



Exploring Adherence to Hypertension Medication in a Rural Community in Indonesia

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Certificate of original authorship

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and in the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are appropriately acknowledged within the thesis.

I acknowledge that Dr Laurel Mackinnon and Lei Cameron provided editing, proofreading and typesetting services, in accordance with the university-endorsed national guideline for editing a research thesis.

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It is not enough to have knowledge, one must also apply it.

It is not enough to have wishes, one must also accomplish.

Johann Wolfgang von Goethe

*Glory to be you (Allah), we have no knowledge except what you have
taught to us. Verily. It is You, the All-Knower, the All-Wise*

Al Baqarah; 2:32

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List of acronyms and abbreviations

ACE	angiotensin-converting enzyme
ANOVA	analysis of variance
ARB	angiotensin receptor blocker
A\$	Australian dollar
BP	blood pressure
CCB	calcium channel blocker
CHC	community health centre
CHW	community health worker
CP	community pharmacy
DOI	digital object identifier
GDP	gross domestic product
HDI	Human Development Index
HREC	Human Research and Ethics Committee
IDR	Indonesian rupiah
IHSP-Elderly	Integrated health service post for the elderly
IPAQ	International Physical Activity Questionnaire
IQR	interquartile range
ISH	International Society of Hypertension
JNC	Joint National Committee
LHW	lay health worker
MET	metabolic equivalent of task
MMAS	Morisky Medication Adherence Scale
N	number of participants
OR	odds ratio
OTC	over the counter
PHC	primary health care
SD	standard deviation
SPSS	Statistical Package for the Social Sciences
US\$	United States dollar
WHO	World Health Organization

List of Indonesian terms

Badan POM	Badan Pengawas Obat dan Makanan (National Agency of Drugs and Food Control)
BPJS-Kesehatan	Badan Penyelenggara Jaminan Sosial Kesehatan (Healthcare Social Security Agency)
Gema Cermat	Gerakan masyarakat cerdas menggunakan obat (People's movement toward wise use of medicines)
Posbindu PTM	Pos Pembinaan terpadu penyakit tidak menular (Integrated health coaching post for non communicable disease)
Posyandu	Pos pelayanan terpadu (Integrated health service post)
Posyandu lansia	Pos pelayanan terpadu untuk lansia (Integrated health service post for the elderly)
Prolanis	Program pengelolaan penyakit kronis (Chronic disease management program)
Puskesmas	Pusat kesehatan masyarakat (Community health centre)
Pusling	Puskesmas keliling (mobile unit service)

Publications and presentations through this PhD research

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Abstract

Globally, hypertension is attributed to more than half of deaths caused by cardiovascular events. In Indonesia, stroke is the most frequent cause of death, and hypertension is the major modifiable risk factor. One-third of Indonesian adults have hypertension but less than 10% have their blood pressure adequately controlled. Although adherence to anti-hypertensive medications is acknowledged as a cornerstone for achieving blood pressure control, little is known about medication adherence among patients in Indonesian rural and underdeveloped areas. This thesis reports on studies that explored adherence to anti-hypertensive medications in such areas with the aim of understanding how patients might be better supported.

Given the scarcity of Indonesian data, the first aim of this thesis research was to explore the use of anti-hypertensive medications and the extent of non-adherence to these medications among Indonesian rural communities. This involved collecting data about the types of medications used, sources of medicine supply and use of traditional medicines for treating hypertension. Adherence to anti-hypertensive medications was measured using a validated adherence scale. The second aim of this research was to identify factors affecting adherence to anti-hypertensive medication. Both quantitative and qualitative approaches were used to identify the enabling factors of, and barriers to, the use of anti-hypertensive medications. Finally, this research aimed to identify challenges to, and strategies for, improving adherence to anti-hypertensive medications in Indonesian rural communities.

The medication-taking practices of people with hypertension were revealed through a survey study of 384 people in the Bantul district, situated in the Yogyakarta province of Indonesia. It was conducted in eight rural underdeveloped villages where people generally have a low level of education (schooling) and economic status. Of the 384 participants, 203 (51%) had taken and 181 had not taken anti-hypertensive medications within the preceding 30 days. They obtained their anti-hypertensive medications from five sources: (i) community pharmacies, by purchasing the medicines without prescription; (ii) healthcare centres, by visiting a community health centre or hospital; (iii) outreach healthcare services in the villages, by visiting community health workers-based program such as the Integrated Health Post for Elderly (IHSP-Elderly); (iv) private practices, by direct dispensing from a doctor, midwife or nurse; or (v) a combination of sites (e.g. community pharmacy plus private doctor). However, only 40 of the 203 (20%) participants had received a sufficient supply of medicine during the preceding 30 days, and almost half had obtained sufficient

anti-hypertensive medications for less than seven days. A validated adherence scale showed that only 42 of 203 (21%) treated participants had good adherence (Morisky Medication Adherence Scale-8 score ≥ 6). A higher level of hypertension knowledge predicted good adherence (OR, 7.1, $p < 0.01$). However, a validated questionnaire to ascertain hypertension knowledge showed that only 15% of participants had a good knowledge of hypertension. Knowledge gaps were identified, particularly about the need for long-term medication, complications of hypertension and the target blood pressure.

Interviews with rural villagers with hypertension revealed some misconceptions associated with non-adherence to anti-hypertensive medications (such as the belief that medications are unnecessary for hypertension) and their expectation of obtaining more information from healthcare professionals. Given the heavy workload of healthcare providers, participants expected community health workers in the villages to play a greater role in providing information to those rural villagers with hypertension. An exploratory study of the role of a community health worker-based program, that is, IHSP-Elderly, was conducted by interviewing elderly people with hypertension, community health workers and a health district officer. The interviewees reported that being healthier, having peer support and accessing free blood pressure checks were key benefits of the IHSP-Elderly. The community health workers have the potential to provide blood pressure screening and monitoring, health education and home visits for elderly patients in the villages. Therefore, the role of these frontline personnel in providing information about hypertension to patients in rural areas should be strengthened.

In-depth interviews with 30 participants who had not taken anti-hypertensive medication within the preceding year revealed associations between this behaviour and all core constructs of the health belief model: (i) perceived susceptibility and severity; (ii) perceived benefits and barriers; (iii) self-efficacy; and (iv) cues of actions. These participants believed that hypertension is not a serious problem and that high blood pressure is normal for elderly people. They perceived that anti-hypertensive medications were unnecessary for them because hypertension can be easily managed by using traditional medicines. The villagers also had pragmatic reasons, such as favouring the use of traditional medicines because they were easy to obtain (e.g. from their own land), could be accessed at any time and were more affordable than anti-hypertensive medications. For some participants, this pragmatic approach also meant that anti-hypertension medications were preferable when easily accessible and affordable.

Traditional medicines were used for lowering blood pressure by 263 of 384 (69%) participants; 134 (51%) used only traditional medicines for their hypertension (i.e. they did not take anti-hypertensive medications). Among traditional medicine users, a lower educational level was associated with the behaviour of not taking anti-hypertensive medications. Vegetables and fruit, such as cucumber and watermelon, as well as homemade herbal medicines were commonly used as a primary means of managing high blood pressure. The research did not identify any socio-demographic variables that predicted the use of traditional medicines. Their uses were not associated with the level of hypertension knowledge.

Overall, this thesis research reveals that most rural villagers with hypertension living in Indonesian underdeveloped villages have poor adherence to anti-hypertensive medications. By combining the findings from quantitative and qualitative studies, the research identifies the following key factors affecting adherence to hypertensive medication, according to the World Health Organisation's multidimensional adherence model: (i) patients' knowledge and beliefs about hypertension and the use of hypertension medication; (ii) self-efficacy in managing hypertension; (iii) access to an adequate supply of anti-hypertensive medications; (iv) information and recommendations regarding hypertension medication; and (v) support from family and community health workers within the villages. Despite the presence of misconceptions and misbeliefs, patients expected to receive more detailed information. The distance from healthcare facilities and a lack of consultation with healthcare providers raise the need to improve patients' self-management skills to manage their blood pressure. Only a few rural villagers reported having access to an adequate supply of anti-hypertensive medications. These findings indicate that rural villagers need support in terms of adequate information, self-management skills, functional social support and accessible anti-hypertensive medication. Targeted interventions for these rural villagers should aim at encouraging the support needed and addressing the potential barriers identified.

The finding that good knowledge significantly predicts good adherence suggests a need to provide adequate information for rural villagers with hypertension. Information about medicines was rarely provided during a clinical encounter, and recommendations from healthcare providers about long-term adherence to medication were lacking. Despite the potential of community pharmacists being front-liners in providing information, only a few participants regarded them as the main source of medicine information. Although the opportunity existed for community health workers and family members to support rural villagers, their limited knowledge about hypertension may preclude an increased role in

providing information. Therefore, in response to the findings in this research, a simplified written information leaflet for patients was developed. The 'Blood Pressure Action Sheet' (BP Action Sheet) was a purpose-designed sheet to inform each patient about his/her target blood pressure, how to achieve the target, key facts about hypertension and sources of support in the local setting. The tailored BP Action sheet provides space to record blood pressure readings measured by healthcare workers (including community health workers) as they monitor the patient. A qualitative study was conducted to canvass feedback on the BP Action Sheet via individual telephone interviews with patients, community health workers in the villages and healthcare professionals in the community health centres. Most participants commented that the information provided in the BP Action Sheet was important, easily understood and well presented. Both patients and healthcare workers supported the use of the BP Action Sheet in practice, particularly by patients who had joined the existing hypertension program supervised by the community health centre. Suggestions for refinement of the BP Action Sheet included a more colourful print to attract attention and the need to provide additional information, such as the role of traditional medicines in the management of hypertension. Community health workers who could explain the information in the BP Action Sheet in their local language were regarded as playing a key role in improving patients' understanding of the information in the sheet as well as encouraging patients to have their blood pressure monitored regularly. Overall, patients and healthcare workers valued the BP Action Sheet as a way to provide information about hypertension, to monitor patients' progress towards achieving their target blood pressure and to facilitate patient-centred communication involving healthcare providers, community health workers and patients. The BP Action Sheet has potential to be a low-cost strategy to improve management of hypertension in Indonesian rural areas.

This thesis research provides first-hand information about poor adherence to anti-hypertensive medications among Indonesian rural villagers. Poor adherence was associated with poor knowledge about hypertension, high self-efficacy for the use of traditional medicines, a lack of access to an adequate supply of medications and a lack of tailored information. Strengthening the role of community health workers in local villages, increasing patient participation in programs to achieve their blood pressure target and providing healthcare support systems in primary healthcare are important aspects for promoting adherence to medication and improving management of hypertension for these rural people. This research has developed the BP Action Sheet aimed at supporting patients in Indonesian rural communities. The potential benefits of the BP Action sheet in clinical practice should be evaluated further.

Structure of the thesis

Chapter 1: Overview of hypertension

Hypertension (high blood pressure (BP)) is a ubiquitous health problem worldwide. This chapter provides an overview of hypertension, including the definitions and classification of hypertension, epidemiology of hypertension worldwide, clinical consequences of hypertension, hypertension treatment and the reasons for the suboptimal management of hypertension.

Chapter 2: Patient medication-taking behaviour

This chapter comprises an overview of adherence, which is one important aspect of medication-taking behaviour, and a review of self-medication practice, one particular form of medication-taking behaviour, among people with hypertension. Section 2.1 defines adherence, describes the types of non-adherence and reviews how adherence can be assessed. Factors affecting adherence are presented using the World Health Organization's (WHO) five dimensions of adherence (patient-, healthcare system-, clinical-, therapy- and socioeconomic-related factors). This chapter also describes strategies to improve medication adherence, including interventions targeting patients, healthcare providers and healthcare system.

Section 2.2 presents a literature review of self-medication practices among people with hypertension which was published in *Family Practice* in January 2017. The review explores the scope of self-medication practices in terms of the scale of use, type of medications and influencing factors.

Chapter 3: Management of hypertension in Indonesia

All studies presented in this thesis were undertaken in rural villages in Yogyakarta province, Indonesia. Chapter 3 provides an overview of Indonesia, its healthcare system, (including regulation around accessing medicines) and how hypertension is managed in the Indonesian primary care setting. This chapter also describes the challenges faced by the Indonesian healthcare system when optimising hypertension management, especially for people living in rural areas.

Chapter 4: Aims, objectives and conceptual framework

This chapter describes the general aims of the studies described in this thesis and the specific objectives across the collection of studies. A brief explanation of the methods used to achieve these objectives is also presented. This chapter also describes the conceptual framework that provides the context for the thesis research.

Chapter 5: Medication-taking practices in rural Indonesian people with hypertension

The findings from a large survey that explored the medication-taking practices of people with hypertension are presented in Chapter 5. This study was conducted in eight rural underdeveloped (poor) villages in the Bantul district, Yogyakarta province.

This chapter comprises three publications:

Section 5.1: Access to medicines for hypertension: A survey in rural Yogyakarta province, Indonesia (resubmitted to *Rural and Remote Health* for final decision after minor revisions, July 2017)

Section 5.2: Factors affecting self-reported medication adherence and hypertension knowledge: A cross sectional study in rural villages, Yogyakarta province, Indonesia (accepted for publication in *Chronic Illness*, July 2017).

Section 5.3: The use of traditional medicines to lower blood pressure: A survey in rural areas of Yogyakarta province, Indonesia (submitted to *Chronic Illness*, August 2017).

Section 5.1 reports where patients obtained their anti-hypertensive medications, the type of medications and duration for taking the medications. This section also describes patients' self-reports about information provided by healthcare professionals. Patients' self-reported adherence to anti-hypertensive medications and their knowledge about the basic features of hypertension and the influencing factors are described in Section 5.2.

Instead of taking anti-hypertensive medications, people with hypertension often relied on traditional medicines to lower their BP. The findings described in Section 5.3 reveal the use of traditional medicines among rural villagers and how it might affect management of hypertension.

Chapter 6: Lay perspectives on the use of anti-hypertensive medications

Chapter 6 reports the findings from two qualitative studies that explored the perceptions of lay people (patients and community health workers) about hypertension and the use of anti-hypertensive medications.

Section 6.1: Perspectives on antihypertensive medication: A qualitative study in a rural Yogyakarta province in Indonesia (published in *Drugs & Therapy Perspectives*, January 2016)

Section 6.2: Understanding untreated hypertension from patients' point of view: A qualitative study in rural Yogyakarta province, Indonesia (published in *Chronic Illness*, August 2017)

Section 6.1 reveals some misconceptions about anti-hypertensive medications among the rural villagers, as well as the potential role for, and limitations of, community health workers in addressing these misconceptions.

Section 6.2 describes the views about untreated hypertension through in-depth interviews with patients who had not taken any anti-hypertensive medications within the preceding year. The interviews canvassed patients' perspectives about high BP treatment, factors influencing their perceptions and how they might be better supported.

Chapter 7 Encouraging the role of lay health workers in improving hypertension management

This chapter comprises one publication from the thesis.

Section 7.1: A community health worker-based program for elderly people with hypertension in Indonesia: A qualitative study (published in *Preventing Chronic Disease*, December 2015).

In-depth interviews were conducted with patients, community health workers and the district health officer in Bantul district, Yogyakarta Province, Indonesia. The study shows the potential of, and challenges faced by, a community health worker-based program in supporting patients with hypertension in rural villages.

Chapter 8: Developing a ‘Blood Pressure Action Sheet’ for patients in rural communities

Findings from the studies in Chapters 5 and 6 emphasise the need to address knowledge gaps and poor medication adherence among people with hypertension. A ‘Blood Pressure Action Sheet’ was developed as a custom-designed written resource for Indonesian patients with hypertension.

Chapter 8 comprises the following publication:

Section 8.1: Feedback on a ‘Blood Pressure Action Sheet’ for patients with hypertension: A qualitative study in rural Yogyakarta province, Indonesia (submitted to *Patient Education and Counselling*, August 2017)

This section describes the findings of a qualitative study, involving telephone interviews that was conducted to canvass feedback from potential end-users (patients and healthcare workers) about the layout, content and potential use of the Blood Pressure Action Sheet.

Chapter 9: Discussion and conclusion

This chapter synthesises the findings from each study, reflects on their implications for practice, acknowledges the strengths and limitations of the research, and presents recommendations for future research.

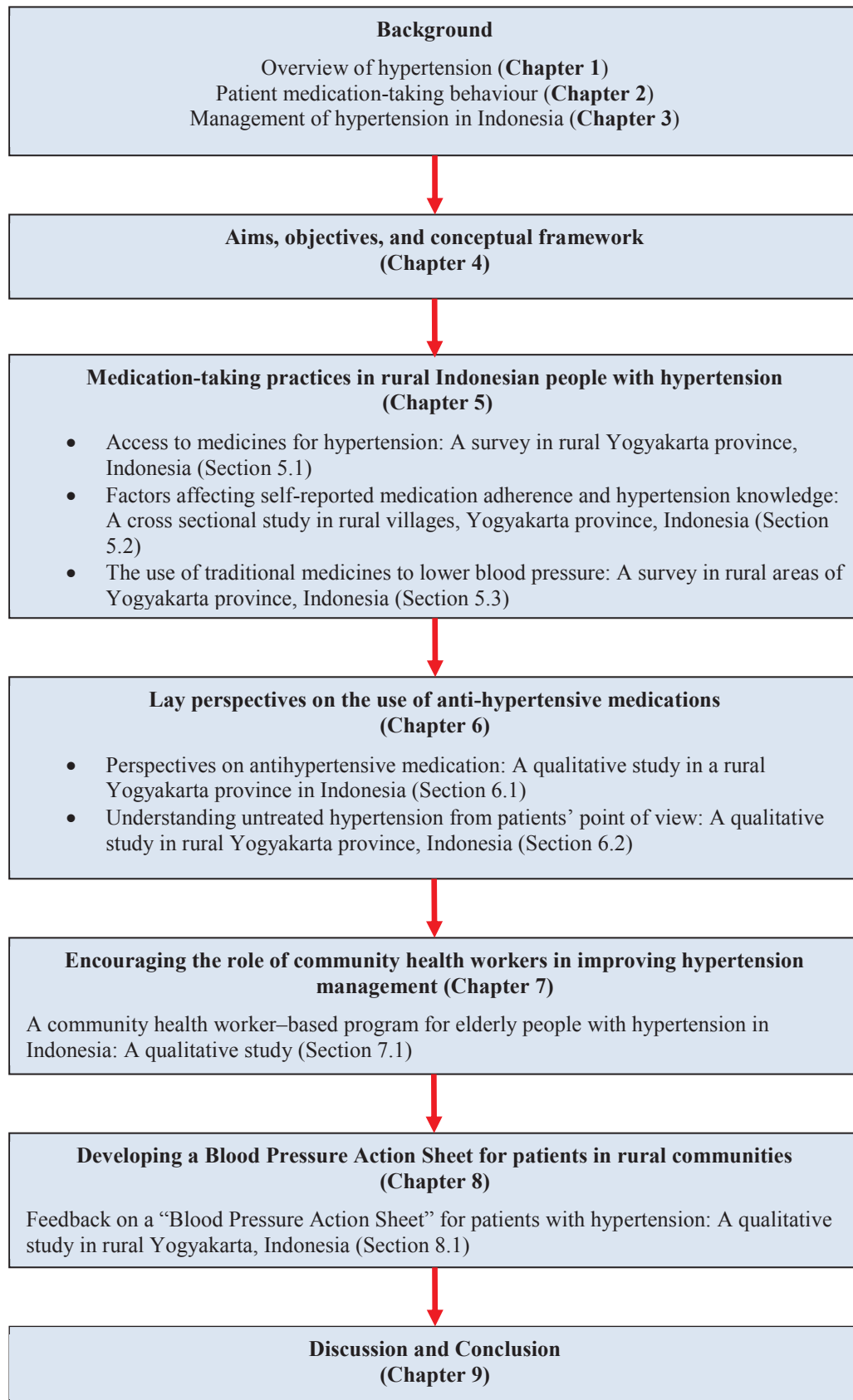


Figure 0.1 **Structure of the thesis**

Chapter 1:

Overview of hypertension

1.1 Overview of hypertension

1.1.1 Definition and classification of hypertension

Blood pressure (BP) is the force exerted by blood against the artery walls (Giles et al. 2009; Nichols, O'Rourke & Vlachopoulos 2011). Normal BP is defined as a systolic BP (the pressure as the heart pumps blood around the body) of less than 120 mmHg and diastolic BP (as the heart relaxes and refills with blood) less than 80 mmHg (Chobanian et al. 2003; James et al. 2014; National Heart Foundation of Australia 2016).

International guidelines for hypertension management such as those provided by the World Health Organization and International Society of Hypertension (WHO/ISH) (Whitworth 2003), and the seventh and eighth Joint National Committee (JNC) report on the prevention, detection, evaluation, and treatment of high BP (Chobanian et al. 2003; James et al. 2014) define hypertension as a systolic BP greater than 140 mmHg or diastolic BP greater than 90 mmHg. The higher systolic or diastolic BP reading is used if the BP categories differ between systolic and diastolic BP (i.e. only one value is elevated). A systolic BP of 120–139 mmHg and/or a diastolic BP of 80–89 mmHg is defined as high-normal BP according to the WHO/ISH (Weber, Schiffrin, White, Mann, Lindholm, Kenerson, Flack, Carter, Materson, Ram, et al. 2014; Whitworth 2003) or pre-hypertension based on the seventh JNC guideline (Chobanian et al. 2003).

Table 1.1 Classification of hypertension for adults¹

Classification	Systolic BP (mmHg)		Diastolic BP (mmHg)
High-normal BP	120–139	and/or	80–99
Hypertension grade 1 (mild)	140–159	and/or	90–99
Hypertension grade 2 (moderate)	160–179	and/or	100–109
Hypertension grade 3 (severe)	≥180	and/or	≥110
Isolated systolic hypertension	≥140 ¹	and	<90

¹ The World Health Organization/International Society of Hypertension (WHO/ISH), 2003

1.1.2 Aetiology and risk factors of hypertension

More than 90% of hypertension cases are diagnosed as primary/essential/idiopathic hypertension (Braun & Anderson 2011). The specific cause of primary hypertension is often unknown, and the condition results from a complex interaction of genetic and environmental factors. Decreased renal salt excretion is considered to be the central process involved in primary hypertension. Renal salt excretion can be influenced by activity of the renin–angiotensin–aldosterone system (particularly aldosterone), insulin resistance, dietary potassium, magnesium and calcium, dysfunction of the natriuretic hormones, endothelial dysfunction and overactivity of sympathetic nervous system (McCance & Huether 2010).

Gene polymorphisms and other hereditary factors account for 30–50% of primary hypertension cases, and may provide potential avenues for treatment of primary hypertension using gene therapy (Timberlake, O'Connor & Parmer 2001). The other unmodifiable factors considered to contribute to the development of hypertension include age, race and family history (Porth 2015). People aged 55 years and older who currently have normal blood pressure have a 90% lifetime risk of developing hypertension (Chobanian et al. 2003; Nguyen et al. 2012). Most factors associated with primary hypertension are modifiable such as obesity, lack of physical activity, high sodium intake, tobacco smoking and excessive alcohol intake (Porth 2015). Many of these factors are also risk factors for cardiovascular events. Physical inactivity, unhealthy diet and tobacco smoking also contributes to diabetes mellitus and dyslipidemia. The metabolic syndrome (i.e. the combination of central obesity, dyslipidemia, impaired glucose intolerance and hypertension) is associated with a higher risk for coronary artery diseases (Alshehri 2010).

Secondary hypertension is diagnosed in 5–10% of patients with hypertension and is caused by underlying diseases or medications. (Porth 2015). It can be caused by renal disorders (e.g. renal parenchymal disease), endocrine disorders (e.g. Cushing syndrome), vascular disorders (e.g. coarctation of the aorta), neurological disorders (e.g. elevated intracranial pressure caused by a brain tumour), acute stress (e.g. psychogenic hypoventilation) and pregnancy-induced hypertension (McCance & Huether 2010). Secondary hypertension can also occur after taking medicines that increase cardiac output or vascular resistance (drug-induced hypertension) such as nonsteroidal anti-inflammatory drugs, oral oestrogen contraceptives, sympathomimetic agents (e.g. decongestants, cocaine), clozapine, monoamine oxidase inhibitors, amphetamine and corticosteroids (Grossman, Messerli & Grossman 2015; Johnson, Nguyen & Day 1994). Pharand et al. (2003) reported that BP can increase after the use of some herbal medicines (e.g. ginseng, guarana).

1.1.3 Clinical consequences of hypertension

Hypertension accounts for 9.4 million deaths per year, about 13% of the total deaths worldwide (Lim et al. 2013; World Health Organization 2013a). Hypertension is referred as a ‘silent killer’ because it typically has no overt symptoms (World Health Organization 2013a). Given the asymptomatic nature, hypertension is often diagnosed incidentally when a patient visits a healthcare provider for other reasons (Legido-Quigley et al. 2015). Some symptoms, such as dull headache, vomiting, blurred vision and dizzy spells, usually do not occur until the BP reading reaches the severe level, although patients with secondary hypertension can exhibit specific symptoms (e.g. polyuria, polydipsia, and episodes of muscle weakness in patients with primary aldosteronism) (McCance & Huether 2010).

Elevated BP is associated with increased cardiac output through increased stroke volume or heart rate and peripheral vascular resistance (Braun & Anderson 2011). Systemic vasoconstriction caused by overstimulation of the sympathetic nervous system or renin–angiotensin–aldosterone system and impairment of sodium excretion by the kidneys increase peripheral vascular resistance. Prolonged vasoconstriction and high pressure can cause direct injury in the inner lining of blood vessel walls (Braun & Anderson 2011).

Hypertension affects mainly the central nervous system, cardiovascular system and renal system. Excessive high BP has damaging effects on the blood vessels in the heart and brain, and increases the risk for life-threatening conditions such as heart attack and stroke (Braun & Anderson 2011; Porth 2015). Hardening and thickening of arteries related to atherosclerosis decreases blood flow to the heart and can affect blood vessels in the brain, leading to stroke. Weakening and bulging of brain blood vessels cause the formation of an aneurysm, which can lead to a haemorrhagic stroke if the aneurysm ruptures (Porth 2015). Reduced blood flow to the kidneys stimulates renin and aldosterone secretion, which contributes to the retention of sodium and water. Tissue damage that compromises filtration is associated with inflammation and ischaemia in the kidney. Prolonged pressure in the kidney arterioles causes hardening and overgrowth of the connective tissues in the kidneys (nephrosclerosis), which can lead to renal failure (McCance & Huether 2010).

1.1.4 Prevalence of hypertension

The WHO has reported that, globally, 22% of the adult population was diagnosed with hypertension in 2014 (World Health Organization 2014). The prevalence of hypertension is higher in people living in low-income countries (30%) than in those living in low-

middle-income (25%) and high-income countries (20%) (World Health Organization 2014). It is estimated that, by 2025, 1.2 billion people in low- and low-middle-income countries, which will represent almost three-quarters of people with hypertension worldwide (Kearney et al. 2005).

Arterial stiffness with ageing leads to increasing peripheral vascular resistance (Braun & Anderson 2011). The prevalence of hypertension increases with age and is estimated to be greater than 50% among elderly people (Chobanian et al. 2003; Triantafyllou et al. 2010). Overall, the prevalence of hypertension is 5–10% higher in men than in women, but the difference diminishes among those aged >60 years or after menopause (Alhawassi, Krass & Pont 2015).

1.1.5 Blood pressure and cardiovascular risk assessment

The cut-off values used to define and classify hypertension are important to guiding the diagnosis and management of hypertension. However, in terms of preventing cardiovascular events, the WHO/ISH (2003) has stated that defining the stage of hypertension should not be based solely on the systolic and diastolic BP but should also consider other cardiovascular risk factors, target organ damage and associated clinical conditions (e.g. diabetes, renal disease) (Table 1.2) (Whitworth 2003; World Health Organization & International Society of Hypertension Writing Group 2003). Many patients with elevated BP often also have other cardiovascular risk factors such as smoking, obesity or dyslipidaemia. Hypertension, therefore, should be seen as ‘part of a complex syndrome of pathologic changes in the vasculature and target organs, leading to cardiovascular and renal disease’ (Giles et al. 2009).

Some models of cardiovascular risk assessment have been developed that consider the absolute cardiovascular risk factors. These include the Framingham Risk Score (D'Agostino et al. 2008), Systematic Coronary Risk Evaluation (SCORE) (Conroy et al. 2003), Australian cardiovascular risk charts (National Vascular Disease Prevention Alliance 2012) and the WHO/ISH models (World Health Organization 2007). Risk stratification according to the WHO/ISH models uses the 10-year risk of a cardiovascular event to classify patients into low risk (<10%), moderate risk (10–20%), high risk (20–30%) and very high risk (>30%) groups (Table 1.2). According to this stratification method, patients with similar BP readings might have different levels of cardiovascular risk. Risk assessment is needed especially for patients aged 45 years or older with no known

cardiovascular diseases or other comorbidities (e.g. diabetes) (National Heart Foundation of Australia 2016) to improve their awareness of their cardiovascular risks.

Table 1.2 Risk stratification of hypertension (WHO/ISH Guideline, 2003)

Additional risk factors¹ and disease history	Hypertension grade 1	Hypertension grade 2	Hypertension grade 3
No other risk factors	Low risk	Medium risk	High risk
1–2 additional risk factors	Medium risk	Medium risk	High risk
3 or more additional risk factors or target organ disease ² or associated clinical conditions	High risk	High risk	High risk

¹ Age (men >55, women >65 years), smoking, total cholesterol >6.1 mmol/L or LDL-cholesterol >4.0 mmol/L, history of cardiovascular disease in first degree relatives before age 50, obesity, physical inactivity

² Left ventricular hypertrophy (electrocardiogram or echocardiogram), microalbuminuria (20-300 mg/day), radiological or ultrasound evidence of extensive atherosclerotic plaque, hypertensive retinopathy grade III and IV

³ Diabetes, cerebrovascular disease (ischaemic stroke, cerebral haemorrhage, transient ischaemic attack, heart disease, myocardial infarction, angina, congestive heart failure), renal disease (plasma creatinine men >1.5 mg/dl; women >1.4 mg/dl), albuminuria >300 mg/day, peripheral vascular disease

To conduct risk stratification at the population level, the healthcare system would need to allocate resources to perform examinations and investigations of all patients. However, these procedures are not easily performed in low- or low-middle-income countries. The diagnosis and management of hypertension are tackled mostly in primary healthcare centres; feasible strategies are needed to accommodate the resource constraints. Mendis (2004) noted the challenges faced by the primary care in developing countries for performing laboratory and other investigations to perform cardiovascular risk assessment (e.g. assessing target organ damage). A simpler risk stratification method therefore is needed to be implemented in that setting. Using hypertension as an entry point, the WHO launched a cardiovascular risk management package for low-and medium-resource settings (World Health Organization 2002). Cardiovascular risk prediction charts for each WHO sub region (and country) were also provided (World Health Organization 2007). In the setting where cholesterol cannot be measured, age, gender, blood pressure, the presence or absence of diabetes and smoking status are used to assess the cardiovascular risk (World Health Organization 2007).

1.2 Hypertension treatment

1.2.1 Lowering blood pressure and cardiovascular risk reduction

The ultimate goal of hypertension treatment is to reduce the morbidity and mortality rates related to cardiovascular events and, for those with established cardiovascular disease, to prevent progression or recurrence of disease (Chobanian et al. 2003; World Health Organization 2013a). The relationship between elevated BP and the risk of cardiovascular events is consistent and independent of other risk factors. The seventh JNC guidelines stated that the cardiovascular risk doubles for each increase in BP of 20/10 mmHg (Chobanian et al. 2003). In a meta-analysis of 61 studies that included one million adults with hypertension, Lewington et al. (2002) reported that a 2 mmHg decrease in mean systolic BP reduces the risk of ischaemic heart disease mortality by 7% and the risk of stroke mortality by 10%.

Despite the strong evidence that lowering BP reduces the risk of cardiovascular events and other causes of mortality (Ninomiya et al. 2013), the target BP threshold is still debated (National Heart Foundation of Australia 2016). A BP of <140/90 mmHg is used as target BP for general patients (Chobanian et al. 2003; James et al. 2014; National Heart Foundation of Australia 2016). However, considering the cardiovascular risk assessment (Table 1.2), the BP target should be adjusted to optimise the prevention of cardiovascular events (World Health Organization 2007). For example, based on the seventh JNC guidelines, the BP target of <130/80 mmHg is recommended for patients with a compelling condition (e.g. diabetes or chronic kidney disease). Furthermore, the 2016 Australian guideline stated that lowering systolic BP to <120 mmHg is beneficial by reducing the risk of cardiovascular events and is reasonable provided if the medications are well tolerated (National Heart Foundation of Australia 2016). Selected patients who are recommended to keep systolic BP <120 mmHg need to be closely monitored to identify adverse effects such as hypotension, syncope and electrolyte abnormalities.

A study involving 6539 adult Americans with hypertension showed that elevated systolic blood pressure was a significant predictor of coronary heart disease risks in patients aged 60 years or older (Franklin et al. 2001). Generally, major international guidelines such as the JNC 8 (James et al. 2014), American Society of Hypertension/International Society of Hypertension (Weber, Schiffrin, White, Mann, Lindholm, Kenerson, Flack, Carter, Materson & Ram 2014), and European Society of Hypertension (Mancia et al. 2013) recommend that the BP should be lower than 150/90 mmHg in elderly patients. The lower

target BP (e.g. <140/90 mmHg) might be considered if medications are well tolerated (Mancia et al. 2013).

Despite the benefits of treating hypertension in the elderly patients, providing anti-hypertensive medications to the elderly should consider the propensity for adverse effect of anti-hypertensive medications, orthostatic hypotension, coexisting medications and drug–drug interactions (Denker & Cohen 2013). Individualised treatment, therefore, is recommended to provide optimal benefit of medications and to minimise the possible risks to elderly people (Solini & Grossman 2016).

Key international guidelines on hypertension management were adopted in many countries both developed and developing countries. For example, the 2013 Indonesian guideline adopted the seventh JNC guidelines (Chobanian et al. 2003) in terms of the classification of hypertension, risk stratification, method for BP measurement and treatment approaches. The BP target of <140/90 mmHg is accepted for patients without compelling indications, and the target of <130/80 mmHg for those with diabetes or chronic kidney disease (Chobanian et al. 2003; Ministry of Health Republic of Indonesia 2013c).

A combination of population-wide strategies (e.g. sodium reduction policy) and high-risk strategies (i.e. intensifying hypertension medications for patients with high cardiovascular risks) has been proposed as cost-effective strategies to manage hypertension, even in low- and middle-income countries (Lim et al. 2007; Mendis 2010). Applying these strategies, Ezzati et al. (2015) reported that in high-income countries and many Latin American countries, cardiovascular mortality rate were decreasing.

1.2.2 Non-pharmacological approaches in hypertension management

Elmer et al. (2006) reported that comprehensive lifestyle changes (including diet, weight control, regular physical exercise and blood pressure control) are effective for controlling BP in people with hypertension stage 1 who have a low cardiovascular risk. The seventh JNC guidelines (Chobanian et al. 2003) stated that lifestyle modifications might contribute to a 2–20 mmHg reduction in systolic BP; included (i) maintain normal body weight (body mass index 18.5–24.9 kg/m²); (ii) adopt the Dietary Approach to Stop Hypertension (DASH) eating plan; (iii) reduce dietary sodium intake; iv) engage in regular aerobic physical activity; and (v) limit alcohol consumption.

Sodium intake of <2 g per day (5 g/day of salt) is recommended by the WHO (World Health Organization 2014) to lower blood pressure. A Cochrane Review reported that a low sodium intake is associated with a reduction of systolic blood pressure of 5–10 mmHg (Graudal, Hubeck-Graudal & Jürgens 2012). Elderly or obese people, and those with diabetes tend to be more sensitive to salt (Hoffmann & Cubeddu 2007), which means they would have a greater reduction in BP in response to salt reduction.

The DASH diet emphasises a food plan that is high in fruit, vegetables, low-fat dairy products, whole grains, poultry, fish and nuts, and recommends limiting the intake of sweets, sugar-sweetened beverages and red meat (Moore et al. 2001; The United States Department of Health Human Services 2006). Blumenthal et al. (2010) showed that the DASH eating plan alone can reduce BP by 11/7 mmHg and that the combination of the DASH plan with weight management can reduce BP by 16/10 mmHg. Similarly, Sacks et al. (2001) reported a BP reduction of 11 mmHg with the combination of the DASH diet and sodium restriction.

A meta-analysis of 54 randomised controlled trials (RCTs) reported the effect of aerobic exercises (e.g. jogging, brisk walking and swimming) on reducing BP by 5/3 mmHg (Whelton et al. 2002). The American Heart Association (2017) recommends an average of 40 minutes of physical exercise three to four times a week for patients with hypertension. The intensity of exercise should be individualised to allow for gradual adaptation and to minimise the risk of injury. Although most patients can begin exercise at any time, a complete evaluation is needed for patients with a high or very high cardiovascular risk before they start any exercise program.

A meta-analysis that included 33,904 men and 193,752 women (Briasoulis, Agarwal & Messerli 2012) showed that compared with non-drinkers, men with heavy alcohol consumption (31–40 g/day) had greater risk of hypertension (relative risk 1.77; confidence interval 1.39–2.26, p value <0.001). A meta-analysis of 15 RCTs reported that alcohol reduction significantly reduced BP by 3.3/2 mmHg (Xin et al. 2001). A meta-analysis of 11 cohorts of patients with hypertension (Huang et al. 2014) reported a lower risk of cardiovascular diseases in patients with low alcohol consumption compared to those with higher alcohol intake.

Non-pharmacological therapy or lifestyle modification should be implemented throughout the management of all patients with hypertension. However, maintaining lifestyle

modifications over the long term is challenging. Despite its proven health benefits, the DASH diet is expensive and is not easily adopted, particularly by patients from low socio-economic communities (Bertoni et al. 2011; Monsivais, Rehm & Drewnowski 2013). Despite the benefits, lifestyle modification alone is not effective in most people of hypertension and should be regarded as a complement to pharmacological therapy rather than an alternative, especially for patients with a high cardiovascular risk (Dickinson et al. 2006; National Heart Foundation of Australia 2016; Nicolson et al. 2004).

1.2.3 Pharmacological approaches

Most patients with hypertension require adequate anti-hypertensive medications to control BP (Chobanian et al. 2003). In a meta-analysis, Ettehad et al. (2016) reported that taking anti-hypertensive medications led to beneficial cardiovascular effects; in this analysis, a 10 mmHg reduction in systolic BP reduced the risk of stroke by 27%, coronary heart disease by 17% and heart failure by 28%.

The classes of anti-hypertensive medications with known BP-lowering effects include angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), beta-blockers, calcium channel blockers (CCBs), diuretics, and other drugs (e.g. aldosterone antagonists, alpha-blockers)(Nguyen et al. 2010). Each class of medication acts through a different mechanism to lower BP, but the efficacy of these medications is similar when used as monotherapy (Jamerson et al. 2004; Law, Morris & Wald 2009). ACE inhibitors and ARBs are the most widely used anti-hypertensive medications (Li, Heran & Wright 2014).

The threshold for initiating treatment with anti-hypertensive medications differs between guidelines. The eighth JNC guidelines (James et al. 2014) recommend initiating treatment with anti-hypertensive medications when the systolic BP is ≥ 150 mmHg or diastolic BP ≥ 90 mmHg. Previously, the seventh JNC guidelines recommended lower thresholds for initiating pharmacological treatment: BP $\geq 140/90$ mmHg for patients without diabetes or chronic kidney disease or BP $\geq 130/90$ mmHg for patients with hypertension who also have diabetes or chronic kidney disease (Chobanian et al. 2003).

The Australian guideline for hypertension management published in 2016 states that medications should be started at a BP $\geq 160/90$ mmHg for patients with a low cardiovascular risk and at 140/90 mmHg for high-risk patients (National Heart Foundation of Australia 2016).

The initial treatment is intended to help the patient reach and maintain the target BP. The seventh JNC guidelines (Chobanian et al. 2003) recommended thiazide-type diuretics as the initial therapy for most uncomplicated patients. However, the newer eighth JNC guidelines (James et al. 2014) recommend selecting from ACE inhibitors, ARBs, CCBs or diuretics as the initial treatment. If the target is not reached after one month of single therapy, combination therapy with two or more different classes of medication is recommended (Chobanian et al. 2003). Patients with a BP >20/10 mmHg above the target BP or those with a BP $\geq$ 160/100 mmHg are also recommended to receive combination therapy to optimise BP control (Mancia et al. 2007). Brown et al. (2003) reported that most patients needed more than one type of anti-hypertensive medications to reach the BP target. The ACE inhibitors are better when combined with CCBs than with diuretics (Bakris et al. 2013; Jamerson et al. 2008). Because of the increased risk of side effects, it is not recommended to combine ACE inhibitors with ARBs (Misra & Stevermer 2009).

1.2.4 Sub-optimal hypertension management

Treatment of hypertension is highly effective for controlling BP (Ettehad et al. 2016), and inexpensive anti-hypertensive medications are widely available (Mendis et al. 2007). However, hypertension is often not managed optimally and remains an important challenge in public health (World Health Organization 2014a).

Awareness, treatment and control of hypertension

Smith et al. (1990) reported the ‘rule of halves’ in hypertension: half of all people with hypertension are unaware that they have it (i.e. they are undiagnosed), half of all patients who are aware they have hypertension do not receive any hypertension treatment, and half of those who are treated do not achieve adequate BP control. Recently, a population-based survey involving 17 countries (Chow et al. 2013) showed that the rule of halves remains valid in terms of awareness; that is, on average, 47% of all patients know that they had hypertension. The treatment rate among patients who are aware of their condition is 87%, however, only 32% of patients who are treated reach their BP target (Chow et al. 2013). Among all people diagnosed with hypertension, only 10–13% achieve adequate BP control (Chow et al. 2013; Lloyd-Sherlock et al. 2014; Pereira et al. 2009). Compared with people in high-income countries, people in low-income and low-middle-income countries have less awareness and are less likely to be treated and to control their hypertension (Chow et al. 2013; Ibrahim & Damasceno 2012).

Reasons for suboptimal hypertension control

Primary health care is the entry point for most hypertension cases (World Health Organization 2010). Mendis (2010) revealed that 98% of patients with hypertension in low-resource settings can be managed in primary care. The study reported that patients who were treated using the WHO protocol (World Health Organization 2002) had lower BP compared to those who received usual care. However, it is found that less than 50% of patients in the intervention group reached their BP target (i.e. 140/90 mmHg) at 12 months follow-up (Mendis 2010). The WHO (2014) stated that inadequate control of BP is attributed to healthcare system-, and patient-related barriers.

Healthcare system-related barriers

Khatib et al. (2014) noted the shortages of healthcare providers and lack of supporting infrastructure (e.g. equipment, medication) as important healthcare system-related factors influencing hypertension management in low-middle income countries,. In contrast, barriers in high-income countries relate more to the availability of guidelines and the organisation of health care (Khatib et al. 2014). Further, Ibrahim & Damasceno (2012) stated that although most essential anti-hypertensive medications are available in generic versions, their availability and affordability remains problematic in developing countries with low-resource settings. A study in Uganda, a low-income country in Sub-Saharan Africa (World Bank 2014), revealed the lack of capacity of the healthcare system to manage hypertension (Musinguzi et al. 2015). Among 126 health facilities studied, 54% of them did not have hypertension guidelines and only 20% were staffed by medical doctors. Moreover, anti-hypertensive medication stocked-out at 34% of the health facilities (Musinguzi et al. 2015). Even though task shifting to non-doctor health workers might overcome the shortage of healthcare workers in low-resource settings in managing hypertension (Abegunde et al. 2007; Gyamfi et al. 2017), the absence of simplified treatment guidelines and the limited supply of medications would impede the quality of hypertension treatment provided to patients (World Health Organization 2016b). Intensifying hypertension treatment is required for patients with medium-or high-cardiovascular risk (World Health Organization 2007). Most patients need treatment with two or more anti-hypertensive medications to achieve the target BP (James et al. 2014; Mancia et al. 2007). However, gaps between guidelines and clinical practice have been identified as important contributors to low rates of BP control in people with hypertension (Elliott 2008; Okonofua et al. 2006). Margolis et al. (2005) found that 55% of healthcare providers in the USA primary care setting believe that BP control can be achieved by

providing monotherapy. It was also reported that substantial proportion of healthcare providers were reluctant to initiate anti-hypertensive medications and failed to modify or intensify therapy (Bramlage et al. 2007; Düsing 2006; Moser & Franklin 2007). Phillips et al. (2001) identified three causes of clinical inertia: (i) overestimation of care; (ii) soft reasons (e.g. perceived improving condition); and (iii) the lack of training for healthcare providers. Okonofua et al. (2006) also noted the lack of knowledge about and clinical skills for treating hypertension as important factors related to the suboptimal management of hypertension. In the Ugandan study, 98% healthcare workers indicated their need for in-service training about hypertension management (Musinguzi et al. 2015).

Patient-related barriers

Poor adherence to a medication regimen is the most important patient-related barrier to achieving BP control (Burnier 2006; Hill, Miller & DeGeest 2011; Krousel-Wood et al. 2004; Sabate 2003). The effectiveness of anti-hypertensive therapy relies heavily on patients adhering to their medication regimen as prescribed (Sabate 2003). Overall, 50–80% of patients treated for hypertension do not adhere to their treatment regimens (Brown & Bussell 2011; Elliott 2008). Patient adherence to medications for chronic conditions such as hypertension typically declines over time (Kulkarni et al. 2006; Sabate 2003; Van Wijk et al. 2005). In Italy, a study of >400,000 patients showed that 41% had discontinued taking their anti-hypertensive medications within one year of diagnosis (Chrostowska & Narkiewicz 2010). A meta-analysis of the importance of adherence to anti-hypertensive medications found that adherent patients were 3.4 times more likely to have their BP controlled than were non-adherent patients (DiMatteo et al. 2002). A cohort study of >15,000 urban Americans with hypertension reported a higher hospitalisation rate among those who were less adherent (Stroupe et al. 2006). Another study of >150,000,000 older adults reported that a higher adherence rate to anti-hypertensive medications was associated with reduced risk of cardiovascular events (Yang et al. 2017). However, non-adherence to anti-hypertensive medications remains high. A recent meta-analysis found a non-adherence rate of 45% among all 12,603 subjects analysed and 84% among those who had uncontrolled BP (Abegaz et al. 2017). Whether patients actually take the medications prescribed and whether they consume other medications that might interfere with the efficacy of anti-hypertensive medications need to be evaluated (Chobanian et al. 2003). Further discussion of adherence to anti-hypertensive medication, factors affecting adherence and strategies to improve adherence are presented in Chapter 2.

A review of 25 qualitative studies and 44 quantitative studies reported that patient-related barriers to achieving adequate BP control included capability barriers (e.g. lack of knowledge about the consequences of hypertension, lack of skills to check BP at home) and intention barriers (e.g. lack of motivation to have their BP checked and treated, difficulty adapting to a healthier lifestyle, non-prioritising regular visits to healthcare professionals) (Khatib et al. 2014). Recently, a prospective cohort study of 11,288 adult Malaysians showed that being female and aged ≥ 60 years were associated with better BP control (Abdul-Razak et al. 2016). In the Malaysian study, older people were twice more likely to be taking hypertension treatment compared with those aged 30–39 years (Abdul-Razak et al. 2016). This study also reported that the proportion of patients who had achieved the BP target was higher in patients with tertiary education (21%) compared to those with no formal education (15%) or primary/secondary education level (16%). Furthermore, the proportion of people with adequate BP control was lower in rural areas compared to those living in urban Malaysia (13% vs 19%) (Abdul-Razak et al. 2016).

The other patient-related barriers in achieving BP control is resistant hypertension (Rose et al. 2007). The seventh JNC guidelines defined resistant hypertension as a BP that remains above target despite adherence to treatment with at least three anti-hypertensive medications including diuretic (Chobanian et al. 2003). It is suggested that 10-35% of patients being treated meet criteria for resistant hypertension (Boolani, Sinha & Randall 2013; Calhoun et al. 2008). However, the true prevalence of resistant hypertension is unclear. To exclude the pseudo-resistant hypertension, adherence to prescribed anti-hypertensive medications should be carefully evaluated to ensure that the patients have appropriately taken their medications (Calhoun et al. 2008; Moser & Setaro 2006). The most frequent causes are obstructive sleep apnoea, renal artery stenosis and primary aldosteronism (Viera 2012). Screening of these secondary causes of hypertension is therefore needed for diagnosing resistant hypertension. Optimising anti-hypertensive medications is needed to reach the BP control (e.g. by adding anti-hypertensive medication from different class). For example, when a patient has received an ACE inhibitor or an ARB plus a diuretic and a beta blocker, a dihydropyridine CCB can be added (Moser & Setaro 2006). When primary aldosteronism is suggested as the secondary cause of hypertension (Calhoun et al. 2008) aldosterone antagonists might be useful (Calhoun et al. 2008). Interventional options (e.g. renal denervation or carotid sinus stimulation) are currently being evaluated for patients with BP remain over the target after optimisation of therapy (Yaxley & Thambar 2015).

Chapter 2:

Patient medication-taking behaviour

2.1 Adherence to anti-hypertensive medication

2.1.1 Terminology of adherence

How patients follow treatment recommendations from healthcare providers, has been studied using several terms such as compliance, adherence, persistence and concordance (Ahmed & Aslani 2014). Adherence is defined by the World Health Organization (WHO) as ‘the extent to which a person’s behaviour – taking medication, following a diet, and/or executing lifestyle changes – corresponds with agreed recommendations from a healthcare provider’ (Sabate 2003). Vrijens et al. (2012) conceptualised adherence to medication as ‘the process by which patients take their medications as prescribed’, comprises: (i) initiation, when patients start the first dose of medications; (ii) implementation, which reflects the actual dosing taken by patients; and (iii) discontinuation, when patients stop taking the medications. Raebel et al. (2013) proposed a clear distinction between primary and secondary adherence. Primary non-adherence, occurs when a patient does not fill their prescription for the medication (undispensed prescriptions) (Beardon et al. 1993). Fischer et al. (2010) reported that in the USA, 28.4% of electronic prescriptions for newly diagnosed hypertension are not filled. Patients living in low-income countries that lack a medicines subsidisation and reimbursement system often cannot afford to purchase all the medications prescribed (Chahal, St. Fort & Bero 2013; Peters et al. 2008). However, the extent of primary non-adherence is difficult to assess given the lack of a link between prescription and dispensing data, particularly where electronic prescribing has not been implemented (Adams & Stolpe 2016). Adherence-enhancing interventions are more likely to target patients with secondary non-adherence (Solomon & Majumdar 2010).

The terms compliance and adherence are often used interchangeably; however, the term adherence places greater emphasis in the patient’s active role in engaging with the treatment plan rather than being simply passive and following the doctor’s instruction (Ahmed & Aslani 2014; Vrijens et al. 2012). Persistence refers the length of time during which the patient engages with the medication regimen and is particularly applicable to patients who discontinue their use of medication (Hugtenburg et al. 2013). The term concordance has been proposed to highlight the greater cooperation and agreement between the healthcare provider and patient in medication-taking behaviour (Cushing & Metcalfe

2007). The two-way communication is a key aspect of concordance; that is, patients become actively involved in the discussion with their healthcare provider about the medications and treatment goal (Stevenson et al. 2004).

Given the variation in the terminology of adherence, this thesis research focused on exploring secondary non-adherence, as defined by Raebel et al. (2013) which represents ‘an ongoing process that measures whether or not the patient received dispensing or refills as prescribed during a defined observation period’ (Raebel et al. 2013). Within this context, the broadest categorisation of secondary non-adherence includes intentional and unintentional non-adherence (Lehane & McCarthy 2007b; Wroe 2002). Scholars have identified several factors that contribute to the deliberate omission of medications (intentional non-adherence) including the patient’s health beliefs, perceptions about the role of medications and previous experience with medications (Banning 2009; Lehane & McCarthy 2007a). Unintentional non-adherence occurs when patients forget to take their medication or unintentionally take their medications incorrectly (Wroe 2002). However, Lehane and McCarthy (2007b) noted that there is an interaction between intentional and unintentional non-adherence. For example, experiencing adverse effects of medication might lead to both intentional and unintentional non-adherence to anti-hypertensive medications (Lowry et al. 2005). Gadkari & McHorney (2012) reported that existing unintentional non-adherence predicts future intentional non-adherence.

2.1.2 Measuring adherence to medication

Several methods have been used to estimate adherence to medication. There is no gold standard method of measuring adherence. Each method of measuring adherence has advantages and disadvantages. Figure 2.1 shows several invasive and non-invasive methods of measuring adherence (Vrijens et al. 2017).

The most valid method to measure adherence requires blood or urine samples (biological assays) but is expensive and impractical in daily practice (Vik, Maxwell & Hogan 2004). Several more practical methods are used to estimate adherence to medication (Table 2.1).

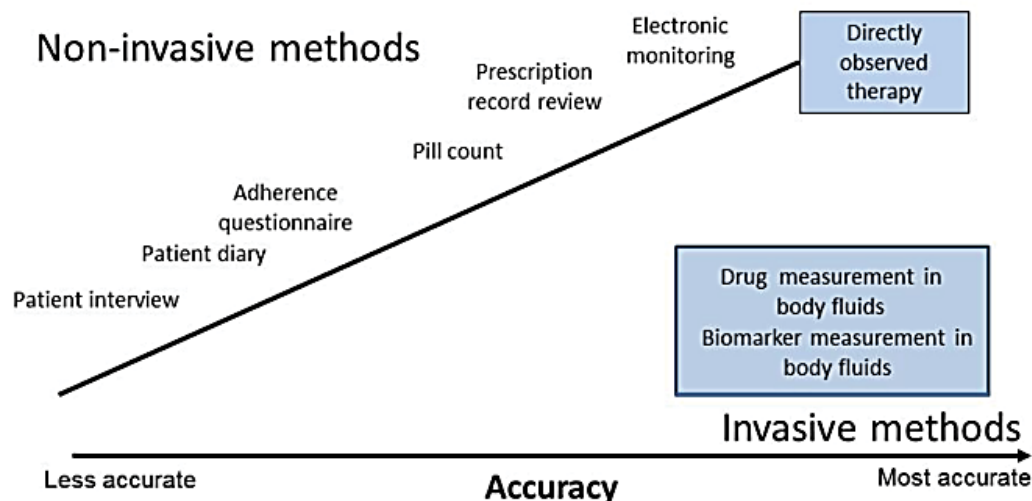
Table 2.1 Methods to measure medication adherence¹

Objective methods	Subjective methods (self-reporting adherence)
• Pharmacy refill records • Pill counts • Medication event monitoring system (MEMS)	• Brief Medication Questionnaire (BMQ) • Morisky Medication Adherence Scale (MMAS) • Medication Adherence Report Scale (MARS) • Brief Illness Perception Questionnaire (IPQ) • Beliefs about Medication Questionnaire (BaMQ) • Health Belief Model Questionnaire (HBMQ) • Medication Management Instrument for Deficiencies in the Elderly (MedMaIDE) • Patients interviews • Patient-kept diaries

¹ References: Lam & Fresco (2015), Stirratt et al. (2015), National Heart Foundation of Australia (2011)

Self-reported adherence is the most practical method because it is low cost, non-invasive and flexible in timing. However, memory bias and social desirability can lead to overestimation of adherence (Stirratt et al. 2015). Generally, self-report methods have high specificity and low sensitivity for detecting poor adherence (Berg & Arnsten 2006). Therefore, Thompson et al. (2012) recommended the use of brief validated self-report measures for use in clinical practice. A study by Villa et al. (2015) proposed the use of a single question ‘Do you recall not having taken your medicines over the last four weeks’ to be used in clinical practice. Besides the simple and easy administration, there is evidence that patients who answer ‘No’ to this single item (adherent patients) have significantly lower systolic and diastolic blood pressure (BP) than do non-adherent patients (Villa et al. 2015).

A systematic review of 97 studies involving patients with essential hypertension (Gwadry-Sridhar et al. 2012) showed that self-report was the most common method (47%) for measuring patient adherence, followed by pharmacy refill records (19%), pill counts (17%) and medication event monitoring systems (MEMS) (11%). Among the self-report methods, the most commonly used were Morisky’s Medication Adherence Scale (MMAS), Brief Medication Questionnaire (BMQ) and Health Belief Model Questionnaire (HBMQ) (Gwadry-Sridhar et al. 2012). Similarly, a review of 20 studies that evaluated the use self-reported adherence medication scale for patients with chronic diseases also found that the MMAS is the most widely used scales for measuring adherence to medication for various kinds of medications (Culig & Leppee 2014).



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Figure 2.1 Methods of measuring adherence to medication (Vrijens et al. 2017)

2.1.3 Reasons for non-adherence to anti-hypertensive medication

Factors affecting patient adherence to medication are complex (Osterberg & Blaschke 2005; Sabate 2003). The WHO classifies these reasons into five dimensions that affect adherence to medication: patient-related factors and four other factors not directly related to patients: (i) healthcare system-related factors; (ii) clinical-related factors; (iii) therapy-related factors; and (iv) socio-economic factors (Sabate 2003). Each is discussed in the following sections.

Patient-related factors

Patient-related factors represent the patients' knowledge, attitudes, beliefs, perceptions and expectations (Sabate 2003). A systematic review found that most studies (39 of 51) reported that patient-related factors influenced non-adherence to anti-hypertensive medication (AlGhurair, Simpson & Guirguis 2012). Forgetfulness, patients' beliefs about hypertension or anti-hypertensive medications and low self-efficacy were the most frequent barriers reported by patients in the studies reviewed (AlGhurair, Simpson & Guirguis 2012). Patient-related factors comprise physical factors (e.g. cognitive impairment, visual impairment, impaired dexterity) and psychosocial factors (e.g. knowledge about the disease condition, understanding the need to take medications, self-efficacy, fear of possible adverse effect or dependence, anxiety) (Osterberg & Blaschke 2005; Sabate 2003). Patients

often consider the benefits versus the risks of taking medications in the context of their everyday life (Benson & Britten 2002; Donovan & Blake 1992), a viewpoint that might differ from that of the healthcare provider (Sidorkiewicz et al. 2016).

Healthcare system-related factors

A good relationship between a patient and the healthcare provider is one of the most important healthcare system-related factors affecting adherence to medication (Rose et al. 2000; Schoenthaler et al. 2009). Poor provider communication skills and lack of positive reinforcement contribute to poor patient knowledge and understanding about medication regimens (Suter et al. 2009). A review of 14 surveys identified three healthcare system-related factors that should be addressed to improve patients' adherence to hypertension medication: (i) the patient-provider relationship; (ii) satisfaction with communication; and (iii) satisfaction with information (AlGhurair, Simpson & Guirguis 2012). This review also found that patients' satisfaction with pharmacy services and access to reimbursement for medication costs may affect patients' adherence. (AlGhurair, Simpson & Guirguis 2012). Recently, a study in Malaysia has highlighted that the lack of follow-up, lack of reimbursement for medications and lack of information provided by healthcare providers negatively affect adherence (Risso-Gill et al. 2015; Sabate 2003). Despite research showing that an adequate supply of medication is crucial to supporting patients' adherence to medications (Schmittiel et al. 2015), healthcare systems in countries with low-resource settings often face limited supplies of medications in their public healthcare facilities (Peters et al. 2008). In these countries, factors affecting patient adherence also include poor access to, or high cost of medicines and lack of continuity of care (Ibrahim & Damasceno 2012). Out-of-pocket expenditure is particularly prevalent in developing countries and it might prevent patients from obtaining an adequate supply of medications (Hong et al. 2009; Peters et al. 2008).

Therapy-related factors

Occurrence of adverse effects, complexity of drug regimens and interference of the medication plan in the patient's daily life are the most common therapy-related factors affecting medication adherence (AlGhurair, Simpson & Guirguis 2012). A meta-analysis showed that the once-daily dosing for anti-hypertensive medication is associated with greater adherence (Iskedjian et al. 2002). Furthermore, even though hypertension can be asymptomatic, the treatment might cause side effects (Bremner 2002; Gregoire et al. 2001). Experiencing side effects is one reason for non-adherence to medication (Shima, Farizah & Majid 2014).

The duration of the initial prescription can also affect adherence. A prospective study of newly diagnosed Chinese patients (Wong et al. 2015) found that the shorter the initial prescription for anti-hypertensive medication, the poorer the adherence to these medications. Patients given a prescription for ≥ 29 days of medication were 4.1 times more likely to have good adherence than were those who received a prescription for ≤ 6 days (Wong et al. 2015).

Socioeconomic-related factors

In developing countries, poverty might mean that hypertension is considered as a lower-priority condition compared with symptomatic illness and urgent household demands (Ibrahim & Damasceno 2012; Perkovic et al. 2007). The high cost of medications and duration of treatment are also determinants of adherence to anti-hypertensive medication (Sabate 2003). A study in rural south-west China reported that the long-term use of anti-hypertensive medication imposes a financial burden upon households and healthcare systems (Le et al. 2012). A recent review of 22 studies in low- and middle-income countries showed that non-adherence to anti-hypertensive medications was mainly associated with socio-economic-related factors such as age, educational level, distance to the clinic, occupation and availability of family support (Nielsen et al. 2017). However, a meta-analysis of 40 cohorts (Alsabbagh et al. 2014) and a review (Osterberg & Blaschke 2005) reported that the relationship between socio-economic status and non-adherence to anti-hypertensive medication was inconsistent across the studies reviewed.

A systematic review of 74 articles on self-reported barriers to adherence to anti-hypertensive medications (AlGhurair et al. 2012) also identified the lack of functional social support (practical, informational and emotional) as factors affecting non-adherence. A meta-analysis (DiMatteo, Lepper & Croghan 2000) reported that patients who obtain practical support (e.g. help for them to take their medication) were 3.6 times more likely to be adherent than were those who had no support.

Condition-related factors

Despite the availability and tolerability of anti-hypertensive medications, adherence to these medications is problematic for asymptomatic conditions such as hypertension (Krousel-Wood, Muntner, et al. 2009). Fix et al. (2014) reported that patients who had other comorbidities (e.g. diabetes, arthritis) tend to be non-adherent to their anti-hypertensive medication because of the asymptomatic nature of hypertension and their concern about

having multiple medications prescribed. Adherence to medication can also be influenced by the presence of other conditions including psychological disability (e.g. depression) (DiMatteo, Lepper & Croghan 2000) or physical disability (e.g. limited mobility) (Martin et al. 2010).

In summary, the reasons for non-adherence to anti-hypertensive medications are multifactorial, noting that some factors are beyond the patient's control. A better understanding of the underlying and modifiable factors associated with non-adherence may help healthcare providers to implement patient-specific interventions.

2.1.4 Interventions to improve adherence to anti-hypertensive medications

Given the ubiquitous problem of adherence, scholars have developed and evaluated interventions to improve patient adherence to medication. Three systematic reviews of adherence to anti-hypertensive medication have been published within the past decade (Gwadry-Shridar et al. 2012; Conn et al. 2015; Morrissey et al. 2017) and have included findings from studies of interventions to improve adherence among people with hypertension. Given the complex factors affecting adherence to medication, interventions must target patients as well as health care providers and policy makers, as discussed in the following section.

Interventions delivered to patients

Patients with a chronic condition such as hypertension need several means of support for improving their self-management skills, including maintaining their adherence to anti-hypertensive medication (Bosworth, Powers & Oddone 2010). A systematic review of 53 studies of interventions directed at patients with adherence problems reported that these interventions include providing written instructions, providing feedback to patients about adherence, increasing communication between providers and patients, providing rewards for good adherence, self-monitoring of disease symptoms or medication administration, and prompts/cues to administer medications (Conn et al. 2016). Another systematic review reported that interventions are delivered to patients by doctors, pharmacists, nurses, or other healthcare workers (Nieuwlaat et al. 2014) in clinic-based settings or community-based settings. Given the large heterogeneity of interventions to improve medication adherence, an updated Cochrane review (Nieuwlaat et al. 2014) omitted classification of the types of interventions, which had been included in the previous review (Haynes et al. 2008). In this chapter, the types of interventions for patients are categorised based on a tool kit from

National Heart Foundation of Australia (2011) that divided the interventions into informational (educational), behavioural, social, and combined interventions.

Informational (educational) interventions

A systematic review of 97 hypertension studies published from 1976 to 2009 showed that interventions aimed at improving patients' knowledge, through individual or small-group sessions, had great potential to improve adherence to medication (Gwadry-Sridhar et al. 2012). About a half of the education-based strategies reviewed (12 of 25 studies) reported significantly improved patient adherence to anti-hypertensive medications (Gwadry-Sridhar et al. 2012). Another systematic review showed that educational interventions should not focus only on patients' knowledge gaps but should also consider their concerns and beliefs about medications that may explain why some of them deliberately chose to be non-adherent (Glynn et al. 2010). For patients with adherence challenges, education should place greater emphasis on strategies to help patients address their challenges rather than trying to persuade them about the importance of adherence to medication (Conn et al. 2016).

Healthcare professionals play an important role in providing information and educating their patients about the consequences of non-adherence to medication (Stevenson et al. 2004). These roles include facilitating good communication with patients, tailoring advice and helping to maintain their patients' motivation to take their medications as prescribed (National Heart Foundation of Australia 2016). Information can be delivered to patients or groups of patients through direct (verbal) communication, written resources or technology and electronic media. Following an RCT of 109 Canadian patients with hypertension, Dawes et al (2010) recommended the use of simple leaflet that provided a written target BP level and was intended to improve patient's basic knowledge about hypertension. This Canadian study also highlighted the need to provide information about complexity of hypertension treatment, the length of therapy, including the possibility to take medications in the rest of life. Despite the important domain of patient education in improving patient knowledge, reviews consistently report that educational interventions could elicit greater improvements in medication adherence when combined with other types of interventions (Costa et al. 2015; Haynes et al. 2008; Kripalani, Yao & Haynes 2007). A systematic review concluded that, to improve their effectiveness, combined interventions should not be delivered in a single visit or be of a short duration (Conn, Ruppar, Chase, et al. 2015). For example, Fahey, Schroeder & Ebrahim (2006) reported that provision of educational materials for patients would be more effective when combined with self-monitoring of BP.

Behavioural interventions

Modifying patient behaviour is the most common intervention reported by studies aiming to promote adherence to anti-hypertensive medications and to improve BP control (Gwadry-Sridhar et al. 2012; Sabate 2003). Behavioural interventions are designed to change patients' behaviour toward treatment in their everyday life (Munro et al. 2007). A recent systematic review reported that the most promising behavioural interventions to improve adherence to anti-hypertensive medications are self-monitoring blood pressure, special packaging of medications (e.g. pill boxes), motivational interviewing, and linking adherence behaviours with patients' daily habits (Conn, Ruppar, Chase, et al. 2015).

Self-monitoring of BP. Having the BP measured at home has potential to assess the response to anti-hypertensive medications, reduce cost to visiting healthcare providers, and improve patients' adherence to medication (Pickering 2008). RCTs have shown that self-monitoring of BP increases adherence to medication and lifestyle advice, and reduces therapeutic inertia (Agarwal et al. 2011). Recently, another systematic review that included 28 RCTs also reported the effectiveness of self-monitoring of BP in improving medication adherence (Fletcher et al. 2015). Further, Fletcher et al. (2016) published a review of the perspectives of patients and healthcare providers on self-monitoring BP that showed the perceived benefits of self-monitoring BP in facilitating interaction during consultations about hypertension, bridging the gap within the patient-provider relationship and empowering patients to manage their BP (Fletcher et al. 2016).

Calendar blister packaging/drug reminder packaging. This simple technical option aims at improving medication adherence by facilitating medication organisation and intake and by decreasing medication error, and is particularly useful for elderly patients and those with multiple medications (Hugtenburg et al. 2013). In their review of 30 studies, Boeni et al. (2014) found that using drug reminder packaging significantly improved medication adherence. Another systematic review confirmed a significant effect of calendar packaging in improving adherence to long-term medication, particularly when combined with educational interventions and a reminder system. A study involving US ambulatory clinics reported that patients who received calendar blister packaging had significantly higher medication adherence and refilled prescriptions more often than those who received traditional bottles of loose tablets (Schneider, Murphy & Pedersen 2008). A recent meta-analysis reported the vital role of the pharmacist to deliver this behavioural intervention and that using blister packs was more effective than pill boxes in improving medication adherence (Conn, Ruppar, Chan, et al. 2015).

Motivational interviewing. This refers to patient-centred counselling aimed at helping patients to explore and resolve their ambivalence (Miller & Rollnick 2003). This counselling approach is focused and goal directed, and aims to increase patients' motivation to change their unhealthy behaviour. The effectiveness of this approach in improving medication adherence among patients with hypertension was reported in RCTs among Chinese (Ma et al. 2014) and African American populations (Ogedegbe et al. 2008). A meta analysis of seven studies found that motivational interviewing interventions significantly reduced systolic and diastolic BP (Ren et al. 2014). To implement this psychological approach in daily practice, Rubak et al. (2005) and Ma et al. (2014) highlighted the need for training in motivational interviewing techniques for healthcare providers and for determining the most efficient technique.

The transtheoretical model-based interventions. The transtheoretical model was originally developed by Prochaska and DiClemente in 1983 and remains widely used today. It is an integrative model of behaviour change that incorporates stages and processes of self-change, decisional balance and patients' self-efficacy (Prochaska & DiClemente 1983). Interventions are initiated by first identifying the patient's stages of change: precontemplation, contemplation, preparation, action or maintenance (Prochaska & Velicer 1997). Stage-matched interventions are applied to patients according to their identified stage. The interventions may include tailored feedback, counselling, education, self-monitoring, personalised service and goal setting (Lee, Park & Min 2015). A study of 108 Koreans with hypertension showed improvements in the stages of change, patients' self-efficacy and the level of medication adherence after an intervention based on the transtheoretical model (Kim 2011).

Prompting mechanism. This intervention is intended to stimulate adherence behaviour through mailed reminders, daily telephone calls, short message service reminder or electronic medication-reminder devices. A meta-review reported that prompting mechanisms (e.g. weekly telephone calls, mailed reminders) are effective for increasing adherence to cardiovascular medications (Glynn et al. 2010). A significant improvement in adherence rates using prompting mechanisms was reported in reviews of RCTs (Fenerty et al. 2012; Glynn & Fahey 2015; Vervloet et al. 2012). A study involving 48 urban Americans with hypertension and high cardiovascular risk found that using a mobile phone-based medication-reminder system significantly improved adherence to anti-hypertensive medication and BP control (Patel et al. 2013).

Simplifying dosing regimens. A study involving 162 French people with hypertension found that reducing the dosing frequency from twice daily to once daily significantly increased the percentage of patients who adhered to anti-hypertensive medications over a 6-month period. In a systematic review, Schroeder, Fahey & Ebrahim (2004) found that seven of nine RCTs reported the effectiveness of simplifying dosing regimens; the relative improvement in adherence ranged from 8% to 20%. Another review of adherence-enhancing interventions for cardiovascular disease (Glynn et al. 2010) also concluded that simplifying the dosing regimen was effective in improving medication adherence.

Social interventions

Involving family or peers in adherence-enhancing interventions may encourage greater social support from them. A meta-analysis (Magrin et al. 2015) concluded that functional social support (e.g. emotional support to patients) may improve patients' adherence to anti-hypertensive medication, whereas structural social support (e.g. living arrangement) has no significant association with adherence. However, noting the small effect sizes across the studies reviewed, the authors suggested that any interventions to encourage better social support from family and peers should be performed in combination with other interventions.

Combined interventions

Nieuwlaat et al. (2014) reviewed the effects of interventions aimed at improving adherence and concluded that the most effective interventions for long-term treatment are complex and include combinations of educational, behavioural and social interventions. Hence, there is no single intervention that is effective and fit for all patients' conditions (Conn, Ruppert, Chase, et al. 2015; Costa et al. 2015). A study in the USA reported the effectiveness of a tailored multifactorial intervention in improving adherence to anti-hypertensive medication; the intervention included giving information, medication, self-monitoring and technological devices (e.g. telephone, text messaging, or telemonitoring) (Bosworth et al. 2005). Despite its effectiveness in improving medication adherence, the feasibility of implementing such complex interventions in everyday practice is low, especially for healthcare services in low-resource settings (Hugtenburg et al. 2013; Nieuwlaat et al. 2014).

Interventions delivered to providers and policy maker

Healthcare professionals play a vital role in facilitating patient adherence. However, discordance with recommendations provided by healthcare professionals is an important cause of non-adherence to medication (Sidorkiewicz et al. 2016). A study in a Canadian

community-based primary care service showed that patients correctly recalled 45–70% of the information about treatment that had just been discussed with a healthcare professional (Richard, Glaser & Lussier 2017). A systematic review reported that healthcare professionals perceived that a lack of knowledge about hypertension management and lack of communication skills were barriers to provide effective patient education and counselling (Khatib et al. 2014). Hence, the WHO states that interventions aimed at improving providers' knowledge, awareness and skills in delivering adherence-enhancing interventions are imperative (Sabate 2003). To strengthen the role of healthcare providers as interventionists, Berben et al. (2012) proposed the inclusion of competencies for measuring adherence and providing interventions to patients in the curriculum for healthcare professionals. Training for healthcare professionals may also include training in educating patients about the use of medicines and how to provide non-judgemental assistance (Sabate 2003). For example, to provide effective motivational interviewing, healthcare professionals need to be trained to use the complex skills required to identify and assist patients' readiness to adopt the recommended actions (Berben et al. 2012; Rubak et al. 2005).

There is growing evidence of the effectiveness of pharmacist- or nurse-led interventions in improving medication adherence and BP control. A systematic review of 16 RCTs reported the effects of pharmacist-led interventions in improving medication adherence and BP control (Cheema, Sutcliffe & Singer 2014). The multiple interventions provided by pharmacists included interviewing and assessing patients' problems with achieving BP control, providing education, verifying patients' adherence, and giving advice to physicians about medication changes (Morgado et al. 2011). Therefore, to perform this role effectively, pharmacists must be trained in methods for medication management including adherence interventions. Adherence to medication is an issue that involves more than the patient and his/her healthcare professional; the wider health system must integrate any interventions at the systems level (Atreja, Bellam & Levy 2005). A higher level of support is needed to facilitate organisational interventions to improve medication adherence (Sabate 2003). For instance, to realise the potential of team-based care interventions, an effective strategy for improving medication adherence and BP control (Carter et al. 2009), the healthcare organisational structure may need to be adjusted to shift from an acute care model to a model for managing chronic condition and to improve coordination between the team members (Carter, Bosworth & Green 2012). People in developing countries often pay for their medications out-of-pocket, and purchasing medications over the long term may impose an economic burden for patients and their families. In such countries, strategies to

improve access to medicines, sustainable financing of health care and reliable supply systems are essential (Quick 2003; Schafheutle, Hassell & Noyce 2002).

2.1.5 Chapter summary

Nonadherence to anti-hypertensive medications has been widely identified as an important factor in the suboptimal management of hypertension. This chapter has presented evidence from the literature about the factors affecting adherence to medications and interventions to improve patients' adherence to taking medication for chronic conditions such as hypertension.

2.2 Self-medication among people with hypertension: A review

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OXFORD

Review

Self-medication among people living with hypertension: a review

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Abstract

Background. Self-medication is commonly practised by patients, underpinned by health beliefs that affect their adherence to medication regimens, and impacting on treatment outcomes.

Objectives. This review explores the scope of self-medication practices among people with hypertension, in terms of the scale of use, types of medication and influencing factors.

Method. A comprehensive search of English language, peer-reviewed literature published between 2000 and 2014 was performed. Twenty-seven studies met the inclusion criteria; 22 of these focused on complementary and alternative medicines (CAMs).

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Results: Anti-hypertensive medications are listed among the 11% of products that patients reportedly obtain over-the-counter (OTC) for self-medication. On average, 25% of patients use CAMs, mostly herbs, to lower blood pressure. Recommendations by family, friends, and neighbours are the most influential factors for self-medication with CAMs. Faith in treatment with CAMs, dissatisfaction with conventional medicine, and the desire to reduce medication costs are also cited. Most (70%) patients with hypertension take OTC medicines to treat minor illnesses. The concurrent use of anti-hypertensive medications with analgesics and herbal medicines is commonly practised. The socio-demographic profile of patients engaging in self-medication differs markedly in the articles reviewed; self-medication practices cannot be attributed to a particular profile. Low disclosure of self-medication is consistently reported.

Conclusion: This review highlights a high proportion of people with hypertension practise self-medication. Further studies are needed to assess the impact of self-medication with OTC and anti-hypertensive medications on hypertension treatment. Health professionals involved in hypertension management should be mindful of any types of self-medication practices.

Keywords: Complementary therapies, hypertension, non-prescription drugs, herbal medicine, self medication, self care.

2.2.1 Introduction

Hypertension remains a leading public health challenge and is a contributor to the majority of cardiovascular diseases worldwide (World Health Organization 2009a, 2013a). At least 970 million people globally have hypertension, and this figure is estimated to rise to more than 1.5 billion by 2025 (Kearney et al. 2005). Although appropriate hypertension treatment is associated with a reduction in cardiovascular events (Hansson et al. 1998; Turnbull 2003), only 25% of patients with hypertension have adequate blood pressure control (Chobanian et al. 2003).

Self-medication is a common form of self-care and is defined as the use of products (including over-the-counter (OTC) medicines, herbal medicines, dietary supplements, and vitamins) to treat self-recognised health complaints or diseases (World Health Organization 2000). It allows patients to take responsibility for managing their health, engendering a sense of self-empowerment (Hughes, McElnay & Fleming 2001). However, self-medication practices can lead to drug interactions as a result of the concurrent use of unprescribed products with prescribed medication (Qato et al. 2008) or can cause side effects (Forman, Rimm & Curhan 2007; Zheng & Du 2014). Inappropriate self-medication can also lead to misdiagnosis, inappropriate dosing, prolonged duration of use, and polypharmacy (Sclafer, Slamet & De Visscher 1997).

Patients with chronic diseases such as hypertension are highly likely to self-medicate (Amoako, Richardson-Campbell & Kennedy-Malone 2003). Studies of patients with cardiovascular diseases have reported the common use of OTC medicines (Qato et al. 2008) as well as complementary and alternative medicines (CAMs) (Chagan et al. 2005; Grant et al. 2012; Pharand et al. 2003). Self-medication among people with hypertension is of particular interest because, in spite of the fact that hypertension is an important factor for a leading global risk for mortality and morbidity (World Health Organization 2009a), patients often develop personal treatment strategies (Gascón et al. 2004; McBane & Halstater 2011). A recent systematic review on self-medication with traditional herbal medicine (THM) among patients with hypertension in Sub-Saharan Africa confirmed that THM was the most common type of CAM used by these patients. However, the four studies at the core of the review did not include evidence of the use of other types of CAM or OTC medicines (Liwa et al. 2014).

Understanding the self-medication practices of people living with hypertension is important for ensuring successful hypertension management. However, it is important to

recognise that self-medication practices can present in various forms, not just as the self-initiated use of alternative therapies. In the broadest sense, self-medication practices encompass: (i) the use of over-the-counter (OTC) medicine; (ii) the use of prescribed medicines without prescription; and (iii) the use of CAMs (e.g. herbal medicines, nutritional supplements, home remedies) (Bennadi 2013; Goh et al. 2009; World Health Organization 2000). The aim of this review, therefore, is to explore the various self-medication forms practised by patients with hypertension. This includes both self-medication intended to lower high blood pressure and self-medication to treat other ailments. In addition, this review also aimed to identify the factors that influence self-medication practices, and to describe the communication between patients and health practitioners regarding self-medication.

2.2.2 Methods

A comprehensive search of literature published between January 2000 and December 2014 was performed using the following online databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Academic Search Complete (EBSCO), Medline (Ovid), and Scopus. The search key terms used were ‘over the counter’, or ‘non-prescription’, or ‘self-medication’, or ‘herbal medicine’, or ‘traditional medicine’, or ‘complementary medicine’ or ‘alternative medicine’ and combined them all with ‘hypertension’, or ‘blood pressure’, or ‘chronic disease’, or ‘cardiovascular’.

The review comprised original research articles that reported self-medication practices with OTC medicines or CAMs among patients with hypertension. It was not restricted by country but was limited to English language peer-reviewed articles on human subjects. Articles in the form of meeting reports, editorials, commentaries, or case reports were excluded as were articles in which the data on participants with hypertension could not be separated from other study populations. Additional articles were searched from the reference lists of retrieved articles and previous review articles.

2.2.3 Results

A total of 27 articles were identified in the full text assessment as meeting the inclusion criteria (Figure 2.2). Using the World Bank country classification (World Bank 2014), it was established that 10 of the studies were undertaken in six developed countries (the United States, United Kingdom, Republic of Trinidad and Tobago, Taiwan, Singapore, and Japan) and 17 studies were undertaken in 12 developing countries (Mexico, South Africa,

Philippines, Turkey, Jordan, Nigeria, Uganda, India, Morocco, Palestine, Malaysia and Ghana). Seventeen studies were conducted in hospitals/clinics, while 10 were conducted in community settings. Survey design was the most common method used, with the data being collected predominantly via face-to-face interviews using structured or semi-structured questionnaires. Sample sizes ranged from 72 patients in Turkey (Toprak & Demir 2007) to 85,622 respondents in a population-based study in Taiwan (Huang et al. 2013).

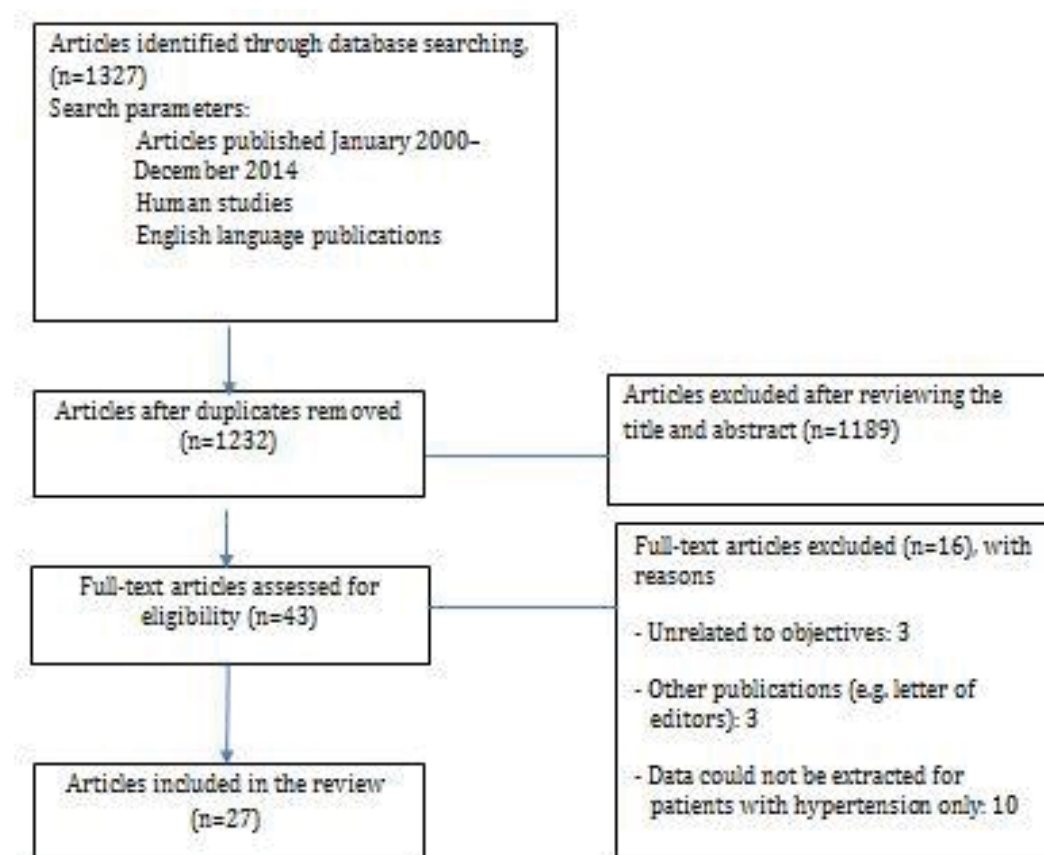


Figure 2.2 Flow diagram for the selection of potential articles included in the review

Proportion of patients practising self-medication

Given the diversity of self-medication practices that patients with hypertension engage in, this review classifies these practices into three categories: 1) self-medication with anti-hypertensive agents, 2) self-medication with OTC medicines, and 3) self-medication with CAMs.

Self-medication with anti-hypertensive agents

Two studies (Balbuena, Aranda & Figueras 2009; Reyes-Gibby & Aday 2000) identified self-medication with anti-hypertensive agents, even though the agents concerned were officially categorised as prescription-only medicines. Balbuena et al (2009) reported that 131 of 245 older Mexican adults purchased medications without prescriptions. Of 246 non-prescription medications taken by patients, 27 (11%) were anti-hypertensive agents (Balbuena, Aranda & Figueras 2009). A smaller study (n=78) in the Philippines showed that four of 33 (11%) patients took anti-hypertensive agents they obtained without a prescription (Reyes-Gibby & Aday 2000). Neither study described the name or type of anti-hypertensive agent purchased, nor the purchasing point. Self-medication with other prescription-only medicines among outpatients living with hypertension was also reported in a study in the Republic of Trinidad and Tobago, with most of these medicines, such as diazepam and lorazepam, being related to sleep disorders (Extavour & Edwards 2008).

Self-medication with over-the-counter medicines

Three studies reporting the use of OTC medicines among patients with hypertension were conducted in the United States and the Republic of Trinidad and Tobago. On average, the proportion of patients using OTC medicines was 70%. This average, however, should be regarded with caution because of differences in the recall period (the time period that patients were asked to consider in responding to the questionnaire). The longer the recall period, the higher the percentage of users: 32%, 86% and 92% for two weeks, one month, and six months, respectively (Extavour & Edwards 2008; Neafsey et al. 2007; Neafsey & Shellman 2001).

Analgesics were the most common OTC medicines used. Sixty two percent (102/165) of patients with hypertension in the Republic of Trinidad and Tobago used analgesics to treat minor illnesses: paracetamol (66%), rubifacient analgesics (37%) and nonsteroidal anti-inflammatory drugs (NSAIDs) (26%) (Extavour & Edwards 2008). The study also identified the concurrent use of NSAIDs with anti-hypertensive agents (e.g. angiotensin-converting enzyme inhibitors, beta blockers, thiazides), potentially reducing the effects of the latter (Extavour & Edwards 2008). Eighty six percent (142/165) of older adult patients with hypertension participating in a study in the United States used at least two OTC medicines (Neafsey & Shellman 2001). The study revealed that analgesics were used by 99 patients (60%; n=165); 49 patients reported the use of OTC NSAIDs (aspirin, ibuprofen) and 39 patients reported the use of paracetamol (Neafsey & Shellman 2001). Other OTC

medicines reported in the reviewed studies included antitussives, antihistamines, decongestants, laxatives, antacids, and sympathomimetics (Extavour & Edwards 2008; Neafsey et al. 2007; Neafsey & Shellman 2001).

Self-medication with complementary and alternative medicines (CAMs)

Of 22 articles reporting the use of CAMs, 13 provided data on self-medication with various types of CAMs, eight reported the use of herbal (Bahar et al. 2013; Eddouks et al. 2002; Hughes et al. 2013; Nuwaha & Musinguzi 2013; Olisa & Oyelola 2009; Osamor & Owumi 2010; Tilburt et al. 2008; Wazaify et al. 2013), and the remaining articles reported the use of Traditional Chinese Medicines (TCM) specifically (Tsai et al. 2014). Among studies reviewed, the recall period varied widely, ranging from current use (Hughes et al. 2013; Mahfudz & Chan 2005; Nuwaha & Musinguzi 2013; Tilburt et al. 2008), to use within the past 12 months (Anderson & Taylor 2012; Bell et al. 2006; Gohar et al. 2008; Hu et al. 2013; Lee et al. 2004), use since first diagnosis (Mollaoğlu & Aciyurt 2013; Peltzer 2004), or use at any time (Shafiq et al. 2003). Ten studies did not give a clear explanation of the recall period used (Ali-Shtayeh et al. 2013; Amira & Okubadejo 2007; Bahar et al. 2013; Eddouks et al. 2002; Kretchy, Owusu-Daaku & Danquah 2014; Olisa & Oyelola 2009; Osamor & Owumi 2010; Toprak & Demir 2007; Tsai et al. 2014; Wazaify et al. 2013).

This review is indicative of the wide variation in the definition and classification of CAMs among the various studies. Seven studies (Ali-Shtayeh et al. 2013; Anderson & Taylor 2012; Bell et al. 2006; Gohar et al. 2008; Hu et al. 2013; Kretchy, Owusu-Daaku & Danquah 2014; Mollaoğlu & Aciyurt 2013) used the classification system from the National Centre for Complementary Alternative Medicine (NCCAM) to define the CAMs under five modalities: alternative medical practice; mind and body intervention; biological-based therapies (including herbal medicines, vitamins, dietary supplements); manipulative and body-based methods; and energy therapies (Frass et al. 2012). Six studies (Amira & Okubadejo 2007; Lee et al. 2004; Mahfudz & Chan 2005; Peltzer 2004; Shafiq et al. 2003; Toprak & Demir 2007) developed their own criteria or did not clearly explain their classification system.

The proportion of patients with hypertension using CAMs is divided in this review into two categories: (i) those who use CAMs to treat hypertension; and (ii) those who use CAMs for any health condition.

a) Self-medication with CAMs for treating hypertension

Across 22 studies, the average proportion of patients using CAMs to treat hypertension was 24.7%, ranging from as low as 5% in Singapore (Lee et al. 2004) to as high as 67% in Turkey (Toprak & Demir 2007). These percentages were derived from only 14 studies, as the proportion of self-medication with CAMs to treat hypertension in the eight remaining studies (Ali-Shtayeh et al. 2013; Anderson & Taylor 2012; Eddouks et al. 2002; Gohar et al. 2008; Hu et al. 2013; Hughes et al. 2013; Mahfudz & Chan 2005; Peltzer 2004) cannot be clearly extracted. Comparing the use of CAMs based on the economic development of countries, 10 studies conducted in developing countries (Amira & Okubadejo 2007; Bahar et al. 2013; Kretchy, Owusu-Daaku & Danquah 2014; Mollaoğlu & Aciyurt 2013; Nuwaha & Musinguzi 2013; Olisa & Oyelola 2009; Osamor & Owumi 2010; Shafiq et al. 2003; Toprak & Demir 2007; Wazaify et al. 2013) reported a higher average (30.7%) than four studies conducted in developed countries, which reported an average of 10% (Bell et al. 2006; Lee et al. 2004; Tilburt et al. 2008; Tsai et al. 2014).

Herbal medicines and dietary supplements were the most common types of CAMs used by patients (Amira & Okubadejo 2007; Hughes et al. 2013; Nuwaha & Musinguzi 2013; Osamor & Owumi 2010; Wazaify et al. 2013). Various types of herbal medicines used for treating hypertension were identified in the studies reviewed, including garlic, neem, roselle, ginger, vinegar, lemon, tea, bitter leaf, black seed, aloe vera, cod liver oil, and fish oil (Shafiq et al. 2003; Tsai et al. 2014). A study involving 380 Moroccan patients with chronic disease identified the use of 73 medicinal plants (phytotherapy) for lowering blood pressure, with garlic being the most common (Eddouks et al. 2002). The use of garlic for hypertension was also commonly reported in another 12 studies (Amira & Okubadejo 2007; Anderson & Taylor 2012; Bahar et al. 2013; Eddouks et al. 2002; Gohar et al. 2008; Kretchy, Owusu-Daaku & Danquah 2014; Olisa & Oyelola 2009; Osamor & Owumi 2010; Tilburt et al. 2008; Toprak & Demir 2007; Wazaify et al. 2013).

The use of other types of CAMs was reported in the studies reviewed. Homeopathic treatments were the most popular CAMs for treating hypertension in the United States (Bell et al. 2006). Ayurveda was chosen by 57% patients with hypertension in India (Shafiq et al. 2003). Mind-body interventions (healing rituals, prayer, meditation, stress-management classes) were commonly used for hypertension among patients in the United States (Anderson & Taylor 2012; Bell et al. 2006),

the United Kingdom (Gohar et al. 2008) and Japan (Hu et al. 2013). In addition, traditional methods of attempting to treat hypertension were also reported in certain groups; these included *hijama* (cupping/blood-letting) in Jordan and Japan (Hu et al. 2013; Wazaify et al. 2013) and applying cold packs on the forehead (Toprak & Demir 2007) in Turkey.

The concurrent use of CAMs with anti-hypertensive agents was reported in 10 studies (Ali-Shtayeh et al. 2013; Amira & Okubadejo 2007; Hughes et al. 2013; Mahfudz & Chan 2005; Nuwaha & Musinguzi 2013; Olisa & Oyelola 2009; Peltzer 2004; Shafiq et al. 2003; Toprak & Demir 2007; Wazaify et al. 2013). Of these studies, three reported diarrhoea, abdominal discomfort and diplopia as side effects of neem, and skin reactions after the use of aloe vera (Ali-Shtayeh et al. 2013; Olisa & Oyelola 2009; Shafiq et al. 2003). The other adverse effect of the concurrent use of CAMs was exacerbation of hypertension, reported in 69 of 93 Indian patients who were dissatisfied with CAMs. These patients subsequently discontinued the use of CAMs for that reason (Shafiq et al. 2003).

b) Self-medication with CAMs for other health conditions

Eight studies reported that an average of 38.2% of patients with hypertension used CAMs for other health conditions (Ali-Shtayeh et al. 2013; Anderson & Taylor 2012; Bell et al. 2006; Gohar et al. 2008; Mahfudz & Chan 2005; Olisa & Oyelola 2009; Tilburt et al. 2008; Tsai et al. 2014). A national survey in the United States reported that herbal medicines and supplements were used by 59% of older people with hypertension to treat chronic conditions, but that only 6% of people used those CAMs specifically for hypertension (Bell et al. 2006). Fish oil, glucosamine, garlic and chondroitin were the most common herbal medicines used by patients with hypertension in the United States (Anderson & Taylor 2012). The survey also reported that multivitamins were commonly used (80%), followed by calcium (27%) and vitamin C supplements (18%) (Anderson & Taylor 2012).

A study in Palestine reported that certain herbs, such as garlic, roselle, olives, hawthorn and anise were taken to treat not only hypertension but also cancer and diabetes (Ali-Shtayeh et al. 2013). Eighty six percent of 4575 patients with hypertension in the study used one or more types of CAMs (Ali-Shtayeh et al. 2013). The use of CAMs for treating other comorbid diseases, including malaria, typhoid,

skin disorder, diabetes, erectile disorders, abdominal disorders, cough, and anxiety, was also reported in 120 ambulatory hypertensive patients in Nigeria (Olisa & Oyelola 2009). *Neem* was found in the study to be the most common herb used (Olisa & Oyelola 2009).

Factors influencing self-medication practices in hypertensive patients

Fifteen studies explored the association of demographic and psychosocial factors with self-medication practices. The profile of self-medication users was retrieved from 12 of these studies (the demographic factors in the remaining three studies could not be extracted for patients with hypertension alone (Balbuena, Aranda & Figueras 2009; Lee et al. 2004; Mollaoğlu & Aciyurt 2013). Across 12 studies, the socio-demographic profiles of patients engaging in self-medication differed markedly in the articles reviewed.

Being older in age was associated with a higher likelihood of CAM use for hypertension in two studies (Ali-Shtayeh et al. 2013; Olisa & Oyelola 2009), but this association was not demonstrated in three studies (Gohar et al. 2008; Kretchy, Owusu-Daaku & Danquah 2014; Nuwaha & Musinguzi 2013). Moreover, one study reported that younger hypertensive patients (<65 years old) were more likely than older patients to take OTC medicines to treat minor illnesses (Extavour & Edwards 2008). With regard to gender differences, two studies found that being male was an independent predictor of CAM use (Kretchy, Owusu-Daaku & Danquah 2014; Osamor & Owumi 2010) and one reported that females were more likely to self-medicate (Anderson & Taylor 2012). However, four studies showed no association between gender and CAM use (Bahar et al. 2013; Gohar et al. 2008; Nuwaha & Musinguzi 2013; Olisa & Oyelola 2009). Further, four studies reported no association between level of education and CAM use (Amira & Okubadejo 2007; Gohar et al. 2008; Kretchy, Owusu-Daaku & Danquah 2014; Nuwaha & Musinguzi 2013), but one study in Palestine showed that lower education was associated with a higher prevalence of herbal medicine use (Ali-Shtayeh et al. 2013). Collectively, the findings indicate that self-medication practices cannot be attributed to a particular socio-demographic profile.

Nine studies reported patients' reasons for self-medication with CAMs (Ali-Shtayeh et al. 2013; Bahar et al. 2013; Eddouks et al. 2002; Mollaoğlu & Aciyurt 2013; Olisa & Oyelola 2009; Osamor & Owumi 2010; Shafiq et al. 2003; Tilburt et al. 2008; Wazaify et al. 2013). Fear of adverse drug reactions was identified in 59% patients in India who were concurrently taking CAMs with anti-hypertensive agents (Shafiq et al. 2003). The desire to reduce the adverse effects of anti-hypertensive agents was also reported in studies from

Turkey and Palestine (Ali-Shtayeh et al. 2013; Mollaoğlu & Aciyurt 2013). A belief that herbal medicines were effective was reportedly an independent predictor of the use of these medicines to treat hypertension in Uganda (Nuwaha & Musinguzi 2013). A study in Morocco revealed that 65% of patients perceived medicinal plants to be better than conventional medicine (Eddouks et al. 2002). Moreover, studies in Nigeria (Olisa & Oyelola 2009) and Turkey (Mollaoğlu & Aciyurt 2013) identified dissatisfaction with conventional treatments as the reason for using CAMs. Three studies in Uganda, Nigeria and India revealed patients' perceptions that traditional healers gave better personal attention and were easier to access (Nuwaha & Musinguzi 2013; Osamor & Owumi 2010; Shafiq et al. 2003). Perceived uncaring attitudes of health practitioners and hospital phobia were also acknowledged by Nigerian patients with hypertension (Olisa & Oyelola 2009).

The relative affordability of CAMs was an important consideration according to three studies conducted in an urban Nigerian community (Osamor & Owumi 2010), in south-eastern Morocco (Eddouks et al. 2002), and an urban African-American population in the United States. Patients believed that they could reduce medication costs by using CAMs. Their belief that conventional medicines were unaffordable was an independent predictor for using CAMs, as reported in a study in Ghana involving 400 patients with hypertension (Kretchy, Owusu-Daaku & Danquah 2014). Notwithstanding, more than half the CAM users (56%) in India were dissatisfied with CAMs, and two thirds of this group complained that their expense was the reason for their dissatisfaction (Shafiq et al. 2003).

Communication between patients and health practitioners regarding self-medication

A study among older urban Mexicans indicated that patients who practiced self-medication used previous prescriptions from their doctors as a basis for requesting further medications without another consultation. In the study, anti-hypertensive agents were reported to be taken as self-medication by 17 of 131 patients (Balbuena, Aranda & Figueras 2009).

Studies in the United States reported that recommendation by health practitioners (doctors, nurses and pharmacists) was the most influential driver of OTC medicine use (Neafsey et al. 2007; Neafsey & Shellman 2001). Nonetheless, one of these studies reported difficulties in obtaining OTC information from health practitioners including patients' perception that doctors or pharmacists were too busy to provide medicine information (Neafsey & Shellman 2001). In these studies, other reported sources of medicine information comprised of labels, books, magazine articles, pharmacy printouts, and advertisements (Neafsey et al. 2007; Neafsey & Shellman 2001).

With regard to the use of CAMs, nine studies reported that on average, more than half of CAM users (52%) received recommendations from family members, friends or neighbours (Ali-Shtayeh et al. 2013; Bahar et al. 2013; Eddouks et al. 2002; Hu et al. 2013; Hughes et al. 2013; Lee et al. 2004; Shafiq et al. 2003; Toprak & Demir 2007; Wazaify et al. 2013), in a range of 41% (Toprak & Demir 2007) to 84% (Shafiq et al. 2003). Recommendations by alternative therapists or herbalists to use CAMs were reported by 11% of patients (Ali-Shtayeh et al. 2013), while 6% to 40% patients reported recommendations by doctors or pharmacists (Ali-Shtayeh et al. 2013; Bahar et al. 2013; Hu et al. 2013; Shafiq et al. 2003). In addition, a study in Palestine and Turkey identified popular media (television, newspapers, advertisements) as key sources of information and recommendation for the use of CAMs among patients with hypertension (Ali-Shtayeh et al. 2013; Toprak & Demir 2007).

Six studies reported the disclosure rate of CAM use (Ali-Shtayeh et al. 2013; Kretchy, Owusu-Daaku & Danquah 2014; Olisa & Oyelola 2009; Shafiq et al. 2003; Toprak & Demir 2007; Wazaify et al. 2013). On average, 21% of patients (5% to 32%) disclosed their CAM use to their doctors. A study involving 196 Britons with hypertension reported that only 7% of patients were specifically asked by doctors about their CAM use (Gohar et al. 2008). Patients' perceptions influenced their decision not to disclose their self-medication with CAMs, including their perception that health practitioners lacked interest, a fear of angering health practitioners if their CAM practices were disclosed, and the perception that disclosure was unnecessary (Kretchy, Owusu-Daaku & Danquah 2014).

2.2.4 Discussion

Across the studies reviewed, the forms of self-medication practised by patients with hypertension were intended to: 1) treat their hypertension (e.g. purchasing captopril without a prescription, consuming garlic to lower blood pressure), or 2) manage other co-existing health conditions (e.g. analgesics for low back pain, herbs for diabetes).

Self-medication with anti-hypertensive medications (i.e. anti-hypertensive medications were purchased over-the-counter) was reported by 11% of patients, despite these medicines being classified as prescription-only. Practising self-medication with prescription-only medicines (e.g. antibiotics) has been reported in previous studies, particularly in those developing countries with less regulation around the use of medicines (Llor & Cots 2009; Volpato et al. 2005). A study among Saudi Arabian pharmacists reported that anti-hypertensive medication (i.e. captopril) was commonly dispensed over-the-counter without

questioning (Al-Mohamadi et al. 2013). Even though the number of published articles reporting this practice is limited, the finding is important because of the possible inappropriate use of anti-hypertensive medications. Given the low disclosure of self-medication practices, the actual proportion of patients purchasing anti-hypertensive medication without prescription may be greater than is currently reported.

This review identified that the concurrent use of OTC medicines with anti-hypertensive agents was commonly practised. More than two-thirds of people with hypertension used OTC medicines (mostly analgesics such as NSAIDs) to treat their minor ailments; this raises concerns about the potential for drug interactions to occur (Forman, Rimm & Curhan 2007; Hughes, McElnay & Fleming 2001). NSAIDs may reduce effect of anti-hypertensive medications and also contribute to increase blood pressure by developing renal injury and salt retention (Zheng & Du 2014). Since pharmacies are the most common point of care for purchasing OTC medicines, pharmacists play a key role in providing information and education for patients on responsible self-medication (World Health Organization 1998). Information to patients should also cover possible interactions with other medicines taken as well as advice about when patients need to consult their healthcare professionals (Bennadi 2013). Educating patients about self-medication can also be performed through other community-based approaches (World Health Organization 2009b). For example, a study reported the effectiveness of a short training for mothers to improving knowledge about self-medication with OTC medicines, and reducing the number of OTC medicines used (Suryawati 2003).

The wide range (5% to 67%) proportion of people with hypertension used OTC CAM in this review is similar to previous findings on the use of traditional herbal medicines for hypertension in Sub-Saharan Africa (Liwa et al. 2014), as well as reviews on CAM use among people with cardiovascular diseases (Grant et al. 2012; Rabito & Kaye 2013). The variable definitions of CAMs and the differences in the research design of the studies reviewed means that considerable uncertainty exists about the true extent of self-medication with CAMs. Overall, the substantial proportion of self-medication with CAMs reported in this review indicates that patients with hypertension have a preference for holistic approaches to managing their health. However, reliable evidence of the efficacy, safety and health-economic benefits of CAM use is currently lacking (Fischer et al. 2014). For example, this review has reported that garlic is a commonly used herbal medicine for treating hypertension, although there is no strong evidence of its efficacy (51). Since garlic has the potential to interact with anticoagulants and increase the risk of bleeding (Borrelli,

Capasso & Izzo 2007), its use should be monitored by health practitioners. Information on the potential side effects of traditional medicines and herb-drug interaction should be informed to patients (Ibrahim et al. 2016). For this reason, key questions about CAM use need to be asked during clinical encounters (Shelley et al. 2009). A study in Trinidad, however, reported that physicians perceived their lack of knowledge as a potential barrier to educate patients about potential drug-herb interactions (Clement et al. 2005). Furthermore, the other study reported the perceived barriers for physicians to initiate discussion with patients about their CAM use (Shelley et al. 2009). Indeed, health professionals' role to provide reliable information about responsible self-medication need to be encouraged.

Limitations

This review potentially has certain limitations. First, the quality of the studies reviewed varies markedly in terms of study design and data presentation. Second, since this review includes only articles in English, the possibly different findings of papers in other languages have been excluded. Third, the number of studies on self-medication with OTC and prescription-only medicines is relatively limited. Further investigation with a specific focus on self-medication with anti-hypertensive agents is needed to determine an appropriate policy approach.

2.2.5 Conclusion

A high proportion of people with hypertension practise self-medication with OTC medicines or CAMs. Self-medication with anti-hypertensive agents is still under-studied, suggesting the need for further studies. Health professionals who manage patients with hypertension should be mindful of possible self-medication by patients, with a view to optimising treatment outcomes and minimising medicine-related problems.

Ethics: Ethical approval was not required for this review

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Chapter 3:

Management of hypertension in Indonesia

3.1 Geography and population of Indonesia

The Republic of Indonesia is a developing country in South-East Asia. It is the fourth most populous nation in the world after China, India and the United States (World Bank 2014), and its population reached more than 250 million in 2015 (Statistics Indonesia 2013). Indonesia is an archipelago comprising more than 17,000 islands. It has 34 provinces, which are scattered over five main islands (Java, Sumatra, Kalimantan, Sulawesi and Papua), and many smaller islands. Provinces with the highest populations tend to be on the islands of Java (West Java, Central Java, East Java and the cities of Jakarta and Yogyakarta) and Bali. (Statistics Indonesia 2013). Each province is subdivided into districts (*kabupaten/kota*). Each district is divided into subdistricts (*kecamatan*). Each subdistrict is further divided into villages (i.e. *desa* in rural areas, or *kelurahan* in urban areas). An administrative village is the lowest level of government administration in Indonesia. It is headed by the head of village (i.e. *kepala desa* in rural areas or *lurah* in urban areas) who is elected by popular vote (Ministry of Health Republic of Indonesia 2015a).

Indonesia is a country with a wide diversity in culture with more than 300 native ethnicities. The largest ethnicity is Javanese (42% of the total population) followed by Sundanese, Malay and Maduranese. *Bahasa Indonesia* is the Indonesian national language; however, each ethnic group might have more than two local languages, and there are more than 730 different local languages and dialects (Hays 2013).

Poverty remains a social problem in Indonesia. In September 2015, 11.1% of the total population was classified as poor and spent less than USD 1 a day (Statistics Indonesia 2015). The percentage of poor people is higher in rural areas (14.1%) than in urban areas (8.2%). Of the total of 74,000 villages in Indonesia, more than 32,000 are categorised as underdeveloped villages (Ministry of Home Affairs of Indonesia 2013). These villages, especially those located in rural, hinterland and border areas, have a low socio-economic level and problems accessing basic needs, including access to healthcare facilities (*Regulation of Ministry of Villages-Underdeveloped Regions and Transmigration Republic of Indonesia No.3 Year 2016*). The World Bank has estimated that Indonesia spends less than 3% of gross domestic product, a relatively low percentage compared relative to gross domestic product in other lower-middle-income countries (5.9%) (Hong et al. 2009). The

Human Development Index (HDI) among the Indonesian population was 68.5% in 2015, which was lower than other developing countries in South-East Asia such as Malaysia (78%) and Thailand (73%) (United Nations Development Programme 2015).

3.2 The Indonesian healthcare system

The healthcare system generally comprises of primary and hospital (secondary, tertiary, and quaternary) care. Primary care is delivered predominantly by community health centres (CHC) at the subdistrict level (*Regulation of Ministry of Health No. 75 Year 2014 about Community Health Centre*). The public healthcare system follows the organisational structure shown in Figure 3.1.

Between 1970 and 1996, the government of Indonesia embraced the Health for All initiative by building and staffing over 7,100 CHC, 19,000 sub CHC, 285 district hospitals and 50 specialised referral hospitals throughout the country (Budijanto & Astuti 2015). In 2015, there were 9754 CHCs across 7,094 subdistricts in Indonesia (Ministry of Health Republic of Indonesia 2015a). On average, one Indonesian CHC served about 30,000 people (World Health Organization 2014b).

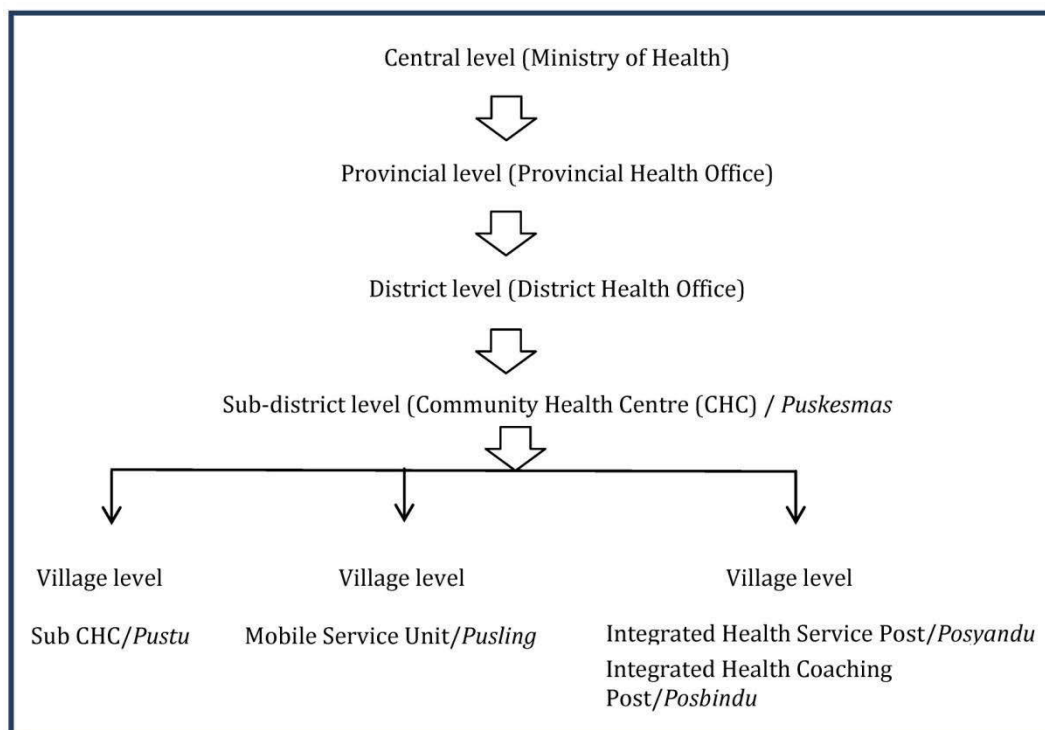


Figure 3.1 Organisational structure of the Indonesian public healthcare system

Since 2010, the Indonesian government has launched new strategies in health management by emphasising health promotion and preventive programs, improving quality of care, encouraging cross-sectoral collaboration towards improving health and decentralising health program implementation (Mboi 2015). Decentralisation means that the authority for regulation at the provincial and district levels is transferred to provincial and district governments. Laws are passed by the national parliament, and the Ministry of Health as an overall regulator develops ministerial level regulations and instructions to provide guidance and direction for provincial and district health offices (Heywood & Choi 2010).

In Indonesia, the CHC (*Puskesmas*) is the core of the primary healthcare system (*Regulation of Ministry of Health No. 75 Year 2014 about Community Health Centre* ; Ministry of Health Republic of Indonesia 2015a), and aims to provide front-line healthcare services for individuals and communities (World Health Organization 1978). A CHC provides six basic health programs, including basic medical and dental care, mother and child health, family planning, nutrition, eradication of communicable diseases, and hygiene, sanitation and environmental health (*Regulation of Ministry of Health No. 75 Year 2014 about Community Health Centre*). Throughout the country, every subdistrict has a minimum of one CHC (Budijanto & Astuti 2015). Of the 258,568 staff across all Indonesian CHCs in 2015, most are midwives (30.7%), followed by nurses (28.3%), supporting/administrative staff (15%), doctors (6.4%), public health staff (6.2%), nutritionists (3.2%), environmental health workforce (3%), pharmacists or pharmacy technicians (2.8%), dentists (2.5%) and laboratory staff (1.8%) (Ministry of Health Republic of Indonesia 2015a). Nearly three-quarters (74.4%) Indonesian CHCs employed at least one doctor in 2015 (Ministry of Health Republic of Indonesia 2015a), which means that one-quarter of all CHCs in Indonesia do not have a doctor. Given the wide geographic distribution, it is a challenge for the Indonesian healthcare system to address the inequalities in the health workforce distribution (Assan et al. 2009), particularly in rural areas (Sohn 2015). On average, there is one doctor for every 16,793 people in rural areas as compared to one doctor for every 2763 people in urban areas (Rokx 2010).

To increase the coverage of healthcare services for people in their local area, each CHC is supported by sub CHC that are managed mostly by midwives or nurses (*Regulation of Ministry of Health No. 75 Year 2014 about Community Health Centre*). The CHC also occasionally provides mobile health services to serve people in rural and remote areas. At

the village level, the CHC supervises community-based programs operated by community health workers in the villages, including the Integrated Health Service Post (IHSP) for children younger than five years (*Posyandu balita*), the IHSP for the elderly (*Posyandu lansia*) and the Integrated Health Coaching Post (*Posbindu*) (*Regulation of Ministry of Health No. 75 Year 2014 about Community Health Centre* ; Ministry of Health Republic of Indonesia 2012).

In addition to the public health sector, private health services are accessed by the Indonesian community, even by people with a low income (Hong et al. 2009; World Health Organization 2016a). In 2004, over two-thirds of ambulatory care was provided by the private sector, and half of all hospital visits were at private hospitals. However, the use of private health services declined, and the use of public health facilities increased between 2004 and 2006, which coincided with the introduction of the government-based insurance scheme for the poor (Hong et al. 2009).

At the primary level, private healthcare providers include doctors, midwives and nurses. Outside of the work hours in the CHC, they operates private practices in their home or clinic (Heywood & Harahap 2009; Hong et al. 2009). This dual practice is common in Indonesia (Holloway 2011). The Indonesian regulations state that private midwives are only allowed to provide healthcare services for general patients (beyond maternity tasks) in areas where there are no doctors (Law No 36, 2014). However, private midwife practices are common in both rural and urban areas (Heywood, Harahap & Ratminah 2010). Given that private nurses and midwives charge a lower service fee than private doctors, poor people prefer to visit a private midwife or nurse over a private doctor (Heywood & Harahap 2009).

3.2.1 The health financing system in Indonesia

With 49% of Indonesian's people living under the internationally defined US\$2 per day poverty line (Watkins 2006), people are vulnerable to unexpected health expenditures. An effective health financing mechanism to protect its population from catastrophic health expenditures is a challenge in this country. Therefore, aiming to achieve the universal coverage for the entire of population in 2019, the Indonesian government is developing a national healthcare financing system, managed by a non-profit organisation called *Badan Penyelenggara Jaminan Sosial Kesehatan* (BPJS-Healthcare). This system aims to cover basic healthcare needs for ambulatory and in-patient services (Mboi 2015). The government pays the insurance premium for patients living under the poverty line, whereas

those living above the poverty line pay their premium by themselves or their employer contributes (Mboi 2015). By December 2015, the BPJS-Healthcare insurance has covered over 156 million people (about 62% of the total population), which included 98 million people living under the poverty line (Ministry of Health Republic of Indonesia 2015a). Members of BPJS-Healthcare insurance use mainly the public healthcare services (CHC, public hospital) (49%) followed by sole private doctors (22%), and private clinics (16%) (Ministry of Health Republic of Indonesia 2015a).

3.2.2 Challenges in delivering an optimal healthcare system in Indonesia

The WHO has identified Indonesia as one of 57 countries with critical shortages in its health workforce; Indonesia's health workforce-to-population density continues to lag behind that of other countries in South-East Asia (World Health Organization 2006). The national target is to have a ratio of 4.5 doctors per 10,000 people by 2019. In 2015, Indonesia's doctor-to-population ratio was 1.6 (range from 1.1 in West Java provinces to 3.9 in North Sulawesi). Moreover, Indonesia has yet to establish a regulatory framework to ensure a high quality of service is provided by healthcare providers (Heywood & Choi 2010). Barber, Gertler & Harimurti (2007) reported that private nurses and midwives in rural and remote areas have poor knowledge of adequate procedures for simple treatments of frequent illnesses such as diarrhoea, cough and fever.

To address the inequitable distribution of doctors (including specialists), Indonesia has introduced a number of policy measures such as the regulation of private practice and financial incentives for rural locations (*Regulation of Ministry of Health No. 2052 Year 2011 about License and Implementation of Medical Practices*). However, the implementation of these regulations is weak. For example, regulations to limit private practice (i.e. maximum of two places per practitioner) are ineffective, and incentives to work in rural/remote areas are inadequate (Meliala, Hort & Trisnantoro 2013). In 2014, there were 40,787 doctors, 237,181 nurses, 124,948 midwives and 30,408 pharmacists in Indonesia (Ministry of Health Republic of Indonesia 2015a). The vast majority of doctors and other formal healthcare providers are employed by the state as permanent civil servants (Hong et al. 2009). The Indonesia Family Life Survey identified that 54% of doctors, 69% of midwives and 65% of nurses work in both the public and private sector (Barber, Gertler & Harimurti 2007). By law, civil servants are also permitted to conduct private services in rural areas after office hours. This policy aims to ensure that doctors and midwives can remain in rural areas but augment their civil servant salaries through private income. The

division of work hours between state and private practice is governed by general regulations for civil servants and specific local (provincial or district) regulations. These regulations require civil servants to spend eight hours per day, five days per week, in their state employment, but they are weakly implemented (Meliala, Hort & Trisnantoro 2013). A qualitative study focusing on the factors influencing professional practices in the CHC found that primary healthcare system in Indonesia also needs to address unclear scope of practice between different healthcare providers (Syah et al. 2015). The evidence presented shows that there are complex challenges to be faced by the Indonesian healthcare system when providing high-quality healthcare services, especially for patients in rural areas.

3.3 Regulation about accessing medicines in Indonesia

In Indonesia, manufactured medicines are classified as over-the-counter (OTC) medicines, pharmacy-only medicines, prescription medicines and psychotropic substances and narcotics (*Regulation of Ministry of Health No. 949 Year 2000 about Drug Registration*).

OTCs are sub-classified into ‘*obat bebas*’ and ‘*obat bebas terbatas*’. The definition of ‘*obat bebas*’ is OTC medicines that can be sold freely to the public, and their packaging is marked by a specific symbol of a green circle with a black border. Examples of this include paracetamol, antacids and vitamins. The definition of ‘*obat bebas terbatas*’ is OTC medicines that need a warning label when sold; they are marked by a blue circle with a black border in their packaging. Examples of this included antihistamines, chloroquine and potassium chloride in liquid (Ministry of Health Republic of Indonesia 2007). Prescription-only medicine is marked by a symbol of a red circle with a black border and the letter K inside. The same symbol is used for psychotropic substances such as diazepam, triazolam and zolpidem (*Law No. 5 Year 2007 Republic of Indonesia about Psychotropic Substances ; Regulation of Ministry of Health No. 9 Year 2015 on Psychotropic Substances Classification Changes*). Narcotics (e.g. morphine, codeine) are marked by a symbol of a red circle with a red border and red cross inside (*Law No. 35 Year 2009 about Narcotics*). Psychotropic substances and narcotics are available from pharmacies with a medical prescription only. These substances should be stored securely in the pharmacies using standardised procedures (*Regulation of Ministry of Health No. 3 Year 2015 on Distribution of Narcotics and Psychotropic Substances*).

To increase coverage of medication to the wider Indonesian communities, some medicines that are categorised as prescription-only medicine can be dispensed without prescription in

the pharmacies when they are enlisted as pharmacy-only medicine (*obat wajib apotek*). The Indonesian Ministry of Health has published three lists of pharmacy-only medicine in 1990 (*Decree of Ministry of Health No. 347 Year 1990 about The List of Pharmacist-Only-Medicines No.1*), 1993 (*Decree of Ministry of Health No. 924 Year 1993 about The List of Pharmacist-Only-Medicines No.2*), and 1999 (*Decree of Ministry of Health No. 1176 Year 1999 about The List of Pharmacist-Only-Medicines No.3*). The lists included the names of medications (such as mefenamic acid, chlorpheniramine maleate, mebendazole, omeprazole, allopurinol) and the maximum number of each medication per patient that can be dispensed. Pharmacy-only medicine can be purchased only in pharmacies and the pharmacist must provide adequate information about the use of the medication (*Decree of Ministry of Health No. 1176 Year 1999 about The List of Pharmacist-Only-Medicines No.3*).

In 2014, there were 24,716 community pharmacies and 8,615 drug stores in Indonesia (Ministry of Health Republic of Indonesia 2015a). The Indonesian law states that prescription medicines and pharmacy-only medicines can be purchased only in pharmacies, whereas drug stores are allowed to sell only OTC medicines. However, Widayati et al. (2011) and Hadi et al. (2010) reported purchasing antibiotics without prescription in both community pharmacies and drug stores. This self-medication practice has also been reported in other countries such as Greece and Spain (Llor & Cots 2009; Skliros et al. 2010).

With regard to policy about the supply of medicines, Indonesia developed its National Drugs Policy in 2006. Regulation about essential drug lists for each level of healthcare service centre, national drug formulary, list of prescription-only medicines and other ministerial decrees have been launched to increase the availability and affordability of medicines for all Indonesian people (*Decree of Ministry of Health No. 312 Year 2013 about Essential Drug List*). Presidential decree No. 103 Year 2001 states that medicine regulatory control is managed through the National Agency of Drugs and Food Control (*Badan POM*). The *Badan POM* is the responsible agency with regards to legislation, regulation, and standardisation of policies and procedure regarding medications and food products in Indonesia. It involves the licensing of pharmaceutical industries, pre- and post- market monitoring, evaluating product advertisements and promotions, and educating public about the safety of products. Given that the distribution of counterfeit medicines in Indonesia is quite high (Hong et al. 2009), the *Badan POM* is also responsible for tracking and identifying their distribution, in coordination with law enforcement.

3.4 Hypertension management in primary health care in Indonesia

3.4.1 Hypertension and cardiovascular events in Indonesia

Although the existing burden of communicable diseases remains a concern in Indonesia, the burden of non-communicable diseases has increased with time (Ministry of Health Republic of Indonesia 2013d). In 2014, the WHO reported that non-communicable diseases accounted for 63% of all deaths in Indonesia (World Health Organization 2014). Cardiovascular diseases contributed to 30% of the total number of deaths followed by cancers (13%) and diabetes (3%) (World Health Organization 2014). Among cardiovascular diseases, stroke is the number one cause of death; in 2012, 21% of all deaths in Indonesia were caused by stroke, which killed 328,000 Indonesian people (World Health Organization 2012). Findings from a national survey in 2013 showed that hypertension contributed to 53% of cases of stroke among Indonesian people aged 55 years and older (Hussain et al. 2016a).

3.4.2 Prevalence of hypertension in Indonesia

In 2013, 25.8% of the adult Indonesian population aged >18 years had high blood pressure (BP); this equates to about 50 million people with hypertension (Ministry of Health Republic of Indonesia 2013d). The prevalence of hypertension increases markedly with age: 63.8% of Indonesians aged ≥ 75 years have hypertension (Ministry of Health Republic of Indonesia 2013d). The prevalence of hypertension is slightly higher among people in urban (26.1%) compared with rural (25.5%) areas (Ministry of Health Republic of Indonesia 2013d). The Indonesian Family Life Survey 2007, which sampled 11,712 people aged 40 years and older, reported a 47.8% prevalence of hypertension; the prevalence was higher in women (52.3%) than in men (43.1%) (Hussain et al. 2016b). Based on the findings from the same data set, older age, being unmarried, having a low socio-economic status, and obesity were identified as risk factors for hypertension (Aizawa & Helble 2016). Having insurance and the level of formal schooling were not associated with the prevalence of hypertension (Aizawa & Helble 2016).

3.4.3 Awareness of hypertension

A national survey involving Indonesian people aged 18 years and older reported that, in 2013, the prevalence of measured hypertension (i.e. based on a BP check within the national survey) was 25.8% (Ministry of Health Republic of Indonesia 2013d). This percentage was higher than that based on self-report in the same survey, which was only

9.5%. This means that 63.2% of people with hypertension in the community were unaware that they had hypertension (Ministry of Health Republic of Indonesia 2013d). Similar to this finding, the study by Hussain et al. (2016b) reported that, among Indonesian people aged 40 years or older, the awareness of hypertension was 30% on average (Hussain et al. 2016b).

Lack of awareness of hypertension is particularly problematic in rural areas because people living in rural areas have less chance of being diagnosed with hypertension. Aizawa & Helble (2016) reported that 28% of rural dwellers with hypertension were aware of their condition. In urban areas, this percentage is 35%. This lack of awareness has also been reported among those with severe hypertension (BP $\geq 160/100$ mmHg): 40% and 50% for people living in rural and urban areas, respectively (Aizawa & Helble 2016). Awareness of hypertension is associated with economic status. Among the poorest quintile, only 18% of people living in rural areas were aware of their hypertension, whereas 30% of those in the highest quintile of wealth were aware of their hypertension (Aizawa & Helble 2016).

3.4.4 Treatment and control of hypertension

Based on findings from an Indonesian Family Life Survey, Aizawa & Helble (2016) reported that 25% of Indonesian people with hypertension had received anti-hypertensive medications (30% of women, 20% of men). In rural areas, the percentages of patients with hypertension who took anti-hypertensive medications on the day of the survey were only 2% (in the lowest wealth quintile) and 4% (in the highest wealth quintile). Even though a higher percentage of treated patients had taken their medication on the survey day in urban areas, the very low percentage (6% and 10% for the lowest and richest wealth quintiles) is concerning. Among rural patients with severe hypertension, only 5% took any anti-hypertensive medications; in urban areas, this percentage was 10% (Aizawa & Helble 2016). These findings indicate that poorer people living in rural areas have a lower rate of hypertension treatment and a higher risk of experiencing complications of hypertension because of untreated hypertension (Aizawa & Helble 2016).

Hussain et al. (2016b) found that among Indonesian patients who had taken any anti-hypertensive medications, 25% had achieved their BP target (i.e. $<140/90$ mmHg). Overall, adequate BP control was attained by 9% of patients who were aware of their condition or by 7% of all patients aged 40 years and older with hypertension (Hussain et al. 2016b). Indeed, a study by Sohn (2015) reported that almost no Indonesian people with hypertension have their blood pressure under control.

A few published studies have looked at the use of anti-hypertensive medications among rural Indonesian people with hypertension. Aizawa and Huelbe (2016) reported that less than 10% of patients with hypertension took anti-hypertensive medications. However, the survey did not include the types of anti-hypertensive medications used by patients. A study in one Indonesian CHC (Rumagit, Pojoh & Manampiring 2012) reported that only 5.6% of patients routinely have their BP checked at a CHC. Patients in the study noted that anti-hypertensive medications, including captopril, nifedipine, amlodipine and reserpine, were provided for only three days (Rumagit, Pojoh & Manampiring 2012). A study in a rural subdistrict in West Java province reported that only 11.5% of patients were currently taking anti-hypertensive medications and that almost all of them combined these medications with one or more traditional herbal medicines such as morinda, star fruit and cucumber (Basuki et al. 2004). However, this study did not describe the type of anti-hypertensive medications used or the reasons for taking traditional herbal medicines. A 1999 study reported Indonesian patients' reasons for visiting traditional healers to manage their hypertension: traditional medicine was cheaper than conventional medicines, they trusted the healer, and feared the side effects of medicines (Santoso, Prasodjo & Zalbawi 2001).

Despite the concerns about adherence to medication and the effectiveness of hypertension treatment, the published data exploring adherence to anti-hypertensive medication in Indonesia are scarce. A small study of 90 patients recruited from one urban CHC identified employment status, distance from community health centre, knowledge about hypertension treatment and patients' motivation to visit healthcare services as factors affecting adherence (Rasajati, Raharjo & Ningrum 2015). However, the convenience sampling method used in that study is a limitation. Moreover, there was no information about how adherence was defined or the method used to measure patient adherence and knowledge in that study (Rasajati, Raharjo & Ningrum 2015).

3.4.5 Hypertension programs in Indonesia

Nationally, management of hypertension is organised under the Directorate General of Non-Communicable Diseases Prevention and Control in the Ministry of Health. Consistent with the structural organisation of the Indonesian public healthcare system (Figure 3.1), the hypertension program is managed at the provincial, district, subdistrict and village levels. The CHC, as the centre of primary healthcare service, is responsible for screening for hypertension and the associated risk factors, providing adequate treatment for patients and providing health education and referrals to other healthcare services (Ministry of Health Republic of Indonesia 2013c). The current national guideline for the screening and

management of hypertension in Indonesian primary health care was launched and disseminated in 2013, replacing the 2006 version (Ministry of Health Republic of Indonesia 2013c). This Indonesian guideline includes the organisation of and strategies for hypertension management in the primary healthcare system and guidelines for surveillance, screening, treatment and evaluation of the hypertension program. The comprehensive and integrated management of community-based hypertension programs involves the following strategies: (i) encouraging and empowering communities to focus on hypertension prevention and control; (ii) improving the capability of health workers to assist in managing hypertension; (iii) enhancing patients access to care; and (iv) improving government support through budgeting and policy.

Chronic disease management program (*Prolanis*)

To encourage promotive and preventive programs in reducing cardiovascular events, a program called the ‘Chronic disease management program’ (*Program penatalaksanaan penyakit kronis (Prolanis)* for hypertension and/or diabetes mellitus was launched in 2014 (Badan Penyelenggara Jaminan Sosial 2015). This program is a part of a program covered by the national health insurance scheme, which aims to achieve universal health coverage for all Indonesians by 2019. The ultimate goal of this program is to reduce the proportion of cardiovascular events caused by hypertension or diabetes. *Prolanis* is an integrated chronic disease management program based on patient-centred care that requires the active roles of both patients and healthcare professionals. The CHCs and family doctors are the gatekeepers in the managed care of the *Prolanis* program in primary health care. The *Prolanis* program provides comprehensive approaches with a particular focus on health promotion and preventive care. Within this program, healthcare professionals play an important role as health educator (Badan Penyelenggara Jaminan Sosial 2015). A study of 40 patients with hypertension from four CHCs in Indonesia reported strong enthusiasm of patients about the *Prolanis* programs, which included educational counselling, medical consultation, short message service gateway, referral to specialists and home visits (Marchianti 2017). However, it has not been reported whether this program has had an impact on BP control or cardiovascular events.

Community health worker-based program

To increase the coverage of service, the Indonesian guideline for hypertension management explicitly cites the involvement of the community health worker-based program as part of the primary healthcare system (Ministry of Health Republic of Indonesia 2013c).

Community health workers are lay people, part of the community, who voluntarily provide services in their village (Rosenthal et al. 2010). The CHCs are responsible for recruiting and providing training and supervision for community health workers across the villages.

One of the existing community health worker-based programs in Indonesia is the Integrated Health Service Post for the Elderly (IHSP-Elderly/*Posyandu lansia*). The Indonesian Ministry of Health stated that, in 2010, there were more than 65,000 IHSP-Elderly across 79,075 villages in Indonesia (Ministry of Health Republic of Indonesia 2013a). This program was developed to improve the health status of older adults (aged 45 years or older) in the community by focusing on health promotion and disease prevention (National Committee for Elderly 2010). The IHSP-Elderly program is operated mainly by community health workers with support from village leaders and the CHC. The CHC is responsible for the supervision of the health services provided by the IHSP-Elderly program (Figure 3.1) as well as providing minor illness treatment and referral services through the mobile service unit (*Pusling*) (Ministry of Health Republic of Indonesia 2013c). Findings from the Indonesian Family Life Survey showed that the IHSP-Elderly program in Indonesia focuses mainly on risk factor screening (e.g. BP check) and treatment for minor illnesses. In rural areas, 97.2% IHSP-Elderly services conduct BP measurements, and in urban areas this percentage is 94.5%. However, a BP-measuring device was available in only 63.9% and 77.5% of rural and urban areas, respectively (Christiani et al. 2016).

Health services provided in the IHSP-Elderly include body weight and BP measurement, health education and home visits (Christiani et al. 2016). Additionally, the IHSP-Elderly can provide social services, physical activity sessions and other services for older people in their area (National Committee for Elderly 2010). The Indonesian National Committee for Elderly (2010) determined that health service for people who attend the IHSP-Elderly program will include these five-steps mechanisms:

- Step 1: Registration
- Step 2: Body weight measurements, BP check
- Step 3: Health examination and treatment for minor illness (including provision of medications). This service is performed only when there are healthcare professionals from CHC visiting the IHSP-Elderly program (i.e. mobile service unit).
- Step 4: Counselling and education
- Step 5: Social services (e.g. provision of healthy food)

Another community health worker-based program related to hypertension management is the Integrated Health Coaching Post for non-communicable diseases (IHCP-NCD/*Posbindu Penyakit Tidak Menular (Posbindu PTM)*). The *Posbindu PTM* is a form of public participation for the early detection and monitoring of risk factors for non-communicable diseases and targets people aged 15-80 years (Ministry of Health Republic of Indonesia 2012). The *Posbindu PTM* program can be integrated in the existing community-based health program (e.g. the IHSP-Elderly), clinics, education institutions, mosques, churches, sport clubs or other community groups. The CHCs are responsible for supervising the *Posbindu PTM* in their local areas in terms of training community health workers, providing public education and following up referral cases in the *Posbindu PTM*. Ideally, the activities in the *Posbindu PTM* are performed in five-steps as follows (Ministry of Health Republic of Indonesia 2012):

Step 1: Registration

Step 2: Anamnesis (taking clinical history)

Step 3: Anthropometric measurements (height, weight, Body Mass Index, waist circumference, and body fat analysis)

Step 4: BP check, blood test (glucose, total cholesterol, triglyceride), clinical breast examination, the peak expiratory flow rate test, Visual Acetic Acid Inspection, alcohol breath test, and amphetamine urine test

Step 5: Counselling, education and follow up

Posbindu PTM provides anthropometric measurements and BP checks for local people at least once every month. The other examinations are performed less often considering the type of tests and the presence of cardiovascular risk factors. For example, it is recommended that healthy people have their blood glucose tested once every three years, but those with diabetes mellitus should be tested every year. A pilot study in Indonesia showed that community-based interventions through the *Posbindu PTM* significantly increased the proportion of people having their BP checked (Krishnan et al. 2011). However, the effects of BP screening within *Posbindu PTM* on BP control and cardiovascular events are not known. The Indonesian government aims to have *Posbindu PTM* in 50% of villages across Indonesian provinces by 2019 (Ministry of Health Republic of Indonesia 2015b). However, only around 25% of villages had *Posbindu PTM* at the end of 2016, and only 60% of them were active. Astuti, Prasetyowati & Ariyanto (2016) reported poor implementation of the *Posbindu PTM* practical guidelines in Indonesian

CHCs because of the lack of human resources in CHCs (to supervise and conduct healthcare services), inadequate training for community health workers, limited equipment, lack of financial support for conducting *Posbindu PTM* monthly, and low awareness of people about *Posbindu PTM* activities. They also showed that hypertension is the most common risk factor found in people who attend the *Posbindu PTM* and are referred to a CHC (Astuti, Prasetyowati & Ariyanto 2016).

3.4.6 Chapter summary

This chapter provides the contextual background for this thesis research, including the poor treatment and control rate of hypertension in Indonesia, the complex challenges faced in rural Indonesian primary health care and the existing hypertension program in Indonesia. Although non-adherence to anti-hypertensive medication is widely considered as important to poor BP control, this chapter shows the lack of Indonesian data about the extent of non-adherence to anti-hypertensive medications and factors influencing adherence to these medications. The following chapter provides the aims, methods and conceptual framework of this thesis research.

Chapter 4:

Aims, methods and conceptual framework

4.1 Aims and objectives of this thesis

The studies in this thesis were conducted after consideration of several factors discussed in the preceding sections. These include the poor control rate of hypertension in Indonesia (Section 3.4); the fact that hypertension is a modifiable risk factor for stroke, which is the leading cause of death in Indonesia (Section 3.4); the evidence that non-adherence to medication is a key factor in the suboptimal treatment of hypertension (Section 2.1); the complexity of problems faced in rural Indonesia primary health care (Section 3.2); and the lack of published data about adherence to anti-hypertensive medication among Indonesian people living in rural areas (Section 3.4).

The proportion of Indonesian patients who have their blood pressure (BP) adequately treated is extremely low. Indonesian data has reported that most patients with hypertension have not achieved their BP target (Hussain et al. 2016b; Sohn 2015). Despite the lower treatment rate among people in rural areas compared with those living in urban areas (Aizawa & Helble 2016), there are few data about the use of anti-hypertensive medications among these rural people and the factors that influence the poor adherence to these medications. Understanding these factors and identifying the key challenges faced by rural communities will help in the development of tailored support strategies for patients. The overall aim of this thesis research was to explore adherence to anti-hypertensive medication among Indonesian people with hypertension living in a rural community and how they might be better supported. Three main objectives were as follows:

1. To explore self-reported use of anti-hypertensive medications and the extent of non-adherence to these medications among Indonesian rural communities.
2. To identify factors affecting poor adherence to anti-hypertensive medications from the patients' perspectives.
3. To identify challenges to, and strategies for, supporting Indonesian rural communities in improving adherence to hypertension treatment and optimising BP control.

4.2 Methods used in this thesis research

To achieve these objectives, a mixed-method design was chosen for this thesis research. Generally, combining quantitative and qualitative studies can optimise the strengths as well as overcome the limitation of each type of study (Bergman 2008; Creswell 2013). Creswell (2013) states that the mixed-method approach is an appropriate strategy for obtaining complete understanding of the topics under study, such as the support needed by a targeted population. Previously, Denscombe (2008) and (Onwuegbuzie & Leech 2005) also stated that the mixing methods is good practice and epistemologically coherent in terms of data, design and analysis.

The first phase of this thesis research was an initial qualitative data collection and analysis. The findings from the initial study were used to identify the important variables to be explored in the second phase of research. To obtain first-hand information from patients living in rural areas, the initial study also attempted to provide insights into the best method for reaching patients in such areas. According to Creswell, the samples used in the first and second phases should not be the same people but should be derived from the same population (Creswell 2013).

The second phase of the study used a convergent parallel mixed method approach, the most familiar type of mixed-method strategy. Both quantitative and qualitative data were collected and analysed separately. Using a nested sampling method (Creswell 2013), some respondents in the quantitative study were selected to provide extensive information in a qualitative study. The findings of both the qualitative and quantitative studies were subsequently compared and converged to determine the key findings of the research. This process was performed using a side-by-side approach that presents each finding with the supporting data from the studies (Creswell 2013).

The findings from the first and second phases were subsequently used to develop a tailored intervention, as a means of achieving the final objectives of this thesis research to support Indonesian rural communities in improving adherence to hypertension treatment and optimising BP control. The type of study (quantitative or qualitative) was determined based on the objectives of the intervention and the feasibility of conducting a study within this thesis research. In this thesis research, a qualitative study was chosen to canvas feedback on the written resource for patients developed in the final phase.

4.3 Conceptual framework

To study further the suboptimal hypertension management among rural people in Indonesia (Section 3.4), this thesis research investigated adherence among these people and the support needed by the patients. The extent of poor adherence and the factors influencing adherence needed to be explored first to inform later studies to identify how patients should be supported.

Factors influencing adherence to medication are complex, and both the patients' understanding and environmental factors beyond the control of patients affect adherence (Berben et al. 2012; Bronfenbrenner 1977). A conceptual framework from the World Health Organization acknowledges that adherence is determined by the interplay of five factors: (i) socio-economic; (ii) healthcare system-related; (iii) clinical-related; (iv) therapy-related; and (v) patient-related (Sabate 2003).

‘The effective ways to help people follow medical treatments could have far larger effects on health than any treatment itself’ (Haynes et al. 2008). Adherence to long-term medication is a part of the patients' task in self-managing their high BP, but patients often have their own understanding, which might differ from that of healthcare providers (Sidorkiewicz et al. 2016). Patient-related factors continue to be the main focus of studies examining adherence to medication (Sabate 2003), which suggests that comprehensive consideration of these factors is needed for designing and implementing tailored interventions. In Indonesia, despite the awareness about the suboptimal control of hypertension, studies exploring factors that influence adherence to anti-hypertensive medication are limited. The extent of the non-adherence problem has not been reported yet (Aizawa & Helble 2016). In addition, despite the common use of traditional medicines among Indonesian patients, the effect of the use of traditional medicines on adherence to anti-hypertensive medication is not well documented (Basuki et al. 2004). In this thesis research, exploring the patient-related factors that enable and hinder adherence to anti-hypertensive medication included collecting information about patients' knowledge of hypertension, patients' perspective about the use of anti-hypertensive medications (including reasons why they chose not to take medications), and patients' report of their use of traditional medicines for lowering BP.

The healthcare system must provide the environment required to support patients, which includes continuity of care, access to medicines, communication between healthcare providers and patients, and collaborative healthcare teams (Sabate 2003). However,

information about how patients in rural areas obtain their anti-hypertensive medications is lacking. Involving community health workers as being a part of the healthcare team might help patients in rural settings where access to healthcare services is limited. Although Indonesia has established some community health worker-based programs, deeper understanding of their potential use in hypertension management might provide insights for the development of strategies for assisting rural populations.

Figure 4.1 shows that this thesis research focuses on patient-related factors (e.g. the patient's perspective on the use of hypertension medication) and healthcare system-related factors (e.g. access to anti-hypertensive medications). Some socio-demographic variables (e.g. level of education) were also included as determinants of adherence to anti-hypertensive medications in the current thesis. This thesis research focused on two of five factors affecting medication adherence by considering the evidence from previous studies about suboptimal hypertension management in rural Indonesia, as described in the previous paragraphs. Time and resource limitations were also considered to determine the form of support for rural Indonesian patients proposed within this thesis research.

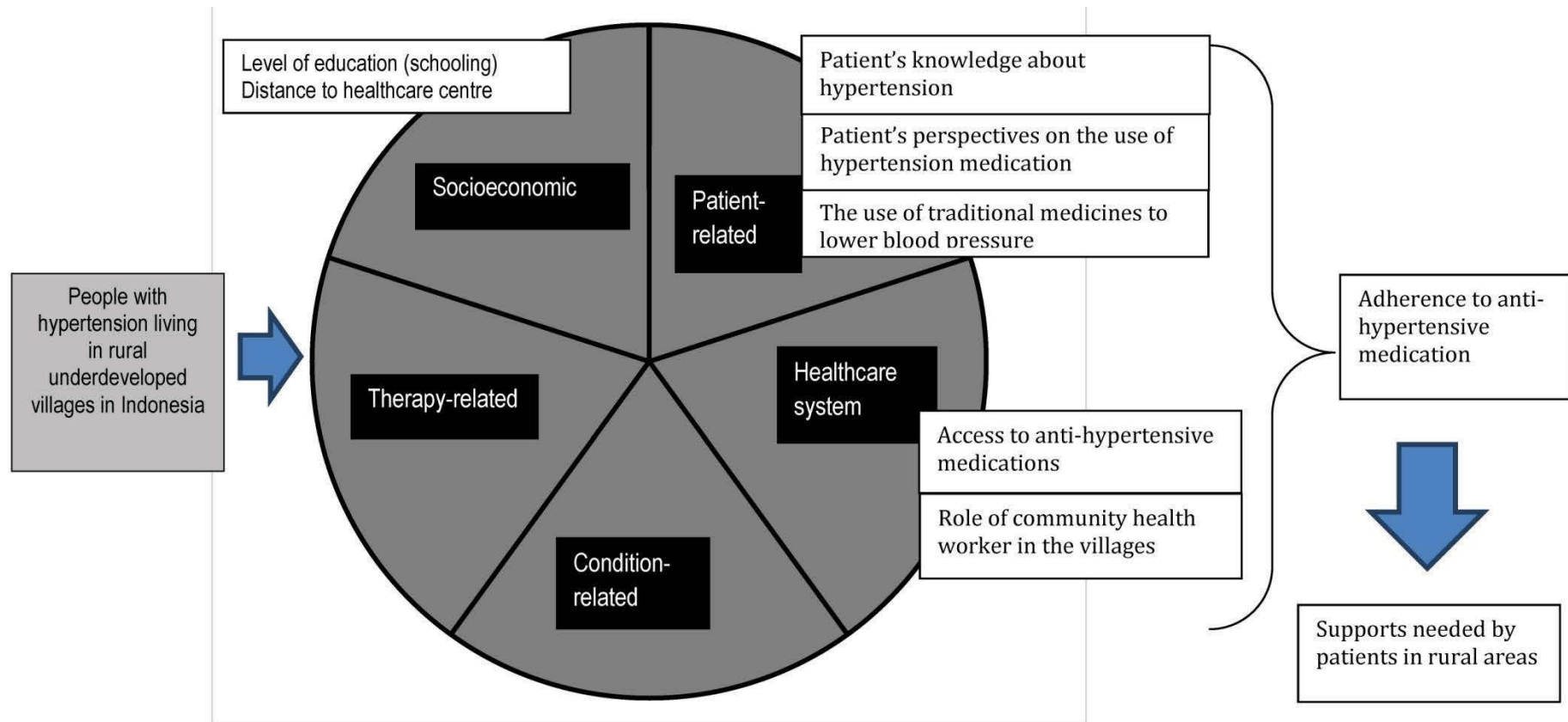


Figure 4.1 Conceptual framework for exploring adherence to anti-hypertensive medications among people in Indonesian rural communities (adapted from the WHO model, 2003)

Chapter 5:

Medication-taking practices of Indonesian rural patients with hypertension

5.1 Access to medicines for hypertension: A survey in rural Yogyakarta province, Indonesia

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Abstract

Background: Obtaining an adequate supply of medicines is an important step in facilitating medication adherence. This study aimed to determine: (i) how people with hypertension in rural villages in Indonesia obtain their supply of anti-hypertensive medications; (ii) type of hypertension medication taken; and (iii) the factors associated with where and how people obtain their medicines supplies.

Method: Data pertaining to people with hypertension (aged ≥ 45 years) were collected from eight rural villages in the Bantul district, Yogyakarta province, Indonesia, using a researcher-administered questionnaire.

Results: Of 384 participants, 203 (52.9%) obtained anti-hypertensive medications from public or private healthcare services. The most common way was by purchasing these medicines without prescription in community pharmacies (n=64, 17%). The medicines obtained this way included captopril, amlodipine, nifedipine, and bisoprolol. One-hundred-nineteen (15%) participants obtained their medicines at no cost by visiting public healthcare services such as community health centres (n=51), the Integrated Health Service Post for the Elderly (n=53), and the public hospital (n=15). Direct dispensing from clinicians was reported by participants who visited a doctor (n=15), midwife (n=23) or nurse (n=21). Having an adequate medication supply (i.e. for an entire 30 days) was reported by 40 (10.4%) participants, who obtained the medication from a community health centre (n=18), public hospital (n=4), community pharmacy (n=5), private hospital (n=2), or multiple sources (n=11). A higher formal educational level was associated with obtaining medicines

from multiple sources rather than from the public or private provider only. Living near a community health centre and having government-insurance were associated with obtaining medicines from the public health service. Age, gender, employment status, presence of other chronic diseases, and knowledge about hypertension were not significantly associated with how participants obtained their medications.

Conclusion: These Indonesian participants obtained their anti-hypertensive medications from various sources; however, the inadequate supplies found in this study could compromise both short and long-term management of hypertension. Direct dispensing, non-doctor prescribing, and self-medication with anti-hypertensive medications indicate the reality of the current complex health care system in Indonesia. Further, this study shows some of the challenges involved in managing out patients with chronic diseases like hypertension in resource-poor settings. It provides important findings for quality improvement practices that should be considered to improve the health lifespan in populous countries such as Indonesia.

Keywords: hypertension; anti-hypertensive agents; community pharmacy; self-medication; direct dispensing

5.1.1 Introduction

Hypertension accounts for at least 12% of total deaths and 3.8% of disability-adjusted life years worldwide (World Health Organization 2009a). Globally, more than one billion people have hypertension, and only 13% of these have their high blood pressure under control (Chow et al. 2013). In Indonesia, the fourth largest population in the world, the prevalence of hypertension among those older than 45 years is more than 50% (Ministry of Health Republic of Indonesia 2013d). Given that high blood pressure is a significant risk factor for stroke, renal failure, heart attack and other cardiovascular events which can cause permanent disability and death (World Health Organization 2013a), optimal hypertension management is very important. In Indonesia, stroke is the leading cause of death and accounted for 15.4% of all deaths in 2007 (Ministry of Health Republic of Indonesia 2008).

Hypertension management requires the use of anti-hypertensive medications and modification of lifestyle factors (James et al. 2014). Long-term medication is usually needed to achieve blood pressure targets; and having access to an adequate supply of medicine is an essential step to facilitating medication adherence. However, the availability and affordability of medicines remains a big challenge in developing countries. A study

conducted in an Indonesian community health centre (CHC) reported that there are limited supplies of anti-hypertensive medications (Wulandari, Perwitasari & Hidayati 2010); provision for three days of medication supply is made available to each patient at a follow-up consultation in the CHC (Rumagit, Pojoh & Manampiring 2012).

Generally, people in Indonesia have several sources of medicine supply (Figure 5.1). In addition to CHCs (a public sector provider), Indonesian people also widely utilise private sector providers (e.g. village doctors) to access health care services and medication (Hong et al. 2009). Alongside the growth in the number of community pharmacies in Indonesia, self-medication practices are also increasing (Hong et al. 2009). Although hypertension is a common condition among Indonesian people (Ministry of Health Republic of Indonesia 2013), data regarding how people actually obtain their anti-hypertensive medications is scarce. This study, therefore, aimed to explore how and where people in rural villages in Indonesia obtain their supplies of anti-hypertensive medications. This study also reports the types of medicines obtained, and factors associated with obtaining anti-hypertensive medications from key sources of supply.

5.1.2 Methods

Study design and setting

A cross-sectional study using a researcher-administered questionnaire was conducted in August–November 2015 in eight rural villages in the Bantul District, Yogyakarta Province, Indonesia.

Participant Recruitment

The villages included in this study were selected based on data from the Bantul District government regarding underdeveloped villages in the district (Bantul District Government 2013). All rural underdeveloped villages in the Bantul district were selected. The minimum sample size per village was proportionally calculated based on the number of people aged 45 years or older in these villages. The study population and sample are described in Figure 5.1.

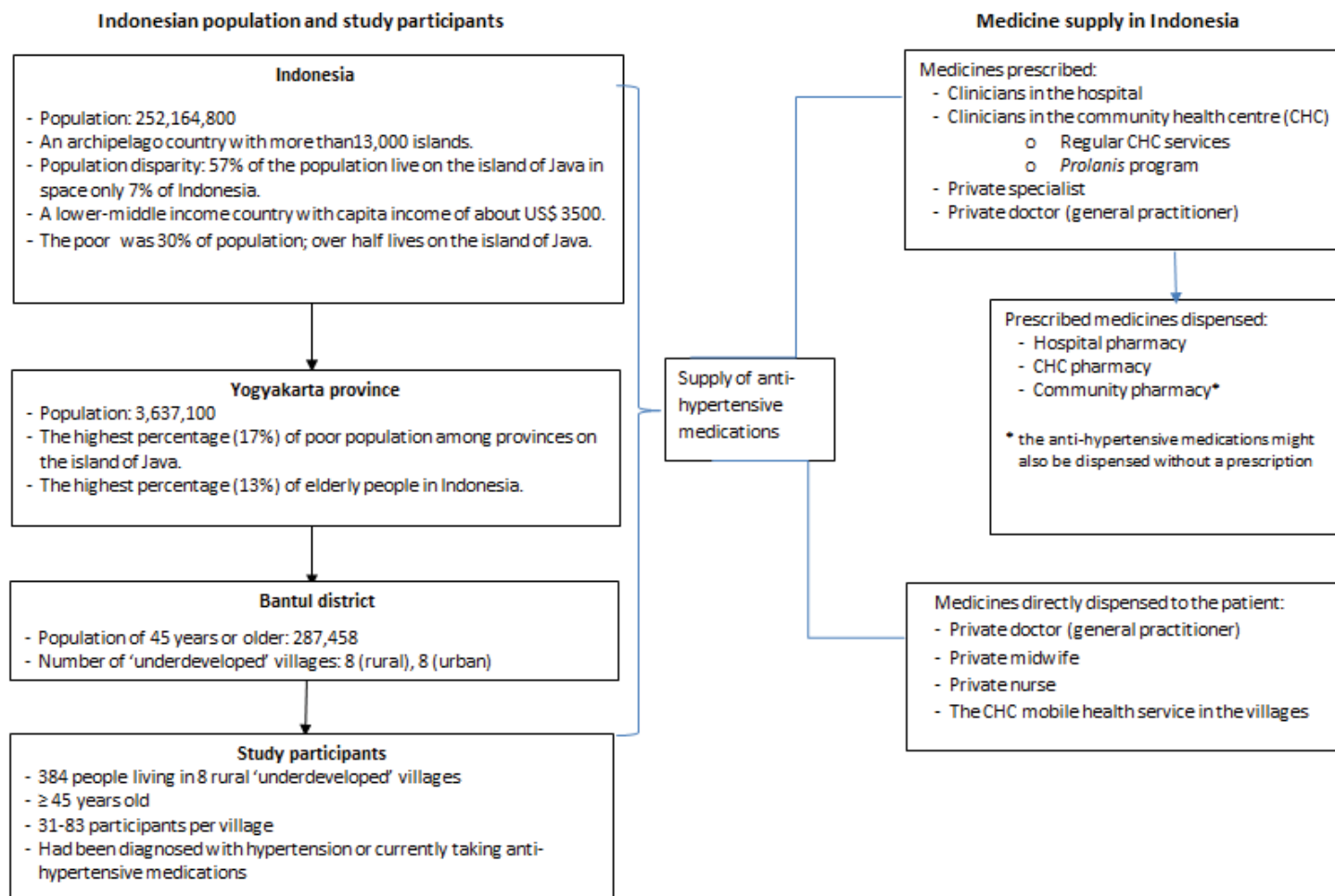


Figure 5.1 Sampling frame and context for study

People were eligible for inclusion if they were villagers, aged 45 years or older, and had been diagnosed with hypertension by a healthcare professional or were currently taking medications for hypertension. Patients with cognitive impairment or severe hearing loss were excluded.

Participants were identified and contacted with the assistance of community (lay) health workers (CHWs). The CHWs distributed an invitational letter to the members of a community-based program, namely Integrated Health Service Post for the Elderly (IHSP-Elderly). People who attended a mobile health service in the village (conducted by a local hospital) were also invited to participate. Purpose-sampling was used to identify potential participants who fulfilled the inclusion criteria; therefore, gender representativeness was not determined before the study. Expressions of interests were collected by CHWs on behalf of the researchers. The CHWs served as the initial conduits of information between the participants and the researcher. Eligible participants were recruited until a sample size was attained.

The sample size for this study was calculated based on the point estimate of effect, defined as the proportion of patients with hypertension expected to be on anti-hypertensive medications in Indonesia, that is, 63% (Setiati & Sutrisna 2005). Using the 95% confidence interval and 5% precision, 359 participants were required for this descriptive study.

Data collection

Using a researcher-administered questionnaire, the first author (who is Indonesian) conducted the interviews in each participant's home (or other convenient location at the participant's request). Each interview took 15–30 minutes to complete. The questionnaire was translated into Bahasa Indonesia and included questions about socio-demographics (e.g. age, level of education, current occupation), history of hypertension (e.g. years since diagnosis, place of diagnosis), the use of hypertension medications (Table 5.1), and the participant's knowledge about hypertension. The short form of the International Physical Activity Questionnaire was used to guide questions regarding participants' physical activity (Craig et al. 2003). Based on the metabolic equivalent of task (MET)-minutes/week, level of physical activity was categorised into inactive (<600 MET-minutes/week), minimally active (600-3000 MET-minutes/week) and active (>3000 MET-minutes/week) (International Physical Activity Questionnaire Scientific Group 2004). Information about the types and names of anti-hypertensive medications was verified from the blister pack (medicine packaging) if the participant had this available during the interview. A

standardised instrument from previous studies was used to assess hypertension knowledge (Li et al. 2013; Sanne et al. 2008; Williams et al. 1998). It comprised 10 questions with a score of 1 for each correct response. Good knowledge was defined as a score of 8 or more.

Table 5.1 Questions for participants to explore access to medicines for hypertension in rural Indonesia

- | |
|--|
| <p>1. Use of anti-hypertensive medications</p> <ul style="list-style-type: none"> a. When did you last take anti-hypertensive medications? b. Have you taken anti-hypertensive medications during the preceding 30 days? c. What are the names of those medications? d. How long did you take those medications (duration)? e. How often did you take those medications (frequencies)? f. Where did you obtain those medications? g. Approximately how much money did you spend on purchasing those medications in the preceding 30 days? <p>2. Information about anti-hypertensive medications</p> <ul style="list-style-type: none"> a. Who mostly gave you information about your medications for hypertension? b. What types of information are usually provided? <p>3. Self-medication with anti-hypertensive medications*</p> <ul style="list-style-type: none"> a. Who purchased those medications? b. What were your reasons for purchasing blood pressure medications without prescription? c. What types of questions were asked by the pharmacy staff when you purchase medications for blood pressure? d. Did the pharmacy staff advise you to consult a doctor? |
|--|

* The questions was asked to patients who obtained their anti-hypertensive medications from community pharmacy within the preceding 30 days.

Data analysis

The Statistical Package for the Social Sciences (SPSS 23.0.0, IBM Corp) was used for data entry and analysis. Descriptive statistics are presented to characterise the study participants. Chi-square test was used to compare categorical data between groups, while Kruskal-Wallis test was applied to continuous data. The Fisher's exact test was used only when more than 20% of expected frequencies were less than 5. A p value of <0.05 was considered statistically significant. The significance values were adjusted using the Bonferroni correction for multiple analyses.

Ethical approval

Approval to conduct this study was obtained from the Human Research Ethics Committee, University of Technology Sydney (Ref. no. 2014000647). Approval from the Bantul district office was also granted (Ref. no. 070/Reg/0558/S3/2015).

5.1.3 Results

Characteristics of participants

Three-hundred and eighty-four participants completed the survey (Table 5.2). As per the study criteria, all participants were 45 years or older; their mean age was 65.7 ± 10.3 years (range 45–90 years). Most of the participants were female (75%). The vast majority had a low level of education: only 29 (7.6%) had completed at least high school. About one-third (32.6%) were unemployed, and farmers predominated (73.4%) among the employed participants. Most participants (61.2%) were physically active (61.2%), while 28.1% and 10.7% were minimally active and inactive, respectively. Almost all ($n=349$, 90.9%) had health insurance, and 339 (88.3%) were recipients of government healthcare insurance for poor people (Harimurti et al. 2013).

Diagnosis of hypertension

As self-reported by participants, the average time since diagnosis of hypertension was 3.9 ± 3.9 years (range 0.5–30 years). Table 5.2 shows that a half of the 384 participants ($n=196$, 51%) were diagnosed by the CHC staff, followed by private clinicians ($n=110$, 28.7%) and hospital staff ($n=78$, 20.3%).

Source of anti-hypertensive medication supply and associated factors

Responses to the question, ‘Where did you obtain your anti-hypertensive medications within the previous 30 days?’ were collected from 203 participants who reportedly took at least some quantity of hypertension medication during the period. Participants were categorised into three groups (Table 5.3) based on where they obtained their medicines: public sector only, private sector only, or multiple sources. Almost half ($n=97$) had obtained their medicines solely from the public sector (CHC, IHSP-Elderly, public hospital) while 61 (30%) participants obtained them solely from the private health sector such as a private hospital, community pharmacy (CP), or private practice (doctor, midwife, or nurse). Other participants ($n=45$, 22%) reported multiple sources of medicines, e.g. from a CP and a CHC (Figure 5.2).

Table 5.2 Characteristics of participants (n=384)

Age in years	
Mean $\pm$ SD	65.7 + 10.3
Median (IQR)	65.0 (17)
Absolute range	45-90
Gender, n (column %)	
Female	288 (75.0)
Education level, n (column %)	
Less than elementary school	246 (64.1)
Elementary school	109 (28.4)
High school or higher	29 (7.6)
Occupation, n (column %)	
Employed	259 (67.4)
Health insurance holder, n (column %)	
Yes	349 (90.9)
Distance from the nearest CHC	
Mean $\pm$ SD	4.1 + 2.3
Median (IQR)	3.5 (3.5)
Absolute range	0.4 – 10
Physical activity ^a, n (column %)	
Inactive, <600 MET-minutes/week	41 (10.7)
Minimally active, 600-3000 MET-minutes/week	108 (28.1)
Active, >3000 MET minutes/week	235 (61.2)
Years since diagnosis	
Mean $\pm$ SD	3.9 + 3.9
Range (minimum – maximum)	0.5 – 30
Presence of other chronic diseases^c, n (column %)	
Yes	249 (64.8)
Place of diagnosis, n (column %)	
CHC	116 (30.2)
IHSP-Elderly	80 (20.8)
Hospital	78 (20.3)
Sole private practice (doctor)	60 (15.6)
Sole private practice (midwife)	21 (5.5)
Sole private practice (nurse)	29 (7.6)
Hypertension knowledge^d, mean $\pm$ SD	
Range (minimum – maximum)	5.0 $\pm$ 2.2 0 – 10

Abbreviations: SD = standard deviation, n = number, IQR = Inter Quartile Range, CHC = community health centre, MET = Metabolic equivalent of task

- a MET minutes/week was calculated based on International Physical Activity Questionnaire protocol (International Physical Activity Questionnaire Scientific Group 2004).
- b Chronic diseases included diagnosed cardiovascular disease, dyslipidaemia, diabetes, chronic back pain, arthritis, neurological disorder including stroke, lung disease, renal disease, cancer, allergy and depression.
- c Assessment of hypertension knowledge was adapted from previous studies (Li et al. 2013; Sanne et al. 2008; Williams et al. 1998).

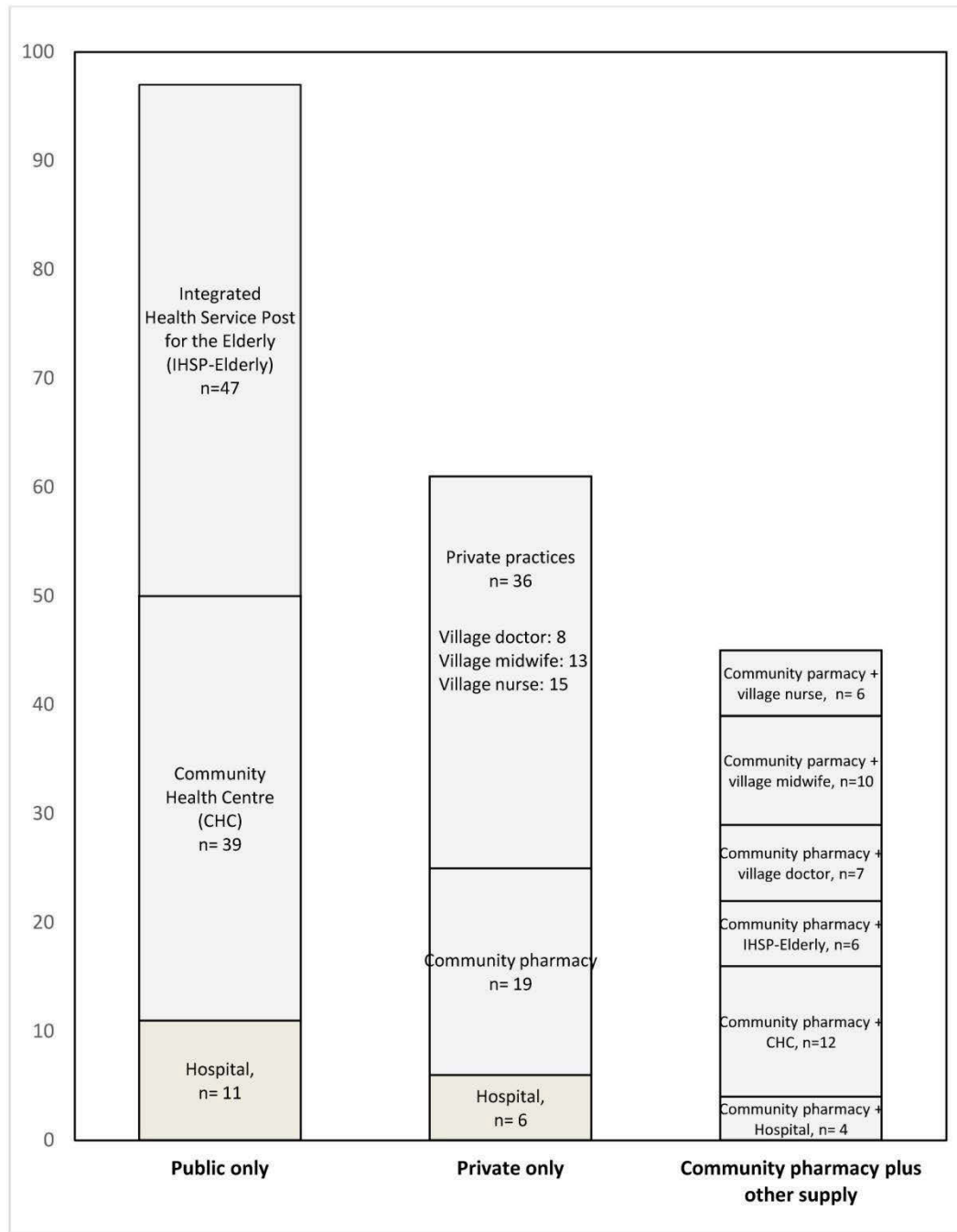


Figure 5.2 Self-reported source of anti-hypertension medication supply (n=203)

Overall, participants within the three ‘sources’ groups differed significantly in terms of educational level ($p<0.01$), distance from the nearest CHC ($p<0.01$), medical insurance status ($p=0.01$), physical activity ($p<0.01$), and years since diagnosis ($p=0.04$) (Table 5.3). There were no significant differences across the groups in age, gender, employment status, presence of other chronic diseases, or hypertension knowledge (Table 5.3). Applying the Bonferroni correction for multiple tests showed that participants in the ‘multiple sources’

group had a higher education level than those in ‘public only’ or ‘private only’ groups. Participants in the ‘public only’ group lived a shorter distance from the CHC than those in the ‘private only’ group. Participants in the ‘multiple-sources’ group have been diagnosed with hypertension for a longer period of time than those in the other two groups, however, the differences between groups were not significant. A higher percentage of participants had medical insurance in the ‘public only’ group than in the ‘private only’ group or ‘multiple-sources’ group. The percentage of patients with low level of physical activity was higher in the ‘private only’ group than in the ‘public only’ or ‘multiple sources’ groups.

Anti-hypertensive medications were obtained most frequently (32%) from a CP, followed by IHSP-Elderly (26%), CHC (25%), village midwife (11%), village nurse (10%), hospital (10%), and village doctor (7%). Participants obtained their anti-hypertensive medications in three major ways: (i) purchasing them from the CP (self-medication); (ii) obtaining the medicines directly from the clinicians (direct-dispensing); and (iii) obtaining them freely from public healthcare services.

Purchasing anti-hypertensive medications from the community pharmacy

Instead of obtaining medicines on prescription, 64 (31.5%) participants obtained their anti-hypertensive medications over-the-counter from the CP, by simply mentioning its name, showing the tablet packaging, or asking for suggestions from the CP staff.

The most common reason for purchasing medicines without a prescription was the desire to continue the medication previously obtained from the clinician (n=40, 67.5%). Five participants (8.3%) claimed to have disclosed this practice to a doctor, midwife, or nurse, and gained their approval. A further, eight participants (12.5%) reported that CP staff recommended to them the type of anti-hypertensive medications (Table 5.4). These eight participants had previously been diagnosed with hypertension by a clinician (doctor, midwife, or nurse); none of them had their hypertension diagnosed by a CP staff. Of the 64 participants, 39 (60.9%) preferred to obtain medicines from a CP because it had more flexible opening hours and shorter queuing times compared with public healthcare services (e.g. CHC or IHSP-Elderly). Twenty-four participants mentioned avoidance of doctors’ consultation fees as a reason for by-passing appointments to obtain a prescription or supply from their clinician, and they instead purchased over-the-counter anti-hypertensive medications.

Table 5.3 Source of anti-hypertensive medication supply (self-reported) within preceding 30 days

	Source of medicine supply – n=203			Overall p value	Value** (df)
	Public sector only n=97	Private sector only n=61	Multiple sources ^a n=45		
Age, in years					
Mean ± SD	65.7 + 9.6	65.1 ± 11.4	61.8 + 10.1	0.06	N/A
Gender, n (column %)					
Male	26 (42.6)	22 (36.1)	13 (21.3)	0.34	1.57 (2)
Female	71 (50.0)	39 (27.5)	32 (22.5)		
Education level, n (column %)					
Less than elementary school	60 (54.1)	36 (32.4)	15 (13.5)	<0.01*	10.75 (2)
Elementary school or higher	37 (40.2)	25 (27.2)	30 (32.6)		
Occupation, n (column %)					
Employed	71 (51.1)	37 (26.6)	31 (22.3)	0.25	2.73 (2)
Unemployed	26 (40.6)	24 (37.5)	14 (21.9)		
Distance from the nearest					
Mean ± SD	3.2 + 1.9	4.4 + 2.3	4.1 + 2.7	<0.01*	N/A
Health insurance holder, n (column %)					
Yes	94 (51.4)	51 (27.9)	38 (20.8)	0.01*	9.58 (2)
No	3 (15.0)	10 (50.0)	7 (35.0)		

	Source of medicine supply – n=203			Overall p value	Value** (df)
	Public sector only n=97	Private sector only n=61	Multiple sources ^a n=45		
Physical activity^b, n (column %)					
Inactive, <600 MET-minutes/week	5 (22.7)	13 (59.1)	4 (18.2)	<0.01*	14.80 (4)
Minimally active, 600-3000 MET-minutes/week	38 (61.3)	14 (22.6)	10 (16.1)		
Active, >3000 MET minutes/week	54 (45.4)	34 (28.6)	31 (26.1)		
Years since diagnosis					
Mean ± SD	4.0 + 3.2	3.6 + 3.8	5.6 + 6.1	0.04*	N/A
Presence of other chronic diseases^c, n (column %)					
Yes	59 (43.4)	44 (32.4)	33 (24.3)	0.20	3.22 (2)
No	38 (56.7)	17 (25.4)	12 (17.9)		
Hypertension knowledge^d, n (column %)					
Low, score <8	76 (46.9)	52 (32.1)	34 (21.0)	0.40	1.75 (2)
High, score ≥8	21 (51.2)	9 (22.0)	11 (26.8)		

* Variables displaying a significant difference (p<0.05). The significance values were adjusted using the Bonferroni correction for multiple analyses.

** Chi-square (X²) values (for categorical data)

Abbreviations: SD = standard deviation, n = number, Df = degrees of freedom, N/A = not available, CHC = community health centre, MET = Metabolic equivalent of task

a Participants obtained medicines from community pharmacy plus other sources.

b MET minutes/week was calculated based on International Physical Activity Questionnaire protocol (International Physical Activity Questionnaire Scientific Group 2004).

c Chronic diseases included health practitioner diagnosed cardiovascular disease, dyslipidaemia, diabetes, chronic back pain, arthritis, neurological disorder including stroke, lung disease, renal disease, cancer, allergy and depression.

d Assessment of hypertension knowledge was adapted from previous studies (Li et al. 2013; Sanne et al. 2008; Williams et al. 1998).

Interestingly, 39 of 64 participants (61%) did not personally attend a CP within the preceding 30 days, but rather had a family member (usually a son or daughter) purchase the anti-hypertensive medications on their behalf (Table 5.4). Twenty-four participants reported that they had never personally attended the CP to purchase their anti-hypertensive medications. Therefore, only 40 of 64 (62.5%) participants were able to provide information about the type of questions posed by CP staff at the point of purchasing medications. Of these 40 participants, 26 (65%) recalled being asked by CP staff ‘Who is the medicine for?’ Other questions asked included the patient’s age (n=17, 42.5%), information about previous medicine used (35%), last blood pressure reading (27.5%), other medications taken (17.5%), and other medical conditions (10.9%). Only four participants (10%) claimed that they were advised by CP staff to consult a doctor. Ten participants (25%) reported that they simply purchased anti-hypertensive medications without any questions from CP staff (Table 5.4). It is important to note that none of the participants could recall whether a pharmacist or pharmacy technician had served them in the pharmacy.

Obtaining medicines directly from clinicians (direct-dispensing)

Fifty-nine participants (29%) reportedly received their anti-hypertensive medications directly from their clinicians, that is, direct dispensing from a doctor (n=15), midwife (n=23), or nurse (n=21). The clinicians did not write prescriptions but instead dispensed medications in the consultation room, and charged patients a fee for the consultation and medications. Participants reported spending 3-5 Australian dollar (A\$) for each visit to a private practice. The total cost paid to a village doctor was higher than that to a midwife or nurse (Table 5.5). To provide a comparison, the monthly minimum wage for people in the Bantul district in 2017 was A\$145 or an hourly rate of about A\$0.7.

The participants cited clinical symptoms (severe headache, dizziness, light-headedness, and blurred vision) as hypertension-related symptoms that were reasons for visiting a private practice. Participants who preferred to obtain their medications from a private practice rather than from other healthcare providers cited their reasons as having an established relationship with the clinicians, experiencing satisfactory services, and believing that treatment in a private practice was better than in public facilities (e.g. CHC).

Table 5.4 Features of the practice of purchasing anti-hypertensive medications (without prescription) in Indonesian community pharmacies

Items	Number (%)
Response to the question ‘Who purchased the medicines?’, N=64	
<i>The participant, n (%)</i>	25 (39)
<i>Family member, n (%)</i>	39 (61)
• Son/daughter	32
• Grandson/granddaughter	3
• Spouse	2
• Nephew/niece	2
Reasons for self-medication*, N=64 (participants could provide more than one reason)	
<i>Easy access/transportation</i>	7 (10.9)
<i>Preferring ‘better’ medicine</i>	4 (6.25)
<i>To refill medications previously prescribed by/provided from doctor/midwife/nurse</i>	40 (62.5)
<i>To refill medications previously recommended by pharmacies staff</i>	8 (12.5)
<i>Saving money (no need to pay fee for service)</i>	24 (37.5)
<i>Saving time (shorter waiting time, longer opening hours)</i>	39 (60.9)
<i>No personal reason - they never purchase medication in community pharmacy by themselves, rely on advice/initiative of family member</i>	24 (37.5)
Questions posed to patient by pharmacy staff at time of medicines purchase (according to patients’ recall of events), N=40	
<i>Who is it for?</i>	26 (65)
<i>What was the last blood pressure?</i>	11 (27.5)
<i>Patient age?</i>	17 (42.5)
<i>History of hypertension?</i>	2 (5)
<i>Any previous anti-hypertensive medication taken?</i>	14 (35)
<i>Any other medical condition?</i>	7 (10.9)
<i>Any other medications taken?</i>	7 (17.5)
<i>No question</i>	10 (25.0)

*Self-medication is defined as purchasing anti-hypertensive medications without any prescription

Obtaining a free supply of medicines from public healthcare services

More than half of the treated participants (119/203, 58.6%) obtained their medicines at no cost by visiting public healthcare services such as the IHSP-Elderly (n=53), CHC (n=51), or public hospital (n=15). In the IHSP-Elderly, healthcare services were performed by the CHC health staff (midwife or nurse). The frequency of these services offered in the villages ranged from once a month to once every three months.

Table 5.5 Participants' use of anti-hypertension medicine across the various sources of supply

	TOTAL (n=203)	Source of supply within preceding 30 days									
		CHC (n=25)	CHC (Prolanis) (n=14)	IHSP- Elderly (n=47)	Public hospital (n=11)	CP (n=19)	Private hospital (n=6)	Village doctor (n=8)	Village midwife (n=13)	Village nurse (n=15)	Multiple sources (CP plus) (n=45)
Name of medication, n (column %)											
Monotherapy: captopril	109 (53.7)	13 (52.0)	3 (21.4)	30 (63.8)	2 (18.2)	12 (63.2)	3 (50)	2 (25.0)	5 (38.5)	7 (46.7)	32 (72.7)
Monotherapy: amlodipine, nifedipine, valsartan, candesartan, or telmisartan	29 (14.3)	3 (12.0)	6 (42.9)	2 (4.3)	4 (36.4)	4(21.1)	0	1 (12.5)	0	1 (6.7)	8 (18.1)
Combination	18 (8.9)	4 (16.0)	5 (35.7)	1(2.1)	3 (27.3)	2 (10.5)		0	0	1 (6.7)	2 (4.5)
Not known	47 (23.1)	5 (20)	0	14 (29.8)	2 (18.2)	1(5.3)	3 (50)	5 (62.5)	8 (61.5)	6 (40)	3 (4.5)
Total duration of medicine use over 30 days, n(column %)											
Less than one week (7 days)	88 (43.3)	9 (36.0)	0	43 (91.5)	2 (18.2)	5(26.3)	2 (33.3)	7 (87.5)	10 (76.9)	10 (66.7)	0
1 – 4 weeks (7 – 30 days)	75 (36.9)	12 (48.0)	0	4 (8.5)	5 (45.5)	9(47.4)	2 (33.3)	1 (12.5)	3 (23.1)	5 (33.3)	34 (68.2)
In a whole month (30 days)	40 (19.7)	4 (16.0)	14 (100)	0	4 (36.4)	5(26.3)	2 (33.3)	0	0	0	11 (25.0)
Cost paid by patients for their anti-hypertensive medicine supply (including fee of service) in IDR											
Average cost	NA	0	0	0	0	17,823	87,500	50,000	30,384	33,928	38,486
SD						18,665	75,812 ^a	5,345 a	8,529 ^a	9,025a	27,516 ^a
^a The cost paid by patients were included fee for service and other medications provided by health care professionals (the cost could not be extracted for anti-hypertensive medicines only) n= number, CHC= community health centre, CHC(Prolanis)=Chronic management program in CHC, IHSP-Elderly= Integrated Health Service Post for Elderly, CP= community pharmacy, CP plus= community pharmacy plus other source of supplies, IDR= Indonesian Rupiah (1 IDR=0.0001AUD)											

Among those participants who obtained their medicine supply from a CHC, 14 noted that they had joined a comprehensive program to manage chronic diseases in a primary health care setting, namely *Prolanis*, in the one to two months before the interview. Members of the *Prolanis* program were scheduled for monthly review at the CHC to have their blood pressure checked and managed. This program implementation was covered by the national health insurance scheme (Badan Penyelenggara Jaminan Sosial 2015). Participants who joined this program were funded mainly by the government-based insurance for poor people.

Type of medicines taken

Of 203 participants, 138 (68%) reported taking only one type of anti-hypertensive medications (monotherapy). The angiotensin-converting enzyme inhibitor (ACE inhibitor) captopril was most frequently taken (53.7%), followed by calcium channel blockers (amlodipine, nifedipine). Eighteen participants (8.9%) took a combination of anti-hypertensive medications including ACE inhibitor plus calcium channel blocker (n=14), calcium channel blocker plus angiotensin II receptor antagonist (n=2), calcium channel blocker plus beta-blocker (n=1), or ACE inhibitor plus beta-blocker (n=1).

Participants purchased captopril, amlodipine, nifedipine, or bisoprolol without prescriptions in CPs. Five participants who took angiotensin II receptor antagonists (valsartan, candesartan, telmisartan) obtained their medicines from the hospital. Of 21 participants who obtained medicines from the hospital, most (86.7%) had other chronic diseases including cardiovascular disease, peptic ulcer disease, or stroke.

The type of anti-hypertensive medications could not be verified for 47 (23.1%) participants because they did not have a supply of their medicines available at time of interview and could not recall its name (Table 5.5).

Medicine use over the preceding 30 days

Among all participants, only 40 (10.4%) had taken anti-hypertensive medications every day for the preceding 30 days (Table 5.5). Most participants who obtained their medications from the IHSP-Elderly, village doctor, village midwife, or village nurse conveyed that the medications provided would last for only 3–5 days.

All participants who were *Prolanis* members (n=14) obtained a 30-day supply of medicine from the CHC (until their next visit to the CHC). By contrast, non-*Prolanis* members

obtained anti-hypertensive medications for less than 30 days at each visit. Four non-*Prolanis* members who took their medications for the entire 30 days reported that they needed to visit the CHC 3–4 times in a month to refill their prescription. Five of the 19 participants who purchased anti-hypertensive medications solely from a CP reportedly took their medicines for the entire 30 days. All five participants were government insurance holders and had other chronic diseases (stroke, arthritis, dyslipidaemia, peptic ulcer disease). Medicines for treating these other diseases were also purchased in the CP without a prescription.

5.1.4 Discussion

This study reported various sources of supply of anti-hypertensive medicines for patients in Indonesia. Overall, it included: (i) purchasing medicines over-the-counter in a CP; (ii) direct-dispensing from private clinicians; (iii) obtaining a free supply from the public health service; or (iv) a combination of these sources of supply. Despite their awareness of having been diagnosed with hypertension, almost half of the participants had not taken anti-hypertensive medication during the preceding 30 days. This finding supports previous Indonesian study reporting a low proportion of people with hypertension take their medication (Setiati & Sutrisna 2005), and raises concerns about the risk of death and disability attributed to untreated hypertension (World Health Organization 2013).

The quantity of anti-hypertensive medications obtained over the previous 30 days varied according to the source of supply, but almost half the number of patients obtained a supply of medicines that was sufficient for less than seven days. Interestingly, inadequate supplies were provided by both the public health service (e.g. CHC) and private providers (e.g. village doctor). The limited supply of medicines from Indonesian CHCs has been reported previously (Rumagit, Pojoh & Manampiring 2012; Wulandari, Perwitasari & Hidayati 2010) and indicates that there is a need to review the CHC policy regarding the provision of medicines (number of days' supply) to each patient at each health visit. Even though the standard treatment guideline for Indonesian CHCs states that up to 30 days' supply of anti-hypertensive medications could be provided at each visit, the 30 days' supply was provided only for patients who joined the *Prolanis* program, a new comprehensive approach under the universal health coverage scheme, which is expected to reduce the incidence of cardiovascular events caused by hypertension and diabetes (Badan Penyelenggara Jaminan Sosial 2015). At the time this study was being conducted, the *Prolanis* program had enrolled only about 50 members per CHC. Further studies are needed to explore the barriers associated with the implementation of the *Prolanis* program such as identifying the

challenges in recruiting patients. The limited number of *Prolanis* members per CHC may be associated with the existing challenges within the health care services in rural areas such as the shortage of doctors and pharmacists (Supardi, Raharni, et al. 2012), poorly defined boundaries relating to the scope of authority between health professionals in the CHC (Syah et al. 2015), and the lack of infrastructure. Further, as CHCs are the main primary health care system in Indonesia (*Regulation of Ministry of Health No. 75 Year 2014 about Community Health Centre*) there is a need to strengthen the CHC capacity to provide accessible and affordable medicines. Indeed, facilitating adherence to anti-hypertensive medications is remarkably onerous when only 10% of patients receive an adequate supply of medicine. Even though the Indonesian government has standardised the medication management for primary health care (Ministry of Health Republic of Indonesia 2003), studies (Razak, Pamudji & Harsono 2012; Silvania, Hakim & Satibi 2012) have indicated the need to improve its implementation to ensure the adequate stock of medicines in CHCs and to promote rational use of medicines.

Other important aspects to improve the provision of better health care for patients with hypertension in the CHC include providing a flowchart to guide the management of hypertension and facilitating a team-based approach in primary health care (Carter et al. 2009; Mittal & Singh 2010). Despite the availability of updated international guidelines on hypertension (e.g. Guidelines for the diagnosis and treatment of hypertension 2016, Australia), they might not be easily implemented in low-resource settings such as rural Indonesia. For example, the ability to conduct cardiovascular risk assessment for hypertension patients as recommended by the Australian Guideline (National Heart Foundation of Australia 2016) is limited by the lack of the infrastructure in the Indonesian primary healthcare setting (Syah et al. 2015). This study showed that a substantial proportion of participants obtained their medications from CHW-based program. Highlighting the potential of CHWs to support patients with hypertension in rural areas (Rahmawati & Bajorek 2015), this finding indicates the need to encourage the role of CHWs, as part of the primary health care team, in assisting patients to obtain adequate supply of medicine.

Patients who were not in the *Prolanis* program did not obtain a 30-days free supply of anti-hypertensive medications and therefore needed to proactively seek multiple sources for their supply of medicines. A substantial proportion of participants obtained their anti-hypertensive medications by purchasing them without a prescription; they sought an additional personal supply once they had no more medicines. This study showed that

patients could easily purchase their anti-hypertensive medications in a CP, bypassing the need for an appointment with their doctor. Previous studies have also reported this self-medication practice in Indonesia and other developing countries (Dewi, Utami & Puspitasari 2016; Rahmawati & Bajorek 2017b). The participants in this study acknowledged their perceived benefits of self-medication with anti-hypertensive medications from the CP. For instance, the patients who did not get adequate supply from other sources (e.g. village doctor) preferred to go to a CP to refill their medicines as it was cheaper and more time efficient. Given that the CP is the most common point-of care for patients with chronic disease, pharmacists play an important role in assisting patients in their medicine use (Stewart et al. 2010). The potential of pharmacist-led interventions to improve medication adherence and blood pressure control has been reported (Bajorek et al. 2016a; Wati, Mustofa & Sari 2015). A recent study among Indonesian community pharmacists reported positive attitudes toward their role in hypertension management which included assessment and documentation, treatment recommendations, counselling, and monitoring of BP reading, side effects of medication, and complications (Dewi, Utami & Puspitasari 2016). To improve the medicine information provided to patients, reports of the lack of information gathering by pharmacists about self-medication (Brata et al. 2013) need to be addressed through educational, managerial and policy approaches. For example, an Australian study reported the effectiveness of a comprehensive training program for pharmacy staff to improve hypertension management (Bajorek et al. 2015). Given the reported purchase of anti-hypertensive medications by family members (without patient presence) in this study, the medicine purchaser should be informed of the drawbacks of such practice in order to minimise the inappropriate use of medicines and delayed clinical evaluation (Hughes, McElnay & Fleming 2001). Studies in Australia and Saudi Arabia have reported that other interventions, such as monitoring blood pressure in the pharmacy, are also appreciated by patients (Bajorek et al. 2016b; Bawazir 2004), but can only be performed with the patient present.

Obtaining anti-hypertensive medications directly from a private practice was reported in this study. Overall, direct-dispensing by clinicians is commonly practised in Indonesia (Hong et al. 2009). According to Indonesian law, private doctors in rural areas, or in areas with limited access to a pharmacy, are allowed to dispense medication (*Law No. 29 Year 2004 Republic of Indonesia about Medical Practice*). Given the high population demand and shortage of doctors, non-doctor clinicians (midwives or nurses) are also allowed to provide healthcare services for the general population (beyond their main competency) (*Law No. 36 Year 2014 Republic of Indonesia about Healthcare Workforce* ; Hong et al.

2009). It was reported that some Indonesian patients cannot differentiate between clinicians, whether they are a doctor, midwife or nurse (Syah et al. 2015). In this study, prescribing and direct dispensing were provided by village doctors as well as midwives and nurses, such that patients did not need to visit a pharmacy to obtain medicines. The reasons why patients preferred to obtain medicines directly from the clinicians might be related to the difficulty in accessing medicines from other sources. Further, given that patients needed to purchase their medications out-of-pocket, affordability might also influence the patients' decision not to refill their anti-hypertensive medications (Rahmawati & Bajorek 2017a). Patients opt to purchase medications which they can afford. This study also found that having health insurance was associated with obtaining medicines from the public healthcare services. This finding is not surprising because most participants in this study were recipients of a government insurance scheme for poor people; the scheme does not cover medications obtained from a private clinician or CP.

Overall, these findings are noteworthy because the participants were derived from a community setting rather than healthcare centres, which provide an opportunity to obtain data from untreated patients who rarely visit healthcare providers. However, this study had some limitations. First, the reliance on self-reported data might overestimate the patients' true level of knowledge and adherence. Second, this study was undertaken in only one district; the results of this study may not be representative of the whole Indonesian population. Third, there more females than males joined this study, which may limit the generalisability of the findings. This might be related to the fact that members of CHW-based program as well as villagers who attended mobile health service were mostly women, which may have encouraged the recruitment of more females. However, the findings do reflect practice in Yogyakarta province as well as other settings with a similar social context.

5.1.5 Conclusion

These Indonesian participants obtained their hypertension medications from various sources; however, the inadequate supplies found in this study could compromise both short and long term management of hypertension. Direct dispensing, non-doctor prescribing, and self-medication with anti-hypertensive medications indicate the reality of the current complex health care system in Indonesia. Further, this study shows some of the challenges involved in managing out patients with chronic diseases like hypertension in resource-poor settings. It provides important findings for quality improvement practices that should be considered to improve the health lifespan in populous countries such as Indonesia.

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5.2 Factors affecting self-reported medication adherence and hypertension knowledge: A cross sectional study in rural villages, Yogyakarta province, Indonesia

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Thu 3/08/2017 12:07 AM

To: Riana Rahmawati <Riana.Rahmawati@student.uts.edu.au>;

02-Aug-2017

Dear Mrs. Rahmawati:

It is my great pleasure to accept your manuscript entitled "Factors affecting self-reported medication adherence and hypertension knowledge: A cross sectional study in underdeveloped villages, Yogyakarta province, Indonesia" in its resubmitted form for publication in *Chronic Illness*. We look forward to seeing your paper in press soon, and to your continued contributions to *Chronic Illness*.

If you would like your article to be freely available online immediately upon publication (as some funding bodies now require), you can opt for it to be published under the SAGE Choice Scheme on payment of a publication fee. Please simply follow the link to the Contributor Agreement form in the next email and you will be able to access instructions and further information about this option within the online form.

Kind regards,
Professor Sharon Lawn
Associate Editor, *Chronic Illness*
Flinders Human Behaviour and Health Research Unit
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Flinders University
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Abstract

Objectives: This study assessed medication adherence and hypertension knowledge, and their predictive factors, in people with hypertension, living in rural communities in Indonesia.

Methods: Data were acquired from 384 people living in eight rural villages via a researcher-administered questionnaire, a validated adherence scale, and a standardised hypertension knowledge survey. Multivariate analysis was used to identify the predictors of adherence and knowledge.

Results: Fifty-nine (15%) participants had good hypertension knowledge (score ≥ 8 out of 10). Compared to participants with poor knowledge, these participants had higher formal education (OR=2.7, 95% CI=1.5-4.7), and lived closer to a community health centre (OR=1.8, 95% CI=1.0-3.3). Knowledge gaps about the need for long-term medication, hypertension complications, and the target blood pressure were identified. Good hypertension knowledge predicted good adherence to medication (OR=7.1, 95% CI=3.3-15.2). Only 42 (11%) participants were considered to have good adherence. Reasons for intentional non-adherence were: (i) beliefs that medicines should be taken only when symptoms are evident; (ii) limited access to healthcare services; and (iii) preference for using traditional medicines.

Conclusion: Strategies for addressing knowledge gaps and misconceptions about hypertension medication are needed, particularly for people with a low educational level and those living some distances from health care facilities.

Keywords: Hypertension, adherence, rural health, Indonesia, patient education

5.2.1 Introduction

Hypertension is an important risk factor for cardiovascular morbidity and mortality (World Health Organization 2009a). Despite being preventable and modifiable, suboptimal blood pressure control is still commonly reported in clinical practice (World Health Organization 2013a). Non-adherence to medication, an important cause of poor blood pressure control (Hill, Miller & DeGeest 2011), is more prevalent among people in developing countries with low-resource settings than in developed countries (Ibrahim & Damasceno 2012; Sabate 2003). In Indonesia, a developing country in South-East Asia, more than 50 million people have hypertension (Ministry of Health Republic of Indonesia 2013d) and only 9% of patients achieve adequate control of blood pressure (BP) (Hussain, Al Mamun, Reid, et al. 2016). The rates of diagnosis of hypertension and access to medication are lower among people living in lower socioeconomic and rural areas compared with those in urban Indonesia (Aizawa & Helble 2016). However, there is limited information about the use of anti-hypertensive medication among rural Indonesian people, and the factors that predict adherence to these medications. Therefore, this study aimed to assess adherence to anti-hypertensive medications and hypertension knowledge among these people. The objectives of this study were: (i) to identify the factors that predict adherence to anti-hypertensive medication; (ii) to describe the reasons given for not taking anti-hypertensive medications; (iii) to identify the factors that predict patients' basic knowledge about hypertension; and

(iv) to report patients' recall about the provision of medicine information by healthcare providers.

5.2.2 Methods

Study design and setting

A community-based, cross-sectional study using a researcher-administered questionnaire was conducted in the Bantul district of Yogyakarta province between August and November 2015. The survey targeted people with hypertension living in rural areas; the accessible population comprised those who were residents in the rural 'underdeveloped' areas of the Bantul district. The term 'underdeveloped villages' is used by the Indonesian government to mean those villages that have a lower socioeconomic status compared with other villages (Bantul District Government 2013; Statistics Indonesia 2013). The study was approved by the Human Research Ethics Committee of the University of Technology Sydney and the Bantul district government.

Participant recruitment

A list of eight rural 'underdeveloped' villages from the Bantul district government (Bantul District Government 2013) was used to identify study locations. This study recruited participants who fulfilled the following inclusion criteria: (i) residing in the selected villages; (ii) aged 45 years or older; (iii) diagnosed with hypertension by a healthcare professional; or (iv) currently taking anti-hypertensive medications. Rural villagers with hypertension were recruited via two mechanisms. The first was through a community health worker (CHW)-based program in the villages, called the Integrated Health Service Post for the Elderly (IHSP-Elderly). CHWs distributed an invitation letter to members of the IHSP-Elderly who were known to have hypertension (systolic BP ≥ 140 mmHg and diastolic BP ≥ 90 mmHg) based on health records kept by CHWs. The second mechanism was through a charity care program provided by a local hospital and which included a BP check in the villages. The CHWs informed the villagers who attended the charity program about the study and provided an invitation to those known to have hypertension. The sample size was calculated based on the precision around the point estimate of effect. Two outcomes were measured in this study, that is, medication adherence and hypertension knowledge. In developing countries, 24% of patients adhere to anti-hypertensive medication (Kamran et al. 2014; Venkatachalam et al. 2015) and 35% have good hypertension knowledge (Sanne et al. 2008). Accordingly, a minimum sample of 350 was required.

Data collection

A researcher-administered questionnaire was used to obtain data from the participants. The questionnaire covered both socio-demographic (age, gender, educational level, current occupation, health insurance, physical activity, distance from the nearest community health centre (CHC)) and clinical information (e.g. number of years since diagnosis and the presence of other chronic diseases). The definition of being close to the CHC was determined based on the median value of a distance from patient's home to the nearest CHC (Table 5.6). All data were based on patient self-report. Participants were asked whether they had taken at least some quantity of anti-hypertensive medication within the preceding 30 days. Those who did not take any anti-hypertensive medication within this period were asked to explain why. The use of traditional medicines to lower BP in the 30-day period was also canvassed.

Knowledge about hypertension was measured using the instrument used in previous studies (Li et al. 2013; Sanne et al. 2008; Williams et al. 1998). The instrument comprises 10 questions; each correctly answered question was awarded one point giving a maximum total score of 10 points. Participants with a total score ≥ 8 were considered to have a good level of hypertension knowledge (Sanne et al. 2008).

A validated Indonesian version of the eight-item Morisky Medication Adherence Scale (MMAS-8) was used to quantify adherence to anti-hypertensive medication in 203 participants who had taken their medications within the preceding 30 days (Krousel-Wood, Islam, et al. 2009; Morisky et al. 2008; Morisky & DiMatteo 2011). Written permission to use the scale was granted by the original developer of the English version of the MMAS. Participants with a score of ≥ 6 were defined as exhibiting good adherence to anti-hypertensive medication (Morisky et al. 2008; Saarti et al. 2016; Sweileh et al. 2014).

Data analysis

Data were entered into the IBM SPSS Statistics for Windows version 23.0 (IBM Corp, 2015). Descriptive statistics included means, frequencies, and percentages. Logistic regression analysis was performed using forward stepwise selection to identify the factors that predicted good adherence and good knowledge. All variables that were significant in the univariate analysis were explored in the multivariate analysis. A p value of <0.05 was considered significant.

5.2.3 Results

Characteristics of participants

In total, 384 people with hypertension (75% female) participated in the study. The mean age was 65.7 ± 10.3 years (range 45–90 years). Most participants had a low level of education; 64% had not completed elementary school. Most participants (88%) were recipients of the government insurance scheme for poor people. The average length of time since the first hypertension diagnosis was 3.9 ± 3.9 years (range 0.5–30 years) (Table 5.6).

Self-reported hypertension knowledge

The mean hypertension knowledge score was 5.0 ± 2.2 out of 10. Only 15% of the participants had good hypertension knowledge. The percentage of patients with good knowledge was higher among those who took medications (21%) compared with those who did not (8%). Similarly, the percentage of patients with good knowledge was significantly higher in those with good adherence (50%) compared with those with poor adherence (12%) (Figure 5.3). These differences were also evident in specific questions about hypertension (Figure 5.4). For example, 35 (83%) participants with good adherence knew that hypertension can cause heart attacks; this percentage was higher than that for participants with poor adherence ($n=63$, 39%) and those who did not take any medications ($n=49$, 27%).

In response to questions about hypertension knowledge, most participants ($n=350$, 91%) knew that a BP of 160/100 mmHg is high, but 34 (9%) responded that this value is normal or did not know its interpretation. Two-thirds of participants ($n=251$) knew that a BP of 120/80 mmHg is normal (Figure 5.4).

When asked about the complications of hypertension, 247 (64%) participants knew about the association between hypertension and stroke. Fewer participants were aware that hypertension can cause eye problems ($n=184$, 48%) heart attack ($n=147$, 38%), and kidney disorders ($n=72$, 19%). Although more participants ($n=339$, 88%) knew that eating less salt could lower BP, only 146 (38%) knew of a relationship between losing weight and lowering BP. Almost two-thirds ($n=239$, 62%) of participants responded that anti-hypertensive medications should be taken only when they felt sick (i.e. had symptoms); only 113 (29%) participants knew that anti-hypertensive medication should be taken every day.

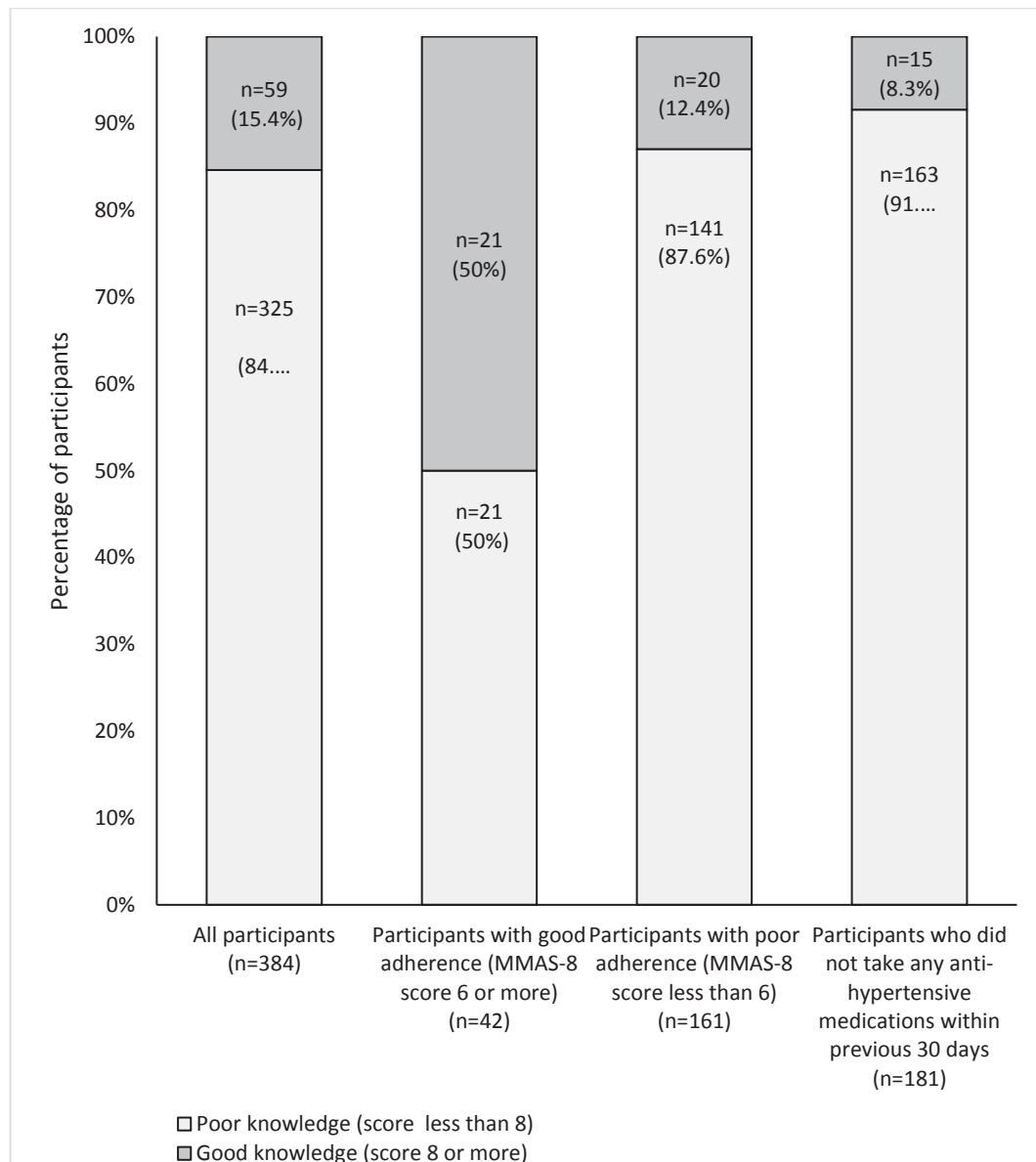
Table 5.6 Characteristics of participants (n=384)

Age in years	
Mean $\pm$ SD	65.7 $\pm$ 10.3
Median (IQR)	65.0 (17)
Age categories, n (%)	
<65 years	173 (45.1)
65 – 80 years	169 (44.0)
$\geq$ 80 years	42 (10.9)
Gender, n (%)	
Female	288 (75.0)
Education level, n (%)	
No schooling or less than elementary school	246 (64.1)
Elementary school	109 (28.4)
High school or higher	29 (7.6)
Occupation, n (%)	
Unemployed	125 (32.6)
Employed	259 (67.4)
Distance from the nearest CHC in km	
Mean $\pm$ SD	4.1 $\pm$ 2.3
Median (IQR)	3.5 (3.5)
Health insurance holder, n (%)	
Government-based insurance for poor people	339 (88.3)
Government-based insurance for civil servant or pensioner	5 (1.3)
National health insurance (non-poor scheme)	5 (1.3)
No health insurance	35 (9.1)
Physical activity*, n (%)	
Inactive, <600 MET-minutes/week	41 (10.7)
Minimally active, 600-3000 MET-minutes/week	108 (28.1)
High active, MET >3000 minutes/week	235 (61.2)
Years since diagnosis	
Mean $\pm$ SD	3.9 $\pm$ 3.9
Median (IQR)	3.3
Most recent BP reading (self-reported)	
Systolic BP in mmHg, mean $\pm$ SD	162.5 $\pm$ 19.0
Diastolic BP in mmHg, mean $\pm$ SD	92.1 $\pm$ 5.6
Presence of other chronic diseases (self-reported)**, n (%)	249 (64.8)
Self-reported use of anti-hypertensive medications within preceding 24 hours, n (%)	85 (22.1)
Self-reported use of anti-hypertensive medications medications within preceding 30 days, n (%)	203 (52.9)
Self-reported use of traditional medicines within preceding 30 days, n (%)	263 (68.5)

Abbreviations: n = number, SD = standard deviation, CHC = community health centre, BP = blood pressure, MET = the metabolic equivalent time

* Adapted from International Physical Activity Questionnaire (IPAQ) protocol (www.ipaq.ki.se)

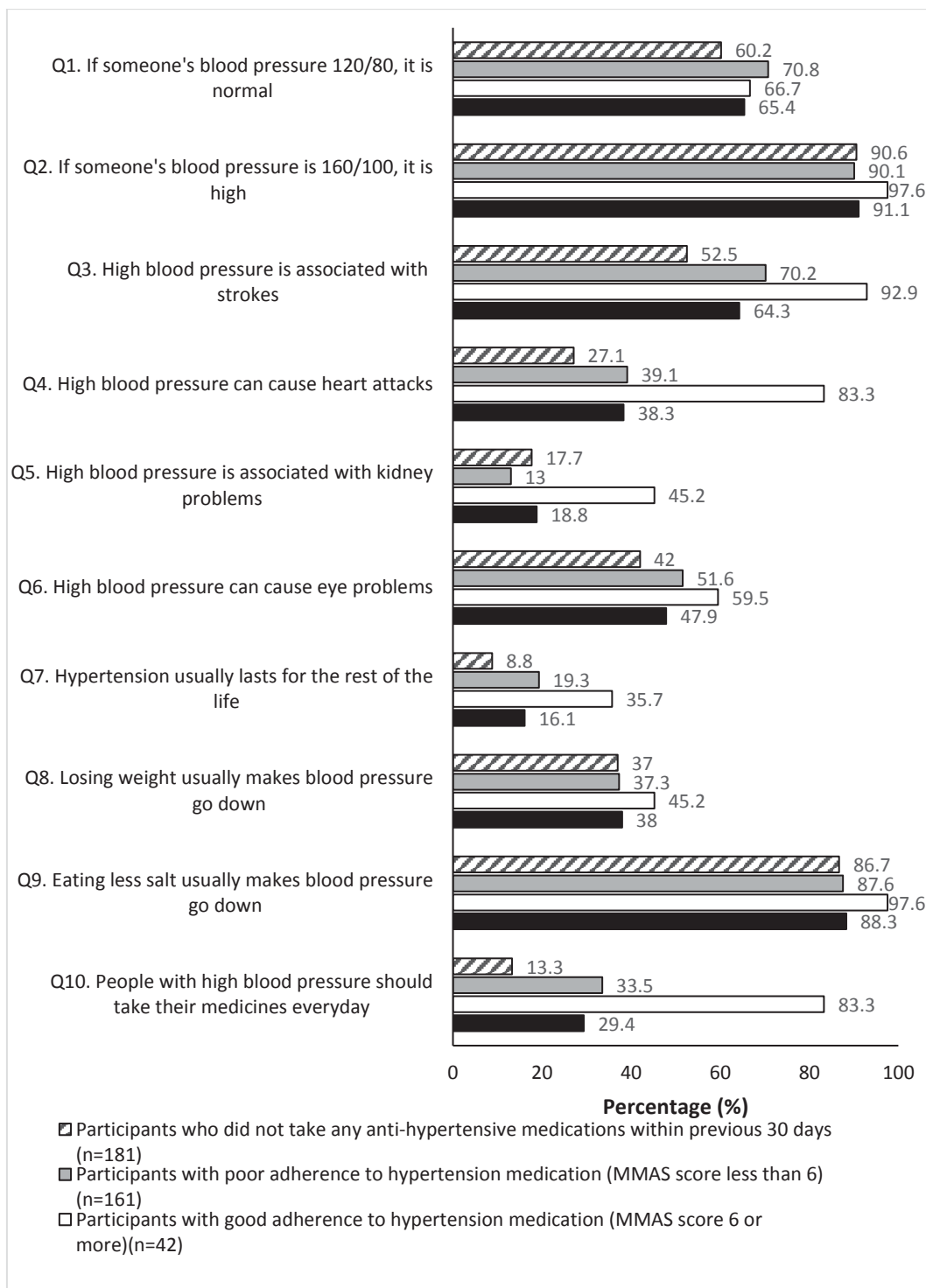
** Presence of other chronic disease included health practitioner diagnosed cardiovascular disease, dyslipidaemia, diabetes, chronic back pain, arthritis, neurological disorder including stroke, lung disease, renal disease, cancer, allergy and depression



MMAS= Morisky Medication Adherence Scale

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Figure 5.3 Self-reported hypertension knowledge among participants in rural Yogyakarta province, Indonesia (n=384)



MMAS= Morisky Medication Adherence Scale

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Figure 5.4 Responses on each item of hypertension knowledge question (n=384)

Factors that predicted whether a participant had good hypertension knowledge were the level of formal schooling and distance from home to the CHC (Table 5.7). Participants with more than elementary schooling were 2.7-times more likely to have good knowledge than those who had no schooling or had less than elementary schooling (95% confidence interval CI=1.5-4.7, $p<0.01$). Participants living close to the nearest CHC were 1.8-times more likely to have good knowledge (95% CI=1.0-3.3, $p=0.04$).

Self-reported medication adherence

The average adherence score was 3.8 ± 2.2 out of 8. Twenty-two (11%) participants attained the highest possible score of 8; 42 participants (21%) had good adherence (score ≥ 6).

Less than one-third (29%) of the 203 participants who took anti-hypertensive medications had taken their medications every day over the preceding two weeks. Within the preceding 30 days, most participants ($n=162$, 78%) had stopped taking their anti-hypertensive medications because they felt better.

Only 62 (30%) participants responded that they sometimes forget to take their anti-hypertensive medication. Despite their reportedly adhering to instructions from health professionals, they did not refill the prescription once they had finished the initial prescription. Their short-term adherence to medication was reported, as illustrated by the following quote from a patient who obtained anti-hypertensive medications from the CHC program in the villages (IHSP-Elderly).

I never forget to take medications provided, how I can forget? It was only six pills, twice a day ... [but I did not take any medicines over the past two weeks] I have no more medicine. It had run out ...

Non-adherence was also observed in the form of rationing of doses. For instance, because some participants obtained less than 10 tablets, they took them on alternating days or skipped doses so that the medication would be available when symptoms appeared.

Overall, a good level of knowledge was an independent predictor of good adherence (Table 5.8). Participants with good knowledge were 7.1 times more likely to have good adherence than those who had poor knowledge (95% CI=3.3-15.2, $p<0.01$).

Table 5.7 Predictors of good hypertension knowledge (n=384)

	Good knowledge n=59	Poor knowledge n=325	Univariate analysis			Multivariate analysis*		
			Odds ratio	95% CI	p value	Odds ratio	95% CI	p value
Age								
<65 years	37 (21.4)	136 (78.6)	2.34	1.32-4.14	0.004	1.80	0.98 – 3.29	0.06
65 years	22 (10.4)	189 (89.6)	1					
Gender								
Male	18 (18.8)	78 (81.3)	1.39	0.76-2.56	0.290	NA	NA	NA
Female	41 (14.2)	247 (85.8)	1					
Education level								
No school or less than elementary school	25 (10.2)	221 (89.8)	1					
Elementary school or higher	34 (24.6)	104 (75.4)	2.89	1.64-5.09	0.000	2.65	1.49 – 4.70	<0.01
Distance from the nearest CHC								
Less than 3.5 kms	38 (20.2)	150 (79.8)	2.11	1.19-3.76	0.011	1.84	1.02 – 3.32	0.04
3.5 kms or more	21 (10.7)	175 (89.3)	1					
Current employment								
Unemployed	18 (14.4)	107 (85.6)	1					
Employed	41 (15.8)	218 (84.2)	1.12	0.61-2.04	0.716	NA	NA	NA

	Good knowledge n=59	Poor knowledge n=325	Univariate analysis			Multivariate analysis*		
			Odds ratio	95% CI	p value	Odds ratio	95% CI	p value
Physical activity**								
Inactive, <600 MET-minutes/week	8 (19.5)	33 (80.5)	1					
Minimally active, 600-3000 MET-minutes/week	16 (14.8)	92 (85.2)	0.72	0.28-1.83	0.487	NA	NA	NA
High active, MET >3000 minutes/week	35 (14.9)	200 (85.1)	0.72	0.31-1.69	0.453	NA	NA	NA
Health insurance holder								
Yes	54 (15.5)	295 (84.5)	1.40	0.47-4.13	0.54	NA	NA	NA
No	5 (14.3)	30 (85.7)	1					
Presence of other chronic diseases								
Yes	41 (16.5)	208 (83.5)	1.28	0.70-2.33	0.417	NA	NA	NA
No	18 (13.3)	117 (86.7)	1					
Years since diagnosis of hypertension								
Mean (SD)	5.1 (4.9)	3.6 (3.6)	1.08	1.01-1.14	0.010	NA	NA	NA

Data are presented as n (column %), unless otherwise indicated.

Abbreviations: n = number, SD = standard deviation, CHC = community health centre, MET = metabolic equivalent of task

* The Hosmer Lemeshow goodness of fit = 84.6%

** Adapted from International Physical Activity Questionnaire (IPAQ) protocol

Reasons for not taking anti-hypertensive medication

Of 181 participants who did not take any anti-hypertensive medications, feeling healthy was the most common reason (n=89, 49%) for not visiting healthcare professionals. Fifty-four (30%) participants had not visited a health professional for hypertension management for >6 months. Furthermore, nine participants (5%) reported that they had perceived no clinical improvement when taking their medication, and they had not continued using them. Forty-four (24%) participants mentioned their preference for using traditional medicines to lower BP, and four (2%) reported their belief that managing stress was more important than taking medicines to lower high BP. Eight participants (4%) explicitly mentioned the high cost as the reason for not taking any hypertension medications within the preceding month.

As the other reasons, 31 participants reported that they relied solely on provision of medication by the mobile CHC in the IHSP-Elderly, and the service was not offered in the preceding month. Furthermore, 64 participants (35%) reported that they had difficulty accessing the nearest CHC because of transport constraints; it was not feasible to walk there and no public transport was available.

Self-reported provision of medicine information by healthcare practitioners

Among the 203 treated participants, 98 (48%) reportedly received information about their medication from health providers in the CHC. Almost no one could clearly specify who these providers were – doctors, midwives or nurses. Other sources of medicine information were the village doctor (13%), village midwife (13%), village nurse (9%), pharmacy staff in the hospital (8%), and staff in the community pharmacy (7%). Participants could not clearly identify the type of pharmacy staff they encountered (e.g. pharmacist versus pharmacy technician). Three participants reported that their family was their primary source of information largely because the family members received information from health professionals and subsequently relayed this information to the participants.

All 203 participants reportedly received directions from health professionals about the use of medicines such as how many times a day the anti-hypertensive medication should be taken. However, few participants obtained clear information about the purpose for using these medicines (n=80, 39%), intended duration of therapy (n=61, 30%), side effects (n=20, 10%), or contraindications and precautions relevant to the medication (n=7, 3%). Most participants using more than one medicine could not describe which medicine was indicated for lowering BP.

Table 5.8 Predictors of self-reported adherence to anti-hypertensive medications (n=203)

	Good adherence MMAS ≥6 n=42	Poor adherence MMAS <6 n=161	Univariate analysis			Multivariate analysis*		
			Odds ratio	95% CI	p value	Odds ratio	95% CI	p value
Age								
<65 years	26 (26.5)	72 (73.5)	2.00	1.00-4.03	0.050	NA	NA	NA
65 years	16 (15.2)	89 (84.8)						
Gender								
Male	13 (21.3)	48 (78.7)	1.05	0.50-2.20	0.886	NA	NA	NA
Female	29 (20.4)	113 (79.6)						
Education level								
No school or less than elementary school	18 (26.1)	93 (73.9)	1					
Elementary school or higher	24 (16.2)	68 (83.8)	1.82	0.92-3.62	0.086	NA	NA	NA
Distance from the nearest CHC								
Less than 3.5 kms	31 (26.7)	85 (73.3)	2.52	1.19-5.36	0.016	2.14	0.96 – 4.76	0.06
3.5 kms or more	11 (12.6)	76 (87.4)	1					
Current employment								
Unemployed	15 (23.4)	49 (76.6)	1					
Employed	27 (19.4)	112 (80.6)	0.79	0.39-1.61	0.512	NA	NA	NA

	Good adherence MMAS ≥6 n=42	Poor adherence MMAS <6 n=161	Univariate analysis			Multivariate analysis*		
			Odds ratio	95% CI	p value	Odds ratio	95% CI	p value
Physical activity**								
Inactive, <600 MET-minutes/week	7 (31.8)	15 (68.2)	1					
Minimally active, 600-3000 MET-minutes/week	15 (24.2)	47 (75.8)	0.68	0.24-1.99	0.486	NA	NA	NA
High active, MET >3000 minutes/week	20 (16.8)	99 (83.2)	0.43	0.16-1.20	0.107	NA	NA	NA
Health insurance holder								
Yes	42 (22.4)	142 (77.6)	5.49	0.71-42.2	0.102	NA	NA	NA
No	1 (5.0)	19 (95.0)	1					
Presence of other chronic diseases								
Yes	28 (20.6)	108 (79.4)	0.98	0.47-2.02	0.959	NA	NA	NA
No	14 (20.9)	53 (79.1)						
Years since diagnosis of hypertension								
Mean (SD)	4.2 (3.1)	4.2 (4.5)	1.00	0.93-1.09	0.954	NA	NA	NA
Score knowledge**								
Mean (SD)	7.1 (1.9)	5.06 (2.0)	1.72	1.39-2.13	0.000	NA	NA	NA
Age								
<65 years	26 (26.5)	72 (73.5)	2.00	1.00-4.03	0.050	NA	NA	NA

	Good adherence MMAS ≥ 6 n=42	Poor adherence MMAS <6 n=161	Univariate analysis			Multivariate analysis*		
			Odds ratio	95% CI	p value	Odds ratio	95% CI	p value
Knowledge about hypertension***								
Poor, score <8	21 (13.0)	141 (87.0)	1					
Good, score ≥ 8	21 (52.2)	20 (48.8)	7.05	3.28-15.15	0.000	7.05	3.28 – 15.2	<0.01
Use of traditional medicines								
Yes	23 (17.8)	106 (82.2)	1.59	0.80-3.17	0.186	NA	NA	NA
No	19 (25.7)	55 (74.3)	1					

Data are presented as number (column %), unless otherwise indicated.

* The Hosmer Lemeshow goodness of fit = 79.8%

** Adapted from International Physical Activity Questionnaire (IPAQ) protocol (www.ipaq.ki.se)

*** Adapted from hypertension knowledge instrument from previous studies (Li et al. 2013; Sanne et al. 2008; Williams et al. 1998), scores range from 0-10

Abbreviations: n = number, SD = standard deviation, MMAS-8 = Morisky Medication Adherence Scale-8, CHC = community health centre, MET = the metabolic equivalent of task.

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5.2.4 Discussion

This study reported that adherence to anti-hypertensive medications was generally low; only 11% of participants or 21% of the treated participants had good adherence. This proportion is lower than those reported in studies from Lebanon (71%) and China (65%) (Lee et al. 2013; Saarti et al. 2016). Most participants (78%) had not taken anti-hypertensive medications on the day of the interview, which is higher than that reported in a previous study in Indonesia (37%) (Setiati & Sutrisna 2005).

We found no association between adherence and age, gender, educational level, employment status, or health insurance status. This reinforces the view that adherence is an active decision influenced mainly by patients' knowledge, experiences, and beliefs rather than by sociodemographic characteristics (Svensson et al. 2000). In this study, the reasons for not taking anti-hypertensive medications were mainly intentional and modifiable. Although reasons for unintentional adherence, such as forgetfulness or carelessness, were commonly found in other settings (Clifford, Barber & Horne 2008; Gadkari & McHorney 2012) a few participants in this study reported such reasons. However, it is of concern that some patients were supplied medicines for less than seven days. Patients may unintentionally not refill their medicines and may discontinue taking them because of transportation and/or financial constraints on accessing a medicine supply.

In this study, a good level of hypertension knowledge was an independent predictor of adherence to anti-hypertensive medications. Given that the vast majority of participants had poor knowledge about hypertension, this finding supports the idea that, to increase adherence, health care professionals should prioritise efforts to provide information to patients when there are knowledge gaps (Gwadry-Sridhar et al. 2012). For example, patients should be informed of their optimum BP target (James et al. 2014) and the importance of medication adherence (Conn, Ruppar, Chase, et al. 2015; Hill, Miller & DeGeest 2011). Similar to previous studies (Demaio et al. 2013; Li et al. 2013), a low level of formal schooling was associated with poor hypertension knowledge. Given the challenges in providing information to people with a low educational level, delivering effective health education must involve appropriate communication strategies and suitable approaches (Coulter & Ellins 2007; Nutbeam 2000). Using pictorial aids such as illustrated brochures to complement verbal communication, involving patients' caregivers in medication counselling, and encouraging the role of community health workers in health education are some approaches for addressing the needs of patients with a low educational level (Kreps & Sparks 2008; Ngoh 2009). This study also found that patients who lived in

some distance from healthcare facilities were more likely to have poor knowledge; the percentage of patients who had not visited a healthcare professional for more than 6 months was higher than that for those who lived closer to healthcare services (18% vs.9%, respectively). These findings are consistent with those of previous studies which have reported that transportation difficulties in accessing medication and information are important barriers to patients' adherence to hypertension medication among people living in rural areas (Legido-Quigley et al. 2015).

Cultural background and local beliefs might shape how hypertension is understood and treated (Horne et al. 2004). In addition to the need to educate patients, the literature emphasises the importance of understanding patients' beliefs that might influence their behaviour. Using Kleinman's Explanatory Model (Kleinman, Eisenberg & Good 2006), previous studies (Hurwicz & Rose 2016; Taylor et al. 2012) have reported that non-adherence to anti-hypertensive medications reflects the differences between patients' and healthcare professionals' beliefs about the cause of hypertension and how it should be managed. Therefore, Kleinman's model recommends providing greater opportunity for patients to express their beliefs about, and personal experience of, their illness (Kleinman, Eisenberg & Good 2006). Within the rural Indonesian context, patients who decided not to take any medications to lower BP perceived that they had no need to worry about being diagnosed with hypertension and believed that anti-hypertensive medications are unnecessary (Rahmawati & Bajorek 2017). To improve adherence to hypertension treatment, strategies should acknowledge that these rural patients have various reasons underlying these perceptions and beliefs, and should be culturally sensitive and tailored to these beliefs (Horne et al. 2004).

Facilitating patient self-management is an important strategy for improving BP control (Bosworth, Powers & Oddone 2010). The patient's role in the clinician–patient relationship should be shifted from being passive to being more proactive in the decision-making (Ahmed & Aslani 2014; Bane et al. 2007). However, this approach may be difficult to implement where there are wide gaps in patients' knowledge and where health professionals have limited time to provide the necessary information during clinical encounters. A previous Indonesian study has reported challenges to the Indonesian CHC's ability to provide high-quality healthcare services, given the shortage of health professionals, heavy workload, low coverage of the health insurance system, and lack of regulation for private practice (Syah et al. 2015). In such situations, it is a challenge for the healthcare system to develop programs and resources aimed at increasing patients' self-

management skills and to implement interventions that may improve patients' knowledge and adherence. To increase the provision of healthcare services to people in rural areas, Indonesian CHCs supervise CHW-based programs in the villages (e.g. IHSP-Elderly) that offer activities such as BP checks and health education (Christiani et al. 2016). Given the potential role of CHWs in liaising between healthcare professionals and the local villagers for the provision of hypertension care (Rahmawati & Bajorek 2015), tailored interventions to improve hypertension control in Indonesian rural areas might benefit by being implemented through CHW-based programs such as the IHSP-Elderly. The IHSP-Elderly has been established in both rural and urban Indonesia areas (Ministry of Health Republic of Indonesia 2013a). The effectiveness of involving CHWs in hypertension management needs to be evaluated further.

This study found that patients did not receive adequate information about their anti-hypertensive medication. As health professionals, community pharmacists have a great opportunity to educate patients as part of routine pharmacy practice (Stewart et al. 2010). A systematic review of 16 randomised controlled trials confirmed that community pharmacist-led interventions (e.g. patient education, pharmacotherapy review) can improve medication adherence and reduce BP (Cheema, Sutcliffe & Singer 2014). However, the review included only one study from a developing country, which highlights the dearth of evidence regarding the pharmacist's role in hypertension management in such settings. Another review showed that delivery of extended pharmacy services in the Southeast Asia region (including Indonesia) was hampered by a range of issues including inadequate training for pharmacy staff to deliver effective patient education, low patient participation in pharmacy services provided, and lack of policies (e.g. generic substitution policy) (Hermansyah, Sainsbury & Krass 2015). Specific to Indonesia, the absence of pharmacists in pharmacies is common, leading to pharmacy services being delivered by pharmacy technicians (Purwanti & Supardi 2012; Supardi, Handayani, et al. 2012). A study of 68 community pharmacies in the capital of Indonesia, Jakarta, found that 60% of pharmacists attended their pharmacies only once every week or less (Purwanti & Supardi 2012). These challenges may influence the successful implementation of any interventions in the community pharmacy setting. Aiming to increase community awareness about the appropriate use of medicines, in late 2015 the Indonesian Ministry of Health launched a program called *Gema Cermat*, which positions the pharmacist as an agent of change in assisting patients with their medication management (Ministry of Health Republic of Indonesia 2016a). Given the accessibility of community pharmacies across Indonesia, the

implementation of *Gema Cermat* might provide great benefits for patients in rural areas where access to medicine information is limited.

Study limitations

The self-reporting method used to measure adherence and hypertension knowledge might have overestimated medication adherence because it relies on participant recall. The study participants were not entirely representative of the Indonesian population since the study was conducted among rural people residing in one district in Yogyakarta province.

5.2.5 Conclusion

Although good knowledge predicts good adherence, knowledge about hypertension and its management was generally low. Given the low proportion of rural villagers with good adherence to anti-hypertensive medication, a range of strategies for addressing knowledge gaps and misconceptions about hypertension medication are needed, particularly for people with a low educational level and those living some distance from health care facilities.

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5.3 The use of traditional medicines to lower blood pressure: A survey in rural areas of Yogyakarta province, Indonesia

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Submitted to *Chronic Illness*, August 2017

Abstract

Objectives: To quantify the use of traditional medicines and to identify factors associated with its use among people in a low-resource setting.

Methods: Data were collected using a researcher-administered questionnaire from people with hypertension in rural underdeveloped villages in Indonesia.

Results: 263 of 384 participants (68.5%) used traditional medicines intended to lower blood pressure; about half of them (n=134) used only traditional medicines while the others (n=129) also took anti-hypertensive medications. Seventy-four (19.2%) participants took only anti-hypertensive medications, and 47 (12.2%) did not use traditional medicines or medications. Herbal medicines were the most frequent products used mainly in the form of herbs and herbal materials, which were obtained from traditional markets (n=169, 44%), family members (n=100, 26%), or their own garden (n=88, 23%). The use of traditional medicines was not associated with any sociodemographic variables. However, among traditional medicines users, participants with a lower formal education were twice as likely to not take anti-hypertensive medications compared with those with a higher educational level.

Conclusions: To treat their blood pressure, these rural villagers used traditional medicines more often than anti-hypertensive medications. Health professionals in rural areas should improve their awareness of how the use of traditional medicine might affect hypertension management.

Keywords: Hypertension, self-care, self-medication, traditional medicines, herbal medicines

5.3.1 Introduction

The World Health Organization (WHO) has reported that more than 80% of the population in developing countries uses traditional medicines to maintain their health and treat various types of clinical conditions (World Health Organization 2013b). Due to the lack of accessible and affordable healthcare services, traditional medicine becomes a primary source of treatment, and sometimes the only source of care in these countries, (World Health Organization 2013b). A tropical country, Indonesia has an abundance of plants with potential medicinal properties that are used traditionally as medicines (Elfahmi, Woerdenbag & Kayser 2014). The use of traditional medicines is more prevalent in rural areas, where cultural factors and beliefs strongly influence patients' decisions about the source of health care, as compared to urban areas (Assan et al. 2009; World Health Organization Regional Office for South East Asia). Preferences for using traditional medicines might also relate to the lack of access to medication and information in rural areas (Assan et al. 2009).

In a national survey, 46.4% of rural Indonesians were diagnosed with hypertension, but only 9% of them were adequately treated (Hussain, Al Mamun, Reid, et al. 2016). People with chronic conditions such as hypertension tend to self-manage their blood pressure by various means, including the use of traditional medicines (Marshall, Wolfe & McKevitt 2012). One review reported that on average 38% of patients with hypertension use traditional medicines for any health condition and 25% of all patients specifically use traditional medicines to lower blood pressure (Rahmawati & Bajorek 2017b). However, on average, only 21% of patients disclosed their traditional medicine use to their healthcare providers (Rahmawati & Bajorek 2017b). Despite this acknowledged use of traditional medicines by rural people (World Health Organization Regional Office for South East Asia), the use of traditional medicines along with hypertension medications has been scarcely reported (Basuki et al. 2004). With a view towards suggesting measures for improving the hypertension care of rural Indonesian people, the objective of this study was to quantify the use of traditional medicines for treating hypertension among people in a rural Indonesian setting and to identify factors associated with its use among people in a low-resource setting. We report here the frequency of the use of traditional medicines and anti-hypertensive medications, the types of traditional medicines used, and the factors that may be associated with the use of traditional medicines among people diagnosed with hypertension in rural villages of Yogyakarta province, Indonesia.

5.3.2 Methods

Design and setting

This cross-sectional study was undertaken in the Bantul district (Yogyakarta, Indonesia) from August to November 2015. The analysis presented here is part of a larger study exploring medication-taking practices among people with hypertension in rural underdeveloped areas, which has been reported elsewhere (Rahmawati & Bajorek 2017a). The Bantul district is located in Yogyakarta province on the island of Java, the most populous island in Indonesia (Ministry of Health Republic of Indonesia 2013a). The villages were selected based on a list identifying rural underdeveloped villages from the Bantul District Government (Bantul District Government 2013). The study was approved by the University of Technology Sydney Human Research Ethics Committee (Ref. No 2014000647). Approval from the Bantul District Government was also granted (Ref No. 070/Reg/0558/S3/2015).

Terminology used in this study

The term ‘traditional medicines’ is used interchangeably with ‘complementary and alternative medicines’ (CAMs) in some countries (World Health Organization 2013). Given the wide variation in defining traditional medicines and CAMs (Frass et al. 2012; Rahmawati & Bajorek 2017b), we adopted the WHO terminology to classify the types of traditional medicines used by participants (World Health Organization 2013; World Health Organization Regional Office for South East Asia). The WHO defines traditional medicines as ‘the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether applicable or not, used in the maintenance of the health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness’ (World Health Organization 2013b). It might contain parts of plants, other plant materials, non-plants materials (e.g. animal and mineral), or a combination of them (World Health Organization 2013b). According to the WHO, herbal medicine is a part of traditional medicines and can be divided into herbs, herbal materials, herbal preparations, and finished herbal products. Herbs and herbal materials refer to the use of plants such as leaves, flowers, fruit, seed, and wood or other plant parts, that can be used as is or be processed using various local procedures (e.g. steaming, roasting) (World Health Organization 2013b). Herbal preparations are the basis of finished herbal products. Both terms refer to herbal products produced by extraction, fractionation, purification, concentration, or other manufacturing processes (World Health Organization 2013b).

Recruitment of participants

The inclusion criteria for the study were that participants had to be village residents, aged 45 years or older, diagnosed with hypertension by a healthcare professional or currently taking anti-hypertensive medication. People with hypertension were recruited through a local health service that offers a mobile service provided by the local hospital in selected villages. Community (lay) health workers (CHWs) distributed an invitation letter to people who were known to have hypertension as recorded by hospital staff, and to members of the Integrated Health Service Post for the Elderly (IHSP-Elderly), a CHW-based program in the villages, who were known to have hypertension. The CHWs helped the researcher to collect the villagers' expressions of interest in participating. Informed written consent was obtained from literate participants. Participants who were illiterate gave informed consent by providing a thumb print on the informed consent sheet, and a literate witness provided his/her signature on the sheet.

Data collection

A semi-structured questionnaire, comprising closed-ended questions with single- or multiple-response options, was used to gather information about the participants' socio-demographic characteristics, history of hypertension, hypertension knowledge, and all medicines used within the preceding 30 days. This questionnaire was administered by an Indonesian researcher (RR) in Bahasa Indonesia or the local language. Participants chose the venue for interviews to take place, for their convenience and to provide their preferred level of privacy.

Participants were asked 'Have you taken any other medicines (herbal medicines, home remedies, or other traditional medicines) to lower your blood pressure in the preceding 30 days?' Those who responded 'Yes' to this question were then asked about the types of traditional medicines used and how they used these medicines. Participants were also asked 'Have you taken any anti-hypertensive medications within the preceding 30 days?' Hypertension knowledge was examined using a standardised instrument described in a previous study (Williams et al. 1998), which comprised 10 questions with multiple-choice answers. Participants who answered eight or more questions correctly (score ≥ 8) were considered to have good knowledge and those who scored < 8 were categorised as possessing poor knowledge.

Data analysis

Descriptive statistics were used to analyse the baseline characteristics of the participants. A comparison between traditional users and non-users was performed using the chi-square test for categorical variables and the Mann–Whitney *U* test for continuous variables. Independent variables included gender, age group, employment, level of education, presence of chronic disease, years since diagnosis, distance from the community health centre (CHC), and hypertension knowledge. All analyses were performed using IBM SPSS for Windows (version 23.0). A p-value of <0.05 was considered to be statistically significant. Analysis using logistic regression analysis was performed to identify factors associated with the use of anti-hypertensive medications in traditional medicine users.

5.3.3 Results

Characteristics of participants

Of the 384 rural villagers who participated in this study, 288 (75%) were female, 246 (64.1%) had no formal education or had completed elementary school only, 259 (67.4%) were employed, and 175 (45.1%) were younger than 65 years. The mean age was 65.7 (SD 10.3) years (range: 45-90 years). Most participants ($n=349$, 90.9%) had health insurance; and most ($n=339$, 88.3%) were enrolled in a government health insurance scheme. A history of other chronic diseases (besides hypertension) was reported by 249 (64.8%) participants. Analysis of the participants' hypertension knowledge showed that most had a low level of hypertension knowledge; 325 of 384 participants (84.6%) scored <8 on the knowledge questionnaire (Table 5.9).

Use of traditional medicines and anti-hypertensive medications

Among 384 participants, 263 (68.5%) used traditional medicines intended to lower blood pressure within the preceding 30 days; 129 (49%) reported the use of traditional medicines along with anti-hypertensive medication, and 134 (51%) participants used only traditional medicines. Forty-seven (12.2%) participants had taken neither anti-hypertensive medication nor traditional medicines in the preceding 30 days.

Table 5.9 shows that there were no differences ($p>0.05$) between traditional medicines users and non-users in terms of age, gender, educational level, occupation, distance from the nearest CHC, health insurance status, presence of other chronic diseases, and hypertension knowledge.

Table 5.9 Factors associated with the use of traditional medicines among rural Indonesian people with hypertension (n=384)

Items	Overall n=384 (100%)	Traditional medicine user (within last 30 days)		p value (2-sided)
		Yes n=263 (68.5%)	No n=121 (31.5%)	
Age categories, n (column %)				
<65 years	173 (45.1)	118 (44.9)	55 (45.5)	0.91
≥65 years	211 (54.9)	145 (55.1)	66 (54.5)	
Gender, n (%)				
Female	288 (75)	193 (73.4)	95 (78.5)	0.31
Male	96 (25)	70 (26.6)	26 (21.5)	
Education level, n (column %)				
Less than elementary school	246 (64.1)	171 (65)	75 (62)	0.57
Elementary school or higher	138 (35.9)	92 (35)	46 (38)	
Occupation, n (column %)				
Unemployed	125 (32.6)	79 (30)	46 (38)	0.13
Employed	259 (67.4)	184 (70)	75 (62)	
Distance from the nearest CHC in kms				
Mean (SD)	4.1 (2.3)	4.2 (2.3)	4.1 (2.4)	0.33
Health insurance holder, n (column %)				
Yes	349 (90.9)	239 (90.9)	110 (90.9)	1.0
No	35 (9.1)	24 (9.1)	11 (9.1)	
Presence of other chronic diseases*, n (column%)				
Yes	249 (64.8)	170 (64.6)	79 (65.3)	1.0
No	135 (35.2)	93 (35.4)	42 (34.7)	
Years since diagnosis				
± (SD)	3.9 ± 3.9	3.8 ± 3.7	4.0 ± 4.2	0.61
Hypertension knowledge, n (column %)				
Low, score <8	325 (84.6)	228 (86.7)	97 (80.2)	0.13
High, score ≥8	59 (15.4)	35 (13.3)	24 (19.8)	

Abbreviations: n = number, SD = standard deviation, CHC = community health centre

* Chronic diseases included health practitioner diagnosed diabetes, chronic back pain, arthritis, neurological disorder including stroke, lung disease, renal disease, liver disease, peptic ulcer disease, cancer, allergy and depression.

Table 5.10 Use of anti-hypertensive medications among traditional medicine users and factors predicting their use (n=263)

Variable items	Have you taken any anti-hypertensive medications within preceding 30 days?		Univariate analysis			Multivariate analysis		
	Yes n=129 (49%)	No n=134 (51%)	Odds ratio	95% CI	p value	Odds ratio	95% CI	p value
Age categories, n (row %)								
<65 years	61 (51.7)	57 (48.3)	1.21	0.74-1.97	0.44	NA	NA	NA
≥65 years	68 (46.9)	77 (53.1)	1					
Gender, n (row %)								
Male	43 (61.4)	27 (38.6)	1.98	1.13-3.46	0.02	1.70	0.96-3.03	0.07
Female	86 (44.6)	107 (55.4)	1					
Education level, n (row %)								
Less than elementary school	71 (41.5)	100 (58.5)	1	1.42-4.04	0.001	2.10	1.22-3.58	0.007
Elementary school or higher	58 (63.0)	34 (37.0)	2.40					
Occupation, n (row %)								
Unemployed	40 (50.6)	39 (49.4)	1.10	0.65-1.86	0.74			
Employed	89 (48.4)	95 (51.6)	1					
Distance from the nearest CHC in kms								
Mean ± SD	3.9 ± 2.2	4.5 ± 2.3	1.12	1.01-1.26	0.03	1.09	0.98-1.22	0.13

Variable items	Have you taken any anti-hypertensive medications within preceding 30 days?		Univariate analysis			Multivariate analysis		
	Yes n=129 (49%)	No n=134 (51%)	Odds ratio	95% CI	p value	Odds ratio	95% CI	p value
Health insurance holder, n (row %)								
Yes	115 (48.1)	124 (51.9)	1					
No	14 (58.3)	10 (41.7)	1.39	0.59-3.29	0.46	NA	NA	NA
Years since diagnosis								
Mean $\pm$ (SD)	4.0 $\pm$ 3.8	3.6 $\pm$ 3.7	0.97	0.91-1.03	0.34	NA	NA	NA
Knowledge about hypertension, n (row %)								
Low, score <8	108 (47.4)	120 (52.6)	1					
High, score $\geq$ 8	21 (60.0)	14 (40.0)	1.67	0.81-3.44	0.17	NA	NA	NA
Presence of other chronic diseases[†], n (row %)								
Yes	85 (50.0)	85 (50.0)	1.11	0.67-1.85	0.68	NA	NA	NA
No	44 (47.3)	49 (52.7)						

Abbreviations: n = number, SD = standard deviation, NA = not available, CHC = community health centre

* Chronic diseases included health practitioner diagnosed diabetes, chronic back pain, arthritis, neurological disorder including stroke, lung disease, renal disease, liver disease, peptic ulcer disease, cancer, allergy and depression.

Factors associated with the use of anti-hypertensive medications were assessed in traditional medicine users (n=263). Univariate and multivariate regression logistic analyses showed that, among traditional medicines users, a low educational level was the only factor associated with the use of anti-hypertensive medications (Table 5.10). Participants who had not completed elementary school were 2.1 times more likely to use only traditional medicines and to not take anti-hypertensive medications.

Sixty-seven (25.5%) participants responded that they did not obtain traditional medicines directly but instead received their traditional medicines from their family members or neighbours. The most common places to purchase traditional medicines were local markets (n=169, 44%), *warung* stalls/corner shops (n=44, 11%) located near the participants' home, and pharmacies (n=8, 3%).

Types of traditional medicines used

Herbal medicines: Herbs and herbal materials

One hundred and sixty-three of the 263 (62%) users of traditional medicines reported using cucumber (*Cucumis sativus*), which is traditionally believed to have blood pressure lowering effects (Table 5.11). Participants also reported the use of watermelon (*Citrullus lanatus*; n=137, 35.7%), melon (*Cucumis melo* L.; n=126, 32.7%), celery (*Apium graveolens*), chayote (*Sechium edule*), yam bean (*Pachyrhizus erosus*), achi (*Morinda citrifolia*), and garlic (*Allium sativum*). Participants noted that they did not consume these herbs on a daily basis, but instead they began taking herbs when they perceived that their blood pressure was high (self-diagnosis). The frequency and duration of use depended primarily on their self-perceived need to lower their blood pressure (self-treatment).

Participants also used herbal materials, which were processed simply at home by participants or family members (Table 5.11). They included the use of soursop leaves (*Annona muricata*; n=30, 11.7%), green cincau leaves (*Premna oblongifolia* Merr.), bay leaves (*Eugenia polyantha*), gooseberry leaves (*Physalis angulata* L.), avocado leaves (*Persea americana*), red betel leaves (*Piper crocatum*), and binahong leaves (*Anredera cordifolia*). Some participants cited their specific recipe; for example, 'I put seven soursop leaves into one litre of water and then boil this until the volume is reduced to 1–2 glasses'. The other materials processed traditionally to lower blood pressure were mangosteen skin (*Garcinia mangostana*), mahogany seeds (*Swietenia macrophylla*), kidney tea plants (*Orthosiphon aristatus*), brotowali (*Tinospora cordifolia*) and wild sugarcane (*Saccharum spontaneum*) (Table 5.11). The raw materials for these kinds of herbal medicines were

obtained from the participants' own land (farm, garden, or field), neighbour's land, or the forest near their village.

Among the 263 herbal medicine users, 39 (14.8%) purchased herbal materials (*jamu*) from local markets, herbal shops, or pedlars. The *jamu* pedlars travelled between villages by foot or bicycle in response to the villagers' requests; their *jamu* is called *jamu gendong*, which is provided as a ready-to-drink liquids. These 39 participants could not provide detailed information about the materials used to make the *jamu*.

Herbal medicines: Herbal preparations and finished herbal products.

Only eight participants reported that they purchased manufactured herbal products from pharmacies (Table 5.11). These included Cuka Apel® (apple cider vinegar), Bio Moringa® (an extraction of *Moringa oleifera*, *Annona muricata*, and *Garcinia mangostana*), and Bio Activa® (an extraction of *Oryza sativa glutinosa*, *Saccharum officinarum*, *Curcuma Xanthorrhiza Rhizoma*, *Pandanus amaryllifolius*, *Annona Muricata Folium*, *Nigella sativa semen*, *Syzygium Polyanthum Folium*, *Imperata Radix*, *Allium sativum*, and *Oryza Sativa*).

Other types of traditional medicines

Seven participants reported the traditional use of insects to manage their hypertension, such as Japanese ant ((Hymenoptera: Formicidae; n=4) (Table 5.11). When preparing this traditional medicine, the participants put 1–2 live ants in a glass of hot water, and once the ants had died, they drank the water. All four participants reported obtaining the ants for the first time from a neighbour, after which they bred the ants themselves. The other insects reportedly used were termite nests (n=1) and antlions (Myrmeleontidae; n=2); the antlions were consumed alive.

Table 5.11 Types of traditional medicines self-reportedly used to lower blood pressure among rural Indonesian people with hypertension (n=263)

Types of traditional medicines	Frequency (%)	Part(s) used	Preparation
Herbs and herbal medicines			
Cucumber (<i>Cucumis sativus</i>)	163 (62)	Whole plant	Just eat as a salad; crush and squeeze to get the juice
Watermelon (<i>Citrullus lanatus</i>)	94 (35.7)	Fruit	Just eat as a fruit; drink as a juice
Melon (<i>Cucumis melo</i>)	86 (32.7)	Fruit	Just eat as a fruit; drink as a juice
Soursop l(<i>Annona muricata</i>)	30 (11.7)	Leaves	Boil the leaves, keep cold, and drink
Green cincau (<i>Premna oblongifolia</i> Merr.)	19 (7.4)	Leaves	Crush and squeeze, steep in a bowl of warm water and drink
Celery (<i>Apium graveolens</i>)	16 (6.2)	Leaves, rod	Steep in a glass of hot water, keep cold, and drink
Achi (<i>Morinda citrifolia</i>)	13 (5.1)	Fruit	Just eat the ripe Achi; boil the raw Achi, keep cold, and drink the liquid
Chayote (<i>Sechium edule</i>)	12 (4.7)	Fruit	Drink as a juice
Bay (<i>Eugenia polyantha</i>)	12 (4.7)	Leaves	Steep in a glass of hot water, keep cold, and drink
Gooseberry (<i>Physalis angulata</i>)	7 (2.7)	Leaves	Just eat as a salad
Avocado (<i>Persea americana</i>)	6 (2.3)	Leaves	Boil the leaves, keep cold and drink
Red betel (<i>Piper crocatum</i>)	3 (1.2)	Leaves	Steep in a glass of hot water, keep cold, and drink
Mangosteen (<i>Garcinia mangostana</i>)	3 (1.2)	Skin	Boil the skin, keep warm, and drink
Mahogany (<i>Swietenia macrophylla</i>)	2 (0.8)	Seed	Eat as a pill
Kidney Tea Plants/Java Tea (<i>Orthosiphon aristatus</i>)	2 (0.8)	Leaves	Steep in a glass of hot water, keep cold, and drink
Garlic (<i>Allium sativum</i>)	2 (0.8)		Eat as a salad
Bratawali (<i>Tinospora cordifolia</i>)	1 (0.4)	Leaves	Boil the leaves, keep cold and drink

Types of traditional medicines	Frequency (%)	Part(s) used	Preparation
Glagah (wild sugarcane, <i>Saccharum spontaneum</i>)	1 (0.4)	Leaves, rod	Boil the leaves/rod, keep cold and drink
Binahong l (<i>Anredera cordifolia</i>)	1 (0.4)	Leaves	Boil the leaves, keep cold and drink
Unknown compounds – traditional herbal medicines (<i>jamu</i>)	39 (14.8)		Ready-to-drink, no preparation needed
Herbal preparations and manufactured herbal products			
Bioactiva® (herbal medicines)*	5 (1.9)		N/A
Cuka apel ® (Apple cider vinegar)	1 (0.4)		N/A
Bio Moringa® (<i>Moringa oleifera folium</i> , <i>Annona muricata folium</i> , and <i>Garcinia mangostana pericarpium</i>)	2 (0.8)		N/A
Other traditional medicines			
Japanese ant	4 (1.6)	Whole body	Steep in a glass of hot water, and eat once the ants have died
Antlions (Myrmeleontidae)	2 (0.8)	Whole body	N/A (eat alive)
Termite nest	1 (0.4)	Nest	Boil the nest, keep warm, and drink the liquid

* herbal medicines, as liquid, the ingredients of Bioactiva®: *Oryza sativa glutinosa*, *Saccharum officinarum*, *Curcuma xanthorrhiza rhizoma*, *Pandanus amaryllifolius*, *Annona muricata folium*, *Nigella sativa semen*, *Syzygium polyanthum folium*, *Imperata radix*, *Allium sativum*, *Oryza sativa*.

5.3.4 Discussion

This study shown that people in rural underdeveloped areas use traditional medicines to lower blood pressure more frequently than they use anti-hypertensive medications. The proportion of users of traditional medicines in this study is higher than that reported among people with hypertension in other community-based surveys in Uganda (Nuwaha & Musinguzi 2013), South Africa (Hughes et al. 2013), and Nigeria (Osamor & Owumi 2010).

The perception that the use of traditional medicines only is sufficient to control blood pressure may provide patients a greater sense of control over their healthcare decisions (Sarahroodi 2012). Previous studies have identified that patients' belief about the efficacy and safety of natural products, ease of access, lower cost, recommendations from family members/peers, and the fact that traditional medicines are culturally acceptable, are the major reasons for the use of traditional medicines (Nuwaha & Musinguzi 2013; World Health Organization 2013b). The tendency to self-medicate with traditional medicines is also related to the fear of adverse effects from long-term use of anti-hypertensive medications (Marshall, Wolfe & McKevitt 2012; Rahmawati & Bajorek 2016), which leads to poor medication adherence (Krousel-Wood et al. 2004). In this study, a substantial proportion of participants used only traditional medicines to lower their high blood pressure, particularly those with a low educational level. Given that such patients usually also have a low level of health literacy (van der Heide et al. 2013), any interventions should be communicated and delivered appropriately (Sheridan et al. 2011).

The consumption of cucumber, watermelon, and melon as a kind of 'medicine' to lower blood pressure found in this study has been reported in other rural communities in Indonesia (Basuki et al. 2004) and Palestine (Ali-Shtayeh et al. 2013). Extracts of cucumber (Shah et al. 2013) and watermelon (Massa et al. 2016) may have potential as anti-hypertensive agents; however, the evidence from clinical practice is weak. Similar to previous studies (Ali-Shtayeh et al. 2013; Basuki et al. 2004), this study classified these fruit/vegetables as herbs because they were not consumed as part of the daily diet but instead were consumed with the intention of lowering blood pressure and were expected to provide an immediate blood pressure-lowering effect. This practice differs from the dietary recommendation to eat more fruit/vegetables as listed in the Dietary Approaches to Stop Hypertension (Chen, Maruthur & Appel 2010; Moore et al. 2001), which recommends long-term dietary changes for the control of hypertension (Sacks et al. 2001). Indeed, even though lifestyle measures are known to improve blood pressure control in patients with pre-hypertension and for

those with low cardiovascular risk (Moore et al. 2001; Sacks et al. 2001), most patients with hypertension need anti-hypertensive medications to achieve their blood pressure target (Chobanian et al. 2003).

Herbs and herbal materials were commonly used by the rural villagers in this study to manage their hypertension. Although the anti-hypertensive properties of some herbs have been acknowledged (Coria-Téllez et al. ; Nwokocha et al. 2012; Sundari, Amalia & Ekawidyani 2014), evidence is lacking regarding their efficacy and safety in practice (Coria-Téllez et al. ; World Health Organization 2013b). For example, the reported microbial contamination in Indonesian *jamu gendong* suggests poor standards of hygiene in the preparation process (Limyati & Juniar 1998). Despite the implementation of the Indonesian national policy on traditional medicine use in 2007, the scope of safety evaluation and registration does not cover homemade herbal medicines and *jamu gendong* (World Health Organization Regional Office for South East Asia). Given the question about the safety use of traditional medicines, it is important that healthcare workers inquire about the use of traditional medicines during patient encounters. Patients must be informed that a ‘natural’ product might have potentially harmful hidden ingredients. For example, the use of Japanese ants, as also reported in this study, has become popular in Indonesia in recent years (*Semut Jepang, serangga yang bisa menyembuhkan penyakit?* 2016), although there are no data regarding the effects on health. Encouraging patients to disclose their use of traditional medicine will help health professionals understand their patients’ views, assess the potential risks of traditional medicine use, and help patients to be more informed about their choice of treatment.

This study has some limitations. The results of this study should be understood in the context of the inclusion of participants from underdeveloped areas in rural settings in one district in Indonesia, and any generalisations should be made cautiously. Our methods for reporting and categorising traditional medicine use may be subject to issues relating to the self-reporting method. Another limitation is the lack of specific probing questions about why patients took traditional medicines. Despite these limitations, the findings provide valuable information about the use of traditional medicines among rural people with hypertension that need to be addressed by the healthcare system.

5.3.5 Conclusion

This study found that rural villagers used traditional medicines more often than anti-hypertensive medicine to lower blood pressure. Herbs and homemade herbal materials were

commonly used as primary ways to manage blood pressure. Healthcare workers in rural areas should improve their awareness of the use of traditional medicines and how it might affect hypertension management particularly among patients with low educational level.

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Chapter 6:

Lay perspectives on the use of anti-hypertensive medications

6.1 Perspectives on anti-hypertensive medication: A qualitative study in a rural Yogyakarta Province in Indonesia

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ORIGINAL RESEARCH ARTICLE

Perspectives on antihypertensive medication: a qualitative study in a rural Yogyakarta province in Indonesia

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Abstract

Aim Patients' perceptions and beliefs underpin their adherence to pharmacotherapeutic regimens and are influenced by access to appropriate information and education. This study explores the perceptions of lay persons from a low-resource community in Indonesia regarding antihypertension medication.

Methodology Individual, semi-structured interviews were conducted, transcribed and thematically analysed. Fourteen respondents (i.e. older persons with hypertension and lay health workers) from a local community-based health programme in Yogyakarta province (Indonesia) were recruited for this qualitative study.

Results Four themes emerged: (1) participants felt that medication for hypertension is unnecessary, instead preferring lifestyle changes and traditional medicines; (2) a

and (4) although lay health workers had an opportunity to provide information about hypertension and its management, participants themselves considered this to be currently inadequate.

Conclusion Some misconceptions regarding the role of antihypertension medication that negatively influenced adherence were identified. Beliefs that hypertension can be easily treated by lifestyle modifications can undermine motivation to take antihypertensive agents. Participants expressed their need for more targeted information about hypertension and its treatment; however, they do not expect to obtain such information from their physician. The potential role of lay health workers needs to be further explored as a strategy to enhance understanding and adherence.

Abstract

Introduction: Patients' perceptions and beliefs underpin their adherence to pharmacotherapeutic regimens and are influenced by access to appropriate information and education. This study explores the perceptions about anti-hypertensive medication of lay persons from a low-resource community in Indonesia.

Methods: Individual, semi-structured interviews were conducted, transcribed and thematically analysed. Fourteen respondents (i.e. older persons with hypertension and lay health workers) from a local community-based health program in Yogyakarta province (Indonesia) were recruited for this qualitative study.

Results: Four themes emerged: 1) Participants felt that medication for hypertension is unnecessary, instead preferring lifestyle changes and traditional medicines; 2) A fear of becoming dependent on medication underpinned non-adherence to anti-hypertensive agents; participants with hypertension wanted to achieve normal blood pressure but without taking long-term medication; 3) Symptom-based drivers for treatment led participants to rank other health problems a higher priority than hypertension; 4) Although lay health workers had an opportunity to provide information about hypertension and its management, participants themselves considered this to be currently inadequate.

Conclusion: Some misconceptions regarding the role of anti-hypertensive medication that negatively influenced adherence were identified. Beliefs that hypertension can be easily treated by lifestyle modifications can undermine motivation to take anti-hypertensive agents. Participants expressed their need for more targeted information about hypertension and its treatment; however, they do not expect to obtain such information from their physician. The potential role of lay health workers needs to be further explored as a strategy to enhance understanding and adherence.

Keywords: Hypertension, adherence, patient perspectives, lay health workers

6.1.1 Introduction

Adherence to prescribed anti-hypertensive agents and appropriate lifestyle changes are keys to the effective management of hypertension in all communities (Burnier 2006; DiMatteo et al. 2002; Krousel-Wood et al. 2004). Unfortunately, poor adherence to medication regimens is a pervasive problem in the treatment of hypertension (Dennis et al. 2011; Gohar et al. 2008; Vinker et al. 2008). In Indonesia, a study involving 1,814

hypertensive adult patients reported that more than one third of patients did not take their anti-hypertensive medication (Setiati & Sutrisna 2005). The complex reasons for non-adherence include factors related to the patients themselves, the health condition, the treatments, and the health system (Bremner 2002; Caro et al. 1999; Osterberg & Blaschke 2005). Therefore, improving adherence to long-term medication requires multiple approaches such as improving patients' recognition of non-adherence, increasing awareness of the factors contributing to non-adherence, and enlisting social support (Haynes, McDonald & Garg 2002).

Patients' beliefs regarding their illness and their knowledge about their medicines significantly affect medication non-adherence (Horne & Weinman 1999; Ross, Walker & MacLeod 2004) and these may be influenced by the local culture (Horne et al. 2004) and access to appropriate information (Alhewiti 2014). For example, a study in Indonesia has shown that some patients believe that it is appropriate to stop taking a medication when feeling better or feeling worse, leading to non-adherence to tuberculosis treatment (Widjanarko et al. 2009). Such factors are particularly prevalent in certain settings, such as those with strong local cultures and/or poor access to health service e.g. rural communities. In some low resource settings, community-based programs run by lay health workers (LHWs) have been reported to address local health needs, including providing support for patients with hypertension (Brownstein et al. 2007; Lehmann & Sanders 2007; Rosenthal et al. 2010) and access to information. Although previous studies have explored how patients' perceptions regarding hypertension medication (Marshall, Wolfe & McKevitt 2012), further information is needed to understand how any misperceptions can be addressed in a targeted way via LHW-based programs. This study, therefore, aimed to explore the perspectives of members of a LHW-based program (i.e. persons with hypertension participating in the support program) in a rural area in Yogyakarta Province (Indonesia) as well as the perspectives of the LHWs in Indonesia, regarding hypertension medication. Addressing their perspectives might aid the improvement of hypertension programs that involve LHWs to better support local patient populations.

6.1.2 Methods

Study design

A qualitative study comprising semi-structured interviews was conducted in a local community-based health program (Integrated Health Service Post for the Elderly/IHSP-Elderly) in the Bantul district, a rural district in Yogyakarta province, Indonesia.

Recruitment of participants

A list of sites (comprising 861 IHSP-Elderly, spread across 27 community health centres in the Bantul district, Yogyakarta province) was utilised as the sampling frame (Bantul District Government 2012). In the first instance, one community health centre was randomly selected using an online number generator. Second, as there were 71 IHSP-Elderly within the selected community health centre, one IHSP-Elderly was similarly randomly selected.

Within the selected IHSP-Elderly there were two groups of respondents (Figure 6.1). The inclusion criteria were:

1. Participants (i.e. member of the IHSP-Elderly): persons aged 60 years and older, diagnosed with hypertension (systolic blood pressure 140 mmHg or higher/diastolic blood pressure 90 mmHg or higher) based on IHSP-Elderly records, had been members of the local IHSP-Elderly for at least one year.
2. Lay Health Workers (LHWs): local residents who had served as volunteer workers of community-based programs in IHSP-Elderly for at least three years.

Lay health workers in the IHSP-Elderly worked as volunteers with responsibility for approximately 70 older persons. In the study, they helped to prepare a list of participants who fulfilled the inclusion criteria (potential participants), and also promoted the study to the participants (i.e. members). All eligible members were invited to take part in the study. Considering the scope of the study, the amount of information per participants, and participants' homogeneity, an estimated 8-10 participants was initially sought to achieve theme saturation, based on requirements for this type of qualitative method (Morse 2000; Sandelowski 1995). Theme saturation was attained after interviewing 11 members of the IHSP-Elderly.

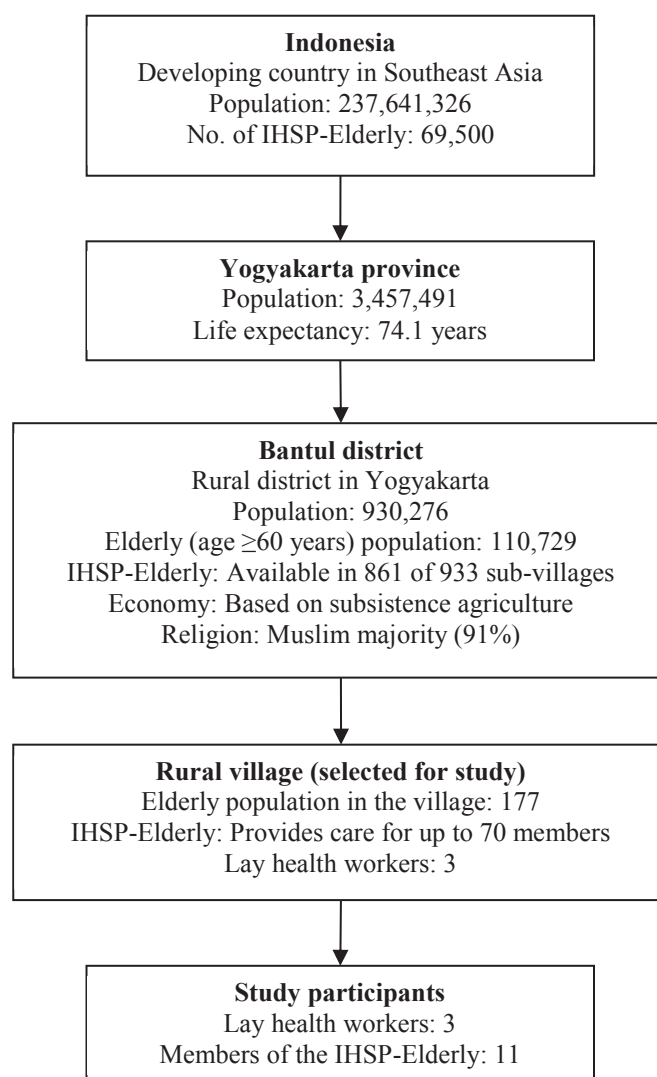


Figure 6.1 Scheme of Indonesian population and study sample – IHSP-Elderly Integrated Health Service Posts for the Elderly

Ethical consideration

Approval to conduct the study was obtained from the local government, authorised in providing approval for conducting research studies. It was an independent administrative process, which involved reviewing the study protocol and other supporting documents. The study was not commenced before obtaining the approval. All participants were informed about the study and were required to provide consent to participate in the study. No participants received financial reward for their interview.

Data collection and analysis

Data were collected through in-depth interviews. The interviews were conducted by the lead researcher, using an interview guide that was designed to elicit participants' perspectives via open-ended questions and probes to trigger discussion. The questions were developed based on previous studies exploring medication-taking behaviour in hypertension patients (Anthony et al. 2012; Ogedegbe et al. 2003). For the convenience of the participants, the interviews were undertaken at an IHSP-Elderly meeting venue.

Interviews were audio-recorded and transcribed verbatim in the local language (Javanese or Indonesian). The lead researcher translated each transcript from the local language into English. An external independent translator verified the accuracy of the translation. All transcripts were subsequently analysed using thematic analysis via manual inductive coding. Once the initial themes were elicited, they were independently reviewed by the co-researcher. Each theme was supported by using the participants' quotes. To ensure validity of the analysis, the final themes were fed-back to selected participants. Interviews were conducted until theme saturation was reached, that is, no new themes emerged.

Table 6.1 Characteristics of respondents

Characteristic	Respondent group (no. of respondents)	
	IHSP-Elderly members (11)	Community health workers (3)
Mean age (years) [SD]	69.8 [9.2]	55.7 [14.5]
Ratio of female: male [%]	8 : 3 (73 : 27)	2 : 1 (67: 33)
Education (no.) [%]		
Less than primary school	6 [55]	
Primary school	2 [18]	
High school	3 [27]	3 [100]
University		
Mean blood pressure (mmHg) [SD]		
Systolic	165.5 [15.1]	NA
Diastolic	94.5 [5.2]	NA

Abbreviations: IHSP-Elderly = Integrated Health Service Post for the Elderly, NA = not applicable, SD = standard deviation.

6.1.3 Results

Eleven members of the IHSP-Elderly with hypertension and three LHWs participated in the study (Table 6.1).

Four key themes were identified: (i) Misconceptions about hypertension and the role of medication; (ii) fear of dependence on medication underpin non-adherence; (iii) symptom-based drivers for treatment; and (iv) inadequate information on hypertension medication.

Misunderstanding of hypertension and the role of medication

Regarding the cause of hypertension, participants and LHWs in this study believed that hypertension was more likely to be associated with diet and lifestyle factors. They acknowledged the relationship between hypertension and food consumption (particularly salty and unhealthy food, and a high meat intake), heavy workload and stress:

I consumed a lot of lamb last month. Actually, I was afraid my blood pressure would increase because of that. (Member)

I realized that at that time I was very tired and had many things to manage. My blood pressure was 180; it was usually only 140. I believe that by taking a rest, my blood pressure will go back to normal. (Member)

I am amazed at how many people, not only the elderly, suffer from hypertension. I think it is because they cannot stay relaxed, and the food, you know, salty, oily, there are so many kinds of unhealthy food surrounding them. (LHW)

These beliefs were reinforced by the advice received from LHWs regarding how to deal with diet and stress:

She [LHW] asked me to be more patient. That's a good thing. I want to have normal blood pressure. (Member)

Usually, I tell them not to worry, not to get angry and to be active in IHSC-Elderly because they can laugh together. It releases the stress. (LHW)

LHWs told me to reduce salty and oily food. (Member)

This in turn affected participants' willingness to take medicines. Although participants were aware that they had hypertension, some of them decided not to consume anti-hypertensive agents as a way to lower their blood pressure, preferring lifestyle changes instead.

No, I didn't take any medicine at all. I only need to drink a glass of hot water. It made me sweaty and then I felt better. (Member)

I never take medicines for high blood pressure. I didn't do anything except come here [IHSP-Elderly] to find out my blood pressure level. In case it is high, I will be more conscious of my diet. (Member)

I prefer drinking herbal remedies. I just asked the seller to give me 'healthy herbal', and they would mix some ingredients and serve it in a glass. I do not know what the ingredients are, but at least all of them are natural, not harmful to my body. (Member)

Using complementary medicine to reduce blood pressure was believed to be safer than using conventional medicine. Furthermore, some participants also reported purposefully consuming several foods which they believed could lower blood pressure, such as Jamaican strawberries, cucumbers, and watermelons.

Fear of dependence on medication as a driver for non-adherence

The participants believed that long-term medication was not a safe option. They assumed that consuming anti-hypertensive medication regularly would cause them to become dependent, leading to negative effects:

I don't want to depend on medicine; as we know, it is a kind of poison. (Member)

Actually, I don't want to depend on medication, but the doctor has asked me to consume anti-hypertension medication routinely. Should I do it? (Member)

Those IHSP-Elderly members who also utilized other standard healthcare services reported that they generally received their medication supplies from a health provider (e.g. physician or nurse), with each supply lasting for 4–10 days only. Once the medication was initiated and provided by a health provider, participants reported that they adhered to the instructions (dosage, frequency and schedule) but intended to stop consuming the medicine once the supply ran out. Participants tended to adhere to short-term medication use, initiating their own 'drug holidays'.

I got medication for ten days, and then after it ran out, I just maintained my healthy diet until the check-up date the next month. I think it's better for me. I will not consume too much medicine. (Member)

Symptom-based drivers for treatment

Most of the participants could not define exactly when they were diagnosed with hypertension, although some participants mentioned they had been diagnosed with

hypertension for more than five years. Participants stated that they could not tell when they first had high blood pressure because they did not experience any symptoms.

No symptoms at all, that's exactly no symptoms. I cannot determine when the blood pressure rises. (Member)

I surrender to God; there was no symptom, no headache. (Member)

Eight years ago, I got information from a midwife that hypertension without a symptom was dangerous. She told me about the risk of stroke. I didn't really understand her explanation. She tried to scare me; however, I didn't feel anything wrong with me. So, I don't really care. I sincerely resign my condition to God. (Member)

When discussing medicines for illness, the vast majority of participants were able to describe the symptoms (especially pain) associated with other conditions and how this affected their quality of life. It was apparent that the presence of symptoms affected the patient's motivation to seek therapy for their illness.

Did I take medicine? Yes I did, for my low back pain. It's really disturbing. I have tried to take a lot of medicines. They were from the health staff in the community health centre, private doctors, pharmacies and groceries. The pain would be relieved after medication but it returned again and again. For the last two days, I didn't take any chemical medicine. Two days ago, I took herbal medicine. It also relieved my pain significantly, but unfortunately it was not long lasting. It is usually just for 3–4 days, and then I will suffer from pain again. (Member)

The participants in this study seemed to be more likely to use medication for pain because they could easily assess its efficacy based on symptom reduction. In contrast, they tended to minimise the use of *chemical* medication for hypertension and instead considered other options such as lifestyle changes and complementary medicine.

It's not the usual back pain, it's very painful. My friend gave me these medicines [dexamethasone 0.5 mg and piroxicam 10 mg]. I have taken these medicines for more than a year. They were really helpful. When I took them before going to sleep, I felt much better in the morning. I could walk without severe pain. I am still taking these medications: two of this [dexamethasone] and one of this [piroxicam]. My friend even takes three of this [dexamethasone]. (Member)

Pain (as a particular symptomatic complaint) was regarded by participants as a chronic condition rather than an acute one, and as such they were happy to take medication indefinitely. Participants were prepared to use medication when effectiveness could be tangibly ascertained, that is, when the pain symptoms decreased. In the above case, the patient self-medicated because she felt that the analgesics worked well, and so continued

to take them long-term, even though there was a possibility of side effects (based on our observation, the participant already displayed visible side effects from steroid use).

Inadequate information on hypertension medication

A number of patients reported that they had obtained anti-hypertensive agents from health providers. When they visited health providers to manage other symptoms, they obtained more than one type of medicine and were unable to recognise which was the anti-hypertensive agent:

I am not sure what the medicine was. I just took it as the doctor prescribed. It was for four days and now it has run out. I don't take any medicine anymore now. (Member)

I am not sure. At that time, the doctor might have given me medication for hypertension, I don't know. I took them for a week. For the last year I only consumed medicine for pain routinely [dexamethasone and piroxicam]. When it would almost run out, my daughter would buy it in the pharmacy. (Member)

I don't know. The doctor gave me three different pills and he didn't tell me which one was the anti-hypertensive agent. (Member)

Some participants, however, accepted the lack of information from the doctor as *normal* because they understood the doctor's heavy workload:

No, I didn't want to ask more. I was ashamed to ask many questions; the doctor was very busy, and there was a long queue behind me. It would annoy the other patients. (Member)

They also reported receiving limited information from the LHWs, and that the information provided seemed to focus only on blood pressure readings, without further explanation about how this connected to their medicines or other management. Most participants confirmed the need for more detailed information and follow-up for their hypertension.

No she didn't. She [the LHW] didn't say anything. She just said that my blood pressure was high, that's it. (Member)

I wish they [LHWs] had given me more advice, because you know, I am not an educated person. (Member)

No, they [LHWs] didn't tell me anything; there was no advice. I need more suggestions actually. (Member)

They [LHWs] should be smarter than us, so they can give us solutions when we have health problems. (Member)

Lay health workers themselves said that they had tried to motivate participants to use hypertension medicines effectively, but emphasised lifestyle changes more so than medication use. LHWs based this advice on the information they received during their own training (as provided by the community health centre) as well information that they had self-sourced.

I usually advise them [members with hypertension] to stay relaxed and be conscious of their diets. I also motivate them to come routinely to IHSP-Elderly for physical exercise. (LHW)

I read magazines or leaflets and other resources to add to my knowledge on health problems of the elderly, and then I will give the information to the elderly. (LHW)

The speaker in the training for LHWs said to us, 'Grandmas, you should not be angry, one minute anger means one year of wasting time.' He reminded us to always keep our minds peaceful. I shared this knowledge with the elderly in IHSP-Elderly. I reminded them to be more patient. (LHW)

6.1.4 Discussion

Despite the known effects of anti-hypertensive agents in reducing cardiovascular complications, this study revealed that some participants perceived medication to be unnecessary. This aligns with previous findings in Indonesian adult population that 37.2% of hypertensive patients did not take any medication (Setiati & Sutrisna 2005). A person's understanding about hypertension is interconnected with their beliefs about the necessity for medication (Ross, Walker & MacLeod 2004); misconceptions about the role of medication appear to be related to patients' perceptions that hypertension can be easily controlled by lifestyle changes alone.

Participants' expressed fears about medication dependence are concerning, since they appear to underpin their discontinuation of medication, supporting the findings from previous studies (Gascón et al. 2004; McBane & Halstater 2011). Moreover, in considering the cultural background of participants in this study, previous research has shown that patients with an Asian background are more likely to have negative views about medication use, compared to patients with a European background, based on their perceptions about the dangers of medicines (Horne et al. 2004). Patients appear to formulate their own views about "chemical medicines", develop personal strategies to minimize the amount of medication taken, and eventually stop using their prescribed treatments (Pound et al. 2005). Patients additionally prefer other treatment options, such as lifestyle modification and traditional medicine (Bane et al. 2007; Gascón et al. 2004), to minimize their intake of conventional medicine.

Patients with comorbidities tend to place lower priority on the management of hypertension than on their other diseases (Fix et al. 2014; Perkovic et al. 2007) because a diagnosis of high blood pressure is not frightening for them (Gascón et al. 2004). As highlighted in this study, participants are more likely to prioritize the use of medication for reducing pain because it is highly symptomatic. The presence and severity of symptoms are associated with patients' beliefs about the need for medication and their decision to take it (DiMatteo, Haskard & Williams 2007). Difficulties in assessing the effectiveness of the therapy, combined with the potential for medication side effects, are important barriers to patients' motivation to take anti-hypertensive agents (Bremner 2002; Osterberg & Blaschke 2005).

This study identifies the need for participants to be given more targeted information about hypertension while at the same time revealing participants' acceptance of the lack of information from health providers. In developing countries the lack of time for patient-doctor consultations, due to the heavy patient loads, seems to be widespread (Claramita et al. 2011; Gascón et al. 2004; Ibrahim & Damasceno 2012). Furthermore, patients in Indonesia, especially those in the low-education group, feel relatively powerless during consultations with doctors, creating a barrier to effective communication and information exchange (Claramita et al. 2013). Thus, there is limited opportunity to discuss the proposed treatment plan and educate patients to facilitate adherence to treatment. Ethnic differences in attitudes toward medicine-taking have also been considered in a study of the New Zealand population (Bassett-Clarke, Krass & Bajorek 2012), reporting that Asian patients were less likely to discuss their medicines with the doctor than European patients. There is a need for health care providers to become more cognisant of the views and beliefs that underpin their patients' low adherence to medication, as well as address patients' concerns about management hypertension and the specific role of medication (Bane et al. 2007; Harmon, Lefante & Krousel-Wood 2006). The role of the community pharmacist, therefore, is central to provide appropriate medicines information and to support patients in their overall adherence to therapy. Previous studies have shown that community pharmacist-led services can significantly improve anti-hypertensive medication adherence (Fikri-Benbrahim et al. 2013; Morgado et al. 2011).

The potential role of LHWs in supporting the management of hypertension in low resource communities has been previously recognized (Brownstein et al. 2007; Lehmann & Sanders 2007; Rosenthal et al. 2010). Considering the long-term nature of hypertension treatment, LHWs can assist in liaising between the local community and health service providers (Foster et al. 2007). They also have relatively more time to engage with patients, compared

to other health professionals, to provide education and counselling (Brownstein et al. 2007), as identified by the participants in our study. However, the LHWs' own limited knowledge of medicines and hypertension therapy may be an obstacle, and needs to be addressed to realise these opportunities. A study in South Africa showed that appropriate training at LHWs can be cost-effective (Gaziano et al. 2014). Further, clinical trials using LHWs trained in hypertension care have demonstrated positive findings in enhancing medical follow-up visits (Krieger et al. 1999) and improving blood pressure control (Brownstein et al. 2005; Brownstein et al. 2007). Collectively, this suggests the need for better policy support and accompanying resources to enhance the contribution and role of LHWs in practice, particularly for chronic diseases (such as hypertension) where patient perceptions need to be addressed in a targeted and culturally appropriate way (Lehmann & Sanders 2007). Health system policies should more specifically consider the role of LHWs, and optimise their contribution to patient care enable through the provision of targeted training and supervision, and allocation of appropriate resources (e.g. calibrated sphygmomanometers for blood pressure checks). Training for LHWs should be developed to enrich their knowledge on hypertension and the medications used, and to improve their communication skills (specifically in supporting behavioural change), technical skills (e.g. accurate blood pressure measurement), and referral skills (access to appropriate health care services) (Han, Kim & Kim 2007).

Limitations

As this qualitative study was conducted in one district with a relatively small sample, the results might not be representative of the broader Indonesian population. However, since the Bantul district is a typical district in Indonesia (socio-economically), the findings of this study provide insights into lay people's understandings about hypertension medication and the potential role of LHWs in supporting hypertension programs in other settings with similar social contexts.

6.1.5 Conclusion

Some misconceptions regarding the role of anti-hypertension medication that negatively influenced adherence were identified. Beliefs that hypertension can be easily treated by lifestyle modifications can undermine motivation to take anti-hypertensive agents. Participants expressed their need for more targeted information about hypertension and its treatment; however, they do not expect to obtain such information from their physician.

The potential role of lay health workers needs to be further explored as a strategy to enhance understanding and adherence.

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6.2 Understanding untreated hypertension from patients' point of view: A qualitative study in rural Yogyakarta province, Indonesia

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Article

Understanding untreated hypertension from patients' point of view: A qualitative study in rural Yogyakarta province, Indonesia

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Abstract
Objectives: This study aimed to explore perspectives about hypertension from patients who do not take anti-hypertensive medications. Factors that shape their perspectives as well as patients' expectations were also canvassed.
Method: Individual, face-to-face interviews were conducted with 30 people (≥ 45 years old) living in rural villages, diagnosed with hypertension, who had not taken any anti-hypertensive medications for at least one year. Interviews were audiotaped, transcribed verbatim and thematically analysed.
Results: Four themes emerged: (1) alternative medicines for managing high blood pressure; (2) accessing health care services; (3) the need for anti-hypertensive medications; and (4) existing support and patients' expectations. Reluctance to take anti-hypertensive medications was influenced by patients' beliefs in personal health threats and the effectiveness of anti-hypertensive medications, high self-efficacy for taking alternative medicines, the lack of recommendation regarding hypertension treatment, and barriers to accessing supplies of medicines.
Conclusion: Despite their awareness of being diagnosed with hypertension, patients undervalued visiting a health professional to control their high blood pressure. Health strategies need to consider patients' beliefs, concerns and expectations. Providing an accessible, affordable and adequate supply of hypertension medication is also key to any programs designed to optimise hypertension management.



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Keywords: Hypertension, health belief, Indonesia, adherence, self-management

6.2.1 Introduction

It is estimated that the number of people with hypertension worldwide will increase to 1.7 billion in 2025 (Kearney et al. 2005). Despite the availability and effectiveness of anti-hypertensive medications in achieving blood pressure control, a substantial number of patients do not take their medications as prescribed (Elliott 2008; Lehane & McCarthy 2007). A recent systematic review showed that 25 – 65% patients were non-adherent to anti-hypertensive medications (Nielsen et al. 2017).

Patients' beliefs are important determinants of adherence to a medication plan (Chummun & Boland 2013; Horne & Weinman 1999). Given poor adherence is the key barrier to the

optimal management of hypertension (Elliott 2008; Krousel-Wood et al. 2004), understanding patients' perspectives might provide useful insights for developing effective strategies for hypertension management. For example, interviews with patients in Malaysia, another developing country in South-East Asia, revealed that experiencing side-effects was the most common reason for poor adherence to anti-hypertensive medication and those patients expected that healthcare professionals would spend more time explaining the possible side-effect (Shima, Farizah & Majid 2014). A systematic review has reported patients' perceptions on hypertension and anti-hypertensive medications (Marshall, Wolfe & McKevitt 2012), but few studies have included rural people in developing countries. In Indonesia, where only 5-25% of adult patients with hypertension reported having received anti-hypertensive medications (Hussain, Al Mamun, Reid, et al. 2016; Sohn 2015), studies explaining patients' perspectives are scarce. This study, therefore, aimed to explore perspectives on untreated hypertension from the patients' point of view. The objectives of this study were to explore how rural villagers in Yogyakarta province, Indonesia, deal with their high blood pressure without anti-hypertensive medications, to identify the factors that influence these people's perceptions, and to canvas their views about factors that may help them achieve blood pressure control.

6.2.2 Method

Design and setting

A qualitative study, based on face-to-face semi-structured interviews was conducted between August and November 2015. People living rural villages in the Bantul district, Yogyakarta, Indonesia, were recruited. Community health workers in the villages helped to distribute an invitation letter. The data were collected as a part of larger study exploring medication-taking practices among people with hypertension in a rural Indonesian population.

Ethics approval

Ethics approval was obtained from the Human Research Ethics Committee of the University of Technology Sydney Australia (Ref No. 2014000647). Approval was also granted by the Bantul District government (Indonesia) responsible for approval to conduct such studies (Ref No. 070/Reg/0558/S3/2015).

Participant recruitment

Participants were recruited if they lived in the selected rural villages, were aged ≥ 45 years, had been diagnosed with hypertension by a healthcare professional or were currently taking anti-hypertensive medications. For this qualitative study, participants who had been diagnosed with hypertension for >1 year but had not taken any anti-hypertensive medications within the preceding year were selected to be interviewed. An estimated 30 participants were determined based on literature regarding the number of participants needed to achieve theme saturation (Trotter 2012).

Data collection

Individual face-to-face interviews were conducted by the lead researcher (RR) in the Bahasa Indonesia language (or the local language). The time and place were determined according to each patient's preference so as to provide a conducive and comfortable environment for interviews. Detailed information about the study was provided to participants before obtaining their informed consent to participate. Reflecting the predetermined study objectives, the purpose-designed interview guide covered the following aspects: how participants manage their high blood pressure, what factors influence their treatment choices (including why they did not take anti-hypertensive medication), and what support they required to help them manage hypertension. The open-ended questions and probes were developed after a review of the relevant literature (Connell, McKevitt & Wolfe 2005; Gascón et al. 2004; Rahmawati & Bajorek 2016). The structure of the interview guide was intentionally not determined within an existing theoretical framework, and a pragmatic approach oriented around real-world practice was used instead. This allowed the researchers to explore the interplay between patients' knowledge, actions, and expectations (Creswell 2013). During the interviews, participants were encouraged to share their views, knowledge and experiences of hypertension treatment. Interviews were conducted until theme saturation was attained.

Data analysis

Interviews were audio-taped and transcribed verbatim. To facilitate inter-researcher reliability, transcripts were translated into English by an external translator and the translation was confirmed by the bilingual lead researcher (RR). The participants' responses were thematically analysed using manual inductive coding to ensure that the process was grounded in the data rather than an established analytic framework (Bradley, Curry & Devers 2007). The analysis comprised identifying the cues or patterns of response

in each transcript, coding preliminary categories based on the responses and then developing the themes. The emerging themes were identified independently by two researchers. Consensus was reached by discussion with the co-researcher (BB). After reviewing the themes and comparing them with established frameworks on medication taking behaviour, both researchers agreed with the need for further analysis using the health belief model (Glanz, Rimer & Viswanath 2008; Rosenstock, Strecher & Becker 1988) to understand factors that influenced patients' decisions for not taking anti-hypertensive medications (Table 6.2). Respondent validation subsequently was sought from selected participants (Trotter 2012).

Table 6.2 The health belief model applied for understanding patients' decisions for not taking anti-hypertensive medications

Constructs	Application to Indonesian patients
Perceived susceptibility	Patients' belief about the likelihood of developing hypertension
Perceived severity	Patients' belief about the seriousness of hypertension
Perceived benefits	Patients' belief in the efficacy of anti-hypertensive medication
Perceived barriers	Patients' belief about the barriers to obtaining hypertension medication
Self-efficacy	Patients' confidence in their ability to manage hypertension
Cues to action	Triggers for prompting actions

6.2.3 Results

Thirty participants (27 women) were interviewed (mean age 65 years, range 50–80 years). Most participants (80%) had not completed elementary school. The mean time since the hypertension was diagnosed was 4.6 years (range 1–20 years).

Themes

Data saturation (i.e. no new information was gained) was achieved after the twenty-third participant. However, as the further seven participants had been invited and agreed to participate, all 30 participants were included.

The analysis identified four key themes:

1. Alternative medicines for managing high blood pressure
2. Accessing healthcare services

3. The need for anti-hypertensive medications
4. Existing support and patients' expectations

Alternative medicines for managing high blood pressure

The participants were generally not familiar with the term 'hypertension' and referred to hypertension as 'blood' or 'tension' (equivalent Indonesian terms). When asked the question 'What kind of medicines can be used for lowering blood pressure?', most participants cited consumption fruit or vegetables as their primary way of lowering blood pressure.

So, in my case, if my blood pressure is high after being checked, I usually eat cucumber, watermelon ... Since I know that my blood pressure is high, I eat those things regularly. (P 17)

I will simply eat the melons. With cucumbers, I have a feeling of a full stomach if I eat them raw, so I grate the flesh and drink the juice. (P 23)

The other personal strategies considered by participants to lower blood pressure were dietary restrictions (i.e. limiting consumption of salty food, mutton, coffee), taking traditional herbal medicines, managing stress, and reducing symptoms with over-the-counter medicines (Table 6.3).

Some participants conveyed their reliance on their personal strategies and perceived such strategies to be effective in lowering blood pressure.

Yes, it works. My blood pressure reading used to be around 170 [mmHg], and after consuming melons and cucumbers, my blood pressure never exceeds 150 [mmHg]. I believe that people have their own remedies ... I can handle my own issues, and so far I've managed to keep my blood pressure controlled. (P 04)

I believe we can cure it [hypertension]. I've seen this for myself; my blood pressure decreased considerably when I drank steeped avocado leaves. (P 07)

However, not everyone considered their alternative approaches to be effective strategies.

I sometimes make juice from grated carrots, eat some cucumber or melons to help me lower my blood pressure, but ... nothing has changed ... The blood pressure reading still hovers somewhere between 150 and 160 [mmHg]. (P 13)

Most participants would moderate their use of these strategies when they felt symptoms that they perceived to be related to hypertension (self-diagnosis), or soon after having their

blood pressure measured. These participants perceived hypertension to be an episodic disease with evident symptoms.

I've grown accustomed to my body signs, and when I feel my blood pressure spikes, I will ask my wife to get me watermelon ... I've learned to sensitise myself to my fluctuating blood pressure for the past five years. (P 02)

So, when I attend the Posyandu [Integrated Health Service Post for the Elderly-IHSP-Elderly] and find out that my blood pressure is high, I will start to handle the problem on my own ... I know ... when I get blurry vision, I know maybe it's due to my high blood pressure ... so I start to munch cucumbers and drink achi (noni) water, and I will get well. (P 19)

Despite the desire to control their hypertension, some participants had a clear preference for managing their hypertension without any medication. For these participants, taking medicine was the last option.

I like to have my blood pressure checked, so I would know whether my blood pressure is low or high ... But I actually hope to only use traditional ways ... to cut down on salt, drink more water, boil the avocado leaves, eat the cucumber ... It's easier and natural. (P 17)

It really is up to each patient. They have the right to decide for themselves, but maybe some people feel secure if they take the medicines prescribed by their doctors. As for me, visiting the doctor would be the last thing on my mind ... I'd rather take the easy way. (P 02)

Accessing healthcare services

Despite being aware that they have hypertension, none of the participants interviewed had visited a health professional to obtain anti-hypertensive medications within the previous year. Most of them perceived that it was unnecessary to visit a health professional unless they actually felt ill. They perceived that hypertension is not a condition that requires consulting with a healthcare professional because it lacks 'serious symptoms.'

I don't want to have myself examined by a doctor because my condition is generally fine. So why should I see the doctor, I think it's weird, isn't it? (P 08)

Basically, I try my best to manage my own health, and only when my head is killing me or when colds and coughs make me feel helpless, I will ask for help and someone will give me a ride to the midwife¹ [private practice]. But this hasn't happened for quite a long time. (P 18)

Some participants seemed to be accustomed to having high blood pressure and did not complain of symptoms, and therefore chose to remain untreated. Other participants

perceived that having a systolic blood pressure of around 150 mmHg is normal for elderly people.

I've learned to sensitise myself to my fluctuating blood pressure for the past five years. I regard 160 or 150 [mmHg] as something normal. As long as I can carry on with my job, it's perfectly normal. (P 02)

When I go to Posyandu [IHSP-Elderly], the most important thing is just to know about my blood pressure ... Because it varies ... But I never have more than 170 [mmHg], mostly I have 150, 160; people say that this is normal for the elderly like me. (P 10)

Some participants mentioned the financial or transportation constraints as barriers to visiting a healthcare professional.

Well, because ... [laughing] ... visiting private practice [village midwife] means that you have to pay too, don't you think, Ma'am? What if I have to see her too often? (P 11)

The Puskesmas (community health centre) is beyond our reach, we cannot afford to get there on foot. We are used to walking. We walked all the time when we were much younger than we are now, we walked to the town too, but we can't do that anymore because we are too old. (P 04)

Only if I think I really need to [visit the doctor] ... Well, if they [my daughter or my son] want to take me there by motorcycle, I wouldn't dare, I feel dizzy ... so when I have to see the doctor, they have to rent a car ... it's not that easy ... also it is costly isn't. (P 22)

The need for anti-hypertensive medications

None of the participants had taken any anti-hypertensive medication within the previous year. However, their perceptions about these medications were not always negative – some of them had positive perceptions.

Negative perceptions were evidenced in their reluctance to take anti-hypertensive medications. These were influenced by: (i) feeling no improvements after taking medications; (ii) experiencing side effects; (iii) difficulty in taking medications (bad smell, hard to swallow); or (iv) having personal beliefs that anti-hypertensive medications are not needed.

I actually have had high blood pressure for quite a long time. In the past, I usually had it checked in the Puskesmas [community health centre]. I took the medicines until I was fed up, I didn't feel any difference. I got bored taking it ... my blood pressure stayed high. (P 11)

I was complaining of headache and got medicines from a village nurse. Instead of helping, the medicines he gave me only worsened my plight! ... And after that, every time I felt unwell, I just shrugged them off and left my hypertension untreated. With enough bed rest, I would get well again. No medicines. (P 06)

I cannot take the pills from the doctor, any pills ... Even when I smell the medicine, I feel nauseous; I really cannot take it. (P 08)

Why should I take them [the medications]? When I feel good, what's the point in taking medicine? I can manage my own blood pressure. I have got a way of easing the hypertension. (P 04)

These perceptions subsequently reduced the participants' motivation to take anti-hypertensive medications, and they tended to rely on lifestyle modification and traditional medicines to treat their hypertension.

However, some other participants conveyed positive perceptions toward anti-hypertensive medications and expressed their willingness to take these medications. They did not take any medication for a long time because: having problems to access a supply of medicine; or having beliefs that anti-hypertensive medications would be needed only when their clinical condition worsened.

If I feel stiffness in the evening, I know that my blood pressure has gone up, so in the morning I will look for the fruit ... actually, if I have medicine, I will take it, but it is so far away to obtain the medicine, so I need to find a cure that I can find in the village ... well, if the medicine is available and is nearer then I would prefer the medicine. (P 14)

Because it is only a common dizziness, I can endure it; I never take it seriously, and I just consume some fruits ... If it is already too high, well actually the medicine [anti-hypertensive medication] seems to be the one that can lower blood pressure ... If I consume only the fruits, I don't think it's enough. (P 11)

Furthermore, participants also expressed their concerns about taking long-term medication.

I am not against taking medications ... but, I don't want to get addicted to seeing the doctor ... I just hate to rely too much on medication. (P 07)

If I had to take it every day, I would be fed up. (P 21)

Perceiving that there was no formal recommendation to take anti-hypertensive medications regularly was also reported. Suggestions from healthcare workers (i.e. healthcare professionals and community health workers), family and peers were related mostly to the need for lifestyle modifications.

She [private midwife] said no medications are needed. She keeps telling me that melons or cucumbers will help me get over the surging blood pressure. Plus, she tells me to consume less salt. (P 23)

But I have never specifically asked for them [medications]. Once I asked one of the CHWs: 'What medicines must I take to get my pressure down below 150[mmHg]?' To which she replied: 'If you can stand it and have no complaints, no medicines are needed, ma'am.' Honestly, if someone gave me some medicines to relieve this high blood pressure, I would be more than happy to take them. (P 13)

Furthermore, perceiving that medications should be sufficiently provided was acknowledged by participants. The view of one participant who refused to obtain anti-hypertensive medications from a community health centre was noteworthy.

In my opinion, to make the medicines really work, one has to take them on a regular basis. How can they expect to get well unless they regularly consume the medicines? Take my husband for example. Every time he goes to the Posyandu [IHSP-Elderly], he obtains medicines that he finishes off within three days and for the remaining days of the month he is without those medicines and can only expect another batch of medicines in the following month [in the next IHSP-Elderly meeting]. I think that's not good because he cannot take the medicines routinely. (P 04)

Existing support and patients' expectations

When asked about who supported them most in managing their high blood pressure, some participants said that they were the best ones to decide on their treatment options. These participants would ask for support from family, peers, neighbours or healthcare professionals only if they needed to. Generally, they did not have any expectations from other people in terms of assistance with medication management.

I've got nobody. I can manage it myself' ... when I get headache I would take the Paramex® [paracetamol] ... So I rarely burden my neighbours or my children with my complaints. I think for myself what medicines or actions I should take. (P 18)

I have to rely on myself' ... to refrain from eating unhealthy food ... when I get dizzy, I just take some rest, sometimes I buy cucumber ... just like that. What can an old woman do, ma'am. (P 12)

I just feel it on my own, when I feel that I need to see the village nurse, I will ask help from my child, but it rarely happens anyway. (P 10)

'I don't have any expectations' responses were also conveyed by patients who perceived that hypertension is not a serious problem and left their high blood pressure untreated.

I take my life easy now, high blood pressure is no problem for me ... I have tried many things, now I just let it remain like this, as long as I don't feel dizzy (P 15)

Well, it is so common for me to be dizzy, so I don't usually take it seriously, as long as I can still do my jobs. (P 11)

In contrast, two elderly participants stated that they depended heavily on their family for treating their hypertension; this included decisions on what they would eat every day. Family support is essential to these participants.

I just take whatever things my kids hand me to lower my blood pressure. I just rely on them to make the decision. And I would eat whatever food they give me. (P 06)

Support from community (lay) health workers (CHWs) in villages was acknowledged. Even though participants did not visit healthcare professionals, most valued the role of CHWs who provided blood pressure checks in the Integrated Health Service Post for the Elderly (IHSP-Elderly), an existing CHW-based program in villages. Participants reported the CHWs sometimes visited their home and motivated them to have their blood pressure checked at the IHSP-Elderly.

When I get there [IHSP-Elderly], the CHW will check my blood pressure, and if she doesn't see me for quite a while, she will come to see me ... and ask me to go there [IHSP-Elderly]. (P 17)

I do appreciate the CHW's commitment, visiting me at least once a month or every two months. (P 16)

I usually go to Posyandu [IHSP-Elderly] or Ms. A's (the CHW) place. When I have a headache or dizziness, I go to Ms. A's place and have my blood pressure checked, to find out if it's surged too high. (P 21)

Some participants knew that they could obtain anti-hypertensive medications in the IHSP-Elderly through the outreach healthcare services conducted by community health centres. Given this service was not routinely available within the IHSP-Elderly program (once every one or three months), participants expected more frequent services in order to have their high blood pressure checked and managed.

Once the community health worker told me that health staff [midwife or nurse] from community health centre would come to Posyandu [IHSP-Elderly], so I went there ... I waited for them for more than two hours, but the staff didn't arrive ... It was a sunny day so I decided to go back home before it was too hot to go on foot. (P 22)

Regarding the lack of information provided by healthcare workers, most participants conveyed their expectations on attaining more information about hypertension treatment.

Honestly, I expect the midwife to give me specific instructions about medicines that can decrease my blood pressure. The truth is, the midwife never told me to take any hypertensive medications. (P 23)

I wish I can tell you [about the type of information needed]. I found high blood pressure is common among the elderly ... I would be glad if someone explained this to me. (P 18)

6.2.4 Discussion

This study reveals how Indonesian villagers with untreated hypertension (i.e. those who had not taken anti-hypertensive medications for more than one year) perceive their high blood pressure, the factors influencing these perspectives, and how they can be supported.

Patients' independence is shown in this study, implying that participants perceived their ability to manage hypertension on their own. Most participants had high self-efficacy regarding the use of alternative approaches to lowering blood pressure. They preferred to use inexpensive and easy-to-obtain alternatives, such as cucumber, avocado leaves, and other traditional medicines. This pragmatic approach is also indicated in taking anti-hypertensive medications; for example, we found that participants would not object to taking these medications if they were accessible and affordable. This highlights that policies and programs aimed at improving hypertension management in rural people must first address affordability of and access to medicines over the long-term.

Participants' limited understanding of their blood pressure targets (e.g. systolic blood pressure 160 mmHg was regarded as normal for elderly people) should be addressed. Given its asymptomatic nature, hypertension is a 'silent killer', to which more than 30% of stroke events are attributed (World Health Organization 2009a). Patients' beliefs about the necessity for, and concerns about, anti-hypertensive medication and their association with treatment choices have been reported (Figueiras et al. 2010). An Indonesian study has shown that people perceive they are ill only if they can feel symptoms or see the effects of the disease (Pujilestari et al. 2014). Based on their experiences and feelings, patients judged the effectiveness of many treatment methods and made their own decisions about which were the most effective at controlling their blood pressure. Factors influencing patients' perspectives in this study are aligned with the health belief model (Glanz, Rimer & Viswanath 2008; Yue et al. 2015). In the context of this model, the four sets of beliefs

(perceived susceptibility, severity, benefits, barriers), cues to action, and self-efficacy were associated with the reasons why patients did not take anti-hypertensive medications (Figure 6.2).

The findings from this study suggest that, patients need several means of support, particularly in terms of improving their understanding about how to manage hypertension and improving their access to affordable anti-hypertensive medications. In response to perceived susceptibility to and perceived severity of their conditions, it is necessary to educate patients so that treatment that focuses on symptoms is changed to treatment that focuses on the individual patient's blood pressure target. Ideally, patients should monitor their blood-pressure at home (Cappuccio et al. 2004). However, home monitoring is difficult to implement in people with low socio-economic status; instead, it is important to facilitate more accessible and affordable screening and blood pressure monitoring for these people. The role of CHWs in this aspect has been reported and should be encouraged (Brownstein et al. 2007; Rahmawati & Bajorek 2015). Assuming that reasons for non-adherence to medication are mostly amenable (Laba et al. 2015), targeted intervention programs should be designed and implemented to address perceived barriers reported by patients in rural areas.

Healthcare workers play an important role in providing information about appropriate use of medicines (Laing, Hogerzeil & Ross-Degnan 2001; Tarn et al. 2009). However, this study reveals the lack of recommendation regarding the need of anti-hypertensive medications. Given the potential of CHWs in supporting rural villagers, primary healthcare systems should encourage their role in the community as a means of liaising between patients and healthcare providers. Relevant training is needed to improve the quality of service (e.g. blood pressure monitoring) and information (e.g. about when patients need to be treated) provided to patients.

6.2.5 Conclusion

Despite their awareness of being diagnosed with hypertension, patients undervalued visiting a health professional to control their high blood pressure. Health systems should develop a range of strategies to encourage rural people with hypertension to visit a health professional and have their high blood pressure managed. Strategies that consider patients' beliefs, concerns and expectations might encourage patients to be more inclined to cooperate with a hypertension treatment plan. Providing an accessible, affordable and

adequate supply of hypertension medication is also key to any programs designed to optimise hypertension management.

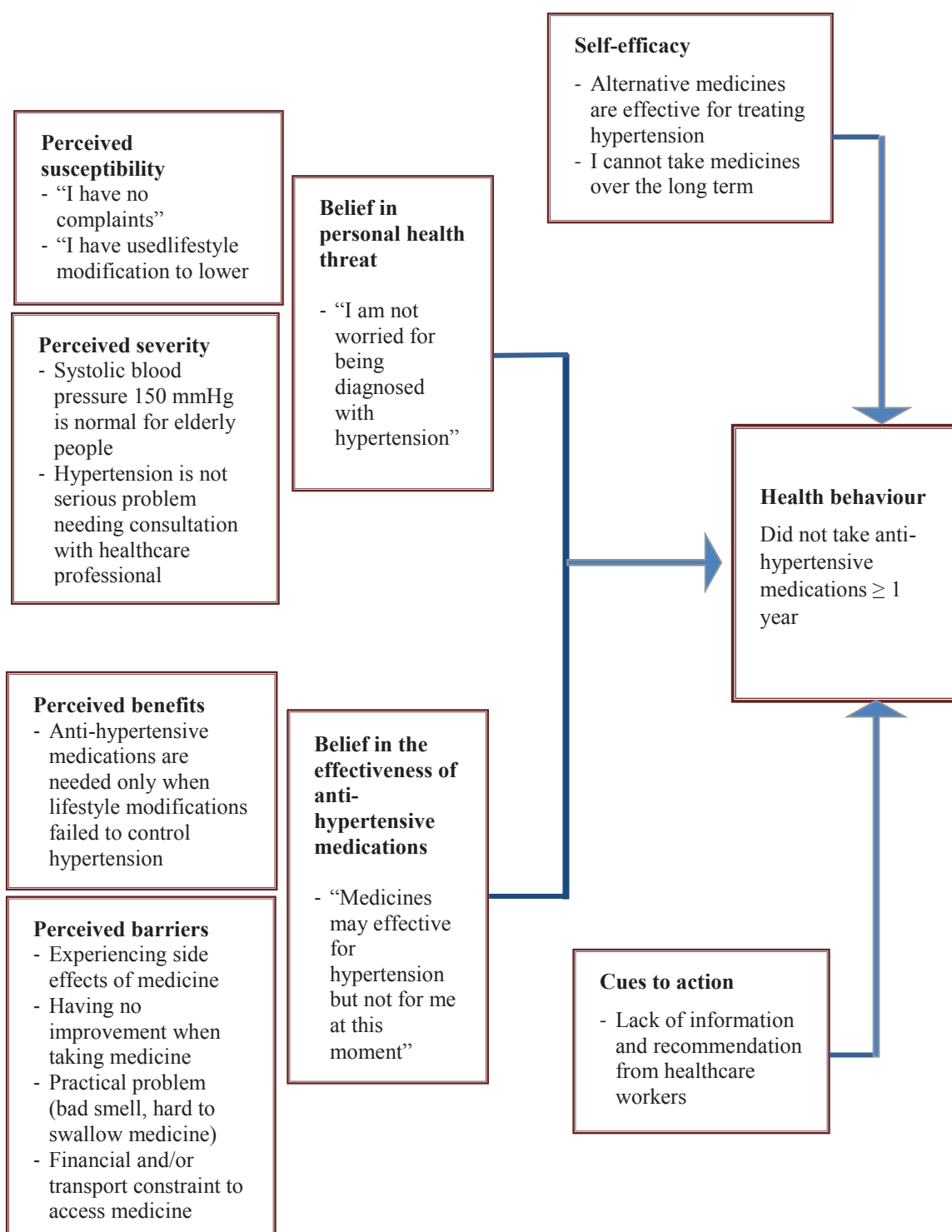


Figure 6.2 Reasons why patients did not take anti-hypertensive medications (adopted from the health belief model)

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Table 6.3 Selected participants' quotes regarding alternative medicines to lowering high blood pressure

Modifying diet (Eating more)	Modifying diet (Eating less)	Consuming herbal medicines	Managing stress, reducing symptoms
<i>I rely on cucumber, melon and celery. I eat them a lot. (P 04)</i> <i>Eating watermelon frequently, it can lower blood pressure, right? Sometimes I also buy cucumber. (P 24)</i> <i>I will simply eat the melons. With cucumbers, I have a case of full stomach if I eat them raw, so I grate the flesh and drink the juice. (P 23)</i> <i>At home I usually just buy fruits which can help lower the BP, such as cucumber, watermelon, or melon. (P 01)</i> <i>For me I think watermelon ... or achi fruit, cucumber. (P 14)</i> <i>You mean, what medicine I use to treat hypertension? Sometimes make juice from grated carrots, eat some cucumber or melons to help me lower the blood pressure. (P 13)</i> <i>Well, yes ... they're cucumbers, melons, and watermelons ... Well, when my vision is blurry ... I will rush to buy cucumbers. (P 19)</i> <i>So whenever I feel that, I usually buy a melon or cucumbers ... when I feel bored of eating them, I usually grate it (cucumber) ... in moderate quantity only, not too much as my BP may dip too low. (P 10)</i> <i>I sometimes only eat cucumber, watermelon, and then it usually goes down. (P 21)</i> <i>Cucumber, and I boil avocado leaves ... I also eat melon. (P 09)</i> <i>Perhaps only eating watermelon ... camcau leaves ... but I don't eat cucumber because if I eat a bit too much I usually feel throbbing pain in my head ... My wife usually buys me a watermelon ... usually it's eaten for 2-3 days. (P 11)</i>	<i>I also never drink coffee. Coffee will cause my blood pressure to increase ... I could feel the signs, every time I drink coffee, my shoulders and neck start to stiff. Since I knew my blood pressure was 170 I quit coffee. (P 18)</i> <i>I try my best to eat less salty food. (P 04)</i> <i>I am not to eat the meat of anything that walks on four legs. I have not guts to drink coffee. I don't even drink tea ... I just drink plain water. (P 12)</i> <i>They tell me to reduce salt ... and I am not allowed to drink coffee ... actually I haven't drunk coffee for quite a while ... and I don't eat mutton at all either. (P 14)</i> <i>I have been trying to avoid lamb for too long. Even the smell of it can make me dizzy when I help my neighbours in the kitchen ... I'm also wary of coffee. (P 19)</i> <i>I just don't drink coffee ... I do have coffee but I never drink it ... because people say that it can increase BP, so I don't drink. (P 01)</i> <i>I was told to reduce salty, oily food ... so I reduced them little by little. (P 15)</i>	<i>I try to boil the avocado leaves, the easier one, isn't it, Ma'am? It's already there ... and it doesn't taste anything, it only taste like common drink. (P 21)</i> <i>I didn't do any special efforts ... I just looked for achi fruits, as for watermelon and cucumber I must buy. (P14)</i> <i>I sometimes eat mahogany seeds, I took it like taking pills ... people say it is good, ... they said a person with high blood pressure should eat bitter things [such as mahoni and achi]. (P 24)</i> <i>Whenever I find noni fruits in the forest, I will boil them right away and drink the water. (P 19)</i> <i>Avocado leaves steeped in boiling water. People tell me to get eleven leaves, put them in a pan and add three glass of water, boil them. (P 07)</i>	<i>the problem is in my mind, if there are many things in my mind then the blood pressure will go up fast ... so what cures it is the mind too ... Try to forget the things, take everything easy ... this is my fate anyway ... as simple as that. (P 15)</i> <i>All I need to do is pray to God Almighty and I'll be alright, I feel good. So you should pray hard, make it a habit, and you will be okay. If you submit yourself to your creator, he will protect you against maladies. (P 04)</i> <i>Whenever I get headache, I buy some pills at the nearest store, usually it's a strip of Bodrex® [OTC paracetamol. (P 02)]</i> <i>I always keep this [aromatic medicated oil] one handy. This really helps me cope with stiffness in the neck and shoulder. Just a little oil, rubbed onto the affected area, the stiffness will reduce. (P 18)</i>

Chapter 7:

Encouraging the role of lay health workers in improving hypertension management

7.1 A community health worker–based program for elderly people with hypertension in Indonesia: A qualitative study

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A Community Health Worker–Based Program for Elderly People With Hypertension in Indonesia: A Qualitative Study, 2013

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Abstract

Introduction
Hypertension is prevalent in the elderly, but treatment is often inadequate, particularly in developing countries. The objective of this study was to explore the role of a community-based program in supporting patients with hypertension in an Indonesian rural community.

more to provide routine blood pressure screening and improve the process of referral to other health care services.

Conclusion
CHWs have the potential to liaise between rural communities and the wider health care system. Their role needs to be strengthened through targeted organizational support that aims to improve delivery of, and referral to, care. Further study is needed to identify the key factors for effective CHW-based programs in rural communities and the incorporation of these programs into the health care system.

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Abstract

Introduction: Hypertension is prevalent in the elderly, but treatment is often inadequate, particularly in developing countries. The objective of this study was to explore the role of a community-based program in supporting patients with hypertension in an Indonesian rural community.

Methods: A qualitative study comprising observation and in-depth interviews was conducted in an Integrated Health Service Post for the Elderly (IHSP-Elderly) program in Bantul district (Yogyakarta province). Eleven members of IHSP-Elderly program (i.e. hypertensive patients), three community health workers (CHWs), and one district health staff member were interviewed to obtain their views about the role of the IHSP-Elderly program in hypertension management. Data were analysed using thematic analysis.

Results: CHWs played a prominent role as the gatekeepers of health care in the rural community. In supporting hypertension management, CHWs served members of the IHSP-Elderly program by facilitating blood pressure checks and physical exercise and providing health education. Members reported various benefits, such as a healthier feeling overall, peer support, and access to affordable health care. Members felt that the IHSP-Elderly program could do more to provide routine blood pressure screening and improve the process of referral to other healthcare services.

Conclusion: CHWs have the potential to liaise between rural communities and the wider healthcare system. Their role needs to be strengthened through targeted organizational support that aims to improve delivery of, and referral to, care. Further study is needed to identify the key factors for effective CHW-based programs in rural communities and the incorporation of these programs into the healthcare system.

7.1.1 Introduction

Hypertension, a risk factor for cardiovascular disease, stroke, and premature death, is prevalent in the elderly (World Health Organization 2009a). However, treatment of hypertension in the elderly is often inadequate, particularly in developing countries, where only 10% of cases are controlled (Lloyd-Sherlock et al. 2014). In Indonesia, a developing country in Southeast Asia, the prevalence of hypertension among those aged 65 or older is 60%, making it the most common chronic disease (Ministry of Health Republic of Indonesia 2013d).

One key strategy to help scale up hypertension management is to involve the community; patient empowerment is the cornerstone of primary health care and chronic disease management (Brownstein et al. 2005). Programs involving community health workers (CHWs) in the United States have increased the proportion of patients with controlled blood pressure (Brownstein et al. 2007; Krantz et al. 2013). The role of CHWs in facilitating access to health care services for patients with particular diseases has been studied in some developing countries (Pallas et al. 2013). For example, a study in Uganda described the role of CHWs in supporting the management of pneumonia and malaria (Rutebemberwa et al. 2012). Few studies describe CHWs' role managing hypertension in developing countries (Reidpath et al. 2012).

In Indonesia, the Integrated Health Service Post for the Elderly (IHSP-Elderly), a national CHW-based program, has been promoting healthy aging since 1997; the program focuses on screening for and managing chronic diseases in low socioeconomic population subgroups (National Committee for Elderly 2010). This study explored how the IHSP-Elderly programs could play a role in improving hypertension management for patients in rural communities in the Bantul district, Yogyakarta. In this district, hypertension is one of the most common diseases treated in primary health care facilities (Bantul District Health Office 2014). The perspectives of CHWs, members of the IHSP-Elderly program (ie, patients), and local government health policy advisors were examined.

7.1.2 Methods

Study design and setting

This qualitative study took place in a rural village in the Bantul district of Yogyakarta province in Indonesia (Box) in March 2013. Yogyakarta province (population, 3.5 million) is in Java, the country's most populous island; almost 52% of 238 million Indonesians live there (Statistics Indonesia 2010b). The life expectancy in Yogyakarta province is 74.1 years (Statistics Indonesia 2010a).

This study used observation and in-depth face-to-face interviews to explore perspectives on the role of the IHSP-Elderly program in the management of hypertension. A semistructured approach used a purpose-designed interview guide (Table 7.1), developed after reviewing the relevant literature (Javanparast et al. 2011; South, Kinsella & Meah 2012; Suri, Gan & Carpenter 2007). A separate set of questions was used for each group of participants. The questions were pilot tested for clarity and relevance. The validity of

findings was confirmed through independent analysis of data by the researchers and through respondent validation.

Box. Bantul District, Yogyakarta Province, Indonesia

Population: 930,276

Elderly population (aged ≥ 60 y): 110,729

Economy based on subsistence agriculture

Muslim majority (91%)

861 of 933 subvillages have an IHSP-Elderly program

Sociocultural climate related to the implementation of IHSP-Elderly program:

- Both men and women are members
- Most (90%) community health workers are women
- Freedom of conversation between sexes is accepted
- Freedom of expression is accepted (i.e. people can freely exchange their views)
- Music and physical exercise in the IHSP-Elderly program are welcomed by members
- Home visitation by CHWs can be undertaken without security concerns

All participants were informed about the study via a purpose-designed information sheet and were required to provide written consent before participation. For three participants who were unable to read fluently, a researcher provided a comprehensive verbal explanation of study requirements before obtaining their consent. All participants were literate enough to write their name and provide a written signature. No participants received a financial reward for their interview. The study was approved by the Bantul district health office responsible for authorising the conduct of research studies. The study protocol and other supporting documents were reviewed. Recruitment of participants began after approval was obtained to ensure no conflict of interest.

Recruitment of participants

Nationally, there are 69,500 IHSP-Elderly programs (Ministry of Health Republic of Indonesia 2013b). Our study's sampling frame comprised 861 IHSP-Elderly programs in 27 community health centres in the Bantul District. First, an online random number generator was used to select a community health centre and then an IHSP-Elderly program. In the village selected for participation, the elderly population consisted of 117 men and

women; the local IHSP-Elderly program provides care for up to 70 members, and it has three CHWs.

Table 7.1 Interview guide for the participant, study of the role of community-based program for elderly people with hypertension, Indonesia, 2013

Questions for members of Integrated Health Service Post (IHSP) for the Elderly 1. How long have you had hypertension (since early diagnosis)? 2. What kind of symptoms do you have relating to hypertension? 3. What kind of medication have you taken? 4. What is your opinion about IHSP-Elderly activities? 5. Why do you think the activities of the IHSP-Elderly are useful? 6. What do you think about blood pressure examination by community health workers (CHWs) in the IHSP-Elderly? 7. What is your opinion about the role of CHWs in the IHSP-Elderly to support hypertension treatment? 8. How can the IHSP-Elderly improve its service in hypertension management?
Questions for community health workers 1. What kind of activities does the IHSP-Elderly organize for healthy aging? 2. Since you are a volunteer, what do you expect to be actively involved in the IHSP-Elderly? 3. What do you usually do after diagnosing members with high blood pressure? 4. How do you get the necessary information and skills relating to hypertension? 5. What are the barriers to implementing the hypertension program? 6. What are your suggestions for future programs?
Questions for district health staff member 1. Why is the IHSP-Elderly program important for communities in the district? 2. What has the government done to support the IHSP-Elderly program? 3. What are the expectations of the district health office for the IHSP-Elderly in regard to the hypertension program?

Abbreviations: IHSP-Elderly = Integrated Health Service Post for the Elderly

The study had three types of participants: (i) members of the IHSP-Elderly program (patients); (ii) CHWs serving the IHSP-Elderly program; and (iii) a district health staff member. Patients were purposely sampled according to the following inclusion criteria: aged 60 years or older, active in the IHSP-Elderly program for at least one year, and with diagnosed hypertension (confirmed by IHSP-Elderly record, systolic blood pressure ≥ 140 mm Hg and $\geq$ diastolic blood pressure 90 mm Hg). The appropriate sample size for members

was initially determined to be 10 (Morse 2000; Sandelowski 1995), but we recruited an additional patient because theme saturation was not reached until we interviewed 11 members. All three CHWs serving the IHSP-Elderly program were invited to participate in the study and participated. These CHWs were local residents who were trained to serve the IHSP-Elderly program, and each had done so for at least three years. The head of the district health office designated the staff member in charge of the IHSP-Elderly program as the participant representing the district health office.

Data collection and analysis

A typical IHSP-Elderly event (a weekly meeting) was observed to collect descriptive information on activities and interactions (verbal and nonverbal behaviour) among members and CHWs. Each member pays 1,000 Indonesian rupiah (IDR) (<US\$0.10) to attend a meeting. In comparison, the standard patient fee for a consultation in the community health centre is 9,000 IDR (Bantul District Government 2011) and about 50,000 IDR in a private clinic. Relative to the average income for Bantul residents (gross regional domestic product in 2013 was 12.1 million IDR per capita (Bantul District Government 2013), the service fee for the IHSP-Elderly program is affordable.

Demographic data for IHSP-Elderly members were extracted from IHSP-Elderly register books and interviews, then tabulated and descriptively analysed. IHSP-Elderly members were interviewed until theme saturation was reached. Interviews were audio-recorded and transcribed in a local language (Javanese or Bahasa). Each transcript was analysed by using thematic analysis via manual inductive coding. The first author (R.R.) translated the transcript from Javanese or Bahasa to English, and external translators, who were not involved in the study, verified the translation. The word use in the translation reflected the language capability of the participants. The coding framework was generated by the first author and subsequently reviewed and validated by the second author (B. B.) To ensure the validity of the analysis, the emergent themes were compared with the transcribed notes and verified by five participants (three patients, one CHW and one district health staff member) who volunteered to provide feedback.

7.1.3 Results

Of the 15 participants, 11 were women; the mean age of the patients was 69.8 (standard deviation, 9.2) years (Table 7.2)

Table 7.2 Characteristic of participants, study of the role of community-based program in Improving hypertension treatment, Yogyakarta, Indonesia, 2013

	Members of IHSP-Elderly (n=11)	CHWs (n=3)	District Health Staff (n=1)
Age in years, mean (SD)	69.8 (9.2)	55.7 (14.5)	41
Number of female	8 (72.7%)	2	1
Education			
Below primary school	6 (54.5%)	-	-
Primary school	2 (18.2%)	-	-
High school	3 (27.3%)	3 (100.0%)	-
University	-	-	1 (100.0%)
Blood pressure level			
Systolic, mmHg, mean (SD)	165.5 (15.1)	NA	NA
Diastolic mmHg, mean (SD)	94.5 (5.2)	NA	NA

Abbreviations: n = number; SD = standard deviation IHSP-Elderly = Integrated Health Service Post for the Elderly; CHWs = community health workers; NA = not available

Field observation of a weekly meeting of the IHSP-Elderly program

The IHSP-Elderly meeting was attended by 25 members (18 women and seven men). The 2-hour session was conducted in the afternoon in the front yard of a CHW's house. The meeting began with a blood pressure check for each member, followed by group physical exercise. Most of the IHSP-Elderly members queued to get their blood pressure checked. The participants were jovial and appeared to have a good time; they shared jokes with CHWs and there was a lot of laughter. They made comments and suggestions freely each time the CHWs explained the blood pressure readings.

The physical exercise, featuring traditional music and simple verbal instructions, was facilitated by an instructor. The exercise was guided by appropriate imagery such as looking at the moon, water paddling, fist clenching, flying, and wave making. Most members followed the instructions with ease. A few had difficulty, but they tried to mimic the instructor's gestures. Every now and then there was a ripple of their laughter. After the exercise finished, the CHWs provided light refreshments for all members.

Thematic analysis of interviews

Three key themes emerged from the interviews: (i) the central role of CHWs; (ii) multiple benefits for the elderly; and (iii) current limitations to providing optimal services.

Central role of CHWs in the community

The district health staff member emphasised the critical role of the IHSP-Elderly program in addressing hypertension in the community. She stressed that the program originated in the community to serve the community: ‘IHSP-Elderly plays a strategic role in our healthy aging program. It is a program by community and for community; as you know there are currently many elderly people. We can say that CHWs are health gatekeepers for the rural community.’

CHWs organized weekly physical exercise and monthly meetings, provided the venue for meetings, organized equipment and refreshments, planned materials and speakers for public education, and reported the IHSP-Elderly programs to the community health centre. They seemed to be highly dedicated to their roles and to volunteering their time to serving the community in this way. Being unpaid volunteers, they were motivated by intangible benefits, such as the appreciation of community leaders, the trust of the community health centre and members of IHSP-Elderly program, and the ability to contribute to the wellness and happiness of the community. ‘I love to share what I know with the elderly. Giving benefits to others makes me happy’ (CHW).

I have been active as a CHW since 1997, with the trust of the community health centre and village leader. They believe that I am still the best ... despite my infirmity as I am getting older. The IHSP-Elderly members also ask me to remain [as a CHW coordinator]. For me personally, managing the IHSP-Elderly is lovely work.

In addition, the CHW prepared invitations and arranged home visits to increase participation of IHSP-Elderly members: ‘Elderly people tend to be forgetful. Giving invitations will remind them to come’ (CHW). ‘In case there were inactive members, we would come to their house, greet them, and wish them all good health’ (CHW).

CHWs also arranged public education programs on the physical, emotional, and spiritual aspects of healthy aging. These monthly programs featured both internal speakers (CHWs) and external speakers. The value of using CHW as speakers was their creativity in facilitating interactive discussions and encouraging elderly members to participate.

Multiple benefits for the elderly

Being healthier. The desire of older members to be healthier was the most motivating factor for participating in the IHSP-Elderly program. In particular, they perceived immediate

health benefits from attending the physical exercise sessions, such as sleeping better and feeling more relaxed. 'I feel better after the physical exercise. It's quite easy for me. It makes me healthier' (Member). 'It makes me healthier, relaxes my breathing, and I can sleep well after exercise. It is also helpful for my knee pain' (Member). 'Members who feel healthier will be active in the IHSP-Elderly program' (CHW).

Having peer support. Peer support was an important motivator for participating in the IHSP-Elderly program: 'I joined IHSP-Elderly a long time ago. It is hard for me now to follow physical exercise, getting older limits me from doing exercise, but CHWs motivated me just to come, and I enjoy the meet-and-greet with the peers' (Member). 'One member, with a walker, always comes and joins IHSP-Elderly activities. She is glad to meet her peers and gets new information' (CHW). 'The benefits come from the joyful meetings. They greet each other weekly. We can say that the active members are healthier than other elderly' (CHW).

Accessing free health care. Participation in the IHSP-Elderly program was also driven by the free access to health care. Members of IHSP-Elderly program were highly enthusiastic about having access to free blood pressure checks, regardless of who measured their blood pressure (the CHWs, health staff, or others). 'Being examined is exciting, you know, as an elderly people, what a great opportunity we have to get an examination for free' (Member). 'I am very glad. I always try to come if a blood-pressure check is announced' (Member). 'I just put on the invitation that there will be blood pressure checks. They would be enthusiastic to come' (CHW). 'They [CHWs] can do it, but sometimes it is done by CHC [community health centre] staff. Three months ago there were medical students who also offered a blood-pressure checking program for free. That is okay, [whoever]' (Member).

Current limitations to providing optimal services

Although the members were enthusiastic about the CHW-led activities of the IHSP-Elderly program, they felt that there were some inconsistencies in what was offered; for instance, blood pressure checks were not done routinely. IHSP-Elderly meetings were conducted weekly, but only physical exercise could be offered weekly. The members suggested that a routine follow-up of blood pressure readings should also be arranged at least once a week. 'It is not a routine program. If I am not mistaken, the last blood pressure check other than the one today was done last month, or two months ago. It would be lovely if they could make it weekly' (Member). 'In some IHSP-Elderly, members can check their blood

pressure. But as far as I know, not all of them have a capable CHW to do that' (District health staff member).

Additionally, the IHSP-Elderly program had only one properly functioning aneroid sphygmomanometer to measure blood pressure. This device was purchased in 2007 and had not been recalibrated in six years. There was no funding to purchase a new device. In this IHSP-Elderly program, only one CHW (female, 40 years old) was properly trained and had enough confidence to measure blood pressure; the other two CHWs did not feel as capable. 'Actually I have been trained, but I felt nervous when people queued around me. I was shaking' (CHW). 'She [the other CHW] did not come for a while because she fractured her hand. During that time, I could not take over her task [to measure blood pressure] as I am not skilful yet' (CHW).

CHWs recognised that their role in managing hypertension was restricted to early screening and monitoring, followed by referring patients to other health service providers. However, this study identified a gap between what elderly members wanted and what the IHSP-Elderly program could provide. Members preferred a simpler care pathway in which the CHWs could provide easier access to hypertension treatment: 'I wish I could receive medication here [in IHSP-Elderly program] so that I needn't go anywhere else' (Member).

Although the CHC provides a mobile health service for patient follow-up (including further examination and provision of medication), most IHSP-Elderly members did not use this service. Access to the mobile service was difficult; members had to travel approximately three kilometres to reach it. Furthermore, because hypertension is symptomless, some members were not motivated to travel. The following quotes illustrate the barriers to using the mobile health service:

When we identified hypertension cases, we would ask the patients to visit mobile health services, but most of them had difficulties accessing that service. I think it was related to transportation. It might also be because they did not feel any serious symptoms. (CHW)

I couldn't go there. No one could take me over there. (Member)

I have told CHC staff that the members might not visit the mobile service, they need to ask their children or grandchildren to take them, and it is not easy in the working hours. (CHW)

7.1.4 Discussion

This study highlights the potential benefits of involving CHWs in improving hypertension management in a developing country (Indonesia), supporting the findings of previous studies focusing on the role of CHWs in hypertension management (Balcazar et al. 2009; Brownstein et al. 2007; Krantz et al. 2013). CHWs serve as a bridge between the community and the healthcare system, addressing community beliefs about diseases and supporting patients' adherence to therapies, which is difficult to achieve in traditional health care settings (Rosenthal et al. 2010; Viswanathan et al. 2009). For example, nonpharmacological approaches play an important role in hypertension management, and CHW-based programs can offer exercise and health education activities. Some studies report that nonpharmacological approaches are not so well addressed as pharmacological approaches are in doctor–patient consultations (Bezreh et al. 2012; Heymann et al. 2011). A CHW-based program may be well positioned to support hypertension management by providing information about lifestyle choices.

Self-monitoring blood pressure improves blood pressure control (Agarwal et al. 2011), but self-monitoring is difficult to facilitate in a low-resource population. Providing free blood pressure checks in a CHW-based program presents an opportunity to monitor patients between scheduled health service visits. Moreover, the patients' enthusiasm for having their blood pressures checked in an IHSP-Elderly program is a good base on which to establish follow-up activities or to enhance self-management.

The limited capability of CHWs and a lack of resources (e.g. calibrated sphygmomanometers) preclude a greater role for CHWs in providing regular blood pressure monitoring for IHSP-Elderly members. Research on the problems related to levels of infrastructure and CHW skill highlights the need for adequate training and supervision for CHWs (Jackson & Parks 1997; Standing & Chowdhury 2008; World Health Organization 1989b). Training could be focused on how to: (i) differentiate grades of hypertension; (ii) help IHSP-Elderly members develop care plans for self-management; and (iii) refer patients to other healthcare services. So that CHWs can provide accurate and up-to-date information to patients about medication for hypertension, training on the key messages about antihypertensive agents (their types, roles, and side effects) is needed, particularly in geographic areas with a high prevalence of hypertension and poor access to information. In such areas, demand for services from CHWs is high because of the constraints faced by the elderly in their ability to access existing follow-up services.

This study is the first of its kind from Indonesia to highlight the perspectives of patients, CHWs, and health policy advisors about a CHW-based program for hypertension management. Because of the methodology of qualitative studies and the fact that this study took place in a rural district and had a small sample, the results of this study cannot be deemed to represent the entire Indonesian population. However, because Bantul District is a typical rural district in Indonesia and the IHSP-Elderly program is a national program, our results support the likelihood that IHSP-Elderly program could play a larger role in CHW-based management of hypertension in other rural areas, even considering the barriers that may be encountered. Moreover, the findings of this study provide insights for the development of CHW-based programs in other settings with a similar social context.

This study highlighted how CHWs have the potential to liaise between rural communities and the wider healthcare system. The role of CHWs needs to be strengthened through targeted organizational support that aims to improve delivery of healthcare services and, when needed, referral to additional healthcare services. Further study is needed to identify the key factors for effective CHW-based programs in rural communities and the incorporation of these programs into the healthcare system.

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Chapter 8:

Developing a ‘Blood Pressure Action Sheet’ for patients in rural communities

8.1 Potential use of a ‘Blood Pressure Action Sheet’ for Indonesian patients with hypertension living in rural villages: A qualitative study

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Abstract

Objective: To obtain feedback on the layout, content, and potential use of a ‘Blood Pressure (BP) Action Sheet’, a purpose-designed written resource for Indonesian patients with hypertension

Methods: Telephone interviews were conducted with 13 health professionals, 12 community health workers, and 12 patients in rural Yogyakarta, Indonesia, to explore their impressions of the BP Action Sheet, how the sheet might affect management of hypertension, and suggestions for improvement.

Results: Participants felt that the sheet presented useful information about achieving the target BP and managing hypertension. The use of the sheet could be optimised by engaging community health workers to help explain the information and to provide assistance around the stated actions for hypertension management. A more attractive design and inclusion of more detail were suggested. Both patients and healthcare workers expressed interest in using the sheet.

Conclusion: The BP action sheet has potential as a useful resource for patients with hypertension by providing information, recording target BP, and facilitating patient-centred communication.

Practice implications: Use of the BP Action Sheet might provide an effective low-cost way for health professionals and community health workers to encourage patients to achieve their target BP.

Keywords: Hypertension; rural health; patient education; primary care

8.1.1 Introduction

Hypertension has become a significant public health epidemic worldwide and is associated with an increased risk of numerous complications such as stroke, kidney disease, coronary heart disease and heart failure (Kearney et al. 2005; World Health Organization 2009a). In Indonesia, data from a national survey show that the prevalence of hypertension has increased from 8.3% in 1995 to 26.7% in 2013 (Ministry of Health Republic of Indonesia 2013d).

Despite concerted efforts to improve the treatment of hypertension, less than 50% of patients with hypertension achieve their blood pressure target (Kearney et al. 2005). The lack of adherence to a recommended treatment regimen is often reported as the main reason for poor control of blood pressure (BP) in patients with hypertension (Krousel-Wood et al. 2004; Sabate 2003). Our previous study in rural villages in Yogyakarta province, Indonesia, demonstrated that patients with a good level of knowledge about hypertension are seven times more likely to adhere to medication prescribed for their hypertension (Rahmawati & Bajorek 2017a). Patient education is an important intervention for improving medication adherence (Bosworth, Powers & Oddone 2010) and should be offered by healthcare professionals (HCPs) during each clinical encounter; however, workload and limited time often preclude effective verbal communication between HCPs and patients (Rahmawati & Bajorek 2016). Furthermore, patients often forget the information provided to them during consultations (Kessels 2003). Therefore, patients may be better informed by being given written educational resources (e.g. leaflets, brochures) that are easy to read and understand (Sheridan et al. 2011).

Despite the advantages of using written educational resources to improve patients' knowledge, a review of 19 non-internet-based leaflets on hypertension in the UK reported a lack of complete information within these leaflets; for instance, only seven clearly stated the importance of BP monitoring (Fitzmaurice & Adams 2000). To be effective, the development of written resources requires input and feedback from potential end-users (including patients) before distribution of the resources in clinical practice (Raynor et al.

2007). In response to the findings of our previous studies (Rahmawati & Bajorek 2016; Rahmawati & Bajorek 2017a, 2017b), we have developed a purpose-designed written resource, the Blood Pressure (BP) Action Sheet, to help Indonesian patients with hypertension. The aim of this study was to obtain feedback about the layout, content, and potential use of the sheet. Feedback was sought from a range of people who were likely to use the sheet: Indonesian people who have hypertension and who live in rural villages, HCPs in community health centres and community health workers in the villages.

8.1.2 Methods

Study design and setting

A qualitative study using telephone interviews was undertaken in two rural villages in the Bantul District of Yogyakarta province in Indonesia from December 2016 to January 2017. These villages were purposely selected because they are categorised as underdeveloped villages by the Indonesian government (Bantul District Government 2013) and because a survey of medication-taking practices had been previously undertaken in these rural villages. Two community health centres that provide health care services for people in the selected villages were also included in this study.

BP Action Sheet

Information and recommendations provided in the BP Action Sheet were developed based on our previous findings that identified some knowledge gaps among rural patients with hypertension and highlighted the need to improve patients' access to information (Rahmawati & Bajorek 2017b). The development of the sheet also considered both the Indonesian and international guidelines for hypertension (James et al. 2014; Ministry of Health Republic of Indonesia 2013c), and the principles of designing effective written health education materials for patients (Hoffmann & Worrall 2004; Shoemaker, Wolf & Brach 2014; Stonecypher 2009; van Beusekom et al. 2016). As a simplified information leaflet, the BP Action Sheet was purpose-designed to:

1. convey the target BP for each patient
2. present key information about hypertension
3. describe the actions for patients to take to manage their hypertension
4. identify sources of support in the local setting to help patients manage their hypertension.

The BP Action Sheet comprises four A5-size pages in black and white print (Appendix I.2). The first page includes the title (High blood pressure (Hypertension)), the patient's details (name, address, contact number), and a picture of an elderly couple saying 'What should I know?' and 'What should I do?' The second page serves to record the patient's BP readings and any actions to be taken. A text box to record the patient's BP target is located in the top right corner of this page. The third page provides key facts about hypertension as well as information about where patients can obtain support related to the specific actions described (Table 8.1). The last page provides a flow chart describing the actions patients should take to achieve and maintain the target BP. The flow chart starts with the question 'Have you achieved your target BP?' Based on the answer ('Yes' or 'No'), a specific action is described.

Table 8.1 Content on page 3 of the Blood Pressure Action Sheet for patients entitled 'What should I know?'

Key information	Key recommendations	Where to go
Hypertension often shows no signs or symptoms Hypertension can cause stroke, heart attack, kidney disease and eye problem	I need to check my blood pressure, even if I feel healthy I need to maintain my blood pressure at the target level	 <i>Puskesmas</i> <i>Posyandu lansia</i> - Community pharmacy - Private practice clinic
Hypertension is treatable Hypertension usually needs long-term medication	I should take medication, as instructed by healthcare professionals I should refill my medication before running out	 <i>Puskesmas</i> - Community pharmacy - Private practice clinic
You can get free medication for your hypertension	I need to join the Prolanis program	 <i>Puskesmas</i> - Private practice clinic

Puskesmas = Indonesian abbreviation for community health centre

Posyandu lansia = Indonesian abbreviation for the Integrated Health Service Post for the Elderly

Recruitment of participants

Three groups of participants took part in this study: patients, HCPs in the community health centres, and community health workers in the rural villages. Using purposive sampling, people who fulfilled the inclusion criteria (Box 1) were recruited. Participants' contact details were obtained with consent via the local contact people (a dedicated person in each

community health centre, appointed by the head of the centre). The local contact person distributed the invitation letter, provided a participant information sheet and collated written consent from participants. Based on the expected number required to achieve theme saturation (Trotter 2012), it was estimated that 12 participants for each group (36 participants overall) were required.

Box 1. Inclusion criteria for study participants

Group 1 (Patients):

Aged over 45 years, self-reportedly diagnosed with hypertension for more than six months, literate, living in a rural underdeveloped village.

Group 2 (HCPs):

Health care professionals in the community health centre who are involved in hypertension management (i.e. doctor, midwife, nurse, pharmacist, nutritionist).

Group 3 (Community health workers):

Community health workers who have served people in their villages for more than three years, living in a rural underdeveloped village.

Data collection

The interviews were conducted in the Indonesian language by the lead researcher (an Indonesian) using a script for telephone interviews and a purpose-designed interview guide. Before posing open-ended questions to participants' about their perspectives on the BP Action Sheet, the researcher confirmed that each participant had reviewed the resource and was ready to provide their feedback. The interview guide focused on participants' first impression of the sheet, how the sheet might affect their management of hypertension and any suggestions for improvement to the sheet. Telephone interviews lasted 15–20 minutes per participant.

Data analysis

A pragmatic approach was applied in this study as it allows researchers to choose the technique that best addresses the central research question (i.e. feedback on the BP Action Sheet for patients) (Creswell 2013). The interview responses were digitally recorded (audio), transcribed verbatim (de-identified), and translated into English by an independent Indonesian translator; the translations were verified by the lead researcher. The data were then manually coded by two researchers using standard thematic analysis techniques (Braun & Clarke 2006). Each researcher independently coded and themed the data before

a joint discussion among the researchers to ensure consensus. Inter-researcher theme validation was conducted by two independent researchers.

Ethical approval

Approval from the University of Technology Sydney Human Research Ethics Committee was granted to conduct this study (Ref No. ETH16-0769). Approval from the Bantul District Government was also received (Ref. No. 070/Reg/3961/S3/2016).

8.1.3 Results

Characteristics of participants

Data saturation in each group was achieved after 8–10 interviews. However, all recruited participants were interviewed: 13 HCPs (three doctors, four nurses, four midwives, one pharmacy technician and one dietician); 12 community health workers; and 12 patients. The participants' characteristics are presented in Table 8.2.

Themes

Four themes emerged from the interviews: (i) benefits of the BP Action Sheet; (ii) potential use of the BP Action Sheet; (iii) optimising the use of the sheet; and (iv) suggestions for improvement.

Theme 1: Benefits of the BP Action Sheet

All participants regarded positively the potential benefits of the BP Action Sheet for improving patients' knowledge of hypertension and its management. Compared with other written resources they had previously read, participants noted the strengths of the BP Action Sheet.

This (BP Action Sheet) is simple, but it's interesting. There are so many leaflets with much content, but it's difficult for us to read [them]. This one ... is easy to understand. (Patient 8)

There are some leaflets in Puskesmas [that are] quite similar, but they do not have the scheme as shown in this sheet. This scheme [on page 4] is easily understood [in terms of] what a patient should do. The other leaflets explain the information only in general. (HCP 5)

Patients will bring it home, right? The other leaflet is not usually used after being read. Some people may throw it [away], and the patients forget their previous BP level. (HCP 13)

Table 8.2 Characteristics of respondents

	Patients (n=12)		Healthcare professionals^a (n=13)		Community health workers (n=12)	
Sex						
Female	8		11		12	
Male	4		2		0	
Age						
Mean $\pm$ SD (years)	58.3 $\pm$ 10.1		39.6 $\pm$ 8.8		39.1 $\pm$ 5.5	
Formal education						
	Elementary school	4	Pharmacy high school	1	Junior high school	1
	Junior high school	5	Diploma for nurse/midwife/dietician	8	Senior high school	11
	Senior high school	3	University (3 doctors, 1 nurse)	4		
Years since hypertension diagnosis						
Mean $\pm$ SD (years)	5.8 $\pm$ 6.4		NR		NR	
Years of experience						
Mean $\pm$ SD (years)	NR		15.1 $\pm$ 10.2		9.6 $\pm$ 6.2	

^a Healthcare professionals included four doctors, three midwives, four nurses, a pharmacy technician and a dietician

Abbreviations: n = number, SD = standard deviation, NR = not relevant

Key facts and information, such as ‘Hypertension is treatable’, ‘Hypertension can cause stroke, heart attack, kidney and eye problems’, and ‘What patients should do’, were regarded by patients as the most important and interesting aspects of the sheet.

I feel happy, for being informed about hypertension so that I do not need to worry. It mentions [here], ‘hypertension is treatable’. (Patient 8)

This one [is the most interesting]: hypertension can cause stroke [or] heart attack. I am afraid of these risks. (Patient 3)

Certain information such as, the need to take medications routinely over the long term was considered to be new information and provided new insights for patients and community health workers.

What I previously believed was that, I need to take medications after visiting the clinic or only when feeling sick. Now I know more about taking the medication, which means that I need to make friends with [hypertension] medications. (Patient 3)

‘Taking medication at the same time each day’ – we did not know this before. My husband has high BP, and he usually takes the medication in the morning or in the evening. So, after reading this leaflet, I know that taking medication should be at the same time. (Community health worker 8)

Some HCPs appreciated that the BP Action Sheet addressed common misconceptions about hypertension medications among their patients and emphasised the importance of this information.

Well, I like this one: ‘Hypertension often shows no signs or symptoms’. This is good, to raise the patient’s awareness that the BP check does not need to wait for symptoms [to appear]. Because many of our patients do that. They wait for the symptoms to occur or worsen. If the symptoms do not occur, they think that they are healthy. (HCP 1)

So, they [patient] think that all kinds of medicines can damage the kidneys. In fact, [as mentioned in the BP Action Sheet] hypertension can cause kidney problems if it’s not well treated [but] lay people often think the opposite. (HCP 12)

The HCPs and community health workers also agreed that the sheet would help them explain hypertension to patients.

In my opinion, we can use it for health education. It will be very useful since many people are recently diagnosed with hypertension. Most older people who visit Posyandu lansia [Integrated Health Service Post for the Elderly] have high blood pressure. (Community health worker 1)

I think HCP s need to explain it, well ... for example, explain the [‘What should I do?’] schemes. (HCP 2)

Patients, HCPs, and community health workers agreed that the content on the second page (presenting an individualised target BP, recording BP readings and actions to be taken) enabled the BP Action Sheet to function as a personal health record. In addition, they mentioned that the BP Action sheet is user-friendly, and this was perceived as a strength of the sheet.

It is good ... because it mentions the target blood pressure. I think most of the leaflets do not include this information, so this leaflet [BP Action Sheet] is much better ... more real ... more functional ... and more personal, because each patient is different. (HCP 8)

We have a health card for the elderly, but we don’t use it. We record the result of each patient’s blood pressure check in our book [because] the font in the card is too small, a lot of columns ... It is not simple. On the other hand, this sheet can be filled in easily. (Community health worker 8)

Theme 2: Potential use of the BP Action Sheet

Both patients and healthcare workers mentioned the importance of patients bringing the BP Action Sheet to their HCP appointments, or when having their BP checked by community health workers. They also agreed that both HCPs and community health workers could record important information on the sheet. For this reason, there was much interest in making copies of the sheet available for their immediate use in practice.

This sheet will be brought [in] by patients. It can be used as a follow-up ... For further steps, I think it can become a program [for Puskesmas]. It is probably beneficial in Puskesmas. We can copy this sheet to be distributed to patients. (HCP 13)

I can copy the sheet and distribute it to patients with high blood pressure. We will tell them that they must bring the sheet to every Posyandu meeting. (Community health worker 4)

Can I copy this by myself? I will also copy it for my neighbours because there are some people with hypertension around here ... let me give this to them. (Patient 9)

Both HCPs and community health workers believed that the *Posyandu lansia* (Integrated Health Service Post for the Elderly, a community health worker-based program for the elderly) would be an ideal place for distributing the sheet to patients because this program is well established in all villages (in the study location). As confirmed by participants, the *Posyandu lansia* uses local villagers as community health workers who provide BP checks for the elderly at least once every 1–3 months.

I really believe that, in my Posyandu lansia, patients will happy to bring this [BP Action]sheet to the Posyandu. (Community health worker 7)

To use this sheet ... patients will bring this ... but, most of them are the elderly, and they need assistance. This is done best by community health workers in the Posyandu lansia [where] they can check [the patient's] BP. They can also read the information to the patients. I think if we do not read this to elderly patients, they will not read [it themselves]. (HCP 9)

HCPs also explicitly mentioned the *Prolanis* program, a newer program for patients with hypertension and/or diabetes mellitus treated in the community health centres, as another portal for disseminating the BP Action Sheet.

We monitor patients [in the Prolanis program], primarily using medical records, so, for me, this sheet will help the patients [members of Prolanis] to see how, after getting a medication, they [can] achieve their target BP. (HCP 12)

Theme 3. Optimising the use of the BP Action Sheet

Although most participants noted that the information in the sheet is easily understood, a few suggested the need for additional verbal explanations of the content and how the sheet should be used. The HCPs expressed the need for assistance from community health workers, not only in distributing the sheet, but also in helping HCPs to explain to patients the information contained within it. The HCPs conveyed their appreciation of the ability of community health workers to provide information using lay language so that is easily understood by patients, particularly older persons with limited reading skills. It was also agreed that community health workers could support BP checking and recording of results on the sheet.

For this sheet, we will ask community health workers to provide information to patients about it. The main point is information ... the community health workers have important roles because they are in the front line. I usually ask for their help for health education ... So, they will inform the patients ... they know the local language better than we do. (HCP 11)

First, we need to give ... general information about hypertension. So, when we distribute the sheet, we start the explanation from the first page, followed by filling in the personal identity, and then going to the next page to write down their BP reading. (Community health worker 10)

In addition, the community health workers noted that verbal explanations also can be provided by family members to help patients understand the information contained in the sheet.

We will ask for help from their family. When we explain it [the sheet], their children are there. It is hoped that they can also explain the information to their parents when they are at home. (Community health worker 11)

Theme 4. Suggestions for improvement

Most participants stated that the design of the sheet was satisfactory, although others suggested using a coloured version of the BP Action Sheet to attract more attention, and adding arrows in the flowchart for clarity.

It is cool ... really cool ... and interesting. The pictures are also interesting ... Although it has black and white pictures, it is [still] interesting ... The recent KMS (health card) is colourful, but when we copy it, it becomes less interesting. (HCP 5)

I think colourful leaflet will be much better ... just to make it [the sheet] more interesting ... because older persons usually have sight problems. (Community health worker 11)

Overall, the responses regarding the content within the sheet were positive. Most patients felt that the information in the sheet was comprehensive. However, some HCPs and community health workers suggested that information about the role of traditional medicines and diet in the management of hypertension should be added to the BP Action Sheet. Other suggestions were to include information about symptoms, risk factors, and classification of hypertension (Box 2). In addition, half of the HCPs suggested clarifying the information about access to medication (free-of-charge) through the *Prolanis* program (Table 8.1), requesting that eligibility criteria be briefly described.

Box 2. Selected quotes expressing patients' suggestions about items that could be added to the Blood Pressure Action Sheet

Some common symptoms occurred are also necessarily mentioned; for example, 'headache'. This will allow the patients to understand that their headache might be related to their high blood pressure and they will want to check their condition. (HCP 1)

The next suggestion is to add risk factors for hypertension, such as age and low physical activity level; these should be included. (HCP 7)

[The BP Action Sheet can be used] also in Posbindu; this program has just started. For now, the Posbindu program focuses on non-communicable diseases, not only hypertension. In Posbindu, we have already trained the community health workers on how to measure body mass index, body fat and other parameters. We have also trained them to measure blood pressure, blood sugar, abdominal circumference, cholesterol. So maybe in 'Where should I go', the Posbindu can be added because hypertension is one risk factor for non-communicable diseases. (HCP 12)

Another one is to state the level of hypertension. This is not mentioned on the Sheet. There are three levels of hypertension: Levels 1, 2 and 3. We should add information about these levels to remind the HCPs and patients. (HCP 6)

Traditional medication, such as Achi (noni) or cucumber, must also be included. [These are] simple examples but they are easily found nearby. In 'Medication', [it would be helpful to] divide [this] into chemical and traditional medicines. (HCP 7)

I think this part (lifestyle measures) needs a more detailed explanation ... such as dietary [changes] for [people with] hypertension ... Mentioning examples will make this more easily understood. (HCP 5)

It needs to add, for example, in the TB [tuberculosis] program, each patient has a person who supervises their taking medication. Maybe if some things happen, it can be informed via that person ... especially for the ones who are illiterate. (HCP 12)

The table should have a place to write the name of the examiner so we know has completed the form – either a HCP or community health worker. [This can be added as] a column. This will allow us to know who has referred the patients or who is checking blood pressure. Thus, this can help in the follow-up of patients. (HCP 8)

8.1.4 Discussion and Conclusion

Discussion

This study describes the feedback obtained about a new written educational resource for Indonesian patients titled the 'BP Action Sheet'. Overall, the sheet was perceived positively as both a source of information for patients with hypertension and as a tool for monitoring their progress toward achieving the target BP.

People with hypertension need adequate information to encourage them to become actively involved in the self-management of their high BP such as by monitoring their BP, taking medication, managing their diet, performing physical activity, and controlling stress (Bosworth, Powers & Oddone 2010). Written educational resources are considered to be an effective mode for providing information to literate patients and as a complement to

information delivered directly by HCPs (Wilson et al. 2012). It is essential that the information in the resources is suited to the targeted patients and is written in understandable language (Shoemaker, Wolf & Brach 2014; Stonecypher 2009). To improve the readability, a written educational resource should be presented at a literacy level that is no higher than eighth-grade schooling or at the sixth-grade schooling for patients with low health literacy (Institute of Medicine Committee on Health 2004). However, the current instruments for assessing readability, such as the Flesch–Kincaid grade (Friedman & Hoffman-Goetz 2006) were developed mainly for English resources (Badarudeen & Sabharwal 2010). Therefore, we used qualitative feedback from potential end users, including patients, to assess the suitability of the sheet for the target recipients (i.e. rural Indonesian patients). As a source of information, the sheet was perceived as being accurate, comprehensive, and easily understood by patients in this study. The strength of the BP Action sheet is that the information contained therein is a response to the findings from previous studies in a similar study setting (Rahmawati & Bajorek 2016; Rahmawati & Bajorek 2017a, 2017b). In addition, as a four-page A5-size leaflet, it is simple and inexpensive to reproduce; it costs less than US\$0.1 to print a paper copy of the sheet.

The BP Action Sheet also has potential as a BP monitoring tool for patients. It is a concern that patients often rely on the appearance of symptoms rather than objective BP readings as an indicator of the need to take treatment (Marshall, Wolfe & McKevitt 2012; Rahmawati & Bajorek 2016). Therefore, each patient's target BP should be recorded and documented (Chobanian et al. 2003). The BP Action Sheet includes space to record the patient's BP, which is intended to provide timely information for both the patient and HCP about the patient's progress in achieving the target BP. Requiring each patient to bring the BP Action Sheet to each visit to the HCP will hopefully trigger discussions about whether the target BP has been met and, if not, strategies to address this. The written recommendation in terms of action needed to achieve the target BP can be provided individually for each patient, which means that the sheet may facilitate communication between HCPs and patients. In addition, as a BP monitoring tool, patients will need to regularly interact with the BP Action Sheet and they will be less inclined to discard the sheet. This is important because a written resource such as a leaflet is often thrown away after reading (Raynor & Knapp 2000).

This study found that there is potential for involving community health workers and family members in optimising the use of a written educational resource such as the BP Action Sheet. Support from community health workers in providing accessible BP checks and

information for rural Indonesian people with hypertension has been reported (Krishnan et al. 2011; Rahmawati & Bajorek 2015). It is expected that community health workers would distribute the BP Action Sheet to rural patients in the study setting, explain the information contained in the sheet, record the BP reading, give advice to patients, and refer them to an HCP when necessary. To improve patients' adherence to the hypertension treatment plan, previous studies have also reported the importance of functional support from family members (Magrin et al. 2015). Family members may help patients to understand the information contained in the resource and to put into practice the recommendations provided by the HCPs. The opportunity to re-read the information contained in the BP Action Sheet, including written recommendations from HCPs and community health workers, might improve patients' understandings about their condition and encourage them to have their BP adequately treated. Because the community health workers can also access the HCPs' recommendations and refer patients to HCPs, the sheet also may enhance patient-centred communication involving HCPs, community health workers, family members, and patients.

This study suggests that it may be feasible to implement the BP Action sheet in programs for rural Indonesian patients, particularly through the existing hypertension programs in the community such as the *Posyandu lansia* or *Prolanis*. The *Prolanis* program is integrated into routine primary health care and offers comprehensive approaches to managing hypertension such as monthly BP checks, health education, physical exercise, medication (free-of-charge), home visits, and referrals to specialists (Badan Penyelenggara Jaminan Sosial 2015). As a simplified information resource and personal BP record, the BP Action Sheet has potential benefits for members of *Prolanis* that could complement its existing approaches. Integrated interventions comprising patient education, behavioural support and case management that are offered in this program might lead to greater improvements in medication adherence, a cornerstone of achieving BP control (Conn, Ruppert, Chase, et al. 2015).

Conclusion

Positive feedback from patients and healthcare workers in rural villages indicates that the BP Action Sheet has the potential to improve patients' knowledge about hypertension and to facilitate the achievement of the target BP. The BP Action Sheet may serve as an affordable and practical tool for patients, HCPs, and community health workers in supporting efforts to manage hypertension among people in low-resource settings. Further refinement is required before the sheet can be piloted in the clinical practice setting.

Support from HCPs, family members, and community health workers is required to optimise the practical use of the BP Action Sheet by patients.

Practice implications

Providing the BP Action Sheet to patients would require them to bring the sheet to each health care visit. This tailored sheet is not only an information source for patients, it can be used as a BP monitoring tool and a facilitator of communication between HCPs, patients and community health workers. Collectively, these functions could greatly support patients to improve adherence to hypertension treatment and to achieve their target BP. As a low cost strategy, the sheet has a potential to support hypertension programs for patients in low-resource settings. Because patients in such settings often present challenges to visiting HCPs, providing accessible and affordable healthcare services is crucial to encouraging patients to have their BP checked and treated.

Declaration: I confirm all personal identifiers have been removed or disguised so the persons described are not identifiable and cannot be identified through the details of story.

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Chapter 9:

Discussion

9.1 Introduction

This chapter highlights the main findings of the studies in this thesis and discusses the practical implications, recommendations for further studies and limitations of the studies. Consistent with the objectives of this thesis research, this chapter first presents the extent of non-adherence to anti-hypertensive medications among Indonesian rural villagers, followed by summarising the factors that affect patient adherence to medications. The World Health Organization (WHO) multidimensional model is used to identify and categorise the key factors affecting adherence to anti-hypertensive medication by combining quantitative and qualitative studies, which are used to form the basis for recommendations about the types of support needed to improve adherence in patients with hypertension in rural Indonesia. In response to the findings, a written resource, “Blood Pressure Action Sheet” (BP Action Sheet), has been developed. The rationale for developing the BP Action Sheet, key features and feedback from potential end-users of this sheet are presented. Finally, this chapter concludes with recommendations for improving adherence to anti-hypertensive medication in the rural Indonesian context.

9.1.1 The extent of non-adherence to anti-hypertensive medications

The management of hypertension is usually represented as the awareness, treatment and control rates (Chow et al. 2013; Hussain et al. 2016b; Lloyd-Sherlock et al. 2014). In Indonesia, Hussain et al. (2016b) found that only 37% of patients diagnosed with hypertension were aware of their condition. Other Indonesian studies (Aizawa & Helble 2016; Hussain et al. 2016b; Setiati & Sutrisna 2005; Sohn 2015) have reported that the treatment rate among patients diagnosed with hypertension (irrespective of their awareness) ranged from 5% (Sohn 2015) to 63% (Setiati & Sutrisna 2005). Recently, Hussain et al. (2016b) reported that the treatment rate among the rural Indonesian population is 24%, which is lower than the rate of 30% among the urban population. Overall, these findings indicate that most patients with hypertension in Indonesian rural villages do not receive adequate treatment for hypertension.

Given the inclusion criteria, all participants in the quantitative study (n=384) were aware that they had been diagnosed with hypertension by a healthcare professional (Chapter 5).

When comparing findings from this study with those of previous studies in Indonesia and other countries, it is important to use similar inclusion criteria. Data presented in Section 5.2 shows that 22% of participants were taking anti-hypertensive medications, which is lower than that in previous studies in Indonesia (70%) (Hussain et al. 2016b), Kyrgyzstan (Murphy et al. 2016)(42%) and India (47%) (Gupta et al. 2012). In these studies, the percentages were calculated using the number of patients who were aware that they had been diagnosed with hypertension as a denominator. The treatment rate in this current thesis was also lower than ‘the rule of halves of hypertension’ (Scheltens et al. 2007), and the average treatment rate (88%) reported in a multi-country study (Chow et al. 2013). As a response to the survey question about the last time participants took anti-hypertensive medications, 203 (53%) participants had taken their medication within the preceding 30 days, and 58 (15%) participants had not taken any anti-hypertensive medications for more than six months.

Data presented in Section 5.2 showed that only 42 (11%) of 384 rural villagers surveyed had good adherence to anti-hypertensive medications, which is much lower than 45% reported in a recent meta-analysis of 28 studies that used MMAS-8 to evaluate patient adherence (Abegaz et al. 2017). There is no comparable Indonesian data on medication adherence rates. However, previous studies have reported that 75% (Hussain et al. 2016b) to 89% (Sohn 2015) of patients who have received anti-hypertensive medications did not achieve their target blood pressure (BP). Assuming that adherence is the most important factor affecting the suboptimal treatment of hypertension (Abegaz et al. 2017; Sabate 2003), this research confirms primary Indonesian data for the magnitude of non-adherence to anti-hypertensive medications obtained at the rural community level. However, this research could not assess the relationship between poor adherence and poor BP control because the self-reported BP measures preclude the objective assessment of BP readings. Overall, only three patients reported that their last BP readings were <140/90 mmHg, which indicates a very low BP control rate among these rural villagers.

9.1.2 Factors affecting adherence to anti-hypertensive medications

Factors affecting adherence to anti-hypertensive medication identified in the quantitative and qualitative studies in this research are presented in Table 9.1. Each finding is subsequently categorised using the WHO multidimensional model (Sabate 2003).

Table 9.1 Study findings of the factors affecting adherence to anti-hypertensive medication among rural people in Indonesia

Findings	Effect on adherence		Dimension of adherence†
	Positive	Negative	
Access to medicines for hypertension: A survey in rural Yogyakarta province, Indonesia (Section 5.1)			
Inadequate supply of anti-hypertensive medications		✓	Healthcare system
Limited access to healthcare services (transport constraint)		✓	Patient, socioeconomic
Financial burden (high cost of medication)		✓	Patient, socio-economic
Factors affecting self-reported medication adherence and hypertension knowledge: A cross sectional study in rural villages, Yogyakarta province, Indonesia (Section 5.2)			
Poor knowledge about hypertension		✓	Patient
Knowledge gaps about the BP target, complications of hypertension and the need to take anti-hypertensive medications		✓	Patient
Beliefs that medicines should be taken only when symptoms are evident		✓	Patient
Beliefs that managing stress is more important than taking medication		✓	Patient
Preference for using traditional medicines		✓	Patient
Lack of clinical improvement when taking medications		✓	Patient, clinical
Inadequate medicine information from healthcare professionals		✓	Healthcare system
Use of traditional medicines among people with hypertension: A survey in rural areas of Yogyakarta province, Indonesia (Section 5.3)			
Reliance on traditional medicines as the primary ways to treat hypertension		✓	Patient
Low educational level		✓	Socioeconomic factor

Findings	Effect on adherence		Dimension of adherence†
	Positive	Negative	
Perspectives on anti-hypertensive medication: A qualitative study in a rural Yogyakarta Province in Indonesia (Section 6.1)			
Belief that hypertension was more likely to be associated with diet and lifestyle factors		✓	Patient
Belief that using complementary medicine to reduce BP is safer than medications		✓	Patient
Belief that long-term medication was not a safe option (fear of dependence)		✓	Patient
Symptom-based drivers of treatment		✓	Patient
Perceived inadequate information about anti-hypertensive medication		✓	Healthcare system
Expectation for more detailed information and follow up of hypertension	✓		Patient
Understanding untreated hypertension from patients' point of view: A qualitative study in rural Yogyakarta province, Indonesia (Section 6.2)			
High self-efficacy for managing high BP using personal strategies and low self-efficacy for adherence to long-term medication		✓	Patient
Preference for managing hypertension without any medication		✓	Patient
Belief that visiting a health professional is unnecessary unless feeling sick		✓	Patient
Transport barriers to visiting healthcare professionals		✓	Patient
Perception of hypertension as an episodic disease with evident symptoms		✓	Patient/clinical
Becoming accustomed to having high BP		✓	Patient
Belief that having a systolic BP of 150 mmHg is normal for older persons		✓	Patient
Perception that hypertension is not serious problem		✓	Patient/clinical
Reluctance to take anti-hypertensive medications because of: Feeling no improvements after taking medications, experiencing side effects, difficulty taking the medicines, believing that anti-hypertensive medications are not needed		✓	Patient/therapy

Findings	Effect on adherence		Dimension of adherence†
	Positive	Negative	
Perceived lack of recommendations to take anti-hypertensive medications regularly		✓	Patient
Strong motivation to have BP checked and treated	✓		Patient
Family/peer support	✓		Patient
The expectation of attaining more information about hypertension treatment	✓		Patient
Role of a community health workers-based program to support elderly people with hypertension: A qualitative study (Section 7.1)			
Dedication of community health workers in volunteering their time to serve people in their villages (including BP checks, home visits)	✓		Healthcare system
Enthusiasm of patients for attending community health worker-based program and having BP checks	✓		Patient
Lack of capability and confidence of some community health workers in performing BP checks and providing information		✓	Healthcare system
Lack of resources (e.g. calibrated sphygmomanometer) to support routine BP checks in community health worker-based programs		✓	Healthcare system

† The WHO multi dimensions of adherence: patient-, healthcare system/healthcare team-, clinical-, therapy-, socioeconomic-related factors (Sabate 2003)

Five factors affecting adherence to anti-hypertensive medications mostly fell within the categories of patient-related, healthcare system-related and socio-economic-related factors and can be summarised as follows:

1. Patient knowledge of, and beliefs about, hypertension and the use of anti-hypertensive medication (patient-related factor)
2. Self-efficacy in managing hypertension (patient-related factor)
3. Access to an adequate supply of anti-hypertensive medications (healthcare system-related, patient-related and socio-economic-related factors)
4. Information and recommendations regarding anti-hypertensive medication (healthcare system-related factor)
5. Support from family and community health workers in the villages (socio-economic-related and healthcare system-related factors).

Previous reviews have identified that forgetfulness (patient-related factor), complexity of medication regimens (therapy-related factor) and side-effects of medications are also important factors that affect a patient's adherence to anti-hypertensive medications (AlGhurair et al. 2012; Khatib et al. 2014). However, findings in Section 5.2 show these factors were rarely mentioned as reasons for not taking anti-hypertensive medications (Section 5.2). The five main factors identified from studies in this thesis research are discussed in the following sections.

Patient knowledge of, and beliefs about, hypertension and the use of anti-hypertensive medication

Most of the rural villagers surveyed had a poor knowledge about hypertension, particularly those with a low educational level and those who lived a considerable distance from public healthcare facilities. An association between a higher level of knowledge and adherence to medications has been reported among patients with hypertension (Karaeren et al. 2009; Lee, Lin & Tsai 2009; Li et al. 2016; Malik et al. 2014; Nielsen et al. 2017). Consistent with these studies are the findings presented in Section 5.2, which show that participants with good hypertension knowledge were seven times more likely to have good adherence to anti-hypertensive medications.

The relationship between a low educational level and poor hypertension knowledge has also been reported among patients in Mongolia (Demaio et al. 2013) and China (Li et al. 2013). Given that most people living in Indonesian rural underdeveloped villages have a low level of education (Ministry of Health Republic of Indonesia 2015a), a lack of knowledge regarding hypertension is considered a common problem among rural villagers and therefore should be addressed.

Findings from both quantitative and qualitative studies in this thesis research show that knowledge gaps were predominantly about the need to take anti-hypertensive medications over the long term, complications of hypertension, and the target BP. Less than one-third of rural villagers knew that anti-hypertensive medication should be taken continually, not only when feeling sick (Section 5.2). This aligns with previous findings in a systematic review that patients' concerns about taking anti-hypertensive medication over the long term is an important factor influencing their decision to discontinue taking medications intentionally (Marshall, Wolfe & McKevitt 2012).

A recent study of Vietnamese people with hypertension showed that being aware of the complications of hypertension positively affected adherence (Nguyen et al. 2017). However, similar to the findings of a study in rural China (Li et al. 2013), a substantial proportion of participants in this thesis research were not aware of the complications caused by hypertension such as stroke, heart attack, eye problems and kidney diseases (Section 5.2). As previously reported in Malaysia (Risso-Gill et al. 2015), some rural villagers perceived that taking medications over the long term might cause unfavourable effects such as kidney disease (Section 6.1, Section 8.1). These findings confirm the need to provide more information to patients because of hypertension is an important risk factor for the development of end-stage kidney disease (Kopp, 2013).

Previous studies have reported that being aware of the target level of BP can improve adherence to medications (Karaeren et al. 2009), follow-up visits (Oliveria et al. 2005) and the control of BP (Li et al. 2016). For example, a study of 227 Turkish people with hypertension showed that patients who knew their target BP were 13 times more likely ($p < 0.001$) to be adherent to anti-hypertensive medications (Karaeren et al. 2009). However, reviews by Buckley et al. (2016) and Marshall et al. (2012) have revealed that patients tend to assess the effectiveness of a treatment based on the symptoms that occur rather than on objective BP readings. By becoming accustomed to a high BP, participants in this thesis research decided not to take any anti-hypertensive medications (Section 6.2). Data reported

in Section 5.3 show that 47 of 384 participants (12%) kept their high BP untreated within the preceding 30 days, that is, they did not take any medications or traditional medicines to lower their BP. Hence, they perceived that high BP was not a serious problem unless symptoms were evident and thus cited this as a common reason to leave it untreated.

Although a BP reading <140/90 mmHg is preferred for reducing cardiovascular complications (Hansson et al. 1998; Chobanian et al. 2003), the rural villagers in this thesis research believed that a systolic BP of 160 mmHg is normal for them, high BP was not a concern and fluctuations in BP were considered to be normal. These perceptions fit with the asymptomatic nature of hypertension and competing priorities with other clinical conditions that have overt symptoms (Khatib et al. 2014). A study of 124 patients in a Malaysian primary care clinic showed that, although 60% of users of traditional medicines felt that their BP had decreased after consuming these medicines, their target BP had not been achieved (Mahfudz & Chan 2005). These findings confirm that knowledge about the normal target BP and how to assess the target objectively are important aspects that should be explained explicitly to patients (Chobanian et al. 2003). Given that rural villagers were not familiar with the terms ‘hypertension’, ‘systolic BP’, and ‘diastolic BP’ (Section 6.2), there is a need to consider effective delivery methods to inform patients about their target BP. For example, van Beusekom et al. (2016) reported the advantage of using images in written resources to help patients increase their understanding of the information provided by healthcare professionals.

Self-efficacy in managing hypertension

Bandura (1997) defined self-efficacy as the patient’s capability to “organise and execute the courses of action required to produce given attainment”. It is one of the core constructs of the health belief model, which was developed to explain why patients do or do not take any actions related to their health condition (Glanz, Rimer & Viswanath 2008). Section 6.2 shows how low self-efficacy for taking long-term medications, simultaneously with other constructs of the health belief model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues of action), influenced patients’ decision to not take their anti-hypertensive medications despite their awareness of having hypertension. Given that achieving the BP goal requires the patient to be able to take anti-hypertensive medications under various situations, self-efficacy is a strong predictor of medication adherence and should be addressed in the targeted interventions for patients (Burke, Dunbar-Jacob & Hill 1997; Scherer & Bruce 2001).

Data presented in Section 5.3 show that 69% of participants took traditional medicines to lower their BP. This percentage is higher than average percentage in other countries (25%), as reported in our published review (Section 2.2). Approximately half of traditional medicine users (51%) relied on traditional medicines to lower their BP. Section 6.2 describes how participants who had not taken any anti-hypertensive medications within the preceding year preferred alternative approaches to lower their BP, such as modifying their diet, consuming herbal medicines, managing stress and treating their symptoms. These rural villagers perceived that traditional medicines, such as herbs, to be effective, because they were natural and cheaper than anti-hypertensive medications. Patients' decision-making about taking medications or alternative medicines were also associated with their perceptions of the benefits and risks, such as experiencing side effects caused by medications. A meta-analysis showed that patients reporting side effects of medications were twice as likely to discontinue their anti-hypertensive medications (Khatib et al. 2014). These findings indicate that patients should be informed that the advantages of taking medications outweigh their possible side effects, especially for patients with hypertension who are at high cardiovascular risk. Because perspectives on the use of anti-hypertensive medication often differ between patients and healthcare providers (Hurwicz & Rose 2016), providing information about the effectiveness of long-term medication in maintaining BP control and reducing cardiovascular risk should also consider patients' underlying reasons for not taking medications.

Access to an adequate supply of anti-hypertensive medications

Data presented in Section 5.1 reveals that only 10% of rural villagers reported having a 30-day supply of anti-hypertensive medications. Using the dataset from the Indonesia Family Life Survey 2008, Aizawa & Helble (2016) and Sohn (2015) have reported the challenges faced by rural Indonesian people in accessing anti-hypertensive medications. According to the WHO adherence model (Sabate 2003), barriers to accessing an adequate supply of medication are influenced simultaneously by patient/socio-economic factors and healthcare system-related factors.

Patient-related barriers included low motivation to visit healthcare providers, difficulty in accessing anti-hypertensive medications because of financial constraints (i.e. the high cost of medication) and a lack of transportation to visit healthcare providers. Similar to findings from rural Malaysia (Risso-Gill et al. 2015), the lack of affordable transport was cited as an important barrier to visiting healthcare services, despite the opportunity to obtain free-of-charge medication in public health care services (Sections 5.2 and 6.2). Chronic

conditions such as hypertension usually need long-term medication, which can be a financial burden for people with low socio-economic status (Ibrahim & Damasceno 2012; Risso-Gill et al. 2015). When there is a lack of government support and health insurance, patients with a low socio-economic status are generally more concerned about the cost of visiting healthcare providers because they must prioritise their basic needs (Khatib et al. 2014). Competition between receiving treatment for hypertension and other health conditions can interfere with patients' adherence (Khatib et al. 2014; Risso-Gill et al. 2015; Sabate 2003). A study in Kyrgyzstan found that low income people were less likely to be adherent to anti-hypertensive medications compared to those with a higher income (Murphy et al. 2016). Similar to the Kyrgyz study, out-of-pocket expenditure to access medication was reported to be a barrier to routine visits to healthcare providers (Section 6.2).

Barriers related to the healthcare system are associated with a lack of reliable outreach healthcare services and an inadequate supply of anti-hypertensive medications from healthcare providers. An US study involving 129,400 participants with hypertension and diabetes found that having an adequate supply of medication (i.e. >90 days) was significantly associated with good adherence to anti-hypertensive medications (Schmitt diel et al. 2015). However, data presented in Section 5.1 show that 43% of rural villagers obtained a supply of anti-hypertensive medications that was sufficient for less than seven days at each health visit regardless of the type of healthcare provider (public or private). Within the public health sector, the supply for patients in the IHSP-Elderly was the lowest, and most patients (92%) obtained only a three-day supply. Because the IHSP-Elderly is held once every 1–3 months, patients would not have any medications available at home for much of this time. Rumagit, Pojoh & Manampiring (2012) also reported on the three-day policy of providing anti-hypertensive medications at each healthcare visit in an Indonesian CHC. This inadequate supply of medications is problematic because, although patients took all medications provided, it was insufficient for provide effective treatment. The seventh Joint National Committee (JNC) Guidelines state that most patients need follow-up visits and adjustment of medications at monthly intervals until the target BP is attained (Chobanian et al. 2003). This follow-up process cannot be implemented with the existing three-day supply scenario. An exception in this thesis research was those patients who joined the *Prolanis* program because they obtained anti-hypertensive medications for 30 days (Section 5.1). Notably, 13 of the 14 *Prolanis* (93%) members had good adherence; this percentage was much higher than that for non-*Prolanis* members (15%). This finding supports a study by Wong et al. (2015), which also reported that new patients who obtained

more than a 29-day supply of anti-hypertensive medications were more likely to have good adherence than those who obtained medications for 7–14 days.

Information and recommendations from healthcare providers regarding anti-hypertensive medication

Given the positive value of patient-centred care (Holmström & Röing 2010), patients with hypertension should be informed about why they need to keep taking medication every day at the same time over the long term. They should also be encouraged to become more involved in using various self-management skills to achieve and maintain BP control (Bensing et al. 2006; Michie, Miles & Weinman 2003). However, rural villagers in this thesis research reported receiving very limited information about anti-hypertensive medications from healthcare providers during their clinical encounters (Section 5.2). The findings presented in Section 6.1 also shows that rural villagers accepted the high patient load as a reason why they received limited support, although they did expect to receive more information. Claramita et al. (2011) reported that although effective communication (i.e. a participatory communication style) is preferred by both healthcare providers and patients, the reality in Indonesia was far from ideal. Indeed, a lack of consultation time is an important barrier to effective communication between the doctor and patient (Claramita, Dalen & Van Der Vleuten 2011; Khatib et al. 2014).

In the Indonesian primary healthcare system, the term ‘healthcare providers’ refers mainly to doctors, midwives and nurses who perform healthcare services for patients in the CHC, solo private practice or both (dual practices). Data presented in Section 5.1 show that rural villagers visited village midwives or nurses more often than village doctors. Anti-hypertensive medications were obtained directly from these private providers (direct dispensing), along with information about medications. Direct dispensing was intended to increase health coverage in rural areas where access to a pharmacy is limited (*Law No. 29 Year 2004 Republic of Indonesia about Medical Practice*). Nationally, the number of community pharmacies in Indonesia has increased markedly in the 12 years from 10,275 in 2004 to 25,336 in 2016 (Department of Health Republic of Indonesia 2007; Ministry of Health Republic of Indonesia 2016b). In the Bantul district, where the survey in this thesis research was undertaken, 27 CHCs, 10 public hospitals and 100 community pharmacies existed (Bantul District Government 2013). Despite the growing number of community pharmacies across Indonesia, this thesis research confirms the previous study (Hong et al. 2009) that reported that direct dispensing is commonly practised among Indonesian private practices. However, it remains unclear whether it influences patients’ adherence to anti-

hypertensive medications. This practice would preclude patients' opportunity to obtain pharmaceutical care from community pharmacists. While a health professional collaborative model is increasingly proposed to improve BP control in primary care (Carter 2016; Polgreen et al. 2015), this collaborative model remains in its infancy in the Indonesian primary healthcare system.

Community pharmacists are often the first point of contact for patients with hypertension; they play a vital role in providing information and consultations for the appropriate use of medications (World Health Organization 1998). Systematic reviews have reported the effectiveness of pharmacist-led interventions in improving patients' adherence to hypertension medication (Cheema, Sutcliffe & Singer 2014; Santschi et al. 2014). In Indonesia, a study involving 76 patients showed that the provision of counselling service by community pharmacists significantly increased adherence to anti-hypertensive medication (Wati, Mustofa & Sari 2015). In this thesis research, data presented in Section 5.1 show that 64 of 203 (32%) rural villagers accessed community pharmacies to obtain anti-hypertensive medications. They purchased these medications without a prescription; however, few reported that pharmacy staff gathered information about the use of these medications. Indeed, anti-hypertensive medications could be purchased without the patient presenting at the pharmacy (Section 5.1). These findings indicate suboptimal medication-management services provided in community pharmacies in the study setting. Without the patient presenting him/herself, medication management services, such as BP checks in pharmacies, recommendations for treatment, counselling, and monitoring of the side effect of medications could not be performed. A qualitative study involving interviews of Indonesian pharmacists has identified such services as part of the pharmacist's role in hypertension management, concluding that these services should be encouraged (Dewi, Utami & Puspitasari 2016).

The CHC is at the core of the primary healthcare system in providing promotive, preventive and curative programs for the Indonesian people (*Regulation of Ministry of Health No. 75 Year 2014 about Community Health Centre*). However, a heavy workload has been identified by Indonesian healthcare providers in the CHC as a barrier to providing optimal information to patients (Syah et al. 2015). Given that 50–100 patients visit each CHC each day (Holloway 2011), the consultation time is less than five minutes per patient. Furthermore, providing information by pharmacy staff in the CHC is also minimal because of a shortage of pharmacists in the Indonesian CHCs (Supardi et al. 2012). In this research, all participating CHCs had no pharmacist, and medications were dispensed by only one

pharmacy technician per CHC. In the Bantul district, where this research was undertaken, only three of 27 CHCs had a pharmacist (Bantul District Government 2013). The limited number of pharmacy staff members created a heavy workload, which prevented the provision of optimal pharmaceutical care to patients (Supardi et al. 2013). There is hence a need to develop effective and efficient methods to ensure that patients receive adequate information about medicines provided in CHCs. This could include the use of written information, such as consumer medicine information, charts, leaflets or posters (Hamrosi, Raynor & Aslani 2014). Long-term strategies should include efforts to improve the availability of pharmacists in Indonesian CHCs. For example, a policy of ‘one CHC, one pharmacist’ should be prioritised through placement regulation at the district or national level (Supardi et al. 2012).

Support from family and community health workers in the villages

Involving family members in educational programs is considered important to optimising support for patients (Miller & DiMatteo 2013). In Indonesia, older people are usually highly respected among their family and communities, and live with their children, who take responsibility for their care until they die (Keasberry 2001; Schröder-Butterfill 2004). Findings in this thesis research indicated that family members provide several means of functional support for patients such as taking family members to visit healthcare providers, relaying information about anti-hypertensive medication, assisting patients with refilling their prescriptions, and supporting lifestyle modifications (e.g. providing a diet rich in vegetables and fruit). Functional social support also derived from a strong sense of community in rural villages (Section 5.1). Meet-and-greet events with peers were perceived as facilitators of attendance at community health worker-based programs for BP checks in the village. A meta-analysis (Magrin et al. 2015) concluded that such functional social support significantly improves patient adherence to anti-hypertensive medication.

Both quantitative and qualitative studies included in this thesis research confirmed the strategic role of community (lay) health workers in supporting rural villagers with hypertension. Community health workers at the front-line in hard-to-reach areas have also been reported in Thailand, another country in South-East Asia that also faces a critical shortage of health workers (Sommanustweechai et al. 2016). In 2014, a report showed that adherence-enhancing intervention and cardiovascular screening provided by community health workers could be cost-effective strategies for reducing cardiovascular events caused by hypertension in South Africa (Gaziano et al. 2015; Gaziano et al. 2014). An existing community health worker-based program in Indonesia, the IHSP-Elderly, has been

established across all provinces in Indonesia to improve access to healthcare services, particularly in rural areas (Christiani et al. 2016; Ministry of Health Republic of Indonesia 2015a). The role of community health workers in the IHSP-Elderly in screening for high BP and conducting patient education programs, as shown in this thesis research, has also been reported by previous studies (Brownstein et al. 2007; Gaziano et al. 2014; Rosenthal et al. 2010). A pilot study of community-based interventions for Indian and Indonesian people with hypertension showed community health workers playing an important role in the significant increase of Indonesians who had their BP measured (Krishnan et al. 2011). A study in Pakistan by Abegunde et al. (2007) showed that non-doctor health workers can be trained to perform cardiovascular risk assessments and to manage hypertension in primary healthcare using the WHO Cardiovascular Risk Management Package (World Health Organization 2002). Mendis (2005) also reported that the WHO package is feasible when implemented in low- and medium-resource settings.

Despite the potential of community health workers supporting patients in rural villages, the findings of this thesis research highlight the need to improve the capability of community health workers to strengthen their front-line role, especially in terms of providing information to patients and referring them to healthcare providers. It is also important to improve their ability to identify patients at high cardiovascular risk because these patients require adequate anti-hypertensive medications in addition to lifestyle modification. Recently, Gaziano (2015) reported that 42 of 68 trained community health workers in four developing countries (Bangladesh, Guatemala, Mexico and South Africa) were considered to be qualified persons to provide screening for cardiovascular risk; the mean level of agreement in calculating risks scores compared with scores assigned by healthcare professionals was 97%.

9.1.3 Support needed for Indonesian patients living in rural villages

Given the extent of poor adherence to anti-hypertensive medication among rural Indonesian villagers, this thesis research has identified five key factors that influence adherence behaviour and the support needed for these villagers (Figure 9.1).

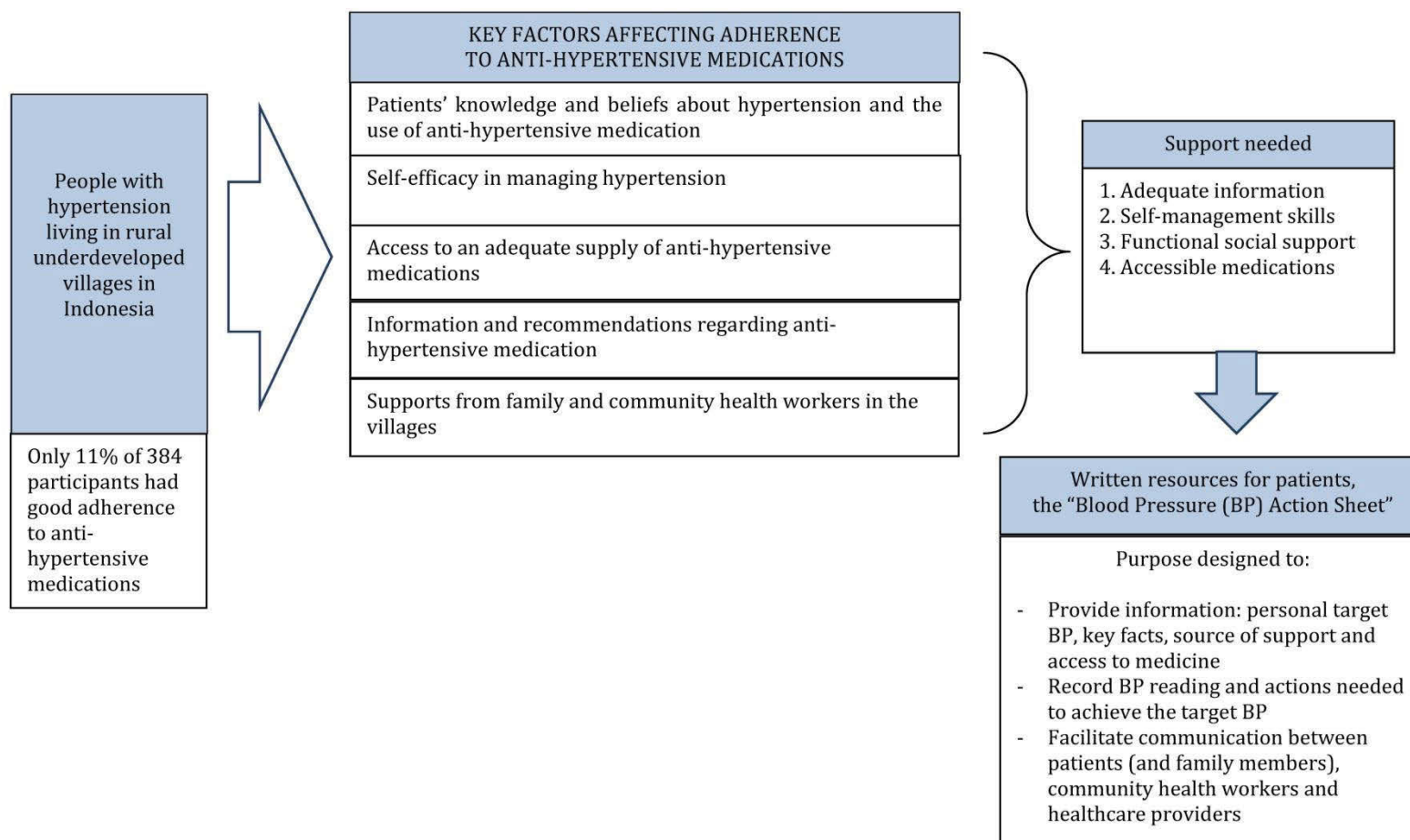


Figure 9.1 Key factors affecting adherence to anti-hypertensive medication and support needed for patients

These findings suggest that patients in rural areas should be supported in terms of: (i) adequate information; (ii) self-management skills; (iii) functional social support; and (iv) accessible medications.

The independent predictor of good adherence in this thesis research was good knowledge about hypertension; no socio-demographic variables predicted adherence to anti-hypertensive medications among these Indonesian rural villagers. The findings indicated that rural villagers need more information to help them address any misconceptions and misbeliefs about hypertension and the use of anti-hypertensive medications. Tailoring and targeting information are customisation strategies that are intended to meet the needs of patients and to improve the effectiveness of communications (Kreuter & Wray 2003). Where tailored information is aimed to provide specific information based on a patient's characteristics, targeted information is purpose-designed to reach subgroups of the population (Kreuter & Skinner 2000). It has been suggested that interventions for patients should be tailored to key factors that affect their adherence by considering each patient's characteristics, resource availability and existing support (Baker et al. 2010; Hugtenburg et al. 2013). When an educational intervention (e.g. provision of information) is chosen as an adherence-enhancing strategy, tailoring the information should also be considered as a strategy for enhancing the relevance of that information for individual patients (Kreuter & Wray 2003).

Targeted information is preferable when the population generally has a low awareness or understanding about a specific issue. In this thesis research, most patients had a low level of hypertension knowledge and awareness about the importance of anti-hypertensive medications, and preferred alternative medicines to manage hypertension. This finding suggests that targeted information is needed. Factors that influenced patients' adherence were complex and varied widely between patients. Some patients were not motivated, while others were highly motivated but experienced difficulty in visiting healthcare services. The target BP and best method to achieve this target can vary between patients, which raises the need for information to be tailored according to a patient's need. Therefore, in the context of improving adherence of patients in rural Indonesia, both tailored and targeted information are required.

Healthcare providers are the best source of information. However, consistent with previous findings in Indonesia (Budijanto & Astuti 2015; Syah et al. 2015), patients perceived that healthcare providers faced a heavy workload and lacked the time to establish effective

interpersonal communications with patients (Section 6.1). Pharmacists are ideally suited to address non-adherence issues, but there are insufficient numbers working in Indonesian CHCs (Supardi, Raharni, et al. 2012) or community pharmacies (Hermansyah et al. 2012; Supardi, Handayani, et al. 2012). Compared with healthcare providers, community health workers in the villages have more time to engage with patients and to provide information (Rosenthal et al. 2010; Sommanustweechai et al. 2016). However, as also shown in other settings (Allen et al. 2016; Stekelenburg, Kyanamina & Wolffers 2003), the limited capability of community health workers to provide information is concerning and needs to be strengthened (World Health Organization 1989a).

Addressing the need for adequate information for patients requires the provision of additional resources to overcome obstacles to providing oral information by healthcare providers and community health workers. This thesis research found that, overall, rural villagers had a low degree of concern about their hypertension but they expected more information. Duggan & Bates (2008) reported that such patients would be more empowered when given educational resources compared with those who had a greater cause to worry (e.g. cancer) but did not expect to know more about their condition. Given that providing education alone is unlikely to improve patient adherence to medication (Conn et al. 2015), developing educational resources for rural villagers should aim at improving patient knowledge, encouraging self-management skills and facilitating better support from family members and healthcare workers.

9.1.4 BP Action Sheet for patients

Dixon-Woods (2001) wrote that using written information (e.g. a leaflet) for patients can be considered as part of the patient-empowerment discourse, which assumes that patients should not be seen as passive and incompetent even if knowledge gaps exist. Written information for patients is a cost-effective method for complementing verbal communication between patients and healthcare professionals (Hamrosi, Raynor & Aslani 2014; Semple & McGowan 2002). Written information can increase a patient's recall of advice (Gibbs, Waters & George 1989), bridge the information gap between healthcare providers and patients (Kenny et al. 1998) and improve adherence to treatment (Arthur 1995). However, a systematic review found that patient information leaflets available for patients with hypertension often omit important information, for example, only eight of 19 non-internet leaflets analysed contained information about the importance of continued BP monitoring (Fitzmaurice & Adams 2000).

As a result of the research on factors affecting medication adherence among rural villagers, a written educational resource (BP Action Sheet) was developed (Appendix I.1). Section 8.1 describes the feedback from the potential end-users in Indonesian primary healthcare settings, including literate patients living in rural underdeveloped villages, community health workers in the villages and healthcare professionals in CHCs. Overall, the respondents' feedback indicated that the BP Action Sheet has potential to provide information, to be useful for monitoring patients' progress towards achieving their BP target, and to help facilitate communication between healthcare providers and patients.

Providing tailored information for patients

Four types of basic information are contained in the BP Action Sheet: (i) the personal target BP; (ii) key facts about hypertension; (iii) sources of support; and (iv) actions needed to manage high BP (Appendix I.1). The seventh JNC Guidelines state that the target BP must be agreed on by the doctor and the patient, and the target should be explicitly documented (Chobanian et al. 2003). When using the BP Action Sheet, the healthcare provider must enter the target BP for each patient. The intention is to inform the patient and other healthcare workers (including community health workers) who will subsequently enter further information into the table for BP monitoring.

Based on findings of these villagers' knowledge gaps about hypertension, key facts about hypertension were included in the BP Action Sheet (Appendix I.1). For example, the statement "Hypertension often shows no signs or symptoms; I need to check my blood pressure, even if I feel healthy" was included. Following each fact about hypertension, the sources available for patients are presented. For example, patients can go to a CHC (*Puskesmas*), IHSP-Elderly (*Posyandu lansia*), community pharmacy or private practice clinic to have their BP checked. Finally, an infographic was purpose-designed to inform patients about the actions needed to manage their hypertension (including taking medications and lifestyle measures).

Recording BP and recommended actions: enhancing self-management skills

Self-monitoring BP is one behavioural intervention that is effective in improving medication adherence (Agarwal et al. 2011; Fletcher et al. 2016). Even though self-monitoring is not easily implemented among rural people in developing countries, this thesis research confirmed the potential for community health workers to provide BP checks, which could facilitate self-monitoring of BP (Section 7.1). Recording BP in the BP Action Sheet is intended to provide timely information for patients and healthcare providers about

the patient's progress in achieving the target BP. Healthcare professionals or community health workers can enter the recommended actions for each patient into the BP Action Sheet which can include specific suggestions related to the use of anti-hypertensive medications or other actions to manage hypertension, such as managing the diet, performing physical activity and controlling stress.

Facilitating communication between patients, community health workers and healthcare providers: a trigger for better social support

As described in Section 8.1, using the BP Action Sheet in clinical practice would require active involvement of patients, healthcare providers and community health workers in the villages. The opportunity to re-read information and actions recommended by healthcare providers might encourage functional social support from family members to encourage the patient to follow through with the recommendations in their daily lives. The BP Action Sheet can also be used as a practical tool for community health workers to refer patients to healthcare providers (e.g. where patients have a systolic BP of more than 200 mmHg). Similarly, healthcare providers might provide written advice to patients to have their BP regularly checked by a community health worker.

Implementing the BP Action Sheet: Its potential as low-cost intervention within a low-resource setting

Collectively, the potential of the BP Action Sheet is to (i) provide information; (ii) monitor the achievement of target BP; and (iii) facilitate patient-centred communications, which may greatly improve the management of hypertension in rural Indonesian areas. Feedback from potential end-users showed that the BP Action Sheet is feasible for implementation for patients, particularly through existing hypertension program in the community, such as the IHSP-Elderly (*Posyandu lansia*). The IHSP-Elderly is well established to provide outreach healthcare services for rural villagers with hypertension. In the Bantul District, there is at least one IHSP-Elderly in each village (Bantul District Government 2012). Nationally, 88% of Indonesian villages ran a IHSP-Elderly program in 2010 (Ministry of Health Republic of Indonesia 2013b), and 97% of the IHSP-Elderly in rural areas performed BP checks for local people (Christiani et al. 2016). To support the strategic role of community health workers as the frontline in screening BP and providing information, implementing the BP Action Sheet may also help community health workers in rural villages to deliver key information about the management of hypertension and to identify when patients need to visit healthcare providers to receive adequate treatment. The BP Action Sheet may also complement the *Prolanis* program, a comprehensive community-

based program in the Indonesian CHC (Section 8.1). Piloting the implementation of the BP Action Sheet through existing hypertension program is required to evaluate the feasibility and usability of the sheet to improve adherence to anti-hypertensive medications among rural Indonesian population, as well as other outcomes in the management of hypertension. Given that a low level of education was associated with patients' poor knowledge about hypertension (Section 5.2.3), further piloting of the BP Action Sheet needs to focus on illiterate patients.

9.2 Strengths and Limitations

By combining quantitative studies with qualitative ones, this research has presented the findings of community-based studies that provide insight into adherence to hypertension medication among people in a rural Indonesian setting; this research also includes those who rarely visit healthcare providers. Therefore, the strength of this research is that it portrays the real conditions experienced in the rural community, beyond a clinical setting. In response to these conditions, this research has developed a customised written resource (BP Action Sheet) and gained feedback from potential end-users in rural Indonesian primary healthcare settings (including patients) with the aim of improving its usability in clinical practice.

This thesis research also has limitations. The main limitation is the reliance on participants' self-report. Despite being efficient and practical (Osterberg & Blaschke 2005), this method has potential bias (e.g. overestimating adherence, forgetfulness). A patient's self-report about the latest BP reading does not allow for accurate assessment of the relationship between adherence and BP control. A second limitation is that some variables that may affect adherence to anti-hypertensive medication, such as health status and household income, were not included. Objective data on patients' health literacy are also lacking. Further, even though this research identified healthcare system-related issues, such as direct dispensing, self-medication with anti-hypertensive medications and non-doctor prescribing, their associations with patients' adherence to hypertension treatment remain unclear. This thesis recommends optimising the potential role of community health workers in providing information for rural villagers. However, the community health workers' knowledge about hypertension was not objectively assessed here. The fact that most participants in each of the studies were female may limit the generalisability of the findings. Moreover, the in-depth interviews about adherence were undertaken only with non-adherent patients, which mean that the perspectives of participants who had high adherence were not included.

Owing to the scarcity of studies of the factors affecting medication adherence in the Indonesian population, further research is required to identify the reasons that underlie the determinants of adherence to anti-hypertensive medication and other factors that have not been included in this thesis research.

9.3 Conclusions

This thesis research provides firsthand information about adherence to anti-hypertensive medications among Indonesian rural villagers. Poor adherence to anti-hypertensive medications is common among rural villagers in Indonesia and is influenced by their understanding of hypertension, perceived need for and concerns about anti-hypertensive medications, high self-efficacy of the use of alternative medicines to treat hypertension, barriers to accessing anti-hypertensive medications and a lack of information about, and support for, treatment. Providing adequate information for patients, strengthening the role of community health workers in the local villages, increasing patient participation in ways to achieve the target BP and enhancing healthcare support systems in primary healthcare are important aspects for promoting adherence to medication and improving management of hypertension in the Indonesian rural population.

Despite the strategic use of community health worker-based programs for providing accessible BP monitoring and information to rural villagers, the follow-up of patients diagnosed with hypertension (including high-risk patients) is lacking. Government bodies (e.g. the district health office) should encourage the CHCs, as the centres of primary health care services, to strengthen the role of community health workers in rural villages through adequate training, supervision and policy support. Inadequate supply of anti-hypertensive medications provided to patients is also a problem that should be prioritised by the Indonesian healthcare system. For example, the policy around the supply of medication that provides anti-hypertensive medications for less than one week needs to be re-evaluated. This thesis research found that the implementation of the *Prolanis* program increased the opportunity for patients to access anti-hypertensive medications and this should be expanded.

This research has developed the BP Action Sheet as a practical strategy to support patients within the community (i.e. rural villages). The sheet is not only a source of information, but has the potential to become a practical tool for monitoring progress towards the achievement of the target BP and facilitating patient-centred communication that involves

patients, their family members, community health workers and healthcare providers. It may be feasible for the BP Action Sheet to be implemented within existing hypertension programs in rural Indonesian. Further studies are needed to pilot the BP Action Sheet and to evaluate the effectiveness of implementing it in clinical practice.

Appendices

Appendix A. Project recruitment and information sheets for study in Chapter 5 and Section 6.2

Project Title: Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting

- A.1 Invitation letter (English)
- A.2 Invitation letter (Bahasa Indonesian)
- A.3 Participant consent form (English)
- A.4 Participant consent form (Bahasa Indonesian)
- A.5 Participant information sheet (English)
- A.6 Participant information sheet (Bahasa Indonesian)

A.1 Invitation letter (English)



INVITATION LETTER

**Study title: Medication-taking practices of patients with hypertension:
A survey in the rural Indonesian setting**

Dear

My name is Riana Rahmawati and I am a PhD student at the University of Technology Sydney.

I am conducting research into the population in Yogyakarta province and would welcome your assistance. The research will involve a survey and should take no more than 30 minutes of your time. I have asked you to participate because your health condition (high blood pressure).

If you are interested in participating, I would be glad if you would contact me or the local contact mentioned below. You are under no obligation to participate in this research.

Yours sincerely,

Riana Rahmawati

Graduate School of Health (Discipline of Pharmacy)
University of Technology Sydney NSW 2007 AUSTRALIA
Telephone: +61 2 9514 9226
Local telephone number : +62 898444 / +628122730508

Email : Riana.Rahmawati@student.uts.edu.au

Local Contact for each village:

Selopamiro village:
Terong village:
Muntuk village:
Mangunan village:
Jatimulyo village:
Wonolelo village:
Bawuran village:
Triwidadi village:

NOTE: This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au), and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Medication-taking practices of patients with hypertension
Version 1, 11/02/2015

A.2 Invitation letter (Bahasa Indonesian)



SURAT UNDANGAN

Judul penelitian:

Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia

(Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting)

Kepada Yth.....

Di desa: _____

Nama saya Riana Rahmawati, mahasiswa program S3 di University of Technology Sydney, Australia.

Saat ini saya sedang melakukan penelitian di masyarakat pedesaan Yogyakarta dan sangat mengharapkan partisipasi Bapak/Ibu/Saudara. Penelitian akan berupa wawancara, dengan waktu tidak lebih dari 30 menit untuk menjawab pertanyaan yang ada. Saya sangat mengharapkan Bapak/Ibu/Saudara berpartisipasi dalam penelitian ini, untuk dapat berbincang-bincang tentang tekanan darah tinggi.

Bagi Bapak/Ibu/Saudara yang tertarik untuk mengikuti penelitian ini dapat menghubungi saya atau kontak lokal di masing-masing desa seperti yang tercantum dibawah. Kepesertaan ini bersifat sukarela.

Hormat saya,

Riana Rahmawati

Graduate School of Health (Discipline of Pharmacy)
University of Technology Sydney NSW 2007 AUSTRALIA
Telp: +61 2 9514 9226
Nomer telpon lokal : +62 898444 / +628122730508
Email : Riana.Rahmawati@student.uts.edu.au

Kontak lokal di tiap desa:

Selopamiro:
Terong:
Muntuk:
Mangunan:
Jatimulyo:
Wonolelo:
Bawuran:
Triwidadi:

CATATAN: Penelitian ini telah disetujui oleh *Human Research Ethic Commitee*/Komite Etik Penelitian Manusia di University of Technology Sydney. Jika Anda mempunyai keluhan atau keberatan terkait dengan partisipasi Anda dalam penelitian yang tidak dapat diselesaikan dengan peneliti, Anda dapat menghubungi Komite Etik melalui Bagian Etika Penelitian/*Research Ethic Officer* (telp. +61 2 9514 9772 Research.Ethics@uts.edu.au) dengan mencantumkan nomer referensi penelitian. Setiap keluhan akan ditangani dengan mengedepankan kerahasiaan dan tanggung jawab, dan Anda akan diinformasikan hasilnya.

Studi penggunaan obat pada pasien hipertensi
Versi 1, 11/02/2015

A.3 Participant consent form (English)



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Telephone: +61 2 9514 8301

Facsimile : +61 2 9514 8300

Email: Beata.Bajorek@uts.edu.au

Participant Consent Form

(English Version)

Title: Medication-taking practices of patients with hypertension:

A survey in the rural Indonesian setting

PART A (Quantitative Survey)

PARTICIPANT CONSENT FORM

I _____ (participant's name) agree to participate in the study **Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting (Part A)** being conducted by Riana Rahmawati of the University of Technology Sydney for her PhD degree in Graduate School of Health (Pharmacy).

I understand that this study aims to describe medication-taking practices of patients with hypertension (high blood pressure) who live in the rural community setting.

In giving my consent I acknowledge that:

- I have understood the Participant Information Sheet and have been given the opportunity to discuss the information and my involvement in the study with the researcher.
- The procedures required for the study, the time involved (30 minutes maximum in total), any inconvenience or risk have been explained to me
- I understand that being in this study is completely voluntary.
- I am aware that I can contact Riana Rahmawati (PhD student) or her supervisor A/Prof Beata Bajorek, if I have concerns about the research.
- I understand that I am free to withdraw my participation from this research study at any time I wish, without consequences, and without giving a reason.
- I agree that dr.Riana Rahmawati has answered all my questions fully and clearly.
- I agree that the research data gathered from this study may be published in a form that does not identify me in any way.

Signature/thumb print (participant)

Date ____/____/____

Signature (witness)

Date ____/____/____

NOTE:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au) and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

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Participant Consent Form

(English Version)

**Title: Medication-taking practices of patients with hypertension:
A survey in the rural Indonesian setting**

PART B (In-depth interview)

PARTICIPANT CONSENT FORM

I _____ (participant's name) agree to participate in the study **Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting (Part B)** being conducted by Riana Rahmawati of the University of Technology Sydney for her PhD degree in Graduate School of Health (Pharmacy).

I understand that this study aims to describe medication-taking practices of patients with hypertension (high blood pressure) who live in the rural community setting.

In giving my consent I acknowledge that:

- I have understood the Participant Information Sheet and have been given the opportunity to discuss the information and my involvement in the study with the researcher.
- The procedures required for the study, the time involved (30 minutes maximum in total), any inconvenience or risk have been explained to me
- I understand that being in this study is completely voluntary.
- I am aware that I can contact Riana Rahmawati (PhD student) or her supervisor A/Prof Beata Bajorek, if I have concerns about the research.
- I understand that I am free to withdraw my participation from this research study at any time I wish, without consequences, and without giving a reason.
- I agree that dr.Riana Rahmawati has answered all my questions fully and clearly.
- I agree that the research data gathered from this study may be published in a form that does not identify me in any way.

Signature/thumb print (participant)

Date ____/ ____/ ____

Signature (witness)

Date ____/ ____/ ____

NOTE:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au) and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

A.4 Participant consent form (Bahasa Indonesian)



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Email: Beata.Bajorek@uts.edu.au

Lembar Persetujuan Partisipan

(Translated version of Participant Consent Form – Part A)

Judul penelitian:

**Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat
pedesaan Indonesia**

TAHAP A (SURVEI)

LEMBAR PERSETUJUAN PARTISIPAN

Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia *Medication-taking Practices of Patients with Hypertension: A survey in the rural Indonesian Setting*

Saya _____ (nama partisipan) menyatakan setuju untuk berpartisipasi dalam penelitian yang berjudul "**Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia**" (Tahap A) yang dilakukan oleh Riana Rahmawati dari Universitas Teknologi Sydney (UTS) sebagai bagian dari penelitian S3 (program doktor) di Graduate School of Health (Farmasi). Saya memahami tujuan penelitian yang ingin menggali informasi dan pandangan Saya mengenai penggunaan obat pada pasien hipertensi.

Dalam memberikan persetujuan ini Saya menyatakan bahwa:

- Saya telah memahami Lembar Penjelasan kepada Calon Partisipan dan telah diberikan kesempatan untuk mendiskusikan informasi dalam lembar tersebut serta keterlibatan Saya dalam penelitian.
- Prosedur yang akan dilakukan selama penelitian, waktu yang diperlukan untuk wawancara (sekitar 60 menit) serta kemungkinan risiko dan ketidaknyamanan telah diterangkan kepada Saya.
- Saya memahami bahwa keterlibatan saya dalam penelitian ini bersifat sukarela
- Saya mengetahui bahwa saya dapat menghubungi Riana Rahmawati (peneliti, mahasiswa program doktor di UTS) atau jika diperlukan supervisornya, A/Prof Beata Bajorek, jika saya ingin mendapatkan penjelasan lebih lanjut.
- Saya memahami bahwa Saya dapat mengundurkan diri dalam penelitian ini kapanpun, tanpa konsekuensi apapun dan tanpa harus memberikan alasan.
- Saya menyatakan bahwa Riana Rahmawati telah menjawab semua pertanyaan yang saya ajukan dengan jelas.
- Saya menyetujui apabila data yang diperoleh dalam penelitian ini akan dipublikasi dengan tanpa menyebutkan identitas saya sebagai responden.

Nama dan tanda tangan/cap jempol (partisipan) Tanggal ____/____/____

Nama jelas dan tanda tangan (saksi) Tanggal ____/____/____

Penelitian ini telah disetujui oleh *Human Research Ethic Commitee*/Komite Etik Penelitian Manusia di University of Technology Sydney. Jika Anda mempunyai keluhan atau keberatan terkait dengan partisipasi Anda dalam penelitian yang tidak dapat diselesaikan dengan peneliti, Anda dapat menghubungi Komite Etik melalui Bagian Etika Penelitian/*Research Ethic Officer* (telp. +61 2 9514 9772 Research.Ethics@uts.edu.au) dengan mencantumkan nomer referensi penelitian. Setiap keluhan akan ditangani dengan mengedepankan kerahasiaan dan tanggung jawab, dan Anda akan diinformasikan hasilnya.

Riana Rahmawati

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University of Technology Sydney NSW 2007

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Associate Professor Beata Bajorek

Graduate School of Health (Farmasi)

University of Technology Sydney NSW 2007

AUSTRALIA

Telepon: +61 2 9514 8301

Faksimile : +61 2 9514 8300

Email: Beata.Bajorek@uts.edu.au

Lembar Persetujuan Partisipan

(Translated version of Participant Consent Form – Part B)

Judul penelitian:

**Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat
pedesaan Indonesia**

TAHAP B (WAWANCARA MENDALAM)

LEMBAR PERSETUJUAN PARTISIPAN

Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia

Medication-taking practices of patients with hypertension: A survey in the rural Indonesian Setting

Saya _____ (nama partisipan) menyatakan setuju untuk berpartisipasi dalam penelitian yang berjudul **"Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia" (Tahap B)** yang dilakukan oleh Riana Rahmawati dari Universitas Teknologi Sydney (UTS) sebagai bagian dari penelitian S3 (program doktor) di Graduate School of Health (Farmasi).

Saya memahami tujuan penelitian yang ingin menggali informasi dan pandangan Saya mengenai penggunaan obat pada pasien hipertensi.

Dalam memberikan persetujuan ini Saya menyatakan bahwa:

- Saya telah memahami Lembar Penjelasan kepada Calon Partisipan dan telah diberikan kesempatan untuk mendiskusikan informasi dalam lembar tersebut serta keterlibatan Saya dalam penelitian.
- Prosedur yang akan dilakukan selama penelitian, waktu yang diperlukan untuk wawancara (sekitar 60 menit) serta kemungkinan risiko dan ketidaknyamanan telah diterangkan kepada Saya.
- Saya memahami bahwa keterlibatan saya dalam penelitian ini bersifat sukarela
- Saya mengetahui bahwa saya dapat menghubungi Riana Rahmawati (peneliti, mahasiswa program doktor di UTS) atau jika diperlukan supervisornya, A/Prof Beata Bajorek, jika saya ingin mendapatkan penjelasan lebih lanjut.
- Saya memahami bahwa Saya dapat mengundurkan diri dalam penelitian ini kapanpun, tanpa konsekuensi apapun dan tanpa harus memberikan alasan.
- Saya menyatakan bahwa Riana Rahmawati telah menjawab semua pertanyaan yang saya ajukan dengan jelas.
- Saya menyetujui apabila data yang diperoleh dalam penelitian ini akan dipublikasi dengan tanpa menyebutkan identitas saya sebagai responden.
-

Nama dan tanda tangan/cap jempol (partisipan) Tanggal ____/____/____

Nama jelas dan tanda tangan (peneliti) Tanggal ____/____/____

Penelitian ini telah disetujui oleh *Human Research Ethic Commitee*/Komite Etik Penelitian Manusia di University of Technology Sydney. Jika Anda mempunyai keluhan atau keberatan terkait dengan partisipasi Anda dalam penelitian yang tidak dapat diselesaikan dengan peneliti, Anda dapat menghubungi Komite Etik melalui Bagian Etika Penelitian/*Research Ethic Officer* (telp. +61 2 9514 9772 Research.Ethics@uts.edu.au) dengan mencantumkan nomor referensi penelitian. Setiap keluhan akan ditangani dengan mengedepankan kerahasiaan dan tanggung jawab, dan Anda akan diinformasikan hasilnya.

A.5 Participant information sheet (English)



Riana Rahmawati

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Telephone: +61 2 9514 8301
Facsimile : +61 2 9514 8300
Email: Beata.Bajorek@uts.edu.au

Participant Information Sheet

(English Version)

**Title: Medication-taking practices of patients with hypertension:
A survey in the rural Indonesian setting**

PART A (Quantitative Survey)

PARTICIPANT INFORMATION SHEET

Title: Medication-taking practices of patients with hypertension:

A survey in the rural Indonesian setting (Part A)

UTS HREC Ref. 2014000647

YOUR INVITATION TO PARTICIPATE

You are invited to take part in a study "Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting" (Part A).

WHO IS DOING THE RESEARCH?

This study is conducted by Riana Rahmawati (PhD student at University of Technology Sydney), under the supervision A/Prof Beata Bajorek (University of Technology Sydney).

WHAT IS THE RESEARCH ABOUT?

We want to learn about medication-taking practices of patients with high blood pressure. We would like to ask you about: what medicines you use, how you take these medicines, and what information you have received about these medicines.

WHO IS INVITED TO TAKE PART

We are interested in taking to people in the local community who:

- Have high blood pressure
- Are aged 45 years or older
- Have lived in this village for at least three year

IF I SAY YES, WHAT WILL IT INVOLVE?

We will ask you some questions as part of a brief interview. That will take about 30 minutes of your time, at a location convenient to you. The researcher (Riana Rahmawati) will conduct this interview with you. The discussion will be audio-recorded so that we do not miss any of your important information.

ARE THERE ANY RISK/INCONVENIENCE

There is no risk from participating in this interview. We will simply invite you to provide your opinion at a time and location convenient to you. All of the information you provide is treated confidentially. Only the researchers named above will have access to the information you provide. No response will be identifiable.

WHY HAVE I BEEN INVITED

You are the type of person we are most interested in hearing from because you have high blood pressure and live in this community. Information from the interview will help us understand more about the current situation regarding medication-taking practices of patients with high blood pressure.

WHAT WILL HAPPEN IF I SAY NO?

Nothing. I will thank you for your time so far and will not contact you about this research again.

IF I SAY YES, CAN I CHANGE MY MIND LATER?

Participant in this study is voluntary. You can change your mind at any time and you do not have to say why. I will thank you for your time so far and will not contact you about this research again. Any information if collected from you during the study will then be destroyed and the information provided will not be included in this study.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about this study that you think I can help you with, please feel free to contact me on:

Riana Rahmawati

Local telephone number: +62 274 898 444/ +62 812 273 050 8

Email : Riana.Rahmawati@student.uts.edu.au

Or, you may refer to the local contact person for this study:

1. Selopamiro village:
2. Terong village:
3. Muntuk village:
4. Mangunan village:
5. Jatimulyo village:
6. Wonolelo village:
7. Bawuran village:
8. Triwidadi village:

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on 02 9514 9772, and quote this number (2014000647)

VERBAL CONSENT SCRIPT

I am Riana Rahmawati, from the Graduate School of Health (Pharmacy), University of Technology Sydney, Australia. Now, I am conducting a study: **Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting (Part A)** for my PhD dissertation under the supervision of A/Prof Beata Bajorek (University of Technology Sydney).

You are invited to take part in this study because you are the type of person we are most interested in hearing from because you have high blood pressure and live in this community. The study will help us understand more about the current situation regarding medication-taking practices of patients with high blood pressure. We would like to ask you about: what medicines you use, how you take these medicines, and what information you have received about these medicines.

You will be participating in an individual face-to-face interview, which should take approximately 30 minutes at a location convenient to you. Your participation is voluntary. If you do not wish to participate, you may stop at any time and you do not have to say why. Any information collected from you during the study will then be destroyed and the information provided will not be included in this study.

The interviews will be audio-recorded so that we do not miss any of your important information. All of the information you provide is treated confidentially. Responses will be completely anonymous; your name will not appear anywhere in the final write up. There is no risk from participating in this interview. We will simply invite you to provide your opinion at a time and location convenient to you.

If you have any questions or concerns regarding the research, you can contact me, Riana Rahmawati (PhD student) or my supervisor A/Prof Beata Bajorek. Or, you may refer to the local contact person for this study:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au) and quote the UTS HREC reference number.

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Email: Beata.Bajorek@uts.edu.au

Participant Information Sheet

(English Version)

**Title: Medication-taking practices of patients with hypertension:
A survey in the rural Indonesian setting**

PART B (In-depth interview)

PARTICIPANT INFORMATION SHEET

**Title: Medication-taking practices of patients with hypertension:
A survey in the rural Indonesian setting (Part B)**
UTS HREC Ref. 2014000647

YOUR INVITATION TO PARTICIPATE

You are invited to take part in a study "Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting" (Part B)

WHO IS DOING THE RESEARCH?

This study is conducted by Riana Rahmawati (PhD student at University of Technology Sydney) under the supervision A/Prof Beata Bajorek (University of Technology Sydney).

WHAT IS THE RESEARCH ABOUT?

In this study, we want to explore in-depth your perspectives about medicine use for hypertension (high blood pressure). We would like to ask you: what factors influence how you use your medicines, the role of medication for hypertension, the usefulness of information about hypertension medication, and your needs and expectation regarding the use of medicine for hypertension.

WHO IS INVITED TO TAKE PART

We are interested in taking to people in the local community who:

- Have high blood pressure
- Are aged 45 years or older
- Have lived in this village for at least three year

IF I SAY YES, WHAT WILL IT INVOLVE?

We will ask you some questions as part of an in-depth interview. That will take about 60 minutes of your time, at a location convenient to you. The researcher (Riana Rahmawati) will conduct this interview with you. The discussion will be audio-recorded so that we do not miss any of your important information.

ARE THERE ANY RISK/INCONVENIENCE

There is no risk from participating in this interview. We will simply invite you to provide your opinion at a time and location convenient to you. All of the information you provide is treated confidentially. Only the researchers named above will have access to the information you provide. No response will be identifiable.

WHY HAVE I BEEN INVITED

You are the type of person we are most interested in hearing from because you have high blood pressure and live in this community. Information from the interview will help us understand more about the current situation regarding medication-taking practices of patients with high blood pressure.

WHAT WILL HAPPEN IF I SAY NO?

Nothing. I will thank you for your time so far and will not contact you about this research again.

IF I SAY YES, CAN I CHANGE MY MIND LATER?

Participant in this study is voluntary. You can change your mind at any time and you do not have to say why. I will thank you for your time so far and will not contact you about this research again. Any information if collected from you during the study will then be destroyed and the information provided will not be included in this study.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about this study that you think I can help you with, please feel free to contact me on:

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6. Wonolelo village:
7. Bawuran village:
8. Triwidadi village:

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on +61295149772, and quote this number (2014000647)

VERBAL CONSENT SCRIPT

I am Riana Rahmawati, from the Graduate School of Health (Pharmacy), University of Technology Sydney, Australia. Now, I am conducting a study: **Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting (Part B)** for my PhD dissertation under the supervision of A/Prof Beata Bajorek (University of Technology Sydney).

You are invited to take part in this study because you are the type of person we are most interested in hearing from because you have high blood pressure and live in this community. The study will help us understand more about the current situation regarding medication-taking practices of patients with high blood pressure. In this study, we want to explore in-depth your perspectives about medicine use for hypertension (high blood pressure). We would like to ask you: what factors influence how you use your medicines, the role of medication for hypertension, the usefulness of information about hypertension medication, and your needs and expectation regarding the use of medicine for hypertension.

You will be participating in an individual face-to-face interview, which should take approximately 60 minutes at a location convenient to you. Your participation is voluntary. If you do not wish to participate, you may stop at any time and you do not have to say why. Any information collected from you during the study will then be destroyed and the information provided will not be included in this study.

The interviews will be audio-recorded so that we do not miss any of your important information. All of the information you provide is treated confidentially. Responses will be completely anonymous; your name will not appear anywhere in the final write up. There is no risk from participating in this interview. We will simply invite you to provide your opinion at a time and location convenient to you.

If you have any questions or concerns regarding the research, you can contact me, Riana Rahmawati (PhD student) or my supervisor A/Prof Beata Bajorek. Or, you may refer to the local contact person for this study.

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au) and quote the UTS HREC reference number.

A.6 Participant information sheet (Bahasa Indonesian)



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Lembar Penjelasan kepada Calon Partisipan

(Translated version of Participant Information Sheet – Part A)

Studi penggunaan obat pada pasien hipertensi: Survey di masyarakat pedesaan Indonesia

TAHAP A (SURVEI)

LEMBAR PENJELASAN KEPADA CALON PARTISIPAN

Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia

Medication-taking practices of patients with hypertension: A survey in the rural Indonesian Setting

UTS HREC NO. 2014000647

AJAKAN PARTISIPASI

Bapak/Ibu/Saudara diundang untuk berpartisipasi dalam penelitian "Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia" (Tahap A).

SIAPA YANG MELAKUKAN PENELITIAN?

Penelitian dilakukan oleh Riana Rahmawati (mahasiswa S3/program doktor di University of Technology Sydney), dibawah bimbingan A/Prof Beata Bajorek (University of Technology Sydney).

HAL APA YANG INGIN DITELITI?

Dalam penelitian ini kami ingin mengetahui penggunaan obat pada pasien dengan tekanan darah tinggi. Kami akan menanyakan tentang: apa dan bagaimana obat untuk tekanan darah tinggi digunakan dan informasi apa yang telah diterima tentang pengobatan tekanan darah tinggi.

SIAPA YANG DIKUTKAN DALAM PENELITIAN INI?

Anggota masyarakat yang memenuhi syarat sebagai berikut:

- Dinyatakan mengalami tekanan darah tinggi
- Umur 45 tahun keatas
- Tinggal di komunitas pedesaan selama paling tidak 3 tahun

JIKA SAYA MENYATAKAN BERSEDIA, APA KETERLIBATAN SAYA?

Bapak/Ibu/Saudara akan menjalani wawancara singkat (maksimum 30 menit) di lokasi nyaman yang disepakati dengan Bapak/Ibu/Saudara. Peneliti (dr.Riana Rahmawati) akan datang untuk melakukan wawancara di waktu yang Bapak/Ibu/Saudara sediakan. Wawancara yang dilakukan akan direkam agar tidak terdapat informasi penting yang tidak tercatat.

APAKAH ADA RISIKO DAN EFEK SAMPING BUAT SAYA?

Tidak terdapat risiko dari partisipasi Bapak/Ibu/Saudara dalam penelitian ini. Kami mengajak Bapak/Ibu/Saudara untuk menyampaikan apa yang diketahui pada waktu dan lokasi yang disepakati. Semua informasi yang diberikan bersifat rahasia. Hanya peneliti yang mempunyai akses data. Data akan ditampilkan tanpa menyebutkan identitas responden.

MENGAPA SAYA DIAJAK BERPARTISIPASI DALAM PENELITIAN INI?

Bapak/Ibu/Saudara kami ajak berpartisipasi karena Kami sangat ingin mendapatkan informasi dari anggota masyarakat yang mengalami tekanan darah tinggi dan tinggal di pedesaan. Informasi tersebut akan membantu Kami lebih memahami kondisi terkini tentang bagaimana penggunaan obat pada orang yang mengalami tekanan darah tinggi.

APA YANG TERJADI KALAU SAYA TIDAK MAU BERPARTISIPASI?

Tidak ada. Kami berterimakasih atas kesediaan Bapak/Ibu/Saudara sejauh ini dan tidak akan menghubungi Bapak/Ibu/Saudara lagi terkait dengan penelitian ini.

JIKA SAYA BERSEDIA IKUT, APAKAH SAYA BOLEH KEMUDIAN BERUBAH PIKIRAN?

Keikutsertaan dalam penelitian ini adalah sukarela. Bapak/Ibu/Saudara dapat merubah pikiran tanpa Bapak/Ibu/Saudara harus menyatakan dengan detail apa sebabnya. Kami akan mengucapkan terimakasih atas partisipasi Bapak/Ibu/Saudara sampai saat itu. Semua informasi yang telah diperoleh dari Bapak/Ibu/Saudara akan dihapus dan informasi dari Bapak/Ibu/Saudara tidak akan disertakan dalam hasil penelitian.

BAGAIMANA JIKA SAYA MEMBUTUHKAN PENJELASAN TAMBAHAN DAN KOMPLAIN

Apabila ada yang belum jelas sehubungan dengan penelitian ini dan Bapak/Ibu/Saudara memerlukan penjelasan lebih lanjut, Bapak/Ibu dapat menghubungi kami

Riana Rahmawati

Telp: +62 274 898 444/ +62 812 273 0508

Email: Riana.Rahmawati@student.uts.edu.au

Atau dapat menghubungi kontak lokal di tiap desa, yaitu:

1. Desa Selopamioro:
2. Desa Terong:
3. Desa Muntuk:
4. Desa Mangunan:
5. Desa Jatimulyo:
6. Desa Wonolelo:
7. Desa Bawuran:
8. Desa Triwidadi:

Keterangan: Jika Bapak/Ibu/Saudara ingin bicara dengan seseorang yang tidak terkait dengan penelitian ini, Bapak/Ibu/Saudara dapat menghubungi Bagian Etika Penelitian UTS di nomer +61295149772 dengan menyebutkan nomer referensi ini (UTS HREC NO. 2014000647)

NASKAH PERSETUJUAN VERBAL PARTISIPAN

Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia

Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting

Saya Riana Rahmawati, dari Graduate School of Health (Pharmacy), University of Technology Sydney, Australia. Saat ini saya sedang mengadakan penelitian berjudul **Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia (Tahap A)**, yang merupakan penelitian disertasi program S3 (doktor) di University of Technology Sydney dengan supervisi dari A/Prof Beata Bajorek.

Bapak/Ibu/Saudara kami ajak berpartisipasi karena Kami sangat ingin mendapatkan informasi dari anggota masyarakat yang mengalami tekanan darah tinggi dan tinggal di pedesaan. Informasi tersebut akan membantu Kami lebih memahami kondisi terkini tentang bagaimana penggunaan obat pada orang yang mengalami tekanan darah tinggi. Kami akan menanyakan tentang: apa dan bagaimana obat untuk tekanan darah tinggi digunakan dan informasi apa yang telah diterima tentang pengobatan tekanan darah tinggi.

Kami akan mengadakan wawancara dengan Bapak/Ibu/Saudara, selama kurang lebih 30 menit di lokasi yang nyaman bagi Bapak/Ibu/Saudara. Kepesertaan dalam penelitian bersifat sukarela. Dalam perjalanan penelitian, Bapak/Ibu/Saudara dapat mengundurkan diri tanpa harus menyatakan dengan detail apa sebabnya. Semua informasi yang telah diperoleh dari Bapak/Ibu/Saudara akan dihapus dan informasi dari Bapak/Ibu/Saudara tidak akan disertakan dalam hasil penelitian.

Wawancara yang dilakukan akan direkam agar tidak terdapat informasi penting yang tidak tercatat. Tidak terdapat risiko dari partisipasi Bapak/Ibu/Saudara dalam penelitian ini. Kami mengajak Bapak/Ibu/Saudara untuk menyampaikan apa yang diketahui pada waktu dan lokasi yang disepakati. Data akan ditampilkan tanpa menyebutkan identitas responden.

Apabila ada yang belum jelas sehubungan dengan penelitian ini dan Bapak/Ibu/Saudara memerlukan penjelasan lebih lanjut, Bapak/Ibu dapat menghubungi saya (dr.Riana Rahmawati) atau supervisor saya (A/Prof.Beata Bajorek). Bapak/Ibu/Saudara juga dapat menghubungi kontak lokal di desa Bapak/Ibu/Saudara.

Jika Bapak/Ibu/Saudara ingin bicara dengan seseorang yang tidak terkait dengan penelitian ini, Bapak/Ibu/Saudara dapat menghubungi Bagian Etika Penelitian UTS di nomor +61295149772 Research.Ethics@uts.edu.au dengan menyebutkan nomer referensi ini (2014000647).

Riana Rahmawati

Graduate School of Health (Farmasi)
University of Technology Sydney NSW 2007
AUSTRALIA
Telepon: +61 2 9514 9226
Email : Riana.Rahmawati@student.uts.edu.au

Associate Professor Beata Bajorek

Graduate School of Health (Farmasi)
University of Technology Sydney NSW 2007
AUSTRALIA
Telepon: +61 2 9514 8301
Faksimile : +61 2 9514 8300
Email: Beata.Bajorek@uts.edu.au

Lembar Penjelasan kepada Calon Partisipan

(Translated version of Participant Information Sheet – Part B)

Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia

TAHAP B (WAWANCARA MENDALAM)

LEMBAR PENJELASAN KEPADA CALON PARTISIPAN

Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia

Medication-taking practices of patients with hypertension: A survey in the rural Indonesian Setting

UTS HREC NO. 2014000647

AJAKAN PARTISIPASI

Bapak/Ibu/Saudara diundang untuk berpartisipasi dalam penelitian "Studi Penggunaan Obat pada Pasien Hipertensi: Survei di masyarakat pedesaan Indonesia".

SIAPA YANG MELAKUKAN PENELITIAN?

Penelitian dilakukan oleh Riana Rahmawati (mahasiswa S3/program doktor di University of Technology Sydney), dibawah bimbingan A/Prof Beata Bajorek (University of Technology Sydney).

HAL APA YANG INGIN DITELITI?

Dalam penelitian ini kami ingin menggali informasi mengenai penggunaan obat untuk menurunkan tekanan darah tinggi. Kami akan menanyakan tentang hal-hal yang mempengaruhi penggunaan obat, peran pengobatan tekanan darah tinggi, kemanfaatan dari informasi yang selama ini diperoleh, serta kebutuhan dan harapan Bapak/Ibu/Saudara terkait dengan penggunaan obat untuk tekanan darah tinggi.

SIAPA YANG DIKUTKAN DALAM PENELITIAN INI?

Anggota masyarakat yang memenuhi syarat sebagai berikut:

- Umur 45 tahun keatas
- Tinggal di komunitas pedesaan selama paling tidak 3 tahun
- Dinyatakan mengalami tekanan darah tinggi sejak lebih dari setahun yang lalu namun tidak berkunjung ke petugas kesehatan untuk kontrol tekanan darah selama 1 tahun.

JIKA SAYA MENYATAKAN BERSEDIA, APA KETERLIBATAN SAYA?

Bapak/Ibu/Saudara akan menjalani wawancara singkat (sekitar 60 menit) di lokasi nyaman yang disepakati dengan Bapak/Ibu/Saudara. Peneliti (dr.Riana Rahmawati) akan datang untuk melakukan wawancara di waktu yang Bapak/Ibu/Saudara sediakan. Wawancara yang dilakukan akan direkam agar tidak terdapat informasi penting yang tidak tercatat.

APAKAH ADA RISIKO DAN EFEK SAMPING BUAT SAYA?

Tidak terdapat risiko dari partisipasi Bapak/Ibu/Saudara dalam penelitian ini. Kami mengajak Bapak/Ibu/Saudara untuk menyampaikan apa yang diketahui pada waktu dan lokasi yang disepakati. Semua informasi yang diberikan bersifat rahasia. Hanya peneliti yang mempunyai akses data mentah. Data akan ditampilkan tanpa menyebutkan identitas responden.

MENGAPA SAYA DIAJAK BERPARTISIPASI DALAM PENELITIAN INI?

Bapak/Ibu/Saudara kami ajak berpartisipasi karena Kami sangat ingin mendapatkan informasi dari anggota masyarakat yang mengalami tekanan darah tinggi dan tinggal di pedesaan. Informasi tersebut akan membantu Kami lebih memahami kondisi terkini tentang bagaimana penggunaan obat pada orang yang mengalami tekanan darah tinggi.

APA YANG TERJADI KALAU SAYA TIDAK MAU BERPARTISIPASI?

Tidak ada. Kami berterimakasih atas kesediaan Bapak/Ibu/Saudara sejauh ini dan tidak akan menghubungi Bapak/Ibu/Saudara lagi terkait dengan penelitian ini.

JIKA SAYA BERSEDIA IKUT, APAKAH SAYA BOLEH KEMUDIAN BERUBAH PIKIRAN?

Keikutsertaan dalam penelitian ini adalah sukarela. Bapak/Ibu/Saudara dapat merubah pikiran tanpa Bapak/Ibu/Saudara harus menyatakan dengan detail apa sebabnya. Kami akan mengucapkan terimakasih atas partisipasi Bapak/Ibu/Saudara sampai saat itu. Semua informasi yang telah diperoleh dari Bapak/Ibu/Saudara akan dihapus dan informasi dari Bapak/Ibu/Saudara tidak akan disertakan dalam hasil penelitian.

BAGAIMANA JIKA SAYA MEMBUTUHKAN PENJELASAN TAMBAHAN DAN KOMPLAIN

Apabila ada yang belum jelas sehubungan dengan penelitian ini dan Bapak/Ibu/Saudara memerlukan penjelasan lebih lanjut, Bapak/Ibu dapat menghubungi kami

Riana Rahmawati

Telp: +62 274 898 444/ +62 812 273 0508

Email: Riana.Rahmawati@student.uts.edu.au

Atau dapat menghubungi kontak lokal di tiap desa, yaitu:

1. Desa Selopamioro:
2. Desa Terong:
3. Desa Muntuk:
4. Desa Mangunan:
5. Desa Jatimulyo:
6. Desa Wonolelo:
7. Desa Bawuran:
8. Desa Triwidadi:

Keterangan: Jika Bapak/Ibu/Saudara ingin bicara dengan seseorang yang tidak terkait dengan penelitian ini, Bapak/Ibu/Saudara dapat menghubungi Bagian Etika Penelitian UTS di nomer +61295149772 dengan menyebutkan nomer referensi ini (2014000647)

NASKAH PERSETUJUAN VERBAL PARTISIPAN

Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia

Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting

Saya Riana Rahmawati, dari Graduate School of Health (Pharmacy), University of Technology Sydney, Australia. Saat ini saya sedang mengadakan penelitian berjudul **Studi penggunaan obat pada pasien hipertensi: Survei di masyarakat pedesaan Indonesia (Tahap B)**, yang merupakan penelitian disertasi program S3 (doktor) di University of Technology Sydney dengan supervisi dari A/Prof Beata Bajorek.

Bapak/Ibu/Saudara kami ajak berpartisipasi karena Kami sangat ingin mendapatkan informasi dari anggota masyarakat yang mengalami tekanan darah tinggi dan tinggal di pedesaan. Informasi tersebut akan membantu Kami lebih memahami kondisi terkini tentang bagaimana penggunaan obat pada orang yang mengalami tekanan darah tinggi. Dalam penelitian ini kami ingin menggali informasi mengenai penggunaan obat untuk menurunkan tekanan darah tinggi. Kami akan menanyakan tentang hal-hal yang mempengaruhi penggunaan obat, peran pengobatan tekanan darah tinggi, kemanfaatan dari informasi yang selama ini diperoleh, serta kebutuhan dan harapan Bapak/Ibu/Saudara terkait dengan penggunaan obat untuk tekanan darah tinggi.

Kami akan mengadakan wawancara dengan Bapak/Ibu/Saudara, selama kurang lebih 60 menit di lokasi yang nyaman bagi Bapak/Ibu/Saudara. Kepesertaan dalam penelitian bersifat sukarela. Dalam perjalanan penelitian, Bapak/Ibu/Saudara dapat mengundurkan diri tanpa harus menyatakan dengan detail apa sebabnya. Semua informasi yang telah diperoleh dari Bapak/Ibu/Saudara akan dihapus dan informasi dari Bapak/Ibu/Saudara tidak akan disertakan dalam hasil penelitian.

Wawancara yang dilakukan akan direkam agar tidak terdapat informasi penting yang tidak tercatat. Tidak terdapat risiko dari partisipasi Bapak/Ibu/Saudara dalam penelitian ini. Kami mengajak Bapak/Ibu/Saudara untuk menyampaikan apa yang diketahui pada waktu dan lokasi yang disepakati. Data akan ditampilkan tanpa menyebutkan identitas responden.

Apabila ada yang belum jelas sehubungan dengan penelitian ini dan Bapak/Ibu/Saudara memerlukan penjelasan lebih lanjut, Bapak/Ibu dapat menghubungi saya (dr.Riana Rahmawati) atau supervisor saya (A/Prof.Beata Bajorek). Bapak/Ibu/Saudara juga dapat menghubungi kontak lokal di desa Bapak/Ibu/Saudara.

Jika Bapak/Ibu/Saudara ingin bicara dengan seseorang yang tidak terkait dengan penelitian ini, Bapak/Ibu/Saudara dapat menghubungi Bagian Etika Penelitian UTS di nomer +61295149772 Research.Ethics@uts.edu.au dengan menyebutkan nomer referensi ini (2014000647).

Appendix B. Human Research & Ethics approval for the conduct of study in Chapter 5 and Section 6.2

Project Title: Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting

- B.1 Approval from affiliated university (UTS HREC Approval)
- B.2 Letter from the district government
- B.3 Letter from the local hospital
- B.4 Copy of the MMAS-8 license

B.1 Approval from affiliated university (UTS HREC Approval)

Project Title: Medication-taking practices of patients with hypertension: a survey in the rural Indonesian setting

UTS HREC Approval

HREC Approval Granted

Research.Ethics@uts.edu.au

Wed 24/06/2015 9:40 AM

To: Beata.Bajorek@uts.edu.au <Beata.Bajorek@uts.edu.au>; Riana Rahmawati <Riana.Rahmawati@student.uts.edu.au>; Research.Ethics@uts.edu.au <Research.Ethics@uts.edu.au>;

Dear Applicant

Thank you for your response to the Committee's comments for your project titled, "Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting". Your response satisfactorily addresses the concerns and questions raised by the Committee who agreed that the application now meets the requirements of the NHMRC National Statement on Ethical Conduct in Human Research (2007). I am pleased to inform you that ethics approval is now granted.

Your approval number is UTS HREC REF NO. 2014000647

Approval will be for a period of five (5) years from the date of this correspondence subject to the provision of annual reports.

Please note that the ethical conduct of research is an on-going process. The National Statement on Ethical Conduct in Research Involving Humans requires us to obtain a report about the progress of the research, and in particular about any changes to the research which may have ethical implications. This report form must be completed at least annually from the date of approval, and at the end of the project (if it takes more than a year). The Ethics Secretariat will contact you when it is time to complete your first report.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

You should consider this your official letter of approval. If you require a hardcopy please contact Research.Ethics@uts.edu.au.

To access this application, please follow the URLs below:

* if accessing within the UTS network:

<http://rmprod.itd.uts.edu.au/RMENet/HOM001N.aspx>

* if accessing outside of UTS network: <https://remote.uts.edu.au> , and click on "RMENet - ResearchMaster Enterprise" after logging in.

We value your feedback on the online ethics process. If you would like to provide feedback please go to:

<http://surveys.uts.edu.au/surveys/onlineethics/index.cfm>

If you have any queries about your ethics approval, or require any amendments to your research in the future, please do not hesitate to contact Research.Ethics@uts.edu.au.

Yours sincerely,

Professor Marion Haas
Chairperson
UTS Human Research Ethics Committee
C/- Research & Innovation Office
University of Technology, Sydney
E: Research.Ethics@uts.edu.au

Ref: E13

B.2 Letter from the district government

**PEMERINTAH KABUPATEN BANTUL**
BADAN PERENCANAAN PEMBANGUNAN DAERAH
(B A P P E D A)
Jln. Robert Wolter Monginsidi No. 1 Bantul 55711, Telp. 367533, Fax. (0274) 367796
Website: bappeda.bantulkab.go.id Webmail: bappeda@bantulkab.go.id

SURAT KETERANGAN/IZIN
Nomor : 070 / Reg / 0558/ S3 / 2015

Menunjuk Surat : Dari : Fakultas Kedokteran Universitas Islam Indonesia (UII)
Nomor : 82/dek/40/div.um/II/2015
Tanggal : 26 Januari 2015 Perihal : **Ijin Penelitian (Perpanjangan)**

Mengingat : a. Peraturan Daerah Nomor 17 Tahun 2007 tentang Pembentukan Organisasi Lembaga Teknis Daerah Di Lingkungan Pemerintah Kabupaten Bantul sebagaimana telah diubah dengan Peraturan Daerah Kabupaten Bantul Nomor 16 Tahun 2009 tentang Perubahan Atas Peraturan Daerah Nomor 17 Tahun 2007 tentang Pembentukan Organisasi Lembaga Teknis Daerah Di Lingkungan Pemerintah Kabupaten Bantul;
b. Peraturan Gubernur Daerah Istimewa Yogyakarta Nomor 18 Tahun 2009 tentang Pedoman Pelayanan Perijinan, Rekomendasi Pelaksanaan Survei, Penelitian, Pengembangan, Pengkajian, dan Studi Lapangan di Daerah Istimewa Yogyakarta;
c. Peraturan Bupati Bantul Nomor 17 Tahun 2011 tentang Ijin Kuliah Kerja Nyata (KKN) dan Praktek Lapangan (PL) Perguruan Tinggi di Kabupaten Bantul.

Diizinkan kepada
Nama : **RIANA RAHMAWATI, DR**
P. T / Alamat : **DPPM UII, YOGYAKARTA**
JL. KALIURANG KM 14,4 YOGYAKARTA
NIP/NIM/No. KTP : **3402146906760003**
Nomor Telp./HP : **08122730508**
Tema/Judul Kegiatan : **MEDICATION-TAKING PRACTICES IN PATIENTS WITH HYPERTENSION : A SURVEY IN INDONESIA RURAL COMMUNITIES**
Lokasi : **KECAMATAN PAJANGAN, DLINGO, PLERET, DLINGO DAN IMOGIRI**
Waktu : **07 Juli 2015 s/d 07 Oktober 2015**

Dengan ketentuan sebagai berikut :

1. Dalam melaksanakan kegiatan tersebut harus selalu berkoordinasi (menyampaikan maksud dan tujuan) dengan institusi Pemerintah Desa setempat serta dinas atau instansi terkait untuk mendapatkan petunjuk seperlunya;
2. Wajib menjaga ketertiban dan mematuhi peraturan perundangan yang berlaku;
3. Izin hanya digunakan untuk kegiatan sesuai izin yang diberikan;
4. Pemegang izin wajib melaporkan pelaksanaan kegiatan bentuk *softcopy* (CD) dan *hardcopy* kepada Pemerintah Kabupaten Bantul c.q Bappeda Kabupaten Bantul setelah selesai melaksanakan kegiatan;
5. Izin dapat dibatalkan sewaktu-waktu apabila tidak memenuhi ketentuan tersebut di atas;
6. Memenuhi ketentuan, etika dan norma yang berlaku di lokasi kegiatan; dan
7. Izin ini tidak boleh disalahgunakan untuk tujuan tertentu yang dapat mengganggu ketertiban umum dan kestabilan pemerintah.

Dikeluarkan di : B a n t u l
Pada tanggal : 07 Juli 2015

A.n. Kepala,
Kepala Bidang Data Penelitian dan
Pengembangan, u.b. Kasubbid.
Litbang


Heny Endrawati, S.P., M.P.
NIP. 197106081998032004

Tembusan disampaikan kepada Yth.

1. Bupati Kab. Bantul (sebagai laporan)
2. Kantor Kesatuan Bangsa dan Politik Kab. Bantul
3. Ka. Dinas Kesehatan Kab. Bantul
4. Camat Dlingo
5. Ka. Puskesmas Dlingo 1
6. Ka. Puskesmas Dlingo 2
7. Lurah Desa Terong, Kec. Dlingo



PEMERINTAH KABUPATEN BANTUL
BADAN PERENCANAAN PEMBANGUNAN DAERAH
(B A P P E D A)

Jln. Robert Wolter Monginsidi No. 1 Bantul 55711, Telp. 367533, Fax. (0274) 367796
Website: bappeda.bantulkab.go.id Webmail: bappeda@bantulkab.go.id

Lampiran Nomor : 070 / Reg / 0558/ S3 / 2015

11. Camat Imogiri
12. Ka. Puskesmas Imogiri 1 Kab. Bantul
13. Ka. Puskesmas Imogiri 2 Kab. Bantul
14. Lurah Desa Selopamioro, Kec. Imogiri
15. Camat Pajangan
16. Ka. Puskesmas Pajangan
17. Lurah Desa Triwidadi, Kec. Pajangan
18. Camat Pleret
19. Ka. Puskesmas Pleret
20. Lurah Desa Wonolelo, Kec. Pleret
21. Dekan Fakultas Kedokteran Universitas Islam Indonesia (UII)
22. Lurah Desa Bawuran, Kec. Pleret
23. Yang Bersangkutan



UNIVERSITAS ISLAM INDONESIA
FAKULTAS KEDOKTERAN

Jl. Kaliurang Km. 14,5 Tel. (0274) 898444 ext. 2096, 2101; Fax. (0274) 898444 ext. 2007
E-mail : fk@uii.ac.id, YOGYAKARTA 55584

Nomor : 82 /Dek/40/Div.Um/1/2015
Hal : Ijin penelitian

Kepada Yth.
Kepala Bappeda Kabupaten Bantul
Jl. Robert Wolter Monginsidi
Bantul, Yogyakarta

Assalamu'alaikum wr. wb.

Sehubungan dengan pelaksanaan penelitian disertasi salah satu dosen kami, dengan ini kami mohon kepada Bapak/Ibu berkenan memberikan ijin kepada:

Nama : dr. Riana Rahmawati, M.Kes
NIP : 017110418
Tempat/tanggal lahir : Yogyakarta, 29 Juni 1976
Jabatan : Dosen Fakultas Kedokteran Universitas Islam Indonesia
Tugas belajar di program PhD, Graduate School of Health (Pharmacy),
the University of Technology Sydney (UTS), New South Wales,
Australia (Nomer mahasiswa: 11784725)
Alamat Kantor : Jl. Kaliurang Km 14,5 Yogyakarta
Judul penelitian : *Medication-taking Practices in Patients with Hypertension: A survey
in Indonesian Rural Communities*
Lokasi penelitian : Kabupaten Bantul

Demikian permohonan ijin ini kami kami sampaikan. Atas perhatian dan kerjasamanya kami ucapkan terima kasih.
Wassalamu'alaikum wr. wb.

Yogyakarta, 26 Januari 2015

Dekan



Dr. Linda Rosita, M.Kes., Sp.PK

B.3 Letter from the local hospital



Rumah Sehat BAZNAS UII Metro TV
Jl. Imogiri Barat, Timbulharjo,
Sewon, Bantul, DIY
Telp. 0274 4396409
Fax : 0274 4396294

No : S-03/Mjr/RSB JGJ/e/II/2015
Hal : Surat Pemberitahuan
Lampiran : 1 lembar

Kepada Yth:

Sdri.dr. Riana Rahmawati, MKes

University of Technology Sydney

Assalamu'alaikum Wr.Wb.

Berdasarkan surat dan proposal penelitian tertanggal 03 Februari 2015, manager Rumah Sehat BAZNAS UII METRO TV (RSB) memberitahukan dengan hormat bahwa:

Nama : dr. Riana Rahmawati, M.Kes
NIM : 11784725
Program : PhD program, Graduate School of Health (discipline of Pharmacy), University of Technology Sydney

Dapat melakukan kerjasama dengan RSB terkait dengan penelitian yang berjudul "*Medication-taking Practices of Patients with Hypertension: A survey in Indonesian Rural Communities*" dengan penjelasan dan ketentuan sebagai berikut:

1. Pelaksanaan penelitian harus memenuhi ketentuan perijinan dari pemerintah kabupaten Bantul sebagai lokasi penelitian
2. Kerjasama dalam pelaksanaan pemeriksaan kesehatan (termasuk didalamnya pemeriksaan tekanan darah) akan dilaksanakan oleh unit Layanan Luar Gedung RSB dalam rentang waktu bulan April-Mei 2015 dengan jadwal tentatif terlampir pada surat ini.
3. Peneliti wajib memberikan laporan hasil penelitian kepada manager RSB.

Demikian, semoga menjadi perhatian dan kerjasama ini dapat memberikan manfaat bagi masyarakat.

Wassalamu'alaikum Wr.Wb.

Yogyakarta, 06 Februari 2015

Rumah Sehat BAZNAS UII METRO TV

Manager,

A handwritten signature in black ink, appearing to read "Tria Meilla Retnaningtyastuti", is written over the Rumah Sehat BAZNAS logo.

dr. Tria Meilla Retnaningtyastuti

Memberikan Pelayanan Secara Humanis dan Profesional

B.4 Copy of the MMAS-8 license

Project Title: Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting

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Please sign and return this contractual agreement in a PDF format, Pages 1 and 2 to Professor Morisky and he will provide you with pages 3 and 4 of the listing of the MMAS-8 items, scoring and re-coding criteria and signature authorizing full use of this copyrighted scale. I agree to use only the English version of the MMAS-8 unless I purchase a validated translation of the MMAS-8 through Professor Morisky. I understand that it is a violation of international copyright laws to either use your own translation and call it the "MMAS-8" or use an existing MMAS-8 scale that has been translated and used for another study. The validated translation is non-transferrable and is linked to a specific license agreement and cannot be reproduced, copied, distributed, placed on the internet, published, or used by another individual.

Name and Contact Info: Riana Rahmawati, a PhD student at the University of Technology Sydney (UTS).

Title of Study:

Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting

Number of Anticipated Administrations of the MMAS-8:
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Appendix C. Data collection form for study in Chapter 5 and Section 6.2

Project Title: Medication-taking practices of patients with hypertension: A survey in the rural Indonesian setting

C.1 Questionnaire and interview guide (English)

C.2 Questionnaire and interview guide (Bahasa Indonesian)

C.1 Questionnaire and interview guide (English)



PART A. Quantitative study

Date of Interview: _____ 2015

QUESTIONNAIRE

Questions will be asked by researcher (*researcher-administered questionnaire*)

1. PARTICIPANT CHARACTERISTICS:

- 1a. Gender : ☐₁ Male, ☐₂ Female
- 1b. Age : _____ years old
- 1c. Education level : ☐₁ No school or less than elementary school
☐₂ Primary school
☐₃ High school
☐₄ University
- 1d. Current employment: : ☐₁ unemployed
☐₂ farmer
☐₃ civil servant
☐₄ other: _____
- 1e. Medical insurance holder : ☐₁ Yes, i.e. : _____
☐₂ No
- 1f. Distance to the nearest community health centre (CHC): _____ km (approximately)
- 1g. Physical activity
- 1g.i. During the last 7 days, on how many days did you do moderate physical activities (i.e. walking, gardening, cleaning, bicycling at a regular pace, swimming or other fitness activities?)
Note: those activities should be done at least 10 minutes at a time).
- ☐₁ _____ days , _____ hours _____ minutes on one of those days
- ☐₂ No day
- ☐₃ Not sure
- 1g.ii. During the last 7 days, on how many days did you do vigorous physical activities (i.e. heavy lifting, heavier garden or construction work, chopping woods, jogging/running or fast bicycling)?
Note: those activities should be done at least 10 minutes at a time).
- ☐₁ _____ days , _____ hours _____ minutes on one of those days
- ☐₂ No day
- ☐₃ Not sure

2. MEDICAL HISTORY:

- 2a. The latest blood pressure level : _____ mmHg
- 2b. Date of measurement : _____
- 2c. Years since diagnosis : _____
- 2d. Where the diagnosis was made? ☐₁ Hospital,
☐₂ Community health centre,
☐₃ Private doctor
☐₅ Other: _____
- 2e. When did you last visit health provider for hypertension control? / Which health provider?
_____/_____

2f. How often did you visit health providers for hypertension control in the last year?

2g. Presence of physician-diagnosed chronic diseases: *(can tick more than one)*

- ☐1 Cardiovascular diseases, ☐2 neurological disorder including stroke, ☐3 Dyslipidaemia,
☐4 diabetes, ☐5 Liver disease, ☐6 Lung disease, ☐7 Peptic ulcer disease, ☐8 Renal disease,
☐9 chronic back pain, ☐10 arthritis, ☐11 depression, ☐12 allergy, ☐13 cancer,
☐13 others: _____

2h. List all of medicines taken during the last month (prescribed medications, over-the-counter medications, complementary and alternative medicines):

3. THE USE OF ANTI-HYPERTENSIVE MEDICATIONS

3a. When did you last take hypertension medication? _____

3b. Have you taken medications for hypertension in the last month?

- ☐1 Yes, *continue to question no 3c*
☐2 No, why? _____

And then continue to questions in section 6

Note: Patients who answered more than 1 year ago for questions number 2c and 3a will be invited to participate for the in-depth interview session.

3c. What are the names of those medications?

☐1 _____

☐2 I don't know, ☐3 I forget

3d. In the last month, how long did you take those medications continuously (duration)?

- ☐1 Less than 1 week
☐2 One to three weeks,
☐3 In a whole month

3e. In the last month, how often did you take those medications (frequencies)?

- ☐1 Once daily
☐2 Twice daily
☐3 Three times daily
☐4 Other (including if there were some variations in the frequencies): _____

3f. Where did you obtain those medications? *[Patients can answer more than one option]*

- ☐1 Obtained from a health provider: ☐1 doctor, ☐2 others, i.e.: _____
☐2 Purchased from a pharmacy on prescription
☐3 Purchased from a pharmacy : without prescription
☐4 Obtained from family or friends
☐5 Leftovers
☐6 Other: _____

3g. How much money did you spend on purchasing those medications in the last month? (approximately) :

4. INFORMATION ABOUT HYPERTENSION MEDICATION

4a. Who mostly gave you information about your medications for hypertension?

- ☐₁ health providers, i.e. _____
☐₂ pharmacy staff
☐₃ other: _____

4b. What types of information are usually provided?

*Tick the box if the patient answers **yes** for the following options:*

- ☐₁ What the medication is for
☐₂ The directions for use are
☐₃ How long to take the medication
☐₄ What the side effects of medication are
☐₅ What the precautions/interactions/contraindications of medication are
☐₇ Other: _____

5. SELF-MEDICATION WITH ANTI-HYPERTENSIVE MEDICATIONS

These questions are for the patients who answered options ☐₃ in question no 3f.

5a. Who purchased those medications?

- ☐₁ Myself
☐₂ My family, i.e.: _____ (state the family relationship)
☐₃ My friend
☐₄ Other: _____

5b. What were your **reasons** for purchasing blood pressure medications without prescription?

[Patients can answer more than one option]

- ☐₁ Previous successful experiences
☐₂ Saving money
☐₃ Saving time
☐₄ Previous prescribed medications
☐₅ Other, i.e.: _____

5c. What types of questions were asked by the pharmacy staff when you purchase medications for blood pressure?

*Tick the box if the patient answers **yes** for the following options:*

- ☐₁ Who is it for?
☐₂ What was the last blood pressure level?
☐₃ Patient age?
☐₄ History of hypertension?
☐₅ Any previous anti-hypertensive taken?
☐₆ Any other medical condition?
☐₇ Any other medications taken?
☐₈ When was the last consultation with a health provider?
☐₉ Other: _____

5e. Did the pharmacy staff advise you to consult a doctor? ☐₁ Yes, ☐₂ No

6. THE USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINES

6a. Have you used any other medicines (traditional or herbal medicines, home remedies etc.) for lowering blood pressure in the last month?

- ☐₁ Yes
☐₂ No, continue to questions in **section 7**

6b. What types/names:

6c. During the last month, how long did you use those products (duration)?

6d. In the last month, how often did you use those products (frequencies)?

6e. Where did you obtain those products? *[Patients can answer more than one option]*

- ☐₂ Purchased from a pharmacy
☐₃ Purchased from _____
☐₄ Obtained from family or friends
☐₅ Leftovers
☐₆ Other: _____

6f. How much money did you spend on purchasing those products in the last month? (approximately):

7. HYPERTENSION KNOWLEDGE

7a. If someone's blood pressure is 120/80, it is..... ☐₁ High, ☐₂ Low, ☐₃ Normal, ☐₄ Don't know

7b. If someone's blood pressure is 160/100, it is..... ☐₁ High, ☐₂ Low, ☐₃ Normal, ☐₄ Don't know

7c. High blood pressure is associated with strokes. ☐₁ Yes, ☐₂ No, ☐₃ Don't know

7d. High blood pressure can cause heart attacks. ☐₁ Yes, ☐₂ No, ☐₃ Don't know

7e. High blood pressure is associated with kidney problems. ☐₁ Yes, ☐₂ No, ☐₃ Don't know

7f. High blood pressure can cause eye problems. ☐₁ Yes, ☐₂ No, ☐₃ Don't know

7g. Hypertension usually lasts for....

- ☐₁ A few years, ☐₂ 5-10 years, ☐₃ The rest of their life, ☐₄ Don't know

7h. Losing weight usually makes blood pressure... ☐₁ Go up ☐₂ Go down ☐₃ Stay the same

7i. Eating less salt usually makes blood pressure... ☐₁ Go up ☐₂ Go down ☐₃ Stay the same

7j. People with high blood pressure should take their medicines...

- ☐₁ Every day ☐₂ At least a few times a week ☐₃ Only when they feel sick

8. MEDICATION ADHERENCE

©Morisky Medication Adherence Scale (MMAS-8-Item)

	Items	Responses				
		No		Yes		
1	Do you sometimes forget to take your high blood pressure medications?					
2	People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your high blood pressure medications?					
3	Have you ever cut back or stopped taking your medications without telling your doctor, because you felt worse when you took it?					
4	When you travel or leave home, do you sometimes forget to bring along your high blood pressure medications?					
5	Did you take your high blood pressure medications yesterday?					
6	When you feel like your high blood pressure is under control, do you sometimes stop taking your medications?					
7	Taking medications every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your high blood pressure treatment plan?					
		Never/ Rarely	Once in a while	Sometimes	Usual ly	All the time
	How often do you have difficulty remembering to take all your medications?					

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PART B. Qualitative Study (in-depth interview)

INTERVIEW GUIDE (Questions and Probes)

1. How do you define “medicines” for hypertension?

- A. In your opinion, what kind of “medicines” can be used for lowering blood pressure?
Medications (tablets/pills) from the health providers (physician/allied health practitioner)
Complementary/ alternative medicines (herbal medicine, home remedies, acupuncture, meditation etc.)
- B. Could you give me some examples of those “medicines”?
- C. What do you understand about how those medicines work?

2. What are the factors that influence your decision to use (or not use) “medicines” for hypertension?

- A. Among those “medicines” you mentioned above [in the question 1] which ones do you prefer?
- B. What are the reasons for your preference?
- C. How does this compare to the medicines that you have taken in the past month?
- D. How are those medicines helping you? In what way they are benefiting you?
- E. You mentioned that..... can lower blood pressure but you did not take them. Why?

3. What do you believe is the role of prescription medication for hypertension [blood pressure pills/ anti-hypertensive agents]?

- A. How important is taking medications for lowering blood pressure?
- B. You mentioned that..... Could you tell me more about that?
- C. How do some people with high blood pressure avoid taking medications?

4. What would be of help to assist you in using your blood pressure medications more?

- A. How did you get information about the medication for hypertension?
- B. On what aspects of using blood pressure medication that you need more support and information? (provide more information (written, oral), provide closer access to medication, provide reminder system, etc.)
- C. Where should the support come from? (physician, pharmacist, community health worker, family/friend, etc.). How can they help you?

C2 Questionnaire and interview guide (Bahasa Indonesian)



BAGIAN A. STUDI KUANTITATIF

Tanggal wawancara: _____ 2015

KUESIONER

Pertanyaan disampaikan pada partisipan

1. KARAKTERISTIK PARTISIPAN

- 1a. Jenis kelamin : ☐₁ Laki-laki, ☐₂ Perempuan
- 1b. Umur : _____ tahun
- 1c. Tingkat pendidikan : ☐₁ Tidak sekolah atau tidak lulus SD
☐₂ lulus SD
☐₃ lulus SMP
☐₄ Perguruan Tinggi
- 1d. Pekerjaan saat ini: ☐₁ tidak bekerja
☐₂ petani
☐₃ pegawai negeri
☐₄lain: _____
- 1e. Asuransi kesehatan : ☐₁ Ya, yaitu. : _____
☐₂ Tidak
- 1f. Jarak rumah dari Puskesmas terdekat: _____ km (kira kira)
- 1g. Kegiatan fisik
- 1g.i. Selama 7 hari terakhir, berapa hari Anda melakukan aktifitas sedang (misal berjalan, berkebun, membersihkan rumah, bersepeda, berenang atau olahraga lain)?
Catatan: Kegiatan itu harus dilakukan setidaknya 10 menit sehari.
☐₁ _____ hari, _____ jam _____ menit sehari dalam hari tersebut
☐₂ Tidak ada
☐₃ Tidak tentu
- 1g.ii. Selama 7 hari terakhir, berapa hari Anda melakukan aktifitas (misal mengangkat barang berat, kerja keras di kebun atau kerja bangunan, memotong kayu, lari atau bersepeda cepat)?
Catatan: Kegiatan itu harus dilakukan setidaknya 10 menit sehari.
☐₁ _____ hari, _____ jam _____ menit sehari dalam hari tersebut
☐₂ Tidak ada
☐₃ Tidak tentu

2. RIWAYAT PENYAKIT:

- 2a. Tekanan darah terakhir : _____ mmHg
- 2b. Tanggal pengukuran : _____
- 2c. Berapa lama terdiagnosis : _____ tahun
- 2d. Dimana didiagnosis? ☐₁ Rumah Sakit
☐₂ Puskesmas
☐₃ Praktik dokter
☐₄ Lain: _____
- 2f. Seberapa sering Anda periksa ke petugas kesehatan dalam tahun terakhir?

2g. Penyakit kronis lain yang didiagnosis oleh dokter: *(bisa lebih dari satu)*

- ☐₁ Penyakit jantung dan pembuluh darah, ☐₂ penyakit saraf termasuk stroke, ☐₃ dislipidemi,
☐₄ diabetes, ☐₅ Penyakit hati, ☐₆ Penyakit paru, ☐₇ Penyakit tukak lambung, ☐₈ Penyakit ginjal,
☐₉ Nyeri punggung kronik, ☐₁₀ radang sendi, ☐₁₁ depresi, ☐₁₂ alergi, ☐₁₂ kanker,
☐₁₃ lain: _____

2h. Sebutkan semua obat yang Anda minum dalam sebulan terakhir (obat dari petugas kesehatan, obat bebas, maupun obat tradisional):

3. PENGGUNAAN OBAT ANTI HIPERTENSI

3a. Kapan terakhir kali Anda minum obat anti hipertensi? _____

3b. Apakah Anda minum obat anti hipertensi dalam sebulan terakhir?

- ☐₁ Ya, lanjutkan ke pertanyaan no 3c
☐₂ Tidak, mengapa? _____

_____ dan lalu lanjutkan ke **bagian 6**

Note: Pasien yang menjawab lebih dari 1 tahun pada pertanyaan 2c and 3a akan diundang untuk wawancara mendalam

3c. Apakah nama obat yang Anda minum?

- ☐₁ _____
☐₂ Saya tidak tahu ☐₃ Saya lupa

3d. Dalam sebulan terakhir ini, berapa total lamanya Anda minum obat (durasi)?

- ☐₁ Kurang dari seminggu
☐₃ Satu sampai dua minggu
☐₄ Satu bulan penuh

3e. Dalam bulan terakhir ini, berapa kali sehari Anda minum obat (frekuensi)?

- ☐₁ Sehari sekali
☐₂ Dua kali sehari
☐₃ Tiga kali sehari
☐₄ Lainnya (termasuk jika ada variasi dalam frekuensi): _____

3f. Dimana Anda memperoleh obat tersebut? *[Pasien dapat memilih lebih dari 1 opsi]*

- ☐₁ Dari petugas kesehatan: ☐₁ dokter, ☐₂ lainnya, yaitu : _____
☐₂ Beli di apotek, dengan resep
☐₃ Beli di apotek, tanpa resep
☐₄ Dai keluarga atau teman
☐₅ Sisa obat sebelumnya
☐₆ Lainnya: _____

3g. Berapa biaya yang Anda keluarkan untuk membeli obat itu selama sebulan? (kira kira) :

4. INFORMASI TENTANG PENGOBATAN HIPERTENSI

4a. Siakah yang paling banyak memberikan informasi tentang pil tensi?

- ☐₁ petugas kesehatan, yaitu _____
☐₂ staf apotek
☐₃ lainnya: _____

4b. Informasi apa yang telah diberikan selama ini?

Contreng pada opsi, bisa lebih dari satu jawaban:

- ☐ Info tentang nama atau jenis obat
☐ Bagaimana obat diminum, misal berapa kali sehari obat diminum
☐ Berapa lama obat diminum
☐ Efek samping obat
☐ Hal apa yang boleh dan tidak boleh selama minum obat
☐ Lainnya: _____

5. PEMBELIAN OBAT ANTI HIPERTENSI DI APOTEK TANPA RESEP

Pertanyaan berikut untuk responden yang menjawab ☐₃ di pertanyaan 3f.

5a. Siapa yang membelikan?

- ☐₁ Saya sendiri
☐₂ Keluarga saya, yaitu : _____ (Sebutkan hubungan kekerabatan)
☐₃ Teman saya

5b. Apakah alasan utama Anda memilih untuk membeli obat anti hipertensi tanpa resep dokter?

- ☐₁ Pengalaman sebelumnya,
☐₂ Hemat biaya, tidak perlu bayar uang periksa
☐₃ Hemat waktu, tidak perlu antri periksa
☐₄ Biasanya dokter/bidan/mantri memberi obat itu
☐₅ :Lainnya, yaitu: _____

5c. Apakah pertanyaan yang diajukan oleh staf apotek saat membeli pil tensi?

Contreng pada opsi, bisa lebih dari satu jawaban:

- ☐ Buat siapa obat diberikan?
☐ Berapa tensi terakhir?
☐ Umur pasien?
☐ Berapa lama mengalami hipertensi?
☐ Pernah minum obat sebelumnya?
☐ Apakah ada penyakit lain?
☐ Apakah minum obat lain?
☐ Kapan terakhir kali konsultasi dengan dokter?
☐ Lainnya: _____

5d. Apakah staf apotek menyarankan untuk konsultasi ke dokter? ☐₁ Ya, ☐₂ Tidak

6. PENGGUNAAN OBAT LAIN UNTUK MENGURANGI TEKANAN DARAH

6a. Apakah Anda minum obat tradisional atau pengobatan alternative untuk menurunkan tekanan darah pada satu bulan terakhir ini?

- ☐₁ Ya
☐₂ Tidak, lanjutkan ke pertanyaan no 7

6b. Jika no 6a jawabannya ya, jenis pengobatan itu berupa:

6c. Dalam sebulan terakhir, berapa lama Anda minum obat tradisional/pengobatan alternatif tersebut?

6d. Dalam bulan terakhir, seberapa sering Anda minum obat tersebut (frekuensi)?

6e. Dimanakah Anda mendapatkan obat tersebut? *[dapat lebih dari satu jawaban]*

- ☐₂ Membeli di apotek
☐₃ Membeli di _____
☐₄ Dari keluarga atau teman
☐₅ Sisa obat sebelumnya
☐₆ Lainnya: _____

6f. Berapa banyak biaya yang dikeluarkan untuk obat tersebut? (kira-kira) :

7. PENGETAHUAN TENTANG HIPERTENSI

7a. Jika tensi seseorang 120/80, itu berarti..... ☐₀ Tinggi, ☐₀ Rendah, ☐₁ Normal, ☐₀ Tidak tahu

7b. Jika tensi seseorang 160/100, itu berarti..... ☐₀ Tinggi, ☐₀ Rendah, ☐₁ Normal, ☐₀ Tidak tahu

7c. Tensi tinggi berhubungan dengan kejadian stroke ☐₁ Ya, ☐₀ Tidak, ☐₀ Tidak tahu

7d. Tensi tinggi dapat berakibat pada serangan jantung. ☐₁ Ya, ☐₀ Tidak, ☐₀ Tidak tahu

7e. Tensi tinggi berhubungan dengan gangguan ginjal. ☐₁ Ya, ☐₀ Tidak, ☐₀ Tidak tahu

7f. Tensi tinggi dapat berakibat pada gangguan penglihatan. ☐₁ Ya, ☐₀ Tidak, ☐₀ Tidak tahu

7g. Penyakit hipertensi biasanya akan dialami seseorang selama....

- ☐₀ Beberapa tahun, ☐₀ 5-10 tahun, ☐₁ Seumur hidup, ☐₀ Tidak tahu

7h. Turunnya berat badan seseorang biasanya menyebabkan tensi seseorang...

- ☐₀ Naik ☐₁ Turun ☐₀ Tetap

7i. Mengurangi makan garam biasanya menyebabkan tensi seseorang ...

- ☐₀ Naik ☐₁ Turun ☐₀ Tetap

7j. Seseorang dengan tensi tinggi perlu minum obatnya...

- ☐₁ Setiap hari ☐₀ Setidaknya beberapa kali seminggu ☐₀ Hanya jika merasa tidak nyaman

8. KEPATUHAN MINUM OBAT

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		Respon				
		Tidak			Ya	
1	Apakah anda terkadang lupa minum obat tekanan darah tinggi Anda ?					
2	Orang kadang-kadang lalai minum obat dengan berbagai alasan, selain alasan klasik seperti lupa. Bila anda ingat kembali dalam dua minggu terakhir, adakah hari-hari dimana anda tidak minum obat tekanan darah tinggi anda?					
3	Apakah anda sudah pernah menghentikan minum obat tanpa berkonsultasi dengan dokter karena anda merasa tambah parah bila meneruskan obatnya itu?					
4	Bila anda bepergian atau meninggalkan rumah apakah anda terkadang lupa membawa serta obat tekanan darah tinggi anda?					
5	Apakah kemarin anda minum obat tekanan darah tinggi?					
6	Ketika anda merasa tekanan darah tinggi teratasi, apakah anda terkadang menghentikan minum obat?					
7	Minum obat setiap hari merupakan sesuatu yang tidak lumrah untuk beberapa orang. Apakah anda pernah merasa kesal karena terpaksa pada rencana pengobatan itu?					
		Tidak pernah/ jarang	Sesekali	Terkadang	Biasanya	Setiap waktu
8	Seberapa sering anda mengalami kesulitan mengingat untuk minum obat?					

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BAGIAN B. Studi Kualitatif (Wawancara Mendalam)

Pedoman Wawancara (Pertanyaan)

- 1. Bagaimana Anda menggambarkan pengobatan untuk tekanan darah tinggi?**
 - A. Menurut pendapat Anda, apa saja yang dapat menurunkan tekanan darah tinggi?
Obat (dari dokter atau petugas kesehatan lain)
Obat tradisional
 - B. Bisa disebutkan contoh dari hal tersebut diatas?
 - C. Apa yang Anda tahu tentang bagaimana obat itu dapat menurunkan tekanan darah tinggi?
- 2. Faktor apa yang mempengaruhi keputusan Anda untuk menggunakan atau tidak menggunakan obat diatas?**
 - A. Diantara yang Anda sebutkan diatas, apa yang paling Anda pilih?
 - B. Mengapa Anda memilih itu?
 - C. Bagaimana jika hal tersebut diterapkan pada Anda bulan ini?
 - D. Apakah obat tersebut membantu Anda? Dalam hal apa?
 - E. Anda menyatakan bahwa hal ini..... dapat menurunkan tekanan darah tapi Anda tidak melakukannya. Mengapa?
- 3. Apa yang Anda yakini tentang penggunaan obat penurun tekanan darah?**
 - A. Seberapa penting obat dalam menurunkan tekanan darah?
 - B. Anda menyatakan bahwa.... Bisa dijelaskan lanjut?
 - C. Bagaimana beberapa orang menghindari minum obat penurun tekanan darah?
- 4. Apa yang dapat membantu Anda untuk menggunakan obat penurun tekanan darah?**
 - A. Bagaimana Anda mendapat informasi tentang obat tekanan darah tinggi?
 - B. Dalam hal apa anda memerlukan dukungan dan informasi tambahan? (misal akses ke layanan kesehatan, informasi lanjut)
 - C. Darimana dukungan itu? (petugas kesehatan, kader, keluarga)

Appendix D. Project recruitment and information sheets for study in Sections 6.1 and 7.1

Project Title: Improving self-management of hypertension in the elderly through local community based health services

D.1 Invitation letter (Bahasa Indonesian)

D.2 Consent form and participant information sheet (Bahasa Indonesian)

D.1 Invitation letter (Bahasa Indonesian)

UNDANGAN MENJADI RESPONDEN PENELITIAN

Yth. Bapak/Ibu/Sdr.....

Di

Assalamu'alaikum wrwb.

Saya yang bertanda tangan di bawah ini:

Nama : Riana Rahmawati

Jabatan : dosen Fakultas Kedokteran Universitas Islam Indonesia

bermaksud untuk melaksanakan penelitian pendahuluan untuk disertasi yang bertema "Peningkatan tata laksana mandiri hipertensi pada lansia melalui layanan kesehatan berbasis masyarakat" (*Improving self-management of hypertension in the elderly through local community based health service*)

Untuk itu, saya mohon kesediaan Bapak/ Ibu untuk menjadi responden dalam studi pendahuluan untuk penelitian tersebut. Informasi yang Bapak/ Ibu berikan sangat bermanfaat untuk mendapatkan informasi terkait tata laksana hipertensi di masyarakat. Data hasil penelitian ini akan dipergunakan sepenuhnya untuk kepentingan ilmiah dan kemanfaatan bagi masyarakat.

Demikian, atas kesediaan Bapak/ Ibu saya ucapkan terimakasih.

Wassalamu'alaikum wrwb

Peneliti

Riana Rahmawati

Alamat dan no kontak:

Departemen Farmakologi, Universitas Islam Indonesia

Jl. Kaliurang Km 14, Yogyakarta

Telp. 0274 898444 ext. 2004

HP. 08122730508

D.2 Consent form and participant information sheet (Bahasa Indonesian)

PENELITIAN

Peningkatan tata laksana mandiri hipertensi pada lansia melalui layanan kesehatan berbasis masyarakat

PENJELASAN DAN PROSUDER PENELITIAN

Penelitian ini akan dilakukan oleh Riana Rahmawati, dosen Fakultas Kedokteran UII Yogyakarta, sebagai penelitian awal untuk disertasinya yang bertemakan "Peningkatan tata laksana mandiri hipertensi pada lansia melalui layanan kesehatan berbasis masyarakat".

Penelitian bertujuan untuk mendapatkan informasi tentang peran Posyandu lansia di masyarakat pedesaan terkait dengan penanganan hipertensi di masyarakat pedesaan. Selain itu kami juga ingin mengetahui pendapat awam tentang hipertensi dan pengobatannya.

Untuk mendapatkan informasi tersebut kami akan mewawancarai masyarakat pedesaan berusia 60 tahun atau lebih yang terdiagnosa mengalami hipertensi dan ikut kegiatan Posyandu lansia di dusun (minimal 1 tahun), kader Posyandu lansia (minimal telah menjadi kader selama 3 tahun) dan staf dari Dinas Kesehatan Bantul.

Bagi responden yang bersedia untuk berpartisipasi, maka akan diminta untuk menandatangani lembar persetujuan.

Selanjutnya, wawancara akan dilakukan oleh peneliti (Riana Rahmawati), selama kurang lebih 30 menit untuk tiap responden. Wawancara akan direkam namun identitas responden akan dirahasiakan dalam pengolahan dan publikasi data penelitian.

Partisipasi dalam penelitian ini bersifat sukarela, responden dapat menghentikan menolak atau tidak melanjutkan wawancara tanpa adanya konsekuensi apapun.

Partisipasi Anda sangat bermanfaat dalam penelitian ini. Jika ada yang kurang jelas Anda dapat sewaktu-waktu menghubungi saya.

Terimakasih

Riana Rahmawati

No. 0274 898444 ext 2004

HP. 08122730508

PENELITIAN

Peningkatan tata laksana mandiri hipertensi pada lansia melalui layanan kesehatan berbasis masyarakat

LEMBAR PERSETUJUAN SETELAH PENJELASAN

(INFORMED CONSENT)

Yang bertanda tangan di bawah ini :

Nama :

Usia :

Alamat :

No. HP :

Setelah mendapatkan keterangan secara terperinci dan jelas mengenai penelitian “Peningkatan tata laksana mandiri hipertensi pada lansia melalui layanan kesehatan berbasis masyarakat” dan setelah mendapat kesempatan tanya jawab tentang segala sesuatu yang berhubungan dengan penelitian tersebut, dengan ini saya menyatakan **BERSEDIA** secara sukarela untuk berpartisipasi menjadi responden penelitian yang dilakukan oleh Riana Rahmawati dari Fakultas Kedokteran Universitas Islam Indonesia Yogyakarta.

Demikian pernyataan ini saya buat dengan sebenar-benarnya.

Tanggal _____

Mengetahui

Peneliti

Responden

Riana Rahmawati

Appendix E. Ethics approval for the conduct of study in Sections 6.1 and 7.1

**Project Title: Improving self-management of hypertension in the elderly through
local community based health service**

E.1 Letter from affiliated university (Bahasa Indonesian)

E.2 Letter from the district government

E.1 Letter from affiliated university (Bahasa Indonesian)



UNIVERSITAS ISLAM INDONESIA
FAKULTAS KEDOKTERAN
Jl. Kaliurang 14,5 Tel. (0274) 898444 ext. 2096, 2101; Fax. (0274) 898444 ext. 2007
E-mail : fk@uii.ac.id, YOGYAKARTA 55584

Nomor : 168 /Dek/70/Bag.Um/II/2013
Lamp. : -
Hal : Permohonan Ijin Penelitian

/2 Februari 2013

Kepada Yth.
Kepala Dinas Kesehatan Bantul
Yogyakarta

Assalamu'alaikum wr.wb.

Berkaitan dengan rencana penelitian Disertasi yang berjudul "Improving Self Management Of Hypertension In The Elderly Through Local Community Based Health Services", dengan ini kami mohon bantuan Bapak/Ibu/Sdr untuk memberikan ijin pada dosen kami :

Nama : dr. Riana Rahmawati, M.Kes
NIP : 017110418

agar dapat melakukan Studi Pendahuluan di Wilayah Kabupaten Bantul yang akan dilaksanakan pada Februari – Maret 2013, dengan judul :

"PROFIL LAYANAN POSYANDU LANSIA DI WILAYAH KABUPATEN BANTUL DAN POTENSINYA DALAM PENINGKATAN KEBERHASILAN TERAPI HIPERTENSI".

Demikian permohonan kami, atas perhatian dan kerjasamanya diucapkan terima kasih.

Wassalamu'alaikum wr.wb.



Dr. Isnaini Miladiyah, M.Kes

E.2 Letter from the district government

**DISTRICT HEALTH OFFICE
BANTUL DISTRICT,
SPECIAL REGION YOGYAKARTA PROVINCE**

Address: Complex II, Government Bantul District Office
Jl. Lingkar Timur, Manding, Trirenggo, Bantul 55714
Phone: 0274-368828, 367531, E-mail: dinkeskabbantul@bantulkab.go.id

Referring to a letter from Faculty of Medicine Islamic University of Indonesia No. 168/Dek/70/Bag.Um/II/2013, we hereby inform that after reviewing the research proposal,

RESEARCH APPROVAL IS GIVEN

To dr. Riana Rahmawati, MH to conduct her research in the Bantul district, Special Region Yogyakarta Province, Indonesia.

Title / Theme : Improving Self-Management of Hypertension in the Elderly through Local Community Based Health Service

Duration : March – April 2013

Location : Bantul District

During the research process, the researcher is obliged to fulfil the requirement as stated below:

1. Must not conduct any other activities that disrupt the public order
2. Must report the results of the research to the District Health Office
3. This research approval will be revoked and declared invalid if the researcher violates the abovementioned conditions.

This research approval is thus issued to be used according to the existing regulations.

Issued in : Bantul
Date : 11 March 2013
On behalf of Head,
Head of Community-based health
program (UKBM)



Nantiran, BSc
NIP. 19621225 198703 2 008

Appendix F. Data collection form for study in Sections 6.1 and 7.1

Project Title: Improving self-management of hypertension in the elderly through local community based health service

F.1 Interview guide (English)

F.2 Interview guide (Bahasa Indonesian)

F.1 Interview guide (English)

Interview Guide

A. For Patients (member of Integrated Health Service Post for Elderly)

General Information:

Age :

Gender :

Years since being a member in the IHSP-Elderly:

Questions for members of Integrated Health Service Post (IHSP) for the Elderly

1. How long have you had hypertension?
2. What kind of symptoms do you have relating to hypertension?
3. What kind of medication have you taken?
4. What is your opinion about IHSP-Elderly activities?
5. Why do you think the activities of the IHSP-Elderly are useful?
6. What do you think about blood pressure examination by community health workers in the IHSP-Elderly?
7. What is your opinion about the role of community health workers in the IHSP-Elderly to support hypertension treatment?
8. How can the IHSP-Elderly improve its service in hypertension management?

B. For community health workers

General Information:

Age :

Gender :

Years since being a community health worker :

Questions for community health workers

1. What kind of activities does the IHSP-Elderly organise for healthy aging?
2. Since you are a volunteer, what do you expect to be actively involved in the IHSP-Elderly?
3. What do you usually do after diagnosing members with high blood pressure?
4. How do you get the necessary information and skills relating to hypertension?
5. What are the barriers to implementing the hypertension program?
6. What are your suggestions for future programs?

C. For district health staff member

General Information:

Age :

Gender :

Questions for district health staff member

1. Why is the IHSP-Elderly program important for communities in the district?
2. What has the government done to support the IHSP-Elderly program?
3. What are the expectations of the district health office for the IHSP-Elderly in regard to the hypertension program?

F.2 Interview guide (Bahasa Indonesian)

Pedoman wawancara

A. Untuk Pasien

Informasi Umum:

Umur :

Jenis kelamin :

Sudah berapa lama ikut Posyandu lansia:

Pertanyaan untuk pasien peserta Posyandu lansia

1. Sudah berapa lama Anda terdiagnosa hipertensi?
2. Gejala apa yang Anda rasakan terkait dengan hipertensi?
3. Obat apa yang Anda minum untuk menangani hipertensi?
4. Bagaimana pendapat Anda tentang kegiatan Posyandu lansia?
5. Mengapa Anda pikir kegiatan Posyandu lansia memberi banyak manfaat?
6. Bagaimana pendapat Anda tentang pemeriksaan tekanan darah di Posyandu lansia?
7. Bagaimana pendapat Anda tentang peran kader Posyandu dalam penanganan hipertensi?
8. Bagaimana Posyandu lansia dapat ditingkatkan perannya bagi pasien dengan hipertensi?

B. Untuk Kader Posyandu Lansia

Informasi Umum:

Umur :

Jenis kelamin :

Sudah berapa lama aktif menjadi kader Posyandu lansia:

Pertanyaan untuk kader Posyandu Lansia

1. Apa sajakah aktifitas di Posyandu lansia terkait dengan peningkatan kesehatan lansia?
2. Sejak Anda menjadi kader, hal apa yang Anda harapkan dari berperan aktif di Posyandu lansia?
3. Apa yang biasanya Anda lakukan setelah melakukan pemeriksaan tekanan darah pasien?
4. Bagaimana Anda mendapatkan pengetahuan dan ketrampilan terkait dengan hipertensi?
5. Apa hambatan dalam melaksanakan program hipertensi?
6. Apa saran Anda lebih lanjut?

C. Untuk staf Dinas kesehatan Bantul

Informasi Umum:

Umur :

Jenis kelamin :

Pertanyaan untuk staf Dinas Kesehatan

1. Mengapa kegiatan Posyandu lansia penting bagi masyarakat di kabupaten ini?
2. Apa yang dilakukan pemerintah daerah untuk mendukung program Posyandu lansia?
3. Apakah harapan dari pihak dinas kesehatan kabupaten untuk peran dari adanya Posyandu lansia?

Appendix G. Project recruitment and information sheets for study in Section 8.1

**Project Title: Feedback from patients and healthcare workers on the Blood Pressure
Action Sheet for Indonesian patients**

- G.1 Invitation letter (English)
- G.2 Invitation letter (Bahasa Indonesian)
- G.3 Participant consent form (English)
- G.4 Participant consent form (Bahasa Indonesian)
- G.5 Participant information sheet for patients English)
- G.6 Participant information sheet for patients (Bahasa Indonesian)

G.1 Invitation letter (English)



INVITATION LETTER

- ☐₁ For patients with hypertension in the villages
☐₂ For healthcare professionals in Community Health Centre
☐₃ For community health workers in the villages

Study title: **Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet" for Indonesian patients**

Dear

My name is Riana Rahmawati. I am a PhD student at the University of Technology Sydney, Australia, under supervision of A/Prof Beata Bajorek.

We have developed a "Blood Pressure Action Sheet" for people with high blood pressure. We are looking for people in the local village and healthcare workers in the Community Health Centre to give us some feedback on this resource. This would involve a short interview (15 – 20 minutes) via telephone.

If you are interested in participating, please contact me or the local contact person mentioned below. You are under no obligation to participate in this research. However, we would highly value your opinions and suggestions for this resource, to help support the local population of people who have high blood pressure.

Yours sincerely,

Riana Rahmawati

Graduate School of Health
University of Technology Sydney NSW 2007 AUSTRALIA
Telephone: +61 2 9514 9226
Mobile phone (text/whatsapp): +628122730508/+61451123376

Email : Riana.Rahmawati@student.uts.edu.au

Local contact:

Name :
Address :
Telephone:

NOTE: This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au), and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

G.2 Invitation letter (Bahasa Indonesian)



SURAT UNDANGAN

☐ untuk pasien hipertensi di pedesaan

☐ untuk petugas kesehatan di Puskesmas

☐ untuk kader kesehatan desa

Judul penelitian:

**Timbal balik dari pasien dan petugas kesehatan
terhadap "Lembar Tindakan untuk Tekanan Darah Tinggi" bagi pasien di Indonesia**

Kepada Yth.....

Nama saya Riana Rahmawati, mahasiswa program PhD di University of Technology Sydney, Australia, dibawah bimbingan A/Prof Beata Bajorek.

Saat ini kami sedang mengembangkan suatu lembar tindakan untuk pasien, yang diperuntukkan bagi masyarakat pedesaan yang mempunyai tekanan darah tinggi. Untuk itu, kami memerlukan masukan dari pasien dan kader di wilayah pedesaan serta tenaga kesehatan di Puskesmas untuk memberikan masukan pada Lembar tindakan tersebut melalui wawancara telepon (selama 15-20 menit).

Bagi Bapak/Ibu/Saudara yang bersedia untuk diwawancarai dalam penelitian ini, dapat menghubungi saya atau kontak lokal yang tercantum dibawah. Kepesertaan ini bersifat sukarela. Kami sangat mengharapkan masukan dari Bapak/Ibu/Saudara pada lembar yang kami susun ini sehingga kedepan dapat memberikan manfaat bagi masyarakat yang mengalami tekanan darah tinggi.

Hormat kami,

Riana Rahmawati

Graduate School of Health
University of Technology Sydney NSW 2007 AUSTRALIA
Telepon: +61295149226
No HP (SMS/whatsapp): +628122730508 / +61451123376
Email : Riana.Rahmawati@student.uts.edu.au

Kontak lokal

Nama :
Alamat :
Telepon :

CATATAN: Penelitian ini telah disetujui oleh Human Research Ethic Commite/Komite Etik Penelitian Manusia di University of Technology Sydney. Jika Anda mempunyai keluhan atau keberatan terkait dengan partisipasi Anda dalam penelitian yang tidak dapat diselesaikan dengan peneliti, Anda dapat menghubungi Komite Etik melalui Bagian Etika Penelitian/Research Ethic Officer (telp. +61 2 9514 9772 Research.Ethics@uts.edu.au) dengan mencantumkan nomer referensi penelitian. Setiap keluhan akan ditangani dengan mengedepankan kerahasiaan dan tanggung jawab, dan Anda akan diinformasikan hasilnya.

G.3 Participant consent form (English)



Riana Rahmawati

Graduate School of Health, Discipline of
Pharmacy
University of Technology Sydney NSW 2007
AUSTRALIA
Telephone: +61 2 9514 9226
Email : Riana.Rahmawati@student.uts.edu.au

Associate Professor Beata Bajorek

Graduate School of Health, Discipline of
Pharmacy
University of Technology Sydney NSW 2007
AUSTRALIA
Telephone: +61 2 9514 8301
Facsimile : +61 2 9514 8300
Email: Beata.Bajorek@uts.edu.au

Participant Consent Form

(English Version)

Study Title:

**Feedback from patients and healthcare workers on a "Blood Pressure
Action Sheet" for Indonesian patients**

PARTICIPANT CONSENT FORM**Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet"
for Indonesian patients**

I _____ (participant's name) agree to participate in the study

Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet" for Indonesian patients

being conducted by Riana Rahmawati of the University of Technology Sydney for her PhD degree in Graduate School of Health (Pharmacy).

Scholarship for this research has been provided by Directorate General of Higher Education, Indonesia and the University of Technology Sydney, Australia

I understand that this study aims to canvas feedback on a resource for patients with high blood pressure who live in the rural community setting.

In giving my consent I acknowledge that:

- ☐ I have understood the participant information sheet and have been given the opportunity to discuss the information and my involvement in the study.
- ☐ The procedures required for the study, the time involved (15-20 minutes), any inconvenience or risk have been explained to me
- ☐ I am aware that I can contact Riana Rahmawati (PhD student), or her supervisor A/Prof Beata Bajorek, if I have concerns about the research.
- ☐ I understand that I am free to withdraw my participation from this research study at any time I wish, without consequences, and without giving a reason.
- ☐ I agree to provide my phone number to the researcher to contact me
- ☐ I agree to be audio-recorded during my telephone interview
- ☐ I agree that the research data gathered from this study may be published in a form that does not identify me in any way.
- ☐ I agree that Riana Rahmawati has answered all of my questions fully and clearly.

Signature (participant)

Date ____/____/____

Signature (Indonesian local contact)

Date ____/____/____

NOTE:

This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph: +61 2 9514 9772 Research.Ethics@uts.edu.au) and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

G.4 Participant consent form (Bahasa Indonesian)



Riana Rahmawati

Graduate School of Health (Farmasi)

University of Technology Sydney NSW 2007

AUSTRALIA

Telepon: +61 2 9514 9226

Email : Riana.Rahmawati@student.uts.edu.au

Associate Professor Beata Bajorek

Graduate School of Health (Farmasi)

University of Technology Sydney NSW 2007

AUSTRALIA

Telepon: +61 2 9514 8301

Faksimile : +61 2 9514 8300

Email: Beata.Bajorek@uts.edu.au

Lembar Persetujuan Partisipan

(Translated version of Participant Consent Form)

Judul penelitian:

Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar Tindakan untuk Tekanan Darah Tinggi” bagi pasien Indonesia

LEMBAR PERSETUJUAN PARTISIPAN

**Timbal balik dari pasien dan petugas kesehatan
terhadap “Lembar Tindakan untuk Tekanan Darah Tinggi” bagi pasien Indonesia**

Saya _____ (nama partisipan) menyatakan setuju untuk berpartisipasi dalam penelitian yang berjudul **“Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar Tindakan untuk Tekanan Darah Tinggi”** yang dilakukan oleh Riana Rahmawati dari Universitas Teknologi Sydney, Australia sebagai bagian dari penelitian PhD (doktoral) di Graduate School of Health (Farmasi). Penelitian dilakukan dengan dukungan dana dari Direktorat Jenderal Pendidikan Tinggi, Indonesia dan Universitas Teknologi Sydney, Australia.

- Saya memahami tujuan penelitian yang ingin menggali informasi dan pandangan Saya mengenai penggunaan obat pada pasien hipertensi.
- Dalam memberikan persetujuan ini Saya menyatakan bahwa:
- Saya telah memahami Lembar Penjelasan kepada Calon Partisipan dan telah diberikan kesempatan untuk mendiskusikan informasi dalam lembar tersebut serta keterlibatan Saya dalam penelitian.
- Prosedur yang akan dilakukan selama penelitian, waktu yang diperlukan untuk wawancara (15-20 menit) termasuk risiko yang mungkin timbul
- Saya mengetahui bahwa saya dapat menghubungi Riana Rahmawati (peneliti, mahasiswa program doktor di UTS) atau jika diperlukan supervisornya, A/Prof Beata Bajorek, jika saya ingin mendapatkan penjelasan lebih lanjut.
- Saya memahami bahwa Saya dapat mengundurkan diri dalam penelitian ini kapanpun, tanpa konsekuensi apapun dan tanpa harus memberikan alasan.
- Saya setuju memberikan nomer telepon saya pada peneliti untuk menghubungi saya
- Saya setuju wawancara akan direkam
- Saya menyetujui apabila data yang diperoleh dalam penelitian ini akan dipublikasi dengan tanpa menyebutkan identitas saya sebagai responden.
- Saya menyatakan bahwa Riana Rahmawati telah menjawab semua pertanyaan yang saya ajukan dengan jelas.

Nama dan tanda tangan (partisipan) Tanggal ____/____/____

Nama jelas dan tanda tangan asisten peneliti (kontak local) Tanggal ____/____/____

KETERANGAN: Penelitian ini telah disetujui oleh *Human Research Ethic Commitee*/Komite Etik Penelitian Manusia di University of Technology Sydney. Jika Anda mempunyai keluhan atau keberatan terkait dengan partisipasi Anda dalam penelitian yang tidak dapat diselesaikan dengan peneliti, Anda dapat menghubungi Komite Etik Penelitian/Research Ethic Officer (telp. +61 2 9514 9772 Research.Ethics@uts.edu.au) dengan mencantumkan nomer referensi penelitian. Setiap keluhan akan ditangani dengan mengedepankan kerahasiaan dan tanggung jawab, dan Anda akan diinformasikan hasilnya

G.5 Participant information sheet for patients English)



Riana Rahmawati

Graduate School of Health, Discipline of Pharmacy
University of Technology Sydney NSW 2007
AUSTRALIA
Telephone: +61 2 9514 9226
Email : Riana.Rahmawati@student.uts.edu.au

Associate Professor Beata Bajorek

Graduate School of Health, Discipline of Pharmacy
University of Technology Sydney NSW 2007
AUSTRALIA
Telephone: +61 2 9514 8301
Facsimile : +61 2 9514 8300
Email: Beata.Bajorek@uts.edu.au

Participant Information Sheet

(English Version)

Study Title:

**Feedback from patients and healthcare workers
on a "Blood Pressure Action Sheet" for Indonesian patients**

PARTICIPANT INFORMATION SHEET

**Study Title: Feedback from patients and healthcare workers
on a "Blood Pressure Action Sheet" for Indonesian patients**
(UTS Ref. No ETH16-0769)

YOUR INVITATION TO PARTICIPATE

You are invited to take part in the study: Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet" for Indonesian patients.

WHO IS DOING THE RESEARCH?

This study is being conducted by Riana Rahmawati (PhD student at University of Technology Sydney, Australia), under the supervision A/Prof Beata Bajorek.

This study is supported a scholarship from Directorate General of Higher Education Indonesia (DIKTI) and the University of Technology Sydney.

WHAT IS THE RESEARCH ABOUT?

We want to obtain your feedback on a "Blood Pressure Action Sheet" for people with high blood pressure. We would like to ask you about the content, lay-out, and potential practical use of the resource as well as your suggestions for any improvements. This will help us to refine the resource before it can be used by other people. We are seeking feedback from patients and healthcare workers in the local Indonesian setting.

WHO IS INVITED TO TAKE PART

We are interested in obtaining feedback from:

- ☐ People who have had high blood pressure for at least 6 months, are aged 45 years or older, literate, and live in the local village
- ☐ Health professionals in the community health centre (CHC) who are involved in the local hypertension management program
- ☐ Community health workers in the village who have served their local community through a CHW-based program (e.g. Integrated Health Service Post for the Elderly) for more than 3 year

IF I SAY YES, WHAT WILL IT INVOLVE?

We will provide you a copy of the resource and ask you to look over it. At a time convenient to you, we will contact you via telephone, and ask you some questions regarding the resource. The local contact person in the CHC will help arrange the interview time. The researcher (Riana Rahmawati) in Sydney, Australia, will conduct this telephone interview with you. It will take about 15-20 minutes of your time. The discussion will be audio-recorded so that we do not miss any important information. All of the information you provide is treated confidentially. We are not recording personal details. Only the researchers named above will have access to the information you provide. No response will be identifiable.

ARE THERE ANY RISK/INCONVENIENCE

There is no risk from participating in this interview. We will simply invite you to provide your opinion at a time convenient to you.

WHY HAVE I BEEN INVITED

You are the type of person we are interested in hearing from regarding the development of a resource for patients with high blood pressure. We would like to interview people who have high blood pressure, or healthcare workers who look after people who have high blood pressure.

WHAT WILL HAPPEN IF I SAY NO?

Nothing. I will thank you for your time so far. Your relationship with any health professionals, patients, or the researchers will not be affected.

IF I SAY YES, CAN I CHANGE MY MIND LATER?

Participation in this study is voluntary. You can change your mind at any time. Any information already collected from you during the study will be destroyed and the information provided will not be included in this study.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about this study that you think I can help you with, please feel free to contact me on:

Riana Rahmawati

Phone number: +62812273050 8/+61451123376

Email : Riana.Rahmawati@student.uts.edu.au

Or the contact local person:

Name : _____

Address : _____

Phone number : _____

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on +61295149772, and quote this number (UTS Ref. No ETH16-0769)

G.6 Participant information sheet for patients (Bahasa Indonesian)



Riana Rahmawati

Graduate School of Health (Farmasi)
University of Technology Sydney NSW 2007
AUSTRALIA
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Email : Riana.Rahmawati@student.uts.edu.au

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Graduate School of Health (Farmasi)
University of Technology Sydney NSW 2007
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Email: Beata.Bajorek@uts.edu.au

Lembar Penjelasan kepada Calon Partisipan

(Translated version of Participant Information Sheet)

Judul Penelitian:

Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia

*Feedback from patients and healthcare workers
on a “Blood Pressure Action Sheet” for Indonesian patients*

LEMBAR PENJELASAN KEPADA CALON PARTISIPAN

Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia

(UTS Ref. No ETH16-0769)

AJAKAN PARTISIPASI

Bapak/Ibu/Saudara diundang untuk berpartisipasi dalam penelitian: Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia.

SIAPA YANG MELAKUKAN PENELITIAN?

Penelitian dilakukan oleh Riana Rahmawati (mahasiswa program doctor (PhD) di University of Technology Sydney), dibawah bimbingan A/Prof Beata Bajorek.

Penelitian ini didukung oleh beasiswa dari Direktorat Jenderal Pendidikan Tinggi Indonesia (DIKTI) dan University of Technology Sydney.

HAL APA YANG INGIN DITELITI?

Dalam penelitian ini kami ingin mendapatkan timbal balik terkait dengan “Lembar Tindakan untuk pasien dengan tekanan darah tinggi” yang kami susun. Kami ingin tahu pendapat Anda tentang isi, tata letak dan penggunaan lembar tersebut termasuk usul Anda untuk perbaikan. Kami ingin mendapatkan masukan dari pasien dan petugas kesehatan di Indonesia.

SIAPA YANG DIKUTKAN DALAM PENELITIAN INI?

Kami ingin mendapatkan masukan dan timbal balik dari:

- Pasien hipertensi: telah dinyatakan mempunyai tekanan darah tinggi lebih dari 6 bulan yang lalu, berumur 45 tahun atau lebih, bisa baca tulis, dan tinggal di pedesaan
- Petugas kesehatan di Puskesmas yang terlibat dalam penanganan hipertensi di Puskesmas (dokter, bidan, perawat, petugas obat)
- Kader kesehatan desa yang telah aktif mendampingi masyarakat (misal sebagai kader Posyandu lansia) selama lebih dari 3 tahun

JIKA SAYA MENYATAKAN BERSEDIA, APA KETERLIBATAN SAYA?

Kami akan memberikan lembar monitoring untuk dibaca dan dipelajari. Pada waktu yang disepakati, kami akan menelpon Anda dan menanyakan beberapa pertanyaan terkait dengan lembar tersebut. Kontak lokal di Puskesmas akan membantu mengatur waktu wawancara. Peneliti (Riana Rahmawati) akan melakukan wawancara. Wawancara akan berlangsung sekitar 15-20 menit. Wawancara yang dilakukan akan direkam agar tidak terdapat informasi penting yang tidak tercatat. Semua informasi yang diberikan bersifat rahasia. Hanya peneliti yang mempunyai akses data. Data akan ditampilkan tanpa menyebutkan identitas responden.

APAKAH ADA RISIKO DAN EFEK SAMPING BUAT SAYA?

Tidak terdapat risiko dari partisipasi Anda dalam penelitian ini. Kami hanya akan mewawancarai Anda pada waktu yang disepakati.

MENGAPA SAYA DIAJAK BERPARTISIPASI DALAM PENELITIAN INI?

Karena Anda kami anggap dapat memberikan masukan berharga bagi penyusunan lembar monitoring ini. Informasi tersebut akan membantu kami untuk memperbaiki lembar tersebut sebelum digunakan lebih luas. Kami akan mewawancarai pasien dengan tekanan darah tinggi dan petugas kesehatan serta kader yang terlibat dalam penanganan pasien dengan tekanan darah tinggi.

APA YANG TERJADI KALAU SAYA TIDAK MAU BERPARTISIPASI?

Tidak ada. Kami berterimakasih atas kesediaan Anda sejauh ini. Hubungan anda dengan petugas kesehatan, pasien atau peneliti tidak akan terdampak.

JIKA SAYA BERSEDIA IKUT, APAKAH SAYA BOLEH KEMUDIAN BERUBAH PIKIRAN?

Keikutsertaan dalam penelitian ini adalah sukarela. Anda dapat merubah pikiran Semua informasi yang telah diperoleh dari Bapak/Ibu/Saudara akan dihapus dan informasi dari Bapak/Ibu/Saudara tidak akan disertakan dalam hasil penelitian.

BAGAIMANA JIKA SAYA MEMBUTUHKAN PENJELASAN TAMBAHAN DAN KOMPLAIN

Apabila ada yang belum jelas sehubungan dengan penelitian ini dan Anda memerlukan penjelasan lebih lanjut, dapat menghubungi kami

Riana Rahmawati

Telp: +628122730508/+61451123376

Email: Riana.Rahmawati@student.uts.edu.au

Atau dapat menghubungi kontak lokal, yaitu:

Nama : _____

Alamat : _____

Telepon: _____

Keterangan:

Jika Bapak/Ibu/Saudara ingin bicara dengan seseorang yang tidak terkait dengan penelitian ini, Bapak/Ibu/Saudara dapat menghubungi Bagian Etika Penelitian UTS di nomer +61295149772 dengan menyebutkan nomer referensi ini (UTS Ref. No ETH16-0769).

Appendix H. Human Research & Ethics approval for the conduct of study in Section 8.1

Project Title: Feedback from patients and healthcare workers on the Blood Pressure Action Sheet for Indonesian patients

- H.1 Approval from affiliated university (UTS HREC approval)
- H.2 Letter from the Indonesian district government

H.1 Approval from affiliated university (UTS HREC approval)

Project Title: Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet" for Indonesian patients

UTS HREC Approval

HREC Approval Granted - ETH16-0769

Research.Ethics@uts.edu.au

Fri 16/12/2016 9:33 AM

To: Beata Bajorek <Beata.Bajorek@uts.edu.au>; Riana Rahmawati <Riana.Rahmawati@student.uts.edu.au>; Research Ethics <research.ethics@uts.edu.au>;

Dear Applicant

Thank you for your response to the Committee's comments for your project titled, "Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet" for Indonesian patients". Your response satisfactorily addresses the concerns and questions raised by the Committee who agreed that the application now meets the requirements of the NHMRC National Statement on Ethical Conduct in Human Research (2007). I am pleased to inform you that ethics approval is now granted.

Your approval number is UTS HREC REF NO. ETH16-0769.

Approval will be for a period of five (5) years from the date of this correspondence subject to the provision of annual reports.

Your approval number must be included in all participant material and advertisements. Any advertisements on the UTS Staff Connect without an approval number will be removed.

Please note that the ethical conduct of research is an on-going process. The National Statement on Ethical Conduct in Research Involving Humans requires us to obtain a report about the progress of the research, and in particular about any changes to the research which may have ethical implications. This report form must be completed at least annually from the date of approval, and at the end of the project (if it takes more than a year). The Ethics Secretariat will contact you when it is time to complete your first report.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

You should consider this your official letter of approval. If you require a hardcopy please contact Research.Ethics@uts.edu.au.

To access this application, please follow the URLs below:

* if accessing within the UTS network: <https://rm.uts.edu.au>

* if accessing outside of UTS network: <https://remote.uts.edu.au> , and click on "RM6 - ResearchMaster Enterprise" after logging in.

We value your feedback on the online ethics process. If you would like to provide feedback please go to:

<http://surveys.uts.edu.au/surveys/onlineethics/index.cfm>

If you have any queries about your ethics approval, or require any amendments to your research in the future, please do not hesitate to contact Research.Ethics@uts.edu.au.

Yours sincerely,

Prof Marion Haas
Chairperson
UTS Human Research Ethics Committee
C/- Research & Innovation Office
University of Technology, Sydney
E: Research.Ethics@uts.edu.au

H.2 Letter from the Indonesian district government



**Bantul District Government
Regional Development Planning Board
(BAPPEDA)**

Jl. Robert Wolter Monginsidi No. 1 Bantul 55711, Telp. 62 274 367533, Fax: +62 274 367796
Website: bappeda.bantulkab.go.id Webmail: bappeda@bantulkab.go.id

**STATEMENT LETTER/PERMISSION
Number : 070 / Reg / 3961/ S3 / 2016**

With Reference : From : Faculty of Medicine UII, Number: 894/Dek/40/Div.um/IX/2016

Date : September 23th, 2016, Subject: Research Permission

Considering :

- a. Regional Regulation Number: 17 year 2007 about the Organization Establishment of Regional Technical Agency at Bantul District Environment as have altered with Regional Regulation of Bantul District Number 16 year 2009 about the Change of Regional Regulation Number 17 year 2007 about Organization Establishment of Regional Technical Agency in Bantul District Environment;
- b. Special Region of Yogyakarta Governor Regulation Number 18 year 2009 about Guidance of Licensing Service, Recommendation of Survey Execution, Research, Development, Assessment, and Field Study at Special Region of Yogyakarta;
- c. Bantul District Head Regulation Number 17 year 2011 about Community Work Permit and University Field Practice at Bantul District.

Has permitted to

Name : dr. Riana Rahmawati, MH
University : Islamic University of Indonesia/ University of Technology Sydney
ID : 117110418/ 11784725
Study Title : **Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet" for Indonesian patients**
Location : Subdistrict Dlingo, Imogiri, Pajangan, Pleret
Date : 05 October 2016 until 04 January 2017
Telp : +628156852066/+628122730508

Under the following provisions;

1. During that activity should always coordinate (deliver the intention and purpose) with institution of local Village Government and also to the related institution to get relevant guidance;
2. Obligated to maintain orderliness and comply the applicable laws and regulations;
3. This permission is only used for activity as given permission.
4. Permission holder is obligated to report the activity in the form of soft copy and hardcopy to the Bantul District Government c.q Bappeda Bantul District after the activity is finished;
5. The permission can be cancelled at any times if not fulfilled the above provisions;
6. Fulfil the provision, ethic and the applicable norm in the location; and
7. This permission cannot be abused for certain purposes which can disturb general orderliness and government stability.

Issued in : Bantul

Date : 05 October 2016

On behalf of Head,

Head of Research and Development

Sub Head of Research and Development

Heny Endrawati, S.P., M.P.

NIP: 197406081998032004

Copies given to:

1. Head of District (as report)
2. Head of National Unity and Politics Office of Bantul District
3. Head of Public Health Service of Bantul District

Appendix I. Data collection form for study in Section 8.1

Project Title: Feedback from patients and healthcare workers on the Blood Pressure Action Sheet for Indonesian patients

- I.1 Blood Pressure Action Sheet (English)
- I.2 Blood Pressure Action Sheet (Bahasa Indonesian)
- I.3 Script for telephone interview with patients (English)
- I.4 Script for telephone interview with patients (Bahasa Indonesian)
- I.5 Script for telephone interview with healthcare professionals (English)
- I.6 Script for telephone interview with healthcare professionals (Bahasa Indonesian)
- I.7 Script for telephone interview with community health workers (English)
- I.8 Script for telephone interview with community health workers (Bahasa Indonesian)

I.1 Blood Pressure Action Sheet (English)

[illegible]

WHAT SHOULD I KNOW?

HYPERTENSION

HIGH BLOOD PRESSURE

Hypertension often shows no signs or symptoms

I need to check my blood pressure, even if I feel healthy

- WHERE?
- Puskesmas
 - Posyandu Lansia
 - Community Pharmacy
 - Private practice clinic

Hypertension can cause stroke, heart attack, kidney disease and eye problem

I need to maintain my blood pressure at the target level

Hypertension is treatable

I should take medication, as instructed by healthcare professionals

- Puskesmas
- Community Pharmacy
- Private practice clinic

Hypertension usually needs long-term medication

I should refill my medication before running out

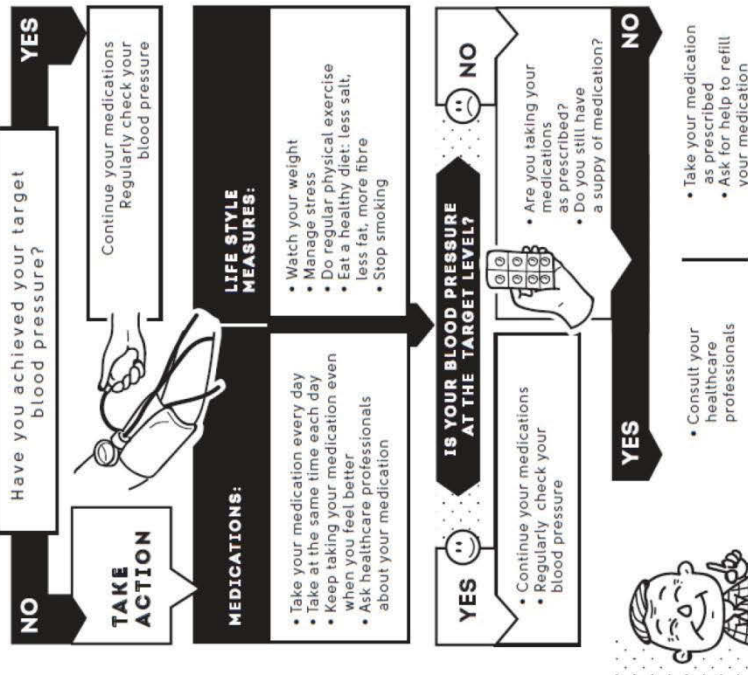
You can get **FREE medication** for your hypertension

I need to join the **PROLANIS program**

- Puskesmas
- Private practice clinic

I HAVE HIGH BLOOD PRESSURE

WHAT SHOULD I DO?



I.2 Blood Pressure Action Sheet (Bahasa Indonesian)

[illegible]

I.3 Script for telephone interview with patients (English)



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University of Technology Sydney NSW 2007
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Facsimile : +61 2 9514 8300
Email: Beata.Bajorek@uts.edu.au

Telephone interview script for patients (English Version)

Study Title:

**Feedback from patients and healthcare workers
on a "Blood Pressure Action Sheet" for Indonesian patients**

Telephone interview script for patients
Feedback from patients and healthcare workers
on a "Blood Pressure Action Sheet" for Indonesian patients

Hello Mr/Mrs _____ I am Riana Rahmawati from the University of Technology Sydney, Australia. Thank you very much for your interest in participating in this study.
 We wish to obtain your feedback about a resource called the "Blood Pressure Action Sheet", that we have already sent to you.

- | | |
|--|--|
| ☐ Have you received and review the tool?
- <i>(The interview will be rescheduled if participants have not received or read the documents)</i> | ☐ Yes ☐ No |
| ☐ Have you read and understood all information in the participant information sheet? | ☐ Yes ☐ No |
| ☐ Before we start the interview, do you have any questions about the information in the Participant Information Sheet?
- <i>(The answers will be responded to accordingly)</i> | ☐ Yes ☐ No |
| ☐ Is the information about the study explained clearly to you?
- <i>(The answers will be responded to accordingly)</i> | ☐ Yes ☐ No |
| ☐ Do you agree to participate in this study? | ☐ Yes ☐ No |
| ☐ Do you agree for this phone interview to be audio-recorded? | ☐ Yes ☐ No |
| ☐ Have you signed the consent form? (researcher to obtain copy from local contact person) | ☐ Yes ☐ No |

Now, may we start our interview about the resource? You can stop the interview any time you wish without any consequences.

First, let me gather some general information about you:

- ☐ Gender : ☐ ₁ Male ☐ ₂ Female
- ☐ Age : _____ years old
- ☐ Education level : ☐ ₁ less than elementary school ☐ ₂ elementary school ☐ ₂ high school
- ☐ Years since diagnosis of hypertension: _____ years

Screening of cognitive impairment.

1. Name 3 objects (orange, money, rose) 1 second to say each. Then ask the patient all 3 after you have said them.
2. How often you need a help for planning daily activities such as errands?
(Never, rarely, sometimes, frequently, always)
3. How often you need a help for remembering to take medications?
(Never, rarely, sometimes, frequently, always)

INTERVIEW GUIDE

Now, we would like to receive your feedback about the resource for patients with hypertension.

- ☐ What is your first impression (general comment) of this resource?

- ☐ What do you like most?

- ☐ What do you like least?

- ☐ How would you use this resource?
 - In what way might it affect how you manage your high blood pressure?

- ☐ What suggestions do you have for the further development of this resource?
 - layout, font, picture, content, practical use

Thank you very much for your participation. If you have any questions or concerns regarding this study, you can contact me, Riana Rahmawati or, you may refer to Mr/Mrs _____ as the local contact person for this study.

I.4 Script for telephone interview with patients (Bahasa Indonesian)



Riana Rahmawati

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University of Technology Sydney NSW 2007
AUSTRALIA

Telepon: +61 2 9514 9226

Email : Riana.Rahmawati@student.uts.edu.au

Associate Professor Beata Bajorek

Graduate School of Health (Farmasi)
University of Technology Sydney NSW 2007
AUSTRALIA

Telepon: +61 2 9514 8301

Faksimile : +61 2 9514 8300

Email: Beata.Bajorek@uts.edu.au

Naskah wawancara telepon untuk pasien

(Translated version of telephone interview script for patients)

Judul penelitian:

**Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar
Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia**

*Feedback from patients and healthcare workers on a “Blood Pressure Action Sheet” for
Indonesian patients*

NASKAH WAWANCARA TELEPON UNTUK PASIEN

Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia

Feedback from patients and healthcare workers on a “Blood Pressure Action Sheet” for Indonesian patients

Halo _____ (nama partisipan), nama saya Riana Rahmawati, dari University of Technology Sydney, Australia.

Pertama, saya mengucapkan terimakasih atas kesediaan Anda berpartisipasi dalam penelitian ini. Kami ingin mengetahui pendapat Anda tentang “Lembar Tindakan untuk Tekanan Darah Tinggi” yang kami susun dan telah kami kirimkan pada Anda sebelumnya.

- ☐ Apakah Anda telah menerima dan membaca lembar tersebut ☐ Ya ☐ Belum
(wawancara akan dijadwal ulang jika partisipan belum menerima atau membaca dokumen)
- ☐ Apakah Anda telah menerima dan membaca lembar informasi untuk partisipan? ☐ Ya ☐ Belum
- ☐ Sebelum saya melanjutkan, apakah ada pertanyaan terkait dengan informasi di lembar informasi untuk partisipan? ☐ Ya ☐ Tidak
- (jawaban akan direspon sebagaimana mestinya)
- ☐ Apakah informasi tentang penelitian ini telah cukup jelas? ☐ Ya ☐ Tidak
- (jawaban akan direspon sebagaimana mestinya)
- ☐ Apakah Anda bersedia berpartisipasi dalam penelitian ini? ☐ Ya ☐ Tidak
- ☐ Apakah Anda tidak keberatan jika wawancara lewat telpon ini kita rekam? ☐ Ya ☐ Tidak
- ☐ Apakah Anda sudah menandatangani lembar persetujuan (Peneliti akan mendapatkan dari kontak lokal) ☐ Ya ☐ Tidak

Sekarang, dapatkah kita mulai wawancara? Anda dapat menghentikan wawancara ini kapanpun Anda mau tanpa ada konsekuensi apapun.

Pertama, beberapa informasi umum tentang Anda:

- ☐ Jenis Kelamin : ☐₁ Lak-laki ☐₂ Perempuan
- ☐ Usia : _____ tahun
- ☐ Pendidikan terakhir : ☐₁ tidak lulus SD ☐₂ lulus SD ☐₃ lulus SMP
- ☐ Berapa lama terdiagnosa hipertensi: _____ tahun

Skrining untuk kemampuan berpikir:

1. Sebutkan 3 buah nama benda (jeruk, unag, mawar), tiap benda 1 detik, pasien disuruh mengulangi ketiga nama benda tadi.
2. Seberapa sering Anda perlu bantuan untuk kegiatan sehari-hari misal mengambil barang?
(Tidak pernah, jarang, kadang, sering, selalu)
3. Seberapa sering Anda perlu bantuan untuk minum obat?
(Tidak pernah, jarang, kadang, sering, selalu)

PEDOMAN WAWANCARA

Selanjutnya, saya akan menanyakan tentang Lembar Tindakan bagi pasien dengan tekanan darah tinggi:

- ☐ Bagaimana kesan pertama Anda dengan lembar ini?
- ☐ Bagian mana yang paling Anda suka?
- ☐ Bagian mana yang Anda kurang suka?
- ☐ Bagaimana kira kira Anda dapat menggunakan lembar ini?
 - Apakah lembar ini mempengaruhi bagaimana cara Anda mengatasi tekanan darah tinggi Anda?
- ☐ Apa saran Anda untuk perbaikan lembar pemantauan hipertensi ini?
 - tata letak, huruf, gambar
 - isi
 - penggunaan praktis

Terimakasih atas partisipasi Anda. Jika Anda mempunyai pertanyaan atau hal yang ingin dikonfirmasi Anda dapat menghubungi saya, Riana Rahmawati atau kontak lokal penelitian ini yaitu Sdr_____

I.5 Script for telephone interview with healthcare professionals (English)



Riana Rahmawati

Graduate School of Health, Discipline of
Pharmacy

University of Technology Sydney NSW 2007
AUSTRALIA

Telephone: +61 2 9514 9226

Email : Riana.Rahmawati@student.uts.edu.au

Associate Professor Beata Bajorek

Graduate School of Health, Discipline of
Pharmacy

University of Technology Sydney NSW 2007
AUSTRALIA

Telephone: +61 2 9514 8301

Facsimile : +61 2 9514 8300

Email: Beata.Bajorek@uts.edu.au

Telephone interview script for healthcare professionals (English Version)

Study Title:

**Feedback from patients and healthcare workers
on a "Blood Pressure Action Sheet" for Indonesian patients**

Telephone interview script for healthcare professionals

Study Title: Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet" for Indonesian patients

Hello Mr/Mrs _____ I am Riana Rahmawati from the University of Technology Sydney, Australia.
Thank you very much for your interest in participating in this study.
We wish to obtain your feedback about a resource called the "Blood Pressure Action Sheet", that we have already sent to you.

- | | | |
|---|------------------------------|-----------------------------|
| ☐ Have you received and review the tool? | ☐ Yes | ☐ No |
| - <i>(The interview will be rescheduled if participants have not received or read the documents)</i> | | |
| ☐ Have you read and understood all information in the participant information sheet? | ☐ Yes | ☐ No |
| ☐ Before we start the interview, do you have any questions about the information in the Participant Information Sheet? | ☐ Yes | ☐ No |
| - <i>(The answers will be responded to accordingly)</i> | | |
| ☐ Is the information about the study explained clearly to you? | ☐ Yes | ☐ No |
| - <i>(The answers will be responded to accordingly)</i> | | |
| ☐ Do you agree to participate in this study? | ☐ Yes | ☐ No |
| ☐ Do you agree for this phone interview to be audio-recorded? | ☐ Yes | ☐ No |
| ☐ Have you signed the consent form? (researcher to obtain copy from local contact person) | ☐ Yes | ☐ No |

Now, may we start our interview about the resource? You can stop the interview any time you wish without any consequences.

First, let me gather some general information about you:

- ☐ Gender : ☐ ₁ Male ☐ ₂ Female
- ☐ Age : _____ years old
- ☐ Type of health professionals: ☐ ₁ Doctor ☐ ₂ Midwife
- ☐ ₃ Nurse ☐ ₄ Pharmacist
- ☐ ₅ Other: _____

- ☐ How many years have you been managing patients with hypertension: _____

INTERVIEW GUIDE

Now, we would like to receive your feedback about the resource for patients with hypertension.

☐ What is your first impression (general comment) of this resource?

☐ What do you like most?

☐ What do you like least?

☐ How do you think your patients would use this resource?

To what extent might it affect how you manage your patients with high blood pressure?

☐ What suggestions do you have for the further development of this resource?

- layout, font, picture
- content
- practical use

Thank you very much for your participation. If you have any questions or concerns regarding this study, you can contact me, Riana Rahmawati or, you may refer to Mr/Mrs _____ as the local contact person for this study.

I.6 Script for telephone interview with healthcare professionals (Bahasa Indonesian)



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Naskah wawancara telepon untuk petugas kesehatan

(Translated version of telephone interview script for healthcare professionals)

Judul penelitian:

**Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar
Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia**

*Feedback from patients and healthcare workers on a “Blood Pressure Action Sheet” for
Indonesian patients*

NASKAH WAWANCARA TELEPON UNTUK PETUGAS KESEHATAN

Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia

Feedback from patients and healthcare workers on a “Blood Pressure Action Sheet” for Indonesian patients

Halo _____ (nama partisipan), nama saya Riana Rahmawati, dari University of Technology Sydney, Australia.

Pertama, saya mengucapkan terimakasih atas kesediaan Anda berpartisipasi dalam penelitian ini. Kami ingin mengetahui pendapat Anda tentang “Lembar Tindakan untuk Tekanan Darah Tinggi” yang kami susun dan telah kami kirimkan pada Anda sebelumnya.

- | | | |
|---|-----------------------------|--------------------------------|
| ☐ Apakah Anda telah menerima dan membaca lembar tersebut
(wawancara akan dijadwal ulang jika partisipan belum menerima atau membaca dokumen) | ☐ Ya | ☐ Belum |
| ☐ Apakah Anda telah menerima dan membaca lembar informasi untuk partisipan? | ☐ Ya | ☐ Belum |
| ☐ Sebelum saya melanjutkan, apakah ada pertanyaan terkait dengan informasi di lembar informasi untuk partisipan?
- (jawaban akan direspon sebagaimana mestinya) | ☐ Ya | ☐ Tidak |
| ☐ Apakah informasi tentang penelitian ini telah cukup jelas?
- (jawaban akan direspon sebagaimana mestinya) | ☐ Ya | ☐ Tidak |
| ☐ Apakah Anda bersedia berpartisipasi dalam penelitian ini? | ☐ Ya | ☐ Tidak |
| ☐ Apakah Anda tidak keberatan jika wawancara lewat telpn ini kita rekam? | ☐ Ya | ☐ Tidak |
| ☐ Apakah Anda sudah menandatangani lembar persetujuan
(Peneliti akan mendapatkan salinannya dari kontak lokal Puskesmas) | ☐ Ya | ☐ Tidak |

Sekarang, dapatkah kita mulai wawancara? Anda dapat menghentikan wawancara ini kapanpun Anda mau tanpa ada konsekuensi apapun.

Pertama, beberapa informasi umum tentang Anda:

- ☐ Jenis Kelamin : ☐ 1 Lak-laki ☐ 2 Perempuan
- ☐ Usia : _____ tahun
- ☐ Tipe petugas kesehatan : ☐ 1 Dokter ☐ 2 Bidan
- ☐ 3 Perawat ☐ 4 Apoteker
- ☐ 5 Lain: _____

1.d. Berapa tahun Anda berpengalaman menangani pasien hipertensi: _____

PEDOMAN WAWANCARA

Selanjutnya, saya akan menanyakan tentang Lembar Tindakan bagi pasien dengan tekanan darah tinggi:

- ☐ Bagaimana kesan pertama Anda dengan lembar ini?
- ☐ Bagian mana yang paling Anda sukai?
- ☐ Bagian mana yang Anda kurang sukai?
- ☐ Bagaimana pasien dapat menggunakan lembar ini?
 - Dalam hal apa adanya lembar ini membantu Anda menangani pasien dengan hipertensi?
- ☐ Apa saran Anda untuk perbaikan lembar pemantauan hipertensi ini?
 - tata letak, huruf, gambar
 - isi
 - penggunaan praktis

Terimakasih atas partisipasi Anda. Jika Anda mempunyai pertanyaan atau hal yang ingin dikonfirmasi Anda dapat menghubungi saya, Riana Rahmawati atau kontak lokal penelitian ini yaitu Sdr_____

I.7 Script for telephone interview with community health workers (English)



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Telephone interview script for community health workers (English Version)

Study Title:

**Feedback from patients and healthcare workers
on a "Blood Pressure Action Sheet" for Indonesian patients**

Telephone interview script for community health workers

Study Title: Feedback from patients and healthcare workers on a "Blood Pressure Action Sheet" for Indonesian patients

Hello Mr/Mrs _____ I am Riana Rahmawati from the University of Technology Sydney, Australia.
Thank you very much for your interest in participating in this study.
We wish to obtain your feedback about a resource called the "Blood Pressure Action Sheet", that we have already sent to you.

- | | |
|---|--|
| ☐ Have you received and review the tool? | ☐ Yes ☐ No |
| - <i>(The interview will be rescheduled if participants have not received or read the documents)</i> | |
| ☐ Have you read and understood all information in the participant information sheet? | ☐ Yes ☐ No |
| ☐ Before we start the interview, do you have any questions about the information in the Participant Information Sheet? | ☐ Yes ☐ No |
| - <i>(The answers will be responded to accordingly)</i> | |
| ☐ Is the information about the study explained clearly to you? | ☐ Yes ☐ No |
| - <i>(The answers will be responded to accordingly)</i> | |
| ☐ Do you agree to participate in this study? | ☐ Yes ☐ No |
| ☐ Do you agree for this phone interview to be audio-recorded? | ☐ Yes ☐ No |
| ☐ Have you signed the consent form? (researcher to obtain copy from local contact person) | ☐ Yes ☐ No |

Now, may we start our interview about the resource? You can stop the interview any time you wish without any consequences.

First, let me gather some general information about you:

- ☐ Gender : ☐1 Male ☐2 Female
- ☐ Age : _____ years old
- ☐ Years of experience as CHWs : _____

INTERVIEW GUIDE

Then, we would like to receive your feedback about the resource for patients with hypertension.

- ☐ What is your first impression (general comment) of this resource?

- ☐ What do you like most?

- ☐ What do you like least?

- ☐ How do you think people with high blood pressure would use this resource?
 - In what way might it affect how people manage their high blood pressure?

- ☐ What suggestions do you have for the further development of this resource?
 - layout, font, picture
 - content
 - practical use

Thank you very much for your participation. If you have any questions or concerns regarding this study, you can contact me, Riana Rahmawati or, you may refer to Mr/Mrs _____ as the local contact person for this study.

I.8 Script for telephone interview with community health workers (Bahasa Indonesian)



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Naskah wawancara telepon untuk kader kesehatan masyarakat

(Translated version of telephone interview script for community health
workers)

Judul penelitian:

**Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar
Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia**

*Feedback from patients and healthcare workers on a “Blood Pressure Action Sheet” for
Indonesian patients*

**Naskah wawancara telepon untuk kader kesehatan masyarakat
Timbal balik dari pasien dan petugas kesehatan terhadap “Lembar
Tindakan untuk Tekanan Darah Tinggi” bagi pasien di Indonesia**

Feedback from patients and healthcare workers on a “Blood Pressure Action Sheet” for Indonesian patients

Halo _____ (nama partisipan), nama saya Riana Rahmawati, dari University of Technology Sydney, Australia.

Pertama, saya mengucapkan terimakasih atas kesediaan Anda berpartisipasi dalam penelitian ini. Kami ingin mengetahui pendapat Anda tentang “Lembar Tindakan untuk Tekanan Darah Tinggi” yang kami susun dan telah kami kirimkan pada Anda sebelumnya.

- ☐ Apakah Anda telah menerima dan membaca lembar tersebut ☐ Ya ☐ Belum
(wawancara akan dijadwal ulang jika partisipan belum menerima atau membaca dokumen)
- ☐ Apakah Anda telah menerima dan membaca lembar informasi untuk partisipan? ☐ Ya ☐ Belum
- ☐ Sebelum saya melanjutkan, apakah ada pertanyaan terkait dengan informasi di lembar informasi untuk partisipan? ☐ Ya ☐ Tidak
- (jawaban akan direspon sebagaimana mestinya)
- ☐ Apakah informasi tentang penelitian ini telah cukup jelas? ☐ Ya ☐ Tidak
- (jawaban akan direspon sebagaimana mestinya)
- ☐ Apakah Anda bersedia berpartisipasi dalam penelitian ini? ☐ Ya ☐ Tidak
- ☐ Apakah Anda tidak keberatan jika wawancara lewat telpon ini kita rekam? ☐ Ya ☐
Tidak
- ☐ Apakah Anda sudah menandatangani lembar persetujuan (Peneliti akan mendapatkan salinannya dari kontak lokal Puskesmas) ☐ Ya ☐ Tidak

Sekarang, dapatkah kita mulai wawancara? Anda dapat menghentikan wawancara ini kapanpun Anda mau tanpa ada konsekuensi apapun.

Pertama, beberapa informasi umum tentang Anda:

- ☐ Jenis Kelamin : ☐₁ Lak-laki ☐₂ Perempuan
- ☐ Usia : _____ tahun
- ☐ Pengalaman sebagai kader : _____ tahun

PEDOMAN WAWANCARA

Selanjutnya, saya akan menanyakan tentang Lembar Tindakan bagi pasien dengan tekanan darah tinggi:

- ☐ Bagaimana kesan pertama Anda dengan lembar ini?
- ☐ Bagian mana yang paling Anda suka?
- ☐ Bagian mana yang Anda kurang suka?
- ☐ Bagaimana pasien hipertensi dapat menggunakan lembar ini?
 - Dalam hal apa adanya lembar ini dapat membantu penanganan pasien dengan tekanan darah tinggi?
- ☐ Apa saran Anda untuk perbaikan lembar pemantauan hipertensi ini?
 - tata letak, huruf, gambar
 - isi
 - penggunaan praktis

Terimakasih atas partisipasi Anda. Jika Anda mempunyai pertanyaan atau hal yang ingin dikonfirmasi Anda dapat menghubungi saya, Riana Rahmawati atau kontak lokal penelitian ini yaitu Sdr_____

Appendix J. Open access published version of study in Section 7.1

PREVENTING CHRONIC DISEASE

PUBLIC HEALTH RESEARCH, PRACTICE, AND POLICY

Volume 12, E175

OCTOBER 2015

ORIGINAL RESEARCH

A Community Health Worker–Based Program for Elderly People With Hypertension in Indonesia: A Qualitative Study, 2013

Riana Rahmawati, MH; Beata Bajorek, PhD

Suggested citation for this article: Rahmawati R, Bajorek B. A Community Health Worker–Based Program for Elderly People With Hypertension in Indonesia: A Qualitative Study, 2013. *Prev Chronic Dis* 2015;12:140530. DOI: <http://dx.doi.org/10.5888/pcd12.140530>.

PEER REVIEWED

Abstract

Introduction

Hypertension is prevalent in the elderly, but treatment is often inadequate, particularly in developing countries. The objective of this study was to explore the role of a community-based program in supporting patients with hypertension in an Indonesian rural community.

Methods

A qualitative study comprising observation and in-depth interviews was conducted in an Integrated Health Service Post for the Elderly (IHSP-Elderly) program in Bantul district (Yogyakarta province). Eleven members of IHSP-Elderly program (ie, hypertensive patients), 3 community health workers (CHWs), and 1 district health staff member were interviewed to obtain their views about the role of the IHSP-Elderly program in hypertension management. Data were analyzed using thematic analysis.

Results

CHWs played a prominent role as the gatekeepers of health care in the rural community. In supporting hypertension management, CHWs served members of the IHSP-Elderly program by facilitating blood pressure checks and physical exercise and providing health education. Members reported various benefits, such as a healthier feeling overall, peer support, and access to affordable health care. Members felt that IHSP-Elderly program could do

more to provide routine blood pressure screening and improve the process of referral to other health care services.

Conclusion

CHWs have the potential to liaise between rural communities and the wider health care system. Their role needs to be strengthened through targeted organizational support that aims to improve delivery of, and referral to, care. Further study is needed to identify the key factors for effective CHW-based programs in rural communities and the incorporation of these programs into the health care system.

Introduction

Hypertension, a risk factor for cardiovascular disease, stroke, and premature death, is prevalent in the elderly (1). However, treatment of hypertension in the elderly is often inadequate, particularly in developing countries, where only 10% of cases are controlled (2). In Indonesia, a developing country in Southeast Asia, the prevalence of hypertension among those aged 65 or older is 60%, making it the most common chronic disease (3).

One key strategy to help scale up hypertension management is to involve the community; patient empowerment is the cornerstone of primary health care and chronic disease management (4). Programs involving community health workers (CHWs) in the United States have increased the proportion of patients with controlled blood pressure (5,6). The role of CHWs in facilitating access to health care services for patients with particular diseases has been studied in some developing countries (7). For example, a study in Uganda described the role of CHWs in supporting the management of pneumonia and malaria (8). Few studies describe CHWs' role managing hypertension in developing countries (9).

In Indonesia, the Integrated Health Service Post for the Elderly (IHSP-Elderly), a national CHW-based program, has been promot-



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ing healthy aging since 1997; the program focuses on screening for and managing chronic diseases in low socioeconomic population subgroups (10). This study explored how the IHSP-Elderly programs could play a role in improving hypertension management for patients in rural communities in the Bantul district, Yogyakarta. In this district, hypertension is one of the most common diseases treated in primary health care facilities (11). The perspectives of CHWs, members of the IHSP-Elderly program (ie, patients), and local government health policy advisors were examined.

Methods

Study setting and design

This qualitative study took place in a village in the rural Bantul district of Yogyakarta province in Indonesia (Box) in March 2013. Yogyakarta province (population, 3.5 million) is in Java, the country's most populous island; almost 52% of 238 million Indonesians live there (14). The life expectancy in Yogyakarta province is 74.1 years (15).

Box. Bantul District, Yogyakarta Province, Indonesia

- Population, 930,276 (12)
- Elderly population (aged ≥60 y), 110,728 (12)
- Economy based on subsistence agriculture (12)
- Muslim majority (91%) (12)
- 861 of 933 subvillages have an IHSP-Elderly program (13)
- Sociocultural climate related to the implementation of IHSP-Elderly program:
 - Both men and women are members
 - Most (90%) community health workers are women (13)
 - Freedom of conversation between sexes is accepted
 - Freedom of expression is accepted (ie, people can freely exchange their views)
 - Music and physical exercise in the IHSP-Elderly program are welcomed by members (12)
 - Home visitation by CHWs can be undertaken without security concerns

This study used observation and in-depth face-to-face interviews to explore perspectives on the role of the IHSP-Elderly program in the management of hypertension. A semistructured approach used a purpose-designed interview guide (Table 1), developed after reviewing the relevant literature (16–18). A separate set of ques-

tions was used for each group of participants. The questions were pilot tested for clarity and relevance. The validity of findings was confirmed through independent analysis of data by the researchers and through respondent validation.

All participants were informed about the study via a purpose-designed information sheet and were required to provide written consent before participation. For 3 participants who were unable to read fluently, a researcher provided a comprehensive verbal explanation of study requirements before obtaining their consent. All participants were literate enough to write their name and provide a written signature. No participants received a financial reward for their interview. The study was approved by the Bantul district health office responsible for authorizing the conduct of research studies. The study protocol and other supporting documents were reviewed. Recruitment of participants began after approval was obtained to ensure no conflict of interest.

Recruitment of participants

Nationally, there are 69,500 IHSP-Elderly programs (19). Our study's sampling frame comprised 861 IHSP-Elderly programs in 27 community health centers in the Bantul District. First, an on-line random number generator was used to select 1 community health center and then 1 IHSP-Elderly program. In the village selected for participation, the elderly population consisted of 117 men and women; the local IHSP-Elderly program provides care for up to 70 members, and it has 3 CHWs.

The study had 3 types of participants: members of the IHSP-Elderly program (patients), CHWs serving the IHSP-Elderly program, and a district health staff member. Patients were purposely sampled according to the following inclusion criteria: aged 60 years or older, active in the IHSP-Elderly program for at least 1 year, and with diagnosed hypertension (confirmed by IHSP-Elderly record, systolic blood pressure ≥140 mm Hg and ≥diastolic blood pressure 90 mm Hg). The appropriate sample size for members was initially determined to be 10 (20,21), but we recruited an additional patient because theme saturation was not reached until we interviewed 11 members. All 3 CHWs serving the IHSP-Elderly program were invited to participate in the study and participated. These CHWs were local residents who were trained to serve the IHSP-Elderly program, and each had done so for at least 3 years. The head of the district health office designated the staff member in charge of the IHSP-Elderly program as the participant representing the district health office.

Data collection and analysis

A typical IHSP-Elderly event (a weekly meeting) was observed to collect descriptive information on activities and interactions

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(verbal and nonverbal behavior) among members and CHWs. Each member pays 1,000 Indonesian rupiah (IDR) (<USD \$0.10) to attend a meeting. In comparison, the standard patient fee for a consultation in the community health center is 9,000 IDR (22) and about 50,000 IDR in a private clinic. Relative to the average income for Banul residents (gross regional domestic product in 2013 was 12.1 million IDR per capita [12]), the service fee for the IHSP-Elderly program is affordable.

Demographic data for IHSP-Elderly members were extracted from IHSP-Elderly register books and interviews, then tabulated and descriptively analyzed. IHSP-Elderly members were interviewed until theme saturation was reached. Interviews were audio-recorded and transcribed in a local language (Javanese or Bahasa). Each transcript was analyzed by using thematic analysis via manual inductive coding. The first author (R.R.) translated the transcript from Javanese or Bahasa to English, and external translators, who were not involved in the study, verified the translation. The word use in the translation reflected the language capability of the participants. The coding framework was generated by the first author and subsequently reviewed and validated by the second author (B.B.). To ensure the validity of the analysis, the emergent themes were compared with the transcribed notes and verified by 5 participants (3 patients, 1 CHW, and 1 district health staff member) who volunteered to provide feedback.

Results

Of the 15 participants, 11 were women; the mean age of the patients was 69.8 (standard deviation, 9.2) years (Table 2).

Field observation of a weekly meeting of the IHSP-Elderly program

The IHSP-Elderly meeting was attended by 25 members (18 women and 7 men). The 2-hour session was conducted in the afternoon in the front yard of a CHW's house. The meeting began with a blood pressure check for each member, followed by group physical exercise. Most of the IHSP-Elderly members queued to get their blood pressure checked. The participants were jovial and appeared to have a good time; they shared jokes with CHWs and there was a lot of laughter. They made comments and suggestions freely each time the CHWs explained the blood pressure readings.

The physical exercise, featuring traditional music and simple verbal instructions, was facilitated by an instructor. The exercise was guided by appropriate imagery such as looking at the moon, water paddling, fist clenching, flying, and wave making. Most members followed the instructions with ease. A few had difficulty,

but they tried to mimic the instructor's gestures. Every now and then there was a ripple of their laughter. After the exercise finished, the CHWs provided light refreshments for all members.

Thematic analysis of interviews

Three key themes emerged from the interviews: the central role of CHWs, multiple benefits for the elderly, and current limitations to providing optimal services.

Central role of CHWs in the community

The district health staff member emphasized the critical role of the IHSP-Elderly program in addressing hypertension in the community. She stressed that the program originated in the community to serve the community: "IHSP-Elderly plays a strategic role in our healthy aging program. It is a program by community and for community, as you know there are currently many elderly people. We can say that CHWs are health gatekeepers for the rural community."

CHWs organized weekly physical exercise and monthly meetings, provided the venue for meetings, organized equipment and refreshments, planned materials and speakers for public education, and reported the IHSP-Elderly programs to the community health center. They seemed to be highly dedicated to their roles and to volunteering their time to serving the community in this way. Being unpaid volunteers, they were motivated by intangible benefits, such as the appreciation of community leaders, the trust of the community health center and members of IHSP-Elderly program, and the ability to contribute to the wellness and happiness of the community. "I love to share what I know with the elderly. Giving benefits to others makes me happy" (CHW).

I have been active as a CHW since 1997, with the trust of the community health center and village leader. They believe that I am still the best . . . despite my infirmity as I am getting older. The IHSP-Elderly members also ask me to remain [as a CHW coordinator]. For me personally, managing the IHSP-Elderly is lovely work.

In addition, the CHW prepared invitations and arranged home visits to increase participation of IHSP-Elderly members: "Elderly people tend to be forgetful. Giving invitations will remind them to come" (CHW). "In case there were inactive members, we would come to their house, greet them, and wish them all good health" (CHW).

CHWs also arranged public education programs on the physical, emotional, and spiritual aspects of healthy aging. These monthly

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programs featured both internal speakers (CHWs) and external speakers. The value of using CHW as speakers was their creativity in facilitating interactive discussions and encouraging elderly members to participate.

Multiple benefits for the elderly

Being healthier. The desire of older members to be healthier was the most motivating factor for participating in the IHSP-Elderly program. In particular, they perceived immediate health benefits from attending the physical exercise sessions, such as sleeping better and feeling more relaxed. "I feel better after the physical exercise. It's quite easy for me. It makes me healthier" (Member). "It makes me healthier, relaxes my breathing, and I can sleep well after exercise. It is also helpful for my knee pain" (Member). "Members who feel healthier will be active in the IHSP-Elderly program" (CHW).

Having peer support. Peer support was an important motivator for participating in the IHSP-Elderly program: "I joined IHSP-Elderly a long time ago. It is hard for me now to follow physical exercise, getting older limits me from doing exercise, but CHWs motivated me just to come, and I enjoy the meet-and-greet with the peers" (Member). "One member, with a walker, always comes and joins IHSP-Elderly activities. She is glad to meet her peers and gets new information" (CHW). "The benefits come from the joyful meetings. They greet each other weekly. We can say that the active members are healthier than other elderly" (CHW).

Accessing free health care. Participation in the IHSP-Elderly program was also driven by the free access to health care. Members of IHSP-Elderly program were highly enthusiastic about having access to free blood pressure checks, regardless of who measured their blood pressure (the CHWs, health staff, or others). "Being examined is exciting, you know, as an elderly people, what a great opportunity we have to get an examination for free" (Member). "I am very glad. I always try to come if a blood-pressure check is announced" (Member). "I just put on the invitation that there will be blood pressure checks. They would be enthusiastic to come" (CHW). "They [CHWs] can do it, but sometimes it is done by CHC [community health center] staff. Three months ago there were medical students who also offered a blood-pressure checking program for free. That is okay, [whoever]" (Member).

Current limitations to providing optimal services

Although the members were enthusiastic about the CHW-led activities of the IHSP-Elderly program, they felt that there were some inconsistencies in what was offered; for instance, blood pressure checks were not done routinely. IHSP-Elderly meetings were conducted weekly, but only physical exercise could be offered weekly. The members suggested that a routine follow-up

of blood pressure readings should also be arranged at least once a week. "It is not a routine program. If I am not mistaken, the last blood pressure check other than the one today was done last month, or two months ago. It would be lovely if they could make it weekly" (Member). "In some IHSP-Elderly, members can check their blood pressure. But as far as I know, not all of them have a capable CHW to do that" (District health staff member).

Additionally, the IHSP-Elderly program had only 1 properly functioning aneroid sphygmomanometer to measure blood pressure. This device was purchased in 2007 and had not been recalibrated in 6 years. There was no funding to purchase a new device. In this IHSP-Elderly program, only 1 CHW (female, 40 years old) was properly trained and had enough confidence to measure blood pressure; the other 2 CHWs did not feel as capable. "Actually I have been trained, but I felt nervous when people queued around me. I was shaking" (CHW). "She [the other CHW] did not come for a while because she fractured her hand. During that time, I could not take over her task [to measure blood pressure] as I am not skillful yet" (CHW).

CHWs recognized that their role in managing hypertension was restricted to early screening and monitoring, followed by referring patients to other health service providers. However, this study identified a gap between what elderly members wanted and what the IHSP-Elderly program could provide. Members preferred a simpler care pathway in which the CHWs could provide easier access to hypertension treatment: "I wish I could receive medication here [in IHSP-Elderly program] so that I needn't go anywhere else" (Member).

Although the CHC provides a mobile health service for patient follow-up (including further examination and provision of medication), most IHSP-Elderly members did not use this service. Access to the mobile service was difficult; members had to travel approximately 3 kilometers to reach it. Furthermore, because hypertension is symptomless, some members were not motivated to travel. The following quotes illustrate the barriers to using the mobile health service:

When we identified hypertension cases, we would ask the patients to visit mobile health services, but most of them had difficulties accessing that service. I think it was related to transportation. It might also be because they did not feel any serious symptoms (CHW).

"I couldn't go there. No one could take me over there" (Member). "I have told CHC staff that the members might not visit the mobile service, they need to ask their children or grandchildren to take them, and it is not easy in the working hours" (CHW).

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Discussion

This study highlights the potential benefits of involving CHWs in improving hypertension management in a developing country (Indonesia), supporting the findings of previous studies focusing on the role of CHWs in hypertension management (7,8,23). CHWs serve as a bridge between the community and the health care system, addressing community beliefs about diseases and supporting patients' adherence to therapies, which is difficult to achieve in traditional health care settings (24,25). For example, nonpharmacological approaches play an important role in hypertension management, and CHW-based programs can offer exercise and health education activities. Some studies report that nonpharmacological approaches are not so well addressed as pharmacological approaches in doctor-patient consultations (26,27). A CHW-based program may be well positioned to support hypertension management by providing information about lifestyle choices.

Self-monitoring blood pressure improves blood pressure control (28), but self-monitoring is difficult to facilitate in a low-resource population. Providing free blood pressure checks in a CHW-based program presents an opportunity to monitor patients between scheduled health service visits. Moreover, the patients' enthusiasm for having their blood pressures checked in an IHSP-Elderly program is a good base on which to establish follow-up activities or to enhance self-management.

The limited capability of CHWs and a lack of resources (eg, calibrated sphygmomanometers) preclude a greater role for CHWs in providing regular blood pressure monitoring for IHSP-Elderly members. Research on the problems related to levels of infrastructure and CHW skill highlights the need for adequate training and supervision for CHWs (29–31). Training could be focused on how to 1) differentiate grades of hypertension, 2) help IHSP-Elderly members develop care plans for self-management, and 3) refer patients to other health care services. So that CHWs can provide accurate and up-to-date information to patients about medication for hypertension, training on the key messages about antihypertensive agents (their types, roles, and side effects) is needed, particularly in geographic areas with a high prevalence of hypertension and poor access to information. In such areas, demand for services from CHWs is high because of the constraints faced by the elderly in their ability to access existing follow-up services.

This study is the first of its kind from Indonesia to highlight the perspectives of patients, CHWs, and health policy advisors about a CHW-based program for hypertension management. Because of the methodology of qualitative studies and the fact that this study took place in 1 rural district and had a small sample, the results of this study cannot be deemed to represent the entire Indonesian

population. However, because Bantul District is a typical rural district in Indonesia and the IHSP-Elderly program is a national program, our results support the likelihood that IHSP-Elderly program could play a larger role in CHW-based management of hypertension in other rural areas, even considering the barriers that may be encountered. Moreover, the findings of this study provide insights for the development of CHW-based programs in other settings with a similar social context.

This study highlighted how CHWs have the potential to liaise between rural communities and the wider health care system. The role of CHWs needs to be strengthened through targeted organizational support that aims to improve delivery of health care services and, when needed, referral to additional health care services. Further study is needed to identify the key factors for effective CHW-based programs in rural communities and the incorporation of these programs into the health care system.

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Tables

Table 1. Interview Guide for Participants, Study of the Role of a Community-Based Program for Elderly People With Hypertension, Indonesia, 2013

Questions for members of Integrated Health Service Post (IHSP) for the Elderly
1. How long have you had hypertension (since early diagnosis)?
2. What kind of symptoms do you have relating to hypertension?
3. What kind of medication have you taken?
4. What is your opinion about IHSP-Elderly activities?
5. Why do you think the activities of the IHSP-Elderly are useful?
6. What do you think about blood pressure examination by CHWs in the IHSP-Elderly?
7. What is your opinion about the role of CHWs in the IHSP-Elderly to support hypertension treatment?
8. How can the IHSP-Elderly improve its service in hypertension management?
Questions for community health workers
1. What kind of activities does the IHSP-Elderly organize for healthy aging?
2. Since you are a volunteer, what do you expect to be actively involved in the IHSP-Elderly?
3. What do you usually do after diagnosing members with high blood pressure?
4. How do you get the necessary information and skills relating to hypertension?
5. What are the barriers to implementing the hypertension program?
6. What are your suggestions for future programs?
Questions for district health staff member
1. Why is the IHSP-Elderly program important for communities in the district?
2. What has the government done to support the IHSP-Elderly program?
3. What are the expectations of the district health office for the IHSP-Elderly in regard to the hypertension program?

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Table 2. Characteristics of Participants (N = 15), Study of the Role of a Community-Based Program for Elderly People with Hypertension, Indonesia, 2013

Characteristic	Members of IHSP-Elderly Program (n = 11)	Community Health Workers (n = 3)	District Health Staff (n = 1)
Age, mean (SD), y	68.8 (9.2)	55.7 (14.5)	41
Women, n	8	2	1
Education			
Below primary school	6	0	0
Primary school	2	0	0
High school	3	3	0
University	0	0	1
Blood pressure, mean (SD), mm Hg			
Systolic	165.5 (15.1)	NA	NA
Diastolic	94.5 (5.2)	NA	NA

Abbreviations: IHSP-Elderly, Integrated Health Service Post for the Elderly; NA, not available; SD, standard deviation.

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