Contents lists available at IOCS

Science Midwifery

journal homepage: www.midwifery.iocspublisher.org

Herbs issue with knowledge, attitudes, and behavior Bangunjiwo Cadres in Bantul

Indrayanti[1], Titiek Hidayati[2], Tauranaswa Farrelabhista Putra Haris[3], Muhammad Ilham Satya Pradhana[4], Muhammad Ikhlasul Amal[5]

[1]Department of Anatomical Pathology, Universitas Muhammadiyah Yogyakarta, Indonesia
[2,3,4]Department of Family Medicine and Public Health, Universitas Muhammadiyah Yogyakarta, Indonesia
[5]PDHI Hospital Yogyakarta, Indonesia

ARTICLE INFO

Article history:

Received Sep 18, 2025
Revised Sep 24, 2025
Accepted Oct 2, 2025

Keywords:

Health Cadres
Herbal
Training

ABSTRACT

The use of herbs as part of traditional health efforts is still widely in demand by the community, so the role of health cadres is needed in providing appropriate education. This study aims to analyze the effect of training on the knowledge, attitudes, and behavior of health cadres at Kasihan I Health Center regarding the use of herbs. The research method used was quantitative with a pre-experimental one group pretest-posttest design. The results of the analysis showed that training had a positive effect on increasing knowledge and changing the behavior of cadres in the use and counseling of herbs. Training had a significant effect on the attitudes (p = 0.00) and behavior (p = 0.002) of health cadres about herbs. However, the effect on attitudes was not statistically significant. These findings indicate the importance of strengthening the affective aspect in training programs so that changes in attitudes occur in line with increased knowledge and behavior.

Corresponding Author:

Titiek Hidayati,
Department of Family Medicine and Public Health,
Universitas Muhammadiyah Yogyakarta,
Jl. Brawijaya, Geblagan, Tamantirto, Kec. Kasihan, Kab. Bantul, Daerah Istimewa Yogyakarta, 55183, Indonesia
Email: titiekakrom@gmail.com

INTRODUCTION

In the world of health, there are two types of treatment methods, namely modern treatment methods and traditional treatment methods (Posadzki et al., 2013). Public knowledge about the use of traditional medicinal plants is still very low. The lack of information about the use of herbal medicine means that many people use and process herbal medicines carelessly so that the herbal medicine does not have an effect on the body and instead has side effects on the user's body. Lack of information about herbal plant information for curing diseases, so that people do not yet know in detail the information on diseases, the process of making medicine, to the type of disease (Febriyanti et al., 2024).

Traditional medicine is a material or concoction of materials in the form of plant materials, animal materials, mineral materials, galenic preparations or a mixture of these materials that have

been used for generations for treatment based on experience (Diyani, A. F., Hidayat, A., & Saraswati, 2021). The further development of traditional medicine is mostly a mixture derived from plants so that it is known as herbal medicine (Nugroho, A. E., & Dewi, 2023). Medicines derived from plants that are processed or extracted in such a way that they become powder, pills or liquids that do not use chemicals in the process are called herbal medicines. As is known, herbal medicines can cure diseases with minimal side effects because they are made from natural ingredients, unlike synthetic drugs that can have side effects either directly or after a long time. Herbal medicines are a mixture of many active ingredients. There are 3 types of herbal medicines, namely: Jamu, standardized herbal medicines and phytopharmaceuticals (Nugroho, A. E., & Dewi, 2023).

Compared to the use of modern medicines in primary health care, the growing popularity of herbal medicines in Indonesia reflects a dual health-seeking behavior in the community. Modern medicines are generally utilized for acute conditions and formal diagnostic services provided by primary health centers, which are supported by government programs and health insurance coverage. In contrast, herbal medicines are often used for chronic disease management, preventive care, or as complementary therapies due to their cultural acceptance, perceived safety, affordability, and ease of access through traditional markets and family knowledge. This parallel use of both systems has created a unique pattern in which modern medicine serves as the mainstay of formal treatment, while herbal medicine remains deeply embedded in daily health practices at the community level (Sianipar, 2021).

Over the past few years, the use of herbal medicines among the general public has increased dramatically. Many reports indicate that herbal medicines are often taken in conjunction with conventional therapies. Although herbal medicines are generally considered safe when used alone at recommended doses and times, there is increasing evidence of drug interactions with herbs that can cause serious side effects or failure of therapy with conventional medicines, from the results of the study there were negative side effects from the use of herbal medicines in conjunction with conventional drugs such as bleeding tendencies caused by ginkgo and aspirin interactions (Sianipar, 2021).

In drug interactions with herbs, not all have adverse effects. Some herbs are reported to interact with drugs and the results are beneficial, such as reducing toxicity or reducing other side effects that may be experienced. Some herbs also increase or decrease drug metabolism, thus affecting drug availability (Duan et al., 2025). Long-term and high-dose use of herbal medicines can cause damage to body organs.

The increasing use of herbal medicines and the lack of information on herbal medicines among the general public can have a negative impact on health, so that sufficient knowledge is needed in the community to prevent complications due to incorrect use of herbs (Kelutur et al., 2025; Natasya et al., 2024). Health cadres are selected community members and are provided with health skills through training by local health service facilities or health centers. Cadres play an active role as drivers and disseminators of health information to the community. Therefore, increasing the knowledge, attitudes, and behavior of health cadres is very necessary in providing health services to the community.

As an extension of healthcare professionals, health cadres play a critical role in promoting the prudent and efficient use of medicinal plants. As social change agents, cadres have a significant impact on how the community knows, thinks, and behaves, including how they use herbal remedies (Ministry of Health of the Republic of Indonesia, 2018). Their role is not only to educate the community about the correct use of herbal medicines, but also to explain the potential risks of drug-herbal interactions, encourage patients to disclose their herbal use when seeking medical care, provide early detection of possible side effects through community-level monitoring, and act as mediators between health workers and the community to ensure safe and complementary use of traditional and modern therapies.

RESEARCH METHOD

Intervension Design and Method

This type of research is cross-sectional. Knowledge, attitudes, and behaviors were measured before and after the intervention. Then the subjects who stated their willingness to participate in the training were asked to fill out a consent form and were then given education for cadres about diabetes and Data on the variables of knowledge, attitudes and behaviors towards diabetes were collected by filling out a questionnaire on knowledge, attitudes and behaviors, each consisting of 14 questions. This study has obtained ethical approval from the Health Research Ethics Committee of the Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta.

Population and Subject

The population in this study were all health cadres in Bangunjiwo Village, Kasihan District, Bantul Regency. This village was chosen because it has the potential to develop the use of medicinal plants and the active involvement of cadres in community health activities. From this population, 29 cadres who met the inclusion criteria were determined as research subjects (Jailani et al., 2023). They are cadres who are active in integrated health post activities and health promotion, and are willing to take part in a full series of training. These subjects were then targeted for training interventions on the use of medicinal plants in an effort to improve public health knowledge, attitudes, and behavior.

Research Instrument and Data Collection

The research instrument used in this study was a structured questionnaire designed to measure three main aspects: knowledge, attitudes, and behavior of health cadres related to the use of medicinal plants. The questionnaire had been previously validated and consisted of multiple-choice questions and a Likert scale for the attitude and behavior aspects (Teh et al., 2023). Data collection was conducted in two stages: a pre-test administered before the training and a post-test after the training. Each participant completed the questionnaire independently under researcher supervision to ensure completeness and accuracy. The training was delivered using audiovisual methods, combining slide presentations and educational videos with interactive discussions. The training material covered an introduction to medicinal plants, their benefits, proper use, and examples of application in community-based health services.

Data Analysis

Collected data were processed and analyzed using SPSS (Statistical Product and Service Solution). Univariate analysis was conducted to describe the characteristics of respondents and the distribution of each variable. To assess the effectiveness of the intervention, bivariate analysis was performed. A paired t-test was used for normally distributed data, while the Wilcoxon signed-rank test was applied for data not meeting the assumption of normality.

RESULTS AND DISCUSSIONS

The following is a description of the research results in the form of statistics and tables based on data on increasing the knowledge of health cadres in Bangunjiwo Village.

Result

Table 1. Respondent characteristics based on demographics

Characteristics	Category	n	%
Gender	Woman	29	100
	Man	0	0
Level of education	Elementary school	0	0
	Junior High School	4	13.8

Characteristics	Category	n	%
	Senior High School	20	69.0
	University	5	17.2
DM Status	Diabetes	2	6.9
	Non diabetes	27	93.1
Age	25-40	4	13.8
	41-55	19	65.5
	56-70	6	20.7
	Mean ± SD		

Based on table 1 above, it shows that all respondents from Bangunjiwo Village are female, each as many as 29 people (100%). The majority of respondents in Bangunjiwo Village are high school graduates, 20 people (69%). The DM status of the Bangunjiwo Village cadre respondents is mostly not DM sufferers, each as many as 27 people (93.1%). The age range of respondents from Tamantirto is mostly in the range of 41-55 years as many as 19 people (65.5%).

Table 2. Average score of knowledge, attitude and behavior of health cadres of Kasihan Health Center 1

No.	Statement	Bangunjiwo Village Health Cadres	
		Mean Score ± SD (%)	
		Pre-Test	Post-Test
1.	Knowledge Score	83.25±17.52	89.65±12.60
2.	Attitude Score	83.25±13.26	94.09±8.12
3.	Behavior Score	76.87±14.67	83.33±14.86

Based on the table above, it can be seen that the average data score of the Bangunjiwo Village health cadre questionnaire shows an increase in all aspects measured after an intervention in the form of training. The knowledge score increased from 83.25 ± 17.52% to 89.65 ± 12.60%, the attitude score increased from 83.25 ± 13.26% to 94.09 ± 8.12%, and the behavior score increased from 76.87 ± 14.67% to 83.33 ± 14.86%. The most significant increase occurred in the attitude score, followed by the knowledge score, and then the behavior score.

Table 3. Data on the level of knowledge of health cadres in Bangunjiwo Village

Category	Bangunjiwo			
	Pre-Test		Post-Test	
	n	%	n	%
Good (76-100%)	18	62,07	23	79,31
Average (56-75%)	10	34,48	6	20,69
Bad (0-55%)	1	3,45	0	0

Based on table 3 above, After the intervention in Bangunjiwo Village, there was an increase in the knowledge of health cadres. The proportion of cadres with "Good" knowledge increased from 62.07% to 79.31%, while the "Moderate" category decreased from 34.48% to 20.69%, and there were no more cadres in the "Poor" category. This shows an increase in cadre understanding after the intervention.

Table 4. The effect of training on the knowledge, attitudes, and behavior of Bangunjiwo Village health cadres towards environmental health

No.	Score Changes	p-value
1.	Knowledge	0.083*
2.	Attitude	0,000*
3.	Behavior	0.002*

* Wilcoxon test

Based on the results of the analysis using the Wilcoxon Test, it is known that training has a significant effect on the attitude (p = 0.000) and behavior (p = 0.002) of health cadres about herbs. However, there is no significant effect of training on the knowledge (p = 0.083) of health cadres about herbs.

Discussion

The training provided to health cadres in Bangunjiwo Village had a significant impact on improving their knowledge, attitudes, and behaviors related to the use of medicinal plants and environmental health. The evaluation results showed a statistically significant increase in knowledge and behavior scores, while the increase in attitude scores was positive but not statistically significant. These findings reflect that the training was effective in enhancing cadres' understanding and promoting practical changes, although affective aspects may require longer and more intensive intervention.

The increase in cadre knowledge after training suggests that the information provided successfully broadened their understanding of the benefits, proper use, and potential risks of herbal medicine. This is consistent with previous research showing that training interventions can strengthen cadre confidence and competence in educating the public (Nadhiroh et al., 2024).. Knowledge serves as the foundation for shaping positive health attitudes and behaviors, and sufficient cadre knowledge is essential to ensure the delivery of accurate and safe health information to the community (Rahman et al., 2021; Syahwal et al., 2025).

Behavioral changes were also evident, as cadres became more active in health promotion activities, such as environmental cleaning, waste management, and community education after training. This finding is in line with the Health Belief Model, which emphasizes knowledge as a determinant of belief and action (Rosenstock & Ph, 1960). Training thus acted as a "cue to action," motivating cadres to adopt healthier practices and encourage their communities to do the same. Similar results have been reported in previous studies where participatory training effectively improved cadres' practical engagement and self-efficacy (Kasjono et al., 2023; Syaharuddin et al., 2024).

However, the finding that attitude change was not statistically significant suggests that the affective component of behavior change has not been optimally addressed. Attitude formation is a complex process influenced by values, personal experiences, and social norms, making it less likely to shift substantially through short-term interventions (Ajzen, 1991; Dahniar, 2020) . This aligns with prior research indicating that knowledge and behavior are more readily modified through training than attitudes, which often require continuous reinforcement over time.

These results highlight the need to refine the training design to better target affective outcomes. More participatory, reflective, and contextual learning methods such as group discussions, case-based simulations, and peer learning could be integrated to foster deeper attitude change. Incorporating cultural values and local wisdom into the training may also bridge the gap between cadre knowledge, attitudes, and behaviors, ensuring sustainability of the intervention's impact (Fatimah et al., 2024; Shen et al., 2024).

CONCLUSION

Health training in Tamantirto and Bangunjiwo Villages has been proven to improve cadre knowledge and behavior, although it has no significant effect on attitudes. The classical training model appears more effective in encouraging behavioral change. Cadres generally reported satisfaction and gained new insights, although some noted that the training duration was too short and that noise disturbances affected the sessions. Cadres also suggested more specific training materials, particularly those related to toddler and maternal health.

This study has several limitations that should be acknowledged. First, the research design used was a one-group pretest and posttest without a control group, which restricts the ability to

infer causal relationships (Siswati et al., 2022). Second, the sample size was relatively small (n = 29) and limited to cadres from a single village, thereby constraining generalizability to broader populations or different cultural settings. Small, localized samples are less able to capture variability in knowledge, attitudes, and practices that may exist across regions, as emphasized by (Khairul Ikram et al., 2024) in their Malaysian adult population survey on herbs and spices consumption. Third, reliance on self-reported questionnaires may introduce response bias and overestimate actual behavioral change (Egele et al., 2021). In addition, the brief duration of training and the absence of control for external factors may have influenced the observed changes in knowledge, attitudes, and behavior.

For further research, it is necessary to evaluate not only the immediate outcomes among cadres but also the real impact of increasing their knowledge, attitudes, and behaviors on community-level changes in herbal medicine use. Future studies could employ experimental or quasi-experimental designs with larger and more diverse samples to strengthen causal inference (Prasetyorini et al., 2019). Longitudinal approaches are also recommended to assess whether improvements in cadres' knowledge, attitudes, and behaviors translate into sustained and measurable behavioral changes within the community. Furthermore, incorporating participatory and culturally sensitive training strategies—such as case-based discussions, role-playing, and peer mentorship—may foster deeper attitude change and enhance cadres' ability to influence community practices (Necipoglu & Aydin, 2025). The integration of digital platforms and ongoing mentoring mechanisms could also extend the reach and sustainability of cadre training, thereby maximizing its potential to shape safer and more rational community use of herbal medicines (Koonrungsesomboon et al., 2024; Teh et al., 2023).

ACKNOWLEDGEMENTS

The researchers would like to express their deepest gratitude to the Community Service Institute of Muhammadiyah University of Yogyakarta (UMY) for the financial assistance provided, which was instrumental in the success of this project. They also express their deepest appreciation to the Head of Kasihan I Community Health Center for the permission and facilities provided, which enabled this research to be successfully conducted.

References

Ajzen. (1991). Theory of Planned Behaviour Participation. *Papagiannidis*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Dahniar, A. (2020). 16. Dahniar (2019). *Tatar Pasundan: Jurnal Diklat Keagamaan*, *13*(2), 202–206.

Diyani, A. F., Hidayat, A., & Saraswati, R. (2021). Supervision and registration of traditional medicine brand in Indonesia. *Pakistan Journal of Medical and Health Sciences*, *15*(1), 264–267.

Duan, X., Fan, X., Jiang, H., Li, J., Shen, X., Xu, Z., Zhou, Z., Xu, J., Chen, C., & Jin, H. (2025). Herb-drug interactions in oncology: pharmacodynamic/pharmacokinetic mechanisms and risk prediction. *Chinese Medicine (United Kingdom)*, *20*(1), 1–30. https://doi.org/10.1186/s13020-025-01156-4

Egele, V. S., Kiefer, L. H., & Stark, R. (2021). Faking self-reports of health behavior: a comparison between a within- and a between-subjects design. *Health Psychology and Behavioral Medicine*, *9*(1), 895–916. https://doi.org/10.1080/21642850.2021.1991803

Fatimah, N., Herisulistyo, A., Anatomi, D., & Kedokteran, F. (2024). *Improving Knowledge and Empowerment of Pitasidia Health*. *8*(3), 402–411.

Febriyanti, R. M., Saefullah, K., Susanti, R. D., & Lestari, K. (2024). Knowledge, attitude, and utilization of traditional medicine within the plural medical system in West Java, Indonesia. *BMC Complementary Medicine and Therapies*, *24*(1), 64. https://doi.org/10.1186/s12906-024-04368-7

Jailani, Syahran, Jeka, & Firdaus. (2023). Populasi dan Sampling (Kuantitatif), Serta Pemilihan Informan Kunci (Kualitatif) dalam Pendekatan Praktis. *Jurnal Pendidikan Tambusai*, *7*(3), 26320–26332.

Kasjono, H. S., Rois, I., Nugraha, A. R., Utari, D., Clorinda, N., Novita, S., Latifah, T. N., Widianto, W., & Widiarto, E. S. (2023). Community empowerment in overcoming environmental health problems in

Padukuhan Sawit Bantul. *Jurnal Pemberdayaan: Publikasi Hasil Pengabdian Kepada Masyarakat*, *7*(2), 40–46. https://doi.org/10.12928/jpm.v7i2.8400

Kelutur, F. J., Adini, S., Amoretti, R. S., Rohmah, S. L., Hasana, I. A. N., Harpan, A., & Hadi, A. O. (2025). Socialization on the use of medicinal plants to raise public awareness of herbal medicine. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, *10*(1), 116–124. https://doi.org/10.26905/abdimas.v10i1.14805

Khairul Ikram, E. H., Ahmadi, N. F., Khairul Ikram, N. K., Muchtaridi, M., & Muhammad, R. (2024). Knowledge, Attitude, and Practices of Traditional Herbs and Spices Consumption among Adults in Malaysia. *Jurnal Gizi Dan Pangan*, *19*(Supp.2), 173–182. https://doi.org/10.25182/jgp.2024.19.supp.2.173-182

Koonrungsesomboon, N., Sakuludomkan, C., Na Takuathung, M., Klinjan, P., Sawong, S., & Perera, P. K. (2024). Study design of herbal medicine clinical trials: a descriptive analysis of published studies investigating the effects of herbal medicinal products on human participants. *BMC Complementary Medicine and Therapies*, *24*(1). https://doi.org/10.1186/s12906-024-04697-7

Ministry of Health of the Republic of Indonesia. (2018). *Technical guidelines for developing health cadres*. Directorate of Health Promotion and Community Empowerment.

Nadhiroh, S. R., Mahmudiono, T., Suarilah, I., Hargiyanto, E. D., Azzahra, C. N., Ramadhan, S. A., Widayani, S. T., & Yusryana, E. A. (2024). Improving Knowledge and Self-Efficacy of Posyandu Cadres in Conducting Education and Creating Nutrition Education Media. *Media Gizi Kesmas*, *13*(2), 816–822. https://doi.org/10.20473/mgk.v13i2.2024.816-822

Natasya, D., Tunggeng, M. G. R., Annisa, P. R., Nopianti, N. I., Dawa, M. M. A., Jafar, N., & Gani, A. (2024). Socialization, cultivation, and utilization of empty land for family medicinal plants. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, *9*(3), 555–563. https://doi.org/10.26905/abdimas.v9i3.12965

Necipoglu, D., & Aydin, N. (2025). Effect of role-play technique on nursing students' attitudes towards student-centred teaching: a Quasi-Experimental study. *BMC Nursing*, *24*(1). https://doi.org/10.1186/s12912-025-03543-6

Nugroho, A. E., & Dewi, N. (2023). Standardization of some Indonesian medicinal plants used in scientific jamu. *IOP Conference Series: Earth and Environmental Science*, *1234*(1).

Posadzki, P., Watson, L. K., & Ernst, E. (2013). Adverse effects of herbal medicines: An overview of systematic reviews. *Clinical Medicine, Journal of the Royal College of Physicians of London*, *13*(1), 7–12. https://doi.org/10.7861/clinmedicine.13-1-7

Prasetyorini, D., Kusnanto, H., & Claramita, M. (2019). Training Effectiveness in Change Knowledge and Attitude of Social Health Workers (Cadres) on Tuberculosis Disease. *Review of Primary Care Practice and Education (Kajian Praktik Dan Pendidikan Layanan Primer)*, *2*(3), 99. https://doi.org/10.22146/rpcpe.48151

Rahman, A. O., Aurora, W. I. D., Darmawan, A., & Iskandar, M. M. (2021). Pelatihan Dasar Herbal Untuk Kader Kesehatan Di Wilayah Kerja Puskesmas Jambi Kecil, Kecamatan Maro Sebo, Kabupaten Muaro Jambi. *Medical Dedication (Medic): Jurnal Pengabdian Kepada Masyarakat FKIK UNJA*, *4*(2), 258–263. https://doi.org/10.22437/medicaldedication.v4i2.15606

Rosenstock, I. M., & Ph, D. (1960). Historical Origins of the Health Belief Model. *Health Education Monographs*, *2*(4), 328–335.

Shen, T., Rasdi, I. B., Ezani, N. E. B., & San, O. T. (2024). The mediating role of pro-environmental attitude and intention on the translation from climate change health risk perception to pro-environmental behavior. *Scientific Reports*, *14*(1), 1–16. https://doi.org/10.1038/s41598-024-60418-7

Sianipar. (2021). The potential of Indonesian traditional herbal medicine as immunomodulatory agents: A review. *International Journal of Pharmaceutical Sciences and Research.*

Siswati, T., Iskandar, S., Pramestuti, N., Raharjo, J., Rialihanto, M. P., Rubaya, A. K., & Wiratama, B. S. (2022). Effect of a Short Course on Improving the Cadres' Knowledge in the Context of Reducing Stunting through Home Visits in Yogyakarta, Indonesia. *International Journal of Environmental Research and Public Health*, *19*(16), 1–10. https://doi.org/10.3390/ijerph19169843

Syaharuddin, S., Ariando Salomon, G., & Anggeraeni, A. (2024). Community empowerment efforts in improving environmental health. *Jurnal Pengabdian Masyarakat Edukasi Indonesia*, *1*(2), 42–48. https://doi.org/10.61099/jpmei.v1i2.39

Syahwal, M., Aluddin, A., & Uksim, M. (2025). Pelatihan Kader Kesehatan: Solusi Nyeri Sendi dengan Jahe Putih dan Bawang Merah. *Ahmar Metakarya: Jurnal Pengabdian Masyarakat*, *4*(2), 207–212. https://doi.org/10.53770/amjpm.v4i2.452

Teh, W. L., Abdin, E., P.V, A., Siva Kumar, F. D., Roystonn, K., Wang, P., Shafie, S., Chang, S., Jeyagurunathan, A., Vaingankar, J. A., Sum, C. F., Lee, E. S., van Dam, R. M., & Subramaniam, M. (2023). Measuring social desirability bias in a multi-ethnic cohort sample: its relationship with self-reported physical activity, dietary habits, and factor structure. *BMC Public Health*, *23*(1), 1–10. https://doi.org/10.1186/s12889-023-15309-3