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# Perspectives of pharmacists and patients on pharmacist services to improve medication adherence among patients with diabetes in Indonesia

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## Abstract

**Objectives:** Pharmacists' role in diabetes care is developing in improving medication adherence. Implementation of pharmacist services needs to consider patients' and pharmacists' perspectives as service users and providers, respectively. Therefore, this study investigates both perspectives on suitable pharmacist services to improve medication adherence in Indonesia.

**Methods:** This study used data collected based on open-ended survey questions, which were part of a survey among 917 patients and 99 pharmacists in community health centres (CHCs) and three hospitals in Surabaya, Indonesia. The open-ended questions aimed to elicit the perspective of patients and pharmacists on pharmacist services. The data were digitally recorded, transcribed and analysed in Atlas.ti 9th software using a pre-defined coding book. The data were then quantified.

**Key findings:** Most patients indicated they did not need services to improve medication adherence (67.25% CHCs vs. 63.06% hospitals). Those who did need services mostly preferred educational-based pharmacist services. This was also pharmacists' most frequently mentioned service (45.45%). Consultation/counselling was the most common service to improve adherence according to pharmacists (66.67%) and patients (15.53% CHCs vs. 19.89% hospitals). Reminders about medication use and providing discussion sessions/seminars, and home care were other options mentioned. Limited human resources, time and pharmacists' high workload were the most commonly identified barriers to implementing the desired pharmacist services.

**Conclusion:** Patients and pharmacists had similar perspectives on the desired services to improve medication adherence, especially educational-based services and consultation/counselling. Barriers to implementing services should be considered when evaluating the current practice and preparing for pharmacists' future role in patient care.

**Keywords:** diabetes; medication; adherence; patient; pharmacist; services

## Introduction

Pharmacists have become more focussed on patient-oriented services.[1–4] Pharmacists further play an important role in disease state management for chronic diseases such as diabetes.[5,6] A recent systematic review demonstrates that various pharmacist services can effectively improve blood glucose control and enhance medication adherence among patients with diabetes.[7]

However, the implementation of new pharmacist services faces many challenges in low- and middle-income countries. First, the pharmacist's role in these countries is still evolving in its focus on patient care services. This role is not yet entirely acknowledged by other healthcare professionals and patients.[8,9] Second, the high workload limits the pharmacists' ability to provide adequate services for patient care.[10–12] Various pharmacist services have been developed, and the implementation of these services can differ depending on the context

or the targeted population as the role of pharmacists is still developing and not yet well established in low- and middle-income countries.[7,13] Consequently, findings from studies in high-income countries are not always applicable and relevant for low- and middle-income countries. Also, it is essential to know the patients' perspectives on pharmacist services to improve their diabetes care and medication adherence.

This study focusses on the pharmacists' and patients' perceptions of the pharmacists' role in diabetes care in Indonesia. Since implementing the universal health coverage (UHC) program in 2014 in Indonesia, the pharmacists' workload has increased. As a result, it has become a challenge to provide services focussing on patient care, especially due to the high number of patients, the limited number of pharmacists and many administrative tasks pharmacists have.[11,12,14] In practice, not all pharmacists can provide services that focus on patient care because of those limitations. Generally, medicine-related information is provided for free

when the medicine is handed to the patient. Two studies on the preferences for pharmacist services in diabetes care in Indonesia show that patients prefer a shorter consultation duration with flexible access to pharmacists and variation in the choice of pharmacist services, like consultation, brochure, medication review or patient group discussion. These studies, however, lack in-depth insight into the pharmacists' and patients' perceptions of suitable pharmacist services. The study presented here adds to the literature by providing evidence of the role of pharmacist services in improving medication adherence. Other studies exploring patient preferences towards pharmacist services to improve medication adherence, especially in diabetes care,[15–17] have reported evidence for the Netherlands and Ireland but not for Indonesia.

Therefore, this study aims to identify pharmacists' and patients' perceptions of what kind of pharmacist services can improve medication adherence among patients with diabetes in Indonesia. The study is important because it provides insight into the consensus among pharmacists and patients on optimizing current services. It also provides a base for recommendations on which pharmacist services can meet the needs of patients with diabetes and improve their medication adherence.

## Theoretical Framework

This study is developed based on the conceptual model of three types of pharmacist-based services for medication adherence: educational-based services, behavioural-based services, and a combination of both strategies (see Figure 1). Pharmacists commonly use these strategies to tackle medication adherence in chronic diseases.[18, 19] This framework is suitable for optimizing the medication adherence of patients with chronic diseases, and for diabetes in particular, regarding the risk factors of non-adherence. First, non-adherence has been associated with a lack of information; therefore, educational-based services may help improve patients' knowledge of their disease and medications. It is expected that improving knowledge may change their non-adherence. Second, non-adherence can be related to patients' health beliefs, illness perception, memory-related problems or forgetfulness, and behavioural-based services can enhance medication adherence.

Educational-based services focus on providing information to improve the knowledge of the patient with the expectation that patients with sufficient information about the disease and medication will adhere more to the medication. The strategy outcomes depend on the willingness and ability of patients to use the information provided by the pharmacist.[19] Distribution of brochures/leaflets, consultation/counselling or discussions/seminars are examples of educational-based services.

On the other hand, behavioural-based services are designed to influence patients' behaviour by shaping, reminding or rewarding desired behaviour (reinforcement).[19] This strategy also promotes a healthy lifestyle and positive changes in symptoms and treatment, including adherence.[18] Phone call reminders, medication management (pill boxes, diaries, scheduled medication administration, medication-taking supervision) or home care are behavioural-based services.

The third strategy is a combination of educational and behavioural-based services. Educating patients with important information about the disease and medication, combined with services that influence patient behaviours, can achieve better results. One systematic review study found that pharmacists commonly use combination strategy-based services to improve medication adherence.[7]
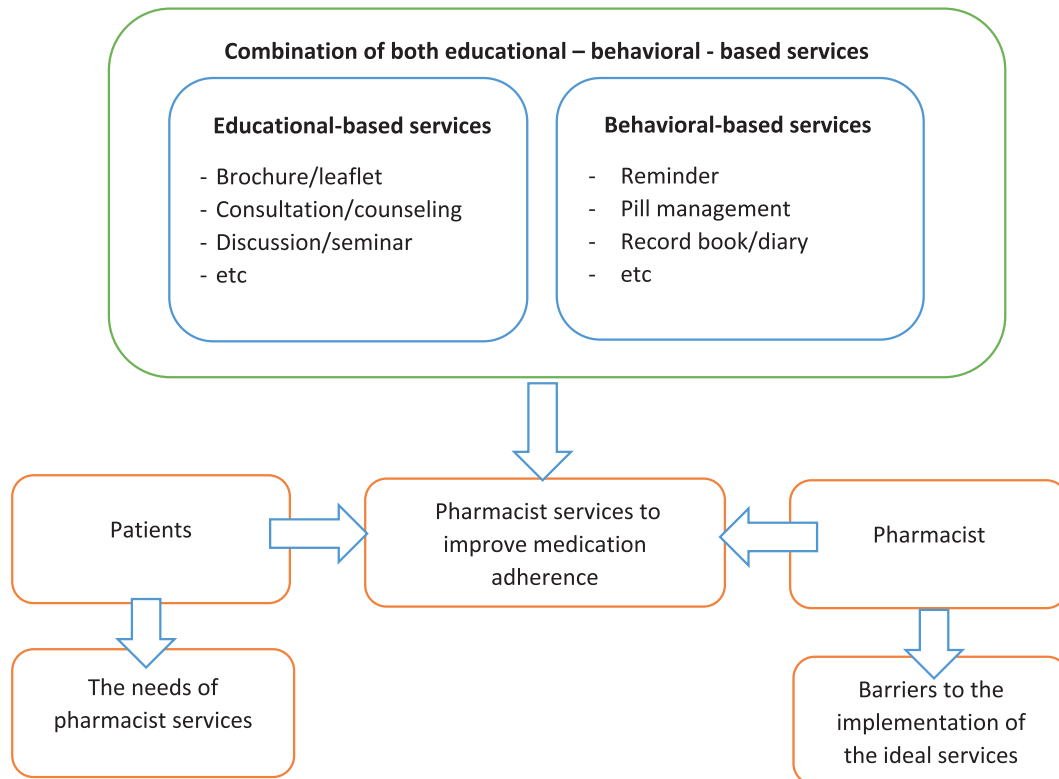


**Figure 1.** Conceptual model.

This study focusses on the need for pharmacist services among patients with diabetes to improve medication adherence and identifies pharmacist services that can improve medication adherence according to the pharmacist and patients. All three strategies are related to the needs of patients and pharmacists as care providers. Factors like pharmacist skills, knowledge, workload, culture or regulations might influence applying suitable pharmacist services.[20–22] Therefore, studying the barriers to applying pharmacist services based on real practice conditions can provide valuable information for implementing these services.

## Methods

### Study approach and settings

This study uses data from a survey on preferences for pharmacist services carried out among patients and pharmacists from February to November 2019 in Surabaya, the second-largest city in Indonesia. The inhabitants of Surabaya include people of different ethnic and educational backgrounds, similar to other cities in Indonesia. People in Surabaya mostly have a low educational background (51.61% in elementary and junior secondary school, 13.37% without any education or not yet finished elementary school and 33.23% in senior high school).[23] There are 37 general hospitals and 63 community health centres (CHCs) in Surabaya.[24] Surabaya also had a poverty rate of 4.51% in 2019.[25] Due to the ethnic minorities living in Surabaya, it is common to find people who cannot communicate in Indonesian. In particular, many older people only understand the local dialect of Surabaya. Javanese and Maduranese are the two most common local dialects. This variety in local dialects influences the way healthcare providers approach patients.

Moreover, as in other Indonesian cities, the implementation of the UHC program in Surabaya impacts health service provision for patients, particularly chronic diseases. Within the UHC program, patients primarily receive medications from community health centres (CHCs) or hospitals. CHC is the frontline of health services providers in Indonesia. In general, patients get their first medical services through CHC, but there is also the possibility of referring patients to a hospital if their health condition needs further comprehensive treatment. Patients visit CHCs or hospitals for routine medical check-ups with physicians and refill their medication at pharmacies. Patients cannot get their medication refills at community pharmacies without a prescription.

Patients and pharmacists from 63 CHCs and 3 hospitals (one public hospital and two private hospitals) were included in the survey. The survey had a face-to-face interview format where interviewers asked the questions included in the standardized survey questionnaire and filled in the responses indicated by the respondents. This study analyzes the data collected through the open-ended questions at the end of the survey questionnaire.

### Ethical approval

The ethical approval of this study was granted by the Institutional Ethical Committee of the University of Surabaya (067/KE/II/2019). In addition, approval for data collection in the community health centre was obtained from the Surabaya City Health Office (072/9061/436.7.2/2019). At the same time, approval for hospital data collection was granted from each research site's board (070/6236/43686/2019, Kp.2.07/2/18/PT.PHC-2019 and 934/RSHU/Dir./V/2019).

### Research instrument

The standardized survey questionnaire was developed with the objective to investigate the types of pharmacist services that can help to improve medication adherence among patients with diabetes from pharmacists' and patients' points of view. The questionnaire was discussed with five academic pharmacists with a primary research interest in pharmacist services in Indonesia. One of the academic pharmacists had a public health background.

The version of the questionnaire used in data collection among pharmacist was slightly different from the version used in data collection among patients. Both versions were face validated among 10 potential respondents. The face validity testing aimed to identify whether the questions were understood by participants and time required for filling in the questionnaire in a face-to-face interview.

The open-ended questions at the end of the survey questionnaire, used in this study, had the objective of gathering data on pharmacists' perception of what pharmacist services are suitable for patients with diabetes to improve their medication adherence. For the patient, the objective was to investigate the patients' needs to get additional services from the pharmacist and identify pharmacist services expected by the patient to enhance medication adherence.

The following open-ended questions were asked: 'what type of pharmacist services would you like to receive to improve medication adherence?' (for the patient) and 'what type of pharmacist services would you like to provide to improve medication adherence among patients with diabetes' (for the pharmacist). One additional question was asked to pharmacists: what barriers are present to implementing the desired pharmacist services to improve medication adherence.

### Sampling and data collection

This study involved all pharmacists from 63 CHCs and three hospitals in the interviews with pharmacists. All pharmacists in CHCs and three hospitals were asked to participate and agreed to do so. This study also involved adult patients (>18 years old) with type 2 diabetes who visited pharmacies at 57 CHC and three hospitals for routine medical check-ups and medication refills. Identifying patients with diabetes was done with the help of pharmacists in each community health centre and hospital. Information on the sampling procedure is presented in Supplementary File 1.

The main researcher collected data among the pharmacists and four research assistants collected data among the patients involved in the study. Before the data collection, research assistants were given training by the main researcher on how to fill in the respondents' answers in the survey questionnaire during the interview. At the start of the interviews, the interviewers (main researcher and research assistants) explained the study to the respondents (patients and pharmacists). All patients and pharmacists who participated in the study were asked to sign the informed consent letter.

Pharmacists' interviews were conducted by making an appointment. For patients, interviews were conducted when the patients were waiting to get medical services and medication at the medical facility. The part with open-ended questions

related to this study took around 5–10 min and was recorded and transcribed.

There were 400 patients in CHC, 517 patients in the hospital and 99 pharmacists involved in this study.

## Data analysis

The research assistants transcribed the data gathered through the open-ended questions, and the quality of the transcripts was checked (for 20% of all transcriptions) by the main researcher. After transcription, the interview data were coded. The coding analysis was based on a coding book to explore the types of pharmacist services to improve medication adherence and the barriers to preferred pharmacist services, according to pharmacists and patients.

Two coders were involved in the development of the coding book. Both coders could understand Indonesian as well as the Javanese language. Each coder initially did coding individually, and discrepancies were resolved by discussion between two coders. The coding was done in Atlas.ti 9th edition software package.

In the coding book, the three pharmacist service strategies were used as a base: educational-based services, behavioural-based services and a combination of both services (see Supplementary File 2). Codes for pharmacist services that the respondents indicated to improve medication adherence were also included.[7, 19]

Results are presented narratively and in table format because it was possible to quantify some data given the high number of respondents. *T*-test and two-sample Wilcoxon rank-sum (Mann–Whitney) test are used to compare the quantified results for CHCs and hospitals. *T*-test was used to compare the sample population for numerical data and two-sample Wilcoxon rank-sum (Mann–Whitney) test was used for nominal data.

## Results

In total, 917 patients and 99 pharmacists were included in the survey and also in this study. Forty-eight patients refused to be interviewed, and 71 patients were excluded from the study because of incomplete answers during the interviews. Majority of the interviews were in the Indonesian language. Only a few interviews were in the Javanese language.

Patients involved in this study had an average age of 59 years (CHC) and 61 years (hospital). Most patients had diabetes for more than 5 years and had comorbidities (≥60%). Pharmacists involved in this study were primarily women aged 23–44 years and reported on average that they had worked 7.75 years as a pharmacist. Details on the socio-demographic data of the respondents can be found in Supplementary Files 3 and 4.

Tables 1 to 3 present an overview of the main findings of the interviews. Below those findings are presented narratively.

Most patients from CHCs (67.25%, see Table 1) and hospitals (63.06%, see Table 1) indicated that they did not need any pharmacist services and commonly reported that such services were unnecessary. The second most common reason was the limited understanding of pharmacist services, making the information provided to patients unclear. The complete list of the reasons can be found in Table 2.

Most patients, however, did not provide any specific reason for not needing pharmacist help. Some quotes from patients related to this statement can be found in Table 4.

## Pharmacist services strategy: educational-based versus behavioural-based services

As explained in the method section, three pharmacist services strategies were identified to classify the type of pharmacist services suggested by respondents. For patients with diabetes in CHCs and hospitals, educational-based services (18.50% vs. 21.86%, see Table 1) and behavioural-based services (12.50% vs. 14.12%, see Table 1) were the most desired strategies to improve medication adherence.

When asked about pharmacist services to improve medication adherence, patients express a need and expectation for pharmacists to educate patients about their medication. Most patients perceived that pharmacists should provide education about medication or diabetes to help improve medication adherence due to a lack of information. Pharmacists' education provision is emphasized in some of the patient quotes that can be found in Table 4.

Some patients were interested in other pharmacist services besides education that can influence their behaviour in medication adherence. Patients perceived that activities/services that directly impact the behaviour are helpful, such as reminders.

In total, only a small percentage of patients (CHC 1.00% vs. hospital 0.97%, see Table 1) are interested in having services that combine educational and behavioural-based services. Similar findings show that patients who perceive adherence and non-adherence with their medications do not favour a combination of services.

Pharmacists reported that educational-based services are the most common strategy for improving medication adherence in patients with diabetes (45.45%, see Table 2). This finding aligns with patients who expect pharmacists to provide educational-based services to improve medication adherence. A combination of educational-behavioural-based services (31.31%, see Table 2) is the second most frequently mentioned pharmacist service.

## Desired types of pharmacist services

Most patients name consultation/counselling as the most desired pharmacist service that can help improve medication adherence. The finding is aligned with the standard of pharmaceutical care services that pharmacists should provide necessary medication information through counselling.

The need for pharmacist services that directly influence behaviour is reflected in the answers that patients want to be reminded about taking their medications or obtaining their refills. A similar finding is found for patients who report they adhere and patients who do not adhere to their medications.

Communication between pharmacists and patients through consultation/counselling is considered necessary by pharmacists to educate and change non-adherence behaviour (see Table 2). Most pharmacists perceive providing information through direct patient interaction as a better approach to improving medication adherence. Like patients, most pharmacists also feel that consultation/counselling is the best method for improving medication adherence.

As seen in Table 2, pharmacists also shared a similar perspective as the patients. A reminder to take their medications or refill is the second most desired service to provide to the patient. Pharmacists with experience helping non-adherent

Table 1 Type of desired pharmacist services the patients with diabetes would like to have to improve medication adherence

| | Frequency (percentage) | | Patients perceive to adherent | | Patients perceive to non-adherent | |
|---|---|---|---|---|---|---|
| | CHCs (400 respondents) | Hospitals (517 respondents) | CHCs (400 respondents) | Hospitals (517 respondents) | CHCs (400 respondents) | Hospitals (517 respondents) |
| **Pharmacist services strategy** | | | | | | |
| Educational based services | 74 (18.50%) | 113 (21.86%) | 51 (22.47%) | 79 (22.25%) | 26 (15.03%) | 34 (20.99%) |
| Behaviour-based services | 50 (12.50%) | 73 (14.12%) | 27 (11.89%) | 45 (12.68%) | 23 (13.29%) | 28 (17.28%) |
| Combination | 4 (1.00%) | 5 (0.97%) | 1 (0.44%) | 2 (0.56%) | 3 (1.73%) | 3 (1.85%) |
| No desired services indicated | 269 (67.25%) | 326 (63.06%) | 148 (65.20%) | 299 (64.51%) | 121 (69.94%) | 97 (59.88%) |
| **Type of pharmacist services indicated** | | | | | | |
| Consultation/counselling | 64 (15.53%) | 104 (19.89%) | 42 (18.03%) | 73 (20.39%) | 22 (12.22%) | 31 (18.79%) |
| Reminder | 49 (11.89%) | 77 (14.72%) | 25 (10.73%) | 46 (12.85%) | 24 (13.33%) | 31 (18.79%) |
| Notes | 13 (3.16%) | 10 (1.91%) | 8 (3.43%) | 6 (1.68%) | 5 (2.78%) | 4 (2.42%) |
| Brochure/leaflet | 4 (0.97%) | 1 (0.19%) | 2 (0.86%) | 1 (0.28%) | 2 (1.11%) | |
| Discussion/seminar | 6 (1.46%) | 1 (0.19%) | 3 (1.29%) | | 3 (1.67%) | 1 (0.61%) |
| Motivation | 4 (0.97%) | 1 (0.19%) | 3 (1.29%) | 1 (0.28%) | 1 (0.56%) | |
| Homecare | 3 (0.73%) | | 2 (0.86%) | | 1 (0.56%) | |
| Performing target assessment | 1 (0.24%) | | | | | |
| Consultation/counselling (family) | | 3 (0.57%) | | 2 (0.56%) | 1 (0.56%) | 1 (0.61%) |
| **Reason for no desired services indicated** | | | | | | |
| No need pharmacist help | 68 (25.28%) | 63 (19.33%) | 36 (24.32%) | 45 (19.65%) | 32 (26.45%) | 18 (18.56%) |
| Missing data due to limited understanding of patient | 55 (20.45%) | 87 (26.69%) | 26 (17.57%) | 54 (23.58%) | 29 (23.97%) | 33 (34.02%) |
| Current pharmacist services is sufficient | 53 (19.70%) | 64 (19.63%) | 35 (23.65%) | 48 (20.96%) | 18 (14.88%) | 16 (16.49%) |
| More expectation on technical aspect of pharmacist services | 31 (11.52%) | 51 (15.64%) | 19 (12.84%) | 38 (16.59%) | 12 (9.92%) | 13 (13.40%) |
| Adherence behaviour heavily depend on personal effort | 24 (8.92%) | 29 (8.90%) | 10 (6.76%) | 16 (6.99%) | 14 (11.57%) | 13 (13.40%) |
| No specific preference on pharmacist services as long as it can enhance the clinical outcome | 23 (8.55%) | 12 (3.68%) | 12 (8.11%) | 12 (5.24%) | 11 (9.09%) | |
| Feel already compliance | 8 (2.97%) | 13 (3.99%) | 8 (5.41%) | 13 (5.68%) | | |
| Focus on family help | 6 (2.23%) | 5 (1.53%) | 2 (1.35%) | 1 (0.44%) | 4 (3.31%) | 4 (4.12%) |
| Missing data due to limited understanding of patient and language barrier | 1 (0.37%) | | | | 1 (0.83%) | |
| Expect on the attitude of pharmacist providing services | | 2 (0.61%) | | 2 (0.87%) | | |

**Table 2** Type of desired pharmacist services that pharmacist would like to provide to improve medication adherence among patients with diabetes

| | Desired pharmacist services (99 respondents) | Pharmacist with experience helping non-adherence diabetes patient (54 respondents) | Pharmacist without experience helping non-adherence diabetes patient (45 respondents) |
|---|---|---|---|
| | Frequency (percentage) | Frequency (percentage) | Frequency (percentage) |
| **Pharmacist services strategy** | | | |
| Educational based services | 45 (45.45%) | 26 (48.15%) | 19 (42.22%) |
| Behaviour-based services | 17 (17.17%) | 9 (16.67%) | 8 (17.78%) |
| Combination | 31 (31.31%) | 14 (25.93%) | 17 (37.78%) |
| Unclear category | 5 (5.05%) | 5 (9.26%) | |
| No desired services indicated | 1 (1.01%) | | 1 (2.22%) |
| **Type of pharmacist services indicated** | | | |
| Consultation/counselling | 66 (66.67%) | 38 (38.38%) | 28 (28.28%) |
| Reminder | 23 (23.23%) | 7 (7.07%) | 16 (16.16%) |
| Discussion/seminar | 20 (20.20%) | 12 (12.12%) | 8 (8.08%) |
| Homecare | 18 (18.18%) | 11 (11.11%) | 7 (7.07%) |
| Record book/diary | 15 (15.15%) | 7 (7.07%) | 8 (8.08%) |
| Brochure/leaflet | 12 (12.12%) | 6 (6.06%) | 6 (6.06%) |
| Pill management | 9 (9.09%) | 6 (6.06%) | 3 (3.03%) |
| Medication review | 8 (8.08%) | 4 (4.04%) | 4 (4.04%) |
| Performing target assessment | 5 (5.05%) | 1 (1.01%) | 4 (4.04%) |
| Monitoring | 1 (1.01%) | 1 (1.01%) | |
| Referral | 1 (1.01%) | 1 (1.01%) | |
| No desired services indicated | 1 (1.01%) | | 1 (1.01%) |
| **List of barriers to services indicated** | | | |
| Limited human resources | 63 (63.64%) | 34 (34.34%) | 29 (29.29%) |
| Workload | 60 (60.61%) | 31 (31.31%) | 29 (29.29%) |
| Limited time | 54 (54.55%) | 26 (26.26%) | 28 (28.28%) |
| Patient related factor | 24 (24.24%) | 17 (17.17%) | 7 (7.07%) |
| Limited facility | 23 (23.23%) | 10 (10.10%) | 13 (13.13%) |
| Language | 3 (3.03%) | 3 (3.03%) | |
| Financial | 3 (3.03%) | 2 (2.02%) | 1 (1.01%) |
| Pharmacist perceived capacity | 3 (3.03%) | 2 (2.02%) | 1 (1.01%) |
| The fragmented target for pharmacist services | 3 (3.03%) | 1 (1.01%) | 2 (2.02%) |
| Professional rewards | 2 (2.02%) | | 2 (2.02%) |
| Method of delivering services | 2 (2.02%) | | 2 (2.02%) |
| Not available (NA) | 2 (2.02%) | 1 (1.01%) | 1 (1.01%) |
| Limited role of the pharmacist | 1 (1.01%) | 1 (1.01%) | |
| Limited support from hospital management | 1 (1.01%) | 1 (1.01%) | |
| Direction national/regional policy | 1 (1.01%) | 1 (1.01%) | |
| Lack of skill | 1 (1.01%) | 1 (1.01%) | |

Table 3 Type of actual pharmacist services that pharmacist provided to improve medication adherence among patients with diabetes

| | Actual pharmacist services (99 respondents) | Pharmacist with experiences helping non-adherence diabetes patient (54 respondents) | pharmacist without experience helping non-adherence diabetes patient (45 respondents) |
|---|---|---|---|
| | Frequency (percentage) | Frequency (percentage) | Frequency (percentage) |
| **Pharmacist services strategy** | | | |
| Educational based services | 81 (81.82%) | 45 (83.33%) | 36 (80.0%) |
| Behaviour-based services | 4 (4.04%) | 3 (5.56%) | 1 (2.2%) |
| Combination | 13 (13.13%) | 5 (9.26%) | 8 (17.78%) |
| Unclear category | 1 (1.01%) | 1 (1.85%) | |
| **Type of pharmacist services indicated** | | | |
| Consultation/counselling | 95 (69.34%) | 50 (66.67%) | 45 (72.58%) |
| Reminder | 7 (5.11%) | 1 (1.33%) | 6 (9.68%) |
| Discussion/seminar | 6 (4.38%) | 3 (4.00%) | 3 (4.84%) |
| Homecare | 7 (5.11%) | 7 (13.0%) | |
| Record book/diary | 5 (3.65%) | 2 (2.67%) | 3 (4.84%) |
| Brochure/leaflet | 8 (5.84%) | 6 (8.00%) | 2 (3.23%) |
| Pill management | 7 (5.11%) | 6 (8.00%) | 1 (1.61%) |
| Medication review | 2 (1.46%) | | 2 (3.23%) |

patients indicated that the provision of discussion sessions, seminars or home care services combined with consultative services was more helpful in improving adherence than using reminders.

## Actual pharmacist services provided and barriers to desired services

Pharmacists also indicate that consultation/counselling is the most common service to improve medication adherence. Consultation/counselling seems to be briefer and limited to medication administration information. Educational-based services (81.82%, see Table 3) are the most common strategy from a pharmacists' point of view, followed by educational-behavioural-based services (13.13%, see Table 3). The details of the pharmacist service types and quotes can be found in Tables 3 and 4.

Pharmacists also indicated barriers to applying desired pharmacist services. The most common barrier is the limited human resources available. This barrier is mentioned by nearly two-thirds of pharmacists in CHCs and hospitals (63.64%, see Table 2). Pharmacists reported that a high workload related to patient care and administrative responsibilities represented the second most common barrier. The third most common barrier is the time needed to perform these patient care and administrative roles since the pharmacists have to manage more patients at the CHCs and hospitals. The other barriers include limited facilities (especially availability of private rooms for consultation) and patient-related factors (such as older patients

without family support, patients in a hurry due to long waiting times to get medical services and medications).

## Discussion

Our findings suggest similarities and differences between patients and pharmacists in their perspectives on the pharmacist services that should be provided for patients to improve their medication adherence.

Most patients do not mention the need for pharmacist services to help them improve their medication adherence. Most patients in our study claim to know everything about diabetes and medication. Some patients also say they do not need further support from pharmacists because they perceive to be adherent to their medications. This limited pharmacist role in medication provision seems to be the prevailing mindset of many patients in this study. In practice, not all pharmacists can have a more focussed role in patient care, which might explain this finding.[11, 12] Many pharmacists focus on their dispensing roles rather than providing services that contribute to patient care. This old paradigm of pharmacist services can influence how patients assess the potential of the pharmacists' role in patient care beyond dispensing. In addition, there might be limitations that can hinder pharmacists from providing services that focus on patient care.[10–12, 26] This finding shows that pharmacists need to promote their role in patient care throughout their actual practice to change the mindset of patients in Indonesia.

**Table 4** Selected quotes from respondents (patients and pharmacists)

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**Patients**

**Quotes related to not suggesting any pharmacist services**

- 'I do not need any help from a pharmacist because I already have used to the medication for 18 years' (CHC)
- 'I do not need any help because everything is good in here' (CHC)
- 'Pharmacist already give the information about the medication and I already understand about the information'. (CHC)
- 'Pharmacist can provide the medication because the prescription is available from the physician. We can not ask for more from the pharmacist. For diabetes with high blood glucose usually taking the medication two times and if already standard only takes once'. (CHC)
- 'If I am not feeling well, I will contact and communicate with the physician. Then the physician will change the medication, not the pharmacist. Pharmacist only provide and give the medication' (hospital)
- 'I feel that the services provided are good and help to improve my health condition and now my condition is already getting better'. (hospital)

**Quotes related to educational-based services**

- 'Do not forget to explain about the medication because each medicine has a lot of function that most patients do not know and understand." (CHC)
- "Pharmacist can help to give the enlightenment to deal with the condition, then explain about the medication, including the medication quality and administration'. (CHC)

**Quotes related to behavioural-based services**

- 'Patients with diabetes should be regularly reminded to control their condition and check on the blood glucose level every month because the level changes every time. Therefore patients need to take care of their blood glucose level'. (hospital)

**Quotes related to the type of pharmacist services**

- 'I would like pharmacist to provide information about the medication, including with the indication, possible side effect, the effect of medication to the disease, and the possibility of the medication to cause other diseases'. (CHC)
- 'Pharmacist should provide information about the medication, especially the effect of the medicine, particularly for me as older people and children'. (CHC)
- 'Pharmacist should deliver many messages to the patients related to regularly control their disease, improve their medication-taking or information about the changing of the medication so can help improve patients medical condition optimally'. (hospital)

**Pharmacists**

**Quotes related to educational-based services**

- 'Most of the patients here have a lower educational background. They do not understand diabetes. Therefore, we give education to the patients through additional counseling, especially if with their lower educational background and nobody accompany the patients'. (CHC)
- 'I will provide information to the patient related to the food to eat, misleading information about renal impairment due to taking diabetes medication and give proper information on the effect of non-adherence to the diabetes medication might result in the development of diabetes complication' (hospital)

**Quotes related to the type of pharmacist services**

- 'I will communicate directly to the patient to emphasize the information optimally compared to brochure because it might be difficult and inconvenient for older patients to read. Therefore I prefer to provide direct communication and education'. (CHC)
- 'By providing consultation, patients will be understanding about their condition and more adhere to the medication. Patients will know how the medication work i.e., when and why the medicine should be taken. By having that knowledge, we expect patients will be more adhere to the medication'. (hospital)

**Quotes related to actual pharmacist service**

- 'If I have time and not doing other activities in pharmacy, I will try to explain the medication information on the chronic drugs. I will provide information this medicine should be taken before or after the meal, so it is limited only to that information' (CHC)

**Quotes related to the barriers of applying ideal pharmacist services**

- 'Due to the human resources in here only two, if we consult or give priority with one patient, the others will complain' (patient in CHC)
- 'We have the many responsibilities to provide the report for the activities, medicine management, delivery of medicine stocks from the government, administrative function using SIMPUS software. Therefore it is not possible to ask us to provide more intensive services'. (CHC)
- 'Our limitation is time and high load of patients, so I could not provide the services 100%'. (CHC)
- 'In here for one patient, it took more than five minutes to provide consultation/counseling, while the other patients already waiting. So it might need specific time separately'. (hospital)
- 'Patient already waiting for long since morning to get medical services, so they tend to go home quickly. Therefore when I provided consultation, they cut me out by claiming that they already know about the information' (hospital)

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Further study should be done to measure medication adherence and determine why patients do not adhere to their medications.

Our findings suggest that patients consider educational-based services the most suitable approach to improve medication adherence. Patients who favour this strategy may perceive their knowledge as insufficient to empower adherence behaviour. The literature indicates that a sufficient understanding of diabetes and medications can improve medication adherence.[27, 28] The need for education among patients with diabetes might also relate to the socio-demographic background of patients. Most patients in this study have low education. As suggested by our results, educational-based strategies should not be neglected in diabetes care, especially to improve medication adherence in Indonesia.

Moreover, we also found that educational-based services are the most common strategy pharmacists use to improve medication adherence among patients with diabetes. Patients with enough knowledge and understanding about their diabetes and treatment may lead to better control and medication

adherence.[18, 19] Although knowledge of diabetes and medication is essential, health literacy, especially in lower-middle-income countries, including Indonesia, needs to be considered because it may influence the successful implementation of an educational-based service strategy.[29–31]

Consultation/counselling is the most common pharmacist service desired by patients and pharmacists to improve medication adherence. Direct interaction between patients and pharmacists through consultation is essential for improving medication adherence.[13, 32, 33] Consultation/counselling is one of the most common media for delivering information, especially in Indonesian settings. This is also confirmed in this study. The patients' perspective is consistent with the findings from another study. In these studies, patients also expected pharmacists to be diabetes educators through consultation. Furthermore, pharmacists are also considered the most accessible healthcare professional in practice.[34, 35]

One of the most common pharmacist services strategies is the reminder to take medications or refills. A reminder can directly help patients, especially those who frequently forget to take medication, although further study needs to be done to explore why patients are not taking their medications.[27] Many studies show that reminding patients to take medication or refills effectively improves medication adherence.[36–40] A similar finding among pharmacists is that reminders are an alternative to consultation/counselling that can help improve medication adherence. In comparison, pharmacists with experience helping patients with non-adherence behaviour perceive discussion/seminar as the second most common service. One possible reason is that pharmacists can educate and provide motivation through discussion sessions/seminars to empower patients to achieve the treatment target.[41] Pharmacists also desired a combination of pharmacist services that involved both educational and behavioural-based services. A combination of multiple pharmacist services may provide better outcomes in diabetes care.[7] However, the implementation of this strategy needs to be considered, such as the resources available in practice.[19]

As discussed above, pharmacists might have limitations in applying services that focus on patient care. Most pharmacists state that a limited number of pharmacists is the most common barrier to providing the desired services. In practice, only one pharmacist is available for each CHC. While the hospital may have more pharmacists, not all are positioned in the pharmacy. Usually, they work in shifts and a rolling system due to many other activities in the hospital. This makes it difficult for pharmacists to provide optimal services in patient care. This barrier is in line with the finding of the other study in Indonesia.[11] The other obstacles are limited time and a high workload for pharmacists. Limitation in time is mainly related to having too many patients who visit medical facilities, as the CHC is the first line of patient care in the UHC program in Indonesia. The high workload among pharmacists might be due to the combination of administrative responsibilities and patient care roles. Pharmacists are responsible for reporting their activities, medication management and other administrative activities. This makes it difficult to provide optimal services.[11, 12] This finding can provide insight to the ministry of health and the pharmacist organization to re-evaluate the conditions and regulations in medical facilities to promote the pharmacist's role and improve the quality of the services.

This study has some limitations that need to be acknowledged. First, these study findings only apply to the CHCs with pharmacists because not all CHCs in Indonesia have pharmacists. Second, hospitals involved in this study have a connection with the educational institution. Therefore, the finding from this study might not be generalizable for other hospitals in different cities in Indonesia, especially in rural areas where no educational institution exists. Third, since we identified their medication non-adherence through questions and did not measure medication adherence using specific tools, there is a possibility of reporting bias in medication non-adherence in the data. Fourth, although the researchers have developed a scheme for coding before the data analysis, the risk of coding bias could not be completely excluded. Finally, we recognize that our data are not as rich as they could have been in a qualitative study based on in-depth interviews.

## Conclusion

Pharmacists and patients in Indonesia mutually perceive educational-based services as the most appropriate strategy to improve medication adherence among patients with diabetes. The direct interaction between patients and pharmacists through consultation/counselling is the most desired pharmacist service to improve medication adherence. Other alternative services include reminders, discussions/seminars or home care. Many barriers need to be addressed in implementing the desired pharmacist services, especially limitations in the number of human resources and the high workload of pharmacists in practice. These findings can provide input to re-evaluate the current pharmacist practice and regulation to overcome the barriers that hinder pharmaceutical care services, especially in implementing services to improve medication adherence.

## Supplementary Material

Supplementary data are available at *Journal of Pharmacy and Pharmacology* online.

## Author Contributions

This work is part of B.P.'s doctoral research supervised by W.G. and M.P. B.P., W.G., and M.P. made all substantial contributions to the concept, design, method, analysis and interpretation of the data, including critical revision of the manuscript. B.P. developed the questionnaire, conducted data collection, conducted data analysis and wrote the first draft. B.P. and E.S. conducted the coding and data analysis. All authors contributed to the preparation of the final manuscript. All authors have read and approved the final manuscript.

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## Conflict of Interest

The authors have no conflict of interest to declare.

## Ethical Approval and Consent to Participate

University of Surabaya Institutional Review Board granted research ethics approval to conduct this research. This ethical approval was also supported by an approval letter for data collection in community health centres from the Surabaya City Health Office, and a letter of data collection approval in one public hospital and two private hospitals. Informed consent was obtained from all respondents who participated in this study.

## Consent for Publication

Not applicable.

## Data Availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request

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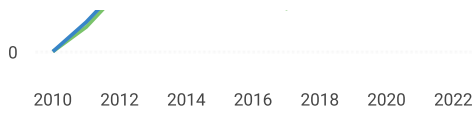
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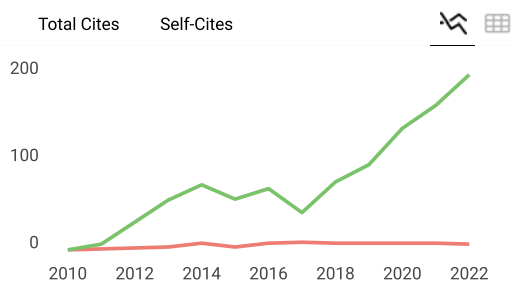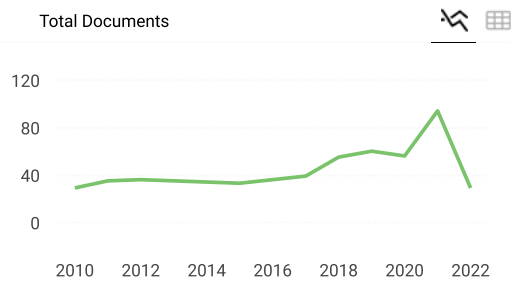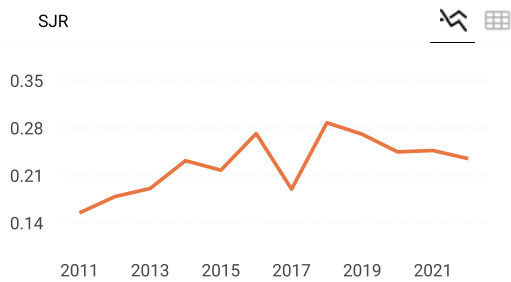
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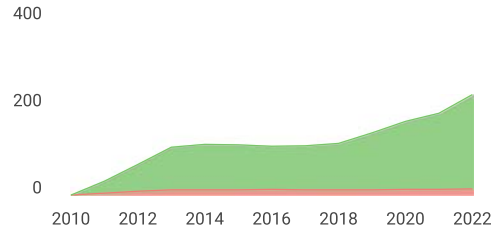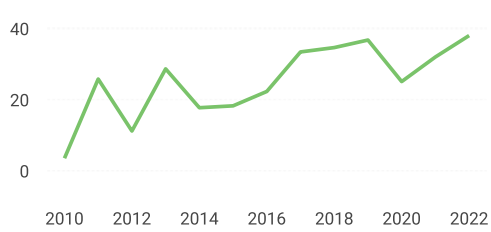
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2010 2012 2014 2016 2018 2020 2022
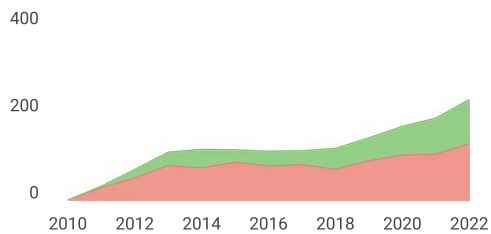
**Journal of Pharmaceutical Health Services Research**

Q2 — Pharmacy
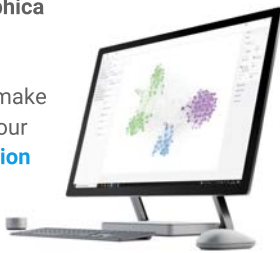
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A  **Ayilya M**   3 years ago

I would like to know if Journal of Pharmaceutical Health Services Research is scopus indexed as of 2021. I would like to know about its impact factor also.

reply

**Melanie Ortiz**   3 years ago

Besides, as SCImago Journal and Country Rank uses Scopus data, our impact indicator is the SJR (Check it above). We suggest you consult the Journal Citation Report for other indicators (like Impact Factor) with a Web of Science data source.
Best Regards, SCImago Team

A    **ASIM AHMED**    3 years ago

Please update the cite score of 2020 or at least 20219 for this Journal
Journal of Pharmaceutical Health Services research

reply

**Melanie Ortiz**    3 years ago

Dear Asim, thank you very much for your comment. We suggest you consult the Scopus database to see the CiteScore.
Best Regards, SCImago Team

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# Source details

## Journal of Pharmaceutical Health Services Research

Scopus coverage years:   from 2010 to Present

Publisher:   Oxford University Press

ISSN:   1759-8885   E-ISSN:   1759-8893

Subject area:   (Pharmacology, Toxicology and Pharmaceutics: Pharmacology, Toxicology and Pharmaceutics (miscellaneous))

(Economics, Econometrics and Finance: Economics, Econometrics and Finance (miscellaneous))

(Health Professions: Pharmacy)

Source type:   Journal

| CiteScore 2022 | ⓘ |
| --- | --- |
| **1.7** | |

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Calculated on 05 May, 2023

### CiteScoreTracker 2023 ⓘ

$$1.4 = \frac{325 \text{ Citations to date}}{239 \text{ Documents to date}}$$

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| --- | --- | --- |
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| Economics, Econometrics and | #92/207 | 55th |

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