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PROFESSIONAL PRACTICES AND PERCEPTIONS OF COMMUNITY PHARMACISTS AND PHARMACY TECHNICIANS TOWARDS THE USE OF HERBAL MEDICINES IN INDONESIA

Vinci Mizranita[1*)], Fauziyyah Sakinatun Nisa[2)]
[1,2] Department of Pharmacy, Universitas Sebelas Maret, Indonesia
JL. Ir. Sutami No. 36A Kentingan, Surakarta 57126, Indonesia
*e-mail: mizranita@staff.uns.ac.id

ABSTRACT

This study examines the perceptions of community pharmacists and pharmacy technicians regarding the use of herbal medicines in Indonesia. Given the rich biodiversity and traditional medicinal practices in Indonesia, herbal medicines play a significant role in healthcare. This study aims to examine the role of pharmacists and pharmacy technicians in advising patients on herbal medicines, focusing on their knowledge, scope, and practices. A cross-sectional survey was conducted among pharmacists and pharmacy technicians in Surakarta, Indonesia, who attended Indonesian Pharmacists Association (IAI) and Indonesian Pharmacy Technicians Association (PAFI) seminars. A total of 123 pharmacists and 121 pharmacy technicians participated in the study. The results indicate that pharmacy technicians are more involved in managing simple common ailments such as acne (93.4%) and cough and cold symptoms (90.1%) compared to pharmacists, who are more involved in treating conditions such as acute pain (72.4%) and diarrhoea (58.5%). This study also shows a significant shift in referral patterns when symptoms do not improve, with pharmacy technicians referring patients to pharmacists 89.3% of the time. This study highlights the critical role of pharmacy technicians in the initial management of symptoms and underscores the importance of collaboration between pharmacists and pharmacy technicians to ensure optimal patient outcomes. The findings suggest areas for further training and protocol development to enhance the efficiency and effectiveness of pharmacy services in Indonesia.

Keywords: *herbal medicines, pharmacy practice, pharmacists, pharmacy technicians, Indonesia*

INTRODUCTION

The use of herbal medicines has been an integral part of healthcare systems worldwide, particularly in regions with rich biodiversity and deep-rooted traditional medicinal practices (Elfahmi et al., 2014). Indonesia, with its diverse flora and a long history of using herbal remedies, provides a unique environment for studying the utilization and perception of herbal medicines. Herbal medicines, often referred to as traditional or complementary medicines, are commonly used in Indonesia, both as primary treatments and as complementary to Western medicine (Indra, 2012).

Herbal medicines are perceived as natural and safer alternatives to Allopathic medicines or Western medicines. However, the increasing use of these medicines has raised concerns about their safety, efficacy, and regulation. Unlike conventional pharmaceutical products, herbal medicines often lack rigorous testing and standardization, leading to variations in quality and potency. These issues are further complicated by potential interactions with Western medicines, which can pose significant health risks to consumers (Akhodza & Atik, 2021; Mizranita & Pratisto, 2015; Torri, 2013).

The global resurgence in herbal medicine use is reflected in various studies indicating a high prevalence of complementary and alternative medicine (CAM) use in countries like Australia, the United States, and the United Kingdom. For instance, in Australia, it is estimated that up to 75% of the population has used some form of complementary medicine, with a significant portion of this use involving herbal products (Xue et al., 2007). Similarly, in the United States, a national survey found that approximately 38% of adults used CAM therapies, with herbal medicines being among the most commonly used (Clarke et al., 2015).

In Indonesia, traditional herbal medicine, known as Jamu, plays a significant role in the cultural and healthcare practices. Jamu is widely used for various health conditions, from minor ailments to chronic diseases, and its popularity continues to grow. The Indonesian National Agency of Drug and Food Control (BPOM) has established a regulation in relation to herbal products used, ensuring consistent quality and safety (Torri, 2012).

Pharmacists and pharmacy technicians play a crucial role in ensuring the safe use of herbal medicines. Studies have shown that consumers often seek advice from pharmacists regarding the use of CAM therapies, highlighting the need for pharmacists to be knowledgeable about these products (Braun et al., 2010; Mizranita et al., 2024). In Indonesia, the role of healthcare providers in advising patients on the use of herbal medicines is even more critical given the widespread use and cultural significance of these remedies. However, despite its widespread use, there is limited scientific evidence research on the practice of pharmacists and pharmacy technicians in supporting delivering herbal medicines used, highlighting the need for comprehensive research in this area (Irawan et al., 2022). This study aimed to examine the perceptions of pharmacists and pharmacy technicians on their professional practice towards herbal medicines, focusing on the knowledge, scopes, and practices.

METHODS

This research was approved by the Universitas Sebelas Maret, Dr. Moewardi Hospital, Surakarta, Indonesia, with approval number 1423/VIII/HREC/2023. The study respondents were pharmacists and pharmacy technicians practicing in community pharmacies in Surakarta, Indonesia, attending the Indonesian Pharmacists Association (IAI) and the Indonesian Pharmacy Technicians Association (PAFI) seminars separately on July-August 2023 for SKP credit or re-registration purposes. Exclusion criteria included those who are working in a pharmacy with a doctor's clinic or skin care clinics. Approximately 120 pharmacists and 120 pharmacy technicians were targeted for this study to allow statistical analysis. The questionnaires used in this study were adapted from Mizranita et al. (2021) and Mizranita et al. (2022) and were distributed and collected anonymously at seminar registration desks. The questionnaires consisted of four parts: (1) demographic respondents; (2) the list of manageable ailments that can be managed using herbal medicines; (3) professional pharmacy practice; and (4) the possibility of referral when symptoms of ailments do not improve. Data were analyzed using SPSS version 25.0. Descriptive statistics summarized respondents' characteristics. Age and years of practice were dichotomized and analyzed with nonparametric tests. Binary logistic regression compared perceptions of managing minor ailments requiring herbal medicines between pharmacists and pharmacy technicians, categorizing minor ailments into those delivered by a pharmacy technician and a pharmacist, and time spent in pharmacy activities engagement. Statistical significance shows a significant difference at $p\text{-value} < 0.05$.

RESULTS AND DISCUSSION

The questionnaires were administered to 125 pharmacists and 127 pharmacy technicians in separate IAI and PAFI seminars. Two pharmacists and six pharmacy technicians declined to participate in the study. The response rate was 98.4% (123/215) for pharmacists and 95.3% (121/217) for pharmacy technician groups. This trend reflects broader demographic patterns in the healthcare sector, where more females in this study (85.37% pharmacists and 90.08% pharmacy technicians) are entering the field. Previous studies have also shown a higher proportion of females in the pharmacy profession, suggesting that targeted strategies might be needed to balance gender representation (Clarke et al., 2015; Mizranita et al., 2023).

Table 1 shows the majority of pharmacists and pharmacy technicians were aged between 20 and 40 years. More than 50.0% of pharmacists (n = 91/123) had been practicing for less than two to five years, similar to pharmacy technicians, 47.11% (n = 57/121). Pharmacists tend to have less experience in practice compared to pharmacy technicians. A higher percentage of pharmacy technicians (52.89%) have more than five years of experience compared to pharmacists (23.3%). This difference may reflect the varying career trajectories and retention rates between the two groups. This could be due to recent graduates entering the workforce or a younger demographic more likely to attend continuing education seminars (Surya et al., 2023). Pharmacy technicians may remain in their roles longer due to different career progression opportunities compared to pharmacists (Naidu et al., 2005).

Table 1. Respondent's characteristics

Pharmacists (n=123)		**Pharmacy Technicians (n=121)**	
Characteristics	**n (%)**	**Characteristics**	**n (%)**
Gender		**Gender**	
Female	105 (85.37)	Female	109 (90.08)
Male	18 (14.63)	Male	12 (9.92)
Age (years)		**Age (years)**	
20-40	99 (80.49)	20-40	83 (68.60)
>40	24 (19.51)	>40	38 (31.40)
Length of practising in the pharmacy (years)		**Length of practising in the pharmacy (years)**	
<2-5	91 (50.5)	<2-5	57 (47.11)
>5	42 (23.3)	>5	64 (52.89)
Education		**Education**	
Pharmacist Degree	123 (100.00)	Pharmacy Diploma	121 (100.00)
Attended herbal medicines training in the last 6 months		**Attended herbal medicines training in the last 6 months**	
No	112 (91.06)	No	101 (83.47)
Yes	13 (10.57)	Yes	20 (16.53)
Type of pharmacy		**Type of pharmacy**	
Standalone	113 (91.86)	Standalone	110 (90.90)
Franchise	10 (12.3)	Franchise	11 (9.10)

All pharmacists held a pharmacist degree, whereas all pharmacy technicians had a diploma, reflecting the educational requirements for each role in Indonesia. The length of practice between pharmacists and pharmacy technicians indicates a balanced workforce in terms of experience. The educational background of all pharmacists holding a pharmacist

degree and all pharmacy technicians having a diploma reflects the structured educational pathways for these roles in Indonesia. This foundational knowledge is crucial for ensuring high standards of practice across the board (Asosiasi Pendidikan Tinggi Farmasi Indonesia [The Association of Indonesian Pharmacy Higher Education], 2013, 2017).

Table 2. Herbal Medicines Used in Manageable Ailments delivered by pharmacists and pharmacy technicians

Minor ailment (active ingredient/s in herbal medicines to treat the ailment)	**Pharmacists (n=123)**	**Pharmacy Technicians (n=121)**	**P-value**
	n (%)		
Acne (Kunyit/Curcuma longa)			**<0.001***
Delivered by a pharmacy technician	92 (75.6)	113 (93.4)	
Delivered by a pharmacist	31 (25.2)	8 (6.6)	
Acute pain (Sambiloto/Andrographis paniculata)			**<0.001**
Delivered by a pharmacy technician	34 (27.6)	48 (39.7)	
Delivered by a pharmacist	89 (72.4)	73 (60.3)	
Constipation (Lidah buaya/Aloe vera)			**0.001**
Delivered by a pharmacy technician	98 (79.7)	110 (90.9)	
Delivered by a pharmacist	25 (20.3)	11 (9.1)	
Cough and cold symptoms (Kencur/ Kaempferia galanga)			**0.001**
Delivered by a pharmacy technician	95 (77.2)	109 (90.1)	
Delivered by a pharmacist	28 (22.8)	12 (9.9)	
Dandruff (Lidah buaya/Aloe vera)			0.114
Delivered by a pharmacy technician	196 (78.0)	104 (86.0)	
Delivered by a pharmacist	27 (22.0)	17 (14.0)	
Diarrhoea (Daun jambu biji/ Psidium guajava)			**<0.001**
Delivered by a pharmacy technician	51 (41.5)	99 (81.8)	
Delivered by a pharmacist	72 (58.5)	22 (18.2)	
Indigestion/heartburn (Temulawak /Curcuma xanthorrhiza)			**<0.001**
Delivered by a pharmacy technician	33 (26.8)	59 (48.8)	
Delivered by a pharmacist	90 (73.2)	63 (52.1)	
Mild headache (Jahe/Zingiber officinale)			**0.023**
Delivered by a pharmacy technician	104 (84.6)	115 (95.0)	
Delivered by a pharmacist	19 (15.4)	7 (5.8)	
Minor burns (Lidah buaya/Aloe vera)			**0.008**
Delivered by a pharmacy technician	81 (65.9)	96 (79.3)	
Delivered by a pharmacist	42 (34.1)	25 (20.7)	

Wounds (Sirih /Piper betle)			**<0.001**
Delivered by a pharmacy technician	52 (42.3)	75 (62.0)	
Delivered by a pharmacist	71 (57.7)	46 (38.0)	

Regarding training in herbal medicines, 91.06% of pharmacists (n = 112/123) had not attended any herbal medicines training in the last six months, while 83.47% (n = 101/121) pharmacy technicians had similar results. Both groups show a low participation rate in herbal medicines training, with pharmacists at 10.57% and pharmacy technicians slightly higher at 16.53%. The low percentage of respondents who had attended herbal medicine training in the last six months highlights a significant area for improvement. Continuous education in herbal medicines is essential, especially in a country such as Indonesia, where herbal treatments are widely used. Enhancing training opportunities for both pharmacists and pharmacy technicians can improve their confidence and competence in recommending and managing herbal treatments (Snoswell, 2020; Taylor & Mehta, 2020). The lack of training is a significant concern given the increasing integration of herbal treatments in healthcare. Enhanced training programs are necessary to ensure both pharmacists and pharmacy technicians are adequately equipped to advise on herbal medicines (Kristianto et al., 2022; Posadzki et al., 2013).

This study shows that a significant majority of both pharmacists and pharmacy technicians work in standalone pharmacies, with 91.86% of pharmacists and 90.90% of pharmacy technicians employed in these settings. This high percentage indicates a prevalent preference or requirement for standalone pharmacy operations in the community pharmacy sector in Indonesia. The similar distribution between pharmacists and pharmacy technicians suggests a consistent trend across different roles within the pharmacy practice. Franchise pharmacies, on the other hand, employ a smaller proportion of the respondents, with 8.13% of pharmacists and 9.10% of pharmacy technicians working in these premises. This lower percentage could reflect the market dynamics in Indonesia, where standalone pharmacies might be more prevalent or preferred by the community (Mizranita et al., 2021).

Table 2 shows that among manageable ailments listed in the Indonesian Ministry of Health's (Directorate General of Pharmacy and Medical Devices, 2008) guidelines for the over-the-counter medicines used, only dandruff shows no significant difference in management between the pharmacists and pharmacy technicians perceptions of practice. There are no discrepancies between pharmacists and pharmacy technicians that dandruff should be within a pharmacy technician's management of practice.

Pharmacy technicians are more involved in delivering treatments for acne compared to pharmacists, with 93.4% of pharmacy technicians and 75.6% of pharmacists managing this condition. This suggests a higher reliance on pharmacy technicians for managing common skin conditions, likely due to their routine interaction with patients seeking over-the-counter remedies. The use of herbal medicines, for example Temulawak and Kunyit, available in commercial products in Indonesia such as JF Sulfur Acne Care and Sariayu Kunyit Lotion, highlights the integration of traditional remedies in everyday skincare (Rizki Amalia et al., 2021; Setiawan et al., 2020).

Pharmacists are predominantly involved in treating indigestion and heartburn (73.2%), compared to pharmacy technicians (48.8%). This suggests that gastrointestinal complaints often require the expertise of pharmacists. Herbal medicines like Kunyit and Temulawak, found in Promag Herbal and Mylanta Herbal, are effective treatments (Husnani & Nur Aidil Fitri, 2022). In contrast, pharmacy technicians play a significant role in managing cough and cold symptoms, with 90.1% involvement compared to 77.2% for pharmacists. This reliance

on pharmacy technicians may stem from their accessibility and the commonality of these ailments.

Table 3 shows that both pharmacists and pharmacy technicians dedicated a significant portion of their time to responding to herbal medicine requests, with pharmacists allocating 23.5% (± 15.1) and pharmacy technicians 23.2% (± 10.3) of their weekly professional activities to this task. The time spent on complementary medicine requests was also comparable between pharmacists (12.0% ± 7.9) and pharmacy technicians (11.4% ± 7.7), with a p-value of 0.713, indicating no significant difference. This finding underscores the crucial role that both pharmacists and pharmacy technicians play in advising patients on the use of herbal medicines. Given the popularity of herbal remedies in Indonesia, it is essential that both professionals are well-versed in this area to provide accurate and reliable advice. The findings of this study highlight the need for ongoing training and education for both pharmacists and pharmacy technicians, particularly in areas where they spend significant time, such as responding to herbal and complementary medicine requests. It is essential that pharmacy professionals stay updated on the latest research, safety profiles, and efficacy of various herbal and complementary medicines. Continuous professional development programs can enhance their knowledge and ensure that they provide evidence-based advice to patients.

Table 3. Mean (%) of the pharmacists and pharmacy technician total time spent on the activities as a professional practice

Activities	**Allocated time per week Mean (%) ± SD**		**P-value[#]**
	Pharmacist (n=89)	**Pharmacy technician (n=77)**	
Responding to herbal medicines requests	23.5 ± 15.1	23.2 ± 10.3	0.624
Requests for complementary medicines	12.0 ± 7.9	11.4 ± 7.7	0.713
Management of minor ailments	17.1 ± 9.6	20.0 ± 12.1	0.077
Medicine information services	7.2 ± 7.8	7.7 ± 8.0	0.378
Providing home care services	2.5 ± 4.1	2.0 ± 3.1	0.233
Requests for a non-therapeutic remedies	8.1 ± 7.9	4.9 ± 4.4	0.654

Pharmacy technicians spent slightly more time managing minor ailments (20.0% ± 12.1) compared to pharmacists (17.1% ± 9.6), although this difference was not statistically significant (p = 0.077). This slight difference may indicate that pharmacy technicians often manage the initial management of minor conditions, such as colds, headaches, and minor skin conditions, which can be effectively treated with over-the-counter medications and basic first aid. The higher time allocation by pharmacy technicians also reflects their role in easing the workload of pharmacists, allowing pharmacists to focus on more complex patient cases and medication management tasks.

Furthermore, pharmacists reported spending more time on requests for non-therapeutic remedies (8.1% ± 7.9) compared to pharmacy technicians (4.9% ± 4.4), although this difference was not statistically significant (p = 0.654). Non-therapeutic remedies can include products for general wellness, cosmetic purposes, or lifestyle enhancements that do not have direct therapeutic effects. The greater involvement of pharmacists in this area may reflect their broader knowledge and ability to provide more comprehensive advice on a wider range of products. However, the role of pharmacy technicians in managing such requests is also significant, indicating their contribution to patient guidance and support.

Given the significant time spent responding to requests for herbal and complementary medicines, patient education and counseling should be a priority. Pharmacy professionals must ensure that patients understand how to use these products safely and effectively, recognize potential interactions with prescription medications, and manage their expectations regarding the outcomes. Clear communication and patient-centered counseling can help mitigate risks and enhance the therapeutic benefits of herbal and complementary medicines.

The allocation of time to various professional activities provides insight into areas where additional resources or support may be needed. For example, the relatively low time spent on home care services suggests a potential area for growth and improvement. Expanding home care services can provide more comprehensive support for patients with chronic conditions, enhance medication adherence, and reduce hospital readmissions. Similarly, ensuring that both pharmacists and pharmacy technicians have access to reliable and up-to-date information resources can improve the quality of medicine information services provided to patients (Akers et al., 2024).

The data in Figure 1 shows the percentage of a possibility when a pharmacy technician referred patients to a pharmacist. The results show that when patients present signs and symptoms, pharmacy technicians are likely to manage the situation themselves 63.6% of the time, only referring to a pharmacist in 36.4% of cases. This indicates a level of confidence and competence among pharmacy technicians in managing initial presentations of symptoms without immediate need for pharmacist intervention. The referral patterns based on the presence of signs and symptoms and the lack of improvement in symptoms reveal the decision-making processes of pharmacy technicians. It reflects the adequacy of their training and the protocols in place that allow them to manage common symptoms independently.

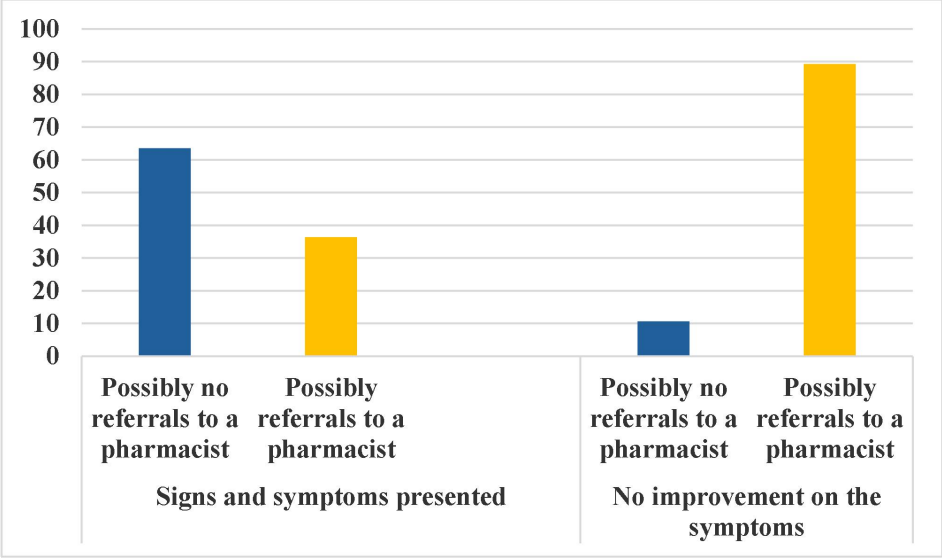

Figure 1. The percentage (%) of a possibility when a pharmacy technician referred patients to a pharmacist, from pharmacy technician respondents perceptions (n=121)

A significant shift in referral patterns is observed when symptoms do not improve. In such cases, pharmacy technicians refer patients to pharmacists 89.3% of the time, only choosing not to refer in 10.7% of cases. This may demonstrate a clear protocol where a lack of symptom improvement triggers a referral to a pharmacist. It ensures that patients receive a higher level of care when initial management by pharmacy technicians is not effective.

The findings of this study can inform policy and regulatory decisions regarding the scopes of practice for pharmacists and pharmacy technicians. Recognizing the significant contributions of pharmacy technicians in managing common ailments and providing

medication information services can lead to policies that support their expanded roles and responsibilities. This can include formal recognition of their expertise, providing opportunities for career advancement, and ensuring that their training programs adequately prepare them for these tasks.

This study highlights several key areas for enhancing pharmacy practice in Indonesia: (1) Continuous Professional Development, where increasing training opportunities in herbal medicines for both pharmacists and pharmacy technicians can improve their knowledge and confidence in recommending and managing these treatments; (2) collaborative practice will encourage teamwork between pharmacists and pharmacy technicians that can ensure the patients receive the appropriate level of care based on the complexity of their conditions. This includes clear protocols for referral when symptoms do not improve; (4) tailored training programs where developing training programs may address the specific needs of pharmacists and pharmacy technicians in different practice settings; (5) pharmacy workforce and professional development of the younger workforce in the pharmacy profession can ensure they are well-prepared to meet the demands of their roles and contribute to the future of pharmacy practice in Indonesia (Jetha et al., 2020).

Overall, the findings in this study emphasize the critical role of pharmacists and pharmacy technicians in the initial assessment and management of patient symptoms. Their ability to manage symptoms without immediate referral in many cases helps to streamline pharmacy operations and allows pharmacists to focus on more complex cases. However, the high referral rate for unresolved symptoms underscores the importance of a well-defined protocol that supports patient safety and ensures timely pharmacist intervention when needed. The data also suggest areas for potential training and protocol development. Ensuring that both pharmacists and pharmacy technicians have robust training in recognizing symptoms that require immediate referral could further enhance the efficiency and effectiveness of pharmacy services. Additionally, the findings could inform the development of guidelines that clearly delineate the responsibilities of pharmacy technicians and pharmacists in patient care.

CONCLUSION

This study underscores the vital role of pharmacists and pharmacy technicians in managing various ailments using herbal medicines in Indonesia. The results highlight that pharmacy technicians often manage common and less complex conditions, while pharmacists are more involved in managing conditions requiring more specialized knowledge. The findings highlight the importance of continuous professional development, especially in herbal medicine training, to ensure pharmacy professionals are well-equipped to provide high-quality care. The collaborative approach between pharmacists and pharmacy technicians, with clear referral protocols, ensures that patients receive the appropriate level of care based on the complexity of their conditions. This study also suggests areas for potential development in guidelines to clearly delineate the responsibilities of pharmacists and pharmacy technicians in practice and the importance of a collaborative approach to maximize the strengths of both pharmacists and pharmacy technicians. This approach ultimately benefits patient health outcomes, ensuring timely and effective care. The integration of herbal medicines into this practice further enriches the range of treatment options available to patients, combining traditional remedies with modern healthcare practices.

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CONFLICT OF INTEREST

No conflict of interest to disclose.

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