School of Pharmacy

A model of community pharmacy-based services for type 2 diabetes patients in the Indonesian setting

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made. This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Signature : 

Date : 01/08/2014

Abstract

Background: The prevalence of diabetes is increasing worldwide, and Indonesia is among the top ten countries with the highest number of people with diabetes. The Indonesian Government has included diabetes as a national health priority area. Starting in 2014, *Jaminan Kesehatan Nasional – JKN* (National Health Insurance) will be implemented to provide subsidised healthcare for the entire population. While Indonesia has a major deficiency in its health workforce, optimising the use of its current healthcare resources, including community pharmacists, will be paramount in improving access to appropriate diabetes care.

Objectives: This study aimed to evaluate community pharmacy-based services for type 2 diabetes patients with regard to current practice, views on community pharmacists' roles, and factors essential to further service development for these patients. This was used to develop a model of services for type 2 diabetes patients within the Indonesian community pharmacy setting.

Methods: Questionnaire surveys and interviews (a qualitative approach) were used to obtain data from three main stakeholder groups, i.e. pharmacists, patients and doctors.

The pharmacist survey - A questionnaire was administered to pharmacists from a random sample of 400 community pharmacies in Surabaya, Indonesia. Current practice and views on future roles were rated using Likert scales, while an open-ended question was used to identify priority roles. Logistic regression models were employed to identify characteristic factors associated with current practice. SPSS version 19.0 was used to assist with data analysis.

The patient survey – A questionnaire survey was conducted in ten community pharmacies (each with more than 50 diabetic patients per month) that were purposefully selected to include different geographical areas and socio-economic

levels within Surabaya, Indonesia. Each pharmacy was requested to recruit approximately 20 patients when they were seeking oral antidiabetic medications. Usage of pharmacy services was identified using binary responses ('yes'/'no') and views on pharmacists' roles were rated using Likert scales, while an open-ended question was used to identify priority roles. Logistic regression models were employed to identify characteristic factors associated with patient views of pharmacists' roles. SPSS version 19.0 was used to perform the analysis.

The qualitative study – In depth face-to-face interviews were conducted with ten doctors and ten pharmacists in Surabaya, Indonesia. They were purposefully selected to include a broad variety of practice settings within the sample. A semi-structured interview guide was used to explore current practice, views on pharmacists' roles and factors contributing to the development of pharmacy-based services for type 2 diabetes patients. Nvivo version 9 was used to facilitate thematic content analysis of the data.

Results:

The pharmacist survey - A response rate of 60% (240/400) was achieved. Community pharmacies mainly provided basic services of dispensing (100%) and education on directions for use of medications (72.6%). All community pharmacists viewed dispensing as part of their roles, and more than half of the pharmacists believed that they should provide services beyond dispensing. Services perceived as priorities included: education related to medications [i.e. directions for use (58.6%), common/important adverse effects (25.7%)], lifestyle education [i.e. exercise (36.5%), diet (47.7%)], and monitoring compliance with medications (27.9%). Facilitators for providing some services beyond dispensing included pharmacists' positive views, diabetes training, high pharmacist availability, higher number of diabetes customers, being set within a doctor's clinic, or availability of a counselling area/room, while low pharmacist availability acted as a barrier.

The patient survey – A total of 196 pharmacy clients with type 2 diabetes responded. Community pharmacies were mainly utilised for the basic services of dispensing

(100%) and education on directions for use of medications (79.6%). Almost all patients viewed dispensing as a part of community pharmacists' roles. There were mixed responses towards pharmacists providing services beyond dispensing. Services perceived as priorities included: education related to medications [i.e. directions for use (64.5%), storage requirements (26.6%), common/important adverse effects (25.5%)]; and monitoring compliance with medications (37.3%). Patients who had higher incomes or who were working were less supportive; whereas patients who had previously used a service, those with other risk factors for complications or having poor/unknown glycaemic control were more supportive of pharmacists providing some services beyond dispensing.

The qualitative study – The data were saturated after the eighth interview with both pharmacist and doctor groups. Community pharmacists mainly supplied medicines (with limited labelling), with some providing services beyond dispensing, (mainly basic information on how to use medications). There was strong agreement between pharmacists and doctors about a pharmacist's dispensing role (with improved labelling) and education related to medications (i.e. directions for use). A lower level of agreement between pharmacists and doctors was reported regarding prescription review (clinical aspects); education related to medications (i.e. common/important adverse effects) and healthy living (i.e. exercise and diet); and the monitoring of medication compliance and treatment outcomes (i.e. inquiring about patients' glycaemic control and problems). Factors influencing the development of pharmacy-based services included: pharmacist − positive views (facilitator) and perceived lack of competence (barrier); relationships with doctors and patients – lack of support and accessibility (barriers); pharmacy environment − business orientation (barrier), lack of staff and poor pharmacist availability (barriers), and availability of supporting resources, such as counselling areas/rooms, procedures/protocols and IT systems for labelling and patient records (facilitators); and external environment − a health system to support pharmacist roles, remuneration, marketing and professional assistance (facilitators).

Based on the surveys and qualitative data, a two-level system of pharmacy services was suggested: (i) basic services – dispensing, prescription review, patient education (medication and healthy living), and monitoring at the time of repeat dispensing; and (ii) advanced services (e.g. medication use reviews) that can be developed to further expand pharmacists' professional roles.

Conclusions:

Collaboration between the Government and *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association) will be required to integrate the developed model of pharmacy services into the health system (under the new *JKN*), thus optimising the current under-utilisation of community pharmacists. Pharmacists should be immediately available at all opening hours or for defined advertised periods. Initially, it is important for *IAI* to facilitate the implementation of IT systems for labelling and patient records as well as the development of appropriate training and professional standards, procedures and other materials. In addition, an appropriate remuneration system should be established to create a stable environment for community pharmacies to remain viable. Improving the professional environment and facilities to deliver the developed model of services will enable piloting of its feasibility and effectiveness within the context of the Indonesian health system.

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Publications related to the thesis

Conference paper

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Abbreviations and Acronyms

AACE	American Association of Clinician Endocrinologists
ADA	American Diabetes Association
APA	*Apoteker Penanggungjawab Apotek* (pharmacist manager)
APTFI	*Asosiasi Perguruan Tinggi Farmasi Indonesia* (Indonesian Association of Higher Education of Pharmacy)
Askeskin	*Asuransi Kesehatan Masyarakat Miskin* (Health Insurance for the Poor)
BGL	blood glucose level
BMI	body mass index
BPSDMK	*Badan Pengembangan dan Pemberdayaan Sumber Daya Manusia* (National Board of Human Resources Development and Empowerment)
CPD	continuing professional development
CPE	continuing professional education
CVD	cardiovascular disease
DRP	drug-related problem
eGFR	estimated glomerular filtration rate
GDP	gross domestic product
GNI	gross national income
GP	general practitioner
GPP	Good Pharmacy Practice
HbA1c	glycosylated haemoglobin
HDL-C	(high-density lipoprotein) cholesterol
IAI	*Ikatan Apoteker Indonesia* (Indonesian Pharmacists Association)
IT	information technology
IDDM	insulin dependent diabetes mellitus
IDF	International Diabetes Federation
Jamkesmas	*Jaminan Kesehatan Masyarakat* (Health Insurance for the Poor/Near Poor)
JKN	*Jaminan Kesehatan Nasional* (National Health Insurance)
KFN	*Komite Farmasi National* (National Pharmacy Committee)

LDL-C	(low-density lipoprotein) cholesterol
MoH RI	Ministry of Health, Republic of Indonesia
NDC	non-communicable disease
NGO	non-government organisation
NIDDM	non-insulin dependent diabetes mellitus
PERKENI	*Perkumpulan Endokrinologi Indonesia* (Indonesian Society of Endocrinology)
PERSADIA	*Persatuan Diabetes Indonesia* (Indonesian Diabetes Association)
PMR	patient medication record
Polindes	*Pondok Bersalin Desa* (Village Midwife Clinic)
Poskesdes	*Pos Kesehatan Desa* (Village Health Post)
Posyandu	*Pos Pelayanan Terpadu* (Integrated Health Post)
PSA	*Pemilik Sarana Apotek* (proprietor – non-'pharmacist manager' owner)
Puskesmas	*Pusat Kesehatan Masyarakat* (Health Centre)
Pustu	*Puskesmas Pembantu* (Auxillary Health Centre)
Renstra	*Rencana Strategis Kementrian Kesehatan* (Ministry of Health Strategic Plan)
Riskerdas	*Riset Kesehatan Dasar* (National Basic Health Research)
SJSN	*Sistem Jaminan Sosial Nasional* (National Social Security System)
SMBG	self-monitoring of blood glucose
THE	total health expenditure
UK	United Kingdom
USA	United States of America
WDF	World Diabetes Foundation
WHO	World Health Organisation

Chapter 1

Introduction

1.1 Background

1.1.1 Type 2 diabetes: The burden in Indonesia

The prevalence of diabetes is increasing worldwide, mostly in developing countries. Indonesia is among the top ten countries with the highest number of people with diabetes. Using the International Diabetes Federation (IDF) Diabetes Atlas update data in 2013,[1] it has been estimated that 8.5 million people in Indonesia were living with diabetes, and this is expected to increase to 14.1 million by 2035. Based on the DiabCare Asia 2008 study, type 2 diabetes is the most common form of diabetes in Indonesia, affecting 97.5% of people diagnosed with diabetes.[2]

Many Indonesians with type 2 diabetes are undiagnosed;[3] and, while the vast majority of those diagnosed receive treatment, only a minority – less than 20%[2] – achieve treatment goals (HbA1c <6.5%). Undertreated diabetics have a higher risk of having a range of microvascular (i.e. neuropathy, retinopathy, nephropathy) and macrovascular (i.e. cardiovascular diseases – CVDs) complications,[4] which may lead to disability, as well as loss of life and productivity. It was estimated that in 2010, non-communicable diseases (NCDs) accounted for 63% of all deaths in Indonesia, and about half of those were due to diabetes and CVDs (some of which might relate to diabetes). Acknowledging the significant health and socio-economic burden of diabetes, the Indonesian Government has included NCDs and diabetes as a national health priority area.[5]

It has been suggested that key barriers to appropriate diabetes care are the lack of awareness, accessibility and affordability; and all are interconnected and lead directly to another key barrier, which is poor quality diabetes care.[6] It has been reported that Indonesia has a major deficiency in its health workforce, contributing to the poor access to diabetes care. In 2007, the doctor:population ratio was 21:100,000;[7] and in terms of specialists, in 2013, there were only approximately 3,000 internal medicine specialists and 64 endocrinologists in the entire country.[6]

This ratio was lower than in most other East Asian and Pacific region countries; and was much lower than in developed countries such as the UK, the USA and Australia with more than 200 doctors per 100,000 population.[7] Moreover, due to the lack of adequate expertise and equipment at the primary care levels, the majority of patients diagnosed with diabetes prefer to use secondary and tertiary care levels (e.g. hospital-based facilities),[2, 8] causing an unnecessary burden at these levels as well as higher health costs and, as such, further contributing to poor accessibility to appropriate care.

Starting in 2014, the Indonesian Government will gradually establish *Jaminan Kesehatan Nasional – JKN* (National Health Insurance) to provide affordable healthcare to the entire population.[9, 10] In consideration of the high rate of diabetes in Indonesia, the implementation of this national health coverage is expected to cause a surge in the demand for diabetes care. Thus, strengthening the referral system and optimising the use of primary care resources, including pharmacists and other healthcare workers (e.g. nurses, diabetes educators), will be paramount in improving access to appropriate diabetes care.

1.1.2 Type 2 diabetes: Community pharmacy-based services in Indonesia

Since the introduction of the concept of Pharmaceutical Care in the eighties, this initiative has been a dominant form of community pharmacy practice around the world.[11] Pharmaceutical care places emphasis on rational and evidence-based pharmacotherapy, thus focusing on improving the patient's quality of life.[12] With regard to type 2 diabetes, extensive studies have indicated potential benefits of community pharmacy-based interventions (e.g. patient education/counselling and monitoring) on patient outcomes.[13, 14-22]

In 2006, pharmaceutical care was included within Indonesian legislation (Ministry of Health Decree No. 1027/MENKES/SK/IX/2004: Standards for Pharmaceutical Care in Community Pharmacies).[23] These standards emphasise the need for community

pharmacists to be more involved in the care of patients with chronic diseases, including type 2 diabetes. Only a few studies have been conducted to evaluate community pharmacy practice in Indonesia;[24-28] all have focused on general aspects of care rather than on diabetes services.

At the international level, pharmaceutical care has been practised in varying forms and degrees.[11, 29] Studies regarding community pharmacy practice in the area of diabetes, however, have been limited to developed countries.[30-35] Developed countries, however, may have different community pharmacy systems, settings, staffing structures, remuneration and funding streams, health systems, levels of support and pharmacist roles than developing countries such as Indonesia. For example, unlike in developed countries, community pharmacies in Indonesia have limited roles within the Government insurance plans; they can be owned by a pharmacist and/or a non-pharmacist (a pharmacist manager is required to be legally responsible for the pharmacy practice); and they usually do not have computerised dispensing/patient record systems. Thus, questions remain about translating findings from developed countries to diabetes practice in Indonesia. To our knowledge, this is the first study designed to develop a model of community pharmacy-based services for patients with type 2 diabetes within the Indonesian setting.

1.2 Objectives

The main objectives of this thesis are:

1. To evaluate data on current community pharmacy-based services for type 2 diabetes patients
2. To explore stakeholder (pharmacist, patient and doctor) views on the roles of community pharmacists in type 2 diabetes care
3. To explore factors associated with the development of community pharmacy-based services for type 2 diabetes patients
4. To develop a model of community pharmacy-based services for type 2 diabetes patients within the Indonesian setting, based on current practice and stakeholder views.

1.3 Significance

The results of this study will provide the basis for an Indonesian model of diabetes care in community pharmacies. It is intended that the model will be a framework used to design and implement support in the development of community pharmacy professional practice in Indonesia, particularly in the area of type 2 diabetes.

In light of the high rate of diabetes and the lack of health workers in Indonesia, the model will be valuable in enabling the inclusion of community pharmacies within the health care system, thus strengthening its ability to provide appropriate primary health care for patients with type 2 diabetes.

1.4 Thesis organisation

This thesis presents three related study reports on community pharmacy-based services for type 2 diabetes in the Indonesian setting:

- Chapter 3 presents a survey of community pharmacists. This provides data on pharmacy- and pharmacist-related characteristics, services provided for type 2 diabetes patients, and pharmacists' views on their roles in diabetes care. This study also investigated pharmacist/pharmacy characteristics and their relationships to provision of services.

- Chapter 4 presents a survey of pharmacy clients with type 2 diabetes. This chapter summarises patients' characteristics and their views on the roles of community pharmacists in type 2 diabetes care. Also presented is an evaluation of patient characteristics associated with positive views towards community pharmacist contributions.

- Chapter 5 presents a qualitative study (interviews) of the main diabetes care providers, i.e. community pharmacists and doctors. This provides rich data regarding type 2 diabetes care practice, expected roles of community pharmacists, and factors affecting the development of community pharmacy-based services for type 2 diabetes patients.

Each of these chapters comprises the specific objectives and methodology of the particular study, as well as the results, discussion and key findings.

Chapter 6 presents general discussion that integrates the findings of the three related studies to address the first three main objectives. Consequently, this satisfies the fourth main objective, which was to develop a model of community pharmacy-based services for type 2 diabetes patients (see Table 1.1).

Table 1.1 Thesis organisation

Objectives	**Chapters**
1. Current community pharmacy-based services for type 2 diabetes patients	Chapter 3: Survey of community pharmacists Chapter 4: Survey of type 2 diabetes patients Chapter 5: Qualitative study (interviews) of doctors and community pharmacists ➔ Chapter 6: General discussion (integrated findings)
2. Views on community pharmacists' roles in type 2 diabetes care	Chapter 3: Survey of community pharmacists Chapter 4: Survey of type 2 diabetes patients Chapter 5: Qualitative study (interviews) of doctors and pharmacists ➔ Chapter 6: General discussion (integrated findings)
3. Factors associated with the development of community pharmacy-based services for type 2 diabetes patients	Chapter 3: Survey of community pharmacists Chapter 4: Survey of type 2 diabetes patients Chapter 5: Qualitative study (interviews) of doctors and community pharmacists ➔ Chapter 6: General discussion (integrated findings)
4. Model of community pharmacy-based services for type 2 diabetes patients	Chapter 6: General discussion (integrated findings)

1.5 Ethical issues

The data collection instruments and methodology used in this study were approved by the Human Research Ethics Committee of Curtin University (PH-09-11 and PH-03-12) as well as *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association) (001/SK/BPD-IAI/SURABAYA/2010). Copies of the ethical approvals from Curtin University have been included in Appendices 1 and 2, while the approval from *IAI* has been included in Appendix 3.

1.5.1 Confidentiality

Confidentiality was an ethical issue for this study, in particular because participants shared information about their pharmacies or their organisations that was not necessarily public knowledge, as well as their own personal opinions and experiences. All data collected for this study were kept strictly confidential. The participants' names were not used at any stage of the research process. The participants were identified by a unique study identifier code to ensure privacy, and the names of persons identified in the questionnaire or interview transcripts were removed. All the data were kept on a secure computer and access to the computer was by specific passwords known only to the principal investigator. The completed questionnaires, transcriptions and audio recordings were stored in a secure locked cabinet at the School of Pharmacy, Curtin University. No information was released or printed that disclosed anyone's personal identity. Participant quotes used in this report contained no personal identifiers. Quotations were identified generically by indicating the type of interviewee (pharmacist or doctor) and number, e.g. Pharmacist 5.

1.5.2 Informed consent

Participants were provided with information about the study. They were made aware that the participation was voluntary and they might withdraw from the study at any time without any adverse consequences. Written informed consent was obtained from all who agreed to participate. Information sheets and consent forms were provided in Bahasa Indonesia. (These are further explained in Chapters 3 to 5.)

1.5.3 Compensation

The interview participants were reimbursed for their time with a cash payment. This is further explained in Chapter 5.

1.5.4 Conflicts of interest

There were no known or anticipated conflicts of interest among the researchers involved in this project.

CHAPTER 2

Literature review

2.1 Diabetes

2.1.1 Overview

Diabetes is a chronic disease characterised by high levels of glucose in the blood (hyperglycaemia). There are three main types of diabetes:

- **Type 1 diabetes**

  Type 1 diabetes was previously known as Insulin Dependent Diabetes Mellitus (IDDM).[36] The disease can occur at any age, although onset mostly occurs in children and young adults.[37]

- **Type 2 diabetes**

  This type of diabetes was known previously as Non-Insulin Dependent Diabetes (NIDDM).[36] Although it mostly occurs in people aged over 40 years, the disease also is becoming increasingly prevalent in younger age groups.[38, 39]

- **Gestational diabetes**

  This type of diabetes affects a woman during pregnancy. The condition usually disappears once the baby is born. However, a history of gestational diabetes increases a woman's risk of developing type 2 diabetes later in life.[37]

Diabetes is an independent risk factor for both macrovascular diseases (due to the damage to larger blood vessels) and microvascular diseases (due to damage to small blood vessels):

- **Macrovascular complications**
    - Cardiovascular diseases: 50% or more of people with diabetes die of cardiovascular disease (primarily heart disease and stroke).[4]

- **Microvascular complications**
    - Neuropathy (peripheral nerve dysfunction): 80% of amputations occur after foot ulceration and injury, which can be a result of diabetic neuropathy.[40]
    - Retinopathy (eye damage): 1% of global blindness can be attributed to diabetes.[41]
    - Nephropathy (kidney damage): diabetes is among the leading causes of kidney failure.[4]

These complications are often the cause of death among people with diabetes. It was reported that the overall risk of death among people with diabetes is at least double that of their peers without diabetes.[42]

2.1.2 Type 2 Diabetes

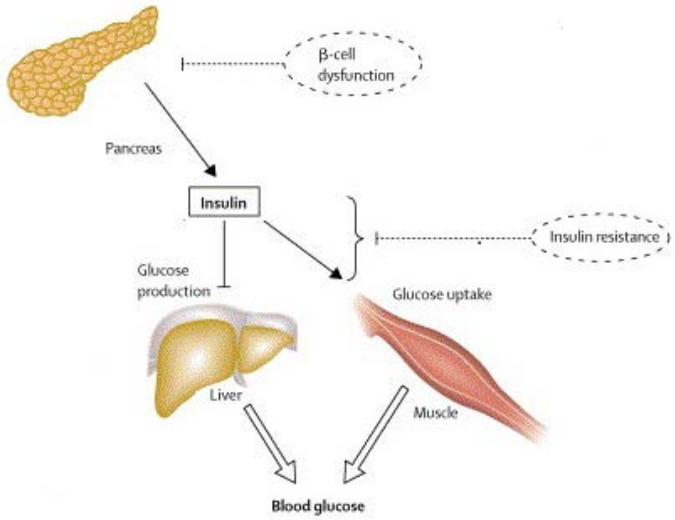
Type 2 diabetes is the most common form of diabetes, affecting approximately 90% of people with diabetes worldwide.[43] The DiabCare Asia 2008 study reported that type 2 diabetes accounted for 97.5% of Indonesians diagnosed with diabetes.[2]

2.1.2.1 Pathophysiology of type 2 diabetes

The pathophysiology of type 2 diabetes is characterised by two major features: the gradual fall in pancreatic ß-cell function (impaired insulin secretion) within a background of insulin resistance.[37, 44, 45] Insulin normally reduces glucose output by the liver and enhances glucose uptake by skeletal muscle. Decreased insulin secretion will reduce insulin-signalling in its target tissues. Insulin resistance pathways affect the action of insulin in each of the major target tissues, leading to hyperglycaemia. In turn, the raised concentrations of glucose in the bloodstream feed back to worsen both insulin secretion and insulin resistance.[44, 45]

Various genetic and environmental factors are reported to contribute to the development of type 2 diabetes.[44, 45] It is reported that a family history of diabetes is associated with a higher risk of developing the disease. Its pathogenesis is assumed to involve genetic abnormalities in the molecules related to the regulatory system of glucose metabolism; to date these genetic abnormalities have been able to explain about 30% of genetic factors responsible for type 2 diabetes.[44] In addition to genetic factors, environmental factors related to an increase of visceral fat, such as ageing, obesity, insufficient energy consumption (lack of physical activity), alcohol drinking, and smoking have been reported to be associated with type 2 diabetes.[44, 45]

Figure 2.1 Pathophysiology of type 2 diabetes (Stumvoll et al., 2005)[45]



2.1.2.2 Treatment of type 2 diabetes

Treatment plans for patients diagnosed with type 2 diabetes should be formulated as a collaborative therapeutic alliance among the patient and family, the doctor and other members of the health care team.[37, 46] The plan should aim to improve quality of life and reduce the progression of complications to prevent premature death.[46] Thus, multiple interventions are needed, not only to control hyperglycaemia, but also to control other risk factors for complications (such as overweight/obesity, hypertension, dyslipidaemia and smoking). The cornerstone of the interventions is the inclusion of:

- **Diet**

  Diet management involves controlling weight and the introduction of a healthy eating plan.[36] Diet plays an important role in preventing and controlling blood glucose, and is an essential component of an overall healthy lifestyle.[36, 37, 46]

- **Physical activity**

  Increasing physical activity improves glucose control, reduces cardiovascular risk factors and contributes to weight loss.[37] The recommendation from *Perkumpulan Endokrinologi Indonesia – PERKENI* (Indonesian Society of Endocrinology) is ≥150 minutes per week of moderate-intensity physical activity (50-70% of maximum heart rate), spread over at least 3 days per week.[46]

- **Medications**

  If a trial of healthy lifestyle practices for six weeks or more is unsuccessful in controlling blood glucose in a person with type 2 diabetes, oral antidiabetic drugs (see Table 2.1) and/or insulin can be used.[36, 46] Insulin may be needed at an early stage of the condition when treatment is being started (when the so-called 'primary' failure of oral antidiabetic drugs suggests the patient actually has type 1 diabetes) or when the patient has later become refractory to oral antidiabetic drugs (which is the so-called 'secondary' failure consistent with the progression of type 2 diabetes).[36]

- **Self-management education and support**

  Education and support is required to facilitate the development of patient knowledge, skills and abilities necessary for diabetes self-care.[37] This ongoing education/support should focus on assisting patients' behavioural changes, including: healthy lifestyle (e.g. physical activity, healthy eating, smoking cessation, weight management); disease self-management (e.g. medication taking and management, self-monitoring of blood glucose); and prevention of diabetes complications (e.g. self-monitoring of foot health, active participation in screening for eye, foot and renal complications).[37, 46]

Table 2.1 Oral antidiabetic medications[46-48]

Medication	Mechanism of action
Well-validated	
Metformin	Metformin is the only biguanide available; its major effect is to decrease hepatic glucose production and insulin resistance.
Sulfonylureas (e.g. gliclazide, glimepiride)	Sulfonylureas lower glycaemia by enhancing insulin secretion.
Less well-validated	
Thiazolidinediones (e.g. rosiglitazone, pioglitazone)	Thiazolidinediones are peroxisome proliferator–activated receptor γ modulators which regulate genes involved in lipid and glucose metabolism; they reduce hepatic glucose production and insulin resistance.
GLP-1 analogues (e.g. exenatide)	GLP-1 is a naturally occurring peptide produced by the L-cells of the small intestine, increasing glucose-dependent insulin secretion and supressing inappropriate glucagon secretion.
Other therapies	
α-Glucosidase inhibitors (e.g. acarbose)	Acarbose delays absorption of carbohydrates by inhibiting α-glucosidase enzymes in the small intestine and, thus, reduces postprandial hyperglycaemia.
Glinides (e.g. repaglinide, nateglinide)	Like the sulfonylureas, the glinides stimulate insulin secretion, although they bind to a different site within the sulfonylurea receptor.
DPP-4 inhibitors (e.g. sitagliptin)	DPP-4 inhibitors are small molecules that enhance the effects of GLP-1 and GIP, increasing glucose-dependent insulin secretion and suppressing glucagon production.
SGLT2 inhibitors (e.g. dapagliglozin, canagliflozing)	This class of drug reduces glucose reabsorption in the kidney and lowers plasma glucose, independent of changes in insulin concentrations or peripheral insulin resistance.

Abbreviations: DPP-4, dipeptidyl peptidase four inhibitors; GLP-1, glucagon-like peptide-1; GIP, glucose-dependent insulinotropic peptide; SGLT2, Sodium-glucose co-transporter 2

Goals for optimum diabetes treatment are summarised in Table 2.2. As hyperglycaemia defines diabetes, glycaemic control is fundamental to the management of diabetes. The American Diabetes Association (ADA) has recommended a goal of HbA1c ≤7.0%;[37] more stringent HbA1c goals (such as <6.5%) have been suggested by the American Association of Clinican Endocrinologists (AACE) to further lower the risk of complications.[49] However, this target should be individualised based on age, presence and absence of complications, and life expectancy.[49]

Table 2.2 Goals for optimum diabetes treatment (*PERKENI*, 2006 & 2011)[46, 50]

	Good	**Fair**	**Poor**
BGL fasting	80–100 mg/dL (4.5–5.5 mmol/L)	100–125 mg/dL (5.5–7.0 mmol/L)	≥126 mg/dL (7.0 mmol/L)
BGL postprandial	80–144 mg/dL (4.5–7.9 mmol/L)	145–179 mg/dL (8.0–9.9 mmol/L)	≥180 mg/dL (10.0 mmol/L)
HbA1c	<6.5%	6.5 – 8.0%	>8%
Total cholesterol	<200 mg/dL (5.2 mmol/L)	200–239 mg/dL (5.2–6.1 mmol/L)	≥240 mg/dL (6.2 mmol/L)
HDL-C	>40 mg/dL (1.1 mmol/L) (male) >50 mg/dL (1.3 mmol/L) (female)		
LDL-C	<100 mg/dL (2.6 mmol/L) (without presence of risk factors) <70 mg/dL (1.8 mmol/L) (with presence of risk factors)	100–129 mg/dL (2.6–3.3 mmol/L)	≥130 mg/dL (3.4 mmol/L)
Triglycerides	<150 mg/dL (1.7 mmol/L)	150–199 mg/dL (1.7–2.2 mmol/L)	≥200 mg/dL (2.3 mmol/L)
BMI	18.5–23 kg/m^2	23 – 25 kg/m^2	>25 kg/m^2
Blood pressure	130/80 mmHg	130-140/80-90 mmHg	>140/90 mmHg

Abbreviations: BGL, blood glucose levels, HbA1c, glycosylated haemoglobin; HDL-C, (high-density lipoprotein) cholesterol; LDL-C, (low-density lipoprotein) cholesterol; BMI, body mass index = weight (kg) divided by height^2 (m^2)

2.1.2.3 Health care for type 2 diabetes

A detailed assessment should be performed at initial diagnosis to include appraisal of diabetes complications and risk factors for complications. This will provide a basis for continuing care that includes a treatment plan, treatment administration, monitoring and review (see Figure 2.2 and Table 2.3).

Figure 2.2 Model of care for type 2 diabetes patients in primary care[36, 37, 46, 51]

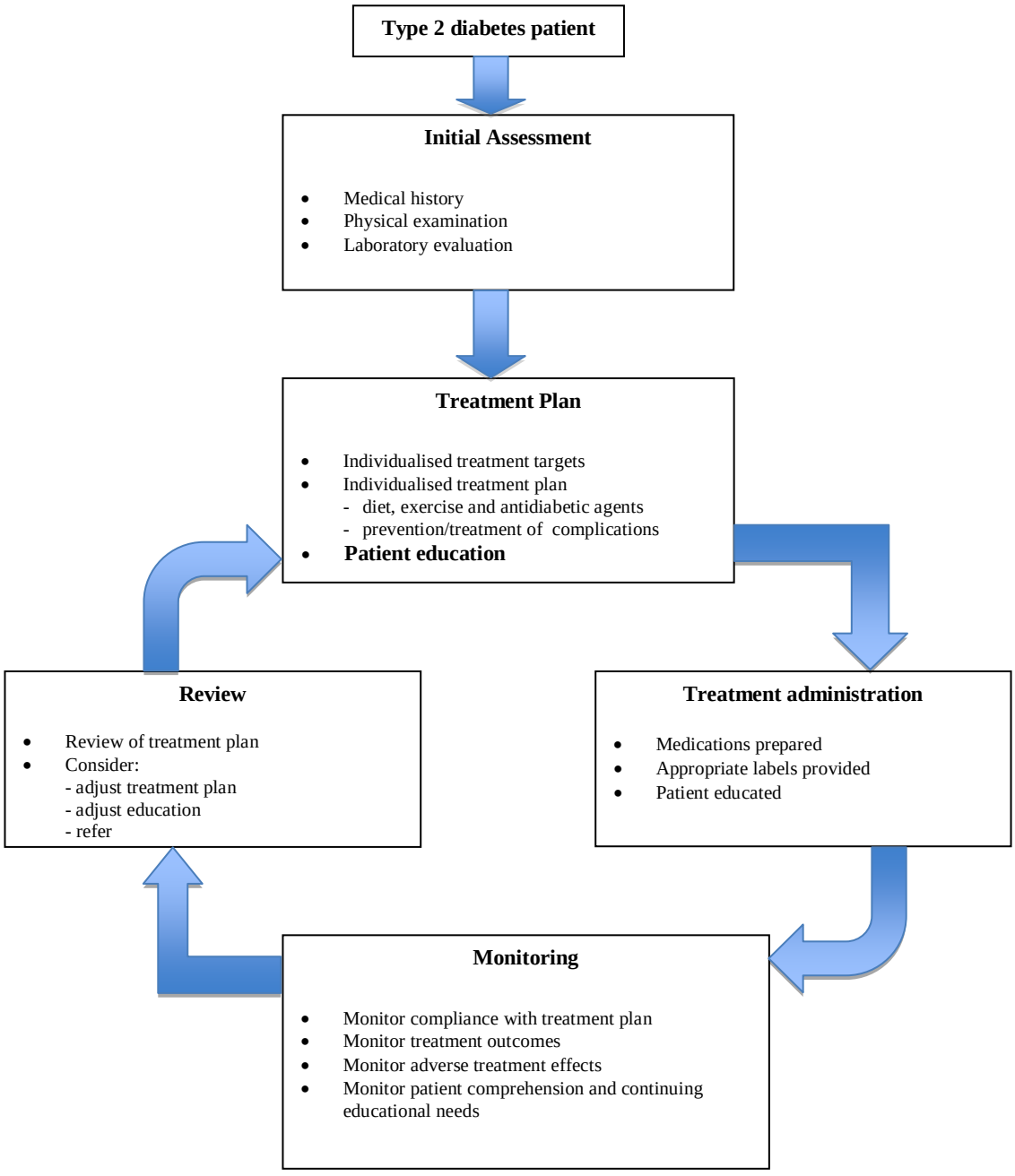


Table 2.3 Tabulation of the processes in the model of care for type 2 diabetes patients in primary care[36, 37, 46, 51, 52]

Stage	Activity	Component
Initial Assessment	History-taking	• Specific symptoms of glycosuria/hyperglycaemia • Predisposition to diabetes: e.g. age, family history, obesity, lifestyle issues (e.g. smoking, diet, alcohol, physical activity, occupation) • Risk factors for complications: personal or family history of cardiovascular disease, overweight/obesity, smoking, hypertension, dyslipidaemia • Symptoms of complications: e.g. cardiovascular symptoms, neurological symptoms, foot and eye problems • Other medical conditions • Medications (if any) • Education (if any) • Psychosocial status: e.g. attitudes about illness, expectations, resources – financial, social and emotional
	Physical examinations	• Weight/waist: BMI, waist circumference • Cardiovascular system: e.g. blood pressure measurement • Eyes: e.g. pupil dilation • Feet: e.g. skin condition, sensation • Peripheral nerves: e.g. sensation • Urinalysis: e.g. albumin
	Laboratory evaluation	• Glycaemia: HbA1c, BGL • Lipids: LDL-C, HDL-C, total cholesterol, triglycerides • Renal function: plasma creatinine (eGFR), microalbuminuria • Other tests when necessary
Treatment Plan	Individualised treatment targets	• Glycaemic control: BGL, HbA1c • Control of risk factors for complications: lipids, blood pressure, BMI, cigarette consumption • Urinary albumin excretion • Physical activity
	Development of treatment plans	• Antidiabetic medications • Diet • Physical activity • Prevention/treatment of complications
Patient education	Patient education	• Diabetes disease process • Treatment targets • Treatment plan - Antidiabetic medicines: dosage instructions, use of insulin devices, storage requirements, special precautions, common/important adverse effects - Exercise - Diet - Prevention/treatment of complications: e.g. foot care, smoking cessation, medications for high lipid/blood pressure levels • Monitoring - SMBG (using glucose meter and interpreting the results) - Need for regular medical monitoring

Table 2.3 (continued)

Stage	Activity	Component
Treatment administration	Medications prepared	N/A
	Appropriate labels provided	• Labels with directions for use • Ancillary labels (if required)
Monitoring	Monitor compliance with treatment plans	• Medications • Exercise plan • Diet plan • Prevention/treatment plans for chronic complications • Scheduled medical monitoring
	Monitor treatment outcomes	• Glycaemic control: HbA1c, BGL, SMBG • Control of risk factors for complications: lipids, blood pressure, BMI, cigarette consumption • Presence of complications: cardiovascular system, peripheral nerves, renal, eyes, feet
	Monitor adverse effects	• Presence of drug adverse effects
Review	Review of treatment plan based on monitoring results	• Consider treatment plan adjustment • Consider education adjustment • Refer

Abbreviations: HbA1c, glycosylated haemoglobin; BGL, blood glucose level; HDL-C, (high-density lipoprotein) cholesterol; LDL-C (low-density lipoprotein) cholesterol; BMI, body mass index; eGFR, estimated glomerular filtration rate; SMBG, self-monitoring of blood glucose.

2.2 Background on Indonesia

2.2.1 Geography, population and governance

The Republic of Indonesia consists of approximately 17,000 islands, which lie between Asia and Australia. There are five major islands: Sumatra in the west; Java in the south; Kalimantan straddling the equator; Sulawesi; and Papua bordering Papua New Guinea on the east. Two remaining groups of islands are Maluku and Nusa Tenggara. All other islands are small and mostly uninhabited. More than 80% of Indonesia's territory is covered with water; the land area is about 1.9 million square kilometres. The large number of islands and their dispersion over a wide area has given rise to a diverse culture, as well as hundreds of ethnic groups and languages. A majority speak the national language, Bahasa Indonesia. Indonesia's climate is tropical, with two seasons. The dry season extends from May to October and the rainy season extends from November to April.[53-55]

According to the 2010 Population Census, the population of Indonesia was 237.6 million. This makes Indonesia the fourth most populous country in the world after the People's Republic of China, India and the United States of America (USA). Indonesia is a lower-middle income country with a per capita gross national income (GNI) of US$ 1,650 and a national poverty rate of 16.7%.[56] A rapidly growing share of Indonesians, approximately 118.3 million people (49.8%) in 2010, live in urban areas and, of these, the majority reside in Java.[57]

Indonesia is divided administratively into 33 provinces. Each province is subdivided into districts (*kabupaten*) and municipalities (*kota*). Altogether, there are 399 districts and 98 municipalities in Indonesia. Each district/municipality consists of sub-districts (*kecamatan*), and each sub-district consists of villages (*desa*).[53] In 2012, there were 6,793 subdistricts and 79,075 villages in Indonesia. Each entire village is classified as urban or rural.[58]

In 1999, Republic of Indonesia Law No. 22 regarding Regional Governance (*Pemerintahan Daerah*) was enacted; this was later revised by Law No. 32 of 2004.[59] With the implementation of the aforementioned laws, the government system in Indonesia has been changed from Centralisation to Decentralisation, which transfers authority from the central government to regional governments (i.e., provinces, districts and municipalities). The district/municipality level is given broader autonomy to manage regional public sectors, such as health, education and infrastructure. On the other hand, the provincial level has limited autonomy (i.e. sectors that have not been covered in the district/municipality level or that have an inter-district/municipality dimension); instead, it acts as a representative of the central government. Meanwhile, the central government has to perform the role of formulating policy and standards, and providing guidance to provincial and district/municipality levels.[59, 60]

2.2.2 Health priorities and diabetes

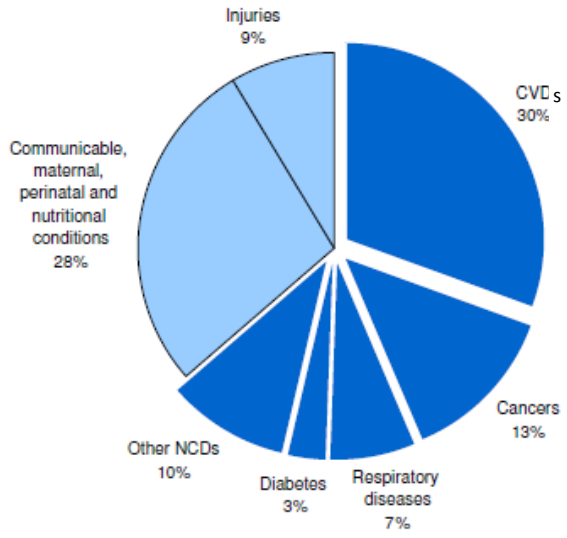
The elderly population in Indonesia is increasing. Based on the 2010 Population Census, there were 18.0 million people above 60 years old (7.6% of the total population), suggesting that Indonesia is becoming an ageing population in its structure.[57] Although communicable diseases remain a large burden in Indonesia, the increasing ageing population[57] and changes in lifestyle[6] have contributed to epidemiological transition towards non-communicable diseases (NCDs) – also known as chronic diseases.

Based on the *Riset Kesehatan Dasar – Riskerdas* (National Basic Health Research) in 2013, the prevalences of four main types of NCDs in Indonesia were: (i) cardiovascular diseases – CVDs [hypertension (25.8%), coronary heart disease (1.5%), heart failure (0.3%) and stroke (13.9%)]; (ii) cancers (1.4%); (iii) chronic respiratory diseases [chronic obstructed pulmonary disease (3.7%) and asthma (4.5%)]; and (iv) diabetes (2.1%).[3] While these figures were based on self-reported data (diagnosis or symptoms), partial data of blood specimens (N=39, 202

persons) showed a higher prevalence of diabetes (6.9%), suggesting that many with diabetes were undiagnosed. Using the International Diabetes Federation (IDF) Diabetes Atlas update data in 2013,[1] approximately 8.5 million people (about 5.6%) in Indonesia were living with diabetes, and this was estimated to increase to 14.1 million by 2035. This makes Indonesia amongst the top 10 countries in number of people living with diabetes in the world.

It was estimated that in 2010, NCDs accounted for 63% of all deaths in Indonesia, with diabetes and CVDs (some of which might relate to diabetes) accounting for approximately 33% (Figure 2.3).[61] NCDs also are associated with high levels of morbidity, not limited to affluent populations in urban settings alone, but also affecting poorer people, reducing their earning capacity and, as such, contributing to further impoverishment.[54] The DiabCare Asia 2008 study (Indonesia) showed that patients diagnosed with diabetes had a range of associated complications, including: retinopathy (42%), nephropathy (7.3%), neuropathy (63.5%) and CVDs (22.5%).[2] This was complicated by the fact that many more were undiagnosed[3] and, while those who are diagnosed receive treatment, only a handful – less than 20%[2] – achieve treatment targets (HbA1c <6.5%). Thus, diabetes and other NCDs represent a real burden to Indonesia from the point of view of health, society and economy.

Figure 2.3 Causes of death in Indonesia (percentage of total deaths, all ages)[61]



The Government, within *Rencana Strategis Kementrian Kesehatan – Renstra* (Ministry of Health Strategic Plan) for 2010–2014,[5] has acknowledged NCDs, including diabetes, as a national health priority area. The strategy includes initiatives around promotion and prevention (for people without NCDs – high risk versus low risk), early detection (of previously undiagnosed NCDs) and management (of diagnosed NCDs), as well as disease surveillance. Specific to diabetes, the Ministry of Health published Guidelines in Controlling Diabetes Mellitus and Metabolic Disorders[62] to establish directions for central to regional activities in controlling the diabetes epidemic. It is difficult, however, to provide a complete picture of diabetes activities in Indonesia. Using data from the Ministry of Health[63, 64] and the World Diabetes Foundation (an organisation established by Novonordisk, currently providing grants for diabetes projects in Indonesia),[6, 65-71] in addition to an Indonesian literature review,[8] the main diabetes activities in Indonesia have been summarised in Table 2.4.

While the current diabetes activities appear to be isolated, Indonesia has not yet seen a coordinated framework of actions amongst stakeholders as well as an integrated approach to the care of type 2 diabetes patients.

Table 2.4 Diabetes activities/projects in Indonesia

Objective	Activity/project	Partnership
Increasing public awareness	World Diabetes Day each November since 2008, diabetes camps and education programmes[6]	MoH RI/WDF in partnership with NGOs, such as *PERSADIA*
	Pos Pembinaan Terpadu Penyakit Tidak Menular – Posbindu PTM (Integrated Health Post for NCDs) is a community-based health facility, created to increase awareness among the general population about NCDs, recognising the risk factors of these diseases and detecting the conditions in the early stages (7,225 Posbindu PTM by 2013)[64]	MoH
Improving the capacity of preventing, detecting and treating diabetes	Training: 1,237 healthcare workers in eight cities (2006-2008)[8, 65] 612 GPs in health centres (by 2013)[64] About 1,200 internal medicine specialists by 2012[6] 450 nurses trained as diabetes nurses and educators (2011-2014)[8, 70]	MoH RI/WDF in partnership with professional bodies and educational institutions
Improving diabetes care and prevention (model)	Establishing three community-based diabetes management centres at the Ternate Island in the North Maluku, Kutai in Kalimantan and in East Jakarta (one centre in Ternate by 2013)[6, 71]	MoH RI/WDF in partnership with health facilities and educational institutions
	Implementing integrated community-based approach in the provinces of West Sumatra, Bengkulu and Banten (2010-2013)[8, 67]	
	Raising public awareness and training healthcare workers in two rural areas (Kediri) - diabetes awareness information posts have been established in 26 districts (2005-2008)[8, 68]	
Improving care and prevention of diabetes complications	Diabetic retinopathy training and treatment: renovation of a screening facility, raising awareness (campaign), staff training, screening and treatment (2009-2012) [8, 66]	MoH RI/WDF in partnership with health facilities and educational institutions
	Diabetes foot care: staff training, improving 2 foot clinics and establishing 14 new clinics (2008-2011)[8, 69]	
Developing guidelines or materials in diabetes care	13 materials by 2013, such as Pharmaceutical Care for Diabetes Mellitus (a pocket book for pharmacists), Technical Guidance for Detection and Management of Diabetes Mellitus (for primary care workers)[64]	MoH RI in partnership with professional bodies and educational institutions
	National diabetes guidelines (medical care), such as Concensus on Diabetes Management and Prevention of type 2 diabetes in Indonesia (latest version in 2011)[8]	*PERKENI*
Improving affordability of care	The Government plans to implement universal health coverage for the entire Indonesian population from January 2014[64] (see Section 2.2.3.2 Health Financing)	Government (MoH RI)

Abrreviations: MoH RI, Ministry of Health, Republic of Indonesia; WDF, World Diabetes Foundation; *PERSADIA*, *Persatuan Diabetes Indonesia* (Indonesian Diabetes Association); NGOs, non-govenrment organisations; *PERKENI*, *Perkumpulan Endokrinologi Indonesia* (Indonesian Society of Endocrinology); GP, general practitioner.

2.2.3 Health system

2.2.3.1 Structure and health service delivery

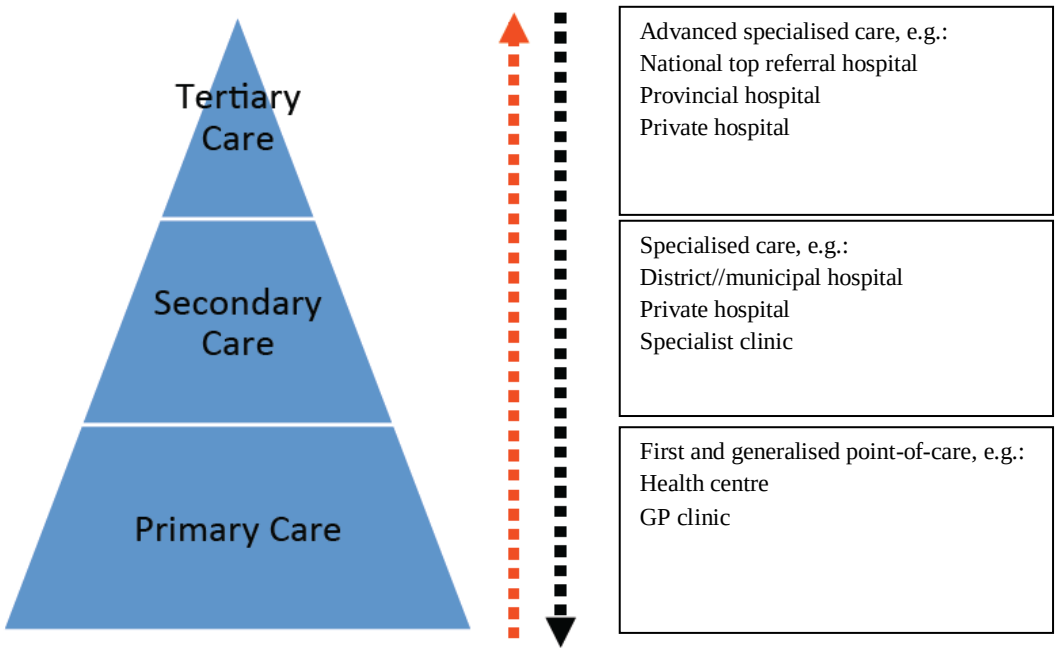
Health services in Indonesia are delivered mainly by the government (the public sector) and the private sector. The government health system includes a *Pusat Kesehatan Masyarakat – Puskesmas* (Health Centre) in each sub-district. This is usually supported by two or three *Puskesmas Pembantu – Pustu* (Auxiliary Health Centres) to further expand its coverage to villages. Moreover, the health centres can assist the establishment of Community-based Health Facilities, e.g. *Pondok Bersalin Des*a *– Polindes* (Village Midwife Clinics), *Pos Pelayanan Terpadu – Posyandu* (Integrated Health Posts), and *Pos Kesehatan Desa – Poskesdes* (Village Health Posts). The system also includes referral pathways from the health centres to the District Hospitals (general/specialist), the Provincial Hospitals (general/specialist) and the National Top Referral Hospitals (general/specialist) to provide secondary or tertiary care (see Table 2.5).[60, 72] The specialist hospital is defined as a hospital primarily providing healthcare in relation to specific medical areas, organs or illnesses.[73]

Table 2.5 The government health structure in Indonesia

Government structure	Health structure	Healthcare facilities
Central	Ministry of Health	National Top Referral Hospital
Provincial	Provincial Health Office	Provincial Hospital
District/Municipality	District Health Office	District/Municipal Hospital
Sub-district	----	Health Centre
Village	----	Auxiliary Health Centre Community-based Health Facilities, eg. Village Midwife Clinic, Integrated Health Post, Village Health Post

The Indonesian private health system consists mainly of hospitals (general/specialist) and clinics [general practitioner (GP) clinics – run by one or several GPs, or specialist clinics – run by one or several specialists]. While the GP clinics provide primary care, the specialist clinics or hospitals (general/specialist) provide secondary or tertiary care. Figure 2.4 summarises the healthcare referral system in Indonesia.[72] Currently, a referral is mandatory for those under health insurance schemes.[74] For those without insurance plans, or preferring not to use their plans, the use of healthcare can be dependent on their preferences and affordability. It was noted that, due to the lack of expertise and equipment at primary care levels, the majority of patients diagnosed with diabetes may prefer to use secondary and tertiary care levels (e.g. hospital-based facilities) for their care.[2, 8]

Figure 2.4 Healthcare referral system in Indonesia[72, 74]



Medications are distributed through district/municipality pharmacy installations, pharmacies and drug stores.[63] District/municipality pharmacy installations are technical units responsible for supplying medications for public primary care facilities (health centres).[63] Pharmacies (except those which are units of public hospitals) and drug stores focus on providing medications to the private sector. Drug stores are not required to have a pharmacist on staff (unlike pharmacies) and are licensed to sell only non-prescription medications.[75] However, many also sell prescription drugs, and both pharmacies and drug stores are known to sell prescription drugs without doctors' prescriptions.[56]

2.2.3.2 Health financing

The overall health financing situation in Indonesia is complex and not completely documented. Using the WHO Global Health Expenditure database,[76] the Indonesian total health expenditure in 2011 was US**$** 201,950,721 or 2.7% of its GDP (gross domestic product). As shown in Table 2.6, this government spending comprises 35% of total health expenditure, while 65% is private. By far the largest private spending is out-of-pocket payments (fee for service), accounting for nearly half of the total health expenditure. It was reported that it is widely accepted among Indonesian consumers to use private sector providers for a range of health services and products, contributing to higher out-of-pocket payments.[77]

Table 2.6 Health expenditure by source of financing in Indonesia (2011)[76]

	Value (US$)	% of THE
Total health expenditure (THE)	**201,950,721**	
General government expenditure, e.g.:	**69,916,289**	**34.6**
Ministry of health	13,179,445	6.5
Social security funds	14,250,279	7.1
Private expenditure, e.g.:	**132,034,432**	**65.4**
Private insurance	4,789,739	2.4
Non-profit institutions serving households (e.g. NGOs)	1,935,342	0.9
Out-of-pocket expenditure	100,708,284	49.9

Abbreviations: NGOs, non-government organisations; THE, total health expenditure

For years, health financing through insurance schemes (social and private) covered only a small proportion of the population (about 20%), but this fraction increased with the establishment of *Asuransi Kesehatan Masyarakat Miskin – Askeskin* (Health Insurance for the Poor) in 2004.[56] *Askeskin* was a non-contributory scheme designed by the Government to increase affordability, accessibility and quality of health services to the poor; this was expanded to *Jaminan Kesehatan Masyarakat – Jamkesmas* in 2008 to include the near poor.[56] In 2012, around 151.5 million Indonesians were covered by some form of health insurance (about 65% of the total population), largely through *Jamkesmas* (see Table 2.7).[10]

Table 2.7 Health insurance coverage in Indonesia (2012)[10]

Type of health insurance	Number of participants
Social health insurance	
Askes (Health Insurance for Civil Servants)	17,274,520
TNI/*Polri* (military and police)	2,200,000
Jamkesmas (Ministry of Health - Health Insurance for the Poor/Near Poor)	76,400,000
JPK *Jamsostek* (Wokforce Social Security – for private formal sector employees)	5,600,000
Jamkesda/PJKMU (Regional Governments' Health Insurance – for poor/near poor households not covered by *Jamkesmas*)	31,866,390
Private voluntary health insurance	
Corporate insurance (self-insured)	15,351,532
Commercial health insurance	2,856,539
Total	**151,548,981**

In January 2014, the Government established *Jaminan Kesehatan Nasional – JKN* (National Health Insurance) as a move towards providing affordable healthcare to its entire population [universal health coverage – based on Republic of Indonesia Law No. 20 of 2004 regarding *Sistem Jaminan Sosial Nasional* – SJSN (National Social Security System)].[9] This first phase targets coverage of participants in the current social health insurance schemes (i.e. *Askes,* TNI/*Polri, Jamkesmas, Jamkesda/*PJKMU and JPK *Jamsostek).* In the second phase, the entire population is expected to be covered under the national scheme by January 2019.[10] The scheme includes the government paying for the poor and near poor households, while the other participants are required to pay a fee according to a tariff determined by their income ranges.[10] In providing universal health coverage, it is expected that there will be an increasing demand for healthcare, as well as healthcare spending. Thus, strengthening the referral system and optimising the use of primary care will be paramount.

2.2.3.3 Health resources

Indonesia has made impressive gains in extending the reach of health services, especially primary care. It has been estimated that more than 90% of the population can have access to primary care facilities. Based on the 2012 Indonesia Health Profile,[63] the Government has constructed 9,510 health centres (in addition to approximately 22,000 auxiliary health centres[56]), giving a ratio of 3.89 health centres per 100,000 population. Secondary and tertiary healthcare in Indonesia, however, has grown slowly. The 2012 Indonesia Health Profile reported a total of 2,083 hospitals (comprising 1,540 public hospitals and 543 private hospitals) with a ratio of 94.6 hospital beds per 100,000 population.[63] As for health facilities supplying medications, there is a total of 497 district/municipality pharmacy installations as well as a total of 17,613 pharmacies and 7,040 drug stores.[63] In addition, there are many unlicensed drug stores (estimated to be around 5,000 in 2005) and other informal outlets, including more than 90,000 small stores and street peddlers.[77]

Reliable data on healthcare workers in Indonesia is lacking and often incomplete. *Badan Pengembangan dan Pemberdayaan Sumber Daya Manusia – BPSDMK* (National Board of Human Resources Development and Empowerment) recorded a total of 567,422 healthcare workers in 2013 (Table 2.8).[63] However, this was mainly based on the available data from public health facilities. Using data from *Konsil Kedokteran Indonesia* – KKI (Indonesia Medical Council), 88,309 doctors were registered within the council, giving a ratio of 36.1 doctors per 100,000 of population.[63] For pharmacists in Indonesia, the estimate was 45,000 in total, 20,799 of whom were registered within *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association) in 2014.[78]

Table 2.8 Healthcare workers in public facilities (2013)[63]

Healthcare workers	Number of persons
Medical staff:	
Specialist	27,333
GP	37,364
Dentist	11,826
Nursing staff:	
Nurse	235,496
Midwife	126,276
Pharmacy staff (i.e. pharmacist and non-pharmacist staff)	31,223
Others	97,904
Total	**567,422**

Abbreviations: GP, general practitioner

Based upon international comparisons, Indonesia's ratios of health facilities (hospitals), as well as healthcare workers, to population, have been low. Using the database of World Development Indicators in 2007, the number of hospital beds per 1,000 population was one of the lowest in the East Asia and Pacific region, even lower than those of countries with much lower incomes, such as the Lao People's Democratic Republic and Vietnam.[7] Similarly, with respect to the total numbers of healthcare workers to population, Indonesia had a much lower ratio than most other East Asia and Pacific region countries, as well as other countries of its income level globally. With regard to the doctor-to-population ratio, when compared with countries that have similar income levels, in 2007, Indonesia had a considerably lower ratio: 21 doctors per 100,000 (although this improved to 36 in 2012) compared with 58 in the Philippines and 70 in Malaysia; and even when compared with countries with lower income per capita than Indonesia.[7]

In addition to the low doctor-to population ratio, it also was reported that Indonesia had the lowest ratio of endocrinologists to people with diabetes in Asia (1:118,000), and had only about 3,000 internal medicine specialists in 2013.[6] Given the small size of the medical workforce, one solution offered was to optimise the use of other healthcare workers, thus improving access to care.[62]

2.2.4 Community pharmacy

2.2.4.1 Pharmacy profession

Based on the Indonesian Government Regulation No. 51 of 2009 regarding Pharmacy Practice,[75] pharmacists are professional health personnel authorised to conduct pharmacy practice that includes:

- production and quality control of pharmaceutical products
- safety assurance, procurement, storage and distribution of medications
- supply of prescription medications
- provision of drug information services
- development of drugs, medical products and traditional medicines.

The work of pharmacists can be supported by pharmacy technicians – those who have completed qualifications such as Bachelor of Pharmacy, undergraduate Diploma of Pharmacy, undergraduate Diploma of Pharmaceutical Analysis (pharmacy analyst), or senior secondary education in pharmacy (pharmacy assistant).[75]

A qualified pharmacist is required to complete the pharmacy undergraduate course (Bachelor of Pharmacy) which is followed by one year pre-registration training. Every pre-registration trainee has to spend his or her year attending lectures as well as gaining experience in hospitals, community pharmacies, industry and the Ministry of Health offices. It has been argued that, while this gives the average Indonesian pharmacist a wider knowledge of all areas of pharmacy practice, this arrangement may not give them sufficient experience in any branch of practice.[55]

The Ministry of Education regulates pharmacy education in Indonesia. In 2000, *Asosiasi Perguruan Tinggi Farmasi Indonesia – APTFI* (Indonesian Association of Higher Education of Pharmacy) was established to serve as a platform for the exchange of ideas and strategies in pharmacy education amongst schools of pharmacy in Indonesia. In 2008, the association established a national pharmacy

curriculum (Bachelor of Pharmacy[79]and pre-registration training[80]) in the hope of achieving an equivalent level of competency for pharmacy graduates across all schools of pharmacy in Indonesia. The national curricula included pharmacotherapy subjects as a basis for providing pharmaceutical care. Practising pharmacists are registered within *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association). In 2011, this professional assosication renewed the standards of competency for pharmacists in Indonesia.[81]

According to the Indonesian Government Regulation No. 51 of 2009,[75] practising pharmacists should be nationally registered by *Komite Farmasi Nasional – KFN* (National Pharmacy Committee), which is an independent body under the Ministry of Health. Guidance about the registration process is provided within the Ministry of Health Regulation No. 889 of 2011.[82] Pharmacists are obliged to renew their registration every five years and each renewal requires a certificate of competency issued by the *IAI*. Supporting this, the association developed a system for competency assessment. Currently, the assessment is conducted through an examination following a two-day workshop; later, it is planned to adopt a portfolio system where pharmacists are required to complete a certain level of credits related to continuing professional development/continuing professional education (CPD/CPE) activities.[83]

2.2.4.2 Community pharmacy characteristics

It has been estimated that Indonesia has 45,000 pharmacists, of whom 20,799 have been registered within the *IAI* in 2014.[78] Based on the 2012 Indonesia Health Profile, there are a total of 17,613 pharmacies,[63] mainly community-based. A study in Jakarta, Indonesia, reported that about 60% of community pharmacy customers privately purchased medications and only about 40% purchased medications with prescriptions.[26] A majority of pharmacies dispensed less than 350 prescriptions (which may contain one or more than one medication items) per week. This is in line

with a previous study which found that community pharmacies in Jakarta dispensed an average of 50 prescriptions per day.[24]

Community pharmacies in Indonesia focus on providing pharmaceutical services to the private sector.[77] The government regulation allows a community pharmacy to be owned by a pharmacist and/or a person, being either a body corporate or a natural person, who is not a pharmacist.[75] Regardless of the ownership, a pharmacy is required to have a pharmacist manager who is legally responsible for the pharmacy practice.[75] Thus, a community pharmacy can be owned by a pharmacist manager (*Apoteker Penanggungjawab Apotek – APA*), a proprietor – a non-'pharmacist manager' owner (*Pemilik Sarana Apotek – PSA*) with an employed pharmacist manager, or a partnership between the pharmacist manager and proprietor. It was reported that the majority of community pharmacies in Jakarta were owned by proprietors (73.5%)[24] and were independent pharmacies (87.8%)[26]. Both studies reported that more than 70% of the pharmacist managers were working part-time,[24,26] while most of them did not have other employee pharmacists.[24]

2.2.4.3 Community pharmacy practice

Since the introduction of the concept of Pharmaceutical Care in the eighties, this initiative has become a dominant form of community pharmacy practice worldwide.[11, 12] The principles of pharmaceutical care derive from the concept of Good Pharmacy Practice (GPP). It is defined as "the responsible provision of pharmacotherapy for the purpose of achieving definite outcomes that improve a patient's quality of life. It is a collaborative process that aims to prevent or identify and solve medicinal product and health related problems. This is a continuous quality improvement process for the use of medicinal products".[84] In 2006, pharmaceutical care was included within Indonesian legislation (Ministry of Health Decree No. 1027/MENKES/SK/IX/2004: Standards for Pharmaceutical Care in Community Pharmacies);[23] the legislation is followed with technical guidance introduced in 2008.[85]

Based on the standards, pharmaceutical care in Indonesian community pharmacies should include, but not be limited to, the following services:[23, 85]

1) Prescription medication service

- Prescription review

  Pharmacists should perform prescription review, including:

  - Administrative review (completeness and legal aspects): doctor identity (i.e. name, licence number, address), prescription date, patient identity (i.e. name, gender, weight), clear instructions for use, and other information.
  - Pharmaceutical review: dosage form, strength, stability and compatibility, route of administration.
  - Clinical review: known medication adverse effects including allergies, interactions with other medications taken, appropriateness (dose, frequency, duration and other specific conditions/comorbidities). Pharmacists are advised to contact the doctor if there is any problem with the prescription.

- Drug dispensing/supply

  - Dispensing medications: This includes preparing/compounding medications, labelling and packaging. Prescription medications should be provided with an attached label (white for oral use and blue for non-oral use). The label is to include patient name and medication directions for use according to the prescription. Ancillary labels may also be provided, such as “shake well before use”.
  - Delivering medications: Prescription medicines should be delivered by the pharmacist.[75] Before delivering the medicine, pharmacists should conduct a final check to ensure that the medicine (and information on the label) is the same as on the prescription.

- Drug information and counselling

  When delivering prescription medicines to the patient or their carer, pharmacists should provide drug information and counselling. The drug information is, at least, to include: how to use medications, duration of use, storage and, if any, specific activity or food that should be avoided during treatment. Patient counselling is to identify and solve problems related to the patient's use of medications (based on information obtained from the prescription, patient medication record, or patient interview/written report). This should be done continuously for patients with chronic diseases, such as diabetes.

- Monitoring

  The pharmacist actively monitors the patient's use of medications (effectiveness, adverse effects, compliance and other problems), particularly for patients with chronic diseases, such as diabetes.

2) Promotion and education

   Pharmacists should provide health promotion and patient education to motivate self-care (i.e. what people do for themselves to establish and maintain health, prevent and deal with illnesses; it is a broad concept encompassing hygiene, nutrition, lifestyle, environmental factors, socioeconomic factors and self-medication[86]). Pharmacists also can help in distributing health information by means of oral (e.g. community education) or written (e.g. leaflets, brochures, posters) presentations.

3) Home/residential care

   It is recommended that pharmacists (as care givers) can provide home/residential care, particularly for the elderly and patients with chronic diseases.

Pharmaceutical care is a form of multidisciplinary collaboration, which means that the pharmacist and the doctor (and possibly other care providers) jointly arrive at an optimal treatment plan for the patient.[12] It requires that a professional relationship between the pharmacist and the patient is established and maintained, and that records of a patient's medications and other specific information are collected and evaluated. In the case of prescription medicines, a therapy plan needs to be developed involving the doctor and the patient.[84] Within the aforementioned Indonesian standards, community pharmacies are required to develop Patient Medication Records (PMRs) and to have a private counselling area/room to provide care.[64, 65]

Several studies have been conducted to evaluate community pharmacy practice in Indonesia. Studies by Purwanti et al.[24] (N=65) and Herman et al.[25] (N=40) compared community pharmacy practice in Jakarta/Makassar/Jogjakarta, Indonesia using the previous standards (Standards for Pharmacy Services in Community Pharmacies, 2003[87]). These standards consisted of four areas, including: non-prescription services, prescription services, information/education services and handling of medications. Both studies showed inadequate compliance with the standards, particularly for information/education services (32.4% and 58.6%, respectively). In addition, a study by Zurmatias[26] (N=98) compared community pharmacy practice in Jakarta with the GPP[88, 89] which consists of four elements (i.e. health promotion, supply and use of medicines, self-care, influencing prescribing). The results showed that 69.4% of pharmacies were at the level of 'less than good'. All of these studies, however, are limited by their small sample sizes and none have focused on diabetes care.

2.2.4.4 Method of payment

Typically, reimbursement to the pharmacy is based on the cost of the drug sold plus a small mark-up and a prescription fee (i.e. fee for preparing medications according to the prescription). Based on the reimbursement rate of *JKN*, the mark-up factor has been set according to the drug cost (see Table 2.9), while the prescription fee is Rp 300 (approximately A$ 0.03), or Rp 500 (approximately A$ 0.05) if compounding is required, per prescribed item.[90]

Table 2.9 Mark-up factor for supplying medications

Drug cost (per unit)	**The maximum mark-up factor**
≤ Rp 50,000 (approximately A$ 5)	20%
< Rp 50,000 to 250,000 (approximately A$ 5 to 25)	15%
> Rp 250,000 to 500,000 (approximately A$ 25 to 50)	10%
> Rp 500,000 to 1,000,000 (approximately A$ 50 to 100)	5%
> Rp 1,000,000 (approximately A$ 100)	2%

2.3 Community pharmacy-based services for type 2 diabetes patients

Type 2 diabetes is a complex condition that requires more time and expertise than one practitioner can provide to achieve optimal therapeutic outcomes for the patient.[37, 46] With the development of the concept of Pharmaceutical Care, in which pharmacists are expected to perform a wider role in patient care,[84] an opportunity exists for community pharmacists to become more involved in the care of patients with type 2 diabetes.

2.3.1 Intervention studies

Extensive studies, worldwide, have tested the effectiveness of community pharmacy-based interventions in supporting people with type 2 diabetes. Most of the studies have been conducted in developed countries and only a few studies have been reported from low and middle-income countries such as India[14] and Brazil[18]. The range of interventions evaluated can be seen in Table 2.10.

The interventions were measured for their effectiveness using:

- clinical outcomes, such as glycaemic control,[14-18, 20, 21, 91-95] reduction of risk factors,[16-21, 95] adherence, [16, 17, 20, 96, 97] compliance to screening for complications,[95] drug-related problems identified/solved[16, 17, 20, 21, 96, 97]
- humanistic/social outcomes, such as quality of life,[14-17, 22] satisfaction,[17, 22, 98] belief,[98] knowledge,[14, 17, 20, 21, 94] lifestyle changes,[19] self-care activity[22]
- economic outcomes, such as health cost.[17, 95]

It was shown that community pharmacy interventions provided some improvements in those outcomes, though not all were statistically significant. A review which included selected studies between 1990 and 2003[91-94, 96-98] noted that components of community pharmacy-based interventions which appear to contribute to effectiveness included: patient education/consultation about their diabetes and its

treatment, medications and lifestyle changes, and monitoring/reviewing glycaemic control.[13]

Table 2.10 Components of type 2 diabetes interventions in community pharmacies

Stage	Intervention	Component
Patient education	Patient education/consultation	Disease process[14]
		Goal setting[91]
		Lifestyle: physical activity, diet[14, 22, 91]
		Medications[14, 96, 98]
		Psychosocial support: patient health beliefs[96, 98]
		SMBG: blood glucose meters[91]
		Prevention/treatment of complications: foot care, smoking cessation, hypertension, dyslipidaemia[22]
		Unspecified[91, 92, 94, 97]/customised[17] content
		Patient self-management services[95]
Monitoring/review	Monitoring treatment outcomes	Review of blood glucose results[16, 91, 93]
		Physical examination (blood pressure, weight, feet, skin)[91]
		HbA1c measurement[92]
	Monitoring compliance	Adherence questionnaire[97]
	Medication review	Medication review[14, 93, 96, 98]
		Interventions based on patient outcomes (pharmacotherapy follow-up) [15, 16, 18-21]
Other	Partnership with other health professionals	Liaison with the prescribing doctor[91, 98]
		Referral for patient education[91, 92]
		Referral to a specialist nurse[92]
		Referral for medical advice[16, 92, 98]

Abrreviations: SMBG, self-monitoring of blood glucose; HbA1c, glycosylated haemoglobin

2.3.2 Reported practices of community pharmacists in type 2 diabetes care

Pharmaceutical care is practised in community pharmacies around the world in varying forms and degrees.[11, 29] Research on the practice of community pharmacists in the specific area of diabetes, however, is limited to a small number of studies[30-35, 99, 100] all of which have been undertaken in developed countries. The scope of diabetes services identified in these studies can be seen in Table 2.11.

Although the scope of diabetes services was variable across studies, it was generally shown that services commonly provided were centred around patient education and monitoring. Components of education and monitoring provided by more than 50% of the community pharmacies in these studies included: patient education related to medications (particularly directions for use, and potential adverse effects), lifestyle education (particularly diet, exercise and smoking cessation), supporting patients in performing self-monitoring of blood glucose (SMBG), and monitoring compliance with medications (Table 2.11).

Table 2.11 The provision of diabetes services in community pharmacies

Stage	Service	Component	Being regularly provided (% of community pharmacists)
Initial assessment	History-taking	Drug history	±70%[30]
		Patient educational needs, assessment and resolution	21%[31]
		Individualised coronary risk assessment	7%[31]
	Physical examinations	Foot checks	2%[35]
Prescription review	Prescription review (clinical aspects)	Checking dose regimens/assessing prescriptions for adverse effects or interactions	79%[32]
Patient education	Patient education/consultation	Diabetes and its implications	20%[35]; 25%[32]; 44%[31]
		Complications of diabetes, e.g. renal	±25%[30]
		Treatment targets	10%[35]; 12%[33]
		Medications: - how to use antidiabetic drug - what to expect from medications - potential adverse effects of antidiabetic drug - use/cautions of non-prescription medications - self-administration of insulin - insulin storage	 30%[32]; >50%[34]; 59%[31]; 60%[33]; >90%[30] 25[32] 46%[33]; ±50%[34]; >90%[30] 75%[32]; >80%[30] 11%[33] 37[33]
		Lifestyle (in general): - exercise - diet (basic information) - alcohol - other preventive activities - immunisation	28%[32]; 57%[31] 10%[35]; 15%[33]; 21%[32]; <50%[34]; ±70%[30] 10%[35]; 15%[33]; 44%[32]; ±50%[34]; ±70%[30] <50%[34]; ±50%[30] ±70% [30]
		SMBG (in general): - use of blood glucose meter - interpretation of the results - control/calibration of the device	±50%[32]; ±70%[30] 13%[33]; 30%[35]; 36%[31]; 95%[34]; 57%[99] 15%[35]; 29%[31]; 54%[34]; 53%[99] 51%[34]; 37%[99]
		Signs and symptoms/treatment of hypogylcaemia	20%[33]; ±50% [30]

Table 2.11 (continued)

Stage	Service	Component	Being regularly provided (% of community pharmacists)
Patient education (continued)	Patient education/consultation (continued)	Prevention/treatment of complications: - controlling blood pressure - smoking cessation - weight reduction - foot care	 ±50%[30] <50%[34]; 54%[31]; ±70%[30] <50%[34] 9%[33]; 49%[31]
		Need for regular medical monitoring: - diabetes check-up/review - eye examination - laboratory test – HbA1c, lipid, creatinine, microalbuminuria	 47%[31] 6%[33]; ±10%[32] 14%[33]
		Patient advice on achieving glycaemic control targets and blood pressure targets	20% and 19%, respectively[31]
		Patient advice on information available from patient organisations	28%[31]
		Sick-day plan	14%[33]; ±20%[30]
		Wearing medical alert bracelet	6%[33]; ±50% [30];
		When to contact the healthcare provider	22%[33]; ±50%[30]
Monitoring/review	Monitoring treatment outcomes	Review of the patient's SMBG	±30%[30]
		Blood pressure monitoring service	10%[31]; ±30%[34]
		Blood glucose monitoring service	7%[31]; ±35%[34]
		Cholesterol monitoring	±1%[34]; 6%[31]
	Monitoring compliance	Review of the patient's drug refill history	>80%[30]
		Concordance problem assessment and resolution	36%[31]
		Checking with patients if they have followed advice given	<50%[32]
	Monitoring adverse effects	Identifying frequency of hypoglycaemia	±50% [30]
	Medication review	Medication review	24%[34]; 31%[31];
		Providing drug therapy recommendation to the doctor/assisting with dosage adjustments	5%[35]; ±25%[30]

Abreviations: HbA1c, glycolylated haemoglobin; SMBG, self-monitoring of blood glucose

2.3.3 Views on community pharmacists' roles in type 2 diabetes care

Understanding pharmacists', doctors' and pharmacy customers' views about the roles of pharmacists in type 2 diabetes care would be useful in supporting practice change and designing professional development programmes in the area of diabetes.

2.3.3.1 Pharmacists' views

Studies regarding pharmacists' perspectives on diabetes care have been limited to developed countries. Two studies reported that pharmacists generally had a positive attitude towards diabetes, including recognition of the need for special training to help people with diabetes, the seriousness of the disease and the value of tight glycaemic control, as well as understanding the impact of this disease on individuals and their need for autonomy.[30, 33] Further, some studies looked at diabetes services perceived as priority/future roles by community pharmacists.[31, 34, 100, 101] It was shown that pharmacists were supportive of diabetes care services, particularly in the areas of patient education (such as education related to medications, healthy lifestyle and SMBG), and monitoring (such as monitoring compliance with medications, blood glucose monitoring service and providing feedback of glycaemic control) (see Table 2.12).

Table 2.12 Pharmacists' views on their roles in diabetes care

Stage	Activity	Component	Level of support*
Dispensing:	Dispensing	Repeat medication service	Strong[31]
Beyond dispensing:			
Initial asessment	History- taking	Coordinated, targeted screening for high risk of CVDs	Strong[31]
		Assessment of an individual's pharmaceutical care needs via patient interview	Strong[31]
Treatment plan	Individualised treatment targets	Agreeing treatment goals with patients	Ambivalent[31]
	Development of treatment plan	Designing and implementating pharmaceutical care plan	Ambivalent[31]
Patient education	Patient education/consultation	Diabetes and its implications	Strong[34]
		Medications (in general): - how to use antidiabetic drugs - what to expect from medications - potential adverse effects of antidiabetic drugs - use/cautions of concurrent medications	Strong[34, 101] Strong[31, 100] Strong[100] Strong[100] Strong[100]
		Lifestyle: - exercise - diet (basic information) - alcohol	 Minimal[100] Ambivalent[34, 100] Strong[100]
		SMBG	Strong[34, 100]
		Signs and symptoms/treatment of hypogylcaemia	Strong[100]
		Prevention/treatment of complications - smoking cessation - weight reduction	 Ambivalent [34, 100] Ambivalent[100]

Table 2.12 (continued)

Stage	Activity	Component	Level of support*
Monitoring/review	Monitoring treatment outcomes	Monitoring to support pharmaceutical care provision (in general): - weight measurement - blood pressure monitoring service - blood glucose monitoring service - cholesterol monitoring	Ambivalent[31] Minimal[100] Ambivalent[34] Strong[34] Minimal[34]
		Checking patient's glucose monitoring	Strong[101]
		Providing patients with routine feedback of glycaemic control, blood pressure and cholesterol-monitoring results[31]	Strong[31]
		Providing a quality control scheme that tests the reliability of home-testing equipment and the competence of patients	Ambivalent[31]
	Monitoring compliance	Signaling when patients use their medications incorrectly and discussion of this	Strong[100]
	Medication review	Pharmaceutical care recommendations made to the multidisciplinary team	Ambivalent[31]

Abrreviations: CVD, cardiovascular disease; SMBG, self-monitoring of blood glucose

* Level of support:

- Strong: 'desirable' (concensus achieved from 1st round of questionnaire); or mean >5 (1=totally disagree, 9=totally agree); or priority services selected by >50% of respondents
- Ambivalent: 'desirable' (concensus achieved after 2nd round of feedback discussion); or mean 3-5 (1=totally disagree, 9=totally agree); or priority services selected by 30-50% of respondents
- Minimal: 'undesirable'; or mean <3 (1=totally disagree, 9 = totally agree); or priority services selected by <30% of respondents)

2.3.3.2 Doctors' views

Although the available data reporting doctors' views on community pharmacists' roles were not specific to diabetes care, the findings have illustrated a range of attitudes towards aspects of community pharmacists' roles (see Table 2.13). Two of these studies were conducted in the developing countries of India[102] and Malaysia[103].

In general, doctors had positive attitudes towards community pharmacists as major drug experts in primary care.[102-108] Thus, they strongly supported pharmacists in extending their roles in relation to drugs (product-related activities) such as technical roles of dispensing,[108] maintaining patient medication profiles,[105, 108, 109] checking for prescription errors (clinical aspects),[107, 108] patient education related to medications[108] and monitoring compliance with medications,[106, 108, 109] as well as being a source of medicine information to doctors (advisory roles).[102, 107, 108] However, there was little support for the idea of pharmacists undertaking more patient-related activities such as health screening,[105, 106, 109] monitoring treatment progress,[105, 108] and assisting in development/adjustment of treatment plans (co-decisive roles).[105-108]

Some of the studies evaluated doctors' characteristics that might influence their attitudes towards the care-providing function of community pharmacists. It was reported that doctors' views correlated significantly with the relationship between doctors and pharmacists.[104] However, the Malaysian study showed that the majority of doctors (98.9%) never or rarely interacted with community pharmacists in relation to patient care matters.[103] In addition to the relationship between doctors and pharmacists, age or years of experience were reported to influence the doctors' perspectives, however, the results were inconsistent among the studies.[102, 103, 105, 107]

Table 2.13 Doctors' views on community pharmacists' roles (general)

Stage	Activity	Component	Level of support*
Dispensing:	Dispensing	Mostly involved in dispensing	Marginal[102, 106, 108]
		Technical prescribing information, eg. availablity of medication	Strong[108]
		Repeat-medication service	Variable, depending to the level of dependence (12%-81%)[104-106, 108]
Beyond dispensing:			
Initial assessment	History-taking	Maintaining a complete medication profile	Marginal[105]/Strong[108]
		Including non-prescription products in patient medication profile	Strong[109]
Prescription review	Prescription review (clinical aspects)	Detecting prescription errors (checking dose, interaction, contraindication)	Marginal[105]/Strong[107, 108]
		Contacting doctors on matters related to prescribing and prescription errors	Marginal[103, 109]
Treatment plan	Development of treatment plan	Assisting in design of drug therapy plan	Minimal[105, 106]
	Advice to prescriber	Being a source of clinical medicine information for doctors, such as drug adverse effects	Marginal[105]/Strong[102, 107, 108]
		Being a source of clinical advice to doctors, such as selection of a medicine for a particular disease state	Ambivalent[104, 108]/Marginal[109]
		Advising on the cost-effectiveness of medicines for disease states	Ambivalent[102, 105]/Marginal[106, 108]
Patient education	Patient education/counselling	General counselling	Marginal[102]
		Health and medicines	Marginal[103]
		Medications: - safe and appropriate use of the medicine - benefit of the medicine - drug adverse effects - how to manage drug adverse effects	 Marginal[105, 107, 109] Marginal[108] Strong[108] Ambivalent[109]
		Smoking cessation	Minimal[103]

Table 2.13 (continued)

Stage	Activity	Component	Level of support*
Monitoring/review	Monitoring compliance	Monitoring cmpliance with medications	Strong[106, 108, 109]
	Monitoring treatment outcomes	Assessing effectiveness of treatment by monitoring the patient's progress/response – and letting doctors know if any DRP occurred	Minimal[105, 108]
		Health screening service (in general) - screening for raised blood lipids - screening for raised blood pressure - screening for glycosuria	Minimal[105]/Ambivalent[109] Minimal[106] Minimal[106] Ambivalent[106]
	Monitoring adverse effects	- Monitoring/reporting adverse effects	Strong[106, 108]
	Medication review	Formally reviewing patient's medicine (screening DRP) and discussing possible alteration to medication therapy with doctors (solving DRP)	Ambivalent[105, 107, 108]
		Making dose adjustments to a patient's medicine/adjusting drug therapy using protocols established with doctors	Minimal [105, 107-109]
	Referral	Writing referral forms for patients seen in the pharmacy, but requiring treatment from their doctors	Ambivalent[105, 106]/Marginal[109]
		Referring customers that exhibit drug-related problems to the doctor	Marginal[103]
		Referring customers who are not suitable for self-care to the respective medical practitioner	Marginal[103]

Abreviations: DRP, drug-related problem

* Level of support:

- Strong: >75% of respondents strongly agree/agree; or mean >6 (1=strongly disagree; 7=strongly agree)
- Marginal: >50-75% of respondents strongly agree/agree); mean >5-6 (1=strongly disagree; 7=strongly agree)
- Ambivalent: >30-50% of respondents strongly agree/agree); mean >3-5 (1=strongly disagree; 7=strongly agree)
- Minimal: <30% of respondents strongly agree/agree); mean 1-3 (1=strongly disagree; 7=strongly agree)

2.3.3.3 Patients' views

Studies worldwide have been conducted to investigate customer utilisation of, or attitudes towards, community pharmacies (general aspects of care); some have been conducted in developing countries such as Indonesia,[28, 110] Malaysia,[111] South Africa,[112] Iraq,[113] Nigeria,[114] and Boznia and Herzegovina.[115] However, only a few studies have focused on diabetes patients and services;[116-120] all were conducted in developed countries. In addition to the diabetes studies, a recent literature review reported customer or public views towards community pharmacy activities in promoting and maintaining health, which can be seen as an integral part of diabetes management.[121]

It has been shown that community pharmacies are essential points of contact for health care, with more than half of the study respondents visiting a pharmacy at least monthly,[113, 119, 122, 123] particularly for purchasing medications.[111, 113, 119, 122, 124] In general, patients have positive perceptions of community pharmacists. Approximately 50% of the respondents perceived pharmacists to have a balanced role between that of a member of a health care team and that of a business person;[115, 122-126] and about half of the respondents would initially talk to pharmacists regarding information or advice on their medications.[113, 123, 124] However, the qualitative findings reported that patients wanted their doctors to initiate and validate pharmacist-led interventions.[120] It was suggested that the extent to which patients would engage with the pharmacist depended on the accessibility and level of care from their doctors.[120, 127]

Patients were generally satisfied regarding pharmacists' professional characteristics,[28, 115, 122] such as knowledge (on medications),[116, 122, 123] interests/concerns,[114, 116, 122, 123, 126] efficiency,[114, 116, 122, 123, 126] availability at designated hours,[114, 125] trustworthiness of the advice,[112, 117] politeness/friendliness/relationship,[28, 112, 114, 116, 122] making customers feel comfortable,[115, 117, 123, 126] and willingness to help.[28, 114, 115] Moreover, patients were

highly confident about pharmacists' technical roles of dispensing/supplying medications.[114, 116]

In most studies, patients mainly used or were offered product-related services, such as dispensing and education related to medications.[22, 28, 111, 112, 114, 115, 122, 123, 125] Only a limited number of studies explored patient expectations regarding aspects of community pharmacists' roles (Table 2.14). It was found that patients were strongly supportive of their activities related to medicines, such as obtaining a patient's medication history,[124, 126, 128, 129] checking prescriptions,[82, 85] patient education/counselling on medications, [110, 115, 118, 124, 128, 129] and referral to doctors.[123, 124, 128] There were mixed responses towards pharmacists providing a more patient-centred service, such as discussing patient treatment plans with doctors,[126, 129] offering monitoring services (using clinical testing devices),[117, 121, 123, 124, 128] and monitoring patient progress.[118, 123, 124, 129] In addition, low expectations regarding pharmacists providing health advice were described.[78, 89] In support of this, the qualitative findings reported that participants identified the primary expertise of the community pharmacist as medicines supply, and there were differing views about a pharmacist's role being extended to advising on prescription medicines and diseases/health, or providing monitoring/screening services.[120, 127]

Some of the studies further evaluated patient characteristics that may influence their views about pharmacist roles. It was reported that older patients[118, 123, 127, 128] and patients who had diabetes for longer periods of time[118] were less likely to believe that pharmacists should conduct pharmaceutical care activities, when compared to younger patients and to those who had diabetes for a shorter duration. This finding was inconsistent with an Iraqi study[113] and a UK study (qualitative)[120] which reported that older patients and those living with diabetes for a long time, respectively, were more likely to acknowledge the contributions of pharmacists. In addition to the age and duration of diabetes, patients who had contact/formed a relationship with their pharmacists were more supportive of pharmaceutical care activities.[120, 123, 126] Some other studies showed more positive attitudes of diabetes patients who had experienced pharmaceutical care.[17, 22, 95, 130, 131]

It was found that the majority of patients were not willing to pay for advice[112, 114, 123, 128] or diagnostic testing.[128] A study in the USA, however, showed that 68% of diabetes patients would be willing to pay for a pharmacist to monitor their diabetes, and urged third-party payers to reimburse this service.[117] In addition to cost, patients had mixed responses towards pharmacists' availability to answer drug-related questions (spending enough time),[112, 115, 116, 120, 122, 124, 126] and maintaining confidentiality.[113, 122-124] While some expressed concerns about confidentiality/privacy which may relate to the open nature of pharmacies or unavailability of a consultation room,[120, 123, 124] some felt uncomfortable with the situation and the space available for consultation in the pharmacy (e.g. it was 'breaking the rules', or an opiate-substitution service).[120, 127] Patients also expressed concerns regarding the incomplete nature of community pharmacy service provision (e.g. if the pharmacist detected high blood pressure, he would not prescribe medication), and the lack of information transfer between the community pharmacy and doctors.[127]

A qualitative study by Tarn et al.[132] (USA) linked patients', doctors' and pharmacists' views on community pharmacist roles. They all indicated that pharmacists often functioned as an intermediary between patients and doctors: to expand upon, reinforce and explain doctor-patient discussions about medications as well as to negotiate medication changes or refills. Concerns were identified in relation to pharmacist-patient and pharmacist-doctor communication, including: incomplete information (e.g. patient medical conditions, indications for prescribed medications and doctor treatment plans), problems with contacting doctors, and pharmacists' time constraints to provide patient counselling. Doctors also expressed concerns regarding variations in the quality and content of pharmacists' counselling (across pharmacies as well as between pharmacy staff).

While the views of pharmacists, doctors and patients regarding diabetes services in developed countries are helpful, it is important to better understand the views of Indonesian pharmacists, doctors and patients to underpin the development of local pharmacy-based services for type 2 diabetes.

Table 2.14 Patients' views on community pharmacists' roles (general and diabetes care)

Stage	Activity	Components	Level of support*
Dispensing:	Dispensing	Mostly involved in dispensing	Minimal[125, 126]
		Prescription drugs clearly labelled	Strong[124]
Beyond dispensing:			
		Provision of a wider range of services	Ambivalent[116, 124]/Strong[123]
		Management of chronic condition	Marginal[122]
Initial assessment	History-taking	Medication history	Marginal[124, 128]/Strong[126, 129]
		Medical history	Marginal[129]
Prescription review	Prescription review (clinical aspects)	Checking prescription for accuracy in terms of drug name and dose	Strong[124, 126]
Treatment plan	Development of treatment plan	Talking with doctors about medication treatment plan	Variable (42 to >75%)[126, 129]
Patient education	Patient education/consultation	Disease	Ambivalent[119]/Marginal[124]
		Medication: - directions for use of medication - medication's action and indication - drug adverse effects/interaction - drug dosage - drug storage - how to manage drug adverse effects - answering drug-related questions - review and discussion of medications with patient	Marginal[118, 128]/Strong[110, 124] Strong[115, 124] Variable (24 to >75%)[115, 124, 128, 129] Marginal[119, 128]/Strong[124, 129] Ambivalent[128] Minimal[128] Ambivalent[119] Strong[124] Marginal[118]
		SMBG	Ambivalent[119]
		How to manage blood glucose	Minimal[119]
		How to pay less for medication	Marginal[119]
		Health promotion/health issues	Minimal/Ambivalent[121, 128]

Table 2.14 (continued)

Stage	Activity	Components	Level of support*
Monitoring/review	Monitoring outcome targets	Performing screening/monitoring services - blood glucose - blood pressure - cholesterol	Variable (26-87%)[121, 123, 124, 128] Marginal[117] Ambivalent[128] Minimal[128]
		Monitoring patient's progress/response to treatment	Variable (23->50%)[118, 123, 124, 129]
	Medication review	Adjusting either the dose of medication or the medication itself (according to agreed protocols with doctors)	Ambivalent[123]
	Referral	Talking about patient symptoms and advising when to visit doctors	Marginal[128]/Strong[123, 124]

Abbreviations: SMBG, self-monitoring of blood glucose

* Level of support:

- Strong : >75% of respondents strongly agree/agree; or mean >4 (1=totally disagree, 5 = totally agree)
- Marginal : >50-75% of respondents strongly agree/agree; or mean >3-4 (1=totally disagree, 5 = totally agree)
- Ambivalent: >30-50% of respondents strongly agree/agree; or mean >2-3 (1=totally disagree, 5 = totally agree)
- Minimal: <30% of respondents strongly agree/agree; or mean ≤2 (1=totally disagree, 5 = totally agree)

2.3.4 Factors associated with the development of community pharmacy-based services

The pharmacy profession's attempts to change from product to patient orientation (pharmaceutical care) has been well documented.[12, 133-135] However, the practice change appears to have been problematic and than expected.[136] Reviews of studies exploring factors (potential and actual) affecting service delivery in community pharmacies were reported by Roberts et al. (2006)[137] and Thornley (2006).[136] The latter review included 32 papers covering studies in developed countries (i.e. USA, UK, Denmark, Malta, the Netherlands, Australia, New Zealand, and Europe) and the majority of the studies used quantitative methods, as opposed to qualitative techniques. In addition, several papers were published after these reviews[25, 27, 35, 138-144] but only a few of them discussed factors in developing countries, i.e. Thailand,[138] China,[144] and Indonesia[25, 27]. The summary of these factors can be seen in Table 2.15 (barriers) and Table 2.16 (facilitators).

Although the results of the studies across the various countries tended to be similar in nature, caution is advised on assessing the context/magnitude of each factor. Each country has different community pharmacy systems, settings, staffing structures, remuneration and funding streams, health systems, levels of support and pharmacist roles. Two qualitative studies were conducted in Indonesia (Herman et al., 2008[25] & 2012[27]) to analyse community pharmacy practice (compared to the standards[23, 75, 87]) and the related factors. The first study focused on SWOT (Strength Weakness Opportunity Threat) analyses of the pharmacies; the latter focused on the qualifications of pharmacists in delivering services. Both studies reported that community pharmacy practices in Indonesia did not fully conform to the standards. Concerns were expressed about pharmacist competencies and availability/presence in the pharmacy, thus suggesting the need for collaboration between the *IAI*, the government and schools of pharmacy to develop appropriate curricula and CPD/CPE activities, registration/competence assessment systems, remuneration systems, supporting systems and standards/legislations/policies. Although these studies highlighted some barriers and facilitators, the themes were not clearly evident.

Two of the studies reviewed the barriers/facilitators that are specific for diabetes services in community pharmacies. The first study, by Plake et. al. (2007),[35] included 791 community pharmacists in Iowa, USA. Of those, 241 pharmacists provided at least one diabetes care service; issues pertaining to remuneration, workload and available time were perceived as the most limiting barriers to providing the services. The second study by Berbatis et. al. (2007)[139] was part of a national survey of community pharmacies in Australia that investigated the provision of extended services. It was reported that 48% of the respondents provided diabetes care services; logistic regressions were further used to analyse pharmacist/pharmacy characteristics associated with the provision of such services. Pharmacies with higher turnover and pharmacists with higher CPE hours were predictors for providing diabetes care; significant barriers identified were lack of confidence and the service not being regarded as 'part of the job'. While these studies conducted in developed countries are helpful, a better understanding of the barriers and facilitators within an Indonesian context is vital in supporting the development of local pharmacy-based services for type 2 diabetes.

Table 2.15 Summary of the barriers for providing community pharmacy-based services

Barriers	Thornley, 2006[136] (Review)	Ngorsuraches et al., 2006[138*] Thailand	Berbatis et al., 2007[139*] Australia	Gasteluruttia et al., 2007[140†] Spain	Plake et al., 2007[35†] USA	Niquille et al., 2010[143*] Switzerland	Yang et al., 2010[144*] China	Herman et al., 2008[25] & 2012[27†] Indonesia
Pharmacist		,						
Pharmacist attitude/perception								
- poor attitudes and opinions about extended services	♦			♦ fear of change				
- lack of willingness	♦							
- low behavioural intention (perceptions that it would be difficult to carry out extended services)	♦							
- low motivation, e.g. image, satisfaction (sense of enjoyment), pharmacist roles (obligation), business (added value)	♦							
Pharmacist confidence	♦							
- lack of confidence in ability to deliver extended service						♦		
Pharmacist competence								
- lack of knowledge and skills (competency)	♦	♦						♦
Pharmacy								
Leadership								
- lack of leadership – internal pharmacy				♦				
Pharmacy culture/practice orientation								
- profit-oriented	♦							
Pharmacy characteristics								
- physical environment, e.g. lack of consultation space/privacy	♦			♦			♦	
Staff resources								
- lack of pharmacists			♦ shortage					♦ lack of presence
- lack of support staff (suitably qualified)	♦							
- lack of communication and teamwork	♦							
Operational								
- lack of access to patient information/records	♦							
- lack of equipment and technology	♦							
- lack of use of protocols	♦							
- lack of access to reference literature	♦							
- lack of documentation system	♦							

Table 2.15 (continued)

Barriers	Thornley, 2006[136] (Review)	Ngorsuraches et al., 2006[138*] Thailand	Berbatis et al., 2007[139*] Australia	Gasteluruttia et al, 2007[140†] Spain	Plake et al, 2007[35†] USA	Niquille et al., 2010[143*] Switzerland	Yang et al., 2010[144*] China	Herman et al., 2008[25] & 2012[27†] Indonesia
Pharmacy (continued)								
Time								
- lack of pharmacist time (workload – administrative work)	♦	♦		♦	♦	♦	♦	♦
- lack of patient time	♦							
Customer								
Patient attitudes								
- low expectations	♦						♦	
Patient demand								
- lack of demand	♦			♦				
Healthcare professional relationship								
Relationship/collaboration with doctors								
- difficult to contact/poor relationship	♦		♦	♦			♦	♦
External environment								
Leadership								
- lack of leadership – profession-wide (lack of guidance)		♦		♦				
Education and training								
- inadequate education (curricula) and training for pharmacists				♦		♦		
Remuneration								
- lack of remuneration/funding	♦	♦	♦	♦	♦		♦	
Legislation								
- Legal barriers or restrictions	♦			♦				
- Slow introduction of legislations							♦	
Poor communication with stakeholders	♦							
Non-conducive health care system/structure	♦							
Lack of evidence of benefits of services	♦	♦						

*Quantitative studies: barriers perceived by >50% of respondents (strongly agree/agree)
†Qualitative studies: themes of barriers

Table 2.16 Summary of the facilitators for providing community pharmacy-based services

Facilitators	Roberts et al., 2006[137] (Review)	Thornley, 2006[136] (Review)	Berbatis et al., 2007[139*] Australia	Gasteluruttia et al., 2009[141†] Spain	Roberts et al., 2008[142*] Austalia	Herman et al., 2008[25] & 2012[27†] Indonesia
Pharmacist						
Pharmacist attitudes and characteristics						
- good attitudes and opinions about extended services	♦	♦		♦		
- willingness	♦	♦				
- behavioural intention of providing extended services		♦				
- motivation, e.g. image, satisfaction (sense of enjoyment), pharmacist roles (obligation), business (added value)	♦	♦				
- fostering level of autonomy	♦	♦				
- experience of extended services		♦				
- pharmacist characteristics (e.g. patient centred, participation in CPE and higher degrees, effective soft networkers, staff development)		♦				
Pharmacist confidence in ability to provide extended services	♦	♦				
Pharmacist competence (knowledge and skills)	♦	♦				
Pharmacy						
Management support and leadership	♦	♦				
Pharmacy culture/practice orientation	♦	♦				
Pharmacy characteristics						
- physical environment, e.g. counselling area, layout, workflow	♦	♦	♦	♦	♦	
- rural location	♦	♦				
- low prescription volumes	♦	♦				
Staff resources						
- sufficient pharmacists				♦		
- sufficient and qualified pharmacy staff	♦	♦				
- use of pharmacy technicians	♦					
- communication and teamwork	♦	♦			♦	
- delegation of tasks	♦	♦				

Table 2.16 (continued)

Facilitators	Roberts et al., 2006[137] (Review)	Thornley, 2006[136] (Review)	Berbatis et al., 2007[139*] Australia	Gasteluruttia et al., 2009[141†] Spain	Roberts et al., 2008[142*] Austalia	Herman et al., 2008[25] & 2012[27†] Indonesia
Pharmacy (continued)						
Operational						
- access to patient information/records	♦	♦	♦			
- equipment and technology	♦	♦				
- use of protocols	♦	♦				
- access to reference literature	♦	♦				
- documentation system	♦	♦				
- quality assurance		♦				
- developing relationship with patients		♦				
Recruitment						
- high proportion of eligible patients visiting pharmacy	♦	♦				
- appointment system			♦			
Time						
- allocation of pharmacist time		♦		♦		
Customer						
Customer needs						
- attention for special patient groups	♦	♦				
- improvement in patients' drug use and outcomes		♦				
Patient attitudes						
- improving patient attitudes	♦	♦				
Patient demands						
- demand for service	♦	♦		♦		

Table 2.16 (continued)

Facilitators	Roberts et al., 2006[137] (Review)	Thornley, 2006[136] (Review)	Berbatis et al., 2007[139*] Australia	Gasteluruttia et al., 2009[141†] Spain	Roberts et al., 2008[142*] Austalia	Herman et al., 2008[25] & 2012[27†] Indonesia
Healthcare professional relationship						
Attitudes of doctors - improving doctor attitudes and perceptions	♦	♦				
Relationships/collaborations with doctors - good working relationship/communication	♦	♦		♦	♦	
External environment						
Leadership (profession-wide) – examples from leading practitioners	♦			♦		
Education and training - appropriate education (curricula) and training for pharmacists - appropriate education and training for pharmacy assistants - professional and personal development	♦ ♦	♦ ♦ ♦	♦ study time, accreditation	♦		♦ ♦ ♦ CPD/CPE, registration/ assessment system
External support and assistance – mentors or advisors	♦	♦			♦	
Interaction with other pharmacists	♦	♦				
Awareness of service – role definition - advertising and marketing - communication with stakeholders	♦	♦ ♦		♦		
Remuneration/incentives	♦	♦		♦	♦	♦
Legislation - legal supports	♦	♦		♦		♦ standards of practice, law enforcement
Profile within the local community	♦	♦				
Pharmacy contracts		♦				
Evidence of benefits of services				♦		

Abbreviations: CPD, continuing professional development; CPE, continuing professional education
[*]Quantitative studies: facilitators perceived by >50% of respondents (strongly agree/agree) or stated as key elements
[†]Qualitative studies: themes of facilitators

2.4 Study methods

To evaluate community pharmacy practice in the area of type 2 diabetes, data were collected employing a combination of questionnaire surveys and face-to-face interviews. The use of different data collection techniques to measure specific objectives allows triangulation, thus producing more robust data.[145] These data collection techniques are briefly discussed below.

2.4.1 Questionnaire survey

Survey research is viewed as a quantitative approach, with data collected from a sample of sufficient size to enable generalisations to be made to a wider population. This approach aims to quantify the population in terms of predetermined characteristics, to identify frequencies of events, to establish the proportion of respondents who hold particular views and/or to describe associations between variables.[145] Survey research enables the gathering of information from a large sample in a wide geographical distribution in a relatively short period of time.[145, 146]

The survey instrument refers to the questions or questionnaire used to collect the data. It is important to consider the issues of validity and reliability when using a questionnaire.[145] Validity refers to "the extent to which the questionnaire actually measures what it is designed to measure". There are four main categories of validity: *face validity* – whether the questions collect accurate information; *criterion validity* – if the questions correlate with other measures of the same variable; *construct validity* – whether the questions present the concept precisely; and *content validity* – if the questions cover all the relevant issues (study objectives).[145] An important step towards ensuring content validity is to conduct fieldwork, which generally implies organising interviews with a small number of individuals from the target population. This should be supported by literature review in order to identify issues which are relevant to the objectives of the study, thus providing content validity.[145]

Reliability relates to "the extent to which the findings are reproducible or internally consistent".[145] A procedure commonly adopted to check for consistency of interpretation and response is the test-retest procedure in which the instrument is administered to a different sample of respondents on two separate occasions, generally a few weeks apart.[145]

Questions in a questionnaire may be closed or open ended. For closed questions, there is a limitation on the range of responses that can be given. It has been suggested that closed questions are often preferred in self-administered questionnaires as they are quicker and easier to answer and their use also results in less missing data. Closed questions also are more practical for the researcher in terms of coding and data analysis.[145, 146] On the other hand, open questions allow respondents to express themselves more fully. These questions are more difficult for the researcher to code and categorise. It has been suggested that open questions are usually left to the end of the questionnaire so that respondents have the opportunity to add issues not covered in the questionnaire, hence providing a good check of content validity.[145]

Questionnaires which assess respondent views or attitudes rely on respondents expressing their opinions based on statements given. Respondents need to have a choice of different strengths that best reflects their opinion on particular statements given. For this purpose, scales such as the Likert are used.[145] This scale was developed in 1932 and still remains one of the most commonly used attitudinal measurement scales.[145]

2.4.2 Interview

The interview is a key method in the qualitative approach, aiming to explore viewpoints of individuals on the issue of interest.[145] It generally relies on a small sample that enables detailed work to be conducted; the sample size considerations shift focus onto data saturation (i.e. when no more new themes can be derived from the data collected).[145, 147] Interviewing is a useful method to capture candid and

sensitive information from participants who may not feel comfortable sharing in a writing or a focus group setting. It also has the advantage of overcoming the difficulties of scheduling multiple professionals from different facilities to participate in a common discussion at a single time and location.[148]

The data collection instrument is commonly referred to as the interview guide. In the development of the interview guide for qualitative studies, concerns relate to the topic headings and the extent to which the guide is structured. An unstructured guide provides a few topic headings which are explored according to the issues raised by the participant, while a semi-structured guide possibly represents a half-way house between providing participants with the opportunities to express their views and obtaining information relating to issues of interest to the researcher. The extent of structuring also will be governed by the degree to which the researcher has preformed ideas regarding the topics on which they want the respondents' views.[145]

As for quantitative approaches, Guba and Lincoln suggest that *credibility* (in reference to validity), *dependability* (in reference to reliability), and *transferability* (in reference to generalisability) should be considered in the pursuit of trustworthy qualitative data.[149] *Credibility* refers to the extent to which the data are an accurate reflection of the views of the participants. Some techniques are used to address the credibility issue, such as having participants validate findings (member checking), thick description of the issue of interest, or examination of previous research to frame findings.[150] *Dependability* or reliability is often not a pertinent issue in qualitative work, in which the data are expected to be context specific. However, attempts should be made to provide an in-depth methodological description of the study, thereby enabling a future researcher to repeat the work, if not necessarily to gain the same results.[150] *Transferability* evaluates whether research findings are transferable to other specific settings. To allow transferability, researchers should provide sufficient detail of the context of the study for a reader to be able to decide whether the prevailing environment is similar to another situation with which he or she is familiar and whether the findings can justifiably be applied to the other setting.[150]

Chapter 3

Pharmacy-based services for type 2 diabetes patients: Pharmacist survey

3.1 Introduction

A range of community pharmacy-based interventions have shown positive outcomes in supporting people with type 2 diabetes (see Table 2.10). However, published work regarding practices and views of community pharmacists in the area of diabetes has been limited to developed countries (see Tables 2.11 and 2.12).

Several studies have been conducted to evaluate community pharmacy practice in Indonesia.[24-27] Three of these studies used questionnaires (quantitative approaches) to gain information from community pharmacists regarding their practices, which then were compared to the Government Standards or Good Pharmacy Practice (GPP).[24-26] Results indicated that Indonesian community pharmacy practices have not fully conformed to the standards, particularly in practising pharmaceutical care. While these studies were not specific to diabetes care and were limited by their small sample size, this present study was conducted to provide the first data from Indonesian community pharmacists regarding their practices in the area of type 2 diabetes.

3.2 Objectives

The main objectives of this part of the thesis are:

1. To collect data on the characteristics of community pharmacies and pharmacists in Surabaya, Indonesia
2. To analyse current community pharmacy-based services for type 2 diabetes patients
3. To assess community pharmacists' views on their roles in type 2 diabetes care
4. To identify factors (pharmacist/pharmacy characteristics) associated with the current provision of community pharmacy-based services for type 2 diabetes patients.

3.3 Methods

The data collection instrument and methodology used in this study were approved by the Human Research Ethics Committee of Curtin University (Appendix 1) as well as *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association) (Appendix 3). A questionnaire survey of community pharmacists was conducted to address the objectives of the study.

3.3.1 Setting and sample size

Surabaya is the capital city of the province of East Java, Indonesia, and the second largest city in Indonesia. A list of community pharmacies in Surabaya was obtained from a survey conducted in 2011.[151] Community pharmacies located in specialist clinics other than cardiovascular/endocrinology/internal medicine were excluded due to their limited contact with type 2 diabetes patients. This left a total population of 597 community pharmacies. This study aimed to analyse the views of this population from a representative sample of pharmacies. In addition, it aimed to identify associations between pharmacist/pharmacy characteristics and the provision of current services, using logistic regression analysis. For this type of analysis, a sample size of approximately 120 was considered to be the minimum required to identify associations between variables exhibiting a moderate effect size (with 80% power, and α=0.05). Therefore, the study aimed to recruit N=200 pharmacies, which would have more power to detect associations. Allowing for a 50% response rate to the survey, a sample size of approximately 400 community pharmacies was considered adequate. A random sample of this size was obtained using the SPSS Statistics version 17.0. One pharmacist at each community pharmacy was invited to participate.

3.3.2 Data collection

3.3.2.1 Questionnaire development

The survey questionnaire consisted of three sections: (A) respondent pharmacist characteristics, (B) services for type 2 diabetes patients – current practice and views on pharmacists' roles, and (C) pharmacy characteristics; in addition to the cover page containing information about the study and a consent form. Section B of the questionnaire contained a list of activities related to type 2 diabetes practice that was drafted based on a generic model generated from the literature (see Section 2.1.2.3). A 6-point Likert scale was used to enable respondents to choose different levels that best reflected their current practice (level of frequency of providing each service: 1=never, 6=always) and views on their roles (extent of agreement for each service to be part of their roles: 1=definitely no, 6=definitely yes). This was followed by open-ended questions: (i) to list any other services provided/viewed as part of their roles; and (ii) to explore priority roles: *"In your opinion, what are the five most important services that should be provided at pharmacies for type 2 diabetes patients?'*. The questionnaire was face and content validated by a panel of two project supervisors, five academics, two board members of the *IAI* and two Indonesian community pharmacists. All of their views and comments were considered and, where appropriate, were incorporated into the final questionnaire.

The questionnaire then followed a translation process: (i) forward translation – the questionnaire was translated to Bahasa Indonesia by the principal investigator, whose first language is Bahasa Indonesia, and the conceptual equivalence was checked by a bilingual panel (consisting of the principal investigator and two academics with experience in instrument development and translation) to resolve any conflicting concepts of the translation; (ii) back-translation – the questionnaire was back-translated to English by an independent English-first language translator; and (iii) the back-translation was compared to the original version by two project supervisors whose first language is English.

The forward-translation questionnaire (Bahasa Indonesia) was piloted by ten community pharmacists in Surabaya. They were administered the questionnaire and interviewed on their understanding of the questions. The pre-testing resulted in minor changes to the final questionnaire (see Appendix 4). To assess reliability, the questionnaire was administered on two occasions with a two-week interval. Test-retest reliability for diabetes services (Question 7, Section B, Appendix 4) was calculated using Kappa statistic tests. Responses to the Likert scales were grouped (ratings of 1 to 4, and ratings of 5 to 6) to ensure that Kappa was able to be calculated (this ensured some responses in each of the two broad categories, both before and after the two-week interval). All items reached Kappa scores greater than 0.40 (ranging from 0.412 to 1.000), indicating 'acceptable' to 'excellent' levels of test-retest reliability. [152]

3.3.2.2 Questionnaire administration

First round – A seminar on the new pharmacy regulations, with the Heads of both the *IAI* and the District Health Office of Surabaya as speakers, was conducted on 16th July 2011. An invitation letter directed to 'The Pharmacist' was sent to the random sample of 400 community pharmacies. A reservation to attend the seminar was required, and it was limited to one pharmacist per pharmacy. Two weeks before the seminar, non-responders were contacted by telephone to ensure that they had received the invitation and to offer a reservation. The questionnaire was included in the seminar kit distributed before the seminar. At the beginning of the seminar, the study was explained and the pharmacists were invited to participate. If the pharmacists had any questions regarding the questionnaire, they were able to talk to the principal investigator during the seminar. Those who completed the questionnaire could submit it to the seminar committee, either during the session breaks or at the end of the seminar. Upon submission of the questionnaire, it was checked for missing data and, if found, the pharmacist respondent was asked for the relevant responses (unless he/she chose not to respond).

Second round – the same questionnaire was mailed, in August 2011, to the sample community pharmacies whose pharmacists did not attend the seminar. A covering letter introducing the study was provided (see Appendix 5). After four weeks, the pharmacies were contacted by survey staff (via telephone or personal visits to the pharmacies) to ensure that the pharmacists had received the questionnaire and to seek a response. Upon collection of the questionnaire, the survey staff would check for missing data and ask for the related responses (unless the respondent pharmacist chose not to respond).

3.3.3 Data analysis

The IBM SPSS Statistics version 19.0 was used for data analysis. Descriptive statistics were used to summarise the characteristics of pharmacist respondents (Section A, Appendix 4) as well as the pharmacy characteristics (Section C, Appendix 4). These included frequencies for categorical variables and means, along with their 95% confidence intervals, for continuous variables. Medians, along with their ranges, were used for continous variables which were not normally distributed. The Kolmogorov-Smirnov test was used to test for Normality.

In relation to services for type 2 diabetes patients (Question 7, Section B, Appendix 4), frequencies were calculated for responses from Likert scales of current practice (level of frequency of providing each service), and views on roles (extent of agreement for each service to be part of roles). Moreover, content analysis was used for responses from open-ended questions to list any other services, and to select the five priority services at pharmacies (Questions 8 and 9, Section B, Appendix 4). These responses were coded, and frequencies were calculated.

Logistic regression models were employed to identify factors (pharmacist/pharmacy characteristics) associated with current provision of pharmacy-based services for type 2 diabetes patients. Responses from each type of current activity were classified into binary variables which indicated ‘regular service’ (Likert scale ratings of 5 to 6)

versus ‘less frequent service’ (Likert scale ratings of 1 to 4), and were used as the dependent variables. Pharmacist characteristics included as independent variables were gender, experience and diabetes training. Pharmacy characteristics included were setting, ownership, number of total customers, number of customers dispensed antidiabetic medications and pharmacist availability. The models also included an independent variable indicating the pharmacist’s view about whether the sevice should be a part of their roles; the responses were classified into binary variables to indicate ‘agreement’ (Likert scale ratings of 5 to 6) versus ‘disagreement’ (Likert scale ratings of 1 to 4). A backward elimination strategy was used in the development of each regression model, whereby all independent variables were included initially, and then the least significant variable was dropped (one at a time) until the p-value associated with each of the variables remaining in the model was less than 0.05. Following convention, a p-value <0.05 was taken to indicate a statistically significant association in all tests.

3.4 Results

3.4.1 Response rate

Response rate refers to the number of community pharmacies whose pharmacists returned their questionnaires as a proportion of the sample community pharmacies. Of 400 questionnaires distributed to the sample of community pharmacies, a total of 240 responses were gathered and useable, giving a total response rate of 60%. This included: 143 responses to the 204 questionnaires distributed in the first round (response rate of 70.1%); and 97 responses out of 196 questionnaires distributed in the second round (response rate of 50.5%).

The characteristics of respondent pharmacists (Section A, Appendix 4) as well as their responses to the questions related to the pharmacy services in 'patient education' and 'monitoring' domains (Section B, Appendix 4) between the first and second round were not significantly different (p-values ranged from 0.060 to 0.989).

3.4.2 Pharmacist and pharmacy characteristics

The characteristics of respondent pharmacists (Section A, Appendix 4) are summarised in Table 3.1. The majority of respondents were female with a median age of 37 years, and were managers of their pharmacies. The term 'pharmacist manager' was used for a pharmacist who was legally responsible for the pharmacy practice. More than half of respondents had more than five years of experience (59.2%), and had received training or continuing education concerning diabetes in the last year (57.1%).

Table 3.1 Respondent pharmacist characteristics

Pharmacist characteristics	**Frequency (%) N=240**
Gender	
Male	38 (15.8)
Female	202 (84.2)
Age, years – median (range)	37 (23 – 79)
Year of registration, median (range)	2000 (1962 – 2010)
Position	
Pharmacist manager as well as owner	63 (26.3)
Pharmacist manager	161 (67.1)
Other pharmacist	16 (6.6)
Years of experience as community pharmacist	
<2 years	31 (12.9)
2-5 years	67 (27.9)
6-10 years	64 (26.7)
>10 years	78 (32.5)
Diabetes training/continuing education in last year	
None	103 (42.9)
1-5 hours	90 (37.5)
6-10 hours	23 (9.6)
>10 hours	24 (10.0)

The characteristics of the pharmacy premises (Section C, Appendix 4) are shown in Table 3.2. The majority of the pharmacies were located as stand alone (63.6%) and owned by proprietors (69.9%). The term 'proprietor' was used for a non-'pharmacist manager' owner. Pharmacist manager ownership accounted for only 30.1% of the pharmacies.

The median operating hours of the pharmacies was 14 hours per day, and the majority of pharmacies had only one pharmacist, i.e. pharmacist manager. Only 26.3% of the pharmacies had more than one pharmacist (up to a maximum of four pharmacists). To evaluate the notional pharmacist availability in each pharmacy, a ratio of total pharmacist working hours per week to total pharmacy opening hours per week was calculated. A ratio of 1 or more would indicate that a pharmacist was available during pharmacy opening hours. The results ranged from 0.0 to 2.1, with most pharmacies having ratios less than 1 (83.7%). This indicated that, in many pharmacies, there was no pharmacist on duty at some time when the pharmacy was open.

Approximately 40% of the pharmacies had 1,000 to 2,000 customers per month, and 51 to 100 patients with diabetes per month. A private area/room dedicated for counselling was provided by only a small number of premises (21.8%).

Table 3.2 Pharmacy characteristics

Pharmacy characteristics	**Frequency (%) N=239***
Setting	
Stand alone	152 (63.6)
Pharmacy within shopping mall complex	10 (4.2)
Pharmacy within doctor clinic	77 (32.2)
Ownership	
Pharmacist manager as owner	45 (18.8)
Single proprietor†	139 (58.2)
Group proprietor†	28 (11.7)
Partnership of proprietor and pharmacist manager	27 (11.3)
Opening days per week, median (range)	7 (6 – 7)
Opening hours per day, median (range)	
Monday – Saturday (N=239 pharmacies)	14 (5-24)
Sunday (N=153 pharmacies)	13 (2-24)
Counselling area/room	52 (21.8)
Number of pharmacists per pharmacy, median (range)	1 (1 - 4)
Working hours of pharmacist per month, median (range)	
Pharmacist manager (N=239 pharmacies)	100 (0 – 400)
Other pharmacist (N=63 pharmacies)	180 (36– 350)
Customers per month	
≤500	34 (14.2)
501 – 1000	59 (24.6)
1001 – 2000	97 (40.6)
2001 – 4000	39 (16.3)
>4000	10 (4.2)
Customers dispensed oral antidiabetic medications per month	
≤50	93 (38.9)
51 – 100	108 (45.2)
101 – 250	23 (9.6)
251– 500	10 (4.2)
>500	5 (2.1)
Customers dispensed insulin per month	
≤10	217 (90.8)
11 – 50	19 (7.9)
>50	3 (1.2)

* From a total of 240 respondents, there was 1 missing response for each variable, giving a total N=239
† Proprietor is defined as non-'pharmacist manager' owner

3.4.3 Current pharmacy-based services for type 2 diabetes patients

The participating pharmacists were given a list of services for type 2 diabetes patients and they were asked to rate the frequency of providing each service in their pharmacies (Question 7, Section B, Appendix 4). No new services were raised from the subsequent open-ended question to list any other services provided/viewed as part of their roles (Question 8, Section B, Appendix 4).

3.4.3.1 Dispensing

All of the respondent pharmacists reported that they frequently (Likert scale ratings of 5 to 6) prepared medications and provided labels with instructions for their use for type 2 diabetes patients (see Table 3.3).

Table 3.3 Current pharmacy-based services related to 'treatment administration'

Treatment administration	% Rating level of frequency* N= 240					
	1	2	3	4	5	6
Prepare medications	0.0	0.0	0.0	0.0	23.3	76.7
Provide labels with instructions for use	0.0	0.0	0.0	0.0	19.6	80.4

*1=never, 6=always

3.4.3.2 Services beyond dispensing

Services other than dispensing were performed in a relatively limited fashion. The only frequent service reported by more than 50% of the repondent pharmacists was 'patient education' on medications, particulary directions for use. Other services, related to 'initial assessment', 'treatment plan', 'monitoring' and 'review' domains, were reported as less common practice. The responses describing current practice are summarised in Tables 3.4 to 3.8.

a) Initial assessment

When type 2 diabetes patients visited pharmacies, less than 50% of the pharmacists commonly performed 'initial assessment' activities. Among those, the most frequent activity was the taking of a patient history, particularly in relation to: age (33.3%), duration of diabetes (26.6%), lifestyle (35.9%), family history (33%), diabetes treatment (41.7%), and history of other medical conditions (28.3%) (see Table 3.4).

Table 3.4 Current pharmacy-based services related to 'initial assessment'

Initial assessment	**% Rating level of frequency*** **N=240**					
	1	**2**	**3**	**4**	**5**	**6**
Patient history:						
Age	15.8	15.8	24.6	10.8	10.4	22.9
Duration of diabetes	19.2	19.2	18.3	16.7	10.8	15.8
Lifestyle	16.3	12.9	18.3	16.7	14.2	21.7
Family history of diabetes	18.3	16.3	18.8	13.8	11.7	21.3
Presence of other risk factors for complications	17.1	15.4	20.0	18.3	13.3	15.8
Knowledge about diabetes	17.9	19.2	22.1	16.3	13.3	11.3
Diabetes treatment	14.6	10.8	18.8	14.2	14.2	27.5
History of acute complications	21.3	22.5	17.1	15.8	12.1	11.3
History of chronic complications	21.2	20.3	18.7	12.9	16.2	10.8
Psychosocial status	28.7	21.3	17.5	18.8	6.7	7.1
History of other medical conditions	17.9	18.8	21.3	13.8	15.8	12.5
Baseline physical examination *(e.g. measure weight/height, blood pressure)*	55.0	15.0	10.4	5.8	7.5	6.3
Baseline test *(e.g. check blood glucose)*	42.5	15.3	12.9	8.3	10.4	10.5

*1=never, 6=always

b) Treatment Plan

Less than 25% of the pharmacists were frequently involved in the development of a treatment plan involving medications, diet, exercise, or prevention/treatment of chronic complications (see Table 3.5).

Table 3.5 Current pharmacy-based services related to 'treatment plan'

Treatment plan	**% Rating level of frequency*** **N=240**					
	1	**2**	**3**	**4**	**5**	**6**
Setting of individualised treatment targets *(with/without involvement of other health care members)*	41.3	17.9	15.0	10.4	6.3	9.2
Development of treatment plans: *(with/without involvement of other health care members)*						
Antidiabetic medications	28.7	15.4	18.8	21.3	10.4	5.4
Exercise	24.6	15.4	18.3	24.2	12.5	5.0
Diet	23.8	9.2	18.8	23.8	14.2	10.4
Prevention/treatment of chronic complications	25.0	18.3	20.0	20.0	12.9	3.8

*1=never, 6=always

c) Patient education

While developing a treatment plan was less common, the more common practice was basically providing patient education. More than 50% of the pharmacists frequently provided education related to medications: directions for use (72.6%), storage requirements (61.3%), special precautions to follow (56.3%), and common/important adverse effects (53.4%). Other education often provided by more than 25% of the pharmacists included: exercise (39.6%), diet (46.7%), self-monitoring of blood glucose – SMBG (35.0%), prevention/treatment of acute complications (35.0%), and smoking cessation (38.9%) (see Table 3.6).

Table 3.6 Current pharmacy-based services related to 'patient education'

Patient education	**% Rating level of frequency*** **N=240**					
	1	**2**	**3**	**4**	**5**	**6**
Disease process	25.4	20.4	22.1	15.0	12.5	4.6
Treatment targets	20.4	19.2	16.6	18.8	16.2	8.8
Antidiabetic medications:						
Directions for use	5.4	5.8	6.7	9.6	18.8	53.8
Use of insulin devices	20.0	12.1	15.4	9.6	16.7	26.3
Storage requirements	8.8	8.3	8.3	13.3	24.6	36.7
Special precautions to follow	7.5	7.1	12.9	16.3	22.5	33.8
Common/important adverse effects	9.2	7.5	14.2	15.8	21.7	31.7
Exercise	14.2	10.0	20.4	15.8	16.7	22.9
Diet	11.3	7.9	18.3	15.8	19.2	27.5
SMBG	20.4	9.2	19.2	16.3	15.0	20.0
Prevention/treatment of acute complications	18.3	13.8	22.1	17.1	15.4	13.3
Prevention/treatment of chronic complications	22.5	12.9	24.2	16.3	15.4	8.8
Need for regular medical monitoring	29.2	17.5	20.0	16.3	12.1	5.0
Foot self-care	34.2	17.8	17.4	14.5	8.3	7.8
Smoking cessation	19.6	12.1	18.3	11.3	13.8	25.1

Abbreviations: SMBG, self-monitoring of blood glucose
*1=never, 6=always

c) Monitoring/review

A small number of the pharmacists provided regular follow-up to their patients. Only approximately 25% of the pharmacists frequently monitored patient compliance with their medications (28.0%) or diet (25.8%). Monitoring of patient responses to treatment, either by performing clinical testings (e.g. blood glucose tests) or by checking test results/SMBG records, was routinely performed by less than 25% of the pharmacists. These monitoring activities are summarised in Table 3.7.

Table 3.7 Current pharmacy-based services related to 'monitoring'

Monitoring	% Rating level of frequency* N=240					
	1	2	3	4	5	6
Monitor compliance with:						
Antidiabetic medications	25.0	14.6	19.2	13.3	13.8	14.2
Exercise plan	31.7	15.8	20.0	12.9	10.8	8.8
Diet plan	29.6	12.9	19.6	12.1	12.9	12.9
Plan for prevention/treatment of chronic complications	32.9	15.8	21.3	13.8	10.8	5.4
Scheduled medical monitoring	39.2	15.8	20.4	11.7	9.2	3.8
Monitor treatment outcomes:						
Check records on SMBG	40.8	15.4	16.3	12.1	6.3	9.2
Carry out blood glucose tests	38.8	13.8	12.9	12.5	8.8	13.3
Measure BMI	54.2	17.9	11.3	9.6	3.3	3.8
Measure blood pressure	41.3	15.0	12.5	11.7	8.3	11.3
Check results on laboratory tests	44.2	17.5	14.2	8.3	5.8	10.0
Monitor for adverse effects	33.3	18.3	20.4	10.8	10.0	7.1

Abbreviations: SMBG, self-monitoring of blood glucose; BMI, body mass index
*1=never, 6=always

'Review' can be seen as a continuing process of monitoring. It was reported that the pharmacists mostly followed up their monitoring activities with referral to other health care professionals when necessary (41.6%) and only a small number of pharmacists often adjusted education according to patient's continuing needs (26.7%). Adjusting treatment plans was the least common practice (see Table 3.8).

Table 3.8 Current pharmacy-based services related to 'review'

Review	**% Rating level of frequency*** **N=240**					
	1	**2**	**3**	**4**	**5**	**6**
Review:						
Adjust treatment plans if necessary *(with/without involvement of other health care members)*	39.2	16.3	15.4	12.5	9.6	7.1
Refer patients if necessary	19.2	9.6	15.8	13.8	18.3	23.3
Adjust diabetes education	24.2	18.8	13.3	17.1	12.1	14.6

*1=never, 6=always

3.4.4 Views on pharmacists' roles in type 2 diabetes care

Given the same list of services related to type 2 diabetes care, the participating pharmacists were asked to rate the extent of agreement for each service to be provided at pharmacies (Question 7, Section B, Appendix 4). No new services were raised from the subsequent open-ended question to list any other services provided/viewed as part of their roles (Question 8, Section B, Appendix 4).

3.4.4.1 Dispensing

All pharmacists agreed about their traditional role of dispensing, i.e. preparing medications and providing labels with instruction for use. These views are summarised in Table 3.9.

Table 3.9 Views on pharmacy-based services related to 'treatment administration'

Treatment administration	% Rating extent of agreement* N=240					
	1	2	3	4	5	6
Prepare medications	0.0	0.0	0.0	0.0	17.9	82.1
Provide labels with instructions for use	0.0	0.0	0.0	0.0	13.8	86.3

*1=definitely no, 6=definitely yes

3.4.4.2 Services beyond dispensing

More than 50% of respondent pharmacists agreed that all activities listed within the 'initial assessment', 'treatment plan', 'patient education', 'monitoring', and 'review' domains were pharmacists' roles. These views on pharmacists' roles can be seen in Tables 3.10 to 3.14.

a) Initial assessment

Among 'initial assessment' activities, the majority of pharmacists favoured taking patient history (71.2%) when type 2 diabetes patients initially visited the pharmacy (see Table 3.10).

Table 3.10 Views on pharmacy-based services related to 'initial assessment'

Initial Assessment	**% Rating extent of agreement* N=240**					
	1	**2**	**3**	**4**	**5**	**6**
Patient history:						
Age	2.5	4.2	8.3	12.1	23.8	49.2
Duration of diabetes	2.1	4.6	7.9	15.0	20.4	50.0
Lifestyle	2.5	2.5	7.5	12.9	22.1	52.5
Family history of diabetes	2.9	3.3	7.9	13.3	19.6	52.9
Presence of other risk factors for complications	2.5	2.9	8.8	11.7	22.9	51.2
Knowledge about diabetes	2.1	3.3	7.9	15.4	22.9	48.3
Diabetes treatment	2.1	2.1	8.3	10.0	20.0	57.5
History of acute complications	3.3	2.1	7.5	14.6	26.3	46.3
History of chronic complications	3.3	1.7	8.8	13.8	29.2	43.3
Psychosocial status	4.6	3.3	13.8	20.4	27.5	30.4
History of other medical conditions	2.5	3.3	8.8	18.3	25.0	42.1
Baseline physical examination *(e.g. measure weight/height, blood pressure)*	11.7	9.6	8.3	14.6	19.2	36.7
Baseline laboratory tests *(e.g. check blood glucose)*	10.0	5.0	12.5	9.6	17.1	45.8

*1=definitely no, 6=definitely yes

b) Treatment plan

A smaller proportion of pharmacists favoured involvement in the 'treatment plan'. All of the activities were supported by less than 70% of the pharmacists (see Table 3.11).

Table 3.11 Views on pharmacy-based services related to 'treatment plan'

Treatment plan	% Rating extent of agreement* N=240					
	1	**2**	**3**	**4**	**5**	**6**
Setting of individualised treatment targets *(with/without involvement of other health care members)*	6.7	5.4	14.2	15.4	20.4	37.9
Development of treatment plans: *(with/without involvement of other health care members)*						
Antidiabetic medications	6.3	3.3	10.0	16.3	18.8	45.4
Exercise	5.0	4.6	8.8	17.1	20.8	43.8
Diet	4.2	4.6	9.2	12.3	21.3	48.5
Prevention/treatment of chronic complications	3.8	6.3	8.3	12.9	23.8	45.0

*1=definitely no, 6=definitely yes

c) Patient education

While involvement in the treatment plan was less favoured, more pharmacists agreed to provide 'patient education' related to: medications (85.0%), diet (76.7%), physical activity (72.9%), SMBG (71.7%), prevention of acute complications (70.4%), and smoking cessation (73.7%). Details of their views regarding patient education are summarised in Table 3.12.

Table 3.12 Views on pharmacy-based services related to 'patient education'

Patient education	% Rating extent of agreement* N=240					
	1	2	3	4	5	6
Disease process	4.2	4.2	13.3	15.8	25.0	37.5
Treatment targets	1.7	3.3	11.3	16.7	23.8	43.3
Antidiabetic medications:						
Directions for use	0.0	1.7	3.3	5.4	15.4	74.2
Use of insulin devices	1.7	2.9	3.8	7.1	18.3	66.3
Storage requirements	0.8	1.3	5.4	6.7	16.7	69.2
Special precautions to follow	0.4	2.9	3.3	10.4	17.1	65.8
Common/important adverse effects	0.8	1.7	6.3	9.2	20.0	62.1
Exercise	1.7	3.3	9.6	12.5	27.5	45.4
Diet	2.5	2.5	6.3	12.1	22.5	54.2
SMBG	3.3	2.1	7.1	15.8	27.9	43.8
Prevention/treatment of acute complications	1.7	4.2	9.2	14.6	29.6	40.8
Prevention/treatment of chronic complications	2.5	3.8	11.3	14.6	30.0	37.9
Need for regular medical monitoring	3.8	5.8	13.3	19.6	22.9	34.6
Foot self-care	5.4	5.0	14.6	16.3	23.3	35.4
Smoking cessation	1.7	2.1	9.2	13.3	20.4	53.3

Abbreviations: SMBG, self-monitoring of blood glucose
*1=definitely no, 6=definitely yes

d) Monitoring/review

Among 'monitoring' activities, the majority of pharmacists favoured monitoring compliance with medications (71.7%). Monitoring blood glucose (either by carrying out blood glucose tests, or checking test results/SMBG records) and monitoring adverse effects were favoured by more than 60% of the pharmacists. Details of their views regarding monitoring are summarised in Table 3.13.

Table 3.13 Views on pharmacy-based services related to 'monitoring'

Monitoring	% Rating extent of agreement* N=240					
	1	2	3	4	5	6
Monitor compliance with:						
Antidiabetic medications	1.7	0.8	11.7	14.2	19.2	52.5
Exercise plan	3.3	4.6	14.6	20.4	21.7	35.4
Diet plan	2.1	6.3	11.3	17.1	21.7	41.7
Plan for prevention/treatment of chronic complications	2.9	4.2	14.6	16.7	21.3	40.4
Scheduled medical monitoring	4.2	5.8	17.5	17.1	20.4	35.0
Monitor treatment outcomes:						
Check records on SMBG	2.5	5.8	11.7	16.3	20.4	43.3
Carry out blood glucose tests	5.4	5.0	12.1	7.3	20.0	44.2
Measure BMI	8.8	6.3	15.4	18.8	21.7	29.2
Measure blood pressure	5.0	6.7	12.9	14.2	22.9	38.3
Check results on laboratory tests	5.4	7.5	11.3	15.8	20.4	39.6
Monitor for adverse effects	4.2	3.3	13.3	12.5	21.3	45.4

Abbreviations: SMBG, self-monitoring of blood glucose; BMI, body mass index
*1=definitely no, 6=definitely yes

With regard to 'review' activities, more pharmacists supported a role in referring patients to other health care professionals (73.7%) or adjusting patient education (66.3%) rather than adjusting treatment plans (see Table 3.14).

Table 3.14 Views on pharmacy-based services related to 'review'

Review	% Rating extent of agreement* N=240					
	1	2	3	4	5	6
Review:						
Adjust treatment plans if necessary *(with/without involvement of other health care members)*	5.4	7.1	13.3	13.3	24.6	36.3
Refer patients if necessary	2.9	2.9	9.6	10.8	23.3	50.4
Adjust diabetes education	2.5	4.2	13.3	13.8	22.1	44.2

*1=definitely no, 6=definitely yes

3.4.4.3 Priority services

To further explore the priority roles of pharmacists, an open-ended question was given to the pharmacists to list the five most important services that should be provided for type 2 diabetes patients at pharmacies (Question 9, Section B, Appendix 4).

The top five services selected as priorities were from the 'patient education' domain: education related to medications [directions for use (58.6%), common/important adverse effects (25.7%)], education on exercise (36.5%), and education on diet (47.7%); and the 'monitoring' domain: monitoring compliance with medications (27.9%). Presumably, the low priority assigned to dispensing ('treatment administration') was because it was acknowledged as part of current practice. This further exploration of priority services is summarised in Table 3.15. No new services were raised from this open-ended question.

Table 3.15 Open-ended views on priority services for type 2 diabetes patients

Priority services[*]	**Number of responses (%) N=222**[†]
Treatment administration	
Prepare medications	30 (13.5)
Provide labels with instructions for use	43 (19.4)
Initial assessment	
Patient history:	
Diabetes treatment	14 (6.3)
Patient education	
Disease process (including complications)	20 (9.0)
Antidiabetic medications:	
Directions for use	130 (58.6)
Use of insulin devices	20 (9.0)
Storage requirements	38 (17.1)
Special precautions to follow	17 (7.7)
Common/important adverse effects	57 (25.7)
Exercise	81 (36.5)
Diet	106 (47.7)
SMBG	32 (14.4)
Prevention/treatment of acute complications	21 (9.5)
Prevention/treatment of chronic complications	20 (9.0)
Need for regular medical monitoring (e.g. blood glucose levels)	13 (5.9)
Monitoring	
Monitor compliance with:	
Antidiabetic medications	62 (27.9)
Monitor treatment outcomes:	
Check records on SMBG	21 (9.5)
Carry out blood glucose tests	45 (20.3)
Measure blood pressure	22 (9.9)
Check results on patient laboratory tests	12 (5.4)
Monitor for adverse effects	15 (6.8)
Review	
Refer patients if necessary	11 (5.0)
Others *(not a specific service)*	
Develop PMRs (obtain patient history)	17 (7.7)
Provide diabetes education	32 (14.4)

Responses to an open-ended question: *'In your opinion, what are the five most important services that should be provided at pharmacies for type 2 diabetes patients?'*
Abbreviations: SMBG, self-monitoring of blood glucose; PMR, patient medication record
[*] Services selected by more than 10 respondents
[†] From a total of 240 respondents, there were 5 missing responses and 13 invalid responses, giving a total N=222

3.4.5 Associations between current practice and views on roles

Chi-square tests were conducted to test univariate associations between current practice (see Section 3.4.3 – responses were categorised into binary variables: Likert scale ratings of 5 to 6 indicated 'regular service' versus ratings of 1 to 4 indicated 'less frequent service') and views of roles (see Section 3.4.4 – responses were categorised into binary variables: Likert scale ratings of 5 to 6 indicated 'agreement' that a service should be provided versus ratings of 1 to 4 indicated 'disagreement'). Some of the activities were grouped together if they were related to the same theme (for example, education related to antidiabetic medications is a composite variable based on five questions in that section) for which a mean rating was calculated (regular provision of or agreement with this composite variable was assumed if the mean rating ≥ 5).

Dispensing practice ('treatment administration') was not tested as it was provided and agreed to by all of the pharmacists. The test results are summarised in Table 3.16. It was shown that pharmacists' agreement for a service to be part of their roles was associated with their pharmacies more frequently offering the service than those not sharing the views (all p-values <0.05).

Table 3.16 Current practice versus views on roles

Services	Being viewed as part of roles*		p-value
	A. Agree	B. Disagree	
	n/N (%) Being provided	n/N (%) Being provided	
Initial assessment			
Patient history†	40/149 (26.9)	2/91 (2.2)	<0.0001
Baseline physical examination	31/134 (23.1)	2/106 (1.9)	<0.0001
Baseline test	47/151 (42.8)	3/89 (3.4)	<0.0001
Treatment plan			
Treatment plan†	24/140 (17.1)	3/100 (3.0)	<0.0001
Patient education			
Disease process	37/150 (24.7)	4/90 (4.4)	<0.0001
Treatment targets	59/161 (36.7)	1/79 (1.3)	<0.0001
Antidiabetic medications†	106/195 (54.4)	5/45 (11.1)	<0.0001
Exercise	92/175 (52.3)	3/65 (4.6)	<0.0001
Diet	110/184 (59.8)	2/56 (3.6)	<0.0001
SMBG	76/172 (44.2)	8/68 (11.8)	<0.0001
Prevention/treatment of acute complications	65/169 (38.5)	4/71 (5.6)	<0.0001
Prevention/treatment of chronic complications	55/163 (33.7)	3/77 (3.9)	<0.0001
Need for regular medical monitoring	39/138 (28.3)	2/102 (2.0)	<0.0001
Foot self-care	37/141 (26.2)	1/99 (1.0)	<0.0001
Smoking cessation	93/177 (52.5)	0/63 (0.0)	<0.0001
Monitoring			
Monitor compliance†	33/130 (25.4)	0/110 (0.0)	<0.0001
Monitor treatment outcomes:	22/130 (16.9)	0/110 (0.0)	<0.0001
Check records on SMBG	117/153 (76.5)	1/87 (1.2)	<0.0001
Carry out blood glucose tests	104/154 (67.5)	3/86 (3.5)	<0.0001
Measure BMI	106/122 (86.9)	1/118 (0.9)	<0.0001
Measure blood pressure	102/147 (69.4)	2/93 (2.2)	<0.0001
Check results on laboratory tests	108/144 (75.0)	2/96 (2.1)	<0.0001
Monitor for adverse effects	39/160 (24.4)	2/80 (2.5)	<0.0001
Review			
Review†	39/146 (26.7)	1/94 (1.1)	<0.0001

Abbreviations: SMBG, self-monitoring of blood glucose; BMI, body mass index

*Current practice versus views on roles: (A) pharmacists agreed that the service should be provided (Likert scale ratings of 5 to 6) and currently provided the service (Likert scale ratings of 5 to 6); (B) pharmacists disagreed with the service (Likert scale ratings of 1 to 4) but currently provided the service (Likert scale ratings of 5 to 6).

†A composite variable where a mean rating ≥5 was used.

3.4.6 Factors associated with current provision of pharmacy-based services for type 2 diabetes patients

Logistic regression models were used to identify pharmacist/pharmacy characteristics (see Section 3.4.2) and views on roles (see Section 3.4.4) which were associated with current practice (see Section 3.4.3). Traditional role of dispensing ('treatment administration') was not included as this was provided in all pharmacies.

For current practice (dependent variable), responses were categorised into binary variables: Likert scale ratings of 5 to 6 indicated 'regular service' versus ratings of 1 to 4 indicated 'less frequent service'. Some of the activities were grouped together if they were related to the same theme (for example, education related to antidiabetic medications was a composite variable based on five questions in that section) for which a mean rating was calculated (regular provision of this composite variable was assumed if the mean rating ≥5). The independent variable of pharmacists' views on their roles was grouped in a similar way, and a mean was calculated for the composite variable. The odds ratios, together with 95% confidence intervals of significant factors associated with the provision of current services, are summarised in Tables 3.17 to 3.21.

a) Initial assessment

Among activities related to initial assessment, more pharmacists believed that taking patient history was part of their roles (see Section 3.4.4). Respondent pharmacists who viewed this as part of their roles and/or completed diabetes training within the last year were more likely to take patient histories. In addition, those working at pharmacies within doctor clinics were more likely to perform this activity. Significant factors associated with the current provision of services related to initial assessment are summarised in Table 3.17. When there is a gap in the table, it indicates that the factor was not significant and thus was dropped during backward elimination used for logistic regression analysis.

Table 3.17 Odds ratios and 95% confidence intervals of significant factors associated with current provision of 'initial assessment'

	Initial assessment		
	Patient history*	Physical examination	Tests
Diabetes training			
No	reference	reference	
Yes	4.8 (1.97–11.78)	4.0 (1.49–10.50)	
Setting			
Not within doctor clinic	reference		
Within doctor clinic	2.3 (1.04–5.03)		
Counselling area			
No			reference
Yes			2.3 (1.12–4.92)
Pharmacist availability†			
Low			NS
Moderate			reference
High			2.3 (1.09–5.06)
Views			
Not part of roles	reference	reference	reference
Part of roles	6.6 (2.9–14.97)	2.9 (1.7–5.04)	3.0 (1.96–4.51)

*A composite variable – taking patient history: age, duration of diabetes, lifestyle, family history of diabetes, presence of other cardiovascular risk factors, knowledge about diabetes, diabetes treatment, history of acute and chronic complications, psychosocial status, history of other medical conditions; a mean rating ≥5 was used
†Ratio of total pharmacist working hours per total pharmacy opening hours (low <0.17, moderate=0.17–0.75, high >0.75)
NS = not significantly different from the reference

b) Treatment plan

Involvement in the 'treatment plan' was neither reported as common practice nor favoured as a priority role by the majority of the pharmacists (see 3.4.3 and 3.4.4). Factors associated with involvement in the treatment plan were pharmacists' views that the service was a part of their roles, and pharmacies having high pharmacist availability. The odds ratios for these factors are summarised in Table 3.18.

Table 3.18 Odds ratios and 95% confidence intervals of significant factors associated with involvement in the 'treatment plan'

	Treatment Plan*
Pharmacist availability†	
Low	NS
Moderate	reference
High	4.0 (1.73–9.08)
Views	
Not part of roles	reference
Part of roles	5.7 (2.57–12.64)

*A composite variable – involvement in the treatment plan: set of individualised treatment targets; and development of treatment plans involving antidiabetic medications, exercise, diet and prevention/treatment of chronic complications; a mean rating ≥5 was used

† Ratio of total pharmacist working hours per total pharmacy opening hours (low <0.17, moderate=0.17–0.75, high >0.75)

NS = not significantly different from the reference

c) Patient education

Providing patient education, particularly regarding medications and lifestyle, was selected amongst priority services (see Section 3.4.4). Respondent pharmacists who viewed that these activities were a part of their roles were more likely to perform the service. Moreover, those working at pharmacies with more than 50 diabetes customers per month were more likely to provide education on diet, whereas those with lower pharmacist availability were less likely to do so. The odds ratios of factors associated with the provision of patient education are summarised in Table 3.19.

Table 3.19 Odds ratios and 95% confidence intervals of significant factors associated with current provision of 'patient education'

	Patient Education			
	Medication*	Exercise	Diet	All education†
Counselling area				
No				reference
Yes				3.7 (1.63–8.38)
Diabetes customers				
≤50			reference	
>50			2.6 (1.38–4.73)	
Pharmacist availability‡				
Low			0.3 (0.17–0.70)	0.3 (0.15–0.69)
Moderate			reference	reference
High			NS	NS
Views				
Not part of roles	reference	reference	reference	reference
Part of roles	3.7 (2.25–6.11)	4.2 (2.71–6.56)	3.5 (2.32–5.24)	4.3 (2.04–9.09)

*A composite variable – education related to antidiabetic medications: directions for use, use of insulin devices (calculated only from those who were currently/previously taking insulin), storage, special precautions and common/important adverse effects; a mean rating ≥5 was used

†A composite variable – all education items: disease process, treatment targets, antidiabetic medications, exercise, diet, self-monitoring of blood glucose, prevention/treatment of acute complications, prevention/treatment of chronic complications, need for regular monitoring, foot self-care and smoking cessation (calculated only from those currently, or had a history of, smoking); a mean rating ≥5 was used

‡ Ratio of total pharmacist working hours per total pharmacy opening hours (low <0.17, moderate=0.17-0.75, high >0.75)

NS = not significantly different from the reference

d) Monitoring/review

Even though 'monitoring' was not commonly performed, monitoring compliance with medications was selected as a priority service (see Sections 3.4.3 and 3.4.4). Factors associated with monitoring compliance included pharmacists' involvement in diabetes training and their views that the service was a part of their roles (acting as facilitators), and pharmacies with lower pharmacist availability (acting as a barrier). The odds ratios are summarised in Table 3.20.

Table 3.20 Odds ratios and 95% confidence intervals of significant factors associated with current provision of 'monitoring'

	Monitoring			
	Compliance*	Perform clinical testings‡	Check test results†	Adverse drug reactions
Diabetes training				
No	reference	reference		reference
Yes	4.4 (1.69–11.70)	4.7 (1.45–15.06)		3.7 (1.58–8.76)
Setting				
Not within doctor clinic		reference	reference	
within doctor clinic		5.1 (1.84–13.98)	2.6 (1.02–6.5)	
Diabetes customers				
≤50		reference	reference	
>50		3.8 (1.16–12.50)	3.3 (1.08–10.14)	
Pharmacist availability§				
Low	0.2 (0.05–0.73)	0.1 (0.03–0.71)	NS	NS
Moderate	reference	reference	reference	reference
High	NS	NS	3.6 (1.40–9.44)	2.2 (1.03–4.91)
Views				
Not part of roles	reference	reference	reference	reference
Part of roles	5.4 (2.50–11.51)	5.0 (2.09–12.20)	3.5 (1.70–7.08)	3.6 (1.95–6.80)

*A composite variable – monitoring compliance with: antidiabetic medications; exercise and diet plan; plan for prevention/treatment of complications; and scheduled medical monitoring; a mean rating ≥5 was used
†A composite variable – checking SMBG and laboratory data; a mean rating ≥5 was used
‡A composite variable – performing clinical testings (i.e. measuring blood glucose, blood pressure and BMI); a mean rating ≥5 was used
§ Ratio of total pharmacist working hours per total pharmacy opening hours (low <0.17, moderate=0.17–0.75, high >0.75)
NS = not significantly different from the reference

As for monitoring, 'review' was practised in a limited fashion, with more pharmacists believing that their roles involved referring patients or adjusting education rather than adjusting treatment plans (see Sections 3.4.3 and 3.4.4). Factors associated with performing reviews were pharmacists' positive attitudes and involvement in training, and those working at pharmacies with high pharmacist availability or with a counselling area/room (see Table 3.21).

Table 3.21 Odds ratios and 95% confidence intervals of significant factors associated with current provision of 'review'

	Review*
Diabetes training	
No	reference
Yes	2.6 (1.09–6.37)
Counselling area	
No	reference
Yes	2.7 (1.19–6.29)
Pharmacist availability†	
Low	NS
Moderate	reference
High	3.2 (1.39–7.35)
Views	
Not part of roles	reference
Part of roles	4.0 (1.98–7.88)

*A composite variable – review comprised of referral, treatment adjustment and education adjustment; a mean rating ≥5 was used

† Ratio of total pharmacist working hours per total pharmacy opening hours (low <0.17, moderate=0.17–0.75, high >0.75)

NS = not significantly different from the reference

3.4.7 Remuneration

Given the limited services (beyond dispensing) provided at the time for type 2 diabetes patients, almost all pharmacists were not remunerated. However, nearly one-third of the pharmacists would expect remuneration when they provided a consultation service for type 2 diabetes patients in the future. These results are summarised in Table 3.22.

Table 3.22 Pharmacists' current and proposed remuneration

Remuneration	Frequency (%)	
	Current N=240	Proposed N=240
Nothing	237 (98.8)	168 (70.0)
<Rp 25,000	3 (1.2)	27 (11.3)
Rp 25,000-50,000	0 (0.0)	38 (15.8)
>Rp 50,000	0 (0.0)	7 (2.9)

Abbreviations: Rp, Indonesian rupiah

3.5 Discussion

To our knowledge, this is the first study focused on Indonesian community pharmacists' practices and their views regarding type 2 diabetes care.

The questionnaire used in this study was constructed following an expert panel as well as a pilot study of the target population (community pharmacists); during the actual survey, no new themes were raised from the open-ended questions related to pharmacy services, confirming the content-validity of the questionnaire.[145] The pilot study showed that the Kappa scores for questions related to the pharmacy services were greater than 0.40, which were considered to be 'acceptable' to 'excellent' levels of test-retest reliability.[152]

This study achieved a total response rate of 60% (N=240) which was adequate for statistical analyses. A higher response rate was reported for the first round (70.1%) compared to the second round (50.5%), however, no differences were found in the responses related to diabetes services between these rounds. There is a possibility of some non-respondents not sharing the same practice and/or views of respondents, hence, some caution should be exercised in generalising the findings. It should be emphasised, however, that non-respondent pharmacists in this study were working at pharmacies which were not different in terms of the socio-economics of their geographical locations[153] compared with respondents (p=0.88). In addition, the characteristics of the respondent pharmacists in this study compare well with respect to gender and age data of community pharmacists registered in Surabaya (2006-2011)[154] and a previous study of community pharmacists in Jakarta, Indonesia.[24] Additionally, the characteristics of pharmacy premises in this study were comparable with terms of ownership[24] and number of customers[26] (based upon data on the number of prescriptions as a fraction of the total customers in the study) to the previous studies in Jakarta.

3.5.1 Current pharmacy-based services for type 2 diabetes patients

While dispensing was well established as part of community pharmacy practice in Surabaya, services beyond dispensing were provided in a limited fashion. The most common practice was providing basic medication education on directions for use. Other published Indonesian studies, although not specific to diabetes care and limited by their small sample sizes, identified a limited role for pharmacists in providing pharmaceutical care.[24-26]

Studies focusing on pharmacy-based services for type 2 diabetes patients in developed countries reported variability of the service scope, however these generally showed that the services provided were centred around patient education and monitoring (see Table 2.11). In line with this present study, some of the studies reported that the majority of pharmacists frequently counselled patients on aspects of their medications, such as administration[30, 31, 33, 34] and adverse effects[30]. However, it also was reported that pharmacists played important roles in providing education on lifestyle and smoking cessation,[30, 31] supporting patients in self-monitoring of blood glucose (SMBG),[30, 34, 99] and monitoring compliance with medications.[30] Monitoring treatment outcomes and involvement in the treatment plan have been reported as less common practices in some studies,[30, 31, 34, 35] which also is evident in this Indonesian study.

3.5.2 Views on pharmacists' roles in type 2 diabetes care

Despite their limited provision of services beyond dispensing, community pharmacists in Surabaya reported positive attitudes towards providing care for type 2 diabetes patients in the future. More than half of the respondent pharmacists agreed that pharmacists should be involved in initial assessment, treatment plans, education, and monitoring/review. This shows pharmacists' awareness of their potential professional roles even though little had been implemented in their current practice.

Services selected as priorities were centred around education related to medications and lifestyle, and monitoring compliance with medications. Studies in developed countries also shared pharmacists' preferences around education and monitoring services (see Table 2.12). These included, but were not limited to, education about medications,[31, 34, 100, 101] healthy lifestyle[100] and SMBG,[34, 100] as well as monitoring compliance with medications,[100] performing blood glucose tests[34] and providing feedback on glycaemic control.[31, 101] Since diabetes, similar to other chronic diseases, requires daily care in the hands of the patient, it is suggested that diabetes health care should include patient or carer education to foster self-care.[37] These educational activities should be followed by monitoring and review of patient outcomes. As patients regularly refill their medications in pharmacies and pharmacists are often the final health care professionals to have contact with patients before they take medications, pharmacists could have potential roles in the areas of education and monitoring. Moreover, it was reported that most Indonesian doctors spent little time to adequately counsel and educate their patients,[155] thus pharmacists could contribute to filling this void. These Indonesian pharmacists' preferences for education and monitoring related to medications and lifestyle should be considered when designing a model for pharmacist professional development.

3.5.3 Factors associated with current provision of pharmacy-based services for type 2 diabetes patients

The logistic regression models demonstrated that a pharmacist's positive attitude towards a service was a facilitator for providing the service. This is in line with findings from a Norwegian study[34] where pharmacists working in pharmacies offering diabetes services scored significantly higher agreement for this service provision than those working in pharmacies that did not offer them.

Pharmacist availability in pharmacies was another factor associated with the provision of some services beyond dispensing (either low pharmacist availability acting as a barrier or high pharmacist availability acting as a facilitator). Based on the Indonesian Government Standards, pharmacy services related to prescribed medications should be performed by pharmacists (see Section 2.2.4.3). Hence, this regulation requires a pharmacist to be present at all times when the pharmacy is open. In this study, less than 20% of the pharmacies in Surabaya had pharmacists available throughout their opening hours. Factors contributing to this low level of compliance might include weak monitoring systems and law enforcement, making the implementation dependent on the pharmacists' levels of commitment. Since the majority of the pharmacies were owned by proprietors (non-'pharmacist manager' owners), their commitment will also have a major influence on this practice. This study found that more pharmacies owned by pharmacist managers had a pharmacist available during opening hours compared to those owned by proprietors (30.6% versus 10.2%, respectively; $p<0.001$). This may reflect proprietors being more 'business' oriented; their views may be that without pharmacists being able to provide value-added services (and thus increasing income), supplying medication can be achieved in less expensive ways without exclusively using pharmacists. In this model, pharmacists would only be required for legal purposes (e.g. starting the pharmacy, signing copies of prescriptions and controlled drugs reports), leading to lower pay for pharmacists. On the other hand, because of poor salaries and shorter hours, pharmacists may take on other jobs resulting in them not being available at pharmacies. Two studies in Jakarta, Indonesia, reported that about 70% of the pharmacists worked in community pharmacies as their secondary jobs.[24, 26]

This study indicated the problem with underutilisation of community pharmacies that may contribute to their lack of affordability to provide resources – including maintaining pharmacist availability – for quality services. The majority of community pharmacies in this study reported seeing less than 2,000 customers per month, with less than 100 of these having type 2 diabetes. This is considerably lower than the Australian figure (approximately 1,400 customers per week) despite the comparable ratio of population per pharmacy between Surabaya, Indonesia, and

Australia (approximately 1:5,000).[156] In 2012, about 65% of the Indonesian population was covered by some form of insurance plan, largely through *Jamkesmas* (insurance for the poor/near poor),[6] through which a limited range of medications can be supplied within health centres. Those who can afford care were reported to use secondary and tertiary care hospitals,[2, 8] thus their medications were mainly supplied from hospital-based pharmacies. Many drug stores are also known to sell prescription drugs despite being licensed to sell only non-prescription drugs. All of these factors may contribute to the lower number of customers in community pharmacies. The implementation of *Jaminan Kesehatan Nasional – JKN* (National Health Coverage)[9] in 2014 should provide an opportunity to better integrate community pharmacies into the health system, enabling their better utilisation. The Government and *IAI* should establish an agreement regarding basic services that should be available in the pharmacies. While the current payment under the scheme includes a very low prescription fee (see Section 2.2.4.4), it is important to ensure adequate remuneration for pharmacists to provide the agreed basic services, thus creating a stable environment to sustain and grow their practices.

Compounding the issue of low pharmacist availability was the issue of competency to provide pharmaceutical care. This study found that pharmacists' involvement in diabetes training was a facilitator for providing some services beyond dispensing. In line with this finding, studies in Australia and Canada have shown that pharmacists involved in training provide more activities related to diabetes management when compared to other pharmacists.[30, 156] In Indonesia, it was not until 2008 that pharmacotherapy subjects were incorporated into the national pharmacy curricula, as a basis for providing pharmaceutical care. The concept of pharmaceutical care also was included within the new standards of community pharmacy practice (see Section 2.2.4.3). While there are currently a variety of opportunistic CPE courses, some of which include general training in diabetes therapeutics, the *IAI* should consider organising formal general diabetes training to deal with the earlier graduates.

In addition to the pharmacists' attitudes, availability and competency, this study indicated that pharmacies with counselling areas, or within doctor clinics, or with a higher number of diabetes customers per month were more likely to provide some services beyond dispensing. Based on the Government Standards, a pharmacy should have a private area/room dedicated for counselling (see Section 2.2.4.3). While the availability of a counselling area/room allows pharmacists and patients/carers to talk privately when providing patient care, this study found that only a small number of pharmacies (21.7%) had allocated a counselling area/room. This study also indicates that pharmacies within doctor clinics might present opportunities for pharmacists to build professional relationships with the doctors, encouraging pharmaceutical care practice. It was previously reported that close proximity of practice sites was one of the facilitators for developing an effective collaboration.[157] Moreover, higher customer numbers might be correlated with higher turnover and thus affordability for the pharmacy to provide more services (e.g. maintaining pharmacist availability, employing adequate staff, diabetes training). An Australian study reported previously that higher turnover was one of the predictors for providing diabetes care.[156] Reviews involving studies in developed countries also confirmed the importance of pharmacy layout, cooperation with doctors and financial support for practising pharmaceutical care.[136, 142]

3.6 Key findings

- Current pharmacy-based services for type 2 diabetes patients in Surabaya, Indonesia:
    - All community pharmacies provided basic services of dispensing.
    - The most common service beyond dispensing was providing education related to medications, particularly directions for use (72.6%).

- Views on pharmacists' roles in type 2 diabetes care:
    - All community pharmacists viewed dispensing as a part of their roles.
    - More than half of the pharmacists believed that they should provide services beyond dispensing; services perceived as priorities were centred around education related to medications [i.e. directions for use (58.6%), common/important adverse effects (25.7%)], lifestyle education [i.e. exercise (36.5%), diet (47.7%)], and monitoring compliance with medications (27.9%).

- Factors associated with current provision of pharmacy-based services for type 2 diabetes patients:
    - A pharmacist's positive view towards a service was associated with the current provision of the service.
    - Pharmacist characteristics, i.e. pharmacists' involvement in diabetes training was a facilitator for providing some services beyond dispensing.
    - Pharmacy characteristics that were associated with the provision of some services beyond dispensing, i.e.: pharmacies with either low pharmacist availability (barrier) or high pharmacist availability (facilitator); pharmacies with a higher number of diabetes customers (facilitator), or within a doctor clinic (facilitator), or with a counselling area/room (facilitator).

Chapter 4

Pharmacy-based services for type 2 diabetes patients: Patient survey

4.1 Introduction

Type 2 diabetes is a chronic metabolic disorder that requires daily care in the hands of patients.[37] To develop community pharmacy-based services for type 2 diabetes patients, it is important to explore the views of this group of patients. International studies have been conducted to investigate patient views regarding aspects of community pharmacists' roles, and some of these studies have included diabetes patients (see Table 2.14). However, it should be emphasised that studies involving diabetes patients have been limited to developed countries.

In Indonesia, two studies, although not specific to diabetes, have been conducted to explore patient views about pharmacy services. The first study assessed patient perceptions of the services based on tangible dimensions, reliability and responsiveness, assurance and empathy.[28] The second study focused on patient attitudes/needs in regard to drug information services.[110] Both studies reported that the majority of patients had positive perceptions of pharmacy services, providing a basis for pharmacists to develop their professional roles. This present study is the first concerning the views of Indonesian patients with type 2 diabetes, and it will inform the development of community pharmacy-based services in this particular setting.

4.2 Objectives

The main objectives of this part of the thesis are:

1. To collect data, within Surabaya, Indonesia, on the characteristics of community pharmacy clients with type 2 diabetes and their use of pharmacy services.
2. To assess their views regarding community pharmacists' roles in type 2 diabetes care.
3. To identify factors (patient characteristics) influencing their views on the roles of community pharmacists in type 2 diabetes care.

4.3 Methods

A questionnaire survey of pharmacy clients with type 2 diabetes was conducted to address the objectives of this study. All data collection instruments and methodologies used in this study were approved by the Human Research Ethics Committee of Curtin University (Appendix 1) as well as *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association) (Appendix 3).

4.3.1 Setting and sample recruitment

This study aimed to analyse the views of pharmacy clients with type 2 diabetes concerning pharmacist roles, and to identify factors influencing their views. A minimum sample size of 120 subjects was required in the logistic regression analysis to identify associations between the dependent variable (i.e. patient views) and independent variables (i.e. patient characteristics), exhibiting a moderate effect size with 80% power and α=0.05. Hence, this study aimed to recruit approximately 200 patients to ensure adequate power to detect associations.

Community pharmacies were used as sampling points to provide data on pharmacy clients with type 2 diabetes in Surabaya, Indonesia. Ten community pharmacies were selected from the 146 community pharmacies in the Pharmacist Survey (Chapter 3) that had more than 50 diabetic patients per month, to ensure an adequate number of potential respondents. These pharmacies were purposefully selected to include different geographical areas and socio-economic levels in Surabaya. Surabaya consists of 31 sub-districts which can be categorised into five geographical areas, i.e. central, west, east, north and south; and four socio-economic levels, from '1: high socio-economic level' to '4: low socioeconomic level'.[153] Each pharmacy was responsible for recruiting approximately 20 patients. Patients eligible for the survey were those aged over 18 years, with a diagnosis of type 2 diabetes for which they were receiving oral antidiabetic medications. Patients were recruited as they were seeking oral antidiabetic medications at these pharmacies.

4.3.2 Data Collection

4.3.2.1 Questionnaire development

The survey questionnaire consisted of four sections: (A) patient demographics, (B) services for type 2 diabetes patients – use of services and views on pharmacists' roles, (C) diabetes profile, and (D) monitoring profile. The questionnaire cover page contained information about the study and a consent form. Section B of the questionnaire contained a list of services for type 2 diabetes patients that was drafted based on a generic model generated from the literature (see Section 2.1.2.3). A binary choice question was used to capture patient usage of each service (previous use of each service: 'yes'/'no'), and a 6-point Likert scale was used to reflect patient views on pharmacists' roles (extent of agreement for each service to be part of pharmacists' roles: 1=definitely no, 6=definitely yes). This was followed by an open-ended question to explore patient priorities in their views of pharmacist roles: *'In your opinion, what are the five most important services that should be provided at pharmacies to assist you with your diabetes?'*. The questionnaire was face and content validated by a panel of two project supervisors, five academics, two board members of the *IAI*, two Indonesian community pharmacists and two diabetes patients. All of the panel members' views and comments were considered and, where appropriate, were incorporated into the questionnaire.

The questionnaire then went through the process of translation: (i) forward translation – the questionnaire was translated to Bahasa Indonesia by the principal investigator, whose first language is Bahasa Indonesia, and the conceptual equivalence was checked by a bilingual panel (consisting of the principal investigator, and two academics with experience in instrument development and translation) to resolve any confusing concepts arising from the translation; (ii) back-translation – the questionnaire was back-translated to English by an independent English-first language translator; and (iii) the back-translation was compared to the original version by two project supervisors whose first language was English.

The forward-translation questionnaire (Bahasa Indonesia) was piloted by ten type 2 diabetes patients, and revised wherever appropriate. This resulted in minor changes to the final questionnaire (Appendix 6). To assess reliability, the questionnaire was distributed on two separate occasions, with a two-week interval. Test-retest reliability for diabetes services (Question 10, Section B, Appendix 6) was calculated using Kappa statistic tests, where responses were grouped for Likert scale ratings of 1 to 4, and ratings of 5 to 6 (this ensured some responses in each of the two broad categories, both before and after the two-week interval). The resulting Kappa scores ranged from 0.412 to 1.000, which were classified as 'acceptable' to 'excellent' levels of test-retest reliability.[152]

4.3.2.2 Questionnaire administration

Owners of the selected community pharmacies were approached by the principal investigator, and agreements were sought to use their pharmacies as sampling points. In the case of refusal, the related pharmacy was replaced with another pharmacy in the same geographical area and socio-economic level, aiming to include ten community pharmacies. At each pharmacy, the pharmacist and/or pharmacy staff member was briefed about the study and how to complete the questionnaire. Patients seeking antidiabetic medications at the pharmacy were introduced to the study and were invited to participate. Those who wished to participate were asked to complete the consent form, and were informed about how to complete the questionnaire. Once completed, the questionnaire was placed in a sealed envelope and submitted to the pharmacist/pharmacy staff; the recruitment was continued to include approximately 20 patients at each pharmacy. The questionnaires were then handed to the principal investigator by the agreed deadline. The survey was conducted during the period from October 2011 to February 2012.

Preliminary data screening was performed to remove patients who had used insulin from the beginning of their treatments (Question 13, Section C, Appendix 6) as they were assumed to have type 1 diabetes and, therefore, were ineligible for this study.

4.3.3 Data Analysis

Descriptive statistics were used to summarise the patient characteristics: demographics (Section A, Appendix 6), diabetes profile (Section C, Appendix 6), and monitoring profile (Section D, Appendix 6). These included frequencies for categorical variables, and means, along with their 95% confidence intervals, for continuous variables. Medians, along with their ranges, were used for continous variables which were not normally distributed. The Kolmogorov-Smirnov test was used to test for Normality. The IBM SPSS Statistics version 19.0 was used to perform the analysis.

In relation to services for type 2 diabetes patients (Question 10, Section B, Appendix 6), frequencies were calculated for binary responses ('yes'/'no') related to the patient usage of services and for responses from Likert scales related to the extent of patient agreement regarding pharmacists' roles. Moreover, content analysis was used for responses from an open-ended question to explore patient views on the five priority services that they considered should be provided at the pharmacies (Question 11, Section B, Appendix 6). These responses were coded, and frequencies were calculated.

Logistic regression models were employed to identify factors (patient characteristics) associated with patients' views of pharmacists' roles. Responses regarding patients' views for each type of service were classified into binary variables, to indicate 'agreement' (Likert scale ratings of 5 to 6) versus 'disagreement' (Likert scale ratings of 1 to 4), and were used as the dependent variables. Patient characteristics included as independent variables were gender, age, education, employment, income, health insurance cover, diabetes organisation membership, duration of diabetes (time since diagnosis), risk factors, complications and diabetes (glycaemic) control (as a

composite of hypo/hyperglycaemic symptoms and HbA1c values). The models also included an independent variable indicating patients' previous use of the service (binary responses: 'yes'/'no'). A backward elimination strategy was used in the development of each regression model, whereby all independent variables were included, initially, and then the least significant variable was dropped (one at a time) until the p-value associated with each of the variables remaining in the model was less than 0.05. Following convention, a p-value <0.05 was taken to indicate a statistically significant association in all tests.

4.4 Results

4.4.1 Sample recruitment

This study managed to include ten community pharmacies as sampling points after approaching eleven community pharmacies in Surabaya, Indonesia. One pharmacy refused, as the employee pharmacist was planning to resign and they were in the process of recruiting a new one. From the final ten pharmacies, a total of 204 patients were recruited; however, eight patients took insulin at the beginning of their therapies and were deemed to have type 1 diabetes, leaving a sample size of 196.

Table 4.1 Patient recruitment from ten community pharmacies

Pharmacy code	Geographical area	Socio-economic level	Number of diabetes patients per month	Number of diabetes patients recruited
Pharmacy 1	East Surabaya	2	150	21
Pharmacy 2	Central Surabaya	1	200	18
Pharmacy 3	East Surabaya	3	70	20
Pharmacy 4	West Surabaya	4	100	19
Pharmacy 5	South Surabaya	3	140	20
Pharmacy 6	Central Surabaya	2	100	20
Pharmacy 7	South Surabaya	4	100	20
Pharmacy 8	North Surabaya	1	240	19
Pharmacy 9	West Surabaya	3	120	20
Pharmacy 10	North Surabaya	2	100	19
Total				**196**

4.4.2 Characteristics of pharmacy clients with type 2 diabetes

4.4.2.1 Demographic data

The demographic information of participating patients (responses to Section A, Appendix 6) is summarised in Table 4.2. Approximately 60% of respondents were female and about half of the respondents were aged 60 years or older. Only about one-third of the respondents had pursued higher education (i.e. diploma/bachelor/postgraduate) (28.1%), and were currently employed (37.2%). Approximately half of the respondents did not have health insurance plans.

Table 4.2 Demographic data of study respondents

Patient demographics	**Frequency (%) N=196**
Gender	
Male	80 (40.8)
Female	116 (59.2)
Age, years – median (range)	60.0 (32–86)
Ethnicity	
Asian	196 (100.0)
Others	0 (0.0)
Highest Education	
No schooling	6 (3.1)
Primary school	23 (11.7)
Junior high school	41 (20.9)
Senior high school	71 (36.2)
Diploma	18 (9.2)
Bachelor degree	25 (12.8)
Postgraduate degree	12 (6.1)
Employment status	
Working full-time (≥40 hours/week)	53 (27.0)
Working part-time (<40 hours/week)	20 (10.2)
Not working	123 (62.8)
Total household income (from all sources) per month[*]	
≤Rp 2 million	103 (52.6)
>Rp 2 million – 5 million	54 (27.6)
>Rp 5 million – 10 million	25 (12.8)
>Rp 10 million	12 (6.1)
Health insurance	
Self-sponsored insurance	31 (15.8)
Employer-sponsored insurance	56 (28.6)
Insurance scheme for the poor/near poor	9 (4.6)
No insurance	100 (51.0)
Member of a diabetes organisation	
Yes	74 (37.8)
No	122 (62.2)

Abbreviations: Rp, Indonesian rupiah
[*] 2 missing responses

4.4.2.2 Diabetes profile

The diabetes profiles of participating patients (responses to Section C, Appendix 6) are shown in Table 4.3. The median duration of diabetes (time since diagnosis) was seven years. More than 80% of the respondents reported that their treatment recommendations included oral antidiabetic medications and diet modifications; approximately one-fifth of respondents were taking insulin (but this had not commenced at the beginning of their therapy). Fewer patients reported recommendations regarding exercise (62.8%). It is important to note that this variable did not measure whether the doctor gave the medication/diet/exercise recommendations, but rather whether the patient remembered and/or reported it.

The questionnaire asked about diabetes-related complications, including macrovascular and microvascular diseases with neuropathy, nephropathy and retinopathy (Question 17, Section C). Almost 60% of the respondents reported having at least one diabetes-related complication. Common complications reported were foot discomfort (41.3%) and eye problems (26.5%).

The questionnaire also asked questions relating to other risk factors for complications (Question 16, Section C). Most of the patients reported having at least one other risk factor, the most common of which was high blood pressure (53.6%), followed by high body mass index – BMI (44.9%) and high cholesterol levels (39.5%).

Table 4.3 Self-reported diabetes profile of study participants

Patient diabetes profile	**Frequency (%) of 'yes'** **N=196**
Duration of diabetes, years – median (range)[*]	7 (1 – 42)
Current diabetes treatment	
Modifying diet	173 (88.3)
Exercise programme	123 (62.8)
Oral Antidiabetic Medication	189 (96.4)
Insulin	44 (22.4)
Risk factors[‡]	157 (80.1)
BMI ≥25 kg/m^2[†]	88 (44.9)
(History of) smoking	41 (20.9)
High cholesterol[§]	77 (39.5)
High blood pressure[#]	104 (53.6)
Complications[‡]	115 (58.7)
Heart disease	34 (17.3)
Eye problems	52 (26.5)
Foot discomfort	81 (41.3)
Foot ulcers	14 (7.1)
Kidney problems	16 (8.2)

[*] Some missing responses
[†] BMI, body mass index = weight (kg) divided by height^2 (m^2); some missing responses
[‡] Respondents responded 'yes' for at least one complication/risk factor (Question 17)
[§] Respondents responded 'yes', either for *"Do you have high cholesterol?" or "Do you take medications to treat your high cholesterol?"*, or for both (Question 16)
[#] Respondents responded 'yes', either for *"Do you have high blood pressure?" or "Do you take medications to treat your high blood pressure?"*, or for both (Question 16)

4.4.2.3 Monitoring profile

Table 4.4 shows the monitoring profile of participating patients (responses to Section D, Appendix 6). Almost half of the respondents reported having had symptoms of hypoglycaemia and/or hyperglycaemia during the previous month (44.4%). Hyperglycaemia and hypoglycaemia symptoms were reported by 28.7% and 22.1% of repondents, respectively. Less than one-third of respondents knew their last HbA1c value (27.0%). To provide insight to patients' diabetes (glycaemic) control, these two variables were combined to indicate: fair-good control (i.e. symptoms 'no' and HbA1c '≤8.0%'); poor control (i.e. symptoms 'yes' or HbA1c '>8.0%'); and unknown (i.e. symptoms 'none/don't know' and/or HbA1c values 'none/don't know'). Using this new variable, most respondents were perceived to have either poor diabetes control (45.9%) or unknown diabetes control (42.3%).

In relation to routine tests, one-third of respondents reported self-monitoring of blood glucose, with a median of once in the day on one day each week. Quarterly medical monitoring was reported by the majority of respondents: blood sugar (86.1%), blood pressure (85.1%) and weight (63.9%). Fewer respondents reported compliance to annual medical monitoring of: lipid profiles (65.1%), renal function (43.1%), HbA1c (33.3%), and feet and eye examinations (23.2% and 21.0%, respectively).

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Table 4.4 Self-reported monitoring profile of study participants

Patient monitoring	**Frequency (%) of 'yes' N=195***
Diabetes (glycaemic) control	
High blood sugar reactions (in the last month)	56 (28.7)
1−3 times	41
>3 times	15
Low blood sugar reactions (in the last month)	43 (22.1)
1−3 times	37
>3 times	6
Severe blood sugar reactions (in the last year)	26 (13.3)
1−3 times	24
>3 times	2
HbA1c last value	53 (27.0)
<6.5%	18
6.5−8%	27
>8%	8
Routine tests	
SMBG (in the last week)	74 (37.9)
Days per week, median (range)	1 (1-7)
Times per day, median (range)	1 (1-2)
Medical monitoring (in the last 3 months)	
Blood sugar	167 (86.1)
Blood pressure	166 (85.1)
Weight	124 (63.9)
HbA1c measurement (in the last year)	65 (33.3)
1 time	29
2−4 times	33
>4 times	3
Medical monitoring (in the last year)	
Cholesterol	127 (65.1)
Kidney	84 (43.1)
Eyes	48 (23.2)
Feet	41 (21.0)

Abbreviations: SMBG, self-monitoring of blood glucose; HbA1c, glycosylated haemoglobin
* 1 missing response

4.4.2.4 Use of pharmacy services related to type 2 diabetes care

The participating patients were given a list of services related to type 2 diabetes care and were asked to indicate services that they have received from pharmacies (Question 10, Section B, Appendix 6). In addition to the traditional role of dispensing ('treatment administration'), the most frequent services reported were 'patient education' about medications, particularly directions for use (79.6%) and special precautions to follow (71.9%). Responses describing patient usage of pharmacy services are summarised in Table 4.5.

Table 4.5 Patients' use of pharmacy services related to type 2 diabetes care

Services	Frequency (%) of 'yes' N=196
Treatment administration	
Prepare medications	196 (100)
Provide labels with instructions for use	196 (100)
Patient education	
Disease process	93 (47.4)
Treatment targets	79 (40.3)
Antidiabetic medications:	
Directions for use	156 (79.6)
Use of insulin devices*	27 (61.4)
Storage requirements	93 (47.4)
Special precautions to follow	141 (71.9)
Common/important adverse effects	87 (44.4)
Exercise	66 (33.7)
Diet	84 (42.9)
SMBG	63 (32.1)
Prevention/treatment of acute complications	67 (34.2)
Prevention/treatment of chronic complications	45 (23.0)
Need for regular medical monitoring	48 (24.5)
Foot self-care	35 (17.9)
Smoking cessation†	12 (29.3)
Monitoring	
Monitor compliance with:	
Antidiabetic medications	100 (51.0)
Exercise plan	62 (31.6)
Diet plan	78 (39.8)
Plan for prevention/treatment of chronic complications	44 (22.4)
Scheduled medical monitoring	38 (19.4)
Monitor treatment outcomes:	
Check records on SMBG	58 (29.6)
Carry out blood glucose tests	58 (29.6)
Measure BMI	40 (20.4)
Measure blood pressure	55 (28.1)
Check results on patient laboratory tests	51 (26.0)
Monitor for adverse effects	63 (32.1)
Review	
Refer patients if necessary	69 (35.2)

Abbreviations: SMBG, self-monitoring of blood glucose; BMI, body mass index
* The percentage was calculated for patients currently/previously taking insulin (N=44)
† The percentage was calculated for patients currently (or had a history of) smoking (N=41)

4.4.2.5 Satisfaction

In spite of the limited services, 69.4% of respondents expressed high levels of general satisfaction ('very satisfied' or 'satisfied') in regard to services provided by pharmacies.

Table 4.6 Patient satisfaction

Level of satisfaction	Frequency (%) N=196
Very satisfied	37 (18.9)
Satisfied	99 (50.5)
Moderately satisfied	47 (24.0)
Slightly satisfied	10 (5.1)
Not at all satisfied	3 (1.5)

4.4.2.6 Source of diabetes information

Table 4.7 summarises data pertaining to the source of patients' information about diabetes. The majority of patients received the information from their doctor's office or clinic (68.9%). Nearly one-third of patients indicated pharmacies as their source of information (28.1%).

Table 4.7 Source of information about diabetes

Information source	Number of responses* (%) N=196
Doctor's office	135 (68.9)
Others	60 (30.6)
Pharmacy	55 (28.1)
Television	45 (23.0)
Newspaper	39 (19.9)
Internet	15 (7.7)
None	11 (5.6)

* Respondents could name more than one source

4.4.3 Views on pharmacists' roles in type 2 diabetes care

Given the same list of services related to type 2 diabetes care, the participating patients were asked to rate the extent of their agreement for each service to be provided at pharmacies (Question 10, Section B, Appendix 6). All patients agreed with pharmacists' roles in dispensing ('treatment administration'). Beyond dispensing, more than 70% of respondents expected pharmacists to provide 'patient education' about medications. Approximately 50% of respondents supported other activities related to 'patient education' and 'monitoring'. Patients' views on pharmacists' roles are shown in Table 4.8.

Table 4.8 Patients' views on pharmacists' roles in type 2 diabetes care

Services	% Rating extent of agreement* N=195*					
	1	2	3	4	5	6
Treatment administration						
Prepare medications	0.0	0.0	0.0	0.0	21.5	78.5
Provide labels with instructions for use	0.0	0.0	0.0	0.0	17.4	82.6
Patient education						
Disease process	13.3	3.1	9.7	12.3	16.9	44.6
Treatment targets	17.9	3.1	8.7	11.3	19.5	39.5
Antidiabetic medications:						
Directions for use	3.6	1.5	4.1	8.7	15.9	66.2
Use of insulin devices†	6.8	6.8	0.0	13.6	15.9	56.8
Storage requirements	4.1	1.5	10.3	10.3	19.5	54.4
Special precautions to follow	3.6	1.5	3.6	11.8	17.4	62.1
Common/important adverse effects	5.6	2.6	7.2	13.3	16.9	54.4
Exercise	17.9	5.1	10.8	16.9	17.4	31.8
Diet	16.4	4.1	11.3	16.4	16.9	34.9
SMBG	14.9	7.7	11.3	11.3	18.5	36.4
Prevention/treatment of acute complications	10.8	3.1	12.3	9.2	19.0	45.6
Prevention/treatment of chronic complications	13.3	3.1	12.3	11.8	20.0	39.5
Need for regular medical monitoring	16.9	6.2	14.4	12.8	14.9	34.9
Foot self-care	19.0	5.6	14.9	11.8	16.9	31.8
Smoking cessation‡	9.8	4.9	14.6	12.2	2.6	34.1
Monitoring						
Monitor compliance with:						
Antidiabetic medications	12.8	5.1	7.7	9.2	13.3	51.8
Exercise plan	20.0	4.1	8.7	14.9	16.9	35.4
Diet plan	19.5	3.6	8.2	12.8	19.0	36.9
Plan for prevention/treatment of chronic complications	19.5	4.6	16.4	12.3	14.4	32.8
Scheduled medical monitoring	20.5	4.1	15.9	10.3	19.0	30.3
Monitor treatment outcomes:						
Check records on SMBG	25.0	4.1	10.3	8.7	21.0	30.8
Carry out blood glucose tests	19.9	4.1	10.3	7.7	19.5	38.5
Measure BMI	24.1	6.7	12.3	11.3	16.9	28.7
Measure blood pressure	24.6	3.6	11.8	7.2	21.5	31.3
Check results on patient laboratory tests	24.6	3.6	11.3	10.3	19.0	31.3
Monitor for adverse effects	17.4	4.1	11.8	10.3	19.0	37.4
Review						
Refer patients if necessary	17.4	5.1	12.3	8.7	22.1	34.4

Abbreviations: SMBG, self-monitoring of blood glucose; BMI, body mass index
* 1 missing response
† Percentages were calculated for patients currently/previously taking insulin (N=44)
‡ Percentages were calculated for patients currently (or had a history of) smoking (N=41)

To further explore the priority roles of pharmacists, an open-ended question was given to the patients to list the five most important services that should be provided in pharmacies to assist them with their diabetes (Question 11, Section B, Appendix 6).

The top five services perceived as priorities by patients (in addition to pharmacists' traditional roles of dispensing) were from the 'patient education' domain – education related to medications [i.e. directions for use (64.5%), common/important adverse effects (25.5%), storage requirements (26.6%)] and the 'monitoring' domain – monitoring compliance with medications (37.3%). This further exploration of pharmacists' priority roles is summarised in Table 4.9. No new services were raised from this open-ended question.

Table 4.9 Patients' open-ended views on priority roles of pharmacists in type 2 diabetes care

Priority services[*]	**Number of responses (%) N=169**[†]
Treatment administration	
Prepare medications	35 (20.7)
Provide labels with instructions for use	66 (39.1)
Patient education	
Disease process	27 (16.0)
Antidiabetic medications:	
Directions for use	109 (64.5)
Use of insulin devices	15 (8.9)
Storage requirements	45 (26.6)
Special precautions to follow	37 (18.9)
Common/important adverse effects	50 (25.5)
Exercise	27 (13.8)
Diet	33 (16.8)
Prevention/treatment of acute complications	27 (16.0)
Prevention/treatment of chronic complications	20 (11.8)
Monitoring	
Monitor compliance with:	
Antidiabetic medications	63 (37.3)
Monitor treatment outcomes:	
Carry out blood glucose tests	30 (17.8)
Measure blood pressure	25 (14.8)
Monitor for adverse effects	23 (13.6)
Others *(not a specific service)*	
Provide a complete range of medications	12 (7.1)
Information about medications	16 (9.5)

Responses to an open-ended question: *"In your opinion, what are the five most important services that should be provided at pharmacies to assist you with your diabetes?"*

[*]Services selected by more than 10 respondents

[†]From a total 196 respondents, there were 26 missing responses and 1 invalid response, giving a total N=169

4.4.4 Associations between use of pharmacy services and views on pharmacists' roles

Chi-square tests were conducted to test univariate associations between patients' use of pharmacy services (see Section 4.4.2.4) and their views on the roles of pharmacists (see Section 4.4.3 – responses were categorised into binary variables: Likert scale ratings of 5 to 6 indicated 'agreement' that a service should be provided versus ratings of 1 to 4 indicated 'disagreement'). Dispensing practice ('treatment administration') was not tested since all respondents used, and agreed on, this traditional pharmacist role. The results are summarised in Table 4.10. They indicate that patients who had experienced a service generally scored a higher agreement level for the service provision than those who had not had such an experience (almost all p-values <0.05).

Table 4.10 Patients' use of pharmacy services versus views on pharmacists' roles

Services	Being used*		
	A. Yes	B. No	
	n/N (%) Being viewed as pharmacist roles	n/N (%) Being viewed as pharmacist roles	p-value
Patient education			
Disease process	77/93 (82.8)	43/103 (41.8)	<0.0001
Treatment targets	65/79 (82.3)	50/117 (42.7)	<0.0001
Antidiabetic medications:			
Directions for use	137/157 (82.3)	23/39 (59.0)	<0.0001
Use of insulin devices†	22/27 (81.5)	10/17 (58.8)	0.103
Storage requirements	74/93 (79.6)	70/103 (68.0)	0.066
Special precautions to follow	119/141 (84.4)	36/55 (65.5)	0.003
Common/important adverse effects	77/87 (88.5)	62/109 (56.9)	<0.0001
Exercise	50/66 (75.8)	46/130 (35.4)	<0.0001
Diet	58/84 (69.1)	43/112 (38.4)	<0.0001
SMBG	48/63 (76.2)	59/133 (44.4)	<0.0001
Prevention/treatment of acute complications	53.67 (79.1)	73/129 (56.6)	0.002
Prevention/treatment of chronic complications	34/45 (75.6)	82/151 (54.3)	0.011
Need for regular medical monitoring	31/48 (64.6)	66/148 (44.6)	0.016
Foot self-care	27/35 (77.1)	68/161 (42.2)	0.0002
Smoking cessation‡	8/12 (66.7)	11/29 (37.9)	0.093
Monitoring			
Monitor compliance with:			
Antidiabetic medications	80/100 (80.0)	47/96 (49.0)	<0.0001
Exercise plan	45/62 (72.6)	57/134 (42.5)	<0.0001
Diet plan	56/78 (71.8)	53/118 (44.9)	0.0002
Plan for prevention/treatment of chronic complications	35/44 (79.6)	57/152 (37.5)	<0.0001
Scheduled medical monitoring	28/38 (73.7)	68/158 (43.0)	0.0007
Monitor treatment outcomes:			
Carry out blood glucose tests	52/58 (89.7)	61/138 (44.2)	<0.0001
Measure BMI	36/40 (90.0)	53/156 (34.0)	<0.0001
Measure blood pressure	48/55 (87.3)	55/141 (39.0)	<0.0001
Check records on SMBG	50/58 (86.2)	51/138 (37.0)	<0.0001
Check results on patient laboratory tests	40/51 (78.4)	58/145 (40.0)	<0.0001
Monitor for adverse effects	51/63 (80.9)	59/133 (44.4)	<0.0001
Review			
Refer patients if necessary	55/69 (79.7)	55/127 (43.3)	<0.0001

Abbreviations: SMBG, self-monitoring of blood glucose; BMI, body mass index

* Patients' use of the service versus views on pharmacists' roles: (A) patients viewed the service as part of a pharmacist's role (Likert scale ratings of 5 to 6) among those who had used the service; (B) patients viewed the service as part of a pharmacist's role (Likert scale ratings of 5 to 6) among those who had not used the service.

† Percentages were calculated for patients currently/previously taking insulin (N=44)

‡ Percentages were calculated for patients currently (or had a history of) smoking (N=41)

4.4.5 Factors associated with views on pharmacists' roles in type 2 diabetes care

Logistic regression models were used to identify patient characteristics (see Sections 4.4.2.1, 4.4.2.2 and 4.4.2.3) and previous use of services (see Section 4.4.2.4) which were associated with patient views on pharmacists' roles (see 4.4.3). Responses regarding the traditional role of dispensing ('treatment administration') were not tested, as this was a common pharmacy practice.

For patient views (dependent variable), responses were categorised into binary variables, with Likert scale ratings of 5 to 6 indicating 'agreement' versus ratings of 1 to 4 indicating 'disagreement'. Some of the activities were grouped together if they were related to the same theme (for example, education related to antidiabetic medications was a composite variable based on five questions in that section) for which a mean rating was calculated (agreement with this composite variable was assumed if the mean rating ≥ 5.) The responses for the independent variable of patient's previous use of services (binary responses: 'yes'/'no') were grouped in a similar way and a mean was calculated for this composite variable. In order to calculate the mean, a 'no' response was classified as '0', and a 'yes' was classified as '1'. The mean was then treated as a continuous variable. In this case, the odds ratio indicates the change in patient views as the mean of the composite variable changes from '0' (a 'no' response to all the individual questions) to '1' (a 'yes' response to all questions).

Patient education, particularly related to medications, was selected as one of the priority roles for pharmacists (see Section 4.4.3). The logistic regression showed that patient experience (previous use) with pharmacy-led education was strongly associated with their views that these activities should be provided by pharmacists. On the other hand, patients with higher incomes were less likely to support pharmacists offering education related to medications or healthy living (i.e. diet and physical activity), and patients who were working were less supportive of education regarding physical activity. The odds ratios of significant factors associated with support for education by pharmacists are summarised in Table 4.11. Where there is a gap in the table, it indicates that the factor was not significant and thus was dropped during backward elimination used for logistic regression analysis.

Table 4.11 Odds ratios and 95% confidence intervals of significant factors associated with support for 'patient education' by pharmacists

	Patient education by pharmacists			
	Medications*	Exercise	Diet	All education†
Employment				
Not working		reference		reference
Working		0.3 (0.15-0.83)		0.5 (0.24-0.94)
Income				
Low	reference	reference	reference	reference
Moderate	NS	0.4 (0.17-0.90)	NS	NS
High	0.3 (0.10-0.72)	0.3 (0.10-0.80)	0.3 (0.12-0.61)	0.3 (0.10-0.68)
Previous use of the service				
No	reference	reference	reference	reference
Yes	4.5 (1.79-11.53)	10.3 (4.6-23.15)	4.4 (2.30-8.30)	4.5 (1.60-12.51)

* A composite variable – education related to antidiabetic medications: directions for use, use of insulin devices (calculated only from those currently/previously taking insulin), storage, special precautions and common/important adverse effects; a mean rating ≥5 was used

† A composite variable – all education: disease process, treatment targets, antidiabetic medications, exercise, diet, self-monitoring of blood glucose, prevention/treatment of acute complications, prevention/treatment of chronic complications, need for regular monitoring, foot self-care and smoking cessation (calculated only from those currently, or had a history of, smoking); a mean rating ≥5 was used

NS = not significantly different from the reference

In addition to education related to medications, patients also selected monitoring compliance with medications as a priority role for pharmacists (see Section 4.4.3). Having had experience (previous use) with monitoring services was associated with support for pharmacists to provide the services. Patients who were working were less likely to support pharmacists' roles in monitoring compliance or treatment outcomes, and those with higher incomes were less supportive of pharmacists monitoring compliance or adverse drug reactions. On the other hand, patients with poor/unknown glycaemic control were more positive regarding pharmacists monitoring treatment outcomes or adverse drug reactions, and those who had other risk factors were more supportive of pharmacists monitoring adverse drug reactions. The odds ratios of significant factors associated with support for monitoring by pharmacists are summarised in Table 4.12.

Table 4.12 Odds ratios and 95% confidence intervals of significant factors associated with support for 'monitoring' by pharmacists

	Monitoring by pharmacists			
	Compliance*	Treatment outcomes		Adverse drug reaction
		Perform clinical testings†	Check test results‡	
Income				
Low	reference			reference
Moderate	NS			NS
High	0.3 (0.10-0.72)			0.2 (0.09-0.53)
Employment				
Not working	reference	reference	reference	
Working	0.43 (0.21-0.88)	0.5 (0.24-0.97)	0.3 (0.15-0.74)	
Risk factors				
No				reference
Yes				3.4 (1.46-8.03)
Diabetes (glycaemic) control§				
Good/fair		reference	reference	reference
Poor		NS	4.9 (1.20-20.55)	3.2 (1.05-9.97)
Unknown		2.3 (1.22-4.51)	10.2 (2.44-42.95)	4.3 (1.36-13.57)
Previous use of the service				
No	reference	reference	reference	reference
Yes	5.2 (1.79-11.52)	13.6 (5.21-35.51)	11.3 (4.51-28.13)	6.3 (2.82-13.90)

* A composite variable – monitoring compliance with: antidiabetic medications, exercise and diet plan, plan for prevention/treatment of complications and scheduled medical monitoring; a mean rating ≥5 was used
† A composite variable – perform clinical testings (measuring blood glucose, blood pressure and BMI); a mean rating ≥5 was used
‡ A composite variable – check patient self-monitoring records and laboratory data; a mean rating ≥5 was used
§ Diabetes (glycaemic) control is a composite variable of hyper/hypoglycaemia symptoms and HbA1c values
NS = not significantly different from the reference

Significant factors associated with patient support for pharmacist-initiated referral included "working" (less support) or "previous use of the service" (more support). The odds ratios of these factors are summarised in Table 4.13.

Table 4.13 Odds ratios and 95% confidence intervals of significant factors associated with support for 'referral' by pharmacists

	Referral by pharmacists
Employment	
Not working	reference
Working	0.3 (0.15-0.66)
Previous use	
No	reference
Yes	6.7 (3.16-14.03)

4.4.6 Willingness to pay

The respondents were asked *"If pharmacies provide a consultation service to help with your diabetes, how much would you be willing to pay for the service (other than cost of medications and/or test kits)?"* (Question 12, Section B, Appendix 6). A majority of respondents were not willing to pay for the services (69.4%).

Table 4.14 Patient willingness to pay

Willingness to pay	**Frequency (%) N=196**
Nothing	142 (72.5)
<Rp 25,000	30 (15.3)
Rp 25,000-50,000	21 (10.7)
>Rp 50,000	3 (1.5)

Abbreviations: Rp, Indonesian rupiah

4.5 Discussion

This is the first study focused on evaluating the characteristics of Indonesian community pharmacy clients with type 2 diabetes and their views of community pharmacists' roles in diabetes care.

The questionnaire used in this study was constructed following an expert panel as well as a pilot study of the target population (pharmacy clients with type 2 diabetes); during the actual survey, no new themes were raised from the open-ended questions related to the pharmacy services, confirming the content-validity of the questionnaire.[145] The pilot study showed that the Kappa scores for all questions related to the pharmacy services were greater than 0.40, which were considered as 'acceptable' to 'excellent' levels of test-retest reliability.[152]

The pharmacy clients with type 2 diabetes in Surabaya that were enrolled in this study were not from a random sample. Hence, the results may suffer some selection bias, and some caution should be exercised in generalising the findings. It should be emphasised that there is no access to a sampling frame because full lists of pharmacy clients with type 2 diabetes were not accessible due to the lack of patient databases within pharmacies, as well as patient confidentiality. This study included ten community pharmacies with more than 50 patients with type 2 diabetes; the request to sample 20 of their clients was to ensure that a range of clients would be included at each pharmacy rather than only sampling those that might support the pharmacy. Hence, the use of more pharmacies but less clients per pharmacy could have increased selection bias. Moreover, the ten pharmacies included in this study covered a range of sampling sites to ensure adequate inclusion of different geographical areas and socio-economic levels in Surabaya. It has been argued that, if a number of sites are used for sampling, diversity in a wider population may be reflected by differences in the sample.[145] Supporting this, the characteristics of the respondents in this study compared well with respect to age, gender and duration of diabetes to those of a population study involving all type 2 diabetic patients visiting 18 medical centres across Indonesia between November 2008 and February 2009 (N=1785).[2]

Thus, the findings should provide adequate information on areas where pharmacy services can be developed.

4.5.1 Characteristics of pharmacy clients with type 2 diabetes

This present study found that the majority of type 2 diabetes patients reported that they had complications and/or other risk factors for complications, and/or had poor/unknown glycaemic control. In line with this, the population study of type 2 diabetes patients in Indonesia reported that 81% of type 2 diabetes patients had not achieved good glycaemic control (HbA1c <6.5%), and approximately 60% of the patients had complications and/or risk factors of complications (i.e. dyslipidaemia and/or hypertension).[2]

Moreover, this present study reported that follow-up care tended to be inadequate, with only about one-third of respondents reporting annual HbA1c monitoring and eye or foot examinations. Supporting this finding, the Patient and Health Provider Survey in Indonesia (2012)[6] indicated that the majority of patients had not received foot or eye examinations within the past year, only 30% had had their HbA1c checked and many had expressed a wish to see health care providers more often. It was suggested that this poor quality of care and patient outcomes might relate to the lack of awareness, accessibility and affordability of diabetes care.[6] It was reported that Indonesia has a major deficiency in its health workforce (see Section 2.2.3.3), thus contributing to the poor access to diabetes care. Starting in 2014, the Government will implement *Jaminan Kesehatan Nasional – JKN* (National Health Coverage) to improve affordability and accessibility of healthcare for the whole population. In light of the high rate of diabetes in Indonesia,[1] optimising the use of health resources – including community pharmacists – would be paramount in improving access and quality of diabetes care.

This study, however, reported that Indonesian community pharmacists currently had little involvement in the care of patients with type 2 diabetes. Respondents mostly utilised pharmacists for their traditional roles of dispensing and providing education related to medication, particularly directions for use. A previous study conducted in Indonesia (i.e. three urban cities: Jakarta, Yogyakarta, Makassar), although not focused on diabetes care, confirmed the limited services provided to pharmacy clients.[28]

4.5.2 Views on pharmacists' roles in type 2 diabetes care

Despite limited use of pharmacy based-services in this study, the majority of patients reported high satisfaction levels. This might relate to the finding that patients provided mixed responses regarding community pharmacists providing services beyond dispensing, thus they might not consider this as an important point in judging their level of satisfaction. This study reported that patients tended to view the priority roles of pharmacists as extensions to their supply roles (i.e. education related to medications, and monitoring compliance with medications). This was confirmed by findings from international studies, of which some studies involved diabetes patients (see Table 2.14). In line with this, two qualitative studies indicated that patients identified the primary expertise of the community pharmacist as medicines supply, and there were mixed perceptions of community pharmacists' roles extending to advising on prescription medicines, providing disease-related/health advice or providing monitoring services (using clinical testing devices).[120, 127]

As discussed above (Section 4.5.1), there is likely to be a demand for better access to quality diabetes care in Indonesia to improve patients' outcomes. As patients refill their medications at pharmacies, this presents an opportunity for pharmacists to assist patients in managing their diabetes between doctor visits and, potentially, reduce unnecessary visits to their doctors. Positive patient outcomes have been reported from pharmacists' interventions in diabetes care, which were centred on activities related to education and monitoring (see Table 2.10).

4.5.3 Factors associated with views on pharmacists' roles in type 2 diabetes care

While patients had mixed responses for diabetes care to be filled by community pharmacists, it is essential to identify factors affecting these expectations in order to support pharmacists in taking up a broader role. The logistic regression models found that a patient's support for a service was influenced by his/her experience (previous use) with the service. Supporting this finding, studies worldwide have shown that type 2 diabetes patients have increased perceptions of pharmacists' ability to assist them after receiving pharmacy-based services.[17, 22, 95, 130, 131] It should be emphasised that most patients in this study (at the time) received limited services from community pharmacies, thus they might not be aware of what pharmacists should and could do.

The implementation of *JKN* in 2014 should provide the opportunity to integrate and optimise the use of Indonesian community pharmacies in primary healthcare. It is important for the Government and *IAI* to establish an agreement on the basic services that should be available in the pharmacies. While the current payment under the scheme includes a very low prescription fee (see Section 2.2.4.4), the *IAI* should negotiate an adequate remuneration for pharmacists to provide the agreed basic services, thus enabling community pharmacies to remain viable. This is particularly important, as this study showed that most patients were not willing to pay out-of-pocket expenses for professional services provided by community pharmacists.

In addition to patients' experiences, patients who were working and had higher incomes were generally less supportive of some pharmacy services beyond dispensing. This might be because these groups of patients were likely to be younger (mean age 63.7 years for non-workers versus 54.0 years for workers, $p<0.0001$; and mean age 60.4 years for income ≤Rp 5 million versus 58.6 years for income >Rp 5 million, $p=0.358$). An Iraqi study[113] and a UK study[120] reported that older patients, or those living with diabetes for a long time, were more supportive of pharmacists' contributions than those who were younger or had shorter duration of diabetes. It has

been suggested that elderly people are one of the groups whose need for additional advice on medications and other related services has been demonstrated.[158]

Moreover, the logistic regression models showed that patients who had other risk factors for complications and had poor/unknown diabetes (glycaemic) control were more supportive of pharmacists monitoring treatment outcomes and adverse drug reactions. Such patients might reflect those with lower health status, representing a target group who might be more motivated and responsive to pharmacists' involvement. It has been suggested that patients who benefit most from pharmacist-led education/coaching and disease state management services include those with poor glycaemic control and multiple comorbidities.[159]

4.6 Key findings

- Characteristics of pharmacy clients with type 2 diabetes in Surabaya Indonesia:
    - The majority of community pharmacy clients with type 2 diabetes reported poor follow-up care and health outcomes.
    - All community pharmacies were utilised for dispensing medications, and the most common service beyond dispensing was providing education related to medications, particularly directions for use (79.6%).

- Views on pharmacists' roles in type 2 diabetes care:
    - Almost all patients viewed dispensing as part of a community pharmacist's role.
    - There were mixed responses towards pharmacists providing services beyond dispensing; services perceived as priorities included: education related to medications [i.e. directions for use (64.5%), storage requirements (26.6%), common/important adverse effects (25.5%)], and monitoring compliance with medications (37.3%).

- Factors associated with views on pharmacists' roles in type 2 diabetes care:
    - Patients' previous use of a service was associated with their positive attitude towards pharmacists providing the service.
    - Patient characteristics, i.e.: those who had higher incomes or were working were less supportive, whereas those with other risk factors for complications or poor/unknown glycaemic control were more supportive, of pharmacists providing some services beyond dispensing.

Chapter 5

Pharmacy-based services for type 2 diabetes patients:

A qualitative study

5.1 Introduction

To date, there are no published studies evaluating the viewpoints of Indonesian pharmacists and doctors regarding community pharmacy-based services for type 2 diabetes patients. The development of such services will require improved collaboration between pharmacists and doctors who, in the current model of health care delivery, are the main diabetes care providers. As highlighted in the literature review chapter (see Tables 2.12, 2.13, 2.15 and 2.16), published work regarding pharmacists' and doctors' views of community pharmacy practice in the area of diabetes has been limited to developed countries.

Several studies, although not specific to diabetes care, have been conducted in Indonesia to evaluate community pharmacy practice.[24-27] Two of these studies used qualitative approaches,[25, 27] one of which involved interviews of pharmacists and doctors.[25] Both studies analysed community pharmacy practice (in comparison with the Government Standards[23, 75, 87]) and contributing factors. The results showed that community pharmacy practice in Indonesia did not completely conform to the standards. While these studies highlighted some issues related to such practice, particularly lack of pharmacist competencies and availability/presence in the pharmacy; the themes were not clearly evident. Thus, this study aimed to explore the views of pharmacists and doctors to provide a better understanding of issues associated with type 2 diabetes practice in Indonesian community pharmacies.

5.2 Objectives

The objectives of this part of the thesis are:

1. To explore current type 2 diabetes practice in community pharmacies and doctor clinics in Surabaya, Indonesia
2. To investigate community pharmacists' and doctors' views on pharmacists' roles in type 2 diabetes care
3. To describe factors (potential and actual) associated with the development of community pharmacy-based services for type 2 diabetes patients

5.3 Methods

The data collection instrument and methodology used in this qualitative study were approved by the Human Research Ethics Committee of Curtin University (Appendix 2) as well as *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association). The qualitative research interview was deemed the most appropriate method for addressing the objectives because it provided the opportunity to explore in-depth views of individuals in order to understand the issues of interest.[145]

5.3.1 Participant selection

The study was carried out in Surabaya, Indonesia, with a purposive sampling of doctors and pharmacists in Surabaya, Indonesia. Purposive sampling was chosen to maximise the variety within the sample[145] because we were interested in obtaining a range of doctors' and pharmacists' views, rather than to represent them proportionately.

Participants for the pharmacist interviews were recruited from pharmacists involved in the Pharmacist Survey (Chapter 3) whose pharmacies reported to service more than 50 diabetic patients per month (n=146). Initially, ten pharmacists were selected by considering a range of characteristics, predominantly the levels of pharmacist availability at their pharmacies. Pharmacist availability was a ratio of total pharmacist working hours per week to total pharmacy opening hours per week. A ratio of one or more would indicate that there was always a pharmacist available during pharmacy opening hours.

Participants for the doctor interviews were recruited through contacting doctors that were treating at least 50 patients with type 2 diabetes per month. This task was difficult as there was no available official data on characteristics of patients visiting doctor clinics in Surabaya. Therefore, the community pharmacists involved in the interviews were asked to provide information on doctors who frequently prescribed

antidiabetic medications. Ten doctors were initially selected to ensure the inclusion of a range of characteristics, predominantly their practice levels [i.e. general practitioner (GP), internal medicine specialist and consultant/endocrinologist].

Before the completion of the planned 20 interviews (i.e. after the eighth pharmacist interview and the eighth doctor interview), no new themes emerged and data saturation was considered to have been reached; thus further recruitment beyond ten pharmacists and ten doctors was considered unnecessary.

5.3.2 Data collection

Each potential community pharmacist and doctor participant was contacted personally by the principal investigator to introduce the study (an information sheet was provided, see Appendix 7), and to seek their agreement to participate. Once they had agreed, the interview was arranged at a convenient location and time for the participant. Recruitment was continued until ten community pharmacists and ten doctors had agreed to participate.

In-depth face-to-face interviews were conducted between May and December 2012, either within the participants' premises or the principal investigator's office in the Universitas Surabaya. At the beginning of each interview, a brief introduction to the project was provided, and a written informed consent was obtained (Appendix 7). All interviews were conducted in Bahasa Indonesia by the principal researcher (whose first language is Bahasa Indonesia) and a semi-structured interview guide was used (see Section 5.3.2.1). At the end of the interview, a separate form was used to gather demographic details of participants and their premises (Appendix 8). The interviews took from 30 minutes to one hour, and were audio-recorded. All participants were reimbursed for their time to participate in the interviews. Reimbursement rates were as follows: endocrinologists/consultants Rp 500,000 (approximately A$ 50); GPs and internal medicine specialists Rp 200,000 (approximately A$ 20); pharmacists Rp 150,000 (approximately A$ 15).

5.3.2.1 Interview guide

The semi-structured interview guide consisted of a series of open-ended questions that were created based on three key topics of interest: (i) current type 2 diabetes practice, (ii) views on the roles of community pharmacists in type 2 diabetes care, and (iii) factors associated with the development of pharmacist roles. This guide was piloted among the principal researcher's pharmacist colleagues at Universitas Surabaya, and was refined as the interviews progressed (Appendix 9). The interview guide provided structure and consistency to ensure that the key topics were explored in each interview. However, it could be used flexibly with respect to the order in which issues were discussed. Time was available to pursue relevant issues raised by an interviewee.

5.3.3 Data analysis

Data collection and analysis were conducted concurrently throughout the study. The audio-recorded data from the interviews (Bahasa Indonesia) was transcribed verbatim. Thematic content analysis was used to analyse the interview transcripts.[160] Firsty, this involved familiarisation with the data where each transcript was read and re-read several times by the principal investigator; in addition, the recordings were listened to, to ensure the accuracy of the transcription.

Secondly, initial coding of the transcript gave each segment/portion a code that represented the meaning of what was occurring in the data (free nodes). The code words were often the very words or phrase used by the participant. Segments/portions within the data were given multiple codes if they were identified as describing more than one meaning. Free nodes were organised into broader code words of higher conceptual level, i.e. categories. This process included a systematic comparison of each segment/portion newly assigned to a category with each of those already assigned to that category to ensure they formed a coherent pattern. The

categories were examined to identify relationships, and a hierarchical structure between categories was developed (tree nodes). The data management was facilitated by the use of the NVivo® database (QSR NVivo; version 9.0, QSR International).

The final stage of the report production involved selecting examples of comments to illustrate properties of the categories/themes. These comments identified issues within the category/theme and presented lucid examples of the points being made. In addition, this stage involved translating the comments into English. This approach enabled analysis to stay in the source language as far as possible, thus avoiding potential limitations when analysing in a language other than the source language.[161] The categories/themes, together with the illustrative comments, were reviewed by the surpervisors to ensure the commonsense of their interpretations. The report also was sent to the participants for feedback. This was used as a means of 'member-checking' to establish the trustworthiness of the data, which is parallel to validity in quantitative research.[150]

5.4 Results

5.4.1 Participant characteristics

A total of ten community pharmacists and ten doctors were interviewed. The characteristics of the participants and their premises are presented in Table 5.1.

Most participating pharmacists were female, more than 40 years old and had practised for more than 10 years. Equal numbers of participants were working in pharmacies owned by a pharmacy manager or single proprietor or group proprietor; and both within or not within doctor clinics. Most of the pharmacies had more than 1,000 customers per month, with more than 100 customers being dispensed oral antidiabetic medications. The number of pharmacists in each pharmacy ranged from one to four, with a range of 8-60 working hours per week per pharmacist. The ratios of pharmacist availability were calculated by dividing pharmacist working hours per week by the pharmacy opening hours per week, resulting in a range from 0.3 to 2.1. Thus, a mixture between pharmacies with and without a pharmacist being available at all times (ratio ≥1 and ratio <1, respectively) was achieved.

The participating doctors comprised of three GPs, five internal medicine specialists and two endocrinologists/consultants. The majority of the doctors were males, more than 50 years old and had been practising more than 20 years. Most of them were practising in clinics with an on-site pharmacy and half of them were serving approximately 100 patients with type 2 diabetes per month (ranging from 50 to 300 diabetic patients per month).

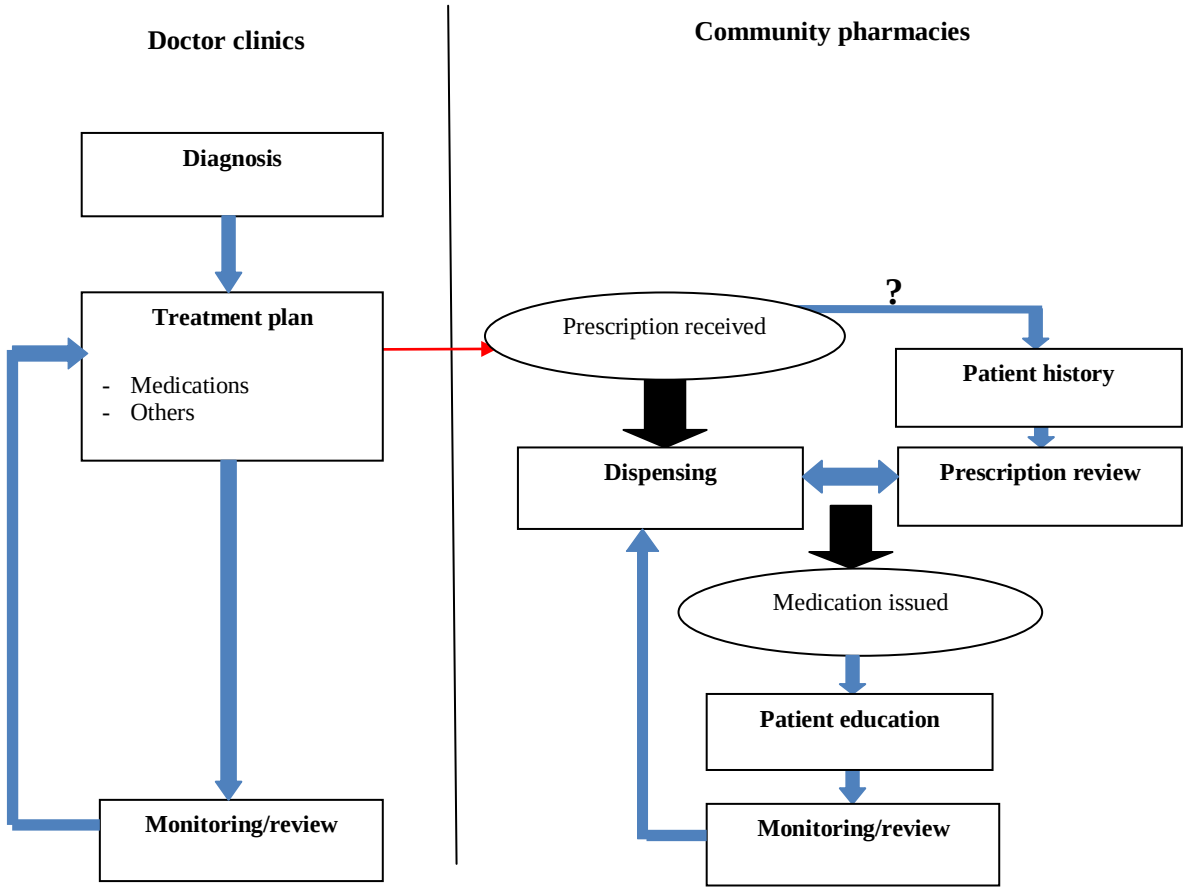
Table 5.1 Characteristics of the participants and their premises

Community pharmacists (N=10)	
Gender, n	
Male	2
Female	8
Age, years – median (range)	44 (26–76)
Position, n	
Pharmacist manager as well as owner	4
Pharmacist manager	5
Pharmacist employee	1
Work experience, years – median (range)	17 (2–37)
Pharmacy characteristics	
Ownership, n	
Pharmacist manager as owner	4
Single proprietor	3
Group proprietor	3
Setting, n	
Within doctor clinic	5
Not within doctor clinic	5
Counselling area/room, n	5
No. of customers per month, median (range)	1590 (750–5600)
No. of diabetics per month, median (range)	122 (70–250)
No. of pharmacists, median (range)	2 (1–4)
Pharmacists' working hours per week, median (range)	42 (8-60)
Opening hours per week, median (range)	100 (76–168)
Doctors (N=10)	
Gender, n	
Male	9
Female	1
Age, years – median (range)	56 (41–82)
Level, n	
General practitioner (GP)	3
Internal medicine specialist	5
Endocrinologist/consultant	2
Work experience, years– median (range)	25 (4–42)
Clinic characteristics	
Setting, n	
With on-site pharmacy	8
Without on-site pharmacy	2
No. of type 2 diabetics per month, median (range)	100 (50–300)

5.4.2 Current type 2 diabetes practice

A model of the current type 2 diabetes practice in doctor clinics and community pharmacies, based on themes arising from pharmacist and doctor interviews, respectively, is shown in Figure 5.1.

Figure 5.1 A model based on themes regarding current type 2 diabetes practice – doctor clinics and community pharmacies



5.4.2.1 Current type 2 diabetes practice – community pharmacies

Themes related to community pharmacy practice (Figure 5.1) are expanded in Table 5.2. This table also indicates the number of respondent pharmacists (coded as numerals) who provided comments related to the themes. The importance of each theme was ranked according to their frequency of appearance in the interviews. A theme which appeared in all of the interviews was ranked ‘common service’ and assigned *** (highlighted in the table). A theme that appeared in more than half but not all of the iverviews was ranked as ‘less common service’ and assigned **; and a theme that appeared in equal to or less than half of the interviews was ranked as ‘least common service’ and assigned *. Further, selected comments were presented to provide typical context of the themes. Differing views were illustrated by the inclusion of more than one comment for individual themes.

Table 5.2 Themes on current type 2 diabetes practice – community pharmacies

Main themes	Sub-themes	Pharmacist codes	Ranking
Dispensing:	• Preparing medications • Providing labels	All	***
Beyond dispensing:			
a) Initial assessment (patient history) *- first visit*[*]	• Obtaining information from the doctor	1, 2, 10	*
	• Obtaining information on medications used	1, 2	*
b) Prescription review	• Prescription review – clinical aspects	1, 2, 5, 7	*
c) Patient education	• Medications		
	- Directions for use	All	***
	- Common/important adverse effects	1, 2, 4, 6, 7	*
	• Diet (general)	6, 7, 8, 10	*
	• Physical activity (general)	7, 8, 10	*
	• Psychological support	4, 8	*
	• Need for regular medical monitoring	8	*
	• Others according to patients' inquiries	1, 4, 10	*
d) Monitoring/review *- return visit*[†]	• Monitoring compliance		
	- Medications	2, 8, 10	*
	- Diet	8, 10	*
	- Physical activity	8, 10	*
	- Scheduled medical monitoring	1	*
	• Monitoring treatment outcomes		
	- Performing blood glucose tests	1, 2, 3, 6, 8	*
	- Inquiring about glycaemic control and problems	1, 2, 6, 7, 8, 10	**

[*] First visit to obtain antidiabetic medications
[†] Return visit to refill antidiabetic medications

5.4.2.1.1 Dispensing (***)

Once doctors have confirmed their diagnoses and prescribed medications, patients can have their medications dispensed at pharmacies (Table 5.2). All participating pharmacists reported that their pharmacies conducted the traditional tasks of dispensing medications, including preparing and labelling medications.

> *"When we receive a prescription, of course… we will need to dispense the medications… put the labels…"* (Pharmacist 5)

In terms of labelling, all participants provided labels on directions for use of medication (in addition to the typical information of the patient's name, pharmacy details, name of the pharmacist manager, date of dispensing and prescription number). However, some of them raised concerns regarding the range of information they can include on the label (other than that requested in the prescription).

> *"…we are not sure whether pharmacists are allowed to provide additional information./…/At the moment, we always inform about timing to take the medications. Even though the doctor writes (on the prescription) 'one tablet three times a day, before or after food', we always put the exact timing (eg. one tablet three times a day, 30 minutes after food)… That's the minimum." (Pharmacist 8)*

5.4.2.1.2 Services beyond dispensing

Services other than dispensing were variable between pharmacies (Table 5.2). The provision of these services generally was opportunistic (i.e. when the pharmacist was available and had time to do the service) and inconsistent (not standardised) within the pharmacy. These situations are illustrated below.

> *"Of course, during busy times, we would miss the patients. It depends – whenever we are available in the pharmacy and the patients are willing to be counselled."* (Pharmacist 2)

> *"…they (employee pharmacist) sometimes missed to ask (the prime questions)."* (Pharmacist 1)

The range of services reported includes:

a) Initial assessment (patient history) (*)

When a patient had antidiabetic medications dispensed for the first time, a small subset of pharmacists conducted a patient interview to collect:

- Information provided by the doctors – this might relate to the disease (e.g. diagnosis, complications, outcome targets and/or scheduled medical monitoring) or the treatment (eg. medications, lifestyle)

  "Usually when we receive a doctor prescription from the patient, we will ask if the doctor has provided any information – we even ask if the doctor has already informed how to administer the medications, when to do tests, what the targets are. Hence, we could reinforce or complement their points." (Pharmacist 1)

- Information regarding all medications taken by the patient, including self-medications and complementary medicines

  "When we receive a prescription, we will ask for all medications being taken – 'As well as taking these antidiabetic medications, are you taking any other medications?' – If yes, we would check if these medications affect (the diabetes treatment)... Hence, this is considered as the most important (information)". (Pharmacist 2)

b) Prescription review – clinical aspects (*)

Based on the prescription (and information gathered during initial assessment), a small subset of pharmacists reported that they undertook prescription review for clinical issues at the time of dispensing. If any problem with the prescription was identified (e.g. inappropriate dose), they would contact the doctor.

> *"In community pharmacies, we are not able to recommend treatment to doctors. This is possibly done in hospitals/… /So, doctors have the authority to (decide patient therapy and) prescribe medications. However if we think there is inappropriateness – for example, the dosage – we will check with the doctor."* (Pharmacist 7)

c) Patient education

All pharmacists reported that they had provided verbal education on dosage instructions in addition to the pharmacy label, especially for new patients (*****).**

> *"Of course it is a bit different. For new patients, we shoud explain about the medications – how to administer the medications, also what to do in the case of hypoglycaemia. We need to explain all of these."* (Pharmacist 2)

A smaller number of pharmacists provided added information on common/important adverse effects (particularly how to recognise and treat hypoglycaemia) (*); and/or a general guide on healthy living (*).

> *"I always tell them that the most important is a healthy lifestyle... In my opinion, physical activity is the most important thing. Antidiabetic medications could be considered as supporting only."* (Pharmacist 10)

> *"The first is education about medications – administration, adverse effects, also the importance of compliance. The second is education related to the disease – diet or what kind of food that is not allowed, also lifestyle."* (Pharmacist 7)

Most participating pharmacists did not provide information on the use of insulin as this information would have been provided in doctors' clinics. Other types of information were provided according to patient inquiries.

d) Monitoring/review

After the medications were issued, some monitoring activities were being undertaken, either at the time of a return visit by the patient or via telephone.

- **Monitoring compliance (*)**

Only a small number of pharmacists asked about patients' compliance to the treatment (i.e. medications, physical activity or diet) or the scheduled medical monitoring.

> *"For routine patients, we usually ask – 'how did you follow your medication instructions and your lifestyle advice?'…"* (Pharmacist 8)

> *"…we use My Diabetes Care Record form (developed by the American Diabetes Association). This (form) has listed a set of tests that should be done. So, while the patient is here, we can fill the form – 'Sir, I guess you have not done this or this test' – Then, we will suggest the patient to ask the doctor whether the particular test should be done."* (Pharmacist 1)

One of the pharmacies had a procedure to record patients' medication profiles, and called the patients to remind them when they needed to refill their medications.

> *"(Tele Farma – name of the procedure) takes records on medication profiles… as well as patients' identity. This programme is about reminding patients via phone when their medications are about to finish."* (Pharmacist 6)

- **Monitoring treatment outcomes**

More than half of the pharmacists would inquire of patients regarding their glycaemic control and problems (**).

> *"… When patients refill their medication, we usually just ask if they have any problems. Also 'Have you been checked for your glucose levels by your doctor?' or 'What has the doctor said about your diabetes?'…"* (Pharmacist 8)

In addition, half of the pharmacists reported that they performed blood glucose testing if asked by their patients (*). Patients usually learned about the service as they were regular customers at the pharmacy or obtained the information from friends or relatives. These patients requested the service particularly when they suspected episodes of hypoglycaemia or hyperglycaemia.

> *"… sometimes they just came back from dining out with friends. As they are worried that their glucose levels might increase, they came by to the pharmacy to have a (blood glucose) test."* (Pharmacist 1)

Only in a few cases did these pharmacists take the initiative to offer monitoring of patients' glucose levels between doctor visits.

> *"We take the initiative – 'After a few days, is it okay for us to call you, Sir?' or 'Maybe if you have some time, would you like to visit our pharmacy? We would like to check how the medication is working'."* (Pharmacist 1)

> *"… if patients are complaining about symptoms that we think may relate to hypoglycaemia or hyperglycaemia, we will suggest to them to have a (blood glucose) test."* (Pharmacist 8)

Based on the monitoring results, these pharmacists would refer patients to their doctors if any concerns arose.

5.4.2.2 Current type 2 diabetes practice – doctor clinics

Themes related to the doctors' practices (Figure 5.1) are expanded in Table 5.3. This table also indicates the number of respondent doctors (coded as numerals) who provided comments related to each theme. The importance of each theme was ranked according to their frequency of appearance in the interviews. A theme which appeared in all of the interviews was ranked as 'common service' and assigned *** (highlighted in the table). A theme that had appeared in more than half but not all of the interviews was ranked 'less common service' and assigned **; and a theme that had appeared in equal to or less than half of the interviews was ranked as 'least common service' and assigned *. Further, selected comments were presented to provide typical context of the themes. Differing views were illustrated by the inclusion of more than one comment for individual themes.

Table 5.3 Themes on current type 2 diabetes practice – doctor clinics

Themes	Sub-themes	Doctor codes	Ranking
a) Initial assessment (diagnosis) - *first visit*	• Clinical signs and symptoms • Physical examination • Diagnostic tests	All	***
b) Treatment plan	• Selecting therapy and setting outcome targets	All	***
c) Patient education	• Disease process	2, 6	*
	• Medications		
	- Indications	8	*
	- Directions for use (especially insulin)	1, 3, 7, 8, 10	*
	- Common/important adverse effects	1, 2, 6, 7	*
	• Diet	All	***
	• Physical activity	All	***
	• Prevention of complications (e.g. smoking cessation, foot care)	1, 4, 5, 7, 8, 9	**
	• Other preventive activities (e.g. immunisation)	4, 5	*
d) Monitoring/review – *regular visit*	• Monitoring compliance		
	- Medications	2, 3, 4	*
	- Diet	3, 4	*
	- Physical activity	3	*
	• Monitoring treatment outcomes		
	- Physical examinations	All	***
	- Results on requested tests (e.g. glucose levels)	All	***
	- Presenting complaints	1, 2, 3, 4, 5, 10	**

a) Initial assessment (diagnosis) (***)

All of the participating doctors reported assessing patients to confirm the diagnosis of diabetes and the presence of complications.

> *"For new patients, we will confirm the diagnosis based on their clinical signs and symptoms, laboratory tests, and physical examination… while we will also check for complications – and if any, when is the onset?/… / For diagnosis, we use the criteria from PERKENI or other professional organisations, such as ADA or other Asian organisations."* (Doctor 4)

b) Treatment plan; and c) Patient education

Based on the assessment, all of the doctors developed treatment plans that included pharmacological and non-pharmacological therapy (***). In regard to non-pharmacological therapy, all of the doctors reported providing education on diet and physical activity (***).

> *"After confirming the diagnosis, we will develop treatment plans that may include medications and non-pharmacological therapies… In terms of medications, these should be selected based on – according to the recent recommendation from ADA – patient preference… not only based on laboratory tests, but also based on patient's education level, patient's life expectancy, etc..."* (Doctor 4)

> *"In terms of non-pharmacological therapy, we would also educate the patients on the diet – if necessary, we could refer them to the dietitian – also recommend them to keep physically active."* (Doctor 4)

In addition to lifestyle education, some of the doctors reported that they provided education related to medications, in particular indications, dosage instructions (especially when insulin was prescribed), and common/important adverse effects (particularly how to recognise and treat hypoglycaemia) (*); education on preventive activities (e.g. smoking cessation, foot care) (**), and education relating to the disease itself, including the potential complications (*). The means of education was mostly face-to-face during the doctor's consultation. Moreover, about half of the doctors emphasised the limited time available.

> *"I guess here (the consultation time) is about two to five minutes… In the outpatient clinic, it may be shorter… only three minutes; in the private practice, it may be longer… up to five minutes (or) ten minutes… if only they ask questions. If they don't… we sometimes even miss the patient education."* (Doctor 2)

In general, the doctors reported that their usual treatment of patients was as independent practitioners. Where necessary (and the patients had no financial issues), they would refer patients to other health care professionals (eg. neurology specialist, dietitian, surgeon); however, follow-up recommendations from these professionals were often provided directly to the patients, and not necessarily to them.

"I sometimes refer the patients to the dietitian. However, the problem is that I do not know what the dietitian said/…/My concern is: What if my recommendations are not in accordance with theirs? This would be awkward." (Doctor 6)

d) Monitoring/review

At the beginning of treatment, all doctors would suggest more frequent return visits – every one or two weeks – to determine the optimal medication dosage. Then, the interval of visits would be gradually lengthened up to every 6 months (but these varied between doctors).

"The frequency of visits would be variable. For those taking medications for the first time – where the optimal dose needs to be determined – the visits could be weekly or fortnightly. After it has been achieved, the visits could be extended to every two to four months, even every six months." (Doctor 8)

One of the doctors, however, mentioned that longer intervals often resulted in poor glycaemic control due to the lack of monitoring during this period.

"If I tell them to come back after three months… often they are not doing well with their glycaemic control. Thus, I ask them to come back every month… so that they will be more aware if there is any increase in their levels… that's the most important thing!" (Doctor 2)

Patients with longer intervals between visits (>1 month) would be provided with either prescriptions signed 'repeat' or prescriptions for the whole period (when they could arrange their own times to get the medications refilled).

"I usually prescribe for a one month supply, and then it could be repeated. Most of the times, patients are not willing to get the medications for the whole period – 'I prefer to get it filled every month' – that's what the patients said." (Doctor 8)

- **Monitoring compliance (*)**

Unless the patients had poor glycaemic control, only a few doctors would perform routine checks on patient compliance with treatment during return visits.

> *"I usually would check whether the patients have taken their medications on a regular basis. Concurrently, I would follow their blood glucose levels... If their diet had been handled by a dietitian, I usually would not check this in detail – I would only ask in general whether the patients have followed their diet advice. That's it."* (Doctor 4)

- **Monitoring treatment outcomes**

During these return visits, all doctors would perform physical examinations and review the test results in order to check the effectiveness of the therapy (***), while fewer doctors would routinely ask about presenting problems (**). A letter to request laboratory tests was provided to patients at each visit, so that the patients would have the tests done and bring the results to the next visit for review.

> *"… we would monitor their glucose levels… in addition to the physical examinations on their visits."* (Doctor 7)

> *"During return visits, I would check their medical records – what was the problem. (Then) I would ask if they are still having the problem..."* (Doctor 3)

Additionally, some doctors encouraged patients to perform self-monitoring of blood glucose (SMBG) and keep records; but this was rarely done. Two of the doctors emphasised the role of SMBG as being particularly important for those on insulin therapy.

> *"...this (SMBG) is not for all diabetic patients… In particular, diabetic patients who are on insulin therapy should be able to perform SMBG. However, those who are on oral medications will not need this; it would be adequate for them to have the tests at scheduled doctor's visits, e.g. every three or four months."* (Doctor 10)

At each visit, all doctors would keep records on patient profiles, such as: medical history, family history, presenting problems, medications, and results of physical examinations and laboratory tests.

> *"Each patient has a medical status which contains – what we get from the initial assessment – family history, history of presenting problems; also data on weight, glucose levels and other laboratory tests. The medications being prescribed also are recorded."* (Doctor 5)

Based on the monitoring of results, the doctors would consider any necessary adjustments to the treatment plan.

5.4.3 Views on pharmacists' roles in type 2 diabetes care

Themes related to doctors' and pharmacists' views on pharmacist roles in diabetes care are presented in Table 5.4.

The importance of each theme was ranked according to their frequency of appearance in the interviews. A theme which appeared in more than half of the interviews with both professional groups (i.e. pharmacists and doctors) was given the rank of 'higher agreement' and assigned **. A theme that appeared in equal to or less than half of the interviews with both professional groups was ranked as 'lower agreement' and assigned *. Further, selected comments have been used to provide typical context related to the themes. Differing views are illustrated by the inclusion of more than one comment for individual themes.

Table 5.4 Themes on doctors' and pharmacists' views on pharmacists' roles in type 2 diabetes care

Main themes	Sub-themes	Pharmacist codes	Doctor codes	Ranking
Dispensing:	• Preparing medications • Providing labels	All	All	**
Beyond dispensing:				
a) Initial assessment	• Obtaining patient history (PMRs)	1,2,4,5, 6, 7,8,9,10		
b) Prescription review	• Prescription review – clinical aspects	1,2,4,5,6,7,8, 10	2,4,5,8,10	*
c) Patient education	• Medications			
	- Directions for use	All	1,2,4,5,7, 8,9,10	**
	- Common/important adverse effects	1,2,4,6,7	2,4,5,8,9	*
	• Diet (general)	1,2,6,7,8,10	2,8,7	*
	• Physical activity (general)	1,2,7,8,10	7,8	*
	• Psychological support	4,8		
	• Regular tests	8		
	• Preventive activities (e.g. smoking cessation, foot care)		2	
	• Others according to patients' inquiries	1,4,10		
d) Monitoring/review	• Monitoring compliance			
	- Medications	1,2,6,7,8,10	5,9,10	*
	- Diet	8,10		
	- Physical activity	8,10		
	- Scheduled medical monitoring	1		
	• Monitoring treatment outcomes			
	- Performing blood glucose tests	1,2,3,6,8		
	- Inquiring about glycaemic control and problems	1,2,4,5,6,7,8, 10	2,4,5,7,8	*
	• Medication review (beyond prescription review at the time of dispensing)	1,2,6,8		

Abbreviations: PMR, patient medication record

5.4.3.1 Dispensing (**)

All pharmacists and doctors agreed with the pharmacist's supply role. In terms of labelling, two of the doctors expected pharmacists to provide more complete information on the labels.

> *"Labels for medications should be prepared as those in the hospitals. In the hospitals, labels are printed with clear information on the patient's name, drug name and strength… all is there. This kind of label has not been seen in the community pharmacies… they only put on how many times patients should take the medications – before or after food – but there is no drug name and strength. Hence, it would cause a mess when patients accidentally put the medication in the wrong medication bag."*(Doctor 8)

Some pharmacists also recognised the potential role of pharmacists in providing additional information on the label to ensure safety and correct use of medications.

> *"Up to now, we have never provided additional information on the label. I think we should move on to that as patients do not always pay attention to what we told them earlier."* (Pharmacist 8)

5.4.3.2 Services beyond dispensing

Participating pharmacists believed that they should extend their roles beyond dispensing (see Table 5.4). However, only half or less than half of the doctors were supportive of pharmacists performing services other than dispensing and education on directions for medication use (see Table 5.4).

a) Initial assessment (patient history)

Most of the participating pharmacists considered that they should obtain a Patient Medication Record (PMR), which included the patient's medical and medication history, in order to provide patient care.

> *"I guess it would be better if pharmacists could develop a sort of patient record the same as those developed by doctors. This could be developed for certain patients – not all patients – such as patients with diabetes, etc. We could take records – when they first come – on their medical history, medications being taken and any problems while taking the medications. All of these are important."* (Pharmacist 7)

b) Prescription review – clinical aspects (*)

Almost all participating pharmacists, and some doctors, considered that pharmacists should check the prescription for clinical issues – such as inappropriate dosage, duplication or interactions – and alert the doctor when any problems were identified.

> *"… receiving prescriptions and delivering medications (to the patient) should be done by us. That's what I think. When a prescription comes into my pharmacy, I should be the first to handle… checking for the proper dosage, etc."* (Pharmacist 5)

> *"Pharmacists sometimes can provide advice, for example in the case of duplication – giving a sulphonylurea together with another sulphonylurea – or when we find errors in the (dosage) calculations/… /In this case, it will be good if they can let us know."* (Doctor 5)

c) Patient education

- **Education on medications – directions for use (**)**

Both health professional groups agreed that pharmacists should contribute to educating patients about medications, particularly directions for use (**), and common/important adverse effects (especially how to recognise and treat hypoglycaemia) (*).

All pharmacists and most doctors emphasised that the most important role for pharmacists is to ensure that the medications are taken properly. Pharmacists were expected to check with doctors if the dosage instructions on the prescription were unclear.

> *"Our role is not just supplying the medications, right?... At least we have to ensure that we provide the right medications to the right patients… we cannot let the patients be messed up with their dosage instructions. This can be fatal."* (Pharmacist 5)

> *"I expect pharmacists should check whether the patients know how to take their medications properly. If they already know – as for regular patients, they have used it for years – that should be fine… But if they still do not know – even though the doctors have written (appropriate) dosage instructions – the pharmacist should explain it again/…/There are various dosage instructions for antidiabetic medications… So, we expect pharmacists to check on dosage instructions prescribed by doctors… sometimes doctors can miss some information, hence pharmacists can add it on or maybe check it with the doctors."* (Doctor 10)

Although half of the doctors believed that pharmacists could inform patients about common/important drug adverse effects, two of them considered pharmacists should limit their information to avoid it hampering patient compliance.

> *"As we have limited time… particularly with regard to education on side effects, I expect pharmacists can help. But this is only for the common side effects. Indeed, this doesn't need to be explained in detail. For example, TZD – 'when experiencing oedema of the legs, do not forget to report'; or maybe simply telling the patients – 'do not stop your medications, if any problems are raised, you should contact the doctor'/… /If this information (side effects) is provided in detail, there are concerns that patients would refuse to take their medications."*(Doctor 2)

- **Education on diet and physical activity (*)**

About half of the pharmacists and fewer doctors agreed that pharmacists should provide (or reinforce) education (provided by doctors) on lifestyle, i.e. diet and physical activity;

> *"I think modification to lifestyle can be our potential role, as doctors usually provide the instructions only… Hence, we need to help patients to follow the instructions."* (Pharmacist 1)

> *"I expect pharmacists to provide information on dosage instructions… a bit of information on diet – 'Ma'am, do not forget to follow your diet instructions! Taking medications only won't be enough'/…/Also, pharmacists can reinforce other information from doctors to make the patients more convinced… since all of us say the same things."* (Doctor 7)

d) Monitoring

- **Monitoring compliance with medications (*)**

More than half of the pharmacists, but fewer doctors, considered that pharmacists should routinely monitor patients with regard to their compliance with medications. It was suggested that pharmacists could alert patients when they needed to get their medications refilled, in order to ensure medication continuity.

> *"… for regular patients – those who are taking antidiabetic medications or other medications that require regular refills – there will be particular records/… /The pharmacists will be responsible to alert the patients when they need to get their medications filled, and also to perform monitoring… follow-up (by phone) – 'Ma'am how is the progress?' – It will be like that."* (Pharmacist 7)

> *"With regard to medications, please emphasise that patients cannot stop the medications/…/When pharmacists find prescriptions signed 'repeat', remind the patients – 'Sir, you should not stop taking the medications. You should get your medications refilled at least two or three days before they run out'/… /When necessary, the pharmacists can make an agreement with the patients – 'Sir, do you want us to remind you when you need to get your medications refilled?' – This will be a good approach."* (Doctor 10)

- **Monitoring treatment outcomes (*)**

While doctors performed monitoring during their patients' return visits, the majority of pharmacists considered that they should be responsible for monitoring between the visits. The majority of pharmacists and half of the doctors agreed that pharmacists could inquire about a patient's glycaemic control and presentation of problems when he/she gets their medications refilled in the pharmacy; and alert their doctor when any concerns arise.

> *"I believe that we should record the patients' blood glucose levels… follow them up on a regular basis..."* (Pharmacist 5)

> *"Monitoring of presenting problems to detect side effects is definitely our role."* (Pharmacist 7)

> *"… If the pharmacist finds that the patient has a high glucose level – 'No (you can't get the medications) you should go back to your doctor – I don't think that pharmacists should be involved in treatment adjustment though, as this is not their role." (Doctor 5)*

Further, a few pharmacists believed that they should conduct a more comprehensive medication review (beyond prescription review that occurs at the time of dispensing) for at-risk patients.

> *"During monitoring… we need to assess whether a patient requires a more comprehensive review… in which we should consider all of their medications as well as other medical conditions."* (Pharmacist 1)

5.4.4 Factors associated with the development of pharmacy-based services for type 2 diabetes patients

The participating doctors and pharmacists identified several factors (potential and actual) affecting the delivery of community pharmacy-based services for type 2 diabetes patients. Themes related to these factors are presented in Table 5.5. Further, selected comments have been used to provide typical context related to the themes. Differing views are illustrated by the inclusion of more than one comment for individual themes.

Table 5.5 Factors affecting pharmacy-based service delivery for type 2 diabetes patients, as perceived by pharmacists and doctors

Main themes	Sub-themes			Pharmacist/doctor codes
		Facilitators	Barriers	
Pharmacist	Attitude	- Positive views towards services beyond dispensing		See Table 5.4
	Competence		- Perceived lack of competence	P: 3, 5, 6, 9, 10
Relationships with doctors	Doctor's attitude	- Doctors' previous interactions with pharmacists contributed to positive attitudes	- Lack of support – encroaching on doctors' clinical autonomy, lack of awareness, retailer image	D: 1, 3, 4, 6, 9, 10 P: 2 ,3, 5, 6, 7, 10
	Doctor's accessibility		- Low accessibility – difficult to contact, limited time	P: 2, 10 D: 1
Relationships with patients	Patient's attitude		- Lack of demand – lack of awareness, retailer image	P: 3, 5, 6, 8, 9, 10
	Patient's accessibility		- Low accessibility – not coming in person, having no time, not coming on a regular basis	P: 1, 2, 3, 4, 5, 6, 9
Pharmacy environment	Practice orientation	- Professional orientation		P: 1, 8, 10
			- Business orientation	P: 6
	Staff resources		- Lack of staff (suitably qualified)	P: 5, 3, 10
		- Task delegation		P: 6, 7
	Pharmacist availability/time		- Lack of pharmacist availability/time	P: 1, 2, 5, 6, 7, 9 D: 1, 5, 7, 8
	Operational	- Counselling areas/rooms		P: 1, 7
			- Difficulty to maintain PMRs	P: 1, 2, 6, 7, 8
			- Poor labelling, and lack of other written information	See Sections 5.4.2.1.1 5.4.2.1.2c, and 5.4.3.1
		- Protocols/procedures		P: 1, 2, 4, 6
External environment	Organisation of roles	- A health system to support delegation of roles to pharmacists	- Lack of a health system to support pharmacist roles (doctor dominance)	D: 1, 2, 4, 6 P: 3, 5, 6
	Financing	- Remuneration system		P: 6
	Marketing	- Raising public awareness		P: 8
	Assistance (profession wide)	- Training for pharmacists		P: 5, 8, 9, 10
		- Mentors		P: 3

Abbreviations: PMR, patient medication record; D, doctor; P, pharmacist

5.4.4.1 Pharmacist

Pharmacist characteristics were viewed to be important in the development of pharmacy services for type 2 diabetes patients.

a) Attitude

The pharmacists believed that they should extend their services beyond dispensing (see Table 5.4). This was seen either as an obligation to conform with the Government Standards or *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association) recommendations, or as a responsibility to their patients. Further, one of the pharmacists commented that feeling more involved in delivering a better service for patients provided her with professional satisfaction and fulfilment.

> *"When I did it…. I feel that our profession can contribute to better patient outcomes… and it made me feel more confident."* (Pharmacist 1)

In addition, two of the pharmacists believed that practising pharmaceutical care might also improve customer satisfaction and, in turn, would benefit their businesses.

> *"… to make my pharmacy more profitable, I should think how to make the customers happy…then they will come back to my pharmacy. Thus, I should provide a value-added service."* (Pharmacist 2)

b) Competence

While competence was perceived as a basic necessity for practising pharmaceutical care, half of the pharmacists expressed concerns regarding pharmacists' competence.

> *"Programmes developed for patient care – disease management – have to be supported by competent people… Competency is playing an important role here. In my opinion, this is the greatest barrier… pharmacists' (inadequate) competency."* (Pharmacist 6)

"To be honest, I do not have the courage to do it (patient care) on my own… I am not that competent. I am afraid to fail it." (Pharmacist 3)

"How can we be doctors' partners? A pharmacist is only studying for five years before practising; a doctor is studying longer… then, additional few years for specialisation. They have enormous knowledge... experiences as well. We might be able to talk about antibiotics… new products… dosage… that's what we know. As for medications for diabetes, pharmacists do not have adequate knowledge. I admit it." (Pharmacist 5)

5.4.4.2 Relationships with doctors

Pharmaceutical care was viewed as a form of multidisciplinary care in which the pharmacist should have a close relationship with the doctor, who is the main care provider.

a) Doctor's attitude

The majority of the doctors expressed concerns about the involvement of pharmacists in patient care, since doctors generally considered clinical activity as their role.

"In terms of developing a treatment plan with doctors, it will be too far… As we can see… even in the inpatient setting (in a hospital in Surabaya), it is hard for the doctors to accept recommendations from the clinical pharmacists... If a pharmacy is practising in that way, I guess this will be bad for its business… as currently doctors are not used to that kind of practice (thus, suggesting patients to get medications from other pharmacies)." (Doctor 1)

"In my opinion, pharmacists should not provide anything other than what doctors have prescribed. If they find it unclear, they can check with the doctor. There is no need for them to inform patients what this medication is used for, right? It is not supposed to be a pharmacist's responsibility, is it? It is the doctor's role to decide what a medication is used for." (Doctor 6)

In line with this, pharmacists were under the impression that doctors were not enthusiastic about their involvement in patient care, and any extension of a pharmacist's role could be seen as an encroachment on the doctor's clinical authority.

> *"Sometimes doctors were irrational. Recently, I found a newborn given amoxycillin at the dosage of 200 mg. In my opinion this did not make sense… the average weight of newborn babies is about 3 kg or 4 kg maximum, amoxycillin dosage is 30 to 40 mg per kg per day, it makes 10 mg each time. If you multiply it with the weight, how much do you think is the appropriate dosage? It is 40 mg, isn't it?... sometimes doctors could give more than 100 mg. When I checked with them, they were so upset with me."* (Pharmacist 5)

> *"Doctors also have the kind of behaviour… treat patients as 'my patients' or 'your patients'. So, they are not focusing on the patients, instead they put their professional egos on top. This can be a barrier. While we are trying to help (with extending our contributions)… they have accused us of encroaching upon their authority –'What has the pharmacist been doing?'…"* (Pharmacist 6)

These doctors' attitudes might be influenced by their lack of awareness of pharmacists' clinical knowledge and continuing professional development roles. Thus, they expressed a lack of confidence in involving pharmacists in patient care.

> *"…this should be done carefully and only if the pharmacist is capable of providing correct information. So, are pharmacists currently ready to take up the service? I guess pharmacy education curriculum should be tailored accordingly… As I said pharmacists have a lack of clinical knowledge – they are still product-minded – as the result of their education curriculum."* (Doctor 3)

This lack of awareness may be compounded by doctors' perceptions around pharmacy business roles, in particular when the pharmacy was not owned by the pharmacist.

> *"The pharmacy business has quite a lot of stakeholders. The pharmacist can be just an employee at the pharmacy… Thus, the owner will decide how to run the pharmacy… if the owner is more business-oriented, they will just need the pharmacist's name to be put as a manager (and do not care for the pharmacists' professional roles). That's the barrier."* (Doctor 1)

b) Doctor's accessibility

While providing patient care requires an effective collaboration with the doctor, pharmacists expressed concerns about access to doctors.

> *"When we identified problems, contacting doctors was a challenge… particularly for those (doctors) with lots of patients."* (Pharmacist 2)

Though doctors generally expected that pharmacists should check with them if their prescriptions were unclear, one of the doctors highlighted that doctors' limited time for communication could be a barrier for pharmacists to assume more clinical roles.

> *"…in the primary care setting where the load is high and we should work fast, time for communication is limited. Hence, I cannot imagine how pharmacists can get involved in developing a treatment plan…. It will be difficult! It may be possible in the hospital, but not in the primary care setting."* (Doctor 1)

The importance of relationship-building was discussed by some of the pharmacists and doctors in terms of improving support from, and access to, doctors. It was considered that it could be commenced with an initial communication to make the doctors aware of what services pharmacists can provide.

> *"...if pharmacists can communicate well to the doctors in relation with what they are planning to do – particularly if they personally know the doctors – I guess it should be okay. However, if pharmacists do not initially contact the doctors, they can misunderstand… that pharmacists are encroaching on their authority, and causing patients to lessen their doctor visits."* (Doctor 4)

> *"We have tried to approach some doctors, though not many… As we were trying to communicate well regarding patients' issues, they responded quite well… maybe they could see that we had a good intention. However, we are a bit worried to contact doctors that we do not personally know."* (Pharmacist 1)

It is essential for pharmacists to demonstrate their competence and value over time to gain doctors' trust. It was shown that two of the doctors had gained trust in pharmacists after working together with them over some time.

> *"In my opinon, what the pharmacist 'X' has been doing is excellent… As I have limited ability, limited time… I guess we should appreciate others who are willing to provide more care to the patients."* (Doctor 2)

5.4.4.3 Relationships with patients

Pharmaceutical care requires a professional relationship between the pharmacist and patients to be established and maintained.

a) Patient's attitude

Pharmacists believed in the importance of patient demand in reinforcing practice change.

> *"(In some cases) they wanted explanations about their medications. So, we need to provide the information. Sometimes they were even smarter… they were bringing ISO (i.e. a book which contained information on drugs distributed within Indonesia) here."* (Pharmacist 4)

> *"Maybe if there is a demand from the community, we might start to develop our roles. Why are we still reticent? In my opinion, this is because the community do not put demand on us... I did PMRs before, but not anymore, as there is no demand…"* (Pharmacist 8)

It was perceived by the pharmacists that the current lack of demand was because patients were not aware of what to expect from a pharmacist. In addition, their perceptions around pharmacists being retailers as well as healthcare providers might create uncertainty in their minds regarding the pharmacists' roles in patient care.

> *"Especially for new customers… as they may not be familiar with our service… they usually just want to get their medications."* (Pharmacist 1)

> *"When I told them not to purchase only two or nine tablets (explaining that otherwise the problem would recur) … they did not comply… probably they thought that I just care to sell my products. This made me feel uneasy… as if I was not telling the truth or something like that."* (Pharmacist 3)

b) Patient's accessibility

Pharmacists reported that the provision of patient care was often hampered by difficulty in accessing patients, such as them not coming in person, having no time or not coming on a regular basis. While patients could choose any pharmacy to dispense their prescription and could switch from one to another on successive visits, this made patient records and service continuity difficult.

> *"Patients were mainly ordering (their medications) via phone."* (Pharmacist 1)

> *"…whenever we are available in the pharmacy and the patients are willing to be counselled. Sometimes they just said – 'Ma'am, I am in a hurry' – that's it, we'll miss them."* (Pharmacist 2)

> *"I wish to have a more thorough patient record… ideally there is data on allergies, etc, but we need adequate time to obtain this information from patients… as I said… in Indonesia, (most) patients are not covered by insurance plans. So that, they could choose whichever pharmacy they like (often patients purchased their medications here and switch to another pharmacy next month)."* (Pharmacist 4)

Hence, it is important to develop a professional relationship between the pharmacist and the patient to improve support from, and access to, patients. Two of the pharmacists reported the use of simple questions about patient medications at the first meeting, to help the patients to recognise their needs and to make them aware that the pharmacist can help. They suggested that, once the patients valued the service, they would be willing to access the service.

> *"We usually start with asking about their medications… at least to introduce them to our role/…/This patient was first counselled about the use of her medication a few days ago… now she asks if she can access the service in the future."* (Pharmacist 1)

5.4.4.4 Pharmacy environment

Pharmacy characteristics were seen as important in supporting the development of community pharmacists' professional roles in type 2 diabetes care.

a) Practice orientation

Practice orientation provides clear focus and accountabilities for service delivery by pharmacy staff. If management teams are not aware of the professional service, or if it is not on their priority list, the service will be very vulnerable to competing pressures from the distribution of drugs and business orientation.

> *"To be honest, in this chain pharmacy 'X', issues related to patient-centred care have not been paid attention… programmes related to this have not been developed so well. What they have developed really well is accounting… financial reports, etc."* (Pharmacist 6)

In contrast, professionally active pharmacy owner/managers shared motivation for their pharmacies to shift towards a more professional role and did not necessarily focus on maximising profit.

> *"I told the pharmacy staff to refer patients with chronic diseases to the pharmacist….so that they can be counselled properly."* (Pharmacist 1)

b) Staff resources

It was considered necessary to have adequate pharmacy staff in order to release pharmacists' time for patient care. However, three of the pharmacists reported difficulties in recruiting qualified staff.

> *"… actually I have time… but if I have inadequate human resources, it will take my time… as I have to do simple tasks all by myself. If I have enough staff – a lot of pharmacist assistants – I will not need to dispense medications – preparing labels and such things – that caused me having no time for patient care. So, the barrier is lack of time as I have inadequate staff/… /Recruting staff is difficult… we can easiliy get a bunch of incompetent ones… but not the competent ones."* (Pharmacist 5)

Moreover, some pharmacists noted the importance of teamwork and task delegation in the pharmacy to support their professional development. Pharmacists could partly delegate the control of prescriptions to pharmacist technicians in order to release part of their time from the daily dispensing routine to attend to patient care.

> *"… from accepting prescriptions to dispensing has been handled by the pharmacist assistants where they need to sign for tasks they have performed. Then, the pharmacists would provide the education. In other pharmacies, the pharmacists might spend most time dispensing… But here, the pharmacists should be at the front (counter) directly facing the customers…. When the dispensed medication is ready, the pharmacists should hand it to the patients (with necessary education)."* (Pharmacist 7)

c) Pharmacist availability/time

To provide patient care, it was emphasised that a 'competent' pharmacist needs at all times to be at the pharmacy during opening hours.

> *"In my opinion, prescriptions should be received by me to check for any errors… dosage, etc. Even if the errors are made by the doctors, we will still take the responsibility for providing wrong medications. So, my senior assistant or I should be at the front counter to check for any errors or fraud. If I am not available in the pharmacy, I will know nothing… (Hence) It will be only about selling medications."* (Pharmacist 5)

> *"I have tried to provide this kind of service (patient care), but I could not always be available in the pharmacy. This made me feel guilty for those patients that already came to the pharmacy… to access the service… but could not get it. But… what can I do? I could not wait for this person the whole time… as people could come at any time. I also have another job at another place."* (Pharmacist 2)

In line with this, doctors mentioned that involving pharmacists in patient care requires them to be available at pharmacies during all opening hours.

> *"… the problem is that pharmacists are not always available at pharmacies… hence, education is not provided by pharmacists but is provided by pharmacist assistants. This is the common practice." (Doctor 5)*

Even during the time when pharmacists were available in the pharmacy, finding 'time' in everyday practice for the development of patient care was an issue. Some pharmacists emphasised that patient care required pharmacists not only to spend more time with patients (personal approach), which was difficult during busy times at the pharmacies, but also to allocate time for other related activities such as maintaining PMRs and training/study time.

> *"The more we are available for counselling, the more time we spend. In general, patients expect a personal approach… (when) they can ask about their treatment from A to Z… this will take quite a long time. Hence, time is the barrier..."* (Pharmacist 1)

> *"…while there are lots of new drugs launched for diabetes, I do not have enough time to learn about each of these drugs..."* (Pharmacist 5)

> *"… we got the (monitoring) forms… but we have not recorded on a regular basis. This is because the pharmacist – like me – only works for 4 hours, from 5 to 9 pm. Hence, it is being considered to extend the working hours to 7 hours in the future. Especially in the evening – which is the busiest times at the pharmacy – we do not have time to make a call (for monitoring purposes)."* (Pharmacist 7)

d) Operational

In order to perform patient care, half of the pharmacies have developed PMRs. However, obtaining complete data and utilising PMRs on a regular basis had proved to be a challenge. Several reasons were reported, such as problems with PMR retrieval during subsequent visits (hardcopy PMRs), lack of pharmacists' time and lack of patient access. These situations are illustrated below.

> *"We actually have a monitoring form… it was developed by WHO, but we did not consistently record the data in the form/…/It is not like… we can retrieve a particular patient's form whenever we need it… sometimes we need to search for it here and there."* (Pharmacist 6)

> *"It seems that hardcopy PMRs caused them (employee pharmacists) quite a load... I often found that lots of temporary notes (i.e. notes written on the back of the prescription copy regarding information gathered) had not been transferred to the PMRs. Hence, in the future we'd like to make it easier... maybe we will use electronic (PMRs). When facing the patients, pharmacists can directly retrieve their data on the computer, and add any new data."* (Pharmacist 1)

"The main problem (with PMRs) is time… obtaining the data requires time. Also, the patients should be willing to share their data/…/With regard to time... particularly in the evening, we are very busy… thus, we cannot just 'wait' for the patients (to obtain the data for PMRs) as we have time limits, for example: minimum 15 minutes for each dispensing. Then, we also need to do patient care …provide information to patients." (Pharmacist 6)

Two pharmacies, however, had developed databases of medications dispensed for individual customers; this enabled the pharmacists to check for any changes in medications used during the subsequent dispensings.

"… my pharmacy has developed a database for each patient – name, address, medications dispensed. For routine customers, I even have their data on dosage instructions… Usually they would ask whether their medications were still the same. If yes, that was fine… meaning the same dosage instructions would be applied. But if there were changes, I would tell them what medications had been changed, and how to take these medications." (Pharmacist 5)

In addition to issues with PMRs, typical pharmacy labels included limited information and there was a lack of written information provided by the pharmacists (Section 5.4.2.1.1, and 5.4.2.1.2c). Thus, some of the pharmacists and two of the doctors suggested improving labelling practice (Section 5.4.3.1).

Some pharmacists mentioned that the use of procedures and protocols could be an important method to ensure consistency and quality of the service. The need for a consultation area/room also was discussed by a few pharmacists, within the context of having it available to discuss personal/private issues.

"Ensuring patients' quality of life… should be seen as a whole. Starting from medications supplied to patients – we already have the protocols, eg. the storage…the supplier… distributors, etc – we can guarantee those things/…/In the future, we wish to expand to 'disease management'. However, we can only say the word… but we do not know how to do this… we do not have the technical procedures." (Pharmacist 6)

"Usually we will consider the patients' situation... if there are no other customers at the pharmacy or they feel comfortable talking here (shop floor)... otherwise we can offer them to talk in the counselling room." (Pharmacist 1)

5.4.4.5 External enviroment

Structures and support outside pharmacies were perceived to be of key importance for community pharmacists' professional development in type 2 diabetes care.

a) Organisation of roles

Indonesian regulations/policies have not, as yet, developed a diverse healthcare system to effectively organise roles of healthcare providers to deliver patient-focused and integrated care (due to doctor dominance). For example:

- While pharmacists are not allowed by regulations to change brand names without doctors' approvals, some pharmacists expressed their concerns regarding a potential unethical alliance between doctors and pharmaceutical companies which might influence doctors' prescribing and professional behaviour.

> *"Pharmaceutical companies treat doctors differently… they have even sponsored doctors to attend seminars, etc. Doctors cannot be blamed as they have the key roles. In developed countries, doctors may only write Paracetamol… what brand to be used is up to the pharmacists… However, here (Indonesia) is different/… /When we encountered doctors with 'money orientation', they would refuse to change the brand (according to the pharmacy stocks), and asked the patients to get it in other pharmacies."* (Pharmacist 5)

This conflict of interest also was acknowledged by one of the doctors, who suggested that doctors might not serve the best interests of their patients. This may threaten the integration of community pharmacists, since effective collaboration will require all providers to agree that the goal is to improve patients' health.

> *"… though doctors should act in the best interests of their patients… if we conduct a survey, we may find this is not the fact… they mostly put patients' interests in the second place, while their personal gain is the first. In this situation, collaboration between pharmacists and doctors will be unable to achieve… as this can only be achieved when we act in the same interests… the patients!"*(Doctor 1)

- It was noted by some of the doctors that some arrangements within the insurance system, e.g. the short interval of doctor visits for patients with stable long-term diseases, were inefficient and not cost-effective for the patients.

> *" Even if we consider that certain patients do not have to come every month, the insurance system requires them to come every month or even shorter intervals (otherwise the medications will not be covered). The cost to fulfil the requirements to make claims (eg. travel, photocopy, etc) is sometimes more expensive than the medications."* (Doctor 1)

Such arrangements within the insurance system, or by the doctor, would also limit pharmacists' roles, but pharmacists should assume a responsibility for monitoring medications that they supply, as illustrated by one of the pharmacists below.

> *"We often find diabetic patients who have good (glycaemic) control, and they just want to get their medications refilled… If we ask them to go back to the doctor – 'arrgh I will get the same there'/ …/This is like holding back our roles… we can take the responsibility to monitor safety, etc, as we provide the medication to the patients."* (Pharmacist 6)

Thus, it was considered that the regulatory bodies (i.e. government and health professional bodies) should develop an agreement to clearly separate roles among care providers, including community pharmacists and doctors.

> *"…the IDI (Ikatan Dokter Indonesia - Indonesian Medical Association) and the IAI – with the Government as the facilitator – should have an agreement about each other's roles in order to provide optimal care for diabetics, e.g. repeat dispensing."* (Pharmacist 6)

> *"I am hoping that health professionals share the same understanding of diabetes care. So, patients will get the same information from me or from you. Basically, I hope that patients will not be afraid of taking insulin, medications, regular control, regular SMBG, when necessary. As for this, I cannot work alone…"* (Doctor 2)

b) Funding

Funding was considered important for the establishment and continuity of pharmacy services. While, currently, pharmacies have not charged any fees for services other than dispensing, one of the pharmacists believed that it is important for pharmacists to be part of the health system and to demonstrate their value, thus they should be reimbursed for their services, e.g. through *Jaminan Kesehatan Nasional – JKN* (National Health Coverage) which is starting in 2014.

> *"If only a system can be set up (to oblige pharmacists to deliver professional services), I would expect pharmacists to get remuneration. However, pharmacists should have adequate skills in advance/…/Especially with the National Health Coverage coming up... this will clearly define doctors' and pharmacists' roles. In this case, how can pharmacists not get remuneration if we already provide services?"* (Pharmacist 6)

c) Marketing

For a service to be successful, patients should be aware and even demand the service. One of the pharmacists considered the importance of a nationwide promotional activity to raise patient awareness, and to help in creating demand.

> *"…for example, raising community awareness to put demand on pharmacies to do this and that. But this should be done at the national level. It can't be done at personal levels, or only at regional or local levels (structural levels of the IAI)."* (Pharmacist 8)

d) Assistance (profession-wide)

Due to the perceived lack of competence, some of the pharmacists emphasised the importance of support from the *IAI* and educational institutions in the development of pharmacy-based services for type 2 diabetes patients. This should not be limited to providing continuing education or training, but should also provide mentors/advisors to assist during the implementation of the service.

> *"… there should be training for pharmacists… to update our knowledge… to help us providing care for the patients."* (Pharmacist 9)

> *"…If only I could collaborate with the educational institution 'X' (for example), I am willing to do it (patient care)… Doing it without help is hard for me."* (Pharmacist 3)

5.5 Discussion

This study included interviews with the two main groups of diabetes care providers in Indonesia, i.e. doctors and pharmacists, to explore a range of issues related to community pharmacy practice in type 2 diabetes care. This qualitative data is a product of views, experiences and perceptions of respondents, thus subjects to bias if respondents are not sharing their true responses.[145] However, potential bias in this study was reduced owing to the lack of pre-determined pharmacist roles in diabetes care and reassurance given to the interviewees regarding confidentiality and the independence of the research. Although this study used a small sample size, it included a range of pharmacists and doctors, enabling it to achieve a detailed and comprehensive data set.[145] The characteristics of sample pharmacists were consistent to those working in Surabaya, Indonesia (Pharmacy Survey, Chapter 3); however no demographic data of doctors was available. Moreover, the interviews took between 30 minutes and one hour; during which, time was made available to pursue relevant issues raised by the interviewees. Ten interviews were conducted for each of the groups (pharmacist and doctor), but it was clear that no new themes had emerged after the eighth interview for each group (data saturation). This suggests that all possible issues have been covered.[145, 147]

5.5.1 Current type 2 diabetes practice

Findings from this study indicated that pharmacists and doctors in Surabaya, Indonesia, have practised their roles separately. Doctors generally focused on diagnosing and prescribing, and often had short consultation times; community pharmacists mainly supplied medicines with limited labelling. Services beyond dispensing varied between pharmacies, and the delivery was opportunistic and inconsistent within pharmacies. The most common pharmacy service was to provide basic information on how to use medications. In light of the increasing burden of type 2 diabetes[1] and the implementation of *JKN* in 2014,[10] the demand for diabetes care is expected to surge. This will place a further burden on the limited health

workforce in Indonesia (see Section 2.2.3.3) and, thus, better utilisation of health resources – including community pharmacists – will be paramount.

5.5.2 Views on pharmacist's roles in type 2 diabetes care

This study indicated that community pharmacists generally believed that they needed to perform services beyond dispensing, while doctors showed less expectation for this to occur. There was a clear agreement between doctors and community pharmacists about the traditional roles of pharmacists in dispensing and basic education related to medications, particularly directions for use. There was some level of agreement between doctors and pharmacists that this should be extended to education on important/common adverse effects.

Some of the doctors and pharmacists in this study also indicated the importance of improving the current standard pharmacy label. The typical pharmacy label was reported to be limited to the patient's name and individual directions for use (in addition to the general information, i.e. date of dispensing, prescription number, pharmacy details and name of the pharmacist manager). Although such a label is considered to meet the Indonesian standards of practice (Section 2.2.4.3), the FIP Working Group for Labelling has recommended that the minimum information should include the patient's name, generic name (product name) and strength of the medicine, and directions for use.[162] Moreover, this study indicated ambiguities in providing additional information other than that requested on the prescription. The use of formal ancillary labels, or Cautionary and Advisory Labels (CALs), as practiced in the UK[163] and Australia[164], has been reported to offer a convenient and effective means of providing instructions regarding safe and correct use of medications.[164] In addition to appropriate labelling, other written information [such as Consumer Medicine Information (CMI)[165] or the Self Care Fact Card[166] as practised in Australia] can be considered to reinforce the current practice of communicating verbally with patients.

Some level of agreement was evident between pharmacists and doctors about prescription review for clinical issues, education on healthy living, monitoring of compliance and monitoring of therapeutic outcomes. The agreement in regard to monitoring therapeutic outcomes was limited to pharmacists inquiring about patients' glycaemic control and problems, and referring patients to doctors if any concerns arose. This is worthy of further development because doctors reported inconsistent arrangements for follow-up visits, from monthly to biannually, thus pharmacists may have the opportunity to perform monitoring when patients get their medications refilled at the pharmacy.

In addition to the services congruent with both pharmacists and doctors' views, it is important for pharmacists to expand their clinical roles in the future, even though this was not supported by the doctors currently. An example would be medication review (beyond prescription review that occurs at the time of dispensing). Various formats of medication review are practised in developed countries, ranging from reviews that consist mostly of patient counselling aimed to improve medication use [e.g. Medication Use Review (MUR) in the UK[167] and Diabetes MedsCheck in Australia[168]] to comprehensive clinical medication reviews [e.g. Medication Therapy Management (MTM) in the USA[169]]. The more comprehensive reviews allow pharmacists to take more direct responsibility for patient treatment plans and outcomes, thus developing their professional roles as part of the diabetes team.

This study generally showed that Indonesian doctors currently exhibit a limited position regarding the scope of future pharmacy practice. This was consistent with findings from other international studies, although not specific to diabetes care, in which doctors strongly supported pharmacists' traditional roles of dispensing and providing patient education related to medications;[108] however, doctors also have been reported to acknowledge the pharmacist's role as a source of medicine information to doctors,[102, 107, 108] and to recognise their roles in prescription review (clinical aspects)[105, 106] and monitoring compliance.[104, 106, 107] Some support has been reported for health screening,[105, 106, 109] monitoring treatment progress,[105, 108] and assisting in the development/adjustment of treatment plans (co-decisive roles)[105-108]

(see Table 2.13). It should be emphasised that these findings were mainly from developed countries[105-109] with possibly more advanced pharmacy practice, thus the relationship between doctors and pharmacists might have been better developed.

5.5.3 Factors associated with the development of pharmacy-based services for type 2 diabetes patients

This study reported a number of factors (potential and actual) related to the pharmacy environment as well as external environment, which have contributed to the development of pharmacist roles in type 2 diabetes care in Indonesia. It is a government requirement that prescription drugs should be issued by pharmacists (see Section 2.2.4.3), thus pharmacists should be available during pharmacy opening hours. However, this study indicated an issue with pharmacist availability in the pharmacies. This was supported by the results of two studies undertaken in Jakarta, Indonesia, which reported that approximately 70% of pharmacists worked in community pharmacies as their side jobs.[14, 16] Moreover, this study indicated that Indonesian regulations/policies have not yet developed such a diverse healthcare system to effectively organise care providers to deliver patient-focused care (due to doctor dominance), thus futher limiting pharmacist roles.

The implementation of *JKN* would present an opportunity to improve utilisation of community pharmacies (more customers/prescriptions). Under the scheme, the Government and *IAI* should consider establishing a formal agreement regarding basic services that should be available in pharmacies; advanced services can be proposed once pilot studies can provide evidence of their benefits. While the current payment under *JKN* includes a very low prescription fee (see Section 2.2.4.4), the *IAI* should negotiate with the Government to ensure that pharmacists receive adequate remuneration for the provision of agreed basic services, to create a stable environment for community pharmacies that enables them to remain viable. In turn, *JKN* can be used to reinforce the requirement for community pharmacies to maintain

pharmacist availability to be considered as eligible service providers, thus improving the quality of pharmacy services.

This present study also illustrated the importance of adequate staffing and task delegation within pharmacies. Hence, individual pharmacies need to assess their workload capacity; their priority should be to maintain pharmacist availability and, when necessary, pharmacy technicians can be used to assist with dispensing. Other necessary pharmacy resources identified in this study were the development of professional procedures/protocols for specific services, PMRs, appropriate labelling and other written information, and consultation areas/rooms. The use of protocols/procedures would be beneficial to ensure both quality and consistency of service delivery. The *IAI* should consider developing specific standards and IT systems for dispensing, to assist with labelling practice. The use of IT systems would also improve access to PMRs, which is of importance in providing pharmaceutical care.

In addition to the environmental factors, this study indicated the importance of the development of close relationships between pharmacists, doctors and patients in providing pharmaceutical care for type 2 diabetics. While pharmacists in this study generally indicated positive attitudes to extending their roles, they perceived competence as an important issue. It should be noted that pharmacotherapy subjects were not incorporated in the national pharmacy curricula until 2008,[79, 80] thus a wide variation of pharmacotherapy knowledge is expected, particularly for those who graduated before 2013 (based on a 5-year length of study to register as a pharmacist). This would explain the expressed concerns of pharmacists regarding competency, as the median was 17 years of work experience. The limited pharmacotherapy knowledge among Indonesian community pharmacists also was reported in a previous study.[27] With the changes in pharmacy curricula, it is to be expected that all new pharmacists will receive general diabetes training as part of their undergraduate programme. However, to deal with earlier graduates, the *IAI* should consider organising formal general diabetes training; when necessary, formal diabetes-specific

CPD/CPE programmes and an accreditation system can be developed for those seeking specialisation.

In terms of pharmacist-doctor relationships, barriers reported were lack of support from the doctors and difficulty to access them. Thus, the *IAI* should consider liaising with doctor organisations to discuss interactions/relationships between doctors and community pharmacists in providing pharmaceutical care. While working with doctors, pharmacists need to demonstrate their value over time, allowing continued development of their professional roles. It was suggested that doctors' acceptance of pharmacists' clinical services was related to their level of exposure to those services,[104] which is consistent with statements from doctor interviews in this study.

With regard to patients, pharmacists were of the opinion that patients did not bother to access services other than dispensing (lack of demand); and patients were often difficult to access (e.g. they did not come to the pharmacy in person). This study highlighted the importance of a nationwide promotional exercise to raise patient awareness when introducing pharmaceutical care. Within the pharmacies, some pharmacists in this study reported to use basic questions regarding patient medication in order to make the patient aware of the service they provided and to start relationship-building. Once the patients engage with their services, it is important for the pharmacists to demonstrate the benefits to the patients. It was suggested that patients who had experienced a pharmacy service were more likely to support the provision of that service.[17, 22, 95, 130, 131]

In general, factors identified in this study were similar in nature to those reported in the international studies (see Tables 2.15 and 2.16);[35, 136-144] however, this study provided insights within the context of the Indonesian health system.

5.6 Key themes

- Current type 2 diabetes practice in Surabaya, Indonesia:
  - Doctors generally focused on diagnosing and prescribing, and often had short consultation times.
  - Community pharmacists mainly supplied medicines (with limited labelling), with some providing services beyond dispensing, particularly providing basic information on how to use medications.
- Views on pharmacists' roles in type 2 diabetes care:
  - There was a strong agreement between pharmacists and doctors around pharmacists' roles in regard to dispensing (with improved labelling) and education related to medications (i.e. directions for use).
  - A lower level of agreement was reported about prescription review (clinical aspects); education related to medications (i.e. common/important adverse effects), and healthy living (i.e. exercise and diet); monitoring compliance with medications and monitoring treatment outcomes (i.e. inquiring about patients' glycaemic control and problems).
- Factors (actual and potential) associated with the development of pharmacy-based services for type 2 diabetes patients:
  - Pharmacist, i.e.: positive views (facilitator); perceived lack of competence (barrier).
  - Relationships with doctors, i.e. lack of doctor support – doctors' negative views regarding encroachment of doctors' clinical autonomy, low awareness towards pharmacist competency, retailer image of pharmacists (barriers); difficulty in accessing doctors (barrier); previous interactions (facilitator).
  - Relationships with patients, i.e.: lack of patient demand (barrier); difficulty in accessing patients (barrier).
  - Pharmacy environment, i.e.: business orientation (barrier); lack of staff (barrier); poor pharmacist availability (barrier); supporting resources, such as counselling areas/rooms, professional procedures/protocols, and IT systems for labelling and PMRs (facilitators).
  - External environment, i.e.: a health system to support pharmacist roles, remuneration, marketing and professional assistance (facilitators).

Chapter 6

General discussion and

Conclusions

6.1 Introduction to the chapter

This chapter draws together the key findings/themes from the pharmacist survey (Chapter 3), the patient survey (Chapter 4), and the qualitative study of pharmacists and doctors (Chapter 5) in relation to the main objectives of this thesis: current diabetes practice, views on community pharmacist roles, and factors (potential/actual) associated with the development of a diabetes service. It then provides general discussion of the findings in addressing the main objectives, and proposes a model of Indonesian community pharmacy-based services for type 2 diabetes patients. The chapter ends with the conclusions from this body of research.

6.2 Summary of key findings/themes

A summary of key findings/themes from the pharmacist survey (Chapter 3), the patient survey (Chapter 4), and interviews with pharmacists and doctors (Chapter 5) in relation to current diabetes practice, potential developments and the contributing factors are provided in Tables 6.1, 6.2 and 6.3.

Table 6.1 Current pharmacy-based services for type 2 diabetes patients

Pharmacist		**Doctor**	**Patient**
Quantitative findings[*]	**Qualitative findings**[†]	**Qualitative findings**[†]	**Quantitative findings**[‡]
Dispensing: 100% of pharmacists reported to prepare medications and provide labels	Minimal contact (prescribing-dispensing interface) • Doctor's main role has been to diagnose and prescribe • Pharmacist's main role has been to supply prescribed medicine (with limited labelling)		**Dispensing:** 100% of patients reported to utilise community pharmacies for dispensing their medications
Beyond dispensing: >50% of pharmacists reported to provide patient education related to medications, particularly directions for use (72.6%)	**Beyond dispensing**: • The common practice has provided patient education related to medications, particularly directions for use • Other services have varied among pharmacies; and the service provision has been opportunistic/inconsistent within the pharmacy	**Other services:** • Doctors commonly have provided patient education on lifestyle; other types of education have been inconsistent – limited consultation time • Doctors have monitored patient outcomes during visits – intervals of visits ranged from monthly to biannually	**Beyond dispensing:** >50% of patients reported that community pharmacies have provided education related to medications, particularly directions for use (79.6%)

[*]Chapter 3: Pharmacist survey
[†]Chapter 5: Qualitative study (interviews with pharmacists and doctors)
[‡]Chapter 4: Patient survey

Table 6.2 Views on pharmacists' roles in type 2 diabetes care

Roles	Pharmacist		Doctor (Qualitative findings)[†]	Patient (Quantitative findings)[‡]
	Quantitative findings[*]	Qualitative findings[†]		
Dispensing	100% of pharmacists viewed dispensing as part of their roles	Clear agreement regarding pharmacists' dispensing role (with improved labelling)		Almost 100% of patients viewed dispensing as part of pharmacists' roles
Beyond dispensing	>50% of pharmacists viewed that they should extend their roles related to initial assessment, treatment plan, education, monitoring and review			Approximately 50% of patients viewed that pharmacists should extend their roles related to education and monitoring
	Priorities: • Patient education - Education related to medications: directions for use (58.6%); common/important adverse effects (25.7%) - Education on lifestyle: exercise (36.5%); diet (47.7%) • Monitoring - Monitoring compliance with medication (27.9%)	Higher agreement: • Patient education - Education related to medications, i.e. directions for use Lower agreement: • Prescription review (clinical aspects) • Patient education - Education related to medications, i.e. common/important adverse effects - Education on lifestyle: exercise, diet • Monitoring - Monitoring compliance with medications - Monitoring outcomes (inquiring about glycaemic control and problems)		Priorities: • Patient education - Education related to medications: directions for use (64.5%); storage requirements (26.6%); common/ important adverse effects (25.5%) • Monitoring - Monitoring compliance with medications (37.3%)

[*]Chapter 3: Pharmacist survey
[†]Chapter 5: Qualitative study (interviews of pharmacists and doctors)
[‡]Chapter 4: Patient survey

Table 6.3 Factors (potential/actual) associated with the development of pharmacy-based services for type 2 diabetes patients

		Facilitators	Barriers
Pharmacist	Attitude	- Pharmacists generally reported positive views towards services beyond dispensing[*†]; a positive view of a service was a facilitator for providing the service[*]	
	Competence	- Training was a facilitator for providing some services beyond dispensing[*]	- Perceived lack of competence[†]
Relationships with doctors	Doctor's attitude	- Doctors' previous interactions with pharmacists contributed to positive attitudes[†]	- Lack of support – encroaching on doctors' clinical autonomy, lack of awareness, retailer image[†]
	Doctor's accessibility		- Low accessibility – difficult to contact, limited time[†]
Relationships with patients	Patient's attitude	- Patients' previous use of a pharmacy service, or those who had other risk factors for complications or poor/unknown glycaemic control, were associated with positive attitudes[‡]	- Lack of expectations[‡] - Lack of demand – lack of awareness, retailer image[†] - Patients who had higher income and not working were less supportive[‡]
	Patient's accessibility		- Low accessibility – not coming in person, having no time, not coming on a regular basis[†]

Table 6.3 (continued)

		Facilitators	Barriers
Pharmacy environment	Current utilisation	- Number of diabetes customers was a facilitator for providing some services beyond dispensing[*]	- Approximately 80% of pharmacies had ≤2,000 customers with ≤100 diabetes customers[*]
	Practice orientation	- Professional orientation[†]	- Business orientation[†] - Approximately 70% of pharmacies were owned by non-'pharmacist manager' (proprietor)[*]
	Staff resources	- Task delegation[†]	- Lack of staff (suitably qualified)[†]
	Pharmacist availability/time	- High pharmacist availability was a facilitator for providing some services beyond dispensing[*]	- Lack of pharmacist availability (less than 20% of pharmacies had a pharmacist available at all times),[†*] and lack of time[†] - Low pharmacist availability was a barrier to some services beyond dispensing[*]
	Operational	- Counselling areas/rooms;[†] availability of a counselling area/room or setting within a doctor clinic were facilitators for providing some services beyond dispensing[*] - Protocols/procedures[†]	- Only 21.8% of pharmacies had counselling areas/rooms[*] - Difficulty to maintain PMRs[†] - Poor labelling, and lack of other written information[†]
External environment	Organisation of roles	- A health system to support delegation of roles to pharmacists[†]	- Lack of a health system to support pharmacist roles (doctor dominance)[†]
	Financing	- Remuneration system[†]	
	Marketing	- Raising public awareness[†]	
	Assistance (profession-wide)	- Training for pharmacists[†] - Mentors[†]	

Abbreviations: PMR, patient medication record
[*]Chapter 3: Pharmacist survey
[†]Chapter 5: Qualitative study (interviews of pharmacists and doctors)
[‡]Chapter 4: Patient survey

6.3 General discussion

This study is the first in Indonesia to provide a comprehensive picture of community pharmacy-based services for type 2 diabetes patients, incorporating information from three main stakeholder groups, i.e. pharmacists (survey and interview), patients (survey), and doctors (interview). In health services research, triangulation provides different perspectives on issues in relation to a research question, and enhances the validity of research findings.[145] This study is an important addition to the body of knowledge regarding community pharmacy practice in type 2 diabetes care (Table 2.11), potential development of services (Tables 2.12, 2.13, and 2.14), and factors associated with service delivery (Tables 2.15 and 2.16), which previously had been derived only from studies in developed country. The findings should assist national bodies in designing programmes and support for the development of Indonesian community pharmacy practice in the area of type 2 diabetes.

6.3.1 Current pharmacy-based services for type 2 diabetes patients

Indonesia is a country with a growing type 2 diabetes epidemic. Using the International Diabetes Federation (IDF) Diabetes Atlas update data in 2013,[1] it was estimated that 8.5 million people in Indonesia were living with diabetes, and this is expected to increase to 14.1 million by 2035.[1] Thus, the Indonesian Government has included diabetes as a national health priority area.[5] In line with this, pharmaceutical care was included within Indonesian legislation (Ministry of Health Republic of Indonesia decree No. 1027/MENKES/SK/IX/2004: Standards for Pharmaceutical Care in Community Pharmacies; see Section 2.2.4.3), emphasising the need for community pharmacists to be more involved in the care of patients with chronic diseases, including diabetes.

This present study, however, found that community pharmacies provided limited services for type 2 diabetes patients. Both quantitative and qualitative findings indicated that the common practice has been supplying medications (with limited

labelling) and providing basic medication education, mainly directions for use (Table 6.1). Previous Indonesian studies, although not specific to diabetes care, have confirmed this limited role of community pharmacists.[24-26]

6.3.2 Views on pharmacists' roles in type 2 diabetes care

The findings indicated that pharmacists generally had positive views about expanding their roles in diabetes care; however doctors and patients generally reported a lower level of expectation (Table 6.2). Using pharmacists', doctors' and patients' consensus on the roles of community pharmacists, potential areas of development of pharmacy services are discussed below.

a) Dispensing (labelling)

While dispensing has been commonly practised in Indonesian community pharmacies, some pharmacists and doctors in this study considered labelling needed to be improved. The typical pharmacy label was reported to include the patient's name and individual directions for use, in addition to the general information, such as date of dispensing and pharmacy details. Although such a label is considered adequate to meet the Indonesian standards (see Section 2.2.4.3), the FIP Working Group for Labelling has recommended that the minimum information should include the patient's name, generic name (product name) and strength of the medicine, and directions for use.[162] This present study also identified ambiguities in providing information other than that requested on the prescription. This may be due to the lack of guidance within the standards regarding ancillary labels (see Section 2.2.4.3). Formal ancillary labels or Cautionary and Advisory Labels (CALs), as used in the UK[163] or Australia,[164] have been reported to offer a convenient and effective means of reinforcing pharmacists' verbal consultations in providing instructions on the safe and correct use of medications.[164] Thus, the Government and *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association) should consider developing specific standards for pharmacy labelling (e.g. content and format of basic labels, the range of ancillary labels, and list of drugs requiring labels) to provide a regulatory

foundation for practice. The use of IT systems for dispensing also would assist in improving labelling practice in Indonesia.

b) Prescription review (clinical aspects)

Doctors and pharmacists are health professionals who communicate via a prescription (from the prescriber to the dispenser). They should share responsibility for the appropriateness of the medications prescribed. For this reason, the Indonesian standards require pharmacists to assess prescriptions for their administrative, pharmaceutical and clinical appropriateness at the point of dispensing.[23]

Our findings showed some level of agreement between pharmacists and doctors towards pharmacists checking for appropriateness of prescription (clinical aspects), such as dosage errors, duplication or interactions. In developed countries, a high level of support from doctors and patients has been reported (Tables 2.13 and 2.14). While clinical assessment of prescriptions has not consistently been performed in Indonesian community pharmacies, this should be considered as a potential area of development. Checking prescriptions may require pharmacists to refer back to the doctors for clarification. This presents an opportunity for pharmacists to start professional interactions with doctors and establish awareness of each other's roles. The use of IT systems for dispensing would provide better access to PMRs, which is essential in performing prescription review.

c) Patient education (medications and lifestyle)

Diabetes education is a critical element of care and is necessary to improve patient outcomes.[37, 46] Based on the Indonesian standards (see Section 2.2.4.3), it is the pharmacists' responsibility to provide adequate education about dispensed medicines. International studies have reported strong support from pharmacists, doctors and patients for community pharmacists to provide education related to medications (Tables 2.12, 2.13, and 2.14). While this present study reported that the

current practice in Indonesia is generally limited to providing basic information on dosage instructions, some of the pharmacists, doctors and patients agreed that this should be expanded to include important/common adverse effects (particularly how to recognise and treat hypoglycaemia). Moreover, doctors and pharmacists showed some agreement that community pharmacists should reinforce education about healthy living (particularly exercise and diet) provided by doctors. This is particularly important, as the qualitative findings indicated that doctors often have limited time for consultation. In addition to the current practice of communicating verbally with patients, written information [such as Consumer Medicine Information (CMI)[165] or the Self Care Fact Card[166] practised in Australia] should be considered to reinforce the communication.

d) Monitoring (compliance and treatment outcomes)

The Government Standards require pharmacists to monitor the use of dispensed medications (see Section 2.2.4.3). Although monitoring of type 2 diabetes patients has not been a common practice in Indonesian community pharmacies, pharmacists, patients and doctors all showed some agreement in regard to pharmacists monitoring compliance with medications, as well as monitoring treatment outcomes (i.e. inquiring of patients regarding their diabetes control and problems, and referring patients to doctors if any concerns arise).

As for diabetic patients with stable long-term treatment, the qualitative findings indicated that doctors made variable arrangements for follow-up visits, from monthly to biannually. For the longer intervals, community pharmacists would have the opportunity to provide targetted monitoring of patients presenting with repeat prescriptions. In countries such as Australia[170] and the UK[171], a formal repeat dispensing scheme has been established. The scheme enables community pharmacists to dispense medications for such patients at regular intervals for a defined period of time (e.g. monthly for a period of six months). At the point of each dispensing, the pharmacist should be responsible for checking patient compliance (e.g. through a PMR or number of refills of prescription, or via a discussion with the

patient) and other clinical factors (i.e. checking if the patient achieved their targets or experienced adverse effects); if there were any problems, the pharmacist would refer the patient back to the doctor. It was reported that repeat dispensing by pharmacists offers advantages for patients, doctors and pharmacists alike.[172, 173] Adopting formalised repeat dispensing in the Indonesian setting would enable doctors to lengthen the interval between visits while using community pharmacists to maintain monitoring between visits, thus improving the efficient use of the limited medical and pharmaceutical workforce in Indonesia (see Section 2.2.3.3).

e) Medication review

Although medication review (beyond prescription review) has not currently been seen as a priority in this Indonesian study, particularly by doctors, taking direct responsibility for individual patients' medication-related needs is important for the professional development of pharmacists and their better integration into the healthcare team. Various formats of medication review have been practised, from reviews consisting mostly of patient counselling aimed at improving medicine use [e.g. Medication Use Review (MUR) in the UK[167] and Diabetes MedsCheck in Australia[168]] to comprehensive clinical medication reviews [e.g. Medication Therapy Management (MTM) in the USA[169]].

In Australia, Diabetes MedsCheck is offered to patients who have been recently diagnosed with type 2 diabetes (in the last 12 months) or whose type 2 diabetes is less than ideally controlled. It is a structured pharmacy service which takes place in the pharmacy, involving face-to-face consultations between the pharmacist and patient. The elements include gathering patient medication and medical history, reviewing and discussing the use of all medicines and medication/monitoring devices, and making recommendations to the patient and his/her doctor, if appropriate. It is undertaken by community pharmacists, without the need for referrals from doctors.[168] MTM involves a more comprehensive procedure in which the pharmacist undertakes a review to address issues relating to the patient's use of

medicines within the context of their clinical conditions.[169] More complex procedures require additional access to patients' specific information, collaboration with doctors, and both training and skill development for the pharmacist. Considering the baseline of pharmacy practice in Indonesia, medication use review, within the scope of Diabetes MedsCheck, would be the most feasible first step to be piloted in an Indonesian setting.

6.3.3 Factors associated with the development of pharmacy-based services for type 2 diabetes patients

The surveys and interviews have identified a number of factors (actual and potential) associated with service delivery for type 2 diabetes patients in Indonesian community pharmacies. These include issues related to the pharmacists, their relationships with doctors, their relationships with patients, the pharmacy environment and the external environment (Table 6.3). Although the findings showed similar types of factors as those from international studies (Tables 2.15 and 2.16), this study provided an understanding within the context of the Indonesian health system. This study has broadened the findings from previous qualitative studies in Indonesia which were focused on the competence and availability of pharmacists.[25, 27]

a) Pharmacy environment and external environment

The pharmacist survey indicated a low utilisation of community pharmacies in Surabaya, Indonesia, where the majority of them had less than 2,000 customers per month. In 2012, about 65% of the Indonesian population was covered by some form of insurance plan, largely through *Jamkesmas* (insurance for the poor/near poor),[56] via which a limited range of medications can be supplied in health centres. Those who can afford care were reported to prefer using secondary and tertiary care levels (e.g. hospital-based facilities),[2, 8] thus, their medications were mainly supplied from

hospital-based pharmacies. Many drug stores are also known to sell prescription drugs despite their licenses being to sell only non-prescription medications.[77] All of these considerations may contribute to the low number of customers in community pharmacies. Compounding this, the qualitative findings indicated a lack of organisation of roles between healthcare professionals (doctor dominance) to provide patient-focused and integrated care, thus further limiting the role of pharmacists.

On the other hand, Indonesia is facing a major deficiency in its health workforce (see Section 2.2.3.3), so one option is to optimise the use of currently underulitised community pharmacists. Starting in 2014, the Government will gradually establish *Jaminan Kesehatan Nasional − JKN* (National Health Coverage)[10] to provide healthcare to the entire population. Since a referral system is used, *JKN* will place most care in primary care levels, expecting an increase in the use of GP clinics as well as community pharmacies (as most of their customers are from doctor clinics). The scheme also will potentially diminish the illegal supply of prescribed medications from drug stores. It is important for the Government and *IAI* to establish a formal agreement regarding basic services that should be available in the pharmacies. An initial initiative should be provided to pilot advanced services; once evidence of improved outcomes is available, widespread implementation and remuneration can be negotiated under *JKN* or private health insurers.

It is a government requirement that prescribed medication should be issued by pharmacists (see Section 2.2.4.3), thus pharmacists should be available during pharmacy opening hours. This pharmacist survey, however, reported that less than 20% of the pharmacies in Surabaya potentially had pharmacists available throughout their opening hours. This may relate to the underutilisation of community pharmacies (lack of turnover/affordability). Compounding this, most of the pharmacies were not owned by the pharmacist manager. While supplying medication can be done in less expensive ways without exclusively using pharmacists, the proprietor may merely use the pharmacist to meet legal requirements with little/no obligation for him/her to be in the pharmacy (ensuring lower salary costs). On the other hand, because of their poor income, pharmacists might take on other jobs

resulting in them not being available at pharmacies. Two studies in Jakarta, Indonesia, have reported that about 70% of pharmacists worked in community pharmacies as their side jobs.[24, 26] As mentioned above, *JKN* is expected to improve utilisation of community pharmacies (more customers/prescriptions), thus increasing their turnover/affordability; in turn, *JKN* can be used to reinforce the requirement for community pharmacies to maintain pharmacists' presence to be eligible service providers. Community pharmacies may consider arranging their opening hours based on the availability of their pharmacists, or advertising periods of pharmacist availability to provide services (e.g. encompassing at least 80% of the opening hours). While the current payment under the *JKN* includes a very low prescription fee (see Section 2.2.4.4), the *IAI* should negotiate an adequate remuneration for pharmacists to provide agreed basic services, so that a stable environment is created for community pharmacies, enabling them to remain viable.

In addition to pharmacists being available, this present study indicated the importance of adequate staff and task delegation within the pharmacy. Hence, individual pharmacies need to assess their workload capacity; their priority should be to maintain pharmacist availability and, when necessary, pharmacy technicians can be used to assist with general dispensing duties. Other pharmacy resources discussed in this study were including professional procedures/protocols for specific services, PMRs, written information and appropriate labelling, and a consultation area/room. The use of protocols/procedures would be beneficial to ensure quality and consistency of service delivery, and the development of IT systems through *IAI* would markedly improve labelling quality and access to PMRs. Based on Government Standards, a pharmacy should have a private area/room dedicated to counselling (see Section 2.2.4.3). While the pharmacist survey reported only a small proportion of pharmacies having a consultation area/room, the qualitative findings indicated the importance of a consultation area/room to discuss personal/private issues.

b) Pharmacist

This present study reported that pharmacists generally had a positive attitude to the extension of their roles; however, there was an issue of competency to provide pharmaceutical care. In Indonesia, it was not until 2008 that pharmacotherapy subjects were included in the national pharmacy curricula,[79, 80] thus, a wide variation of pharmacotherapy knowledge is expected among earlier graduates. Limited pharmacotherapy knowledge among community pharmacists also was reported in a previous Indonesian study.[27] Currently, there are a variety of opportunistic CPE courses, some of which include general training in diabetes therapeutics. The pharmacist survey found that pharmacists who attended diabetes training appeared to want to perform more services for their patients. With the changes in pharmacy curricula (inclusion of pharmacotherapy), it would be expected that all new pharmacists would receive general diabetes training as part of their undergraduate degree programme. However, to deal with earlier graduates, the *IAI* should consider organising formal general diabetes training; when necessary, diabetes-specific CPE/CPD activities and an accreditation system can be developed for pharmacists seeking to specialise in diabetes care.

c) Relationships with doctors

In providing pharmaceutical care, pharmacists will need to develop collaborative practice with doctors.[12] The qualitative study indicated that the barriers to the pharmacist-doctor relationship were lack of support from the doctors and difficulty to access them. Thus, to introduce a diabetes service, the *IAI* should consider developing a formal liaison with doctor organisations to enhance understanding of pharmacist roles. Pharmacists would also need to explain the service to, and seek support from, the local doctors. It was suggested that building a relationship should start with professional awareness; during this stage, pharmacists should be the primary instigators to build the relationship (unilateral relationship).[157] While providing the service, pharmacists should demonstrate their values and build trustworthy relationships with doctors to achieve an effective collaboration for

improving patients' outcomes (increasing bilateral relationship).[157] It was suggested that doctors' attitudes correlated significantly with the relationship between doctors and pharmacists,[104] which is consistent with the statements from doctor interviews in this study.

d) Relationships with patients

Pharmacist interviews indicated that the barriers to pharmacist-patient relationships were lack of patient demand and difficulty accessing patients (e.g. many patients send another person to collect medicines). This might be due to the patients' lack of awareness as to pharmacists' roles, which was confirmed in the patient survey. Thus, to introduce a diabetes service, this study noted the importance of a nationwide promotional exercise to raise patients' awareness. The pharmacist would also need to make the patients aware of the service, e.g. asking simple questions about their medication at the first meeting. Once the patient has engaged with the service, it is important for the pharmacist to demonstrate its benefits to the patient. International studies have suggested that patients who had experience with a pharmacy service were more likely to support the provision of that service,[17, 22, 95, 130, 131] which also is evident from the patient survey in this study.

The Government and *IAI* should collaborate to optimise the use of community pharmacies by integrating their services into the primary care system and including adequate remuneration. Implementation of the services will require pharmacists to be available in the pharmacies, together with the availability of adequate pharmacy resources and close pharmacist-doctor-patient relationships.

6.4 Limitations

This research encountered several limitations, which have been described in detail in the preceding chapters. To provide a cohesive summary, the key limitations are reiterated here.

There was a possibility of non-response bias in the pharmacist survey (Chapter 3), thus, some caution should be exercised in generalising the findings. However, no significant differences in the responses between the first and second rounds of the survey were found; it has been suggested that late responders (i.e. the responses from the second round) may better reflect non-responders.[174] Moreover, results from the survey compared well with available data for the population,[153, 154] as well as with prior work in Indonesia.[24, 26]

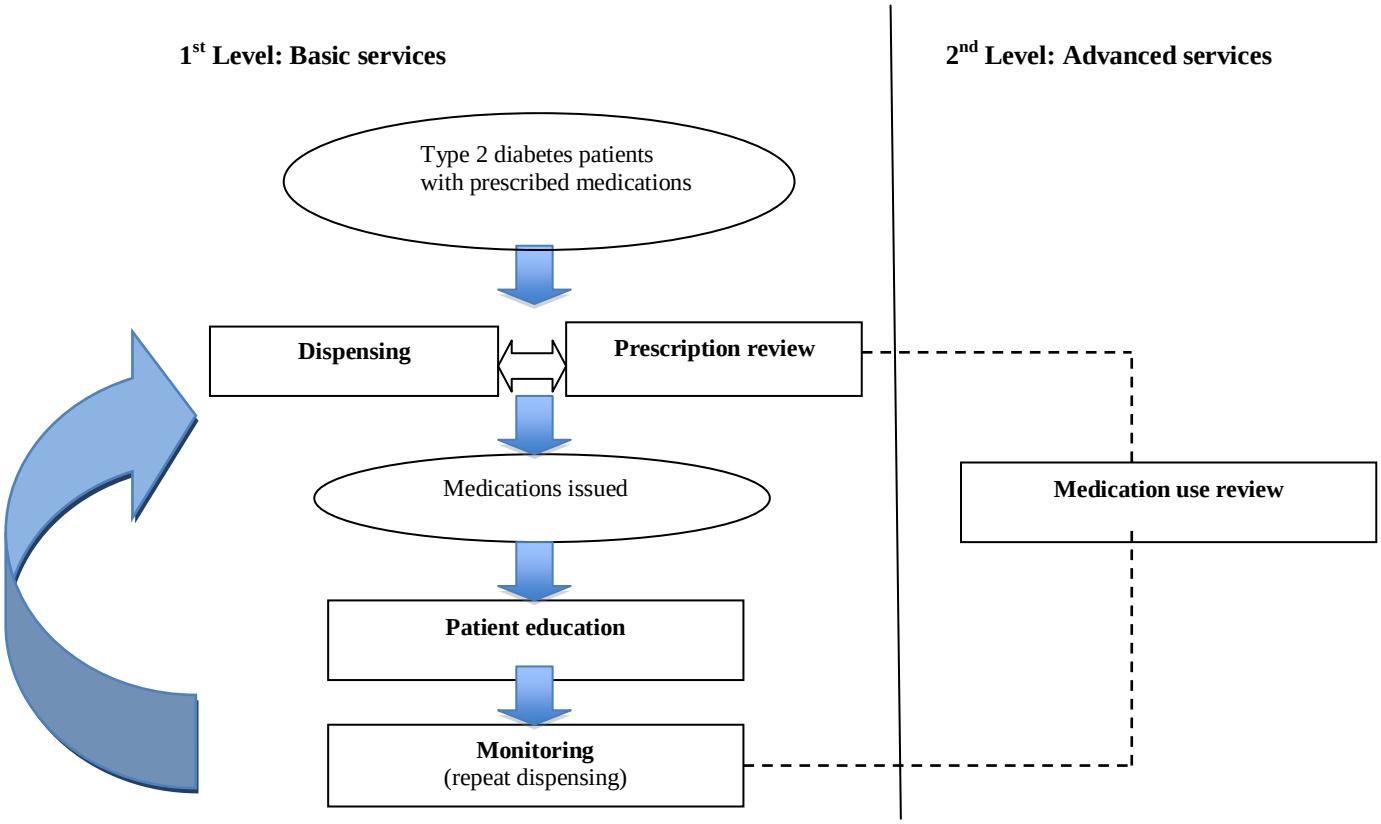
Another limitation was selection bias in the patient survey (Chapter 4), as the recruited pharmacy clients with type 2 diabetes did not constitute a random sample. Thus, some cautions should be used in generalising the findings. It should be emphasised, however, that the sampling points covered a range of geographical areas and socio-economic levels in Surabaya, and each of them were represented by an adequate potential sample. It was argued that, if a number of sites are used for sampling, diversity in a wider population may be reflected by differences in the sample.[145] Supporting this view, the characteristics of the respondents for this study were comparable to the available data for the Indonesian population.[2]

The qualitative data (Chapter 5) might be subject to bias if the respondents were not sharing their true responses. However, the potential bias in this study was possibly reduced owing to the lack of pre-determined pharmacist roles in diabetes care.

6.5 Developing a model of pharmacy-based services for type 2 diabetes patients

Based on the findings in this study (Section 6.2) and the previous discussion (Section 6.3), a two-level development of community pharmacy-based services for type 2 diabetes patients in Indonesia is discussed below.

Figure 6.1 Proposed model of community pharmacy-based services for type 2 diabetes patients



1st Level: Basic services

The first level should be considered as the basic services in Indonesian community pharmacies that should be offered to all patients with type 2 diabetes. Monitoring should be considered for any type 2 diabetes patients presenting with a repeat prescription.

Service	Components	Implementation requirements
Dispensing	• Select/prepare medications • Label medications • Provide ancillary labels (where appropriate)	• Personnel: - Pharmacist • IT requirements: - Software for dispensing – to support labelling practices, access to PMRs (prescription review), online verification of *JKN* entitlement and claiming • Infrastructure and staffing: - Counselling area/room - Pharmacy technician may assist in the dispensary (if required) • Training • Supporting standards, procedures and other materials: - Standards for labelling, including the use of ancillary labels - Protocols/procedures - Educational materials • Remuneration: - under *JKN*
Prescription review	• Review appropriateness of prescription, including identification of actual and potential DRPs (clinical aspects)	
Patient education	• Provide education related to medications (particularly directions for use and important/common adverse effects) • Reinforce general education on healthy living (particularly exercise and diet)	
Monitoring - at the point of repeat dispensing	• Monitor compliance with medications • Monitor treatment outcomes – inquire about patients' glycaemic control and problems • Refer to doctors if any concerns	

Abbreviations: IT, information technology; PMR, patient medication record; DRP, drug-related problem; *JKN*, *Jaminan Kesehatan Nasional* (National Health Coverage)

- **Personnel**

  The pharmacy should maintain a pharmacist in attendance during opening hours, or advertise periods when the pharmacist is available to provide the service (e.g. encompassing at least 80% of opening hours). Individual pharmacies will need to assess their workload capacity according to the volume of prescriptions dispensed. Based on the Standards for Pharmaceutical Care in Community Pharmacies (see Section 2.2.4.3), the overall responsibility for supply of prescription medications lies with the pharmacist. Pharmacy technicians can be used to assist in the dispensary, if required (e.g. in busier community pharmacies).

- **IT requirements**

  The *IAI* should consider the introduction and use of computerised dispensary systems to improve labelling practices. This would also help the pharmacist in maintaining PMRs and undertaking prescription reviews (e.g. detect drug to drug interactions, overdoses and similar clinical considerations in the dispensing process). With the introduction of *JKN*, the systems could be used as a tool for online verification of *JKN* entitlement and claims. Thus, dispensary computer systems should be seen as a fundamental step to improve patient care by contributing to the safe and effective dispensing of medicines.

- **Supporting standards, procedures and other materials**

  In addition to the current generic standard (Standards for Pharmaceutical Care in Community Pharmacies; Section 2.2.4.3):

  - The Government and *IAI* should consider developing specific standards for pharmacy labelling that describes the minimum content and format of the label. The FIP recommendation for minimum information on the pharmacy label includes the patient's name, product name (generic name) and strength of the medicine, and directions for use (see Section 6.3.2a),[162] in addition to the general information, such as date of dispensing, an identifying code and pharmacy details. The standards should also consider including clear

guidance on the use of ancillary labels. Appropriate labelling is essential in providing instructions on the safe and correct use of medications.

- The *IAI* needs to develop service specific protocols/procedures to ensure quality and consistency of the service delivery.
- The *IAI*, in collaboration with patient organisations [such as *Persatuan Diabetes Indonesia – PERSADIA* (Indonesian Diabetes Association)], should consider providing written materials for patient education. In addition to appropriate labelling, other written educational materials should be considered to support verbal counselling.

- **Training**

  Pharmacy graduates should be trained to a level where they can confidently provide basic services upon registration. Service-specific training may assist the service delivery (e.g. how to use the dispensary software, patient recruitment, documentation).

- **Remuneration**

  The Government and *IAI* should ensure that community pharmacists receive adequate remuneration for basic services under *JKN*. The current method of payment under *JKN* includes the cost of the drug plus a small mark-up and a prescription fee (see Section 2.2.4.4). Adequate remuneration should be considered to create a stable environment that will enable community pharmacies to remain viable.

  With the introduction of *JKN*, the Government and *IAI* should consider piloting a repeat dispensing system for patients with stable long-term treatment (e.g. 6-month interval of visits). Evidence from the pilot with regard to patient outcomes and related health care costs could be used to support a nationwide implementation of the system, thus enhancing the pharmacist's role in patient monitoring.

2nd Level: Advanced service

This second level for advanced services (e.g. medication use review) should be offered by accredited community pharmacies and pharmacists. This service would be offered to at-risk patients, e.g. type 2 diabetes patients who are newly diagnosed or less than ideally controlled.

Service	Components	Implementation requirements
Medication use review (Based on Diabetes MedsCheck in Australia; see Section 6.3.2e)[168]	• Gather patient history – medicines and medical conditions • Review the use of all medicines and monitoring devices, including: - Assess compliance - Monitor efficacy (glycaemic control) and adverse effects of drugs - Monitor disease progress (complications) - Assess education needs - Provide education and guidance on correct use of medications and monitoring devices - Discuss management of diabetes and other medical conditions, including lifestyle factors and self-management • Make recommendations to the patients and doctors, if appropriate	• Personnel: - Pharmacist • IT requirements: - Software to perform the service • Infrastructure and staffing: - Counselling area/room that allows for confidential consultation - Another pharmacist may be needed to manage professional activities within the pharmacy at the time of consultation • Training • Supporting standards, procedures and other materials • Funding: - Initial initiative (under agreement between the Government and *IAI*) - Potential remuneration from *JKN* or private health insurers

The Government and *IAI* should consider providing an initial initiative to pilot this advanced service. As part of the project, software, training, supporting standards, protocols and other materials would need to be developed. The pilot project would be beneficial in providing evidence on the clinical, humanistic and economic outcomes of the service, which could be used to justify its introduction into the system. This implementation would allow potential remuneration under *JKN* or private insurers. Meanwhile, the *IAI* should develop an accreditation system to determine the eligibility of community pharmacies and pharmacists to deliver this advanced service; for example, the pharmacy should have a consultation area/room and the pharmacist should complete formal diabetes-specific training which also includes medication use review. Later the range of advanced services could be expanded, over time, to better utilise community pharmacists, with the aim of improving the health of type 2 diabetes patients.

6.6 Conclusions

The current services provided for type 2 diabetes patients in Indonesian community pharmacies have been, mainly, dispensing (with limited labelling) and providing education related to medications, particularly directions for use. Better utilisation of community pharmacists is paramount in improving diabetes care in Indonesia. Pharmacists', doctors' and patients' views in this study have highlighted potential service developments. Firstly, the development should be focused on services with some level of agreement between the three stakeholder groups: dispensing (emphasising improved labelling), prescription review (clinical aspects), education (medication and lifestyle education), monitoring (monitoring compliance, and monitoring outcomes by inquiring about patients' glycaemic control and problems). Secondly, the development should be focused on pharmacists providing advanced diabetes services, such as providing medication use review, thus further expanding their professional roles.

A number of factors associated with the development of pharmacy services were identified, including factors related to the pharmacists, their relationships with doctors and with patients, the pharmacy environment and the external environment. The current utilisation of community pharmacies by the Indonesian population in Surabaya is remarkably low. Collaboration between the Government and *IAI* will be required to integrate pharmacy services into the primary health system under *JKN* and, thus, to deliver much increased customer traffic to more pharmacies. Otherwise, a large number should close down. Pharmacists should be immediately available at all opening hours, or for advertised periods (e.g. encompassing at least 80% of the opening hours). It is important to establish an appropriate remuneration for pharmacy services, so that a stable environment is created for the pharmacy community, enabling it to remain viable. The service implementation also will require adequate support and resources, including: training, IT systems, infrastructure and staffing, supporting standards, procedures and other materials.

Further research should be considered to involve the Government and *IAI* to validate the model and to use it as a basis for developing future pharmacy services/programmes. It will then be necessary to pilot the services/programmes to assess their feasibility and effectiveness.

References

1. International Diabetes Federation (IDF). IDF Diabetes Atlas 6th edition [Internet]. Brussels: IDF; 2013 [cited 2014 Jan 31]. Available from: http://www.idf.org/sites/default/files/EN_6E_Atlas_Full_0.pdf
2. Soewondo P, Soegondo S, Suastika K, Pranoto A, Soeatmadji D, Tjokroprawiro A. The DiabCare Asia 2008 study – outcomes on control and complications of type 2 diabetic patients in Indonesia. Med J Indon. 2010; 19(4):235-244.
3. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Riset Kesehatan Dasar − Riskerdas 2013. Jakarta: Kemenkes RI; 2013.
4. Fowler M. Microvascular and macrovascular complications of diabetes. Clin Diabetes. 2008; 26(2):77-82.
5. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Keputusan Menteri Kesehatan Republik Indonesia nomor HK.03.01/60/I/2010: Rencana Strategis Kementrian Kesehatan tahun 2010-2014. Jakarta: Kemenkes RI; 2010.
6. Novo Nordisk. Where economics and health meet: changing diabetes in Indonesia: the blueprint for change programme [Internet]. 2013 [cited 2013 May 11]. Available from:http://www.novonordisk.com/images/Sustainability/PDFs/Blueprint-for-change-Indonesia--52383_Korr19.pdf
7. Rokx C, Giles J, Satriawan E, Marzoeki P, Harimurti P, Yavuz E. New insights into the provision of health services in Indonesia: a health workforce study [Internet]. Washington: The World Bank; 2010 [cited 2014 Mar 11]. Available from: https://openknowledge.worldbank.org/bitstream/handle/10986/2434/538830PUB0Heal101Official0Use0Only1.pdf?sequence=1
8. Soewondo P, Ferrario A, Tahapary D. Challenges in diabetes management in Indonesia: a literature review. Global Health. 2013; 9(1):63.
9. Pemerintah Republik Indonesia. Undang-Undang Republik Indonesia nomor 40 tahun 2004: Sistem Jaminan Sosial Nasional. Jakarta: Sekretariat Negara Republik Indonesia; 2004.

10. Pemerintah Republik Indonesia. Peta jalan menuju Jaminan Kesehatan Nasional 2012-2019. Jakarta: Pemerintah Republik Indonesia; 2012.
11. Farris K, Fernandez-Llimos F, Benrimoj S. Pharmaceutical care in community pharmacies: practice and research from around the world. Ann Pharmacother. 2005; 39:1539-1541.
12. Berenguer B, La Casa C, de la Matta M, Martin-Calero M. Pharmaceutical care: past, present and future. Curr Pharm Des. 2004; 10(31):3931-3946.
13. Blenkinsopp A, Hassey A. Effectiveness and acceptability of community pharmacy-based interventions in type 2 diabetes: a critical review of intervention design, pharmacist and patient perspectives. Int J Pharm Pract. 2005; 13(4):231-240.
14. Adepu R, Rasheed A, Nagavi B. Effect of patient counseling on quality of life in type 2 diabetes mellitus patients in two selected South Indian community pharmacies: a study. Indian Journal of Pharmaceutical Sciences. 2007; 69(4):519-524.
15. Armour C, Taylor S, Hourihan F, Smith C, Krass I. Implementation and evaluation of Australian pharmacists' diabetes care services. J Am Pharm Assoc. 2004; 44(4):455-466.
16. Krass I, Armour C, Mitchell B, Brilliant M, Dienaar R, Hughes J, et al. The Pharmacy Diabetes Care Program: assessment of a community pharmacy diabetes service model in Australia. Diabet Med. 2007; 24(6):677-683.
17. Hughes J. Final report: customised education programs for patients with diabetes mellitus − use of structured questionnaires and education modules (DMEP Study). Perth: Curtin University of Technology; 2006.
18. Correr C, Melchiors A, Fernandez-Llimos F, Pontarolo R. Effects of a pharmacotherapy follow-up in community pharmacies on type 2 diabetes patients in Brazil. Int J Clin Pharm. 2011; 33(2):273-280.
19. Pinto S, Bechtol R, Partha G. Evaluation of outcomes of a medication therapy management program for patients with diabetes. J Am Pharm Assoc. 2012; 52(4):519-523.

20. Wermeille J, Bennie M, Brown I, McKnight J. Pharmaceutical care model for patients with type 2 diabetes: integration of the community pharmacist into the diabetes team - a pilot study. Pharm World Sci. 2004; 26(1):18-25.
21. Fornos J, Andre´s N, Andre´s J, Guerra M, Egea B. A pharmacotherapy follow-up program in patients with type 2 diabetes in community pharmacies in Spain. Pharm World Sci. 2006; 28(2):65-72.
22. Abduelkarem A, Sackville M. Changes of some health indicators in patients with type 2 diabetes: a prospective study in three community pharmacies in Sharjah, United Arab Emirates. Libyan J Med. 2009; 4(1):31-36.
23. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Keputusan Menteri Kesehatan nomor 1027/MENKES/SK/IX/2004: standar layanan kefarmasian di apotek. Jakarta: Kemenkes RI; 2006.
24. Purwanti A, Harianto, Supardi S. Gambaran pelaksanaan standar pelayanan farmasi di apotek DKI Jakarta. Majalah Ilmu Kefarmasian. 2004; 1(2):102-115.
25. Herman M, Sasanti R, Raharni, Siahaan S. Analisis faktor internal dan eksternal yang terkait dengan model pelayanan prima di apotek. Bulletin Penelitian Sistem Kesehatan. 2008; 11(2):145-155.
26. Zurmatias R. Pharmaceutical services in community pharmacy in Jakarta [dissertation]. Bangkok: Chulalongkorn University; 2007.
27. Herman M, Susyanty A. Kajian praktek kefarmasian oleh apoteker di apotek komunitas. Buletin Penelitian Sistem Kesehatan. 2012; 15(3):271-281.
28. Handayani R, Raharni, Gitawati R. Persepsi konsumen apotek terhadap pelayanan apotek di tiga kota di Indonesia. Makara Kesehatan. 2009; 13(1):22-26.
29. Smith F. The quality of private pharmacy services in low and middle-income countries: a systematic review. Pharm World Sci. 2009; 31(3):351-361.
30. Simpson S, Haggarty S, Johnson J, Schindel T, Ross T, Lewanczuk R. Survey of pharmacist activities and attitudes in diabetes management. Can Pharm J. 2009; 142(3):127-134.

31. Douglas E, Power A, Hudson S. Pharmaceutical care of the patient with diabetes mellitus: pharmacsts' priorities for services and educational needs in Scotland. Int J Pharm Pract. 2007; 15(1):47-52.
32. Abduelkarem A, Sackville M, Morgan R, Sackville M, Hildreth A. Views and practices of community pharmacists regarding services for people with type 2 diabetes. Int J Pharm Pract 2003; 11(3):161-168.
33. Younis W, Campbell S, Slack M. Pharmacists' attitudes toward diabetes and their involvement in diabetes education. Ann Pharmacother. 2001; 35(7):841-845.
34. Kjome R, Sandberg S, Granås A. Diabetes care in Norwegian pharmacies: a descriptive study. Pharm World Sci 2008; 30(2): 191-198.
35. Plake K, Chesnut R, Odorzynski M. Barriers to community pharmacists' provision of diabetes care services in Iowa. J Pharm Technol. 2007; 23(6):327-338.
36. Diabetes Australia. Diabetes management in general practice: guidelines for type 2 diabetes 2012/13. Canberra: Diabetes Australia Limited; 2012.
37. American Diabetes Association. Standards of medical care in diabetes - 2013. Diabetes Care. 2013; 36 Suppl 1:S11-66.
38. Pinhas-Hamiel O, Zeitler P. The global spread of type 2 diabetes mellitus in children and adolescent. J Pediatr. 2005; 146(5):693-700.
39. American Diabetes Association. Type 2 diabetes in children and adolescent. Diabetes Care. 2000; 23(3):381-389.
40. Boulton A, Vinik A, Arezzo J, Bril V, Feldman E, Freeman R, et al. Diabetic neuropathies: a statement by the American Diabetes Association. Diabetes Care. 2005; 28(4):956-962.
41. World Health Organisation (WHO). Global data on visual impairments 2010 [Internet]. Geneva: WHO; 2012 [cited 2014 Feb 11]. Available from: http://www.who.int/blindness/GLOBALDATAFINALforweb.pdf
42. Roglic G, Unwin N, Bennett P, Mathers C, Tuomilehto J, Nag S, et al. The burden of mortality attributable to diabetes: realistic estimates for the year 2000. Diabetes Care. 2005; 28(9):2130-2135.

43. World Health Organisation (WHO). Definition, diagnosis and classification of diabetes mellitus and its complications. Part 1: Diagnosis and classification of diabetes mellitus [Internet]. Geneva: WHO; 1999 [cited 2014 Feb 11]. Available from: http://www.who.int/blindness/GLOBALDATAFINAL forweb.pdf
44. Kaku K. Pathophysiology of type 2 diabetes and its treatment policy. JMAJ. 2010; 53(1):41-46.
45. Stumvoll M, Goldstein B, van Haeften T. Type 2 diabetes: principles of pathogenesis and therapy. Lancet. 2005; 365(9467):1333-1346.
46. Perkumpulan Endokrinologi Indonesia (PERKENI). Konsensus pengendalian dan pencegahan diabetes mellitus tipe 2 di Indonesia 2011 [Internet]. Jakarta: PERKENI; 2011 [cited 2012 June 20]. Available from: http://www.perkeni.org/
47. American Diabetes Association, and European Association for the Study of Diabetes. Medical management of hyperglycemia in type 2 diabetes: a consensus algorithm for the initiation and adjustment of therapy. Diabetes Care. 2009; 32(1):193-203.
48. Rossi S, editor. Australian Medicines Handbook 2014. Adelaide: Australian Medicines Handbook Pty Ltd; 2014.
49. American Association of Clinical Endocrinologists. Medical guidelines for clinical practice for the management of diabetes mellitus. Endocr Pract. 2007; 13 Suppl 1:S1-68.
50. Perkumpulan Endokrinologi Indonesia (PERKENI). Konsensus pengendalian dan pencegahan diabetes mellitus tipe 2 di Indonesia 2006 [Internet]. Jakarta: PERKENI; 2006 [cited 2012 June 20]. Available from: http://www.perkeni.org/
51. Power A, Douglas E, Mc Gregor A, Hudson S. Professional development of pharmaceutical care in type 2 diabetes mellitus: a multidisciplinary conceptual model. Int J Pharm Pract. 2006; 14(4): 289-299.

52. Department of Health Western Australia. Diabetes model of care [Internet]. Perth: Department of Health Western Australia; 2008 [cited 2012 June 20]. Available from: http://www.healthnetworks.health.wa.gov.au/modelsofcare/docs/Diabetes_Model_of_Care.pdf
53. Badan Pusat Statistik (BPS), Badan Kependudukan dan Keluarga Berencana Nasional (BKKBN), and Kementrian Kesehatan (Kemenkes), and ICF International. Indonesia demographic and health survey 2012. Jakarta: BPS, BKKBN, Kemenkes, and ICF International; 2013
54. World Health Organisation (WHO). WHO country cooperation strategy 2007-2011: Indonesia [Internet]. New Delhi: WHO; 2008 [cited 2014 February 20]. Available from: http://www.who.int/countryfocus/cooperation_strategy/ccs_indonesia_2007_2011_en.pdf
55. Tan CK, Aslam M. The development of clinical pharmacy in Indonesia. Pharm J. 2000; 264(7098):817-819.
56. Rokx C, Schieber G, Harimurti P, Tandon A, Somanathan A. Health financing in Indonesia: a reform road map [Internet]. Washington DC: The World Bank; 2009 [cited 2014 March 12]. Available from: http://siteresources.worldbank.org/HEALTHNUTRITIONANDPOPULATION/Resources/Peer-Reviewed-Publications/HealthFinancinginIndonesiaAReformRoadMap2009.pdf
57. Badan Pusat Statistik (BPS). Sensus penduduk 2010 [Internet]. Jakarta: BPS; 2010 [cited 2014 Mar 12]. Available from: http://sp2010.bps.go.id/
58. Badan Pusat Statistik (BPS). Statistik Indonesia 2012 [Internet]. Jakarta: BPS; 2012 [cited 2012 Mar 12]. Available from: http://www.bps.go.id/hasil_publikasi/si_2012/index3.php?pub=Statistik%20Indonesia%202012
59. Pemerintah Republik Indonesia. Undang-Undang Republik Indonesia nomor 32 tahun 2004: pemerintahan daerah. Jakarta: Sekretariat Negara Republik Indonesia; 2004.
60. World Health Organisation (WHO). Country health system profile: Indonesia [Internet]. Geneva: WHO; 2007 [cited 2010 Jul 27]. Available from: http://209.61.208.233/EN/Section313/Section1520_6822.htm

61. World Health Organisation. NCD country profiles: Indonesia [Internet]. Geneva: WHO; 2011 [cited 2014 Feb 12]. Available from: www.who.int/nmh/countries/idn_en.pdf
62. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Pedoman pengendalian diabetes dan melitus dan penyakit metabolik. Jakarta: Kemenkes RI; 2008.
63. Kementrian Kesehatan Republik Indonesia. Indonesia health profile 2012 [Internet]. Jakarta: Kemenkes RI; 2013 [cited 2014 Mar 20]. Available from: http://depkes.go.id/downloads/Profil%20Kesehatan_2012%20(4%20Sept%202013).pdf
64. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Diabetes Melitus penyebab kematian nomor 6 di dunia: Kemenkes tawarkan solusi CERDIK melalui POSBINDU [Internet]. Jakarta: Kemenkes RI; 2013 [cited 2014 Mr 20]. Available from: http://www.depkes.go.id/index.php?vw=2&id=2383.
65. World Diabetes Foundation (WDF). Improving diabetes health care delivery WDF06-173 [Internet]. Gentofte: WDF; 2014 [cited 2014 Feb 15]. Available from: http://www.worlddiabetesfoundation.org/projects/indonesia-wdf06-173
66. World Diabetes Foundation (WDF). Diabetic retinopathy training and treatment WDF08-335 [Internet]. Gentofte: WDF; 2014 [cited 2014 Feb 15]. Available from: http://www.worlddiabetesfoundation.org/projects/indonesia-wdf08-335
67. World Diabetes Foundation (WDF). Prevention and control of diabetes WDF08-328 [Internet]. Gentofte: WDF; 2014 [cited 2014 Feb 15]. Available from: http://www.worlddiabetesfoundation.org/projects/ dW-, indonesia-wdf08-328
68. World Diabetes Foundation (WDF). Diabetes education and prevention WDF05-136 [Internet]. Gentofte: WDF; 2014 [cited 2014 Feb 15]. Available from: http://www.worlddiabetesfoundation.org/projects/indonesiawdf05-136
69. World Diabetes Foundation (WDF). Diabetes foot care WDF08-315 [Internet]. Gentofte: WDF; 2014 [cited 2014 Feb 15]. Available from: http://www.worlddiabetesfoundation.org/projects/indonesia-wdf08-315

70. World Diabetes Foundation (WDF). Diabetes nurses WDF11-586 [Internet]. Gentofte: WDF; 2014 [cited 2014 Feb 15]. Available from: http://www.worlddiabetesfoundation.org/projects/indonesia-wdf11-586
71. World Diabetes Foundation (WDF). Diabetes prevention and care at primary care level WDF08-314 [Internet]. Gentofte: WDF; 2014 [cited Feb 15, 2014]. Available from: http://www.worlddiabetesfoundation.org/projects/indonesia-wdf08-314
72. Pemerintah Republik Indonesia. Undang-undang Republik Indonesia nomor 44 tahun 2009: Rumah Sakit. Jakarta: Sekretariat Negara Republik Indonesia; 2009.
73. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Peraturan Menteri Kesehatan Republik Indonesia nomor 001 tahun 2012: sistem rujukan pelayanan kesehatan perorangan. Jakarta: Kemenkes RI; 2012.
74. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Keputusan Menteri Kesehatan Republik Indonesia nomor 128/MENKES/SK/II/2004: Kebijakan dasar Pusat Kesehatan Masyarakat. Jakarta: Kemenkes RI; 2004
75. Pemerintah Republik Indonesia. Peraturan Pemerintah nomor 51 tahun 2009: pekerjaan kefarmasian. Jakarta: Pemerintah Republik Indonesia; 2009.
76. World Health Organisation (WHO). National Health Accounts – Indonesia [Internet]. Geneva: WHO; 2011 [cited 2014 Jan 22]. Available from: http://apps.who.int/nha/database/StandardReport.aspx?ID=REP_WEB_MINI_TEMPLATE_WEB_VERSION&COUNTRYKEY=84604
77. Wang H, McEuen M, Mize L, Cisek C, Private sector in Indonesia: a desk review [Internet]. Bethesda: Health Systems 20/20 project Abt Associates Inc.; 2009 [cited 2014 Feb 20]. Available from: http://www.healthsystems2020.org/content/resource/detail/2355/
78. Ikatan Apoteker Indonesia (IAI). News: penyebaran apoteker belum merata [Internet]. Jakarta: IAI. 2013 [cited 2014 Mar 20]. Available from: http://www.ikatanapotekerindonesia.net/pharmacy-news/34-pharmacy-news/2041-penyebaran-apoteker-belum-merata.html.
79. Asosiasi Perguruan Tinggi Farmasi Indonesia (APTFI). Kurikulum program pendidikan sarjana farmasi [Internet]. Surabaya: APTFI; 2008 [cited 2014 Mar

20]. Available from: http://aptfi.or.id/files/kurikulum-inti-program-pendidikan-sarjana-farmasi.pdf

80. Asosiasi Perguruan Tinggi Farmasi Indonesia (APTFI). Kurikulum program pendidikan apoteker [Internet]. Yogyakarta: APFI; 2008 [cited 2012 Mar 1]. Available from: http://aptfi.or.id/files/Kurikulum%20Program%20 Pendidikan%20Apoteker.pdf
81. Ikatan Apoteker Indonesia (IAI). Surat Keputusan Pengurus Pusat Ikatan Apoteker Indonesia nomor 058/SK/PP.IAI/IV/2011: standar kompetensi apoteker Indonesia [Internet]. Jakarta: IAI; 2011 [cited 2012 Mar 1]. Available from: www.ikatanapotekerindonesia.net
82. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Peraturan Menteri Kesehatan nomor 889/MENKES/PER/V/2009: registrasi, izin praktik, dan izin kerja tenaga kefarmasian. Jakarta: Kemenkes RI; 2011.
83. Ikatan Apoteker Indonesia (IAI). Program kerja Ikatan Apoteker Indonesia. Jakarta: IAI; 2011 [cited 2013 April 25]. Available from: http://www.ikatanapotekerindonesia.net/about-iai/strategic-plan/1074-evaluasi-program-kerja-2011.html
84. Fédération Internationale Pharmaceutique (FIP). FIP statement of professional standards: Pharmaceutical Care [Internet]. The Hague: FIP; 1998 [cited 2014 Feb 1]. Available from: http://www.fip.org/www/uploads/database_file. php?id =269&table_id.
85. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Petunjuk teknis standar pelayanan kefarmasian di apotek (SK nomor 1027/MENKES/SK/IX/2004). Jakarta: Kemenkes RI; 2008.
86. World Health Organization (WHO). The role of the pharmacist in self-care and self-medication [Internet]. The Hague: WHO; 1998 [Available from: http://apps.who.int/medicinedocs/en/d/Jwhozip32e/3.1.html
87. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Standar pelayanan farmasi di apotek. Jakarta: Kemenkes RI; 2003.
88. World Health Organisation (WHO). Good Pharmacy Practice in community and hospital settings. Geneva: WHO; 1996.

89. Fédération Internationale Pharmaceutique (FIP). Standards for quality of pharmacy services: Good Pharmacy Practice. The Hague: FIP; 1997.
90. Kementrian Kesehatan Republik Indonesia (Kemenkes RI). Surat Edaran nomor HK/MENKES/31/2014: pelaksanaan standar tarif pelayanan kesehatan pada fasilitas kesehatan tingkat pertama dan fasilitas kesehatan tingkat lanjutan dalam penyelenggaraan program jaminan kesehatan. Jakarta; Kemenkes RI; 2014.
91. Cranor C, Bunting B, Christensen D. The Asheville Project: long-term clinical and economic outcomes of a community pharmacy diabetes care program. J Am Pharm Assoc. 2003; 43(2):173-184.
92. Bliss E, Codack H, Boothe J. Diabetes care - an evaluation of a community pharmacy based HbA(1c) testing service. Pharm J. 2001; 267:264-266.
93. Berringer R, Shibley M, Cary C, Pugh C, Rafi J. Outcomes of a community pharmacy based diabetes monitoring program. J Am Pharm Assoc. 1999; 39(6):791-797.
94. Swain J, Macklin R. Individualised diabetes care in a rural community pharmacy. J Am Pharm Assoc. 2001; 41(3): 458-461.
95. Fera T, Bluml B, Ellis W, Schaller C, Garrett D. The diabetes ten city challenge: interim clinical and humanistic outcomes of a multisite community pharmacy diabetes care program. J Am Pharm Assoc. 2008; 48(2):181-190.
96. Krass I, Stephenson S, Thuis U, Hourihan F, Taylor S, Armour C. Increasing adherence to medications through delivery of a disease management service for type 2 diabetes in community pharmacies. J Soc Adm Pharm. 2002; 19: 211.
97. Grant R, Devita N, Singer D, Meigs J. Improving adherence and reducing medication discrepancies in patients with diabetes. Ann Pharmacother. 2003; 37(7-8): 962-969.
98. Rajei-Dehkordi Z, Hollingshead C, Herkes D, Holden M, Rao S. Investigating the contribution of community pharmacists in identifying, understanding and meeting the needs of patients with diabetes, in collaboration with other health care professionals. Int J Pharm Pract. 2003; 11(1):R18.

99. Storimans J. Pharmaceutical care in diabetes: Quantifying and evaluating community pharmacy's support to patients performing blood glucose self-monitoring [dissertation]. Uthrecht, the Netherlands: Utrecht University; 2005.
100. Timmer J, de Smet P, Schuling J, Tromp T, de Jong-van den Berg L. Patient education to users of oral hypoglycaemic agents: the perspective of Dutch community pharmacists. Pharm World Sci. 1999; 21(5):200-204.
101. Stewart K, O'Shea J, McCaig D. Agreement of practitioners with the recommendations of the 'Guidelines for community pharmacists on the care of patients with diabetes'. J Soc Adm Pharm. 2003; 20(1):13-17.
102. Adepu R, Nagavi B. General practitioners' perceptions about the extended roles of the community pharmacists in the state of Karnataka: a study. 2006; 68(1):36-40.
103. Sarriff A, Nordin N, Hassali M. Extending the roles of community pharmacists: views from general medical practitioners. Med J Malay. 2012; 67(6):577-581.
104. Muijrers P, Knottnerus J, Sijbrandij J, Janknegt R, Grol R. Changing relationships: attitudes and opinions of general practitioners and pharmacists regarding the role of the community pharmacist. Pharm World Sci. 2003; 25(5):235-241.
105. Smith W, Ray M, Shannon D. Physician's expectations of pharmacists. Am J Health Syst Pharm. 2002; 59(1):50-57.
106. Bleiker P, Lewis A. Extending the role of community pharmacists: the views of GPs. Int J Pharm Pract. 1998; 6(3):140-144.
107. Wilbur K, Beniles A, Hammuda A. Physician perceptions of pharmacist roles in a primary care setting in Qatar. Global Health [Internet]. 2012 [cited 2014 Mar 6]; 8:12. Available from: http://www.globalizationhealth.com/content/ 8/1/12.
108. Bryant L, Coster G, Gamble G, McCormick R. General practitioners' and pharmacists' perceptions of the role of community pharmacists in delivering clinical services. Res Social Adm Pharm. 2009; 5(4):347-362.
109. Bradshaw S, Doucette W. Community pharmacists as patient advocates: physician attitudes. J Am Pharm Assoc. 1998; 38(5):598-602.

110. Abdullah N, Andrajati R, Supardi S. Pengetahuan, sikap dan kebutuhan pengunjung apotek terhadap informasi obat di kota Depok. Buletin Penelitian Sistem Kesehatan. 2010; 13(4):344-352.
111. Siew S, Kien P, Hong G. Utilisation of community pharmacists by the general public in Malaysia. Int J Pharm Pract. 2013; 21(1):66-69.
112. Hill P, Dowse R. Cognitive pharmaceutical services and the community pharmacist: are South African patients receiving them and are they willing to pay? Int J Pharm Pract. 2007; 15(3):201-208.
113. Ibrahim I, Al Tukmagi H, Wayyes A. Attitudes of Iraqi society towards the role of community pharmacists. Innov Pharm. 2013; 4(2):1-10.
114. Oparah A, Kikanme L. Consumer satisfaction with community pharmacies in Warri, Nigeria. Res Social Adm Pharm. 2006; 2(4):499-511.
115. Catic T, Jusufovic F, Tabakovic V. Patients perception of community pharmacist in Bosnia and Herzegovina. Mater Sociomed. 2013; 25(3):206-209.
116. Abduelkarem A, Sackville M, Morgan R, Hildreth A. An assessment of the level of type 2 diabetes patients' satisfaction with community pharmacists' services. Pharm J. 2003; 270(7242):446-449.
117. Weitzman A, McDowell K, Elswick B, Blommel M. Patient perceptions of pharmacists' role in diabetes: results of an Operation Diabetes initiative. J Am Pharm Assoc. 2009; 49(6):716-717.
118. Brown C, Green A. Expectations of patients with diabetes for pharmaceutical care services in community pharmacy settings. J Soc Adm Pharm. 2000; 17: 219-223.
119. Hermansen-Kobulnicky C, Worley M. Exploring the patient perspective regarding community pharmacists' educational roles in diabetes medication and blood glucose management. Int J Pharm Pract. 2008; 16(2):81-90.
120. Twigg M, Poland F, Bhattacharya D, Desborough J, Wright D. The current and future roles of community pharmacists: views and experiences of patients with type 2 diabetes. Res Social Adm Pharm. 2013; 9(6):777-789.
121. Eades C, Ferguson J, O'Carroll R. Public health in community pharmacy: a systematic review of pharmacist and consumer views. BMC Public Health

[Internet]. 2011 [cited 2014 Mar 2014]; 11:582. Available from: http://www.biomedcentral.com/1471-2458/11/582

122. Wirth F, Tabone F, Azzopardi L, Gauci M, Zarb-Adami M, Serracino-Inglott A. Consumer perception of the community pharmacist and community pharmacy services in Malta. J Pharm Health Serv Res. 2010; 1(4):189-194.
123. Bell H, McElnay J, Hughes C. Societal perspectives on the role of the community pharmacist and community-based pharmaceutical services. J Soc Adm Pharm. 2000; 17(2):119-128.
124. El Hajj M, Salem S, Mansoor H. Public's attitudes towards community pharmacy in Qatar: a pilot study. Patient Prefer Adherence. 2011; 5:405-422.
125. Al-Arifi M. Patients' perception, views and satisfaction with pharmacists' role as health care provider in community pharmacy setting at Riyadh, Saudi Arabia. Saudi Pharm J. 2012; 20:323-330.
126. Cerulli J. Patients' perceptions of independent community pharmacists. J Am Pharm Assoc. 2002; 42(2):279-282.
127. Gidman W, Cowley J. A qualitative exploration of opinions on the community pharmacists' role amongst the general public in Scotland. Int J Pharm Pract. 2013; 21(5):288-296.
128. Williamson V, Winn S, Livingstone C, Pugh A. Public views on an extended role for community pharmacy. Int J Pharm Pract. 1992; 1(4):223-229.
129. Kassam R, Collins J, Berkowitz J. Patient satisfaction with pharmaceutical care delivery in community pharmacies. Patient Prefer Adherence. 2012; 6:337-348.
130. Garrett D, Martin L. The Ashville project: participants' perceptions of factors contributing to the success of a patient self management diabetes program. J Am Pharm Assoc. 2003; 43(2):185-190.
131. Hales J, Alderdice A, Staniford T, Manser J. Evaluation of the diabetes pilot program. Adelaide: Australian Government Department of Health and Ageing; 2010.
132. Tarn D, Paterniti D, Wenger N, Williams W, Chewning B. Older patient, physician and pharmacist perspectives about community pharmacists' roles. Int J Pharm Pract. 2013; 20(5):285-293.

133. Harding G, Taylor K. Pharmacy as a profession. In: Taylor K, Harding G, editors. PharmacyPractice. London: Taylor and Francis; 2001.
134. Hepler C, Stran L. Opportunities and responsibilities in pharmaceutical care. Am J Hosp Pharm. 1990; 47(3):533-543.
135. Young M, Stilling W, Munger M. Pharmacy practice acts: a decade of progress. Ann Pharmacother. 1999; 33(9):920-926.
136. Thornley T. Factors affecting service delivery within community pharmacy in the United Kingdom [dissertation]. Nottingham: University of Nottingham; 2006.
137. Roberts A, Benrimoj S, Chen T, Williams K, Aslani P. Implementing cognitive services in community pharmacy: a review of facilitators used in practice change. Int J Pharm Pract. 2006; 14(3):163-170.
138. Ngorsuraches S, Chen Li S. Thai pharmacists understanding, attitudes and perceived barriers related to providing pharmaceutical care. Am J Health Syst Pharm. 2006; 63(21):2144-2150.
139. Berbatis C, Sunderland B, Joyce A, Bulsara M, Mills C. Enhanced pharmacy services, barriers and facilitators in Australia's community pharmacies: Australia's National Pharmacy Database Project. Int J Pharm Pract. 2007; 15(3):185-191.
140. Gastelurrutia M, Fernandez-Llimos F, Benrimoj S, Castrillon C, Faus M. Barriers for the implementation of cognitive servies in Spanish community pharmacies. J Aten Primaria. 2007; 39(9):465-472.
141. Gastelurrutia MA, Charlie Benrimoj S, Castrillon C, Casado de Amezua M, Fernandez-Llimos F, Faus M. Facilitators for practice change in Spanish community pharmacy. Pharm World Sci. 2009; 31(1):32-39.
142. Roberts A, Benrimoj S, Chen T, Williams K, Aslani P. Practice change in community pharmacy: quantification of facilitators. Ann Pharmacother. 2008; 42(6):861-868.
143. Niquille A, Lattmann C, Bugnon O. Medication reviews led by community pharmacists in Switzerland: a qualitative survey to evaluate barriers and facilitators. Pharm Pract. 2010; 8(1):35-42.

144. Fang Y, Yang S, Feng B, Ni Y, Zhang K. Pharmacists' perception of pharmaceutical care in community pharmacy: a questionnaire survey in Northwest China. Health Soc Care Community. 2011; 19(2):189-197.
145. Smith F. Research methods in pharmacy practice. London: Pharmaceutical Press; 2002.
146. Portney L, Watkins M. Foundations of clinical research: application to practice. 3rd ed. New Jersey: Pearson Education, Inc.; 2009.
147. Holloway I. Qualitative writing. In: Holloway I, editor. Qualitative research in health care. Maidenhead: Open University Press; 2005.
148. Gilchrist V. Key informant interviews. Newbury Park: Sage Publications; 1992.
149. Lincoln Y, Guba E. Naturalistic inquiry. Beverly Hills: Sage; 1985.
150. Shenton A. Strategies for ensuring trustworthiness in qualitative research projects. Education for Information. 2004; 22:63-75.
151. Universitas Airlangga. Daftar apotek hasil survei 2011. Surabaya: Universitas Airlangga; 2011.
152. Landis J, Koch G. The measurement of observer agreement for categorical data. Biometrics. 1977; 33(1):159-174.
153. Nugroho M. Analisis pengelompokan dan pemetaan kecamatan sebagai dasar program untuk mengatasi masalah-masalah sosial-ekonomi di Kota Surabaya [dissertation]. Surabaya: Institut Sepuluh Nopember; 2010.
154. Ikatan Apoteker Indonesia (IAI) – cabang Surabaya. Daftar apoteker Surabaya 2006-2011. Surabaya: IAI; 2011.
155. Herqutanto. Wahai dokter Indonesia, berkomunikasilah. Maj Kedokt Indon. 2009; 59:35-38.
156. Berbatis C, Sunderland B, Mills C, Bulsara M. National pharmacy database project. Perth: Curtin Unversity; 2003.
157. McDonough R, Doucette W. Developing collaborative working relationships between pharmacists and physicians. J Am Pharm Assoc. 2001; 41(5):682-692.
158. Cartwright A, Smith C. Elderly people, their medicinse, and their doctors. London: Routledge; 1988.

159. Sisson E, Kuhn C. Pharmacist roles in the management of patients with type 2 diabetes. J Am Pharm Assoc. 2009; 49 Suppl 1:S41-45.
160. Zhang Y, Wildemuth B. Thematic content analysis. In: Wildemuth B, editor. Applications of Social Research Methods to Questions in Information and Library Science. Westport, CT: Libraries Unlimited; 2009.
161. van Nes F, Abma T, Jonsson H, Deeg D. Languange differences in qualitative research: is meaning lost in translation? Eur J Ageing. 2010; 7(4):313-316.
162. Fédération Internationale Pharmaceutique (FIP). FIP guidelines for the labels of prescribed medicines [Internet]. The Hague: FIP; 2001 [cited 2013 Oct 15]. Available from: http://www.fip.org/www/uploads/database_file.php?id=256 &table_id.
163. British Medical Association, and the Royal Pharmaceutical Society. British National Formulary. 65th ed. London: British National Formulary Publications; 2013.
164. Pharmaceutical Society of Australia (PSA). CALs in practice. Australian Pharmacist. 2012; 31(3):182-183.
165. Therapeutic Goods Administration (TGA). Consumer Medicine Information (CMI) [Internet]. Canberra: TGA; 2012 [cited June 19 2014]. Available from: http://www.tga.gov.au/consumers/information-medicines-cmi.htm
166. Pharmaceutical Society of Australia (PSA). Self care. Canberra: PSA; 2014 [cited 2014 June 6]. Available from: http://www.psa.org.au/supporting-practice/self-care.
167. Pharmaceutical Services Negotiating Committee (PSNC). Medicines use review and prescription intervention service [Internet]. London: PSNC; 2013 [cited 2014 Jan 22,]. Available from: http://psnc.org.uk/wp-content/uploads/2013/06/MUR-service-spec-Aug-2013-changes_FINAL.pdf
168. Pharmaceutical Society of Australia (PSA). Guidelines for pharmacists providing medicines use review (MedsCheck) and diabetes medication management (Diabetes MedsCheck) services. Deakin: PSA; 2012 [cited 2013 Sep 10]. Available from: http://www.psa.org.au/download/guidelines/3612-medscheck-guidelines-c.pdf

169. American Pharmacists Association and the National Association of Chain Drug Stores Foundation. Medication Therapy Management in pharmacy practice: core elements of an MTM service model (version 2.0). J Am Pharm Assoc. 2008; 48(3):341-353.
170. Pharmacy Board of Australia. Guidelines for dispensing of medicines [Internet]. Canberra: Pharmacy Board of Australia; 2009 [cited Jan 22, 2014]. Available from: http://www.pharmacyboard.gov.au/Codes-Guidelines.aspx
171. National Prescribing Centre (NPC). Dispensing with repeats: a practical guide to repeat dispensing [Internet]. Liverpool: NPC; 2008 [cited 2013 Oct 24]. Available from: http://www.npc.nhs.uk/repeat_medication/repeat_dispensing/resources/dwr_for_web.pdf.
172. Bond C, Matheson C, Williams S, Williams P, Donnan P. Repeat prescribing: a role for community pharmacists in controlling and monitoring repeat. Br J Gen Pract. 2000; 50(453):271-275.
173. Dowell J, Cruikshand J, Bain J, Staines H. Repeat dispensing by community pharmacists: advantages for patients and practitioners. Br J Gen Pract. 1998; 48(437):1858-1859.
174. Smith F. Survey research: (1) Design, samples and response. Int J Pharm Pract. 1997; 5(3):152-166.

Appendix 1

Approval from the Human Research Ethics Committee of Curtin University (2011/2012)

Curtin University

Memorandum

To	Yosi Wibowo, School of Pharmacy
From	Alison Smith, R&D Coordinator, School of Pharmacy
Subject	Protocol Approval **PH-09-11**
Date	4 May 2011
Copy	Prof Bruce Sunderland, Prof Jeff Hughes

Faculty of Health Sciences
School of Pharmacy
TELEPHONE 9266 9816
FACSIMILE 9266 3793
EMAIL a.j.smith@curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled *"A model of community pharmacy-based services for type 2 diabetes patients in the Indonesian setting"*. On behalf of the Human Research Ethics Committee I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months **04/05/2011** to **04/05/2012**.

The approval number for your project is **PH-09-11**. *Please quote this number in any future correspondence*. If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

Alison Smith
Research & Development Support Coordinator
School of Pharmacy

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number «Approval_Number»). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or hrec@curtin.edu.au

Appendix 2

Approval from the Human Research Ethics Committee of Curtin University (2012/2013)

Curtin University

Memorandum

To	Yosi Wibowo, School of Pharmacy
From	Alison Smith, R&D Coordinator, School of Pharmacy
Subject	Protocol Approval **PH-03-12**
Date	29 March 2012
Copy	Prof Jeff Hughes, E/Prof Bruce Sunderland

Faculty of Health Sciences
School of Pharmacy
TELEPHONE 9266 7418
FACSIMILE 9266 3793
EMAIL a.j.smith@curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled *"A model of community pharmacy-based services for type 2 diabetes patients in the Indonesian setting"*. On behalf of the Human Research Ethics Committee I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months **29/03/2012** to **29/02/2013**.

The approval number for your project is **PH-03-12**. *Please quote this number in any future correspondence*. If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.

Sincerely,

Alison Smith
Research & Development Support Coordinator
School of Pharmacy

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number PH-03-12). If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth, 6845 or by telephoning 9266 2784 or hrec@curtin.edu.au

Appendix 3

Approval from *Ikatan Apoteker Indonesia – IAI* (Indonesian Pharmacists Association)

PENGURUS CABANG
IKATAN APOTEKER INDONESIA
SURABAYA
SEKRETARIAT: D/a PIOLK UBAYA - Ged. FF Lt 5
Jalan Raya Kalirungkut (Tenggilis) ☎ (031) 2981170, Fax. (031) 2981171 Surabaya 60293

Nomor : 001/SK/BPD-IAI/SURABAYA/11/2010 20 Desember 2010
Hal : Persetujuan untuk melakukan penelitian

Kepada
Yth. : **Sdr. Yosi Irawati Wibowo, M. Pharm., Apt.**
School of Pharmacy, Curtin University
GPO Box U1987, Perth WA 9845

Dengan hormat,

Memperhatikan surat Saudara tanggal 18 Desember 2010 perihal permohonan untuk melakukan penelitian praktek kefarmasian di Surabaya berkaitan dengan:

1. Studi S3 Saudara di *School of Pharmacy, Curtin University, Perth-Australia*
2. Judul proyek penelitian: *"A model of community pharmacy-based services for type 2 diabetes patients in the Indonesian setting"*,

yang melibatkan survei kuesioner maupun interview apoteker, pasien apotek, dokter dan perawat di Surabaya, melalui surat ini kami beritahukan bahwa permohonan tersebut dapat disetujui.

Atas perhatian dan kerjasama yang baik, kami mengucapkan terima kasih.

Hormat kami,
Ketua IAI Cabang Surabaya

Drs. Adji Prayitno, MS, Apt

AP/di

Appendix 4

Pharmacist questionnaire (English and Indonesian versions)

Pharmacist Questionnaire:
Pharmacy-based Services for Type 2 Diabetes Patients

This study is being conducted by Curtin University's School of Pharmacy with approval from the Indonesian Pharmacist Association - Surabaya (No. 001/SK/BPD-IAI/SURABAYA/001). The aim of this study is to explore the potential roles of community pharmacists in diabetes care. The results of this study will help shape how future pharmacy-based services are designed in order to provide a better care for Type 2 Diabetes patients. This service is also of importance for pharmacists to develop as a profession.

As part of this study, we would like to invite **community pharmacists in Surabaya** to complete a survey. It is your decision whether or not to take part in this survey. If you decide to participate, we would ask you to sign a consent form (below), and to complete the enclosed questionnaire. The questionnaire should take approximately 15 minutes to complete.

We hope that you will participate, **as your answers will make a significant contribution to the development of pharmacist professions as well as the improvement of care for Type 2 Diabetes patients**. All information provided will be treated as **strictly confidential**. Your information will be combined with that of others, and you will be de-identified in any publications arising from this study. Should you have any queries, the contact details of the investigators are as follows:

Ms. Yosi Wibowo
PhD student, School of Pharmacy, Curtin University
Pharmacist, Pusat Informasi Obat dan Layanan Kefarmasian
Universitas Surabaya
Phone : 031-2981170
Email : yosi.wibowo@postgrad.curtin.edu.au

Professor Jeff Hughes
Professor Bruce Sunderland
Supervisors, School of Pharmacy, Curtin University
Phone : +61 8 9266 7369
Email : J.D.Hughes@curtin.edu.au
B.Sunderland@curtin.edu.au

Thank you for participating in this study

Consent Form

I consent to the collection and use of the data in the enclosed form based on the understanding of the nature of the study as outlined above. I understand that all data provided will be treated with the strictest confidence, and respondents will be de-identified in any publications arising from this research.

Signature : _____

Name : _____

Pharmacy :_____ Date : __/__/2011

This study has been approved by the Curtin University Human Research Ethics Committee (Approval No PH-09-11). The Committee is comprised of members of the public, academics, lawyers, doctors and pastoral carers. Its main role is to protect respondents. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth, 6845 or by telephoning +61 8 9266 2784 or by emailing hrec@curtin.edu.au.

RESPONDENT DETAILS

1. **Gender.** Please tick (✓).

☐ Male
☐ Female

2. **Year of birth:**

1	9		

3. In which **year** did you obtain your **registration** as a pharmacist?

4. Please tick (✓) your **position** at the pharmacy you currently work for:

☐ Pharmacist manager ('Apoteker Penanggung Jawab Apotek') as well as Owner
☐ Pharmacist manager ('Apoteker Penanggung Jawab Apotek')
☐ Employee pharmacist ('Apoteker Pendamping')
☐ Other (please specify):_____

5. How long have you been **working** as a **community pharmacist**? Please tick (✓).

☐ Less than 2 years
☐ 2 – 5 years
☐ 6 – 10 years
☐ More than 10 years

6. How much time in total have you spent on **training/continuing education on diabetes** (eg. seminar, e-learning module, self-reading) in the past 12 months? Please tick (✓).

☐ None
☐ 1 – 5 hours
☐ 6 – 10 hours
☐ More than 10 hours

DIABETES SERVICES

7. In relation to services for Type 2 Diabetes patients at **PHARMACIES**, please indicate your response under **Section (I)** and **(II)**. *(Due to the lack of pre-determined pharmacist roles in diabetes care in our country, the provision of services may vary between pharmacies. Hence, we are interested to hear your **honest response**)*

	(I) **HOW OFTEN** does **THIS PHARMACY** provide the following services for **Type 2 Diabetes** patients: *(Circle one number)* *Never* → *Always*						**(II)** Do you think that **PHARMACIES SHOULD PROVIDE** the following services for **Type 2 Diabetes** patients; *(Circle one number)* *Definitely No* → *Definitely Yes*					
A. INITIAL ASSESSMENT												
Taking patient **history,** including:												
• age	1	2	3	4	5	6	1	2	3	4	5	6
• duration of diabetes	1	2	3	4	5	6	1	2	3	4	5	6
• lifestyle *(eg. eating patterns, physical activity habits)*	1	2	3	4	5	6	1	2	3	4	5	6
• family history of diabetes	1	2	3	4	5	6	1	2	3	4	5	6
• presence of other risk factors for complications *(e g. hypertension, dyslipidemia, smoking, family history of cardiovascular diseases)*	1	2	3	4	5	6	1	2	3	4	5	6
• knowledge about diabetes	1	2	3	4	5	6	1	2	3	4	5	6
• diabetes treatment	1	2	3	4	5	6	1	2	3	4	5	6
• history of acute complications *(e.g. hypoglycaemic episodes)*	1	2	3	4	5	6	1	2	3	4	5	6
• history of chronic complications *(e.g. retinopathy, nephropathy, neuropathy, diabetic foot, cardiovascular diseases)*	1	2	3	4	5	6	1	2	3	4	5	6
• psychosocial status *(e.g. attitudes about illness, expectations, resources – financial, social and emotional)*	1	2	3	4	5	6	1	2	3	4	5	6
• history of other medical conditions	1	2	3	4	5	6	1	2	3	4	5	6
Baseline physical assessment *(e.g. measure weight/height, blood pressure)*	1	2	3	4	5	6	1	2	3	4	5	6
Baseline laboratory examinations *(e.g. check blood glucose)*	1	2	3	4	5	6	1	2	3	4	5	6
B. TREATMENT PLAN												
Set of individualised **treatment targets** *(with/without involvement of other health care members)*	1	2	3	4	5	6	1	2	3	4	5	6
Develop **treatment plans,** including: *(with/without involvement of other health care members)*												
• antidiabetic medications	1	2	3	4	5	6	1	2	3	4	5	6
• exercise	1	2	3	4	5	6	1	2	3	4	5	6
• diet	1	2	3	4	5	6	1	2	3	4	5	6
• prevention/treatment of chronic complications	1	2	3	4	5	6	1	2	3	4	5	6
C. TREATMENT ADMINISTRATION												
Prepare medications	1	2	3	4	5	6	1	2	3	4	5	6
Provide **labels** with instructions for use *(e.g. 1 tablet 3 times daily)*	1	2	3	4	5	6	1	2	3	4	5	6

No.7 (continued)

	(I) **HOW OFTEN** does **THIS PHARMACY** provide the following services for **Type 2 Diabetes** patients: *(Circle one number)* *Never* → *Always*						**(II)** Do you think that **PHARMACIES SHOULD PROVIDE** the following services for **Type 2 Diabetes** patients: *(Circle one number)* *Definitely No* → *Definitely Yes*					
D. PATIENT EDUCATION												
Provide **information (written or verbal)** about:												
• diabetes disease process	1	2	3	4	5	6	1	2	3	4	5	6
• treatment targets	1	2	3	4	5	6	1	2	3	4	5	6
• antidiabetic medications:												
- directions for use	1	2	3	4	5	6	1	2	3	4	5	6
- use of insulin devices	1	2	3	4	5	6	1	2	3	4	5	6
- storage requirements	1	2	3	4	5	6	1	2	3	4	5	6
- special precautions to follow	1	2	3	4	5	6	1	2	3	4	5	6
- common/important adverse effects	1	2	3	4	5	6	1	2	3	4	5	6
• exercise	1	2	3	4	5	6	1	2	3	4	5	6
• diet	1	2	3	4	5	6	1	2	3	4	5	6
• Self-Monitoring of Blood Glucose *(e g. use of glucose meter and interpretation of the results)*	1	2	3	4	5	6	1	2	3	4	5	6
• prevention/treatment of acute complications *(e g. hypoglycaemia)*	1	2	3	4	5	6	1	2	3	4	5	6
• prevention/treatment of chronic complications *(e g. cardiovascular diseases)*	1	2	3	4	5	6	1	2	3	4	5	6
• need for regular medical monitoring (e g. heart, kidney, eye and feet examinations)	1	2	3	4	5	6	1	2	3	4	5	6
• foot self-care	1	2	3	4	5	6	1	2	3	4	5	6
• smoking cessation	1	2	3	4	5	6	1	2	3	4	5	6
E. MONITORING												
Monitor **compliance** with:												
• antidiabetic medications	1	2	3	4	5	6	1	2	3	4	5	6
• exercise plan	1	2	3	4	5	6	1	2	3	4	5	6
• diet plan	1	2	3	4	5	6	1	2	3	4	5	6
• plan for prevention/treatment of chronic complications	1	2	3	4	5	6	1	2	3	4	5	6
• scheduled medical monitoring	1	2	3	4	5	6	1	2	3	4	5	6
Monitor **treatment outcomes**:												
• check records on patient 'Self-Monitoring of Blood Glucose'	1	2	3	4	5	6	1	2	3	4	5	6
• carry out blood glucose tests	1	2	3	4	5	6	1	2	3	4	5	6
• measure Body Mass Index (BMI)	1	2	3	4	5	6	1	2	3	4	5	6
• measure blood pressure	1	2	3	4	5	6	1	2	3	4	5	6
• check results of laboratory tests *(e.g. HbA1c, cholesterol, albumin)*	1	2	3	4	5	6	1	2	3	4	5	6
• check presence of adverse effects	1	2	3	4	5	6	1	2	3	4	5	6
Adjust treatment plans if necessary *(with/without involvement of other health care members)*	1	2	3	4	5	6	1	2	3	4	5	6
Refer patients (e.g. to doctors/specialists) wherever appropriate	1	2	3	4	5	6	1	2	3	4	5	6
Adjust diabetes education based on patients' continuing needs	1	2	3	4	5	6	1	2	3	4	5	6

8. If you think there are other Type 2 Diabetes services **NOT listed in Question 7**, please write them in the **Section (I);** then indicate your response regarding those services under **Section (II)** and **(III)**.

(I) In your opinion, are there other Type 2 Diabetes services **NOT listed in Question 7?** *(Please fill in the blank)*	**(II)** **HOW OFTEN** does **THIS PHARMACY** provide the following services for **Type 2 Diabetes** patients? *(Circle one number)* ***Never*** ... ***Always***	**(III)** Do you think that **PHARMACIES SHOULD PROVIDE** the following services for **Type 2 Diabetes** patients? *(Circle one number)* ***Definitely No*** ... ***Definitely Yes***
	1 2 3 4 5 6	1 2 3 4 5 6
	1 2 3 4 5 6	1 2 3 4 5 6
	1 2 3 4 5 6	1 2 3 4 5 6
	1 2 3 4 5 6	1 2 3 4 5 6
	1 2 3 4 5 6	1 2 3 4 5 6

9. In your opinion, what are the **5 most important services** that **SHOULD BE PROVIDED at PHARMACIES** for **Type 2 Diabetes** patients (this may include services listed in Question 7 and 8)?
(Try to be as specific as possible, eg. providing information about antidiabetic medications)

1
2
3
4
5

10. How much does this pharmacy **currently charge** for providing services for Type 2 Diabetes patients (other than cost for medications and/or test kits)? Please tick (✓).

☐ Nothing
☐ Any payment less than Rp 25,000
☐ Rp 25,000 – 50,000
☐ More than Rp 50,000

11. How much do you think **this pharmacy should charge** for providing a consultation service for Type 2 Diabetes patients (other than cost for medications and/or test kits)? Please tick (✓).

☐ Nothing
☐ Any payment less than Rp 25,000
☐ Rp 25,000 – 50,000
☐ More than Rp 50,000

PHARMACY CHARACTERISTICS

12. Which one of the following best describes the **setting of this pharmacy**? Please tick (✓).

☐ Stand alone
☐ Shopping mall complex
☐ Pharmacy with doctor clinics
☐ Other (please specify):_____

13. Which one of the following best describes the **ownership** of this pharmacy? Please tick (✓).

☐ Pharmacist Manager (*Apoteker Penanggung Jawab Apotek*)
☐ Single proprietor (*Pemilik Sarana Apotek – perorangan*)
☐ Group proprietor (*Pemilik Sarana Apotek – kelompok/perusahaan*)
☐ Partnership between proprietor and pharmacist manager
☐ Other (please specify):_____

14. Is there a **private counselling area/room** within this pharmacy? Please tick (✓).

☐ Yes
☐ No

15. Please record the **opening and closing hours** in each day for this pharmacy.

Monday		**Tuesday**		**Wednesday**		**Thursday**		**Friday**		**Saturday**		**Sunday**	
Open	*Close*	*Open*	*Close*	*Open*	*Close*	*Open*	*Close*	*Open*	*Close*	*Open*	*Close*	*Open*	*Close*

16. Please record the **total working hours for each pharmacist** (including yourself) in this pharmacy.

Pharmacist	**Total working hours**
Pharmacist Manager	……. hours *(per week /per month)**
Employee pharmacist (A)	……. hours *(per week /per month)**
Employee pharmacist (B)	……. hours *(per week /per month)**
……	……. hours *(per week /per month)**
……	……. hours *(per week /per month)**
…….	……. hours *(per week /per month)**
……	……. hours *(per week /per month)**
…….	……. hours *(per week /per month)**

** Please cross that are not applied*

17. What is the estimated total number of **customers** purchasing **any items (prescriptions or non-prescriptions)** in this pharmacy per month? Please tick (✓).

☐ Up to 200
☐ 201 – 500
☐ 501 – 1000
☐ 1001 – 2000
☐ 2001 – 4000
☐ More than 4000

18. What is the estimated number of **customers** dispensed **Oral Antidiabetic Medications** in this pharmacy per month? Please tick (✓).

☐ Up to 20
☐ 21 – 50
☐ 51 – 100
☐ 101 – 250
☐ 251 – 500
☐ More than 500

19. What is the estimated number of **customers** dispensed **Insulin** in this pharmacy per month? Please tick (✓).

☐ Up to 10
☐ 11 – 25
☐ 26 – 51
☐ 51 – 100
☐ More than 100

THANK YOU FOR YOUR TIME AND PARTICIPATION

Survei Apoteker:
Layanan Diabetes Tipe 2 di Apotek

School of Pharmacy, *Curtin University* dengan persetujuan Ikatan Apoteker Indonesia cabang Surabaya (No. 001/SK/BPD-IAI/SURABAYA/2010) akan melakukan penelitian untuk menggali peran potensial apoteker di apotek dalam layanan Diabetes. Hasil penelitian ini diharapkan menjadi acuan dalam perencanaan layanan di apotek yang lebih baik bagi pasien Diabetes Tipe 2. Layanan ini juga penting artinya bagi perkembangan profesi apoteker.

Sebagai bagian dari penelitian ini, kami mengajak para **apoteker di apotek di Surabaya** untuk ikut serta dalam survei berikut. Bapak/Ibu dapat memutuskan untuk bersedia ataupun tidak bersedia berpartisipasi. Namun, kami percaya bahwa Bapak/Ibu akan turut berpartisipasi, karena **jawaban Bapak/Ibu akan menjadi sumbangan yang berarti bagi perkembangan profesi apoteker, serta bagi peningkatan layanan untuk pasien Diabetes Tipe 2**. Untuk itu, kami mohon Bapak/Ibu menandatangani lembar persetujuan di bawah ini, serta melengkapi kuesioner terlampir. Pengisian kuesioner ini akan memerlukan waktu sekitar 15 menit.

Semua jawaban akan **dirahasiakan**. Jawaban Bapak/Ibu akan digabungkan dengan jawaban responden lain, dan identitas Bapak/Ibu tidak akan diketahui dalam semua bentuk laporan penelitian ini. Jika Bapak/Ibu mempunyai pertanyaan, silakan menghubungi peneliti:

Ms. Yosi Wibowo
PhD student, School of Pharmacy, Curtin University
Apoteker, Pusat Informasi Obat & Layanan Kefarmasian,
Universitas Surabaya
Telepon : 031-2981170
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Professor Bruce Sunderland
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B.Sunderland@curtin.edu.au

Terima Kasih atas Partisipasi Bapak/Ibu

Lembar Persetujuan

Saya menyetujui pengambilan dan penggunaan data pada kuesioner terlampir setelah memahami karakteristik penelitian sebagaimana dijelaskan di atas. Saya memahami bahwa seluruh data yang diperoleh akan dirahasiakan, dan identitas responden tidak akan diketahui dalam semua bentuk laporan penelitian ini.

Tanda tangan : _____

Nama : _____

Nama Apotek : _____ Tanggal : __ - __ - 2011

Penelitian ini telah disetujui oleh Curtin University Human Research Ethics Committee (No. PH-09-011). Komite ini terdiri dari anggota masyarakat, akademisi, pengacara, dokter dan pemuka agama. Tugas utamanya adalah memberikan perlindungan bagi responden. Jika diperlukan verifikasi, Bapak/Ibu dapat mengirimkan surat ke Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University of Technology, GPO Box U1987, Perth, 6845, atau menelepon ke +61 8 9266 2784, atau mengirimkan email ke hrec@curtin.edu.au.

DATA RESPONDEN

1. Mohon dicentang (✓). **Jenis kelamin** Bapak/Ibu:

☐ Pria
☐ Wanita

2. **Tahun kelahiran** Bapak/Ibu:

1	9		

3. **Tahun kelulusan** Bapak/Ibu sebagai **Apoteker**?

4. Mohon dicentang (✓) **posisi** Bapak/Ibu di apotek tempat Bapak/Ibu bekerja?

☐ Apoteker Penanggung-jawab Apotek (APA) sekaligus Pemilik
☐ Apoteker Penanggung-jawab Apotek (APA)
☐ Apoteker Pendamping
☐ Lainnya (mohon disebutkan):_____

5. Berapa lamakah pengalaman Bapak/Ibu **bekerja sebagai Apoteker di apotek**? Mohon dicentang (✓).

☐ Kurang dari 2 tahun
☐ 2 – 5 tahun
☐ 6 – 10 tahun
☐ Lebih dari 10 tahun

6. Berapakah **total waktu** yang Bapak/Ibu gunakan dalam 12 bulan terakhir untuk mengikuti **pelatihan/pendidikan berkelanjutan mengenai Diabetes** (misalnya: seminar, modul pembelajaran elektronik, belajar mandiri)? Mohon dicentang (✓).

☐ Tidak ada
☐ 1 – 5 jam
☐ 6 – 10 jam
☐ Lebih dari 10 jam

LAYANAN DIABETES

7. Terkait dengan layanan untuk pasien Diabetes Tipe 2 di apotek, mohon diberikan jawaban pada **Bagian (I)** dan **Bagian (II)**. *(Hingga kini **belum diberlakukan standar pelayanan Diabetes di apotek** di negara kita. Semuanya tergantung pada kesanggupan masing-masing apotek. Oleh sebab itu, **sangat penting untuk menjawab setiap pertanyaan <u>apa adanya</u>**)*

	(I) **Seberapa SERING APOTEK Anda** memberikan layanan di bawah ini untuk pasien **Diabetes Tipe 2**? *(Lingkari satu angka)*						**(II)** Apakah menurut Anda, suatu **APOTEK SEHARUSNYA MENGADAKAN** layanan di bawah ini untuk pasien **Diabetes Tipe 2**? *(Lingkari satu angka)*					
	Tidak pernah					***Selalu***	***Tidak diadakan***					***Harus diadakan***
A. PENILAIAN AWAL												
Menanyakan **riwayat pasien** meliputi:												
• usia	1	2	3	4	5	6	1	2	3	4	5	6
• kapan mulai menderita diabetes	1	2	3	4	5	6	1	2	3	4	5	6
• gaya hidup *(misalnya: pola makan, aktivitas fisik)*	1	2	3	4	5	6	1	2	3	4	5	6
• riwayat diabetes dalam keluarga	1	2	3	4	5	6	1	2	3	4	5	6
• adanya faktor risiko lain untuk terjadinya komplikasi *(misalnya: hipertensi, dislipidemia, merokok, riwayat penyakit kardiovaskuler dalam keluarga)*	1	2	3	4	5	6	1	2	3	4	5	6
• pengetahuan tentang diabetes	1	2	3	4	5	6	1	2	3	4	5	6
• pengobatan diabetes yang pernah didapatkan	1	2	3	4	5	6	1	2	3	4	5	6
• riwayat komplikasi akut *(misalnya: kejadian hipoglikemia)*	1	2	3	4	5	6	1	2	3	4	5	6
• riwayat komplikasi kronis *(misalnya: retinopati, nefropati, neuropati, kaki diabetes, penyakit kardiovaskuler)*	1	2	3	4	5	6	1	2	3	4	5	6
• status psikososial *(misalnya: sikap terhadap penyakitnya, harapan, sumber daya – finansial, sosial dan emosional)*	1	2	3	4	5	6	1	2	3	4	5	6
• riwayat penyakit lain	1	2	3	4	5	6	1	2	3	4	5	6
Melakukan **pemeriksaan fisik awal** (misalnya: mengukur tinggi/berat badan, tekanan darah)	1	2	3	4	5	6	1	2	3	4	5	6
Melakukan **tes laboratorium awal** (misalnya: mengukur gula darah)	1	2	3	4	5	6	1	2	3	4	5	6
B. RENCANA PENGOBATAN												
Menetapkan **target hasil pengobatan** untuk individu pasien *(dengan/tanpa keterlibatan tenaga kesehatan lain)*	1	2	3	4	5	6	1	2	3	4	5	6
Menyusun **rencana pengobatan** yang meliputi: *(dengan/tanpa keterlibatan tenaga kesehatan lain)*												
• obat antidiabetes	1	2	3	4	5	6	1	2	3	4	5	6
• olahraga	1	2	3	4	5	6	1	2	3	4	5	6
• pengaturan makanan	1	2	3	4	5	6	1	2	3	4	5	6
• pencegahan/pengobatan komplikasi kronis	1	2	3	4	5	6	1	2	3	4	5	6
C. PEMBERIAN OBAT												
Menyiapkan/meracik obat	1	2	3	4	5	6	1	2	3	4	5	6
Memberikan **label** tentang aturan pakai obat *(misalnya: 1 tablet, 3 kali sehari)*	1	2	3	4	5	6	1	2	3	4	5	6

No. 7 (lanjutan)

	(I) **Seberapa SERING APOTEK Anda** memberikan layanan di bawah ini untuk pasien **Diabetes Tipe 2**? *(Lingkari satu angka)* *Tidak pernah* → *Selalu*						**(II)** Apakah menurut Anda, suatu **APOTEK SEHARUSNYA MENGADAKAN** layanan di bawah ini untuk pasien **Diabetes Tipe 2**? *(Lingkari satu angka)* *Tidak diadakan* → *Harus diadakan*					
D. EDUKASI PASIEN												
Memberikan **informasi** (secara lisan atau tulisan) mengenai:												
• proses penyakit diabetes	1	2	3	4	5	6	1	2	3	4	5	6
• target hasil pengobatan	1	2	3	4	5	6	1	2	3	4	5	6
• obat antidiabetes:												
- aturan pakai obat	1	2	3	4	5	6	1	2	3	4	5	6
- cara pakai alat untuk pemberian insulin	1	2	3	4	5	6	1	2	3	4	5	6
- cara penyimpanan obat	1	2	3	4	5	6	1	2	3	4	5	6
- perhatian khusus terkait penggunaan obat	1	2	3	4	5	6	1	2	3	4	5	6
- efek samping obat yang umum/penting	1	2	3	4	5	6	1	2	3	4	5	6
• olahraga	1	2	3	4	5	6	1	2	3	4	5	6
• pengaturan makanan	1	2	3	4	5	6	1	2	3	4	5	6
• Pemantauan Gula Darah Mandiri *(misalnya: cara penggunaan alat tes gula darah, dan interpretasi hasil tes)*	1	2	3	4	5	6	1	2	3	4	5	6
• pencegahan/pengobatan komplikasi akut (misalnya: hipoglikemia)	1	2	3	4	5	6	1	2	3	4	5	6
• pencegahan/pengobatan komplikasi kronis *(misalnya: penyakit kardiovaskuler)*	1	2	3	4	5	6	1	2	3	4	5	6
• perlunya skrining komplikasi kronis secara rutin *(misalnya: pemeriksaan jantung, ginjal, mata dan kaki)*	1	2	3	4	5	6	1	2	3	4	5	6
• perawatan-kaki secara mandiri	1	2	3	4	5	6	1	2	3	4	5	6
• penghentian merokok	1	2	3	4	5	6	1	2	3	4	5	6
E. PEMANTAUAN												
Memantau **kepatuhan** terhadap:												
• penggunaan obat antidiabetes	1	2	3	4	5	6	1	2	3	4	5	6
• program olahraga	1	2	3	4	5	6	1	2	3	4	5	6
• program pengaturan makanan	1	2	3	4	5	6	1	2	3	4	5	6
• program pencegahan/pengobatan komplikasi kronis	1	2	3	4	5	6	1	2	3	4	5	6
• program skrining untuk komplikasi kronis	1	2	3	4	5	6	1	2	3	4	5	6
Memantau **target hasil pengobatan**:												
• memeriksa catatan Pemantauan 'Gula Darah Mandiri' pasien	1	2	3	4	5	6	1	2	3	4	5	6
• melakukan tes gula darah	1	2	3	4	5	6	1	2	3	4	5	6
• mengukur Body Mass Index (BMI)	1	2	3	4	5	6	1	2	3	4	5	6
• mengukur tekanan darah	1	2	3	4	5	6	1	2	3	4	5	6
• memeriksa hasil tes laboratorium pasien *(misalnya: HbA1c, kolesterol, albumin)*	1	2	3	4	5	6	1	2	3	4	5	6
• memeriksa adanya efek samping obat	1	2	3	4	5	6	1	2	3	4	5	6
Menyesuaikan rencana pengobatan jika diperlukan *(dengan/tanpa keterlibatan tenaga kesehatan lain)*	1	2	3	4	5	6	1	2	3	4	5	6
Merujuk pasien jika diperlukan (misalnya: ke dokter/spesialis)	1	2	3	4	5	6	1	2	3	4	5	6
Menyesuaikan edukasi diabetes dengan mengikuti kebutuhan pasien	1	2	3	4	5	6	1	2	3	4	5	6

8. Jika menurut Bapak/Ibu masih terdapat layanan untuk pasien Diabetes Tipe 2 yang **TIDAK tercantum pada pertanyaan No. 7**, mohon dituliskan pada **Bagian (I);** dan mohon memberikan jawaban terkait layanan tersebut pada **Bagian (II)** dan **Bagian (III).**

(I) Menurut Anda, apakah ada layanan untuk pasien Diabetes Tipe 2 yang **TIDAK tercantum pada pertanyaan No. 7**? *(Mohon dituliskan dalam kotak dibawah ini)*	**(II)** **Seberapa SERING APOTEK Anda** memberikan layanan tersebut? *(Lingkari satu angka)* ***Tidak pernah*** ... ***Selalu***	**(III)** Apakah menurut Anda, suatu **APOTEK SEHARUSNYA MENGADAKAN** layanan tersebut? *(Lingkari satu angka)* ***Tidak diadakan*** ... ***Harus diadakan***
	1 2 3 4 5 6	1 2 3 4 5 6
	1 2 3 4 5 6	1 2 3 4 5 6
	1 2 3 4 5 6	1 2 3 4 5 6
	1 2 3 4 5 6	1 2 3 4 5 6
	1 2 3 4 5 6	1 2 3 4 5 6

9. Mohon disebutkan **LIMA layanan utama** yang menurut Bapak/Ibu **SEHARUSNYA DIADAKAN** di suatu **APOTEK** untuk pasien **Diabetes Tipe 2** (dapat termasuk layanan yang tercantum pada **Pertanyaan No. 7 and 8**).
(Mohon disebutkan layanannya secara spesifik, misalnya: memberikan informasi mengenai obat antidiabetes)

1
2
3
4
5

10. Berapakah **biaya yang dipungut** oleh apotek Bapak/Ibu saat ini untuk pemberian layanan bagi pasien Diabetes Tipe 2 (selain biaya obat dan/atau alat tes)? Mohon dicentang (✓).

☐ Tanpa dipungut biaya
☐ Pembayaran kurang dari Rp. 25.000
☐ Rp. 25.000 – 50.000
☐ Lebih dari Rp. 50.000

11. Menurut Bapak/Ibu, berapakah **biaya yang selayaknya dipungut** oleh apotek Bapak/Ibu untuk pemberian layanan konsultasi bagi pasien Diabetes Tipe 2 (selain biaya obat dan/atau alat tes)? Mohon dicentang (✓).

☐ Tanpa dipungut biaya
☐ Pembayaran kurang dari Rp. 25.000
☐ Rp. 25.000 – 50.000
☐ Lebih dari Rp. 50.000

KARAKTERISTIK APOTEK

12. Kategori manakah yang paling cocok **menggambarkan** apotek tempat Bapak/Ibu bekerja? Mohon dicentang (✓).

☐ Satu bangunan apotek yang berdiri sendiri
☐ Apotek dalam pusat perbelanjaan
☐ Apotek dengan praktek dokter
☐Lainnya (mohon disebutkan):_____

13. Kategori manakah yang paling menggambarkan **kepemilikan** apotek tempat Bapak/Ibu bekerja? Mohon dicentang (✓).

☐ Apoteker Penanggung Jawab Apotek (APA)
☐ Pemilik Sarana Apotek (PSA) perorangan
☐ Pemilik Sarana Apotek (PSA) kelompok/Badan Usaha
☐ Kepemilikan bersama PSA dan APA
☐ Lainnya (mohon disebutkan):_____

14. Apakah apotek Bapak/Ibu memiliki **tempat konseling** (dapat berupa: area khusus atau ruang tersendiri yang tidak terganggu)? Mohon dicentang (✓).

☐ Ya
☐ Tidak

15. Mohon dituliskan **jam buka** dan **jam tutup** apotek Bapak/Ibu untuk tiap harinya.

Senin		**Selasa**		**Rabu**		**Kamis**		**Jumat**		**Sabtu**		**Minggu**	
Jam buka	*Jam tutup*	*Jam buka*	*Jam tutup*	*Jam buka*	*Jam tutup*	*Jam buka*	*Jam tutup*	*Jam buka*	*Jam tutup*	*Jam buka*	*Jam tutup*	*Jam buka*	*Jam tutup*

16. Mohon dituliskan **total jam kerja masing-masing apoteker** (termasuk Bapak/Ibu sendiri) di apotek tempat Bapak/Ibu bekerja.

Apoteker	**Total jam kerja**
Apoteker Penanggung-jawab Apotek (APA)	…….. jam *(per minggu / per bulan)**
Apoteker pendamping (A)	…….. jam *(per minggu / per bulan)**
Apoteker pendamping (B)	…….. jam *(per minggu / per bulan)**
……	…….. jam *(per minggu / per bulan)**
……	…….. jam *(per minggu / per bulan)**
…….	…….. jam *(per minggu / per bulan)**
……	……. *jam (per minggu / per bulan)**
……	……. *jam (per minggu / per bulan)**

** coret yang tidak perlu*

17. Berapakah perkiraan **total jumlah pembeli obat (resep** maupun **non-resep)** per bulan di apotek Bapak/Ibu? Mohon dicentang (✓).

☐ Sampai dengan 200 orang
☐ 201 – 500 orang
☐ 501 – 1000 orang
☐ 1001 – 2000 orang
☐ 2001 – 4000 orang
☐ Lebih dari 4000 orang

18. Berapakah perkiraan **jumlah pembeli Obat Antidiabetes Oral** per bulan di apotek Bapak/Ibu? Mohon dicentang (✓).

☐ Sampai dengan 20 orang
☐ 21 – 50 orang
☐ 51 – 100 orang
☐ 101 – 250 orang
☐ 251 – 500 orang
☐ Lebih dari 500 orang

19. Berapakah perkiraan **jumlah pembeli Insulin** per bulan di apotek Bapak/Ibu? Mohon dicentang (✓).

☐ Sampai dengan 10 orang
☐ 11 – 25 orang
☐ 26 – 50 orang
☐ 51 – 100 orang
☐ Lebih dari 100 orang

TERIMA KASIH UNTUK WAKTU DAN PARTISIPASI BAPAK/IBU

Appendix 5

Invitation letter for the pharmacist survey (second round)

Curtin University

Kepada
Yth. Bapak/Ibu Apoteker di Apotek
Di Surabaya

Surabaya, 8 Agustus 2011

Dengan hormat,
Bersama surat ini kami bermaksud mengundang Bapak/Ibu Apoteker di Apotek untuk turut serta dalam survei mengenai Layanan Diabetes. Survei ini diadakan oleh *Curtin University*, dan telah mendapatkan persetujuan IAI Cabang Surabaya (No. 001/SK/BPD-IAI/SURABAYA/2010). Tujuannya adalah menggali peran potensial apoteker di apotek dalam memberikan Layanan Diabetes.

Jenis Layanan Diabetes di apotek dapat bervariasi tergantung pada kesanggupan masing-masing apotek, sehingga sangat penting untuk menjawab apa adanya.
Kami juga ingin mengetahui harapan Bapak/Ibu mengenai Layanan Diabetes yang seharusnya diadakan di apotek.
Jawaban Bapak/Ibu akan sangat bermanfaat dalam perencanaan layanan kefarmasian di apotek dan bagi perkembangan profesi apoteker.

Untuk itu, Kami mohon Bapak/Ibu berkenan mengisi kuesioner terlampir. Pengisian kuesioner akan memerlukan waktu sekitar 15 menit. ***Jawaban beserta identitas Bapak/Ibu akan kami rahasiakan dalam penyajian data.***

Kuesioner yang sudah diisi dengan lengkap, mohon dimasukkan kembali ke dalam amplop yang sama; dan akan kami ambil ***di Apotek tempat Bapak/Ibu bekerja*** pada tanggal ***12 s/d 17 September 2011***.

Sebagai tanda terima kasih atas partisipasi Bapak/Ibu, kami sertakan materi Seminar 'Sosialisasi Peraturan Perundang-undangan' yang diselenggarakan PIOLK Universitas Surabaya pada bulan lalu. Selain itu, kami akan memberikan ***Buku 'Peraturan Perundang-undangan TERBARU di Bidang Pelayanan Kefarmasian di Apotek' pada saat pengambilan kuesioner yang telah terisi lengkap.*** Kami percaya Bapak/Ibu bersedia memberikan masukan, karena perbaikan layanan kefarmasian sangat penting artinya bagi eksistensi profesi apoteker.

Terima kasih atas perhatian dan partisipasi Bapak/Ibu. Semoga Tuhan membalas kebaikan Bapak/Ibu dengan rahmat dan berkah yang melimpah.

Hormat kami,
Signature
Yosi Irawati Wibowo (Ms)
PhD Student, School of Pharmacy, Curtin University
Apoteker, Pusat Informasi Obat & Layanan Kefarmasian (PIOLK), Universitas Surabaya

Professor Jeff Hughes
Professor Bruce Sunderland
Supervisors, School of Pharmacy, Curtin University

Appendix 6

Patient questionnaire (English and Indonesian versions)

Patient Survey:
Pharmacy-based Type 2 Diabetes Services

This study is being conducted by Curtin University's School of Pharmacy with approval from the Indonesian Pharmacist Association - Surabaya (No. 001/SK/BPD-IAI/2010). The aim of this study is to explore the potential roles of community pharmacists in providing care for Type 2 Diabetes patients.

As part of our study, we would like to invite **pharmacy patients with Type 2 Diabetes** to complete a survey. It is your decision whether or not to take part in this survey. If you decide to take part, you will be asked to sign a consent form (below), and to complete the enclosed questionnaire. The questionnaire should take approximately 15 minutes to complete.

We hope that you will participate in this study, **as your answer will assist community pharmacists to help you in managing your Diabetes**. Needs for diabetes services may vary between patients. Hence, we are interested to hear your **honest response**. All information provided will be treated as **strictly confidential**. Your information will be combined with that of others, and you will be de-identified in any publications arising from this study. Should you require any further information, please contact the project pharmacist or the investigators:

Ms. Yosi Wibowo
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Pharmacist, Pusat Informasi Obat dan Layanan Kefarmasian, Universitas Surabaya
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Professor Jeff Hughes
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B.Sunderland@curtin.edu.au

Thank you for participating in this study

Consent Form

I consent to the collection and use of the data in the enclosed form based on the understanding of the nature of the study as outlined above. I understand that all data provided will be treated with the strictest confidence, and respondents will be de-identified in any publications arising from this research.

Signature : _____

Name : _____

Address : _____ Date : __/__/2011

This study has been approved by the Curtin University Human Research Ethics Committee (Approval No PH-09-11). The Committee is comprised of members of the public, academics, lawyers, doctors and pastoral carers. Its main role is to protect respondents. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth, 6845 or by telephoning +61 8 9266 2784 or by emailing hrec@curtin.edu.au.

RESPONDENT DETAILS

1. **Gender**.Please tick (✓).

☐ Male
☐ Female

2. **Year of birth**:

1	9		

3. **Ethnicity.** Please tick (✓).

☐ Asian
☐ Other (please specify): _____

4. Please tick (✓) your **highest level of education**:

☐ No schooling
☐ Primary school graduate
☐ Junior high school graduate
☐ Senior high school graduate
☐ Diploma graduate
☐ Bachelor degree graduate
☐ Postgraduate degree graduate

5. Please tick (✓) your **current employment status**:

☐ Working full-time (40 hours or more per week)
☐ Working part-time (less than 40 hours per week)
☐ Unemployed
☐ Other (please specify):_____

6. Please tick (✓) **total combined income in your household** (from all sources) per month:

☐ Up to Rp. 2 millions
☐ > Rp. 2 millions – 5 millions
☐ > Rp. 5 millions – 10 millions
☐ More than Rp. 10 millions

7. Please tick (✓) the **health insurance plan(s)** that you have:

☐ Insurance plan where **you or member of your family pays** all of the plan premium
☐ Insurance plan where the **employer/institution pays** all or part of the plan premium
☐ I do not have an insurance plan, but I am **eligible for insurance scheme for the poor** (eg. *Jamkesmas*)
☐ I have **no insurance plans**

8. Are you a **member of a diabetes organisation?** Please tick (✓).

☐ Yes
☐ No

DIABETES SERVICES

9. Please rate **your satisfaction** regarding **services at the PHARMACY** (you visit most frequently) in assisting you with **your Diabetes**:

☐ Very satisfied
☐ Satisfied
☐ Moderately satisfied
☐ Slightly satisfied
☐ Not at all satisfied

10. Thinking about your visits to a **PHARMACY**, please indicate your response under **Section (I)** and **(II)**.

	(I) Have you ever **RECEIVED** the following services: *(Circle one answer)*		**(II)** Do you think that **PHARMACIES SHOULD PROVIDE** the following services in assisting you with **your Diabetes**: *(Circle one number)*					
			Definitely no					***Definitely yes***
A. TREATMENT ADMINISTRATION								
The pharmacy prepares and delivers your medications	Yes	No	1	2	3	4	5	6
The pharmacy provides **labels** with instruction for use *(eg. a label written '1 tablet 3 times daily')*	Yes	No	1	2	3	4	5	6
B. EDUCATION								
The pharmacy provides **information** (verbal or written), including:								
• Information on what diabetes is	Yes	No	1	2	3	4	5	6
• Information about treatment targets *(eg. the desired blood sugar levels)*	Yes	No	1	2	3	4	5	6
• Information about medications for diabetes:								
- how to take your medications	Yes	No	1	2	3	4	5	6
- how to use insulin devices	Yes	No	1	2	3	4	5	6
- how to store your medications	Yes	No	1	2	3	4	5	6
- special precautions to follow when using medications *(eg. this medication should be taken with or soon after food to avoid risk of low blood sugar)*	Yes	No	1	2	3	4	5	6
- common/important adverse effects *(eg. after taking this medication, nausea may occur)*	Yes	No	1	2	3	4	5	6
• Information about appropriate exercise	Yes	No	1	2	3	4	5	6
• Information about healthy diet	Yes	No	1	2	3	4	5	6
• Information on self-monitoring of blood sugar *(eg. how to use blood sugar test devices, and interpret the results)*	Yes	No	1	2	3	4	5	6
• Information on how to prevent/treat emergency problems *(eg. how to treat low blood sugar)*	Yes	No	1	2	3	4	5	6
• Information on how to prevent/treat diabetes complications *(eg. how to prevent heart disease)*	Yes	No	1	2	3	4	5	6
• Information on the needs for regular medical monitoring *(eg. heart, kidney, eye and foot examination)*	Yes	No	1	2	3	4	5	6
• Information on foot self-care *eg. toenail trimming, examine for any trauma)*	Yes	No	1	2	3	4	5	6
• Information about smoking cessation	Yes	No	1	2	3	4	5	6

No. 10 (continued)

	(I) Have you ever **RECEIVED** the following services**:** *(Circle one answer)*		**(II)** Do you think that **PHARMACIES SHOULD PROVIDE** the following services in assisting you with **your Diabetes**: *(Circle one number)* ***Definitely no*** → ***Definitely yes***					
C. MONITORING								
The pharmacy monitors **compliance** by:								
• Asking if you have regularly taken your medications for diabetes	Yes	No	1	2	3	4	5	6
• Asking if you have followed your exercise plan	Yes	No	1	2	3	4	5	6
• Asking if you have followed your diet plan	Yes	No	1	2	3	4	5	6
• Asking if you have maintained plan for preventing/treating diabetes complications *(eg. have you regularly taken cholesterol drugs?)*	Yes	No	1	2	3	4	5	6
• Asking if you have followed scheduled medical monitoring *(eg. heart, kidney, eye and foot examination)*	Yes	No	1	2	3	4	5	6
The pharmacy monitors **treatment targets** by:								
• Testing your blood sugar	Yes	No	1	2	3	4	5	6
• Measuring your weight	Yes	No	1	2	3	4	5	6
• Measuring your blood pressure	Yes	No	1	2	3	4	5	6
• Checking your records on self-monitoring of blood sugar	Yes	No	1	2	3	4	5	6
• Checking your results of laboratory tests	Yes	No	1	2	3	4	5	6
• Asking if you experience any adverse effects from your medications	Yes	No	1	2	3	4	5	6
The pharmacy provides referrals (eg. to doctors/specialists) wherever appropriate	Yes	No	1	2	3	4	5	6

11. In your opinion, what are the **5 most important services** that **SHOULD BE PROVIDED at PHARMACIES** to assist you with **your Diabetes** (this may include services listed in **Question 9**)?
(Try to be as specific as possible, eg. providing information about medications for diabetes)

1
2
3
4
5

12. If pharmacies provide **a consultation service** to help with your diabetes, how much would you be **willing to pay** for the service (other than cost of medications and/or test kits)? Please tick (✓).

☐ Nothing
☐ Any payment less than Rp. 25,000
☐ Rp. 25,000 – 50,000
☐ More than Rp. 50,000

DIABETES HISTORY

13. In what **year** were you diagnosed with diabetes? ☐☐☐☐

14. Is your Diabetes being **treated** by:

(Tick ✓ one box on each line)

modifying diet?	☐ Yes	☐ No
routine exercise programme?	☐ Yes	☐ No
medications taken by mouth (eg. tablets/capsules)?	☐ Yes	☐ No
insulin injection?	☐ Yes	☐ No

If you are on **insulin**, have you taken insulin **<u>since</u> your diabetes treatment started**?

☐ Yes
☐ No

15. Have you ever received **diabetes information**?

☐ Yes
☐ No

If **Yes**, where do you get the information **from**?
(Tick ✓ more than one box if necessary)

	Doctor's office
	Pharmacy
	Television
	Internet
	Newspaper
	Others (please specify):_____

16. Other health factors:

a) Your **height**: _____ cm

b) Your **weigh**t: _____ kg

Do you **smoke**?	☐ Yes	☐ No, previously smoked	☐ No, never smoked
a) Do you have **high cholesterol**?	☐ Yes	☐ No	☐ Don't know
b) Do you take **medications** to treat your high cholesterol?	☐ Yes	☐ No	☐ Don't know
a) Do you have high **blood pressure**?	☐ Yes	☐ No	☐ Don't know
b) Do you take **medications** to treat your high blood pressure?	☐ Yes	☐ No	☐ Don't know

17. Do you suffer from:

(Tick ✓ one box on each line)

heart disease (i.e. chest pain, heart attack, or heart failure)?	☐ Yes	☐ No	☐ Don't know
eye problems (i.e. blurred vision which is not correctable with glasses, vision blocked with patches, or sudden vision loss)?	☐ Yes	☐ No	☐ Don't know
foot discomfort (i.e. burning/numbness/frequent tingling)?	☐ Yes	☐ No	☐ Don't know
foot ulcers?	☐ Yes	☐ No	☐ Don't know
kidney problems?	☐ Yes	☐ No	☐ Don't know

DIABETES MONITORING

18. How many times in the last month have you had **high blood sugar** reactions such as thirst, dry mouth and skin, increased sugar in the urine, less appetite, nausea, or fatigue? Please tick (✓).

☐ 0 times
☐ 1 – 3 times
☐ 4 – 6 times
☐ 6 – 12 times
☐ More than 12 times
☐ Don't know

19. How many times in the last month have you had **low blood sugar** reactions such as sweating, weakness, anxiety, trembling, hunger or headache? Please tick (✓).

☐ 0 times
☐ 1 – 3 times
☐ 4 – 6 times
☐ 6 – 12 times
☐ More than 12 times
☐ Don't know

20. How many times in the past 12 months have you had **severe low blood sugar** reactions such as passing out or needing immediate help to treat the reaction? Please tick (✓).

☐ 0 times
☐ 1 – 3 times
☐ 4 – 6 times
☐ 6 – 12 times
☐ More than 12 times
☐ Don't know

21. In the last week, did you test your **blood sugar** (i.e. when you need to take blood from your finger**)**?
(if you were sick in the last week, try to remember the most recent 7 days when you were NOT sick)

☐ Yes
☐ No

If **Yes**,

a) On **how many days** in the last week did you test your blood sugar?

_____days

b) On days that you test your blood sugar, **how many times** per day did you test on **average**?

_____ times

Note: Health professionals could be doctors, pharmacists, nurses or laboratory/health facility staff

22. In the past three months, did any **health professional** check your:

(*Tick ✓one box on each line*)

blood sugar?	☐ Yes	☐ No	☐ Don't know
blood pressure?	☐ Yes	☐ No	☐ Don't know
weight?	☐ Yes	☐ No	☐ Don't know

23. In the past 12 months, did any **health professional** check your:

(*Tick✓one box on each line*)

cholesterol (when you need to give a blood sample to be tested)?	☐ Yes	☐ No	☐ Don't know
kidney (when you need to give a urine sample to be tested)?	☐ Yes	☐ No	☐ Don't know
eye (when drops were put in your eyes and caused blurred vision for 1-2 hours)?	☐ Yes	☐ No	☐ Don't know
feet (when your feet were checked for any sores or irritation)?	☐ Yes	☐ No	☐ Don't know

24. In the past 12 months, did any **health professional** check your blood for **HbA1c**?

(HbA1c is a blood test that is done to monitor average sugar levels in the past 2-3 months. Please note that this test should be done in laboratory, hospital or doctor's office; this is NOT a test that you can perform at home)

☐ Yes
☐ No
☐ Don't know

If **Yes**,

a) **How many times** have you had HbA1c checks in the past 12 months?
(Tick✓one box)

	1 time
	2 – 4 times
	More than 4 times
	Don't know

b) What was your **last HbA1c value**?
(Tick✓one box)

	Less than 6.5%
	6.5 – 8%
	More than 8%
	Dont't know

THANK YOU FOR YOUR TIME AND PARTICIPATION

Survei Pasien:
Layanan Diabetes Tipe 2 di Apotek

School of Pharmacy, *Curtin University*, dengan persetujuan Ikatan Apoteker Indonesia cabang Surabaya (No. 001/SK/BPD-IAI/SURABAYA/2010) akan melakukan penelitian untuk menggali kemungkinan peran apoteker di apotek dalam memberikan layanan bagi pasien Diabetes Tipe 2.

Sebagai bagian dari penelitian ini, kami mengajak **pasien apotek yang menderita Diabetes Tipe 2** untuk ikut serta dalam survei berikut. Bapak/Ibu dapat memutuskan untuk bersedia ataupun tidak bersedia berpartisipasi. Jika Bapak/Ibu bersedia berpartisipasi, silakan menandatangani lembar persetujuan di bawah ini, dan melengkapi kuesioner yang terlampir. Pengisian kuesioner ini akan memerlukan waktu sekitar 15 menit.

Besar harapan kami bahwa Bapak/Ibu akan turut berpartisipasi, karena **jawaban Bapak/Ibu akan menjadi masukan bagi apoteker di apotek dalam membantu menangani penyakit Diabetes Anda**. Jenis layanan diabetes tergantung pada kebutuhan masing-masing Bapak/Ibu, sehingga sangatlah penting untuk menjawab **apa adanya**. Semua jawaban akan **dirahasiakan**. Jawaban Bapak/Ibu akan digabungkan dengan jawaban responden lain, dan identitas Bapak/Ibu tidak akan diketahui dalam laporan penelitian ini. Jika Bapak/Ibu mempunyai pertanyaan, silakan menghubungi apoteker di apotek ini atau peneliti:

Ms. Yosi Wibowo
PhD student, School of Pharmacy, Curtin University
Apoteker, Pusat Informasi Obat dan Layanan Kefarmasian, Universitas Surabaya
Telepon : 031-2981170
Email : yosi.wibowo@postgrad.curtin.edu.au

Professor Jeff Hughes
Professor Bruce Sunderland
Supervisors, School of Pharmacy, Curtin University
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Email : J.D.Hughes@curtin.edu.au
B.Sunderland@curtin.edu.au

Terima Kasih atas Partisipasi Bapak/Ibu

Lembar Persetujuan

Saya menyetujui pengambilan dan penggunaan data pada kuesioner terlampir setelah memahami karakteristik penelitian sebagaimana dijelaskan di atas. Saya memahami bahwa seluruh data akan dirahasiakan, dan identitas responden tidak akan diketahui dalam laporan penelitian ini.

Tanda tangan : _____

Nama : _____

Alamat : _____ Tanggal : __ - __ - 2011

Penelitian ini telah mendapat persetujuan dari Curtin University Human Research Ethics Committee (No. PH-09-011). Komite ini terdiri dari anggota masyarakat, akademisi, pengacara, dokter dan pemuka agama. Tugas utamanya adalah memberikan perlindungan bagi responden. Jika diperlukan verifikasi, Bapak/Ibu dapat mengirimkan surat ke Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth, 6845 atau menelepon ke +61 8 9266 2784 atau mengirimkan email ke hrec@curtin.edu.au.

DATA RESPONDEN

1. Mohon dicentang (✓). **Jenis Kelamin** Bapak/Ibu:

☐ Pria
☐ Wanita

2. **Tahun kelahiran** Bapak/Ibu:

1	9		

3. Mohon dicentang (✓). **Etnis** Bapak/Ibu:

☐ Asia
☐ Lainnya (mohon disebutkan): _____

4. Mohon dicentang (✓). **Tingkat pendidikan terakhir** Bapak/Ibu:

☐ Tidak sekolah
☐ lulus SD
☐ lulus SMP/sederajat
☐ lulus SMA/sederajat
☐ lulus Diploma/Akademi
☐ lulus Sarjana (S1)
☐ lulus Pasca-sarjana (S2/S3)

5. Mohon dicentang (✓). **Status pekerjaan** Bapak/Ibu saat ini:

☐ Bekerja penuh-waktu (40 jam atau lebih per minggu)
☐ Bekerja paruh-waktu (kurang dari 40 jam per minggu)
☐ Tidak bekerja
☐ Lainnya (mohon disebutkan):_____

6. Mohon dicentang (✓). **Pendapatan rumah tangga** Bapak/Ibu (yaitu: total gaji suami-istri dan sumber penghasilan lain) per bulan:

☐ Tidak lebih dari Rp. 2 juta
☐ > Rp. 2 juta – 5 juta
☐ > Rp. 5 juta – 10 juta
☐ Lebih dari Rp. 10 juta

7. Mohon dicentang (✓). Bentuk **asuransi kesehatan** yang Bapak/Ibu miliki saat ini:

☐ Asuransi kesehatan yang seluruhnya **dibayar sendiri** oleh Bapak/Ibu atau keluarga
☐ Asuransi kesehatan yang sebagian atau seluruhnya **dibayarkan oleh perusahaan/institusi**
☐ Saya tidak memiliki asuransi kesehatan, tetapi saya dapat memperoleh **Jaminan kesehatan untuk rakyat miskin** *(Jamkesmas* atau yang sejenis)
☐ Saya **tidak memiliki** asuransi kesehatan apapun

8. Apakah Bapak/Ibu menjadi anggota perkumpulan diabetes (diabetes club)? Mohon dicentang (✓).

☐ Ya
☐ Tidak

LAYANAN DIABETES

9. **Seberapa puas** Bapak/Ibu terhadap **layanan di APOTEK** (yang paling sering dikunjungi) dalam membantu menangani **Diabetes Anda**?

☐ Sangat puas
☐ Puas
☐ Cukup puas
☐ Agak puas
☐ Tidak puas

10. Dengan memikirkan saat Bapak/Ibu mengunjungi **APOTEK**, mohon diberikan jawaban pada **Bagian (I)** dan **(II)**.

	(I) Apakah Anda **PERNAH MENDAPATKAN** layanan di bawah ini : *(Lingkari satu jawaban)*		**(II)** Apakah menurut Anda (dalam rangka menangani **Diabetes Anda**), **APOTEK SEHARUSNYA MENGADAKAN** layanan di bawah ini: *(Lingkari satu angka)* ***Tidak perlu diadakan*** ***Harus diadakan***					
A. PEMBERIAN OBAT								
Apotek menyiapkan dan menyerahkan obat	Ya	Tidak	1	2	3	4	5	6
Apotek memberikan **label** tentang cara minum obat *(misalnya: label tertulis 'sehari 3x1 tablet')*	Ya	Tidak	1	2	3	4	5	6
B. EDUKASI								
Apotek memberikan **penjelasan** (secara lisan atau tulisan) berupa:								
• Informasi tentang apa itu penyakit diabetes	Ya	Tidak	1	2	3	4	5	6
• Informasi tentang target hasil pengobatan *(misalnya: kadar gula darah yang seharusnya)*	Ya	Tidak	1	2	3	4	5	6
• informasi tentang obat untuk diabetes: - cara minum obat	Ya	Tidak	1	2	3	4	5	6
- cara pakai alat untuk pemberian insulin	Ya	Tidak	1	2	3	4	5	6
- cara penyimpanan obat	Ya	Tidak	1	2	3	4	5	6
- hal yang perlu diperhatikan saat menggunakan obat *(misalnya: obat ini harus diminum dengan atau segera setelah makan untuk menghindari risiko gula darah rendah)*	Ya	Tidak	1	2	3	4	5	6
- efek samping obat yang umum/penting *(misalnya: setelah minum obat ini dapat menyebabkan mual)*	Ya	Tidak	1	2	3	4	5	6
• Informasi bagaimana berolahraga secara tepat	Ya	Tidak	1	2	3	4	5	6
• Informasi bagaimana menjalankan pola makan sehat	Ya	Tidak	1	2	3	4	5	6
• Informasi bagaimana memeriksa gula darah sendiri *(misalnya: cara penggunaan alat tes gula darah, dan arti hasil tes)*	Ya	Tidak	1	2	3	4	5	6
• Informasi cara mencegah/mengobati kondisi darurat *(misalnya: cara menangani gula darah rendah)*	Ya	Tidak	1	2	3	4	5	6
• Informasi cara mencegah/mengobati komplikasi diabetes *(misalnya: cara mencegah penyakit jantung)*	Ya	Tidak	1	2	3	4	5	6
• Informasi agar melakukan pemeriksaan komplikasi (seperti: pemeriksaan jantung, ginjal, mata dan kaki) secara teratur	Ya	Tidak	1	2	3	4	5	6
• Informasi bagaimana merawat kaki sendiri *(misalnya: merapikan kuku, memeriksa adanya luka di kaki)*	Ya	Tidak	1	2	3	4	5	6
• Informasi cara penghentian merokok	Ya	Tidak	1	2	3	4	5	6

No.10 (lanjutan)

	(I) Apakah Anda **PERNAH MENDAPATKAN** layanan di bawah ini: *(Lingkari satu jawaban)*		(II) Apakah menurut Anda (dalam rangka menangani **Diabetes Anda**), **APOTEK SEHARUSNYA MENGADAKAN** layanan di bawah ini: *(Lingkari satu angka)* *Tidak perlu diadakan* → *Harus diadakan*					
C. PEMANTAUAN								
Apotek memantau **kepatuhan** dengan:								
• Menanyakan apakah obat untuk diabetes diminum teratur	Ya	Tidak	1	2	3	4	5	6
• Menanyakan apakah telah mengikuti program olahraga	Ya	Tidak	1	2	3	4	5	6
• Menanyakan apakah telah mengikuti pengaturan pola makan	Ya	Tidak	1	2	3	4	5	6
• Menanyakan apakah telah mengikuti program untuk mencegah/mengobati komplikasi diabetes *(misalnya: apakah telah minum obat kolesterol secara teratur?)*	Ya	Tidak	1	2	3	4	5	6
• Menanyakan apakah pemeriksaan komplikasi (seperti: pemeriksaan jantung, ginjal, mata dan kaki) dilakukan teratur	Ya	Tidak	1	2	3	4	5	6
Apotek memantau **target hasil pengobatan** dengan:								
• Memeriksa gula darah Anda	Ya	Tidak	1	2	3	4	5	6
• Mengukur berat badan Anda	Ya	Tidak	1	2	3	4	5	6
• Mengukur tekanan darah Anda	Ya	Tidak	1	2	3	4	5	6
• Melihat catatan hasil 'pemeriksaan gula darah yang Anda lakukan'	Ya	Tidak	1	2	3	4	5	6
• Melihat hasil tes laboratorium Anda	Ya	Tidak	1	2	3	4	5	6
• Menanyakan adanya efek samping terkait pengobatan	Ya	Tidak	1	2	3	4	5	6
Apotek merujuk Anda (misalnya: ke dokter/spesialis) saat diperlukan	Ya	Tidak	1	2	3	4	5	6

11. Menurut Bapak/Ibu, manakah **LIMA layanan terpenting** yang **HARUS ADA di APOTEK** untuk membantu menangani **Diabetes Anda** (dapat termasuk layanan yang tecantum pada **Pertanyaan No. 9**)?
(Mohon disebutkan layanannya secara spesifik, misalnya: pemberian informasi mengenai cara minum obat untuk diabetes)

1
2
3
4
5

12. Jika apotek menyediakan **layanan konsultasi** untuk membantu menangani **Diabetes Bapak/Ibu**, berapakah Bapak/Ibu bersedia **membayar** untuk layanan tersebut (selain biaya obat dan/atau alat tes)? Mohon dicentang (✓).

☐ Tanpa dipungut biaya
☐ Pembayaran kurang dari Rp 25.000
☐ Rp. 25.000 – 50.000
☐ Lebih dari Rp. 50.000

RIWAYAT DIABETES

13. **Tahun** dinyatakan (didiagnosis dokter) menderita Diabetes: ☐☐☐☐

14. Apakah saat ini Diabetes Bapak/Ibu **diobati** dengan:

(Centang ✓satu jawaban pada tiap baris)

pengaturan pola makan?	☐ Ya	☐ Tidak
program olahraga rutin?	☐ Ya	☐ Tidak
obat yang ditelan (misalnya: tablet/kapsul)?	☐ Ya	☐ Tidak
suntikan Insulin?	☐ Ya	☐ Tidak

Jika saat ini menggunakan **suntikan Insulin**, apakah Bapak/Ibu telah menggunakannya **sejak pengobatan diabetes Bapak/Ibu dimulai sampai sekarang**?

☐ Ya
☐ Tidak

15. Apakah Bapak/Ibu pernah mendapatkan **informasi mengenai diabetes**?

☐ Ya
☐ Tidak

Jika **Ya**, **darimana** mendapatkan informasi tersebut?
(Centang ✓lebih dari satu jawaban jika perlu)

	Tempat praktek dokter
	Apotek
	Televisi
	Internet
	Surat kabar
	Lainnya (mohon disebutkan):_____

16. Faktor kesehatan yang lain:

Tinggi badan Bapak/Ibu: _____ cm			
Berat badan Bapak/Ibu: _____kg			
Apakah Bapak/Ibu **merokok**? ☐ Ya ☐ Dulu merokok, tapi sudah berhenti ☐ Tidak pernah merokok			
a) Apakah Bapak/Ibu memiliki **kolesterol tinggi**?	☐ Ya	☐ Tidak	☐ Tidak tahu
b) Apakah saat ini Bapak/Ibu minum **obat** untuk kolesterol tinggi?	☐ Ya	☐ Tidak	☐ Tidak tahu
a) Apakah Bapak/Ibu memiliki **tekanan darah tinggi**?	☐ Ya	☐ Tidak	☐ Tidak tahu
b) Apakah saat ini Bapak/Ibu minum **obat** untuk tekanan darah tinggi?	☐ Ya	☐ Tidak	☐ Tidak tahu

17. Apakah Bapak/Ibu menderita:

(Centang ✓satu jawaban pada tiap baris)

penyakit jantung (yaitu: nyeri dada, serangan jantung, atau gagal jantung)?	☐ Ya	☐ Tidak	☐ Tidak tahu
gangguan pada mata (yaitu: penglihatan kabur yang tidak terbantu dengan pakai kaca mata, terdapat bercak-bercak yang menghalangi penglihatan, atau kehilangan penglihatan secara mendadak)?	☐ Ya	☐ Tidak	☐ Tidak tahu
gangguan pada kaki (yaitu: rasa panas/mati rasa/sering kesemutan)?	☐ Ya	☐ Tidak	☐ Tidak tahu
borok pada kaki?	☐ Ya	☐ Tidak	☐ Tidak tahu
gangguan ginjal?	☐ Ya	☐ Tidak	☐ Tidak tahu

PEMANTAUAN DIABETES

18. Dalam bulan lalu, berapa kali Bapak/Ibu mengalami **gejala akibat gula darah tinggi**, seperti: merasa kehausan, mulut dan kulit kering, peningkatan gula dalam urin, nafsu makan berkurang, mual, atau kelelahan? Mohon dicentang (✓).

☐ Tidak pernah
☐ 1 – 3 kali
☐ 4 – 6 kali
☐ 6 – 12 kali
☐ Lebih dari 12 kali
☐ Tidak tahu

19. Dalam bulan lalu, berapa kali Bapak/Ibu mengalami **gejala akibat gula darah rendah**, seperti: berkeringat dingin, lemas, gelisah, gemetar, merasa kelaparan, atau sakit kepala? Mohon dicentang (✓).

☐ Tidak pernah
☐ 1 – 3 kali
☐ 4 – 6 kali
☐ 6 – 12 kali
☐ Lebih dari 12 kali
☐ Tidak tahu

20. Dalam 1 tahun terakhir, berapa kali Bapak/Ibu mengalami **gejala yang parah** akibat gula darah rendah, seperti: pingsan atau memerlukan bantuan segera untuk mengatasinya? Mohon dicentang (✓).

☐ Tidak pernah
☐ 1 – 3 kali
☐ 4 – 6 kali
☐ 6 – 12 kali
☐ Lebih dari 12 kali
☐ Tidak tahu

21. Dalam minggu lalu, apakah Bapak/Ibu melakukan tes **gula darah** (yaitu: dengan mengambil darah dari jari)?
(Jika anda sakit dalam minggu lalu, cobalah mengingat 7 hari terakhir saat anda TIDAK sakit)

☐ Ya
☐ Tidak

Jika **Ya**,

a) Dalam minggu lalu, pada **hari** apa saja Anda melakukan tes gula darah?
(Centang ✓ lebih dari satu jawaban jika perlu)

	Senin
	Selasa
	Rabu
	Kamis
	Jumat
	Sabtu
	Minggu

b) Pada hari-hari dimana Anda melakukan tes gula darah, rata-rata berapa **kali** per hari Anda melakukannya?
_____kali

Catatan: Yang dimaksud tenaga kesehatan dibawah ini adalah dokter, apoteker, perawat atau petugas laboratorium/fasilitas kesehatan

22. Dalam 3 bulan terakhir, apakah **tenaga kesehatan** memeriksa:

(*Centang ✓satu jawaban pada tiap baris*)

gula darah Anda?	☐ Ya	☐ Tidak	☐ Tidak tahu
tekanan darah Anda?	☐ Ya	☐ Tidak	☐ Tidak tahu
berat badan Anda?	☐ Ya	☐ Tidak	☐ Tidak tahu

23. Dalam 1 tahun terakhir, apakah **tenaga kesehatan** memeriksa:

(*Centang ✓satu jawaban pada tiap baris*)

kolesterol (yaitu: dengan mengambil sampel darah Anda untuk dites)?	☐ Ya	☐ Tidak	☐ Tidak tahu
ginjal (yaitu: dengan mengambil sampel urin Anda untuk dites)?	☐ Ya	☐ Tidak	☐ Tidak tahu
mata (yaitu: dengan menetesi mata Anda dengan suatu cairan yang dapat membuat pandangan kabur selama 1-2 jam)?	☐ Ya	☐ Tidak	☐ Tidak tahu
kaki (yaitu: dengan memeriksa adanya luka atau iritasi pada kaki Anda)?	☐ Ya	☐ Tidak	☐ Tidak tahu

24. Dalam 1 tahun terakhir, apakah **tenaga kesehatan** melakukan tes darah untuk memeriksa **HbA1c** Bapak/Ibu?
(HbA1c adalah tes darah yang dilakukan untuk melihat rata-rata kadar gula selama 2-3 bulan terakhir. Tes ini hanya dapat dilakukan di laboratorium, rumah sakit atau tempat praktek dokter; ini BUKANLAH tes yang dapat dilakukan sendiri di rumah).

☐ Ya
☐ Tidak
☐ Tidak tahu

Jika **Ya,**

a) Berapa **kali** HbA1c Anda diperiksa dalam 1 tahun terakhir?
(*Centang ✓satu jawaban*)

	1 kali
	2 – 4 kali
	Lebih dari 4 kali
	Tidak tahu

b) Berapa **nilai HbA1c** Anda pada pemeriksaan **terakhir**?
(*Centang ✓satu jawaban*)

	Kurang dari 6,5%
	6,5 – 8%
	Lebih dari 8%
	Tidak tahu

TERIMA KASIH UNTUK WAKTU DAN PARTISIPASI BAPAK/IBU

Appendix 7

Information sheet and consent form for the qualitative study (English and Indonesian versions)

Curtin University

PARTICIPANT INFORMATION SHEET

Study: Pharmacy-based Type 2 Diabetes Services

You are invited to participate in a study exploring pharmacy-based services for type-2 diabetes patients in Indonesian setting. This study is being conducted by Curtin University's School of Pharmacy with the approval from the Indonesian Pharmacist Association – Surabaya (No. 001/SK/BPD-IAI/SURABAYA/2010).

What is the purpose of the study?

The purpose of the study is:

1. To explore the current practice of doctors and pharmacists with respect to the management of type 2 diabetes in primary care.
2. To explore doctors' and pharmacists' expectations of community pharmacists' professional responsibilities with respect to management of type 2 diabetes.

When and where will the study take place?

Data for the study will be collected through your participation in an interview arranged at a time and place that suits your convenience.

Who is being asked to take part and what will they do?

We are interested in learning more about the current practice of diabetes care, and the potential role of community pharmacists in diabetes care. During the interview, you will be asked to describe your opinions on this topic. The interview will take one hour or less. The interview will be tape-recorded to ensure the inclusion of all details.

What are the risks and benefits of the study?

Participation is voluntary. You are not required to answer any questions that you do not want to and participation or non-participation will not have any effect on your professional or personal life. You have the right to withdraw from the study at any time with no adverse consequences.

A potential benefit from your participation is the opportunity to air your views regarding the role of community pharmacists in diabetes care. Your opinion will help shape the future development of the pharmacy profession as part of the diabetes team to deliver an integrated service.

Is the study confidential?

All of the data collected will be kept strictly confidential. Your name will not be used at any stage of the research process. You will be given a unique study identifier code to ensure privacy, and the names of persons identified in interviews will be removed from the transcriptions. All data will be kept on a password-protected computer or a locked cabinet accessible only by the researchers. No information will be reported that would disclose any personal identity. The final report may be submitted for publication in a peer-reviewed journal.

Your participation is very important to the study and we hope that you will agree to take part. Should you have any queries, please find our contact details are as follows:

Ms. Yosi Wibowo
PhD student, School of Pharmacy, Curtin University
Pharmacist, Pusat Informasi Obat & Layanan Kefarmasian
Universitas Surabaya
Phone : 031- 298 1170
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Professor Jeff Hughes
Professor Bruce Sunderland
Supervisors, School of Pharmacy
Curtin University
Phone : +61 8 9266 7369
Email : J.D.Hughes@curtin.edu.au
B.Sunderland@curtin.edu.au

This study has been approved by the Curtin University Human Research Ethics Committee (Approval Number PH-03-12). The Committee is comprised of members of the public, academics, lawyers, doctors and pastoral carers. Its main role is to protect participants. If needed, verification of approval can be obtained either by writing to the Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth WA 6845 or by telephoning +61 8 9266 2784 or by emailing hrec@curtin.edu.au

Curtin University

CONSENT FORM

Study: Pharmacy-based Type 2 Diabetes Services

I have read the information sheet, I have had the nature of the study explained to me, and I agree to participate in the study described. I understand that the interview will be tape-recorded. All questions have been answered to my satisfaction.

I understand that any information I provide for the study will be kept confidential. All data will be securely stored. No information will be reported that would disclose any personal identity.

I understand that my participation in this study is voluntary and that I have the right to withdraw at any time.

Date: ____/____/____ (to be dated by participant)

Signature of participant **:** _____

Name of participant **:** _____

Curtin University

LEMBAR INFORMASI UNTUK PARTISIPAN

Layanan Diabetes Tipe 2 di Apotek

School of Pharmacy, Curtin University dengan persetujuan IAI Surabaya (001/SK/BPD-IAI/SURABAYA/2010) meminta kesediaan Bapak/Ibu untuk berpartisipasi dalam penelitian mengenai layanan untuk pasien diabetes tipe 2 di apotek.

Tujuan penelitian

Penelitian ini bertujuan untuk:

1. Mengetahui praktek layanan dokter dan apoteker untuk pasien diabetes tipe 2 rawat jalan
2. Menggali harapan dokter dan apoteker terhadap peran apoteker di apotek dalam memberikan layanan diabetes tipe 2 rawat jalan

Waktu dan tempat penelitian

Pengumpulan data penelitian dilakukan melalui proses wawancara yang akan diatur pada waktu dan tempat yang disepakati.

Target partisipan dan kewajiban partisipan

Pada penelitian ini, kami tertarik untuk mengetahui praktek layanan diabetes yang ada saat ini, dan kemungkinan apoteker di apotek terlibat dalam layanan tersebut. Selama wawancara, Bapak/Ibu akan diajak berdiskusi mengenai topik ini. Wawancara akan berlangsung sekitar 1 jam. Jalannya wawancara akan direkam supaya semua yang Bapak/Ibu katakan dapat tercatat dengan baik.

Manfaat penelitian

Dengan berpartisipasi dalam penelitian ini, Bapak/Ibu dapat menyuarakan pendapat Bapak/Ibu terkait peran apoteker dalam layanan diabetes. Masukan ini bermanfaat untuk menentukan arah perkembangan profesi apoteker - sebagai bagian dari tim kesehatan - dalam memberikan layanan diabetes yang terintegrasi.

Kami berharap Bapak/Ibu secara sukarela berpartisipasi dalam penelitian ini. Bapak/Ibu bebas menarik diri kapan saja tanpa dampak apapun.

Kerahasiaan

Semua informasi yang diperoleh akan dijaga kerahasiaannya. Identitas Bapak/Ibu tidak akan diketahui dalam proses penelitian ini, sebagai gantinya akan diberikan suatu kode identifikasi. Semua data akan disimpan dalam komputer yang ber-*password* atau dalam laci terkunci yang hanya dapat diakses oleh peneliti. Semua laporan terkait penelitian ini tidak akan mencantumkan identitas Bapak/Ibu.

Besar harapan kami bahwa Bapak/Ibu bersedia berpartisipasi**.** Jika Bapak/Ibu mempunyai pertanyaan, silakan menghubungi peneliti:

Ms. Yosi Wibowo
PhD student, School of Pharmacy, Curtin University
Pharmacist, Pusat Informasi Obat & Layanan Kefarmasian
Universitas Surabaya
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B.Sunderland@curtin.edu.au

Penelitian ini telah disetujui oleh Curtin University Human Research Ethics Committee (No. PH-09-011). Komite ini terdiri dari anggota masyarakat, akademisi, pengacara, dokter dan pemuka agama. Tugas utamanya adalah memberikan perlindungan bagi responden. Jika diperlukan verifikasi, Bapak/Ibu dapat mengirimkan surat ke Curtin University Human Research Ethics Committee, c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth, 6845, atau menelepon ke +61 8 9266 2784, atau mengirimkan email ke hrec@curtin.edu.au.

LEMBAR PERSETUJUAN

Layanan Diabetes Tipe 2 di Apotek

Saya menyetujui untuk berpartisipasi dalam penelitian ini, setelah membaca lembar informasi dan memahami karakteristik penelitian ini. Saya memahami bahwa proses wawancara akan direkam. Semua pertanyaan saya terkait penelitian ini telah dijawab dengan memuaskan.

Saya juga memahami bahwa seluruh data akan dijaga kerahasiaannya, dan disimpan di tempat yang aman. Laporan terkait penelitian ini tidak akan mencantumkan identitas pribadi.

Saya memahami bahwa partisipasi saya bersifat sukarela, dan saya berhak mengundurkan diri kapanpun.

Tanggal : ____/____/____ (dilengkapi oleh partisipan)

Tanda tangan partisipan : _____

Nama partisipan : _____

Appendix 8

Demographic data form for the qualitative study

Demograpic Data – Community Pharmacist

Interview No. : _____

Date : ____/_____/_____

Location : _____

Interviewer : _____

Interviewee : _____

Pharmacy : _____

Respondent details

Gender : _____

Age : _____

Position : _____

Years of work experience: _____

Pharmacy characteristics

Setting

- Location : _____
- Within doctor clinic : Yes / No
- Private counselling area/room : Yes / No

Ownership : _____

Opening hours

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Staffing

Pharmacy Staff	Working hours
Pharmacist manager	
Pharmacist A	
Pharmacist B	

Total no. of customers: _____/month

No. of customers dispensed oral antidiabetic medications: _____/month

Demograpic Data – Doctor

Interview No. : _____

Date : ____/_____/_____

Location : _____

Interviewer : _____

Interviewee : _____

Respondent details

Gender : _____

Age : _____

Level : _____

Years of work experience : _____

Clinic characteristics

Setting

- Location : _____
- With on-site pharmacy : Yes / No
- Others : _____

Opening hours

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

Staffing

Clinic staff	Working hours

No. of type 2 diabetes patients: _____/month

Appendix 9

Interview guides for the qualitative study

Interview Guide – Community Pharmacist

Opening

The marked increase of type 2 diabetes patients in Indonesia will place pressure on health care workers to ensure optimal diabetes management. In this situation, there is a need to make better use of health care resources in the community, including community pharmacies.

Current practice (process of services)

1. WHAT- When a patient with type -2 diabetes visits your pharmacy, please describe services provided.

    - *Probe/challenge them on each point in the generic model of care, starting with:*
        - Treatment administration
        - Education/counselling
        - Initial assessment (provide the definition)
        - Treatment plan (provide the definition)
        - Monitoring/review (provide the definition)
    - PROBE: Patients is newly diagnosed or has longstanding disease – vary?
    - PROBE: Patient with and without insurance – differences?

2. HOW - For each service, could you tell me how you run it (details of the process)?

    - PROBE: personnel and resources
      (If there is any documents (e.g. reports, protocols, etc.), ask permission to review it)

3. What has been your overall experience when providing the service?

    - PROBE: Barriers/facilitators – is there any difficulty/driving force in providing the service?
    - PROBE: Customer feedback
    - PROBE: Charges

Views on community pharmacists' roles

The marked increase of type 2 diabetes patients will place pressure on health care workers to ensure optimal diabetes management. This provides challenges to pharmacy profession to be actively involved in the diabetes team.

4. What do you think that community pharmacists SHOULD do for type-2 diabetes patients?

    - *Probe/challenge them on each point in the generic model of care*
        - Treatment administration
        - Education/counselling
        - Initial assessment
        - Treatment plan
        - Monitoring /review
    - *(If they mention services beyond dispensing)* PROBE: Why do you think this service is important?
    - *(If they mention no services should be provided - except for dispensing medications)* PROBE: what things made you think that community pharmacists should only do dispensing?
    - *(If the services mentioned haven't done – check point 2)* PROBE: Barriers – what things made it difficult for you to provide the services?

In Closing

5. Our project is about the role of community pharmacists with respect to diabetes care. Does anything else come to mind that I haven't asked you about?

THANK YOU FOR YOUR PARTICIPATION

Interview Guide – Doctor

Opening

The marked increase of type 2 diabetes patients in Indonesia will place pressure on health care workers to ensure optimal diabetes management. In this situation, there is a need to make better use of health care resources.

Current practice (process of services)

1. WHAT - When a patient with type -2 diabetes visits your clinic, please describe a typical consultation/assessment provided.

    - *Probe/challenge them on each point in the generic model of care*
        - Initial assessment
        - Treatment plan
        - Education/counselling
        - Monitoring/review
    - PROBE: Patient is newly diagnosed or has longstanding disease -vary?
    - PROBE: Patient with and without insurance – differences?

2. HOW - For each service, could you tell me how you run it (details of the process)?

    - PROBE: personnel and resources
      (If there is any documents (e.g. reports, protocols, etc.), ask permission to review it)

Views on community pharmacists' roles

The marked increase of type 2 diabetes patients in Indonesia will place pressure on health care workers to ensure optimal diabetes management. In this situation, there is a need to make better use of health care resources in the community. In other countries such as Australia, community pharmacists have a more active role within diabetes team, such as: repeat medications (i.e. doctors prescribe medications that allow patients to refill their medication for certain times where pharmacists ensure their diabetes control), patient education/counselling, and monitoring (e.g. blood glucose level, blood pressure, weight).

3. What would you like community pharmacists to do in helping your type-2 diabetes patients?

    - *Probe/challenge them on each point in the generic model of care, starting with:*
        - Treatment Administration (how about repeat medications?)
        - Education/Counselling

          Then:
        - Assessment (provide examples)
        - Treatment Plan (provide examples)
        - Monitoring/review (provide examples)
    - *(If they mention some extended services)* PROBE: Why do you think this service is important to be provided in the pharmacy?
    - *(If they mention no services should be provided - except for dispensing medications)* PROBE: what things made you think that community pharmacists should only do dispensing?
    - *(We previously did surveys among patients and pharmacists, and we found areas other than dispensing that pharmacists could be involved, such as monitoring, and counselling)* PROBE: What do you think about that?

In Closing

4. Our project is about the role of community pharmacists with respect to diabetes care. Does anything else come to mind that I haven't asked you about?

THANK YOU FOR YOUR PARTICIPATION