

Pharmacists perspectives on challenges and facilitators in initiating medications take-back program in Indonesia: A qualitative study

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Sofa D Alfian^{1,2,3} , Annisa M Azzahra¹, Qisty A Khoiry¹,
Meliana Griselda¹, Irma M Puspitasari^{1,2} and Rizky Abdulah^{1,2}

Abstract

Objective: The establishment of a medication take-back program is an important intervention to prevent the improper disposal of expired or unused household medications. However, such a program has not been established in Indonesia. A significant step in establishing the program is to gain a better understanding of pharmacists' perspectives on the associated challenges and facilitators. Therefore, this study aimed to explore pharmacists' perspectives on the associated challenges and facilitators in initiating medications take-back program in Indonesia.

Methods: This qualitative study was conducted through Key Informant Interviews with a purposive sample of nine pharmacists working in community health centers (CHC) in Bandung City, Indonesia. The discussions were transcribed, coded, and analyzed using Atlas.ti9 software.

Results: Pharmacists' perspectives on initiating medications take-back program were categorized into two main themes, including challenges and facilitators. The identified challenges comprised a lack of personnel, financial constraints, geographical constraints, lack of facilities, and inadequate knowledge. Meanwhile, the facilitators included the good responsibility of pharmacists, incentives, and convenient locations.

Conclusion: The identified challenges and facilitators should be considered when initiating medication take-back programs in Indonesia.

Keywords

Pharmaceutical waste, unused and expired household medications disposal, pharmacists, qualitative study, medications take-back program, Indonesia

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Introduction

Pharmaceutical waste has become a global issue since it has experienced a significant increase in recent years¹ and posed substantial environmental risks.^{2,3} However, there is a lack of awareness regarding the risks associated with the improper disposal of unused and expired household medications, particularly in developing countries.⁴ In these countries, the common disposal practices include direct disposal in the trash or flushing medications down the toilet or sink.^{5–9}

An important intervention to prevent the improper disposal of expired and unused household medications is the establishment of a medication take-back program. This initiative allows the public to return unused and expired household medications to a dedicated place for proper management and disposal, proving to be effective.^{10–12} Numerous countries, including Australia, Egypt, and the United States, have

adopted medications take-back program,^{13–15} but similar initiatives are rarely observed in Asia. In Indonesia, medications take-back programs, are often used by some pharmacies as part of their community social responsibility, covering the costs and dedicating the time. This is attributed to the absence

¹Faculty of Pharmacy, Department of Pharmacology and Clinical Pharmacy, Universitas Padjadjaran, Jatinangor, Indonesia

²Drug Utilization and Pharmacoepidemiology Research Group, Center of Excellence for Pharmaceutical Care Innovation, Universitas Padjadjaran, Jatinangor, Indonesia

³Center for Health Technology Assessment, Universitas Padjadjaran, Jatinangor, Indonesia

Corresponding author:

Sofa D Alfian, Faculty of Pharmacy, Department of Pharmacology and Clinical Pharmacy, Universitas Padjadjaran, Jl. Raya Jatinangor, KM 21, Jatinangor, Sumedang 45363, Indonesia.

Email: sofa.alfian@unpad.ac.id



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Table 1. Characteristics of participants (N = 9).

Characteristics	n	%
Gender		
Male	5	55.5
Female	4	44.5
Age, in years		
20–30	5	55.5
31–40	2	22.3
41–50	2	22.3
Education level		
Registered pharmacists	8	88.8
Master	1	11.2

of an official policy mandating pharmacists to receive unused and expired household medications from the public. In 2019, a campaign under the slogan “Let’s Dispose of Medications Properly” was launched where 1000 pharmacies in Indonesia collaborated to disseminate information regarding the return of expired and unused medications.¹⁶ However, the effectiveness and sustainability of such a program remains unknown, since very few Indonesians return unused and expired household medications to pharmacies.⁹

Addressing challenges and facilitators in initiating medications take-back program is crucial for effective planning and integration.^{17,18} Some previously reported challenges include high costs,¹⁹ limited spaces, options for returning unused household medications, regulatory barriers,¹⁸ as well as educational and time constraints.¹⁷ The identified facilitators in initiating medications take-back program comprise convenient collection methods, regulatory feasibility, sustainability, and efficient outreach and education for the public.¹⁸ Meanwhile, the acceptance from stakeholders, particularly pharmacists, is important for the successful and effective use of a such new program or system.²⁰ These factors have been observed in high-income countries with well-established healthcare systems, and their applicability in low and middle-income countries remains uncertain. Despite these considerations, no investigations have explored pharmacists’ perspectives on initiating medications take-back program for unused and expired household medications in Indonesia. Therefore, this study aimed to explore pharmacists’ perspectives on the identified challenges and facilitators in initiating medications take-back program in the country.

Methods

This study was reported based on the Consolidated Criteria for Reporting Qualitative Analysis²¹ (Table S1, Supplemental data).

Study design

This qualitative study was conducted among registered community pharmacists in Bandung City, Indonesia with Key

Informant Interviews (KIIs) approach. We employed descriptive phenomenology using thematic analysis as proposed by Collaizzi²² and Edward and Welch,²³ to elicit and gain a deeper understanding of the phenomenon under study.

Ethics approval

The study was approved by the Health Research Ethics Committee of Universitas Padjadjaran, Indonesia (671/UN6. KEP/EC/2022). All participants provided signed written informed consent, and privacy with anonymity was maintained during data collection and analysis.

Study population

Purposive sampling was used to select pharmacists with at least 1 year of experience working in a community health center in Bandung City, Indonesia. The participants were selected based on gender, age, and position to ensure heterogeneity (Table 1).

Recruitment process

Community pharmacists were approached after working hours, informed about the study’s objective, and verified for eligibility. The participants were provided with an outline of the study objective and informed of the time needed for the KIIs. All pharmacists who agreed to participate signed written informed consent.

Topic guide development

The topic guide consisted of unbiased, open-ended questions, and probes that were adopted from the literature regarding the disposal of unused and expired household medications.^{24,25} Open-ended questions were used to enable interviewees to fully express their opinions and to gain a better understanding of the issues. Some examples of such questions include, “Suppose this program is implemented, what do you see as barriers?” and “What would help to support and facilitate the implementation of medications take-back program?” (Table S2, Supplemental data). The topic guide was pilot-tested with two pharmacists and reviewed for credibility by SDA and IMP. The guide was slightly modified due to suggestions and recommendations from the pilot interview. Meanwhile, the data collected during the pilot interview were not included in the analysis results.

Data collection

KIIs were conducted online on 19 October 2022, and interviewed by AMA, a pharmacy expert. Before the commencement of KIIs, the interviewer explained the ground rules and objectives of the study. The session lasted approximately 103 min. Data saturation was not considered in this study.

Study paradigm

Considering the lack of exploratory reviews on pharmacists' perspectives regarding the disposal of unused and expired household medications, a conventional content analysis was performed.²⁶ This framework aimed to explore and understand pharmacists' perspectives in terms of challenges and facilitators in initiating medication take-back programs in Indonesia.

Challenges and facilitators

Factors were considered challenges when they hindered the use of medications take-back program. Meanwhile, factors were considered facilitators when they promoted the use of such a program.

Data analysis

Discussions were recorded with permission and transcribed verbatim by AMA. The transcribed data were then coded and analyzed by SDA and AMA using the software Atlas.ti9. Atlas.ti9 is a computer-aided qualitative data analysis software that assists in qualitative research by enabling collected data to be entered in quotes and then coded into categories to be addressed as the outline of the study's findings. AMA summarized and clustered the statements by adopting thematic methods, including the selection of quotations and keywords, coding, theme development, conceptualization through interpretation of keywords, codes, and themes, as well as the development of conceptual model.²⁷ SDA conducted further independent verification, and it was observed that any disagreements between the two experts were resolved through discussions.

Data validation

Peer debriefing was conducted with two experienced experts (RA and IMP) who provided comments and input related to the analysis results. A summary of experts' interpretations was sent to all participating pharmacists within 1 week after completing KIIs. This member-checking process was required to verify the accuracy of the interpretations and to enhance data credibility.

Data quality control

To establish trustworthiness, the study used several measures based on Lincoln and Guba²⁸ including, first, a reflective journal was used during note-taking to reduce experts's bias. Second, participants' characteristics such as gender, age, and education level, were recorded to address data transferability. Third, the completeness and credibility of the content were ensured by returning the transcript to the participants for verification. Fourth, the unit of analysis was taken as sentences instead of letters or words to give proper meaning to

the text. Finally, continuous discussion and negotiation regarding the content of keywords, broader concepts, and units of meaning were conducted among the experienced experts to ensure the credibility and validity of the information obtained from the participants.

Results

In this study, nine pharmacists participated, with the majority of them are male (55.5%), aged 30 years or below (55.5%), and registered pharmacists (88.8%), as shown in Table 1. Using the open-coding method, 32 codes surfaced and grouped into 14 categories that were further grouped into eight subthemes. The subthemes were finally presented and described under two broader themes, including challenges and facilitators associated with medications take-back program in Indonesia (Table 2).

Challenges

Lack of personnel. Pharmacists need additional support to initiate medications take-back program due to the high level of workload. For instance, pharmacists expressed,

“...in my pharmacy, there is only one pharmacist and one assistant, thereby making it difficult to initiate a new program. . .” (Pharmacist 1).

Financial constraints. The collection and destruction of medication wastes require costs. As more unused and expired medications are collected and disposed of, the associated charges tend to increase, as expressed by two pharmacists.

“The collection of unused and expired medications and their destruction are not free. There is a need for collaboration with third parties. The more medications are collected and destroyed, the more money is needed. This should be taken into account. . .” (Pharmacist 2).

“Accepting medicine returns from the public is unfavorable, as the waste management company charges incineration fees based on weight. The more waste there is, the more expensive the incineration fees would be”, as expressed by Pharmacist 9.

Geographical constraints. Given that Indonesia is an archipelagic country, residents in remote areas have been facing a lot of challenges in returning and disposing of unused and expired household medications. This difficulty was expressed by one pharmacist as,

“From the village to the nearest pharmacy can take approximately 3–4 h, therefore, it seems difficult to initiate medications take-back program. . .”, as expressed by Pharmacist 3.

Lack of facilities. Pharmacists mentioned that there was a lack of facilities for collecting and destroying medication waste

Table 2. Frequencies of categories.

Themes and subthemes	No. of categories	No. of codes
Challenges		
Lack of personnel	1	3
Financial constraints	2	5
Geographical constraints	1	4
Lack of facilities	2	3
Lack of knowledge	1	2
Facilitators		
Good responsibility of pharmacists	2	3
Incentives	2	7
Convenient location	3	5

from the public. Current regulations mainly addressed unused or expired medications from healthcare institutions and pharmacies, neglecting those from households. The following were examples of relevant quotes from some pharmacists.

“... facilities and infrastructure are only available in regional hospitals. . .”, as expressed by Pharmacist 3.

“... if you have your incinerator, it is more effective because it may reduce costs. Therefore, the government must facilitate the incinerator”, as suggested by Pharmacist 4.

Lack of knowledge. Pharmacists mentioned that disposing of medication waste directly into the trash was less harmful than disposing of it in the river. This point was expressed by one pharmacist as,

“... in my opinion, disposing of medications waste into the trash can have a negative impact, but it is better than disposing the waste into the river. . .” (Pharmacist 3).

Facilitators

Good responsibility of pharmacists. Pharmacists are responsible for educating the public about the proper disposing of unused and expired household medications. This was expressed as,

“... it is indeed pharmacists’ responsibility to educate the public about appropriate medications disposal” (Pharmacist 5).

“We, pharmacists, have an important role in educating the public on how to properly store and dispose of unused and expired medications. . .”, as expressed by Pharmacist 1.

Incentives. Based on pharmacists’ statements, additional incentives are needed to motivate them to initiate medications take-back program. The following quote was provided by pharmacists.

“For pharmacists who participated in medications take-back program, they need to be given additional incentives. When they

are only given responsibility and there is no reward, there will be no action. . .” (Pharmacist 4).

“To consider accepting medications from the public, there should be additional incentives from the government, as the process can be an extra workload for the pharmacy staff”, as expressed by Pharmacist 6.

Convenient location. Establishing a convenient location for collecting unused and expired household medications, through collaboration with local public associations is considered crucial. This location would socialize and provide a temporary space for disposing of medication waste, which was then handed over to the nearest pharmacy or hospital at regular intervals. The following represented quotations from pharmacists.

“We also have to coordinate with cross-sectors, for example, the local public association to socialize and provide temporary shelter for medications waste. At the end of the time, it will be handed over to the nearest pharmacy or hospital”, as expressed by Pharmacist 4.

“I think there should be a system to collect the unused medications from the residential areas”, as suggested by Pharmacist 5

“The location to return the medicines should be conveniently reachable by the public. Therefore, unused medicines collection points can be initiated along with the local public association”, as described by Pharmacist 7.

Discussion

This study aimed to investigate the perspectives of community pharmacists regarding the associated challenges and facilitators of initiating medications take-back program in Indonesia. Pharmacists identified specific methods required for using such a program, suggesting that methods might vary between pharmacies.

Some challenges such as lack of awareness and knowledge, financial constraints, and time barriers were in line with previous results.^{17–19} In this study, a qualitative method was adopted to enable a more in-depth exploration of

additional challenges, particularly geographic constraints, that might hinder the initiation of medications take-back program in Indonesia.

We observed that lack of personnel posed significant challenges in initiating medications take-back program in Indonesia. The workload of community pharmacists included prescription screening and analysis, compounding, medications dispensing, packaging, labeling, providing drug information, managing pharmaceutical supplies, patient counseling, and drug usage monitoring.²⁹ It was observed that the number of pharmacists in some health facilities has failed to meet the minimal requirement.³⁰ Therefore, introducing the new medications take-back program for collecting and disposing of unused and expired household medications would necessitate an increased number of pharmacists to manage the additional workload. Furthermore, pharmacy assistants would be required to share responsibilities to implement such a program and reduce barriers to medication take-back implementation.³¹ Therefore, implementing a medication take-back program is a significant step that would require the collective effort of additional pharmacists and pharmacy assistants to manage the increased workload. The existing staff, including pharmacists and pharmacy assistants, would need training on the procedures and protocols specific to the take-back program, adding to the current demands on their time.

We further observed that the financial burden and lack of facilities were also shown as challenges in initiating medications take-back program in Indonesia. This was in line with the situation in Malaysia, where pharmacists refrained from accepting returned medicines due to operational costs associated with safe disposal and the lack of facilities for managing unwanted, expired, and returned medicines.³² Previous investigations reported that the total value of medications collected in a year reached \$63,183.³³ Additional indirect expenses included medications package disposal, printer ink, labels, and labor payments.^{18,33,34} Another study reported that medications take-back program held over 3 years cost \$1,118,020.³⁵ Implementing the medicine take-back program would necessitate significant funding to cover disposal fees, transportation, manhour fees, and other costs, which would add to the current regular expenditure of pharmacies. Additional work would also be required to create an overview of the fund utilization and source qualified vendors to handle the disposal procedure. These costs could be shared with other stakeholders in the pharmaceutical sector.³⁶ Both community and hospital-based pharmacies may include additional charges in medication purchases as an alternative fund for disposing of unused or expired medication. Alternatively, general tax revenue and charging a disposal fee at the time of purchasing could be a potential source of funding.¹⁸ In Canada, Australia, and Europe, the funding was obtained by allocating an operating fee for a disposal program to manufacturers, pharmacies, and wholesalers, where the quantity of medicines collected formed the basis for manufacturer fees.¹⁸

Moreover, pharmacists mentioned that geographical constraints posed a significant challenge to initiating medications take-back program. The country's archipelagic nature necessitates a unique approach to overcome all geographical constraints. However, initiating such a program by gradually covering the area may be a useful starting point for implementation. In Indonesian rural areas, drop-off locations could be placed in more prevalent public facilities such as police stations, community health centers, schools, or markets, which were trusted due to a lack of health facilities.^{18,37} Previous reviews in the USA showed that the public was willing to participate in medications take-back program as long as they would not travel more than 5 miles to return unused and expired medications.³⁸ Therefore, locations should be familiar, comfortable, and freely accessible to the public.¹⁸ Alternatively, pharmacists, in collaboration with other health professionals, may take the initiative to pick up unused medications in rotation from one region to another, concurrently with their regular public health programs that are usually held in community health centers in Indonesia. Addressing these geographical constraints would also necessitate additional fees for transportation expenses; consequently, we should encourage drug manufacturers and medication distributors to provide pick-up services for unused medication from pharmacies simultaneously after returning from their distribution activities. This approach could also be an alternative solution to reduce the expense.

In this study, inadequate knowledge was further identified as another challenge in initiating medications take-back program in Indonesia. A prior study in Indonesia reported that pharmacists had insufficient knowledge regarding medication return guidelines.³⁹ Initiation of such a program required pharmacists to have sufficient knowledge of proper medication disposal procedures and related regulations.⁴⁰ To address this barrier, pharmacists need to be adequately educated on how to perform and educate the public about proper disposal of medication waste.^{10,41–43} Therefore, education and widespread outreach to pharmacists and other healthcare providers were urgently needed to initiate medications take-back program.¹⁸ The education and training should include the increased accountability of providing proper disposal information to strengthen the pharmacist's authority as a medication expert.⁴¹ It may also be essential to incorporate more medication disposal knowledge into pharmacy school.⁴³

Pharmacists in this study mentioned several facilitators for starting medication take-back programs in Indonesia. An important factor needed for initiating medications take-back program was the good responsibility of pharmacists. Effective and participatory results in such a program were achieved through commendable and responsible cooperation among pharmacists, public associations, government, and the public.¹⁹ Encouraging pharmacists to assess their patients' practice on medication disposal during the drug counseling session could establish opportunities to regularly deliver education about medication disposal.⁴³

Moreover, interprofessional cooperation may also improve greater coordination to address patient safety issues let alone drug-related environmental issues.⁴⁴

Furthermore, pharmacists mentioned that offering additional incentives could serve as other facilitators in initiating medications take-back program. The sustainability of the program relied on securing broader participation. Therefore, this study showed that pharmacists would support medications take-back program when they received incentives and support from the government or pharmacists' organizations. Given their current workload and responsibilities, pharmacists showed a greater willingness to implement medication take-back programs when provided with incentives. As a result, providing assistance by recruiting more pharmacists and pharmacy assistants to share the workload would be essential to facilitating the take-back program. Even though such a strategy would increase current expenses, necessitating additional financial support, adequate incentives could improve pharmacists' performance and clinical service, resulting in a significant reduction in total care costs.^{45,46}

We further observed that a convenient location played an important role in driving the public to return unused and expired household medications. Previous studies showed that the most preferred take-back locations included outpatient clinics, convenience stores used for selling over-the-counter medicines, and licensed pharmacies.⁴⁷ When unused and expired household medications were collected in convenience stores, obtaining statutory exemptions to permit such stores to retain prescribed medications would be necessary. Additionally, appropriate waste transport and disposal procedures for collected pharmaceutical wastes needed to be integrated.⁴⁷ When collection points were set up at clinics that the public normally visited, unused and expired household medications were returned without incurring extra travel.⁴⁷ Collaboration with public associations, such as community health centers or local municipalities, might further facilitate the initiation of the take-back program. This was because the associations were directly connected with the public at the sub-district to rural level and were established in many Indonesian areas.⁴⁸ Moreover, collaborative medications take-back events were proven to be effective in removing unused medications from the community.³⁵ The Indonesian Ministry of Health, the National Health Insurance Program, and National Community Pharmacists Associations can collaborate on such events, and hospitals and Community Health Centers (CHCs) can hold regular public health programs that also involve community pharmacies and telepharmacy service providers to implement a sustainable take-back program.^{49,50}

This study showed specific methods that were needed for integrating medications take-back program. It is important to consider that such methods might need to be tailored for each community pharmacist, considering available resources. Pharmacists' awareness of the risks associated with improper disposal of expired and unused household medications, along with the acknowledgment of their responsibilities to

protect the environment, provided an opportunity for initiating the take-back program.⁵¹ Furthermore, pharmacists who took the responsibility to counsel regarding information on disposal elicited improvements in disposal practices among patients.⁵² Moreover, a collaborative implementation aimed at broadening the acceptance of unused medication disposal services in pharmacies and hospital-based pharmacies will strengthen the elimination of harmful environmental impacts caused by inappropriate medication disposal.^{10,53} However, to ensure the sustainability of such systems' implementation, stakeholders and national drug regulatory bodies would be required to provide support.

The study became the first to explore pharmacists' perspectives regarding the identified challenges and facilitators in initiating medications take-back program in Indonesia. However, it is important to acknowledge the limitations of the analysis. We did not include an independent coder as a mediator for any disagreements, since the two coders resolved them through discussions. Furthermore, the results were context-specific and drawn from a small sample of pharmacists. Future investigations might include related stakeholders, particularly government agencies to develop strategies for initiating medications take-back program. The investigations were also recommended to understand the public attitudes and willingness to participate in such a program.

Conclusions

In conclusion, the identified challenges in initiating medications take-back program consisted of a lack of personnel, financial constraints, geographical constraints, lack of facilities, and insufficient knowledge. Meanwhile, the facilitators included good responsibility of pharmacists, additional incentives, and convenient locations for collecting unused and expired household medications. These identified challenges and facilitators should be considered when initiating a medication take-back program.

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Authors' contribution

Conceptualization: SDA and AMA; Methodology: SDA, AMA, QAK, and IMP; Software: SDA and QAK; Formal analysis: SDA, AMA, and IMP; Investigation: SDA and RA; Data curation: SDA and AMA; Writing – original draft preparation: SDA; Writing – review and editing: SDA, AMA, QAK, MG, IMP and RA; Supervision: IMP and RA. All authors have read and agreed to the published version of the manuscript.

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Ethics approval

Ethical approval for this study was obtained from the Health Research Ethics Committee of Universitas Padjadjaran, Indonesia (671/UN6.KEP/EC/2022).

Informed consent

Written informed consent was obtained from all subjects before the study.

Trial registration

Not applicable.

ORCID iD

Sofa D Alfian  <https://orcid.org/0000-0001-5419-8938>

Supplemental material

Supplemental material for this article is available online.

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