Pharmacist services and medication adherence in diabetes care in Indonesia

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SUMMARY

The role of pharmacists has shifted and has become more focused on patient care as pharmacists can contribute more to patient care through services beyond medication dispensing. In low-resource countries, pharmacists’ role in patient care is still in transition to become patient-oriented. This dissertation provides knowledge and insight into the pharmacist’s role in diabetes care and focuses on their role in improving medication adherence among patients with diabetes in Indonesia. Diabetes is one of the most common chronic diseases that require long-term medication use. This raises questions related to adherence to treatment goals to minimize complications. Non-adherence to diabetes medication can result in treatment failure and risk of diabetes complications that potentially increase health expenditure. As part of the diabetes care team, pharmacists can help enhance medication adherence by providing certain services. Finding suitable services that meet patients’ needs and preferences is important in the pharmacist services design. Therefore, this dissertation aims to identify suitable pharmacist services to improve medication adherence among patients with diabetes.

Chapter 2 of this dissertation has reviewed the evidence on the various type of pharmacists and their effectiveness in improving diabetes treatment goals and medication adherence based on published literature. This helps to identify patients’ and pharmacists’ preferences towards pharmacist services that should be provided in practice to improve medication adherence. In Chapters 3 and 4, a discrete choice experiment (DCE) method is used to elicit preferences among patients with diabetes and pharmacists. In Chapter 5, a ranking-based approach is used to determine the rank of evidence-based pharmacist services to improve medication adherence based on pharmacists’ and patients’ perspectives. Chapter 6 of this dissertation has explored the desired pharmacist services from pharmacists’ and patients’ perspectives through interviews. Combining both perspectives can help provide a better view of the suitable pharmacist services provided to the patients. The findings are discussed with input and suggestions for the policy and further research. All seven chapters of the dissertation are summarized below.
Chapter 1 outlines the scope of this dissertation and provides background information regarding the need to explore suitable pharmacist services in Indonesia, especially in diabetes care. This chapter focuses on diabetes prevalence and medication adherence problems in Indonesia. Information about the transitional changes of the pharmacist role to become more focused on patient care without neglecting the role in medicine provision, is presented to provide insight into how pharmacists practice, specifically in Indonesia. As the role of pharmacists in Indonesia is still developing, many challenges are faced by pharmacists to implement the role in practice. Pharmacists can provide many types of services to optimize treatment outcomes in diabetes to facilitate their new role in patient care, but there is a lack of information regarding preferences for suitable pharmacist services to improve medication adherence in the Indonesian setting. With the implementation of the Universal Health Coverage program in Indonesia, pharmacists can contribute to patient care due to the high likelihood of meeting patients during physician visits and taking their medication in the pharmacy. This new role can benefit and reduce the burden of physicians in providing care to the patients, especially in low-resource countries that sometimes experience a lack of healthcare professionals in medical facilities. Finding suitable pharmacist services that meet patients’ needs and preferences is important. Therefore, this dissertation aims to identify preferences for pharmacist services to improve medication adherence among patients with diabetes in Indonesia.

There are four sub-questions to answer the main aim of the dissertation. Five studies have been done to achieve answers to each of the sub-questions. The studies involve quantitative and qualitative data analysis, including systematic reviews and meta-analyses, discrete-choice experiments (DCE) studies, rank-order probit models, and interviews. The focus of all of the studies is to explore preferences towards pharmacist services to improve medication adherence based on pharmacists’ and patients’ points of view. This chapter concludes with the outline of the dissertation.
Chapter 2 presents the evidence on pharmacist services that have been developed and evaluated in the published literature. It is important to explore the available evidence-based pharmacist services on their effectiveness to improve medication adherence in diabetes care. The systematic review study involves six databases, including PubMed, Cochrane Library, EMBASE, CINAHL, JSTOR, and Web of Science. There are three main keywords used to find suitable published literature, namely, “diabetes”, “medication adherence”, and “pharmacist”. A slightly modified set of search terms is used in each of the databases, as there are differences in the search system. The search process is updated until Sept 2017 without any restriction on the year of publication. The main outcomes of this systematic review are related to medication adherence, glycosylated hemoglobin (HbA1c), fasting plasma glucose (FPG), postprandial plasma glucose (PPG), or random blood glucose (RBG).

The systematic review includes 59 studies and shows that most published studies on pharmacist services are done in Asia and America. The United States and India are the two countries with a high contribution of studies. This review shows that various pharmacist services have been studied to improve diabetes treatment goals and medication adherence. Educational-based services and a combination of educational and behavioral-based services are pharmacists’ most common approaches to improve medication adherence among patients with diabetes. Both of these strategies are also proven to improve diabetes treatment outcomes. Many pharmacist services have effectively improved medication adherence, such as consultation, education, medication review, printed/digital material, telephone call, or group discussions. Most pharmacist services significantly enhance treatment outcomes in the subgroup analysis. This review also shows that a longer duration of follow-up may provide better results and determine the services’ sustainability.

The evidence and analysis support the pharmacist’s role in diabetes care to improve medication adherence. Even though it is still challenging to find the best pharmacist services to improve medication adherence, this finding supports pharmacists’ potential involvement in diabetes care with potential
collaboration with other healthcare professionals to optimize treatment outcomes. This chapter identifies many types of services or interventions that can be used to enhance diabetes treatment goals and medication adherence.

**Chapter 3** uses data from community health centers (CHCs) and three hospitals in Surabaya, Indonesia, to elicit patients’ preferences toward pharmacist services to improve medication adherence among patients with diabetes. A DCE method is used to elicit preferences using 16 sets of choices. Adult patients with diabetes who visit CHCs and hospitals are asked to participate in the study by signing the informed consent letter during the data collection. In total, 833 respondents from 57 CHCs and three hospitals are involved in the study by filling in the questionnaire. A scenario is presented before respondents select the preferred choice sets to help them imagine the situation. The marginal rate of substitution is calculated to determine respondents’ willingness to trade-off higher prices to the change of the attributes.

The results show that most patients prefer to have a shorter consultation duration and a private consultation room. Even though there is no standard on the ideal consultation duration, these preferences might be related to practice conditions. Most patients in Indonesia need to wait for a long time to get medical services and obtain their medication. Thus, patients prefer to have a shorter consultation duration, even though some patients who have experience with pharmacist services think that a longer duration can be better for them. A low patient copayment is a common preference among patients. While for the private consultation room, most patients prefer to have this facility because of privacy matters. These preferences are followed by a preference for flexible access to pharmacists whenever patients need help. This can be challenging when looking at the number of pharmacists in medical facilities, the high number of patients, and the workload in Indonesia. Medication review, brochure, or patient group discussion are the other pharmacist services that patients would like to have together with the consultation.
This chapter identifies the preferences of patients with diabetes in CHCs and hospitals toward the type of pharmacist services that can help them to improve medication adherence. These preferences need to be considered when deciding on suitable services that meet their needs. These findings provide important insights into the design of ideal pharmacist services to improve medication adherence, especially diabetes care.

Chapter 4 presents the results of a study on pharmacists’ preferences on health services to improve medication adherence among patients with diabetes in Surabaya, Indonesia. Pharmacists who work in all CHCs and three hospitals in Surabaya, Indonesia, are involved. A total of 99 pharmacists participate in the study by answering the questions in the questionnaire. A DCE method is used to elicit the pharmacists’ preferences toward the services through 16 choice sets that respondents are confronted with. The marginal rate of substitution is calculated to identify the willingness to pay for a change in the attribute levels.

The findings show that pharmacists prefer a shorter consultation duration and flexible access to contact pharmacists. Preferences toward a shorter duration for consultation can be influenced by the fact that a limited number of pharmacists need to help a high number of patients in CHCs and hospitals. While flexible access is considered important in providing services and convenient for patients, some pharmacists with master’s degrees prefer to have a prior appointment before the consultation. Even though making an appointment can benefit patients through a specific time allocation to discuss the problems, it is only possible if the number of pharmacists is adequate to provide the services. The availability of a private consultation room is needed for the consultation from pharmacists’ perspectives. This can be done to ensure privacy between pharmacists and patients. The Indonesian pharmaceutical care standards regulate private consultation rooms, but most medical facilities do not have a specific room for consultation in practice. A combination of consultation with other pharmacist services, such as a brochure, medication reviews, or patient group discussion, can be considered in providing the service to improve medication adherence.
This chapter provides insight into pharmacists' preferences for services that should be provided to patients with diabetes. The results of this study can be used in addition to the preferences of patients with diabetes in CHCs and hospitals to identify suitable pharmacist services to improve medication adherence in diabetes care, especially in the Indonesian setting.

**Chapter 5** presents the ranking of pharmacist services that can help improve medication adherence of patients and pharmacists in CHCs and three hospitals in Surabaya, Indonesia. Data from respondents (pharmacists and patients) are collected through the questionnaire as part of a larger survey regarding the pharmacists’ and patients’ preferences to improve medication adherence. A total of 1036 adult patients with diabetes and 99 pharmacists from CHCs and three hospitals participate in the study. A rank-ordered probit model is used to identify the influence of respondents’ characteristics on the pharmacist services ranking and the correlation between pharmacist services’ ranking conditional on the impact of observable traits. There are five pharmacist services to improve medication adherence, i.e., face-to-face consultation, brochure/leaflet, medication review, patient group discussion, and a phone call refill reminder.

This study shows that consultation and brochure are the highest rankings of pharmacist services that can improve medication adherence among patients with diabetes. Similar results are found for both pharmacists and patients. The need for face-to-face interaction between pharmacists and patients to discuss medication problems and find solutions for them might be a reason behind the higher rank for consultation compared with other pharmacist services. As the other highly ranked pharmacist services, brochures can be seen as the easiest way to deliver the services, especially in Indonesia with a high number of patients who visit medical facilities, time constraints, and a lack of pharmacists. Older patients highly ranked a brochure. This can be explained by the fact that most patients have to wait long to get medical services and medication in medical facilities. It can be uncomfortable for older patients to wait for the consultation. The educational background of the respondents influences the ranking of pharmacist services. Patients with lower education
or without formal education have a lower probability of choosing brochures as convenient services to improve medication adherence, including the choice of medication reviews.

This chapter provides insight on the ranking of pharmacist services that can be used in practice, especially to improve medication adherence among patients with diabetes. This information can help prioritize which pharmacist services should be evaluated and modified to meet patients’ needs. These findings can also give information to negotiate with other healthcare professionals regarding which role in patient care can be delegated to the pharmacists.

**Chapter 6** of this dissertation presents qualitative results on the desired pharmacist services to improve medication adherence among patients with diabetes based on the perception of patients and pharmacists. This study involves CHCs and three hospitals in Surabaya, Indonesia. Data collection is done by open-question interviews with respondents (patients and pharmacists). In total, 917 patients with diabetes and 99 pharmacists participate in the interviews. All of the interview data are transcribed and analyzed based on the coding developed by the researcher. The interview data is analyzed based on pharmacist services strategies, type of pharmacist services, and barriers to applying the ideal pharmacist services. Three pharmacist services strategies are used in the coding, i.e., educational-based services, behavioral-based services, and combination of both services.

Interestingly, this qualitative study shows that most patients do not have any suggestions on pharmacist services that can help improve medication adherence among patients with diabetes. Patients perceive they know everything about diabetes and treatment already and feel already compliant with medication. These are some reasons identified in the study behind the finding. This study indicates that educational-based services are the most common services strategy patients and pharmacists prefer to improve medication adherence. This desired strategy can be seen as enhancing their knowledge of diabetes and medication to help improve their adherence. Most patients have a lower educational background, which might influence the need for an educational-based service strategy. Patients with adequate knowledge
and understanding about diabetes and medication may have better control and medication adherence. As identified in the study, combining educational and behavioral-based services is another strategy that can help improve medication adherence. Consultation is the most desired pharmacist service to improve medication adherence among patients with diabetes and pharmacists in CHCs and three hospitals in this study. A reminder to take medication is the other type of pharmacist service categorized in behavioral-based service that is desired to improve medication adherence. There are some barriers in implementing these desired pharmacist services based on the perception of pharmacists that need to be considered in practice. The most common barriers identified in this study are limited pharmacists in medical facilities, limited time, and workload.

This chapter shows that input from patients and pharmacists regarding the desired pharmacist services that meet patients’ needs can be insightful to design suitable services to implement in practice, especially in the Indonesian setting. Identifying barriers to the feasibility of implementing certain pharmacist services needs to be further studied and analyzed to find the best solution in supporting the application of the services to improve medication adherence.

**Chapter 7** presents the discussion of the main findings of this dissertation through five general statements.

**Statement 1: A combination of educational and behavioral-based services is needed to improve medication adherence among patients with diabetes.**

This dissertation shows that educational-based services are important and should not be neglected to improve medication adherence. Combining educational and behavioral-based services can potentially provide better outcomes than a single type of service strategy. This combination can cover both the knowledge and behavioral aspects of the patients regarding adherence. Evaluation of current practice and adjustment of the policy regarding the number of pharmacists and patients might be needed to facilitate the desired pharmacist services that patients would like to have and support the pharmacist role in patient care, especially diabetes care in the Indonesian setting.
**Statements 2: Direct interaction between pharmacists and patients is a critical component of the desired services to improve medication adherence**

This dissertation indicates that consultation is the most desired pharmacist service to help improve medication adherence in diabetes care. Pharmacists and patients confirm these preferences, as shown by the findings in some of the chapters. The need for direct interaction and communication between pharmacists and patients through consultation seems to influence this desired pharmacist service. Delivery of necessary information to improve adherence and involving patients in shared decision-making is possible through direct interaction in consultation. Evaluation of the pharmacists’ workload in medical facilities in Indonesia is needed to provide solutions for pharmacists to provide this kind of services instead of providing brief general medication information in practice.

**Statement 3: Patients value privacy in consulting with the pharmacist to discuss their medication problems and ways to improve medication adherence.**

Maintaining patients’ privacy during the consultation is critical for patients in discussing their medication problems with pharmacists, including their medication adherence. A private consultation room accommodates this privacy while patients consult with pharmacists. The need for this specific room is emphasized in this dissertation by both pharmacists and patients. Pharmacists’ awareness of the importance of privacy and skills to maintain patient privacy is needed to enable a suitable approach during a consultation. Exploring other possible alternatives to maintain patients’ privacy to build trust with patients to choose pharmacist services, especially in improving medication adherence, is needed if there is no possibility of having specific room for consultation.

**Statement 4: Easy access to a pharmacist is essential and is the first step for the pharmacist to deliver services that focus on patient care, especially to improve medication adherence.**

This dissertation shows that providing easy access to pharmacists is essential
for patients to discuss their medication problems whenever they need these services. As one of the most accessible healthcare professionals, pharmacists are expected to facilitate the need for flexible access from patients. Even though easy access to consult with pharmacists can be convenient for patients, this easy access needs to be supported by the commitment of pharmacists to be always ready to provide consultation. This can be challenging in low-resource countries, including Indonesia, with an imbalance ratio between pharmacists and patients in medical facilities. The number of pharmacists in each medical facility needs to be assessed to know the feasibility of providing easy access. This is followed by the need for clear delegation between pharmacists and staff regarding pharmacist activities to reduce the burden for pharmacists to provide flexible access to consult.

**Statement 5: More freedom of choice to patients regarding pharmacist services to improve medication adherence may better cater to their preferences.**

The freedom to select desired pharmacist services in Indonesia can be complex. Certain services, such as providing medication information, are given together when patients get the medication in pharmacies, so patients usually will get the services automatically. Providing freedom for patients to choose their desire for additional pharmacist services can help patients express their needs for specific pharmacist services to improve medication adherence. Making sure that patients have the option to choose their preferred pharmacist services can be a starting point. It will be possible to implement this as long as there are sufficient pharmacists. Workload assessment and staffing plan are needed for providing recommendations for policymakers.

**To conclude,** this dissertation provides information regarding the preferences for pharmacist services to improve medication adherence among patients with diabetes. The evidence shows that many aspects of the pharmacist services need to be considered when identifying the desired pharmacist services preferences. Evaluation of current practice, assessment, and addressing the barriers that potentially can hamper the implementation of the desired pharmacist services is important to be further studied. A combination of
perspectives of both patients and pharmacists can provide a more complete picture of the suitable pharmacist services that meet patients’ needs. Changing or modifying the policy to implement the services is complex, takes some time to implement, and involves many stakeholders. These findings can be the first essential step in facilitating patients' perspectives as users and pharmacists as healthcare providers in designing suitable pharmacist services, especially to improve medication adherence among patients with diabetes.