



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.

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Table of contents

Certificate of original authorship	i
Acknowledgements.....	ii
Table of contents.....	iv
List of figures.....	viii
List of tables	ix
List of acronyms and abbreviations	xi
List of Indonesian terms	xii
Publications and presentations through this PhD research	xiii
List of peer-reviewed publications	xiv
Research presentations related to the thesis	xvi
Abstract.....	xvii
Structure of the thesis	xxi
Chapter 1: Overview of hypertension	1
1.1 Overview of hypertension	1
1.1.1 Definition and classification of hypertension	1
1.1.2 Aetiology and risk factors of hypertension	2
1.1.3 Clinical consequences of hypertension	3
1.1.4 Prevalence of hypertension	3
1.1.5 Blood pressure and cardiovascular risk assessment	4
1.2 Hypertension treatment.....	6
1.2.1 Lowering blood pressure and cardiovascular risk reduction	6
1.2.2 Non-pharmacological approaches in hypertension management	7
1.2.3 Pharmacological approaches	9
1.2.4 Sub-optimal hypertension management	10
Chapter 2: Patient medication-taking behaviour	14
2.1 Adherence to anti-hypertensive medication.....	14
2.1.1 Terminology of adherence	14
2.1.2 Measuring adherence to medication	15
2.1.3 Reasons for non-adherence to anti-hypertensive medication	17
2.1.4 Interventions to improve adherence to anti-hypertensive medications	20
2.1.5 Chapter summary	26
2.2 Self-medication among people with hypertension: A review	27
2.2.1 Introduction	29
2.2.2 Methods	30
2.2.3 Results	30
2.2.4 Discussion	38

2.2.5 Conclusion	40
Chapter 3: Management of hypertension in Indonesia	47
3.1 Geography and population of Indonesia	47
3.2 The Indonesian healthcare system	48
3.2.1 The health financing system in Indonesia	50
3.2.2 Challenges in delivering an optimal healthcare system in Indonesia	51
3.3 Regulation about accessing medicines in Indonesia	52
3.4 Hypertension management in primary health care in Indonesia	54
3.4.1 Hypertension and cardiovascular events in Indonesia	54
3.4.2 Prevalence of hypertension in Indonesia	54
3.4.3 Awareness of hypertension	54
3.4.4 Treatment and control of hypertension	55
3.4.5 Hypertension programs in Indonesia	56
3.4.6 Chapter summary	60
Chapter 4: Aims, methods and conceptual framework	61
4.1 Aims and objectives of this thesis	61
4.2 Methods used in this thesis research	62
4.3 Conceptual framework	63
Chapter 5: Medication-taking practices of Indonesian rural patients with hypertension	67
5.1 Access to medicines for hypertension: A survey in rural Yogyakarta province, Indonesia	67
5.1.1 Introduction	68
5.1.2 Methods	69
5.1.3 Results	73
5.1.4 Discussion	83
5.1.5 Conclusion	86
5.2 Factors affecting self-reported medication adherence and hypertension knowledge: A cross sectional study in rural villages, Yogyakarta province, Indonesia	91
5.2.1 Introduction	92
5.2.2 Methods	93
5.2.3 Results	95
5.2.4 Discussion	106
5.2.5 Conclusion	109
5.3 The use of traditional medicines to lower blood pressure: A survey in rural areas of Yogyakarta province, Indonesia	114
5.3.1 Introduction	115
5.3.2 Methods	116
5.3.3 Results	118
5.3.4 Discussion	126
5.3.5 Conclusion	127
Chapter 6: Lay perspectives on the use of anti-hypertensive medications	133
6.1 Perspectives on anti-hypertensive medication: A qualitative study in a rural Yogyakarta Province in Indonesia	133
6.1.1 Introduction	134

6.1.2	Methods	135
6.1.3	Results	139
6.1.4	Discussion	143
6.2	Understanding untreated hypertension from patients' point of view: A qualitative study in rural Yogyakarta province, Indonesia ...	150
6.2.1	Introduction	151
6.2.2	Method	152
6.2.3	Results	154
6.2.4	Discussion	161
6.2.5	Conclusion	162
Chapter 7: Encouraging the role of lay health workers in improving hypertension management		169
7.1	A community health worker–based program for elderly people with hypertension in Indonesia: A qualitative study	169
7.1.1	Introduction	170
7.1.2	Methods	171
7.1.3	Results	174
7.1.4	Discussion	179
Chapter 8: Developing a 'Blood Pressure Action Sheet' for patients in rural communities		183
8.1	Potential use of a 'Blood Pressure Action Sheet' for Indonesian patients with hypertension living in rural villages: A qualitative study.....	183
8.1.1	Introduction	184
8.1.2	Methods	185
8.1.3	Results	188
8.1.4	Discussion and Conclusion	194
Chapter 9: Discussion		201
9.1	Introduction.....	201
9.1.1	The extent of non-adherence to anti-hypertensive medications	201
9.1.2	Factors affecting adherence to anti-hypertensive medications	202
9.1.3	Support needed for Indonesian patients living in rural villages	214
9.1.4	BP Action Sheet for patients	217
9.2	Strengths and Limitations.....	220
9.3	Conclusions	221
Appendices		223
Appendix A. Project recruitment and information sheets for study in Chapter 5 and Section 6.2		223
A.1	Invitation letter (English)	224
A.2	Invitation letter (Bahasa Indonesian)	225
A.3	Participant consent form (English)	226
A.4	Participant consent form (Bahasa Indonesian)	230
A.5	Participant information sheet (English)	234
A.6	Participant information sheet (Bahasa Indonesian)	242
Appendix B. Human Research & Ethics approval for the conduct of study in Chapter 5 and Section 6.2.....		250
B.1	Approval from affiliated university (UTS HREC Approval)	251
B.2	Letter from the district government	253

B.3	Letter from the local hospital	256
B.4	Copy of the MMAS-8 license	257
Appendix C. Data collection form for study in Chapter 5 and Section 6.2		259
C.1	Questionnaire and interview guide (English)	260
C.2	Questionnaire and interview guide (Bahasa Indonesian)	266
Appendix D. Project recruitment and information sheets for study in Sections 6.1 and 7.1		272
D.1	Invitation letter (Bahasa Indonesian)	273
D.2	Consent form and participant information sheet (Bahasa Indonesian)	274
Appendix E. Ethics approval for the conduct of study in Sections 6.1 and 7.1		276
E.1	Letter from affiliated university (Bahasa Indonesian)	277
E.2	Letter from the district government	278
Appendix F. Data collection form for study in Sections 6.1 and 7.1		279
F.1	Interview guide (English)	280
F.2	Interview guide (Bahasa Indonesian)	282
Appendix G. Project recruitment and information sheets for study in Section 8.1		284
G.1	Invitation letter (English)	285
G.2	Invitation letter (Bahasa Indonesian)	286
G.3	Participant consent form (English)	287
G.4	Participant consent form (Bahasa Indonesian)	289
G.5	Participant information sheet for patients English	291
G.6	Participant information sheet for patients (Bahasa Indonesian)	294
Appendix H. Human Research & Ethics approval for the conduct of study in Section 8.1		297
H.1	Approval from affiliated university (UTS HREC approval)	298
H.2	Letter from the Indonesian district government	300
Appendix I. Data collection form for study in Section 8.1		301
I.1	Blood Pressure Action Sheet (English)	302
I.2	Blood Pressure Action Sheet (Bahasa Indonesian)	304
I.3	Script for telephone interview with patients (English)	306
I.4	Script for telephone interview with patients (Bahasa Indonesian)	309
I.5	Script for telephone interview with healthcare professionals (English)	312
I.6	Script for telephone interview with healthcare professionals (Bahasa Indonesian)	315
I.7	Script for telephone interview with community health workers (English)	318
I.8	Script for telephone interview with community health workers (Bahasa Indonesian)	321
Appendix J. Open access published version of study in Section 7.1		324
Appendix K. Copy permission from published journals		333
K.1	Permission granted from <i>Family Practice</i>	334
K.2	Permission granted from <i>Chronic Illness</i>	335
K.3	Permission granted from <i>Drugs and Therapy Perspective</i>	336
Bibliography		337

List of figures

Preliminary

Figure 0.1	Structure of the thesis.....	xxv
------------	------------------------------	-----

Chapter 2

Figure 2.1	Methods of measuring adherence to medication (Vrijens et al. 2017)	17
------------	--	----

Figure 2.2	Flow diagram for the selection of potential articles included in the review.....	31
------------	--	----

Chapter 3

Figure 3.1	Organisational structure of the Indonesian public healthcare system	48
------------	---	----

Chapter 4

Figure 4.1	Conceptual framework for exploring adherence to anti-hypertensive medications among people in Indonesian rural communities (adapted from the WHO model, 2003).....	65
------------	--	----

Chapter 5

Figure 5.1	Sampling frame and context for study	70
------------	--	----

Figure 5.2	Self-reported source of anti-hypertension medication supply (n=203).....	75
------------	--	----

Figure 5.3	Self-reported hypertension knowledge among participants in rural Yogyakarta province, Indonesia (n=384).....	97
------------	--	----

Figure 5.4	Responses on each item of hypertension knowledge question (n=384).....	98
------------	--	----

Chapter 6

Figure 6.1	Scheme of Indonesian population and study sample – IHSP-Elderly Integrated Health Service Posts for the Elderly	137
------------	---	-----

Figure 6.2	Reasons why patients did not take anti-hypertensive medications (adopted from the health belief model)	163
------------	--	-----

Chapter 9

Figure 9.1	Key factors affecting adherence to anti-hypertensive medication and support needed for patients.....	215
------------	--	-----

List of tables

Chapter 1

Table 1.1	Classification of hypertension for adults ¹	1
Table 1.2	Risk stratification of hypertension (WHO/ISH Guideline, 2003).....	5

Chapter 2

Table 2.1	Methods to measure medication adherence ¹	16
-----------	--	----

Chapter 5

Table 5.1	Questions for participants to explore access to medicines for hypertension in rural Indonesia	72
Table 5.2	Characteristics of participants (n=384)	74
Table 5.3	Source of anti-hypertensive medication supply (self-reported) within preceding 30 days.....	77
Table 5.4	Features of the practice of purchasing anti-hypertensive medications (without prescription) in Indonesian community pharmacies.....	80
Table 5.5	Participants' use of anti-hypertension medicine across the various sources of supply	81
Table 5.6	Characteristics of participants (n=384)	96
Table 5.7	Predictors of good hypertension knowledge (n=384)	100
Table 5.8	Predictors of self-reported adherence to anti-hypertensive medications (n=203).....	103
Table 5.9	Factors associated with the use of traditional medicines among rural Indonesian people with hypertension (n=384).....	119
Table 5.10	Use of anti-hypertensive medications among traditional medicine users and factors predicting their use (n=263).....	120
Table 5.11	Types of traditional medicines self-reportedly used to lower blood pressure among rural Indonesian people with hypertension (n=263)	124

Chapter 6

Table 6.1	Characteristics of respondents	138
Table 6.2	The health belief model applied for understanding patients' decisions for not taking anti-hypertensive medications.....	154
Table 6.3	Selected participants' quotes regarding alternative medicines to lowering high blood pressure.....	167

Chapter 7

Table 7.1	Interview guide for the participant, study of the role of community-based program for elderly people with hypertension, Indonesia, 2013	173
Table 7.2	Characteristic of participants, study of the role of community-based program in Improving hypertension treatment, Yogyakarta, Indonesia, 2013	175

Chapter 8

Table 8.1	Content on page 3 of the Blood Pressure Action Sheet for patients entitled 'What should I know?'	186
Table 8.2	Characteristics of respondents	189

Chapter 9

Table 9.1	Study findings of the factors affecting adherence to anti-hypertensive medication among rural people in Indonesia	203
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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

The following people and institutions contributed to the publication of work undertaken as part of this thesis 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.

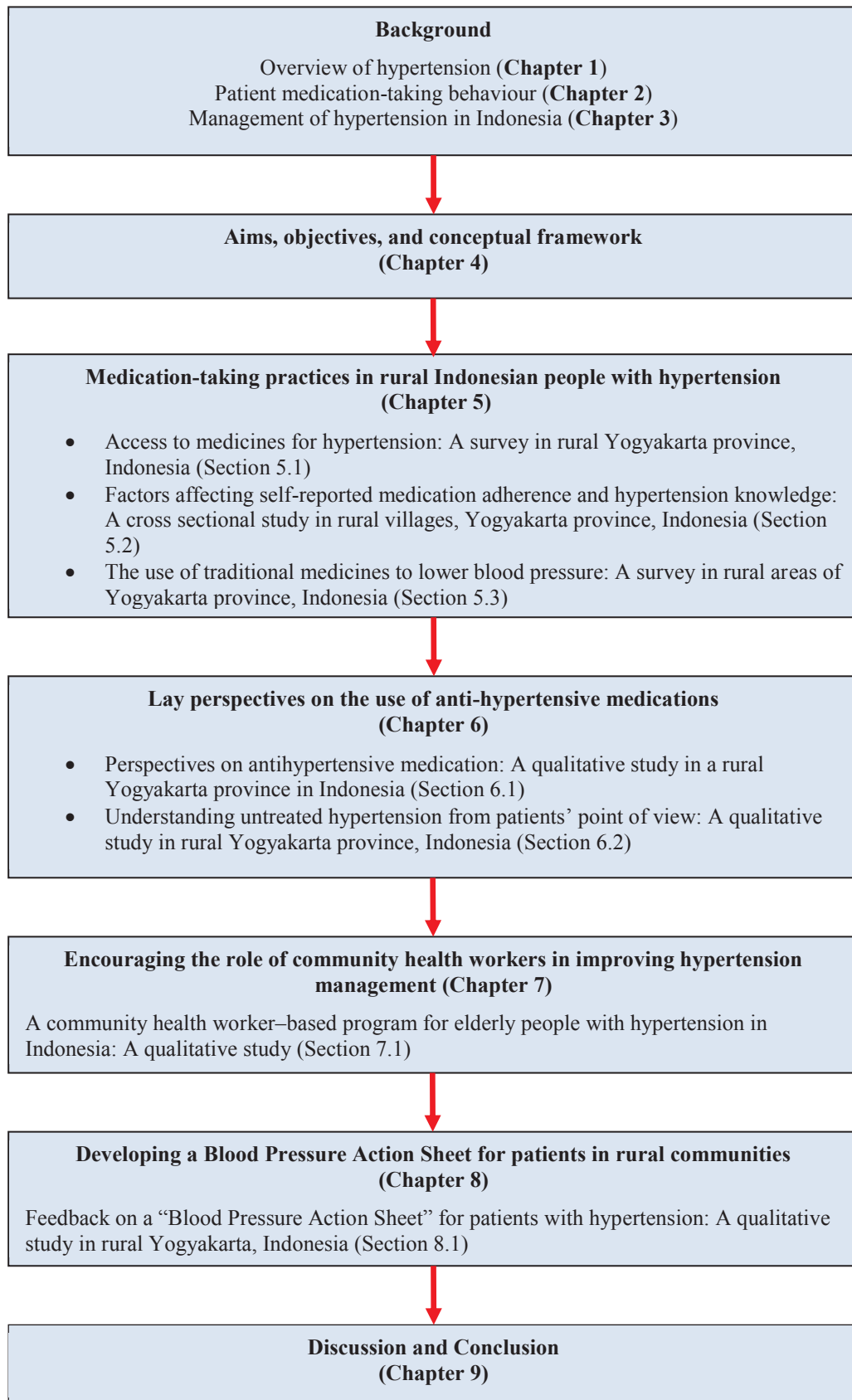


Figure 0.1 Structure of the thesis

