ORIGINAL ARTICLE

Journal of Community Empowerment for Health (*JCOEMPH*) 2025, Volume 8, Number 2: 61-67
P-ISSN. 2655-0164, E-ISSN: 2654-8283

Improving literacy about the cultivation and utilization of family medicinal plants in Blunyahrejo Village, Yogyakarta City

Mae Sri Hartati Wahyuningsih[1,2], Ifa Najiyati[3,4], Sri Peni Wastutiningsih[5], Setyo Purwono[1,2], Retna Siwi Padmawati[3,6*]

[1]Department of Pharmacology and Therapy, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia;
[2]Center of Herbal Medicine, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia;
[3]Center of Health Behavior and Promotion, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia;
[4]School of Public Health, Faculty of Health Sciences, Universitas Jenderal Soedirman, Purwokerto, Indonesia;
[5]Department of Agricultural Socio-Economic, Faculty of Agriculture, Universitas Gadjah Mada, Yogyakarta, Indonesia;
[6]Department of Health Behavior, Environment, and Social Medicine; Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia.

*Corresponding author:
Retna Siwi Padmawati;
Center of Health Promotion and Behavior, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Jl. Farmako, Sekip Utara, Yogyakarta 55281, Indonesia;
rspadmawati@ugm.ac.id

Submitted: 2023-03-02
Revised: 2024-12-11
Accepted: 2025-02-10

ABSTRACT

Introduction: During the COVID-19 pandemic, Indonesian society used family medicinal plants to prevent infection by enhancing immunity. Consumption of medicinal plants as herbal medicine should have scientific consideration so that the benefits can be proven and do not cause harmful side effects. Cultivation of medicinal plants is necessary to meet the needs of family's medicinal plants independently.

Methods: We designed a community-based education to improve literacy about the cultivation and utilization of family medicinal plants to farmer groups at Blunyahrejo, Yogyakarta. The study used a quasi-experimental research design with a one-group pre-post-test design. The group received an intervention in the form of training on the use and cultivation of medicinal plants. Community literacy was measured before and after participants attended the training. The 1st post-test was conducted right after the training, and the 2nd post-test was carried out after 3 months of intervention. The data were analyzed by a paired t-test.

Results: The total number of participants who participated was 28. Observations have also been done during and after the training. The study showed that there was an increase in knowledge about the cultivation and utilization of family medicinal plants between the pre-test and 1st post-test, 1st post-test and 2nd post-test, and the pre-test and 2nd post-test (9.96%; 1.98%; 12.04%).

Conclusion: The training improved the literacy about the cultivation and utilization of family medicinal plants of the farmer group in Blunyahrejo, Yogyakarta. Although the number of participants was quite small, participants showed a positive response during and after the training. Community leaders often reported the activities of farmer groups that showed enthusiasm for maintaining and continuing the cultivation of medicinal plants after the training.

Keywords: Medicinal plants; literacy improvement; medicinal plants cultivation; medicinal plants utilization; training.
Cite This Article: Wahyuningsih, M.S.H., Najiyati, I., Wastutiningsih, S.P., Purwono, S., Padmawati, R.S. 2025. Improving literacy about the cultivation and utilization of family medicinal plants in Blunyahrejo Village, Yogyakarta City. *Journal of Community Empowerment for Health* 8(2): 61-67. DOI: 10.22146/jcoemph.82763

INTRODUCTION

Indonesia has a wide variety of plant species and natural materials that are used as medicinal plants.[1] The Indonesian government is currently promoting various programs related to improving public health through the use of medicinal plants, including traditional health efforts through self-care utilising family medicine gardens and skills. It is a community program related to the use of home-based cultivated plants that have medicinal properties, independently by individuals within a family or group. Some examples of family medicinal plants are ginger, turmeric, basil, galangal, lemongrass, bitter, and many more.[2]

Yogyakarta City has a land area of around 32.5 km², which has the opportunity to be utilized and developed as intensive and modern agricultural land. Urban areas have relatively narrow land for farming. The Yogyakarta city government took the initiative to encourage residents to use their land for farming. Urban farming offers alternative land uses to integrate multiple land functions in densely populated areas.[3,4] The cultivation of family medicinal plants can be an option for urban communities to farm because it requires less land, for example, in the yard. Aside from that, the maintenance is more practical, and it does not require extra care, such as ornamental plants.[5]

Over the years, researchers have been finding out the importance of medicinal plants and trying to raise public awareness of their potential benefits. These efforts have resulted in a significant increase in community knowledge and integration of medicinal plants into traditional healthcare practices. The cultivation of family medicinal plants is very beneficial in meeting the needs of family medicine. Family medicinal plants are useful when a family member gets sick suddenly.[5] Furthermore, the use of family

medicinal plants does not require costs because they are available around the house. Communities can also sell family medicinal plants, thereby increasing family income.[6]

Family medicinal plants are consumed to boost immunity during a pandemic. This caused the selling value of medicinal plants to increase significantly.[7] The Ministry of Health of the Republic of Indonesia through the Directorate General of Health Services sent Circular number HK.02.02/IV/2243/2020 to governors, regents/mayors throughout Indonesia to utilize traditional medicines for health care, disease prevention and health care without ignoring health protocols and continue to practice a Clean and Healthy Lifestyle.[8]

However, gaps still exist in the use of family medicinal plants, especially in ensuring that the knowledge is scientifically validated and widely accessible. People who use family medicinal plants for health are based on the perception that it is safe without side effects.[9] The knowledge and use of family medicinal plants are usually inherited from parents. Therefore, the information obtained by the public is usually without scientific basis and allows for misinformation.[10] Hoaxes about family medicinal plants were found during the COVID-19 pandemic.[11]

Efforts to strengthen health literacy in the community certainly need to be carried out massively and continuously. Therefore, we conduct training as a community-based education to increase knowledge regarding the cultivation and use of family medicinal plants. Unlike prior efforts that often focused on documenting medicinal plant usage or theoretical knowledge dissemination, current research emphasizes practical, community-based interventions. This study involved direct engagement with farmer groups through training and education to address the dual challenges of misinformation and limited cultivation skills. This study aims to assess the effect of training on knowledge about the cultivation and utilization of family medicinal plants in the farmer group at Blunyahrejo Village, Tegalrejo District, Yogyakarta City.

METHOD

Study design

The study used a quasi-experimental research design with a one-group pre-post-test design. The study was carried out in one group as an experimental group without a control group for comparison. We examined the knowledge of the participants related to the cultivation and utilization of family medicinal plants before and after the intervention. The study began after the ethical clearance from FM-PHN UGM was granted. The ethical clearance has been issued with the number KE/FK/0722/EC/2022.

We initially conducted a needs assessment to explore community issues and identify needs and actions through FGD with the members of the farmer group, including the community leaders. Furthermore, we designed a community service in the form of training as an intervention for the experimental group. The training is about the cultivation and utilization of family medicinal plants, with the topics based on the FGD to improve community literacy. We also conducted qualitative data collection for monitoring after the intervention, using direct observation and online interviews. A qualitative approach was carried out to strengthen the results. Direct observation was conducted during the training by paying attention to the participants' verbal and nonverbal cues. Then, we also interviewed the community leaders to find out the participants' response and behavior after the intervention was given.

Participants received educational materials and pocket books regarding general instructions for preparing and processing medicinal plants, examples of medicinal plants with their functions and toxicity, as well as clarification of wrong information about medicinal plants. Participants also practiced tilling the land and planting ginger. Community literacy was measured before and after participants attended the training.

Study setting

The study was conducted in the Tegalrejo District, Yogyakarta City, Indonesia. Total sampling was used in this study. Participants were members of the farmer group at Blunyahrejo Village, with a total number of 28 people. Blunyahrejo village was chosen because in that area, a farmer group called "*Tumuju Guyub*" has been formed, which is now developing the cultivation and utilization of family medicinal plants.

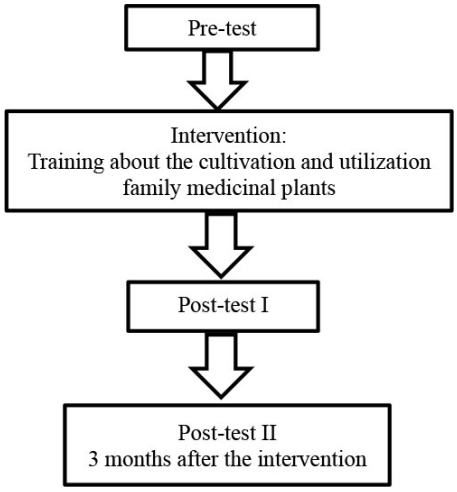

Figure 1. Steps in the study.

Data collection and analysis

Data was collected using a questionnaire that consisted of demographics information (sex, age, and occupation) and 20 multiple-choice questions regarding knowledge of the 4 topics given during the training. The questions were developed based on a literature review related to the benefits, cultivation, processing, and information seeking of medicinal plants by the research team according to their expertise. The content validity of the questionnaire was confirmed through joint discussions. In addition, the results of the FGD were used to ensure that the questions were relevant to the needs of the community.

Data was collected by distributing the questionnaires to participants before the training to get pre-test scores. The first post-test was conducted right after the training, and the second post-test was carried out after 3 months of intervention. The training was held on 24 July 2022. Data were analysed using STATA 13. Pre-test and post-test scores were tested with paired t-tests. Demographic data were analysed descriptively.

FGD for need assessment and interviews after training were recorded and transcribed and then thematically analyzed using open code. The themes

of the FGD for need assessment were 1) community social capital; 2) the activities related to cultivation and utilization of family medicinal plants; 3) the sources of information on family medicinal plants; 4) the issues faced farmer group; and 5) suggestions for training. Meanwhile, the themes that emerged from the interviews after the training were 1) response to the program, 2) current activities related to the cultivation and utilization of family medicinal plants, and 3) suggestions for the next program. The informants of the interviews were community leaders, namely the head of the farmer group and the head of the village association, as the farmer group advisor.

RESULTS

Need Assessment through FGD

Community social capital

The first step before the intervention was conducting the FGD for need assessment. According to the FGD, "*Tumuju Guyub*" farmer group was established during the pandemic with the aim of providing access to food, such as medicinal plants and vegetables, to the community. The formation of farmer groups is performed as a community empowerment movement. They utilize unused community land. This has the permission of the owner as long as it is used for community-oriented activities. They already have regular activities in managing urban farming. Furthermore, they already have a decree letter issued by the local village regarding the community's membership in the "*Tumuju Guyub*" farmer group. These potentially support the sustainability of the program.

The activities related to cultivation and utilization family medicinal plants

Some medicinal plants that informants have utilized are lemongrass, ginger, turmeric, *bawang dayak,* and cinnamon. The informant said that he squeezes and boils lemongrass, ginger, and turmeric, which he drinks every morning to boost his immunity. Another informant brewed cinnamon for fitness. Some people use *bawang dayak* to treat lumps or tumors. However, the medicinal plants that have been cultivated by the farmer groups are ginger, lemongrass, and *bawang dayak*. They planted it in mutual assistance and utilize it together.

> *"We have bawang dayak. My wife had a breast tumor. She used to take it regularly, and so did I. But once she stopped, I stopped too. This is bawang dayak, it's good and easy. It (bawang dayak) is cut, brewed with hot water. When it cools down, drink it morning and night…But not yet tested (1)"*

> *"I consider all these plants to have benefits. For example, I used to grow mahogany, ciplukan, lemongrass, and turmeric. Even now, lemongrass and passion fruit, whatever we plant. There is galangal, ginger. All are boiled on average (7)"*

The source of information on family medicinal plants

The majority of informants said that the source of information related to the benefits of medicinal plants comes from generations and friends by word of mouth. They think about the truth of the information using logic. They stated that relying on the news is confusing. Another informant said that if he heard news related to the benefits of medicinal plants, he relied on his child to check it on the internet and trusted the results of his child's search.

> *"I got the info from a badminton friend ... he said that it turns out that cinnamon is good. It's just for fitness and I feel good (2)"*

The issues faced farmer group

The constraints felt by farmer groups are the limited land in terms of size and fertility. It was because the land used contains residual building land. They have no idea what should be planted in such soil conditions, and thus, how to cultivate it. Government support is also considered lacking. The support in this context is related to coaching and assistance in the form of seeds, fertilizers, and a budget for operational costs. They have been using self-funding from group members.

> *"The soil here is less fertile. There used to be a house here, then it was demolished. There used to be bushes. People also dumped building debris here (3)"*

Suggestions for training

There were four topics given in the training based on the FGD. The topics namely: 1) the benefits of family medicinal plants for health; 2) how to find and ensure information related to family medicinal plants; 3) how to cultivate family medicinal plants; and 4) processing of family medicinal plants for health practices. Moreover, the informant suggested that the communication media and the language of delivery during training be adapted to the community, for example, through discussion. Learning media containing photos, names, and benefits of medicinal plants are also considered to contribute to improving community literacy.

> *"Actually, I still have a question mark. People use medicine or medicinal plants. They think that because they use this, is this really the impact of the benefits of taking the last medicine? We don't know. Therefore, we hope that in terms of dosage, this plant is really for what is right in medicine. Technically, it can be understood that the specifications are for this. Although in the community traditionally already understand based on the experience of their ancestors. So that we know exactly how useful it is. Because I really don't understand whether this is true or just a coincidence (2)"*

Changes in Literacy before and after training

Table 1 shows the characteristics of the participants who joined the training. Based on Table 1, there were more male participants (53.57%) than women; the majority of participants were aged 50 to 69 years (62.07%), and most of the participants were self-employed (21.43%).

As shown in Table 2, there were mean differences between the pre-test, the first post-test, and the second post-test. There was an increase in mean scores from the pre-test to the first post-test (9.96%) and from the first post-test to the second post-test (1.96%). Moreover, the mean increase of 12.04% from the second pre-test to the second post-test. Based on the paired t-test, there was a significant difference in the means before and after the training (p-value < 0.05). The training can improve the knowledge about the cultivation and

Table 1. Characteristics of farmer group in Blunyahrejo Village, Yogyakarta City (n=28)

Variable	n (%)
Sex	
Male	15 (53.57)
Female	13 (46.43)
Age	
< 30	2 (6.90)
30-49	6 (20.69)
50-69	18 (62.07)
>70	2 (7.14)
Occupation	
Housewife	11 (39.29)
Student	1 (3.57)
Retired	4 (14.29)
Labor	4 (14.29)
Employee	2 (7.14)
Self-employed	6 (21.43)

Table 2. Pre-test, post-test I, and post-test II

Variable	Mean	Median	Minimal	Maximal	P values	T
Pre-test	13.46	14	8	17	0.0002	-4.3806
Post-test I	14.80	15	10	18		
Post-test II	15.08	15	11	18		

utilization of family medicinal plants in the farmer group at Blunyahrejo Village.

Based on the results of the direct assessment, participants seemed enthusiastic about joining the training. This can be seen from the seriousness of the participants in paying attention to the material presented by the resource person while taking notes on the explanation. Some participants also showed their interest by asking questions during the training about their experiences in utilizing and cultivating medicinal plants.

Monitoring after the intervention

After training, monitoring was carried out by communicating with community leaders. We conducted interview related to the training program with them. The results were as follows:

The response to the program

Community leaders said that farmer group members were satisfied with the activities that had been carried out. They expected that there would be further activities. Community leader often sent photos or videos showing the enthusiasm of farmer groups in maintaining and continuing the cultivation of medicinal plants after the training.

> *"We are very grateful to the team, the community is also happy with the activities. We hope that in the future we can continue to develop urban farming here (1)"*

Current activities related to cultivation and utilization of family medicinal plants

The goal of the activities that have been carried out was that the farmer group can cultivate and utilize the medicinal plants they have planted. Based on the interview with the community leader, the members of the farmer group are still very active in managing the ginger plants that were used during the practice in the training. Currently, they also utilize the medicinal plants by making "*seroja*" drinks (*sereh-rosella-jahe*/ lemongrass-rosella-ginger).

> *"We worked together to install UV plastic to prevent excessive humidity in the polybags containing ginger (1)"*

Suggestions for the next program

Training activities on medicinal plant cultivation focused on ginger. Informants said that cultivation activities need to be improved, particularly for the types of medicinal plants grown, such as *bawang dayak*. Several community members have initiated planting *bawang dayak* but it has not been optimally cultivated and has not been widely developed in other areas. This has the potential to become a distinctive feature of the target area. Other informants stated that the program would be more beneficial if it could be related to economic aspects that could increase the productivity of farmer groups.

> *"I hope it (the activities that will be carried out) can reach the economic aspects, for example later making 'wedang uwuh'. How is the packaging, licensing and marketing. So that the results can be used for the operational costs of the farm. There is an empowerment aspect but also an economic aspect (2)"*

Another suggestion from the informant was that the next program should aim to achieve food security. This is because the "*Tumuju Guyub*" farmer group was formed with the initial intention of achieving food security.

> *"Our orientation was initially to carbohydrates and vegetables Ms. Food security was our principle in the beginning… Not only medicinal plants, we hope that there will also be vegetables such as tomato, eggplant, chili so that people who need them can come and take them home (1)"*

DISCUSSION

The majority of participants involved in the study are housewives. This is similar to the previous study that showed the cultivation of family medicinal plants is usually done by housewives. Knowledge of housewives regarding family medicinal plants is generally obtained from generation to generation.[6] Therefore, the information obtained is usually without scientific consideration and prone to misinformation. During the pandemic COVID-19, many hoaxes spread on social media regarding the use of family medicinal plants. Such information includes consuming a) a mixture of young coconut water, lime, and salt[12], b) boiled water from starfruit[13], c) inhaling hot steam from herbal tea[14], or d) boiled guava leaves, ginger, garlic, lemon, shallots, and vinegar[15], and e) gargling with warm water and salt or vinegar to get rid of the coronavirus in the throat.[16] The Indonesia COVID-19 Task Force has clarified that the information is wrong.[17]

One of the learning topics in the

training held for farming groups is about how to ensure the truth of medicinal plant information. Although, the Indonesian government already had the websites to clarify hoax information, namely through the ministry of communication and informatics[18] or the COVID handling task force[17], however people still have difficulties in avoiding the behavior. To tackle the misinformation, it is recommended to use combining strategies and methods. Detection and prevention of misinformation usually used machine learning or fact-checkers, but the individual's ability to ensure the correctness of the information is required.[19]

Other topics of the training are the benefits of family medicinal plants for health and processing of family medicinal plants for health practices. A study showed that sufficient knowledge and low-cost factors are the main factors that facilitate the use of medicinal plants. However, obstacles in the proper use of medicinal plants are caused by poor quality control and limited information.[20] This statement is in accordance with another study, which stated that the safety and quality of using medicinal plants that are below standard and less effective control can be a problem in the use of plants. Medicinal plants are often considered to have no risks, even though medicinal plants cannot be completely free of side effects and toxicity.[21] The training program specifically focused on medicinal plants such as ginger and turmeric, which were selected due to their known health benefits and widespread use in traditional practices. Ginger and turmeric, for instance, are recognized for their anti-inflammatory and immune-boosting properties.[22]

During the COVID-19 pandemic, many people cultivated medicinal plants to increase their body's immunity. Socialization activities regarding medicinal plants and their cultivation practices can increase the knowledge of the participants.[23] Increased knowledge about the cultivation of medicinal plants also occurred in this study. Research by Alipour et.al., stated that the cultivation of medicinal plants can increase the economy.[24] The training on medicinal plant cultivation in this study are expected to be able to initiate the community to be more productive in cultivating medicinal plants, then it can become a source for improving the economy in the future.

The training was conducted to improve the knowledge regarding the cultivation and use of family medicinal plants while the topics based on the need of the participants. Based on the results, there were differences in the knowledge scores before and after the training which indicated that community-based education intervention was effective to improve the farmer group's knowledge. The results are in line with the previous study that health education has an effect on increasing the knowledge.[25] In another study, it was found that training had an effect on awareness of the safety of medicinal plants.[26]

The evaluation of respondents' understanding of these medicinal plants was conducted through pre-test and post-test assessments. Results demonstrated a notable improvement in knowledge, with a 9.96% increase immediately after the training and a cumulative 12.04% increase three months post-training. This significant gain reflects the effectiveness of the training in enhancing respondents' literacy regarding the cultivation and utilization of medicinal plants. Moreover, observations revealed heightened enthusiasm and active participation among the respondents, further indicating the program's impact on fostering practical knowledge and interest in medicinal plant use.

A strategy for implement the community-based program is engage with the community. It such as listening and communication, participation, need assessment and partnership.[27] We engaged the community since the preparation of the intervention though involvement of the community during the need assessment activities. Not only to ensure that programs are suitable for the needs of the community, but also to increase community participation. We also regularly communicate with community leaders to build trust and maintain networking. These provide insights and strategies on how to build community-based program.

In addition, the community engagement strategy used in this training reflects a combination of strengths-based and needs-based approaches, as suggested by Stover et al. regarding community-based health communication.[28] The strengths-based approach capitalised on the potential of local communities in cultivating medicinal plants, while the needs-based approach focused on filling scientific literacy gaps related to the safe use of medicinal plants. This strategy builds cooperation through participatory dialogue, thereby increasing community engagement.

Compared with study from DeCorby-Watson et.al.,[29] which reported that training improves a variety of outcomes, including knowledge, skills, confidence, improvements in practice and policies, behaviour change, and application of knowledge, thus, this study has limitations by only measuring knowledge changes and did not consider the educational factor of the participants. Future studies are expected to include educational factors and assess changes in attitudes and behaviors following the intervention. Despite the number of participants being quite small, this number already covers 90 percent of the total number of farmer groups. The participants also showed a positive response to the intervention. During and after the training, the farmer groups showed interest and enthusiasm. A study showed that enthusiasm has a positive effect on intention.[30] Based on the theory of planned behavior and theory of reasoned action, intention will drive behavior change.[31]

CONCLUSION

The training improved the knowledge about the cultivation and utilization of family medicinal plants of the farmer group in Blunyahrejo village, Tegalrejo District, Yogyakarta City. There was an increase in knowledge between the pre-test, the first post-test, and the second post-test. Participants showed a positive response during and after the training by showing interest and enthusiasm within the activities. Furthermore, the follow up community service is needed to strengthen the knowledge of the utilization of the family medicinal plants that have been obtained so that it can be practiced

as an appropriate healthy behavior. The potential family of medicinal plants need to be cultivated more in the area to improve the benefits.

ACKNOWLEDGMENT

We express our gratitude to the Directorate of Community Service UGM for financial support. The authors thank to the head of Blunyahrejo and Dody Kastono, SP. MP., from the Department of Agricultural Cultivation, Faculty of Agriculture, UGM for the support and involvement during the program. We also thank to Tutik Istiyani, Javanti Binary and Riyanti Setyaningsih for their assistance in program implementation.

CONFLICT OF INTERESTS

There is no conflict of interest.

RESEARCH FUNDING

The research received funding from the Directorate of Community Service UGM under the Grant for Community Service Program based on Education for Sustainable Development 2022.

AUTHOR CONTRIBUTION

MSHW: Concepts, design, definition of intellectual content, literature search, experimental studies, data acquisition, data analysis, manuscript preparation, manuscript editing, manuscript review, and guarantor.

RSP: Design, definition of intellectual content, literature search, experimental studies, data acquisition, data analysis, statistical analysis, manuscript preparation, manuscript editing, manuscript review, and guarantor.

IN: Concept, design, literature search, experimental studies, data acquisition, data analysis, statistical analysis, manuscript preparation, manuscript editing, and manuscript review.

SPW: Definition of intellectual content, literature search, experimental studies, data acquisition, data analysis, manuscript preparation, manuscript editing and manuscript review.

SP: Definition of intellectual content, literature search, experimental studies, data acquisition, and data analysis.

REFERENCES

1. Cahyaningsih R, Brehm JM, Maxted N. Gap analysis of Indonesian priority medicinal plant species as part of their conservation planning. Global Ecology and Conservation. 2021;26. DOI: 10.1016/j.gecco.2021.e01459.
2. Regulation of the Minister of Health of the Republic of Indonesia Number 9 of 2016 concerning Traditional Health Efforts through Independent Care Utilisation of Family Medicine Gardens and Skills.
3. Hatab AA, Cavinato MER, Lindemer A, Lagerkvist C. Urban sprawl, food security and agricultural systems in developing countries: A systematic review of the literature. Cities. 2019; 94: 129-42. DOI: 10.1016/j.cities.2019.06.001.
4. Siegner A, Sowerwine J, Acey C. Does urban agriculture improve food security? Examining the nexus of food access and distribution of urban produced foods in the United States: A systematic review. Sustainability. 2018; 10, 2988; DOI:10.3390/su10092988.
5. Rahimah SB, Kharisma Y, Nurhayati E, Yuniarti, Santoso, Faridza M. Community knowledge and behavior in the utilization of medicinal plants in Cikoneng. Global Medical and Health Communication. 2019; 7(1). Online submission: http://ejournal.unisba.ac.id/index.php/gmhc. DOI: 10.29313/gmhc.v7i1.3214.
6. Sari ID, Yuniar Y, Siahaan S, Riswati, Syaripuddin M. Tradisi masyarakat dalam penanaman dan pemanfaatan tumbuhan obat lekat di pekarangan. Jurnal Kefarmasian Indonesia.2015; 5(2): 123-32. DOI: 10.22435/jki.v5i2.3695.
7. Pambudi PA. Pandemi COVID-19: refleksi pentingnya optimasi lahan pekarangan sebagai penyokong kemandirian pangan dan kesehatan keluarga. EnviroScienteae. 2020; 16(3): 408-23. DOI: 10.20527/es.v16i2.9683.
8. Kementerian Kesehatan Republik Indonesia. Surat Edaran Nomor: HK.02.02/IV.2243/2020 Tentang Pemanfaatan Obat Tradisional untuk Pemeliharaan Kesehatan, Pencegahan Penyakit dan Perawatan Kesehatan. Available from: https://covid19.hukumonline.com/wp-content/uploads/2021/05/surat_edaran_direktur_jenderal_pelayanan_kesehatan_nomor_hk_02_02_iv_2243_2020_tahun_2020.pdf.
9. Emilda, Hidayah M, Heriyati. Analisis pengetahuan masyarakat tentang pemanfaatan tanaman obat keluarga (studi kasus Kelurahan Situgede, Kecamatan Bogor Barat). Sainmatika. 2017; 14(1): 11-21. DOI: 10.31851/sainmatika.v14i1.1106.
10. Mewengkang CH, Manginsela EP, Memah MY. Deskripsi pengetahuan dan penerapan tanaman obat keluarga (TOGA) di Desa Pinilih Kecamatan Dimembe Kabupaten Minahasa Utara. Agri-SosioEkonomi Unsrat. 2020; 16(1): 87-96. DOI: 10.35791/agrsosek.16.1.2020.27122.
11. Satgas Penanganan COVID-19. Hoax buster: (salah): Video air rebusan belimbing wuluh dapat mencegah dan menyembuhkan COVID-19; 2021. Available from: https://covid19.go.id/p/hoax-buster/salah-video-air-rebusan-belimbing-wuluh-dapat-mencegah-dan-menyembuhkan-covid-19
12. Satgas Penanganan COVID-19. Hoax buster: (salah) Air kelapa muda, jeruk nipis dan garam obat COVID-19; 2020. Available from: https://covid19.go.id/p/hoax-buster/salah-air-kelapa-muda-jeruk-nipis-dan-garam-obat-covid-19
13. Satgas Penanganan COVID-19. Hoax buster: (salah): Video air rebusan belimbing wuluh dapat mencegah dan menyembuhkan COVID-19; 2021. Available from: https://covid19.go.id/p/hoax-buster/salah-video-air-rebusan-belimbing-wuluh-dapat-mencegah-dan-menyembuhkan-covid-19
14. Satgas Penanganan COVID-19. Hoax buster: (salah): Menghirup uap panas teh herbal dapat mencegah dan menyembuhkan COVID-19; 2021. Available from: https://covid19.go.id/p/hoax-buster/salah-menghirup-uap-panas-teh-herbal-dapat-mencegah-dan-menyembuhkan-covid-19
15. Satgas Penanganan COVID-19. Hoax buster: (salah): Uap panas hasil rebusan daun jambu dapat mengobati COVID-19; 2021. Available from: https://covid19.go.id/p/hoax-buster/salah-uap-panas-hasil-rebusan-daun-jambu-dapat-mengobati-covid-19
16. Satgas Penanganan COVID-19 Hoax buster: (salah) Minum banyak air dan berkumur dengan air hangat dan garam atau cuka dapat menghilangkan virus Corona saat di tenggorokan; 2020. Available from: https://turnbackhoax.id/2020/03/17/salah-minum-banyak-air-dan-berkumur-dengan-air-hangat-garam-atau-cuka-dapat-menghilangkan-virus-corona-saat-di-tenggorokan/
17. Satgas Penanganan COVID-19. Hoax Buster; 2021. Available from: https://covid19.go.id/p/hoax-buster.
18. Kementerian Komunikasi dan Informatika Republik Indonesia. Laporan Isu Hoaks; 2022. Available from: https://www.kominfo.go.id/content/all/laporan_isu_hoaks.
19. Naeem SB, Boulos MNK. COVID-19 misinformation online and health literacy: A brief overview. Int J Environ Res Public Health. 2021; 18(15):8091. DOI: 10.3390/ijerph18158091.
20. Hilal M, Hilal S. Knowledge, attitude, and utilization of herbal medicines by physicians in the Kingdom of Bahrain: A cross-sectional study. Journal of the Association of Arab Universities for Basic and Applied Sciences. 2018. DOI: 10.1016/j.jaubas.2016.11.001
21. Munira MA, Wadha MA, Samia A, Mohammed K, Faisal A. Herbal medicines: Saudi population knowledge, attitude, and practice at a glance. Journal of Family Medicine and Primary Care. 2018; 7(5): 865-75. DOI: 10.4103/jfmpc.jfmpc_315_17.
22. Zhou X, Afzal S, Wohlmuth H, Münch G, Leach D, Low M, Li CG. Synergistic anti-inflammatory activity of ginger and turmeric extracts in inhibiting lipopolysaccharide and interferon-γ-induced proinflammatory mediators. Molecules. 2022;27(12):3877. DOI: 10.3390/molecules27123877
23. Ikhsani H, Ervayenri, Azwin. Family medicinal plant cultivation (TOGA) in the new normal

of the Covid-19 pandemic. Dinamisia: Jurnal Pengabdian Kepada Masyarakat. 2021;5(6):1553-8. DOI: 10.31849/dinamisia.v5i6.7821

24. Alipour M, Jafari H, Alizadeh K. The effect of cultivation of medicinal plants on the economic development of rural settlements case study: villages of Kalat city. Propósitos y Representaciones. 2021; 9 (SPE2), e957. DOI: 10.20511/pyr2021.v9nSPE2.957
25. Suprayitno E, Hidayat S, Permatasari D, Mumpuningtias ED, Wardita Y. Community-based health education improve knowledge and attitude of COVID-19 prevention. Journal of Nursing Practice.2021;5(1):136-45. DOI: 10.30994/jnp.v5i1.164.
26. Hasen G, Hasyim R. Current awareness of health professionals on the safety of herbal medicine and associated factors in the south west of Ethiopia. J Multidiscip Healthc. 2021; 14:2001-8. DOI: 10.2147/JMDH.S321765.
27. Laverack, G. Health promotion practice: Building empowered communities. New York: Open University Press;2007.
28. Stover J, Avadhanula L, Sood S. A review of strategies and levels of community engagement in strengths-based and needs-based health communication interventions. Front Public Health. 2024;12:1231827. DOI: 10.3389/fpubh.2024.1231827
29. DeCorby-Watson K, Mensah G, Bergeron K, Abdi S, Rempel B, Manson H. Effectiveness of capacity building interventions relevant to public health practice: A systematic review. BMC Public Health.2018; 18 (684). DOI: 10.1186/s12889-018-5591-6
30. Purwanto BM, Rostiani R. The influence of enthusiasm and personal constraints on the intention to continue volunteering in an uncertain and turbulent environment. Int Rev Public Nonprofit Mark. 2022. DOI: 10.1007/s12208-022-00349-z.
31. Hagger MS, Cameron LD, Hamilton K, Hankonen N, Lintunen T. The handbook of behavior change. Cambridge: Cambridge University Press; 2020.