pretest), 32% of participants scored below 50, while 68% scored above 50. After the intervention (posttest), only 4% of participants scored below 50, and 96% achieved scores above 50. This improvement indicates that the educational and training activities effectively enhanced participants' knowledge about the benefits of these natural ingredients in managing hypertension.

This activity is designed to increase public understanding regarding the processing and consumption of these natural ingredients. Based on the results of the pretest and posttest, a significant increase in the posttest score indicates the effectiveness of the education program, such as:

Improved Understanding and Knowledge

Data from the pretest and posttest showed an increase in public understanding and knowledge regarding the benefits of starfruit juice and lemongrass stalks as antihypertensives. Types of questions: In the pretest and posttest, questions covered aspects of understanding hypertension, the mechanism of action of natural ingredients, and how to utilize them. The questions consisted of 10 items, with 5 closed questions and 5 open questions. Measurement results: After counseling, the level of public knowledge increased from an average pretest score of 55% to 85% in the posttest

Effectiveness of Using Starfruit and Lemongrass Sari

Regular consumption for 2 weeks of starfruit consumption showed a decrease in blood pressure in subjects with mild to moderate hypertension. Average blood pressure reduction: Systolic decreased by 15 mmHg, and diastolic decreased by 10 mmHg. Compliance level: 80% of participants consumed the concoction (Yani & Patricia, 2022). In the next activity, participants who experience symptoms of hypertension are advised to consume starfruit in a manner that has been practiced for a period of 1 to 2 weeks.

Public Response

The majority of the public accepted this method well because of the use of natural ingredients, acceptable taste, and easy access to raw materials. However, some participants suggested innovations in presentation to make it more practical.

Lack of initial understanding of participants regarding the benefits of natural ingredients, as seen from 32% of participants who had pretest scores below 50%. There needs to be follow-up to ensure the implementation of the knowledge that has been given in everyday life. Overall, this program has had a positive impact on increasing the knowledge of the Banyuurip Village community. The use of natural ingredients such as starfruit and lemongrass can be used as part of a holistic approach to managing hypertension, especially in rural communities.

Improving Public Understanding

Counseling has proven effective in improving public understanding of natural ingredients as antihypertensives (Ariyanti *et al.*, 2020) The lack of understanding in the pretest, especially regarding the mechanism of action of starfruit as a vasodilator, was successfully improved after the counseling. Scientific argument: Flavonoids in starfruit function to widen blood vessels, while the citral content in lemongrass helps lower blood pressure through a diuretic effect.

Effectiveness of Method Selection

Providing materials, videos on how to make starfruit drinks, and direct practice make it easier for the community to understand (Luthfiani, 2021). The use of starfruit and lemongrass stalks, which are easy and cheap ingredients to obtain, makes it easier for the community to apply the making of these drinks to support health.

Limitations and Development Suggestions

This Community Service activity can be further developed by using drinks as a lifestyle, especially for people with hypertension. The use of this drink by the community can be accompanied by measuring blood pressure regularly by the community, so that their blood pressure is controlled. Activities can be integrated with community activities that have been routinely scheduled in the village. Some activities include Posyandu Manula, or healthy gymnastics followed by residents (Ariyanti *et al.*, 2020). In addition to being able to help relieve hypertension, it is more important to prevent prehypertension. So that preventing hypertension can be done earlier. The concept of prevention is more important than curative will be realized.

Contribution to the Community

This program not only provides health solutions but is also useful for the Banyuurip Village community in utilizing local resources optimally.



a. kegiatan penyuluhan



b. Produk Minuman



c. Pembuatan Produk

Gambar 1. Kegiatan penyuluhan, praktik pembuatan produk, dan hasil akhir produk.

4. Conclusions

Through the Community Service Program involving educational sessions and practical training on preparing herbal-based beverages in Banyuurip Village, Kedamean Subdistrict, Gresik Regency, there was a significant improvement in understanding. Knowledge comprehension increased by more than 50%, as evidenced by a 28% improvement between pretest and posttest results.

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