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Health cadre empowerment to use herbal plants for therapy and health in Girirejo Village, Imogiri, Bantul

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ABSTRACT

Introduction: The high rate of obesity and hypertension in the productive age group demands special attention from various parties for early detection and treatment, which can be accomplished by empowering village health cadres. This community service program is intended to increase knowledge and skills in the use of herbal plants for therapy and health among health cadres in Girirejo Village, Imogiri, Bantul.

Methods: This study, done as part of a community service program in September 2023, included 42 health cadres (women aged 25-62 years) from Girirejo Village, Imogiri, Bantul, Yogyakarta. Participants learned about the therapeutic and physiological benefits of using herbal plants. The materials delivered included identifying various herbal materials, making herbal combinations, and employing therapeutic plants for health purposes. Pre- and post-tests were given before and after education. Training is provided through the practice of making herbal infusions. Statistical analysis uses the paired *t*-test.

Results: The results revealed a significant difference ($p<0.001$) in the mean pre-test (64.50 ± 15.23) and post-test (80.75 ± 15.21). This suggests that this education can help health cadres learn more about knowledge and the utilization of herbal plants.

Conclusion: The study concluded that this community service program might increase understanding and skills of the use of herbal plants for the health of Health Cadres in Girirejo Village. Participants indicated their satisfaction with the program's implementation. It is proposed that a new Community Service Strategic Plan, which includes Girirejo Village Health Cadres, be designed as a structured, innovative, and forward-thinking program plan to strengthen the empowerment of health cadres and the natural potential of local wisdom.

Keywords: Health cadres; empowerment; herbal plants; therapy; community service.
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INTRODUCTION

The results of health screening in the 2021 Community Service Program by analysing the nutritional status of the productive age people in Pajimatan Hamlet indicated that overweight and obesity were quite common among participants, both men and women. Women with central obesity were higher than men (70% vs. 38.5%; $p<0.05$). Aside from that, the prevalence of prehypertension in men is exceedingly high (46.2% vs 15% in women), on the other hand, women seemed to be higher in hypertension I and II than men (40% vs 30.8%, $p<0.05$). In addition, type-2 diabetes was also found in women (7.5%) and men (7.7%).[1]

Pajimatan Hamlet is one of the five hamlets located in Girirejo Village, Imogiri District, Bantul Regency. While Girirejo Village is one of eight villages in Imogiri District's administrative territory, located east of the district's centre.[2,3] The majority of the population makes a living as farmers and non-permanent laborers, with only a small portion working for large corporations or as government employees. The Girirejo Village region is rural, located on the fringes of the sub-district city and approximately 1 km from the District Office. The natural rural setting is still well preserved; many residences have huge yards with numerous large trees. There are also various rice fields and gardens in the midst of residential neighbourhoods.

The high prevalence of obesity and hypertension in Pajimatan Hamlet's productive age population necessitates immediate evaluation and treatment by various parties, as obesity and hypertension are risk factors for a variety of diseases, including cardiovascular,[4,5] metabolic syndrome,[6-8] cancer, and others.[9]

Following the completion of the steps, beginning with screening, risk factor identification, risk factor education, and therapy. So, in order to sustain the program in the community and empower the community, adequate provision of health knowledge and treatment is required through the use of the surrounding natural

resources that constitute local wisdom, namely, the many herbal plants that are abundant in the community. Herbal plants contain various bioactive components, including polyphenols, pigments, secondary metabolites, and some vitamins, which provide extensive health advantages via specific mechanisms.[10] Therefore, the objective of this community service program is to provide knowledge and training on the therapeutic and medicinal benefits of herbal plants. This community service program's goal has been expanded to include village-level health cadres.

Village Health Cadres play a vital part in the community's health care. Apart from the robust intensity of connection with the community, Health Cadres serve as role models in the health sector, with the intention that this will be propagated to families and larger village communities, making it more acceptable to the community. Local health role models are projected to improve program efficiency and empower village populations through education and training. The purpose of this community service and research is to educate health cadres in Girirejo Village, Imogiri, Bantul, on the use of herbal plants for therapy and health.

METHODS

Participants

The subjects were 42 village health cadres selected randomly from about 80 health cadres in Girirejo Village. Village health cadres were appointed by the village government with inclusion criteria including: village cadre, adult age (18-65 years), living in the Girirejo Village, Imogiri, Bantul, willing to participate in education and training till completion, as evidenced by signing an informed consent. Being unwell can prevent one from participating in community service and research initiatives. The activity took place on September, 2023 at the Posyandu Podhang Building, Taman Mutiara Toga, Girirejo Village, Imogiri, Bantul. The Medical Research Ethics Committee of the Faculty of Medicine, Public Health, and Nursing Universitas Gadjah Mada approved the ethical clearance with the number: KE/FK/1244/EC/2023.

Steps of the Community Service Program and Research

The detailed way of the community service and research is as follows: 1) Pre-test questionnaire to assess knowledge of herbal plants. 2) Information and instruction on herbal plants for therapy and health. 3) Assess knowledge of herbal plants and the usage following education and training. 4) Post-test and participation feedback.

The activity began with participant registration and a pre-test, followed by education via class presentations and discussions that included materials such as recognizing different types of herbal ingredients, a guide to making herbal mixtures, using herbal plants for health, and making herbal infusions. Following teaching, participants take a post-test and then receive training on preparing infused water with herbal ingredients and fruit. Pre- and post-test materials included 20 multiple-choice questions given in 10 minutes, covering basic understanding of herbal plants, their application for health, and how to make herbal infusions. Each question carries 5 points, for a total of 100 points. Examples of questions: "Which fruit is a kind of herbal fruit? a) mango, b) bell fruit, c) noni, d) snake fruit, e) ambarella fruit"; "Which of the following ingredients are not suitable for making infused water? a) durian, b) ginger, c) kiwi, d) cucumber, e) cinnamon". The pre-test and post-test scores were compared and examined. The increasing post-test score indicates that the participants' knowledge has increased.

The activity of preparing infused water was fascinating; participants prepared and combined their own ingredients (fruits and herbs) based on their preferences and the information offered during the lesson. Participants' infused water was prepared using infused water tumblers provided at registration at the start of the meeting as a form of compensation for attendance. Because infused water takes an extended time to prepare before it is ready for consumption, the Community Service team has offered different types of infused water that are ready to drink so that participants can sample the flavour of ready-to-drink infused water. At the end of the program, a discussion session was held to solicit input, and participants were given a formula that included a partner satisfaction survey.

Statistical analysis

The Shapiro-Wilk test was used to evaluate the normal distribution. The paired *t*-test was used in statistical analysis to compare knowledge levels before and after education and training. A significance level of <0.05 was deemed significant. The data were processed with the SPSS program (version 25).

RESULTS

On September 17, 2023, 42 health cadres aged 25 to 62 years participated in the community service event; however, only 40 cadres followed both the pre-test and post-test. Characteristics of the participants were presented in Table 1. All participants were females with an average age of 45.3 (±7.4) years. The majority of participants were self-employed (42.5%), followed by housewives (27.5%, business owners (22.5%), and private employees (7.5%). Using the Shapiro-Wilk test, the pre-test was normally distributed, but the post-test was not. The results of the pre- and post-test were summarized in Table 2.

The minimum pre-test score was 25, the highest was 85, and the minimum post-test score was 40, with a maximum of 95. The paired *t*-test results indicated a significant difference in the mean pre-test and post-test scores of individuals ($p<0.001$).

The findings of the feedback survey showed that the average for questions 1–10 is between 4 and 5 (4= agree; 5= strongly agree), with the exception of issue 5, which was 3.21 (3= neutral; 4= agree) as shown in Table 3. This demonstrated that the majority of participants agreed or strongly agreed, with the exception of issue 5 on the program's sustainability after Community Service, as depicted in Figure 1 with the spider web graph of partner satisfaction scores for the ten items in the survey.

DISCUSSION

The 2023 Community Service Program in Girirejo Village, Imogiri, Bantul, is the third year of the Community Service Plan, which focuses on health risk factor

prevention and rehabilitation to promote healthy living. Forty-two health cadres aged 25 to 62 years participated in the community service and research activity; however, only 40 cadres (all females) completed the pre-test and post-test entirely, with 39 collecting the feedback survey. The paired t-test results show a significant difference in mean pre- and post-test scores across subjects ($p<0.001$). This suggests that this education has the potential to increase the understanding of herbal plant use among health cadres in Girirejo Village.

The materials provided include: identifying different types of herbal components, a guide to preparing herbal mixtures, the use of medicinal plants for health, and making herbal infusions, all of which can pique participants' interest and encourage them to participate enthusiastically in the activity. The Posyandu Podhang Building, which hosted the community service event, was also very helpful because, in addition to being environmentally friendly, a living pharmacy park, Taman Mutiara Toga, was built adjacent to the Posyandu Podhang Building and now serves as a model pharmacy park for Girirejo Village. Mutiara Toga Park offers a wide range of herbal plants, including betel trees, saucer leaves, cat's whiskers, devil's horsewhip, butterfly pea flowers, bay leaves, lemongrass, red ginger, cat's tail, purple leaves, kejibeling, willow, Chinese Croton (*sambang darah*), gondola red, bitter, and more. Mutiara Toga Park has a variety of herbal plants that participants can identify and examine. Figures 2 and 3 demonstrate the enthusiasm of participants in contributing to the community service and the study.

However, this time, the Community Service program did not emphasize the prescription of these herbal plants for medication. This is because, in order to prescribe herbal plants as medicine, participants must have a thorough understanding of both herbalism as medicine and therapy. Given that village health cadres are the first to be involved in this Community Service program, a new strategic plan incorporating these health cadres is required to achieve maximum and more effective community empowerment in the use of herbal plants as medicine.

To promote the empowerment of health cadres, this initiative provides knowledge and training on how to prepare infused water using herbal ingredients and fruits. Infused water not only enhances the taste of drinking water but also contains micronutrient extracts from natural herbs and fruits, making it highly beneficial for overall health. Additionally, infused water can stimulate the desire to drink, ensuring that the essential daily hydration

Table 1. Characteristics of participants

No	Variable	Value
1.	Age (years; means ±SD)	45.3 (±7.4)
2.	Gender:	
	Female (n, %)	40 (100%)
	Male (n, %)	0
3.	Occupation:	
	Self-employed	17 (42.5 %)
	Business	9 (22.5 %)
	Private employees	3 (7.5 %)
	Housewife	11 (27.5 %)
4.	Normality distribution test:[a]	
	Pre-test (p)	0.236*
	Post-test (p)	0.000

SD: standard deviation; a: Shapiro-Wilk test; *$p>0.05$ indicates normal distribution

Table 2. Paired *t*-test of participants' pre-test and post-test scores (n = 40)

Score	Pre-test	Post-test	*p*
Minimum	25	40	
Maximum	85	95	
Range	60	55	
Means (SD)	64.50 (15,23)	80.75 (15,21)	<0.001**

SD: standard deviation

Table 3. Feedback from participants regarding the Community Service Program

No	Question	Score				
		Min	Max	Median	Modus	Means
1	The programs can improve our past conditions.	3	5	4	4	4.38
2	The program meets our needs.	4	5	4	4	4.46
3	The program is able to increase the local potential of our area.	3	5	4	4	4.33
4	We benefit from the community service.	4	5	4	4	4.44
5	We can continue the program without assistance from the Service Community Team.	1	5	4	4	3.21
6	The program helps us become independent.	2	5	4	4	4.13
7	We actively participate in this program.	2	5	4	4	4.08
8	The program promotes respect for community conventions and values.	3	5	4	4	4.26
9	The Community Service Team behaves politely, kindly and honestly.	4	5	5	5	4.64
10	The Community Service Team responded to our needs well and professionally.	4	5	5	5	4.59

Note: N= 39; min= minimum; max= maximum; score 1 = strongly disagree; score 2 = disagree; score 3 = neutral; score 4 = agree; score 5= strongly agree

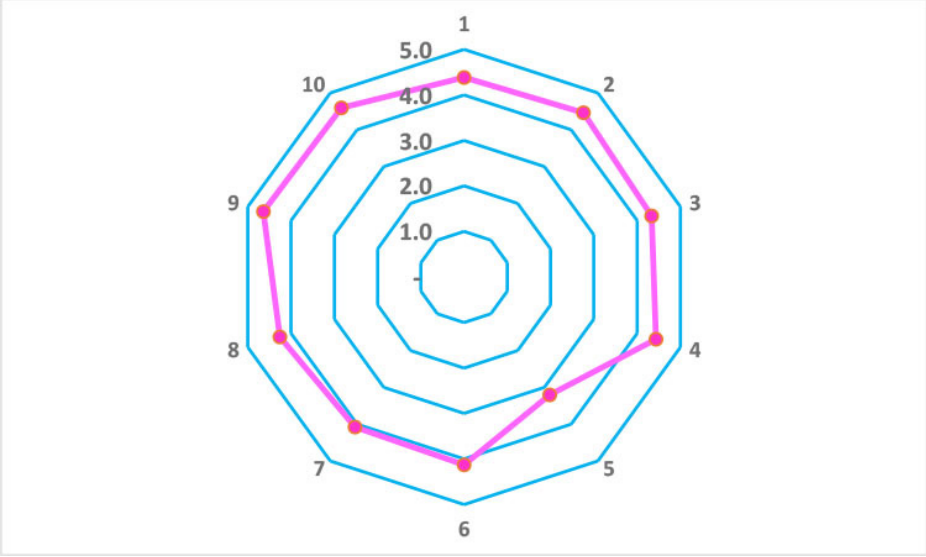

Figure 1. Spider web graph reflecting participants' feedback for the Community Service program.

Figure 2. Implementation of the Community Service Program.

needs are met. Fruits and herbs contain a variety of phytochemicals that can be released through a process known as water infusion, in which the materials are steeped in water for a specific duration. Phytochemical compounds that can be extracted using water include flavonoids (such as naringenin, quercetin, kaempferol, and apigenin), phenolic compounds (including curcumin, chlorogenic acid, gallic acid, and hydroxybenzoic acid), carotenoids (such as β-carotene, lycopene, and lutein), and alkaloids (such as theobromine). These compounds possess a wide range of therapeutic properties, including antioxidant, antidiabetic, anti-inflammatory, antihypertensive, anticancer, and antimicrobial activities.[11] Regular consumption of 250 ml of herbal infused water, which contains 12,769 ppm of total antioxidant activity, over 14 days has been shown to benefit body weight reduction in patients with metabolic syndrome.[12]

This Community Service program offers a wide range of herbal and fruit ingredients to make infuse water, including ginger, turmeric, cloves, cinnamon, lemongrass, and mint leaves for herbal types, as well as apples, Sunkist oranges, mandarins, lemons, limes, cucumber, watermelon, kiwi, grapes, pear, pineapple, dates, and star fruit for fruits.

Participants were encouraged to mix infused water based on their preferred benefits and flavours, using the infused water tumbler provided as a gift. Figure 4 shows herb and fruit materials for infused water. To get the most out of infused water, specific conditions must be met, such as composition, proportion, immersion time, and temperature (room temperature or in a fridge). For example, a study utilizing lemon (*Citrus lemon*) and red ginger (*Zingiber officinale* Roxb. var. Rubrum) discovered that a 6-hour immersion in a refrigerator with a specific composition resulted in the highest organoleptic test score.[13] Since infused water cannot be consumed immediately and must be stored for several hours, the Community Service Team also provides several types of infused water made from herbal and fruit ingredients that are prepared late at night/early in the morning and consumed at the time of implementation. In this way, participants can taste and experience some infused waters that are ready, with the intention that they would acquire an interest and passion for infused water after discovering its flavour.

Despite the popularity and widespread enjoyment of herbal-infused water beverages, caution should be exercised due to potential natural contaminants, such as mycotoxins, which may be prevalent in herbs and pose significant food safety and public health concerns. However, Caldeiro et al.[14] found that the levels of mycotoxins in herbal-infused water are substantially lower than those in dried herbs. Additional concerns include secondary metabolites produced by herbal plants that may be mutagenic, genotoxic, or carcinogenic, as well as issues related to the health, safety, and quality of these products. Since most herbal plants are sourced from wild stocks, intrinsic and extrinsic factors—such as biotic and abiotic influences, as well as geographical

Figure 3. Implementation of the Community Service Program (pre- and post-tests).

Figure 4. Implementation of the Community Service Program (infused water preparation).

variations—affect the production of phytochemical constituents.[15]

In addition to completing the post-test, participants were asked to complete a feedback survey form consisting of 10 Likert scale items about program implementation (ranging from strongly disagree = 1 and strongly agree = 5). The findings of the feedback survey show that the average score for questions 1-10 is between 4 and 5 (4 = agree; 5 = strongly agree), with the exception of issue 5, which has a score of 3.21 (3 = neutral; 4 = agree). This indicates that the majority of participants agreed or strongly agreed, with the exception of issue 5, which addressed the program's sustainability following Community Service. Some participants were concerned about their ability to complete the program without the support of the Community Service team. This can be understood and possibly influenced by the involvement of participants, i.e., health cadres, who are the first to be involved in this series of Community Service programs, despite the fact that the program is currently in its third and final year, having been implemented in Girirejo Village since 2021. In 2021 and 2022, productive-aged residents of Pajimatan/North Payaman Hamlet, Girirejo Village, participated in community service. Because Community Service efforts revealed a high occurrence of a variety of health risk factors in the community, this program was established to provide health risk factor education and therapy.

The final year of the strategic plan, 2023, is designed to provide education and training on the usage of herbal plants with substantial local potential in Girirejo Village, which can be used to prevent and treat a variety of diseases/health problems in the community. Yet, the limited number of the health cadres and the research region which only included one hamlet, restricted the potential for generalisation of the findings. However, it is intended that by incorporating village health cadres, the Girirejo Village Community would be greater empowered, as health cadres are members of the village apparatus working group closest to the community and engage with it on a daily basis, such as during Posyandu events.

CONCLUSIONS

Finally, this community service program will significantly improve Girirejo Village Health Cadres' knowledge of the utilization of herbal plants for health advantages. The vast majority of participants agreed, strongly agreed, and praised the program's implementation. However, participant response suggests that the sustainability of program implementation without the support of the Community Service Team is less convincing than general implementation. As a result, it is proposed that a new strategic plan for Community Service, which includes Girirejo Village Health Cadres, be developed as a structured, innovative, and forward-thinking program to enhance community empowerment and local potential.

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CONFLICT OF INTEREST

There are no conflicts of interest to declare.

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AUTHOR CONTRIBUTION

JH contributes to concepts, design, definition of intellectual content, literature search, data acquisition, data analysis, and statistical analysis, manuscript preparation, editing, and review, as well as guarantor. NTR contributes to concepts, design, definition of intellectual content, data acquisition and analysis, manuscript editing and review. While, EPS contributes to concepts, design, definition of intellectual content, manuscript editing and review, as well as guarantor.

REFERENCES

1. Hastuti J and Rahmawati NT. Improving knowledge of healthy lifestyles using social media and health screening of productive age population in Pajimatan Hamlet, Imogiri, Bantul. JCOEMPH. 2023; 6 (2): 80-86. Doi: https://doi.org/10.22146/jcoemph.77258
2. Badan Pusat Statistik Kabupaten Bantul. Kecamatan Imogiri Dalam Angka 2016. Bantul: Badan Pusat Statistik Kabupaten Bantul; 2016 [cited 2023 September 17th]. Available from https://bantulkab.bps.go.id/publication/2016/07/29/a231338e97da6724bd0566e7/kecamatan-imogiri-dalam-angka-2016.html.
3. Badan Pusat Statistik Kabupaten Bantul. Statistik Daerah Kabupaten Bantul 2020. Bantul: Badan Pusat Statistik Kabupaten Bantul; 2016 [cited 2023 September 17th]. Available from https://bantulkab.bps.go.id/publication/2020/12/21/cdd18fe8ee1c1da21ebc6576/statistik-daerah-kabupaten-bantul-2020.html.
4. Macek P, Biskup M, Terek-Derszniak M, Krol H, Smok-Kalwat J, Gozdz S, *et al*. Optimal cut-off values for anthropometric measures of obesity in screening for cardiometabolic disorders in adults. Sci Report. 2020; 10 (1): 11253. Doi: 10.1038/s41598-020-68265-y.
5. Tian T, Zhang J, Zhu Q, Xie W, Wang Y, Dai Y. Predicting value of five anthropometric measures in metabolic syndrome among Jiangsu Province, China. BMC Public Health. 2020; 20 (1): 1317. Doi: 10.1186/s12889-020-09423-9.
6. Zhang X, Wang Y, Brinkley JS, Oniffrey TM, Zhang R, Chen G, Li R, *et al*. Eating frequency is not associated with obesity in Chinese Adults. Int J Environ Res Public Health. 2020; 15 (11): 2561. Doi: 10.3390/ijerph15112561.
7. Głuszek S, Ciesla E, Głuszek-Osuch M, Kozieł D, Kiebzak W, Wypchło Ł, *et al*. Anthropometric indices and cut-off points in the diagnosis of metabolic disorders. PLoS ONE. 2020; 15 (6): e0235121. Doi: 10.1371/journal.pone.0235121.
8. Lee BJ and Yim MH. Comparison of anthropometric and body composition indices in the identification of metabolic risk factors. Sci Report. 2021; 11 (1): 9931. Doi: 10.1038/s41598-021-89422-x.
9. World Health Organization. Obesity and overweight 2022 [Updated 2021 June 19; cited 2022 January 15]. Available from https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight
10. Farzaneh V and Carvalho IS. (2015). A review of the health benefit potentials of herbal plant infusions and their mechanism of actions. Ind Crops and Prod. 2015; 65:247-258.
11. Thiagarajah K, Ong MK, Teh LK, Lye HS. Plants infused water as preferred Hhealthy drinks, Editor(s): Grumezescu AM, Holban AM. Bottled and Packaged Water. Woodhead Publishing: 2019; 367-402, ISBN 9780128152720, https://doi.org/10.1016/B978-0-12-815272-0.00013-1. (https://www.sciencedirect.com/science/article/pii/B9780128152720000131)
12. Purwanti A, Sugiarto S, Indarto D. The effects of combined fruit-infused water (apple, pineapple, strawberry, cucumber) on blood pressure and fasting blood glucose in patients with metabolic syndrome. Amerta Nutrition. 2021.
13. Munir NF and Munir N. Infused Water Jeruk Lemon (*Citrus lemon*) dan Jahe Merah (*Zingiber officinale* Roxb.Var. Rubrum). 2020.
14. Caldeirão L, Sousa J, Nunes LCG, Godoy HT, Fernandes JO, Cunha SC. Herbs and herbal infusions: Determination of natural contaminants (mycotoxins and trace elements) and evaluation of their exposure. Food Res Int. 2021; 144:110322. Doi: 10.1016/j.foodres.2021.110322.
15. van Wyk AS and Prinsloo G. (2020). Health, safety and quality concerns of plant-based traditional medicines and herbal remedies. S Afr J Bot. 2020; 133: 54-62.