Development of a Preventive and Promotive Health Behaviors Model for Middle-aged People with Hypertension in Rural West Java, Indonesia

BY

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DISSERTATION

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Abstract

[Purpose] Hypertension, a metabolic risk factor of noncommunicable diseases, is a significant health issue in Indonesia and a rural district of West Java due to aging and economic growth. The purpose of this study was to develop a perceived preventative and promotive health behaviors model of middle-aged people with hypertension in a rural district of West Java, to better inform the district's health program and nursing education.

[Methods] The design was a descriptive cross-sectional study. A literature review and preliminary study guided the study framework, which proposed that perceived preventive and promotive health behaviors were predicted by perceived predictors. Participants ages 40-64 with hypertension (N=450) were recruited from four health centers in the district. Data were collected in September 2014. A 204-item original questionnaire measured perceived preventive and promotive health behaviors and the predictors and a WHOQOL-BREF measured perceived health status and quality of life. Data analyses included descriptive statistics, one-way ANOVA, principal component analysis, exploratory factor analysis, general linear model, and structural equation modeling. The Research Ethics Committee of St. Luke's International University approved this study (No.14-029).

[Results] Data from 447 participants were usable for analysis; three questionnaires were omitted because of missing data. All participants were Muslim and 77% were female. The mean age was 54 years old. Participants did not practice enough salt reduction, smoking cessation, exercise, and health check-ups. The model indicated good fit (RMSEA = .042, CFI = .903). Seeking health information predicted salt reduction (β =.18), eating vegetable and fruits (.20), and stress management (.14). Fulfilling obligations to God predicted salt reduction (.19) and stress management (.24). Behavioral beliefs, competence, Islamic spiritual support, social support and health system support also positively predicted those behaviors. Eating vegetables and fruits predicted health status (.39) and environmental quality of life (.38). Stress management predicted psychological quality of life (.26).

[Conclusion] Middle-aged Muslims with hypertension in rural West Java indicated limited health behaviors for noncommunicable diseases prevention and health promotion. Fulfilling obligations to God and seeking health information were core health behaviors that predicted other limited health behaviors. Supporting peoples' core health behaviors and the predictors enhances other health behaviors.

Abstrak (Bahasa Indonesia)

[Tujuan] Hipertensi, salah satu faktor risiko metabolik untuk penyakit tidak menular, adalah masalah kesehatan di pedesaan Jawa Barat di Indonesia karena penuaan dan pertumbuhan ekonomi. Tujuan penelitian ini adalah mengembangkan model perilaku sehat preventif dan promotif untuk penderita hipertensi usia pertengahan di kabupaten pedesaan Jawa Barat, supaya merekomendasikan program kesehatan kabupaten dan pendidikan keperawatan kabupaten.

[Metode] Desain adalah penelitian kros-seksional deskriptif. Kerangka penelitian dikembangkan oleh peneliti berdasarkan tinjauan pustaka dan penelitian pendahuluan. Kerangka tersebut mengusulkan bahwa perilaku sehat preventif dan promotif diprediksi oleh prediktor. Peserta adalah penderita hipertensi dengan usia 40 s.d. 64 (N=450) yang direkrut dari empat puskesmas di kabupaten. Data dikumpulkan di bulan September tahun 2014 dengan menggnakan 204-item kuesioner yang dikembangkan untuk mengukur perilaku sehat preventif dan promotif dan prediktor dan WHOQOL-BREF untuk mengukur persepsi status kesehatan dan kualitas hidup. Descriptive statistics, one-way ANOVA, principal component analysis, exploratory factor analysis, general linear model, dan structural equation modeling dilakukan. Penelitian Etika Komite Universitas St. Luke Internasional menyetujui penelitian ini (No.14-029)

[Hasil] 447 partisipan digunakan untuk data analisis. Tiga partisipan (kuesioner) tidak digunakan karena data tidak lengkap. Semua partisipan beragama Islam dengan 77% adalah perempuan. Usia rata-rata adalah 54. Peserta berperilaku kurang pengurangan garam, berhenti merokok, olahraga, dan cek kesehatan. Model yang dikembangkan mengindikasikan cocok (RMSEA = .042, CFI = .903). Perilaku mencari informasi kesehatan dapat mempengaruhi pegurangan garam (β = .18), makan sayur dan buah (.20) dan mengatur stress (.14). Perilaku memenuhi kewajiban kepada Allah dapat mempengaruhi pegurangan garam (.19) dan mengatur stress (.24). Prediktor lain seperti keyakinan berperilaku, kompetensi, dukungan spiritual Islam, dukungan sosial dan dukungan sistem kesehatan dapat mempengaruhi perilaku sehat tersebut secara positif. Makan sayur dan buah dapat mempengaruhi persepsi status kesehatan (.39) dan kualitas hidup lingkungan

(.38). Mengatur stress mempengaruhi kualitas hidup psikologis (.26).

[Kesimpulan] Penderita hipertensi usia pertengahan yang Muslim di Jawa Barat berperilaku kurang perilaku sehat untuk pencegahan penyakit tidak menular dan promosi kesehatan. Perilaku memenuhi kewajiban kepada Allah dan mencari informasi kesehatan adalah perilaku sehat utama, yang memprediksi perilaku sehat yang kurang. Perilaku sehat utama dan prediktor meningkatkan perilaku sehat yang kurang.

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Chapter 1.
Introduction

I. Background

Indonesia is an emerging country. Like other middle-income countries, the pattern of cause of death has changed from communicable diseases to non-communicable diseases (NCDs) in Indonesia. Percentage of NCDs as cause of death increased from 25% in 1980 to 49% in 2000 (Indonesian Ministry of Health & World Health Organization, 2006) and then to 71% in 2012 (World Health Organization, 2014a). In particular, cardiovascular diseases are the leading causes of deaths in Indonesia (World Health Organization, 2014a) and hypertension is a major metabolic risk factor for cardiovascular diseases (World Health Organization, 2013a). The prevalence of hypertension in Indonesia is 37%, which is the 3rd highest among 11 World Health Organization South-East Asia Region countries (World Health Organization, 2011).

Ageing is the major contributing factor to the rising prevalence of NCDs (World Health Organization, 2012b). Population ageing is growing at a faster rate in developing regions than in developed regions in the world (United Nations, 2002). The proportion of people aged 65 and over is estimated to increase from 5% in 2000 to 16% in 2050 in Indonesia (United Nations, 2002). NCDs prevention and health promotion throughout the life-course starting at an early stage are necessary for people to strengthen healthy ageing (World Health Organization, 2012b).

In the study field of a rural district of West Java, hypertension is regarded as one of the major health issues by the district's health professionals, which was found through a study using the Precede-Proceed Model (Mizutani, Tashiro, & Maftuhah, 2015). Hypertension is the second leading morbidity for people aged 45-75 in the district (Dinas Kesehatan Kabupaten Indramayu, 2013). High consumption of salty and sweet food, less consumption of fruits and vegetables, physical inactivity, smoking, and limited stress management are perceived as the issues regarding NCDs (Mizutani et al., 2013). Increased processed food and increased pressure on life due to economic growth, existence and preference of salty food due to coastal area, and cultural norms like encouragement of food

and tobacco consumption at social gatherings are perceived underlying factors (Mizutani et al., 2013).

Globally, cumulative evidence suggests that preventive and promotive health behaviors are crucial for preventing NCDs and for promoting health of people. These behaviors include the following: increased physical activity; avoiding tobacco smoking; limiting alcohol intake; consumption of a healthy diet that is rich in fruits and vegetables, and low in saturated fats and salt (World Health Organization Regional Office for South-East Asia, 2013); early detection of hypertension; adherence to medication; and seeking medical advice when necessary (World Health Organization, 2013a). Moreover, studies have been suggested that the importance of evaluating predictors including individual perceptions and beliefs are crucial to understanding their health behaviors.

Recently, the Indonesian Ministry of Health has been prioritizing preventive and promotive primary health care (Kementerian Kesehatan Republik Indonesia, 2009). A national NCDs policy and strategy was formulated in 2003. Subsequently, the Directorate of NCDs was established at the Ministry of Health (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2012; World Health Organization Regional Office for South-East Asia, 2007). 'Clean and healthy life behaviors' *(Perilaku Hidup Bersih dan Sehat)* are promoted to prevent NCDs and to promote people's health through national and district health strategies (Kementerian Kesehatan Republik Indonesia, 2012; Dinas Kesehatan Kabupaten Indramayu, 2014). However, district health professionals reported that there was limited development and implementation of programs for NCDs prevention and health promotion (Mizutani et al., 2013). Moreover, there are very few studies that have identified and assessed preventive and promotive health behaviors and the predictors in Indonesia.

Identifying preventive and promotive health behaviors and the predictors of middle-aged people with hypertension in the district is an important first step towards development of effective district specific health strategies and tailored interventions to support the preventive and promotive health behaviors. The author conducted this study as an international collaborator in order to address a global health issue of health behaviors of hypertension with Indonesian researchers.

II. Purpose

The purpose of this study was to develop a preventive and promotive health behaviors model of middle-aged people with hypertension in a rural district of West Java, Indonesia, in order to better inform the district's health programs and nursing education so as to strengthen development and implementation of programs for NCDs prevention and health promotion.

III. Goals

1. To describe preventive and promotive health behaviors of middle-aged people with hypertension in the rural district of West Java, Indonesia based on a model developed by a preliminary qualitative study.

2. To describe the predictors of preventive and promotive health behaviors of middle-aged people with hypertension in the rural district of West Java, Indonesia based on a model developed by a preliminary qualitative study.

3. To examine the structure among the preventive and promotive health behaviors and the predictors and develop a preventive and promotive health behaviors model of middle-aged people with hypertension in the rural district of West Java, Indonesia by using structural equation modeling.

4. To discuss necessary health programs and nursing education for NCDs prevention and health promotion for middle-aged people with hypertension in a rural district of West Java based on the developed model.

IV. Definition of Terms

1. Health: This study was conducted based on the World Health Organization's definition of health, which is: "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity".

2. The people with hypertension in rural West Java: People aged 40-64 who have ever been diagnosed with hypertension in a rural district of West Java, Indonesia.

3. Preventive and promotive health behaviors (PPHBs): Perceived actions of an

individual to prevent and detect hypertension and its complications and to maintain and promote his/her health and life. These behaviors are practiced to actualize his/her potential to achieve his/her goals in life. They include: eating behaviors, physical activity, resting, not smoking, managing stress, seeking health information, seeking health care, caring for others, and fulfilling obligations to God. The behaviors can be promoted, prevented or hindered by personal, social and environmental predictors.

4. Predictors of PPHBs: Individual's perception that can have positive or negative impact on the PPHBs. They include: (i) personal predictors such as behavioral beliefs, competence, prior experience and personal barriers; (ii) social predictors such as religious support, social support, health system support, and social barriers and (iii) environmental predictors like environmental barriers.

V. Significance of the Study

The results of this study will be the first model to depict the PPHBs and the predictors for middle-aged people with hypertension in a rural district of West Java, Indonesia. The results can support and strengthening the development and implementation of a people-centered program for NCDs prevention and health promotion. Since hypertension is also a significant health issue in other districts in Indonesia the results could support strengthening development and implementation of programs for NCDs prevention and health promotion in the other districts.

Chapter 2.
Literature Review

This chapter provides information on three areas. The first area describes the background information of hypertension prevention and health promotion in Indonesia and a rural district of West Java. The second area is a review of existing studies on health behaviors and the predictors of adults with hypertension worldwide. The third area provides implications for the study.

I. Background Information of Hypertension Prevention and Health Promotion in Indonesia and a Rural District of West Java

1. Social background.

1) Geography. Indonesia is an archipelago located in Southeast Asia. It is administratively divided into 33 *provinsi* (provinces) and 497 *kabupaten* (districts) and *kota* (municipalities), both of which are at the same level under the provinces. (Kementerian Kesehatan Republik Indonesia, 2013a). The rural district of West Java is located about 200 kilometers east from the capital city, Jakarta and the North coastal area of West Java. The district is divided into 31 *kecamatan* (sub-district) and 315 villages (110 *desa* and 215 *kelulahan*) (Dinas Kesehatan Provinsi Jawa Barat, 2012). The district land area is about 2,092 square kilometers (Dinas Kesehatan Provinsi Jawa Barat, 2012), which is as large as Tokyo. The climate is tropical with only two seasons: dry and rainy (World Health Organization Country Office for Indonesia, 2008).

2) Population. In Indonesia, the total population is around 244.8 million people. The proportion of working-age population (15-64 years) and elderly population (over 65 years) increased from 65.7% and 4.7% in 2004 (Kementerian Kesehatan Republik Indonesia, 2006b) to 66.1% and 5.1% in 2012 (Kementerian Kesehatan Republik Indonesia, 2013a) respectively. In the district, the total population is 1.7 million people (Dinas Kesehatan Provinsi Jawa Barat, 2012). The proportion of working-age population is 68%, followed by younger population (0-14 years), and elderly population (5%) (Dinas Kesehatan Provinsi Jawa Barat, 2012). Due to the bulging population numbers of working-age and elderly, a

larger number of people are at risk for noncommunicable diseases (NCDs), especially since people in this age group may take care of their children and aged parents at the expense of themselves.

3) Religion and culture. Indonesia has a diverse culture and hundreds of ethnic groups, each with its own language. Despite the diversity of cultures, the national language, *Bahasa Indonesia* is a unifying factor (World Health Organization Country Office for Indonesia, 2008). The majority is Muslim both in Indonesia (87%) (Badan Pusat Statistik, 2010) and in the district (99%) (Pemerintah Kabupaten Indramayu, 2010). Muslims are required to practice the Five Pillars of Islam: (1) *Shahadah*—"There is no other God but Allah, and Muhammad is the Prophet of Allah"; (2) *Salat*— praying five times a day; (3) *Zakat*—giving money to people who are poor or in need; (4) *Sawm*—fasting during the month of Ramadan; and (5) *Hajj*—pilgrimage to Makkah (Penney, 1999). '*Ketuhanan Yang Maha Esa* (Belief in One Supreme God)' is the national philosophy (Atqa, 2010), which potentially influences people's perception and life.

4) Economy. After the economic crisis of the 1990's, the economy of Indonesia resumed its growth. The per capita gross national income dropped from US $630 in 1990 to US $580 in 2000 and then increased to US $3,580 in 2013 (World Bank, 2014b). The district's gross domestic product per capita per year is 31,320,523 Indonesian rupiah (about JPY 338,262; US $2,788), which is the 4th highest among the 26 districts in the province. Revenue from oil and gas accounts for 60% of the district's gross domestic product (Badan Perencanaan Pembangunan Daerah Provinsi Jawa Barat, 2012). This economic growth and the greater urbanization have contributed to lifestyle changes in Indonesia (Rada & Regmi, 2010). In particular, people have increased their consumption of high-value foods such as vegetable oils, meats, fish/seafood, fruits and vegetables and packaged food (Rada & Regmi, 2010). However, the high poverty rate of the district (18%) (Pemerintah Kabupaten Indramayu, 2013) implies that there are gaps in affluence among people in the district.

5) Education. The proportion of people who completed junior high school is lower in the district (34%) (Dinas Kesehatan Provinsi Jawa Barat, 2012) than that of the nation (50%) (Kementerian Kesehatan Republik Indonesia, 2013a). Moreover, literacy rate for the people aged 10 and over is lower in the district (80%) (Dinas Kesehatan Provinsi Jawa Barat, 2012)

than that of the nation (95%) (Kementerian Kesehatan Republik Indonesia, 2013a). In particular, the literacy rate of women (71%) is lower than that of men (89%) (Dinas Kesehatan Provinsi Jawa Barat, 2012). This implies that it may be more difficult for women to access health information.

2. Status on NCDs and hypertension.

1) Mortality and morbidity due to NCDs. The life expectancy at birth has improved from 62 years in 1990 to 71 in 2012 in Indonesia (World Health Organization, 2014b) and from 65 in 2006 to 66 years in 2008 in the district (Mizutani et al., 2015). Percentage of NCDs as cause of death in Indonesia increased from 25% in 1980 to 49% in 2000 (Indonesian Ministry of Health & World Health Organization, 2006) and 71% in 2012 (World Health Organization, 2014a). In particular, cardiovascular diseases are the leading causes of deaths accounting for 37% of all deaths in Indonesia (World Health Organization, 2014a). In the district, NCDs were reported as 'an increasing health need' (Mizutani et al., 2015).

2) Prevalence of hypertension. The prevalence of hypertension in Indonesia rose from 8% in 1995 to 21 % in 2001 (Indonesian Ministry of Health & World Health Organization, 2006) and 37% in 2008 (World Health Organization, 2011), which is the 3rd highest among 11 World Health Organization South-East Asia Region countries. A study that used the Precede-Proceed Model found that district health professionals regarded hypertension as one of the major health issues in the district (Mizutani et al., 2015). It is the second leading cause of morbidity for people aged 45-75 in the district and the fourth leading cause of morbidity for all age groups (Dinas Kesehatan Kabupaten Indramayu 2013).

3. Status of health behaviors.

Perilaku Hidup Bersih dan Sehat also known as 'Clean and Healthy Life Behaviors' are indicators set by the Indonesian Ministry of Health to promote healthy behaviors of people. Three of the 10 indicators relate to NCDs and hypertension: eating fruits and vegetables every day; physical activity every day; do not smoke in the house. Only 57% of people in Indonesia (Kementerian Kesehatan Republik Indonesia, 2013a) and 58% of people in the district (Mizutani et al., 2013) practiced the 'clean and healthy life behaviors', which was lower than the national target of 60%.

The Indonesian Ministry of health also recommends "CERDIK" behaviors for

prevention of NCDs and its risk factors and for health promotion (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2013). CERDIK means *Cek kesehatan secara berkala* (periodical health check-ups), *Enyahkan asap rokok* (non-smoking), *Rajin aktifitas fisik* (diligent physical activity), *Diet sehat dan seimbang* (healthy and balanced diet), *Istirahat cukup* (enough rest), and *Kendalian stress* (stress management). However, the author only noticed the slogan in the capital city of West Java, but not in rural West Java during her research stay.

1) Consumption of vegetables, fruits, fatty and salty food. Five portions of vegetables or fruits per day is the national target. However, 94% of people consume less vegetables and fruits than the target (Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan Republik Indonesia, 2013). The percentages of people who consume salty food and fatty food more than once every day in West Java province (45% and 50%, respectively) are higher than that of the national average (26% and 41%). The rate of sweet food consumption in West Java (50%) is similar to the national average (53%) (Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan Republik Indonesia, 2013). Food and drinks in the district that had high salt levels and sugar levels (checked by the author using a salt meter, Atago PAL-sio and a refractometer, Atago, PEN-J) are listed in Table 2.1 and Table 2.2.

2) Physical activity. The national target of physical activity is at least five days or more with a total duration of 150 minutes of activity in one week. The physical inactivity rate in West Java province (25%) is similar to the national average (26%) (Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan Republik Indonesia, 2013).

3) Smoking. Prevalence of smoking in Indonesia is 28% (World Health Organization, 2011), which is the highest among seven middle-income countries in World Health Organization South-East Asian Region. The rate is higher in West Java province (33%) than the national average (29%) (Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan Republik Indonesia, 2013).

4. Health system for NCDs prevention and health promotion.

1) Health policy. Indonesia is in the early stage for prevention and control of NCDs including hypertension. A national NCDs policy and strategy was formulated in 2003.

Table 2. 1. ***Salt Level of Food in the District***

	Food	Place	Salt (%)	Sugar (%)
1	Telur asin -putih (White part of salty egg)	Small shop	3.1	-
2	Tongkol (Skipjack tuna)	Padang restaurant	2.79	12.7
3	Sambal (Condiment)	Catering	2.42	-
4	Asinan (Pickles)	Catering	2.18	4.8
5	Nasi jamblang (Buffet)	Restaurant	1.74	-
6	Tumis labu pahit (Stir-fried bitter gourd)	Small shop	1.71	69.7
7	Bubur rumbah cecek (Porridge)	Catering	1.67	13.7
8	Capcai (Stir-fried vegetable dish)	Restaurant	1.63	11.3
9	Nasi lengko (Rice with tofu, bean sprouts, fried onions, soy sauce)	House	1.61	7.2
10	Mie ayam (Chicken noodle)	Catering	1.37	-
11	Daging cingcang (Meat)	Padang restaurant	1.31	10.5
12	Sop (Vegetable and meat soup)	Catering	1.24	3.6
13	Bakso (Meatball soup)	Catering	1.20	4.2
14	Sop sambal (Condiment soup)	Catering	1.2	60.4
15	Sayur asam (Sour vegetable soup)	Catering	1.18	5.8
16	Mie goreng (Fried noodle)	Catering	0.96	18.2
17	Telur asin -kuning (Yolk of salty egg)	Small shop	0.6	-
18	Sambal (Condiment)	Catering	0.51	69.3

Table 2. 2. ***Sugar Level of Food in the District***

	Food	Place	Salt (%)	Sugar (%)
1	Tumis labu pahit (Stir-fried bitter gourd)	Small shop	1.71	69.7
2	Sambal (Condiment)	Catering	0.51	69.3
3	Sop sambal (Condiment soup)	Catering	1.2	60.4
4	Kopiko (Sweet coffee drink)	-	-	18.9
5	Mie goreng (Fried noodle)	Catering	0.96	18.2
6	Bubur rumbah cecek (Porridge)	Catering	1.67	13.7
8	Sprite	-	-	13.0
9	Teh manis (Sweet tea)	Restaurant	-	13.0
10	Tongkol (Skipjack tuna)	Padang restaurant	2.79	12.7
11	Daging cingcang (Meat)	Padang restaurant	1.31	10.5
12	Capcai (Stir-fried vegetable dish)	Restaurant	1.63	11.3
13	Teh manis (Sweet tea)	Padang restaurant	-	9.1
14	Teh botol (Bottled sweet tea)	-	-	9.0
15	Nasi lengko (Rice with tofu, bean sprouts, fried onions, soy sauce)	House	1.61	7.2
16	Sayur asam (Sour vegetable soup)	Catering	1.18	5.8
17	Asinan (Pickles)	Catering	2.18	4.8
18	Bakso (Meatball soup)	Catering	1.20	4.2
19	Sop (Vegetable and meat soup)	Catering	1.24	3.6

Subsequently, the Directorate of NCDs was established at the Ministry of Health (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2012; World Health Organization Regional Office for South-East Asia, 2007). Recently, the Indonesian Ministry of Health has been prioritizing preventive and promotive primary health care (Kementerian Kesehatan Republik Indonesia, 2013a). In the *Rencana Strategis Kementerian Kesehatan Tahun 2010-2014* (Strategic plan of the Ministry of Health 2010-2014) (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2012), one of the eight targets is NCDs control. The plan includes two NCDs evaluation indicators: percentage of provinces that have legislation on non-smoking area and percentage of provinces that develop and implement NCDs prevention and control (Kementerian Kesehatan Republik Indonesia, 2012).

The district health office is also focusing on preventive and promotive health care based on their vision, "*Masyarakat Sehat Yang Mandiri dan Berkeadilan di Kabupaten* (Healthy Community which is Independent and Equitable)". One of the six targets is improving prevention and control of diseases including NCDs (Dinas Kesehatan Kabupaten Indramayu, 2014). However, the target is mainly for communicable diseases such as tuberculosis, pneumonia, diarrhea, and HIV/AIDS.

2) Health programs. Indonesia has an extensive primary health care system. Each subdistrict has at least one *Pusat Kesehatan Masyarakat* (*Puskesmas*: community health center), which serves approximately 30,000 people. The *Puskesmas* is linked to community-level health stations called *Pos Pembinaan Terpadu Penyakit Tidak Menular (Posbindu PTM). Posbindu PTM* is a community health post to prevent and control NCDs, targeting people aged over 25 years. Five activities including measurement of body mass index, blood pressure, blood glucose and cholesterol, counseling and health education, and physical activity (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2012). Activities are implemented by community health volunteers, facilitated by village offices, and supervised by the *Puskesmas* (community health center) and *Dinas Kesehatan Kabupaten* (district health office). However, the implementation status differs among provinces. In one province, the activities are

provided at most of the districts, while in the other province, the activities are only provided within few districts (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2012). The district health professionals reported that there was limited development and implementation of programs for NCDs prevention and health promotion (Mizutani et al., 2013).

3) Health financing. In Indonesia, the percentage of government expenditure on health of the gross domestic product was about 3% in 2010 (World Health Organization, 2013d). This is the lowest among seven middle-income countries in the World Health Organization South-East Asia Regions. Under the decentralization, which started in 2001, the majority of the health budget allocated is from each district. In West Java province, 72% of the source of the health budget is from each district (Dinas Kesehatan Provinsi Jawa Barat, 2008). In the report of the Ministry of Health, they mentioned that lack of financial resources of local governments was a challenge (Pusat Promosi Kesehatan, Kementerian Kesehatan Republik Indonesia, 2010). Also health professionals in the district, reported a limited health sector budget (Mizutani et al., 2015).

Until very recently, only 50% of the Indonesian population was covered by health insurance (Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan Republik Indonesia, 2013). The most common health insurance has been the *Jaminan Kesehatan Masyarakat* (*Jamkesmas*: community health insurance, which provides access to health services to poor people) and is held by 29% of people (Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan Republik Indonesia, 2013). Universal Health Coverage, which is named *Jaminan Kesehatan Nasional* (National Health Insurance) program began in January 2014 in order to provide health care for the entire population (Kementerian Kesehatan Republik Indonesia, 2014).

4) Human resources for health. The ratio of general physicians is 4 per 100,000 population in the district (Dinas Kesehatan Provinsi Jawa Barat, 2012) is lower than that of the nation, which is 7 per 100,000 (Kementerian Kesehatan Republik Indonesia, 2013a). The ratio of nurses and midwives is 67 and 33 per 100,000 in the district (respectively) (Dinas Kesehatan Provinsi Jawa Barat, 2012) and is lower than the national ratio (79/100,000 and 43/100,000 respectively) (Kementerian Kesehatan Republik Indonesia,

2013a). The government is attempting to fulfill its target of increasing health personnel for remote areas, under developed areas and bordering areas.

The role description of community health nursing is described as: health promotion; maternal and child health; nutrition; communicable diseases; healthy environment; and treatment (Kementerian Kesehatan Republik Indonesia, 2006a). There is no description about NCDs.

Basic nursing education has been shifting to a higher educational level. Bachelor's programs in nursing increased from 9 in 2000 to 318 in 2011, a 3,344% increase (Asosiasi Institusi Pendidikan Ners Indonesia, Asosiasi Institusi Pendidikan Diploma Tiga Keperawatan Indonesia, dan Persatuan Perawat Nasional Indonesia, 2012b; Nursing in the World Editorial Committee, 2000). Securing quality of education at graduation has been promoted and national competency examinations at graduation started in 2013 as a pilot project (Asosiasi Institusi Pendidikan Ners Indonesia, Asosiasi Institusi Pendidikan Diploma Tiga Keperawatan Indonesia, dan Persatuan Perawat Nasional Indonesia, 2012a).

Regarding the nursing curriculum at the diploma level, there is more focus on clinical nursing in hospitals rather than preventive care in the community. For the bachelor's of nursing, the class credits for the community, family and gerontology nursing subjects are around 15 credits while in the diploma programs, the content is about 10 credits (World Health Organization Regional Office for South-East Asia, 2011).

Moreover, the educational level for lecturers has not achieved the national target. According to the Ministry of Education, lecturers of the bachelor's program should have a master's degree (Direktorat Jenderal Pendidikan Tinggi, Kementerian Pendidikan dan Kebudayaan, 2010). However, most of them (74%) are only bachelor's prepared and the target about educational level for lecturers has not yet been achieved (Direktorat Jenderal Pendidikan Tinggi, Kementerian Pendidikan dan Kebudayaan, 2010).

5) Health information systems. NCDs risk factors surveillance has started as a pilot project (Indonesian Ministry of Health & World Health Organization, 2006). However, the health system decentralization that was implemented in 2001 resulted in a partial breakdown of the health information systems and led to unclear reporting responsibilities (World Health Organization Country Office for Indonesia, 2008). As a result, it is difficult to access

comprehensive data that covers the entire nation.

4. Summary of the background information.

Figure 2.1 shows the summary of background information of hypertension prevention and health promotion in Indonesia with a highlight of the study field, a rural district of West Java. Hypertension, which is a metabolic factor of NCDs, has become a significant health issue in the study field. The situation is similar in other districts of Indonesia. High consumption of salty and fatty food, less consumption of vegetables and fruits, physical inactivity, and smoking are behavioral factors. Bulging population of working-age and elderly, lifestyle changes due to economic growth, and limited educational attainment are underlying factors. Although the national and district health policy on NCDs have been in existence, the development and implementation of health programs for NCDs prevention and health promotion were limited in the district. The following weaknesses of health resources prevent the development and implementation: limited health financing, limited human resources for health and limited health information system. Due to limited health resources, it is important for people to independently practice health behaviors for hypertension prevention and health promotion, which is consistent with the vision of the district health office, “Healthy Community which is Independent and Equitable”. In order to strengthen development and implementation of the district health program for NCDs prevention and health promotion, it is essential to understand people’s perceptions on health behaviors.

II. Precede-Proceed Model

The Precede-Proceed Model (Green & Kreuter, 2005) is the most widely used planning model for the development of health promotion and policy programs in the world (Glasgow, 2011). Unlike other behavioral change theories, the main purpose of the PPM is not just to explain the structure among the factors but to provide a structure for planning and evaluating health behavior change programs (Gielen, McDonald, Gary, & Bone, 2008). The author chose the PPM as a theoretical premise of this study because the purpose of this study was to better inform the district’s health programs and nursing education so as to strengthen development and implementation of programs for NCDs prevention and health promotion.

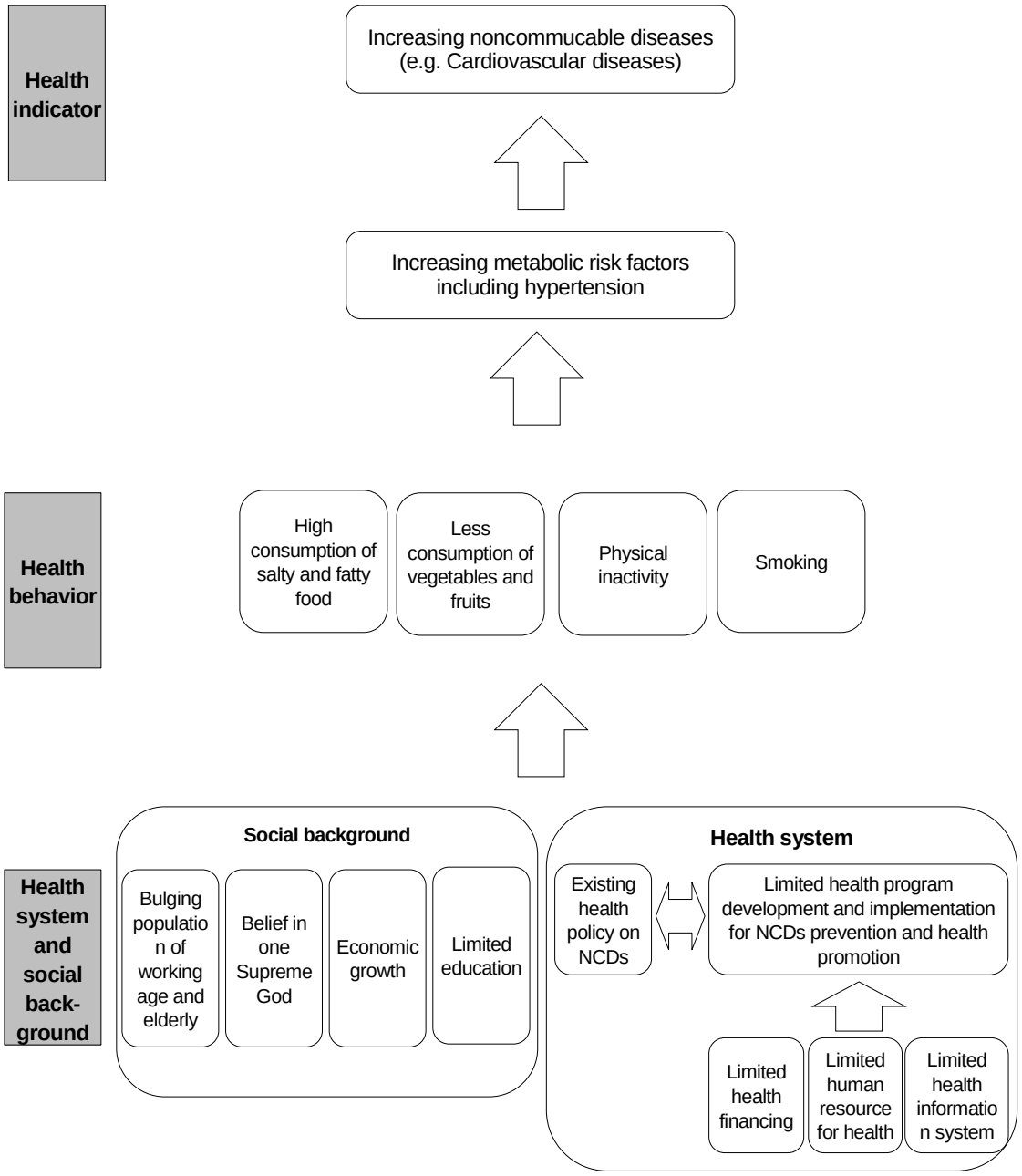

Figure 2. 1. **Summary of background information of hypertension prevention and health promotion in Indonesia and a rural district of West Java.**

The PPM presents a cause-and-effect process that will finally lead to health and improved quality of life (Green & Kreuter, 2005). It consists of four planning phases, one implementation phase, and three evaluation phases (Gielen, et al., 2008). The four planning phases are: social assessment (phase 1), epidemiological, behavioral and environmental assessment (phase 2), educational and ecological assessment (phase 3), and administrative and policy assessment (phase 4). Since the target of this study is people, the study focused on phase 1, 2, and 3. Phase 1 focuses on hopes and problems of people as indicators of quality of life. Phase 2 identifies the specific health goals and problems, and their behavioral and environmental factors. Environmental factors include social and political environment. Phase 3 identifies antecedent predisposing, reinforcing, and enabling factors, which influence the behavioral factors (Green & Kreuter, 2005; Gielen, et al., 2008). Predisposing factors are "antecedents to behavioral change that provide the rationale or motivation for the behavior" (Green & Kreuter, 2005, p.147), which include people's knowledge, beliefs, values, attitudes, and confidence. Reinforcing factors are "factors following a behavior that provide the continuing reward or incentive for the persistence or repetition of the behavior" (Green & Kreuter, 2005, p.147), which include support from family, peers, health care providers, and community leaders. Enabling factors are "antecedents to behavioral or environmental change that allow a motivation or environmental policy to be realized" (Green & Kreuter, 2005, p.147), which include availability, accessibility and affordability of health care and resources, and skills and capacity to implement behavioral changes.

III. Studies on Health Behaviors and the Predictors of Adults with Hypertension Worldwide

This literature review was guided by Cooper's (2010) process of research synthesis. It includes seven steps: problem formulation, literature search, information gathering, quality evaluation, analysis and integration, interpretation and results presentation.

1. Problem formulation.

The aim was to review relevant studies in order to identify the following: 1) countries; 2) health behaviors of adults with hypertension (behavioral outcomes); 3) predictors of the

health behaviors and 4) other outcomes.

2. Literature search.

Figure 2.2 shows the literature search and selection process.

Literature search was conducted using key words: “hypertens*” in the title and combined with “health behavior” in the subject terms. The literature was searched using the databases: CINAHL, MEDLINE, PsycINFO, SocINDEX and ‘hand search’.

Inclusion criteria covering four major areas were: 1) Major study focus was to explore health behaviors and the predictors for hypertension prevention and health promotion (Topical); 2) The participant group includes adults of any nationality. Studies were excluded if the main population was elderly, pregnant women, or people with mental health problems (Population); 3) The study method was a quantitative methodology in English or Indonesian (Methodological); 4) The study was published between 2004 and 2014 (Temporal).

3. Information gathering.

Thirty-five publications met the inclusion criteria (Table 2.3). The following information of each study was organized into a synthesis matrix: design, author, publication year, country, participant, predictors, behavioral outcomes, and other outcomes (if any).

4. Quality evaluation.

A methodological quality evaluation was done using critical appraisal tools (Joanna Briggs Institute, 2011) (Table 2.4). There are 10 criteria to guide the appraisal of randomized controlled trials and nine criteria to guide the appraisal of cohort studies and descriptive studies.

5. Analysis and integration.

1) Countries. Thirty studies were conducted in high-income countries, while five studies were conducted in middle-income countries (the classification of countries was based on Country and Lending Groups (World Bank, 2014a)) such as Brazil, China, Ghana, Indonesia, and Iran. Studies conducted in middle-income countries had increased around 2011. This is consistent with the time when global attention increased about NCDs especially in middle-income countries. In the Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases 2008-2013 (World Health Organization, 2008), particular foci are given to low- and middle-income countries and vulnerable populations.

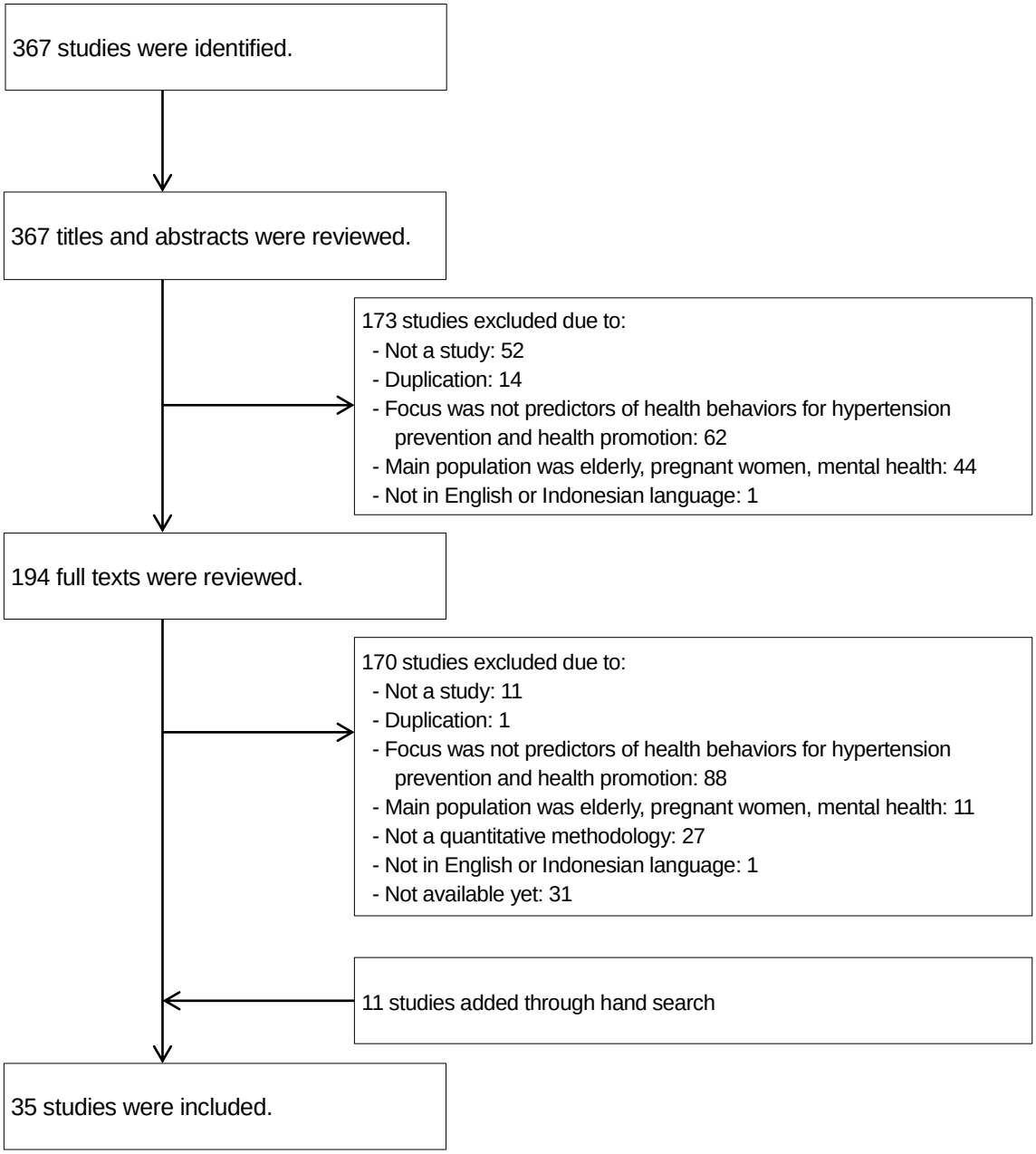

Figure 2. 2. **Literature search and selection process of health behaviors and the predictors of adults with hypertension worldwide.**

Table 2. 3. ***Studies on Health Behaviors and the Predictors of Adults with Hypertension Worldwide (N=35)***

	Design	Author	Year	Country	Participant Age: Mean/[Range]	Predictors: Positive association (+); Negative association (-).	Behavioral outcome	Other outcome
1	RCT	Epstein	2012	USA	N=144 with HT. Age:52.	<At 4 months> Ethnicity: African American (-).	Dietary adherence.	Blood pressure (BP)
2	RCT	Martin	2011	USA	N=434 with HT. Age:[19+].	<At 6 & 12 months> Clinic type: FHQC (large area) (-).	Medication adherence.	-
3	RCT	Burke, Beilin	2008	Australia	N=241with HT. Age:[40-70].	<At 4 months> 1)Self-efficacy (+). 2)Self-efficacy (+). <At 1 year> 1) Self-efficacy (+).	Behavior change: 1) Reduced fat intake. 2) Physical activity.	-
4	RCT	Burke, Mansour	2008	Australia	N=241 with HT. Age:[40-70].	<At 4 months> 1) Self-efficacy (+). 2) Beliefs on PA; Self-efficacy (+). <At 1 year> 1) Social support (+). 2) Self-efficacy; Social support (+).	Health-related behaviors 1) Decreased saturated fat intake. 2) Weekly hours of exercise.	Weight.
5	Cohort	Mansyur	2013	USA	N= 185 with HT. Age:54.	1) Self-efficacy (+). Addiction (-). 2) Busy (-). 3) Traditions (-).	Multiple behavior: 1) Smoking cessation; 2) Physical activity; 3) Low-sodium diet.	-
6	Cohort	Roumie	2011	USA	N=1,341 with HT. Age:67.	<At 6 months> Patient centered primary care (+).	Medication adherence.	BP
7	Cross-sectional (CS)	Pickett	2014	USA	N=111 with HT. Age:52.2.	HT representation: 5) Ability to control BP (-). 7),8) Understanding of HT (+) 9),10) Believe HT as chronic (+). Causal attribution of HT: 1),2) Uncontrollable factors (-). 7),8) Risk factors (-). 9) Stress-producing factors (-).	Self-care behaviors: 1) Low-fat diet; 2) Low-salt diet; 3) Fruits&vegetables; 4) Physically active; 5) Stress control; 6) Weight control; 7) Avoid alcohol use; 8) Avoid tobacco use; 9) Doctor visits; 10) Medication adherence.	BP.
8	CS	Cuffee	2013	USA	N=780 with HT. Age:53.	Discrimination reduced (+). Trust in physician (+).	Medication adherence.	-
9	CS	Hu	2013	China	N=318 with HT. Age:63.	1) Longer duration of HT (+). 2) Older (+). 3),5) Older; female (+). 6) Female (+).	Self-care behaviors: 1) Medication adherence; 2) Regular BP measurement; 3) Low-salt diet; 4) Physical exercise; 5) Non-smoking; 6) Alcohol abstinence.	-
10	CS	Kretchy	2013	Ghana	N=400 with HT. Age50-59:33%.	High spirituality (-).	Medication adherence.	-
11	CS	Cornélio	2012	Brazil	N=108 with HT. Age:57.	1) Intention (+). 2) Diet quality (+). 3) Hedonic determinant (+).	Salt-related behaviors: 1) Using <4 g of salt / day; 2) Avoiding adding salt; 3) Avoiding salty foods.	-
12	CS	Lewis	2012	USA	N=253 with HT. Age:57.	Self-efficacy; Older (+). Depression (-).	Medication adherence.	-
13	CS	Li	2012	Taiwan	N=200 with HT. Age:60.	Susceptibility to specific diseases (+). Length of HT diagnosis (-).	Medication adherence.	BP
14	CS	Schoenthaler	2012	USA	N=597 with HT. Age:57.	Collaborative provider communication in race-discordant relationships (+).	Medication adherence.	-
15	CS	Stavropoulou	2012	Greece	N=743 with HT. Age:61.	Well informed about medication; Use of media; Older; Higher education (+).	Medication adherence.	-
16	CS	Wook	2012	Korea	N=1,956 cancer survivors & 1,124 general people with HT. Age:63.	1),2) Cancer survivor (+).	1) Medication adherence. 2) Frequency of BP monitoring.	Perceived BP control.

Table 2. 3. ***Studies on Health Behaviors and the Predictors of Adults with Hypertension Worldwide (Cont.)***

	Design	Author	Year	Country	Participant Age: Mean/[Range]	Predictors: Positive association (+); Negative association (-).	Behavioral outcome	Other outcome
17	CS	Warren-Findlow	2011	USA	N=188 with HT. Age:53.	1)2)3)4)6) Self-efficacy (+).	Self-care behavior: 1) Medication adherence; 2) Low-salt diet; 3) Physical activity; 4) Non-smoking; 5) Alcohol abstinence; 6) Weight management.	-
18	CS	Dalyoko	2011	Indonesia	N=70 with HT. Age60-74:66%.	Attitude (+). Family supervising (+). Knowledge (+).	Effort to control hypertension (Regular exercise, adequate rest, reducing salt intake)	-
19	CS	Heymann	2011	Israel	N=1,125 with HT. Age61+:78%.	Constructive beliefs on HT management; Knowledge on HT management; Lifestyle counseling (+).	Lifestyle behaviors (physical activity, diet, smoking).	BP, weight.
20	CS	Kemppainen	2011	Japan, US	N=212 in Japan & 105 in US with HT. Age:[30-89].	1) Married (+). Not working (+).	Health-promoting behaviors: 1) People in US and 2) People in Japan.	-
21	CS	Padilla	2011	USA	N=6,793 with HT. Age:55.	1),2),3) Acculturation (+).	Adherence to: 1) HT medication; 2) Lipid medication; 3) Antidepressant medication.	BP, T-C, LDL-C, BMI.
22	CS	Lee	2010	USA	N=445 with HT. Age:52.	HT control self-efficacy; Longer years of HT; Older (+).	HT self-care behaviors (medication-taking, exercise, diet, weight control).	-
23	CS	Jones	2009	USA	N=80 with HT. Age:51.	Behavioral stress (-), Physical stress; Higher education; Older (+).	Health-promoting nutrition behaviors.	-
24	CS	Schoenthaler, Chaplin	2009	USA	N=439 with HT. Age:58.	Providers' collaborative communication; Older (+). Depression (-).	Medication adherence.	-
25	CS	Schoenthaler, Ogedegbe	2009	USA	N=167 with HT. Age:54.	Self-efficacy; Higher education (+). Depression (-)	Medication adherence.	-
26	CS	Hekler	2008	USA	N=102 with HT. Age:62.	Commonsense beliefs: 1) Medical belief model (+). 2) Stress belief model (+).	Adherence behaviors: 1) Lifestyle behaviors. 2) Stress-reduction behaviors. 3) Medication adherence.	BP
27	CS	Peters	2008	USA	N=306. HT:38%. Age:44.	BP knowledge; Older; HT history (+). Higher BMI (-).	Self-care behaviors.	BP
28	CS	Tilburt	2008	USA	N=272 with HT. Age:51.	1),2) Home remedy use (+).	1) Medication adherence. 2) Dietary adherence. 3) Lifestyle adherence. 4) Appointment adherence.	-
29	CS	Trivedi	2008	USA	N= 636 with HT. Age:61.	1) Married (+). Side effect (-). 2),3) Emotional well-being; Older (+). 4) Emotional well-being; Married; Older (+).	1) Medication adherence. 2) Dietary adherence. 3) Exercise adherence. 4) Lower smoking status.	-
30	CS	Viera	2008	USA	N=28,457 with HT. Age40+:87%.	1),2),3),4) Lifestyle modification advice (+)	Lifestyle modification: 1) Change eating habits; 2) Reduce salt; 3) Exercise; 4) Reduce alcohol consumption.	-
31	CS	Cho	2007	USA	N=554 with HT. Age:63.	1) Providers' participatory decision making style (+).	HT self-care behaviors: 1) Having a home monitor; 2) Frequency of monitoring; 3) Medication adherence.	BP
32	CS	Ham	2007	Korea	N=204,099 with HT. Age35-54:70%.	1),2) Older; Female; Nonsmoker; Comorbidity; Infrequent alcohol consumption (+). 2) Rural residents; Full-time workers (+).	Health service utilization: 1) Making contact with health care services. 2) Volume of health services utilization.	-
33	CS	Ayalon	2006	Israel	N=1,125 with HT. Age:72.	-	Health behaviors: 1) Physically active (NS); 2) Followed a HT diet (+); 3) Regular HT self-care (NS).	QOL
34	CS	Hadi	2004	Iran	N=250 with HT. Age:51.	Positive attitude toward medication; Shorter interval of physician visit (+).	Medication compliance.	BP
35	CS	Ross	2004	UK	N=272 with HT. Age:60.	Medication necessity; Older (+). High emotional response to illness; Personal control (-).	Medication compliance.	BP

Table 2. 4. ***Quality Evaluation of Studies on Health Behaviors and the Predictors of Adults with Hypertension Worldwide***

	Author	Year	Criteria										Total 'Yes' Score
			Randomised control trials										
			1. Random assignment ?	2. Blinded allocation from participants?	3. Concealed allocation from allocator?	4. Outcomes of withdrawal included in analysis?	5. Blinded allocation from assessor?	6. Groups comparable at entry?	7. Groups treated identically other than intervention?	8. Outcomes measured in the same way?	9. Outcomes measured in reliable way?	10. Appropriate statistical analysis?	-
1	Epstein	2012	Yes	Unclear	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	6
2	Martin	2011	Yes	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	7
3	Burke, Beilin	2008	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	7
4	Burke, Mansour	2008	Yes	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	7
			Cohort										
			1. Representative sample?	2. Similar patients?	3. Bias minimised to select cases?	4. Counfounding factors identified?	5. Outcome assessed using objective criteria?	6. Follow-up carried out over sufficient period?	7. Withdrawal included in analysis?	8. Outcomes measured in reliable way?	9. Appropriate statistical analysis?	-	-
5	Mansyur	2013	Unclear	Yes	Yes	Yes	Yes	Yes	Unclear	Unclear	Yes	-	6
6	Roumie	2011	Unclear	Yes	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	-	6
			Descriptive (Longitudinal, Cross-sectional)										
			1. Random sampling?	2. Inclusion criteria clearly defined?	3. Counfounding factors identified?	4. Outcome assessed using objective criteria?	5. Sufficient description for comparison?	6. Follow-up carried out over sufficient period?	7. Withdrawal included in analysis?	8. Outcomes measured in reliable way?	9. Appropriate statistical analysis?	-	-
7	Pickett	2014	No	Yes	Unclear	Yes	N/A	N/A	N/A	Yes	Yes	-	4
8	Cuffee	2013	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
9	Hu	2013	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
10	Kretchy	2013	No	Yes	Unclear	Yes	N/A	N/A	N/A	Unclear	Yes	-	3
11	Cornélio	2012	No	Yes	Yes	Yes	N/A	Unclear	Unclear	Unclear	Yes	-	4
12	Lewis	2012	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
13	Li	2012	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
14	Schoenthaler	2012	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
15	Stavropoulou	2012	No	Unclear	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	4
16	Wook	2012	No	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes	-	6
17	Warren-Findlow	2011	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
18	Dalyoko	2011	Yes	Yes	Unclear	Unclear	N/A	N/A	N/A	Unclear	Yes	-	2
19	Heymann	2011	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
20	Kemppainen	2011	No	Yes	Yes	Yes	N/A	N/A	N/A	Unclear	Yes	-	4
21	Padilla	2011	No	Yes	Yes	Unclear	N/A	N/A	N/A	Yes	Yes	-	4
22	Lee	2010	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
23	Jones	2009	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
24	Schoenthaler, Chaplin	2009	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
25	Schoenthaler, Ogedegbe	2009	No	Yes	Yes	Yes	N/A	Unclear	Unclear	Yes	Yes	-	5
26	Hekler	2008	No	Yes	Yes	Yes	N/A	N/A	Unclear	Unclear	Yes	-	4
27	Peters	2008	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
28	Tilburt	2008	No	Yes	Yes	Yes	N/A	N/A	N/A	Unclear	Yes	-	4
29	Trivedi	2008	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
30	Viera	2008	Yes	Yes	Yes	Unclear	N/A	N/A	N/A	Yes	Yes	-	5
31	Cho	2007	Yes	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	6
32	Ham	2007	No	Yes	Yes	Unclear	N/A	N/A	N/A	Yes	Yes	-	4
33	Ayalon	2006	No	Yes	Yes	Unclear	N/A	N/A	N/A	Yes	Yes	-	4
34	Hadi	2004	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5
35	Ross	2004	No	Yes	Yes	Yes	N/A	N/A	N/A	Yes	Yes	-	5

2) Behavioral outcomes. Health behaviors are referred to variously as: self-care behaviors, adherence, compliance, lifestyle behaviors, health promoting behaviors, and health behaviors.

The term of self-care behaviors was used in the context of chronic disease management. The self-care behaviors included: antihypertensive medication adherence, weight management, low-salt diet, limiting alcohol, physical activity, non-smoking and blood pressure measurement (Hu, Li, & Arao, 2013; Lee et al., 2010; Warren-Findlow et al., 2012). Adherence or compliance is the level of concordance between the patient behavior and medical or health recommendations including medication or diet recommendation (Hadi & Rostami-Gooran, 2004; Li, Kuo, Hwang, & Hsu, 2012). The terms were used particularly for medication adherence.

The term of lifestyle was used in the context of cardiovascular risk reduction. Lifestyle behaviors included: reduction of saturated fat intake, physical activity, reducing alcohol consumption, and avoiding smoking (Burke, Mansour et al., 2008; Hekler et al., 2008). Healthy lifestyles including physical activity, avoiding tobacco use and limiting alcohol intake, and consumption of a healthy diet that is rich in fruits and vegetables and low in saturated fats and salt are recommended to prevent hypertension (World Health Organization Regional Office for South-East Asia, 2013).

The term of health promoting behavior was used aiming at actualization of human potential (Kemppainen et al., 2011). The behaviors included: health responsibility, physical activity, nutrition, interpersonal relations, spiritual growth and stress management.

The term of health behaviors was used to denote comprehensive behaviors. The behaviors include: lifestyle behaviors like physical activity and diet; self-care behaviors like regular medical follow-ups and regular blood checks and pharmaceutical treatment related to hypertension care (Ayalon et al., 2006).

3) Predictors of the health behaviors. Personal, social, and environmental predictors were derived. Personal predictors include: self-efficacy, beliefs about hypertension, knowledge, personal characteristics and personal barriers. Social predictors include: social support, support from health professionals and social barriers. Environmental predictors are environmental barriers.

Self-efficacy was the most frequently described as a predictor. It predicted medication adherence (Lewis, Schoenthaler, & Ogedegbe, 2012; Schoenthaler, Ogedegbe, & Allegrante, 2009; Warren-Findlow & Seymour, 2011), physical activity (Burke, Beilin, Cutt, Mansour, & Mori, 2008; Burke, Mansour et al., 2008, Warren-Findlow & Seymour, 2011), low-fat diet (Burke, Beilin et al., 2008; Burke, Mansour et al., 2008), low-salt diet, non-smoking, and weight management (Warren-Findlow & Seymour, 2011), and self-care behaviors (Lee et al., 2010). However, some studies showed self-efficacy did not predict physical activity, low-salt diet (Mansyur, Pavlik, Hyman, Taylor, & Goodrick, 2013) or alcohol abstinence (Warren-Findlow & Seymour, 2011). Therefore, self-efficacy alone cannot be enough to promote health behaviors.

Beliefs about hypertension also predicted health behaviors. Believing that external factors caused hypertension (Pickett, Allen, Franklin, & Peters, 2014) was negatively associated with self-care behaviors. Believing that hypertension is a chronic condition (Pickett et al., 2014) was associated with self-care behaviors. Moreover, believing in the necessity of medication (Ross, Walker, & Macleod, 2004) was positively associated with medication adherence. Knowledge of hypertension and its management was associated with self-care behaviors (Peters & Templin, 2008). Social support predicted low-fat intake and physical activity (Burke, Mansour et al., 2008).

Support from health professionals was mainly described in studies from high-income countries. Providers' communication skills (Roumie et al., 2011), provider's collaborative communication (Schoenthaler, Chaplin et al., 2009), and being well informed about medication (Stavropoulou, 2012) were predictors of medication adherence. Being given lifestyle modification advice was associated with salt reduction, physical activity, and alcohol reduction (Viera, Kshirsagar, & Hinderliter, 2008).

Demographic characteristics, like higher education, were predictors of health-promoting nutrition behaviors (Jones, Tucker, & Herman, 2009). Moreover, prior experience of having diseases predicted self-care behaviors (Peters & Templin, 2008) and medication adherence (Wook et al., 2012).

Personal barriers like addiction were associated with smoking (Mansyur et al., 2013) and busyness was associated with physical inactivity (Mansyur et al., 2013). A social barrier

like racial discrimination was associated with medical non-adherence (Cuffee et al., 2013). The environmental barriers like difficulty getting to the clinic for medication was associated with medical non-adherence (Martin et al., 2011).

Correlation coefficients between the predictors and health behaviors, which had statistical significance ranged from r = .19 to r = .31. The correlation coefficients were as follows: history of hypertension (r = .19), belief in hypertension as chronic (r = .20.), perceived ability to control blood pressure (r = .20), understanding of hypertension (r = .22), belief in hypertension as uncontrollable factors (r = -.26) and knowledge about blood pressure (r = .31) (Peters & Templin, 2008; Pickett et al., 2014).

4) Other outcomes. Blood pressure, weight, and quality of life were measured. A study found that lack of hypertension diet was related to worse quality of life (Ayalon et al., 2006). Studies found that participants who practiced healthy behaviors improved their blood pressure (Epstein et al., 2012; Hekler et al., 2008) and perceived better blood pressure control (Wook et al., 2012).

6. Interpretation: A model of health behaviors and the predictors of adults with hypertension worldwide.

A model of health behaviors and the predictors of adults with hypertension worldwide was derived from a synthesis of the findings (Figure 2.3). Health behaviors include: eating behavior (consumption of low-salt diet, low-fat diet, fruits and vegetable), physical activity, non-smoking, alcohol abstinence, stress control, and regular blood pressure check, doctor visits, and medication adherence. Personal predictors such as self-efficacy, beliefs about hypertension, and knowledge of hypertension and its management predicted these behaviors. The personal predictors were reinforced by demographic characteristics, social support, and support from health professionals. However, the health behaviors were not likely to happen if personal barriers, social barriers or environmental barriers had a more powerful influence. Moreover, people who practice healthy behaviors were more likely to have a better health status and perceive a better quality of life.

In the Precede-Proceed Model, self-efficacy, beliefs, knowledge, and demographic characteristics are predisposing factors which provide motivation to practice health behaviors. Social support is a reinforcing factor, which provides incentives for continuing

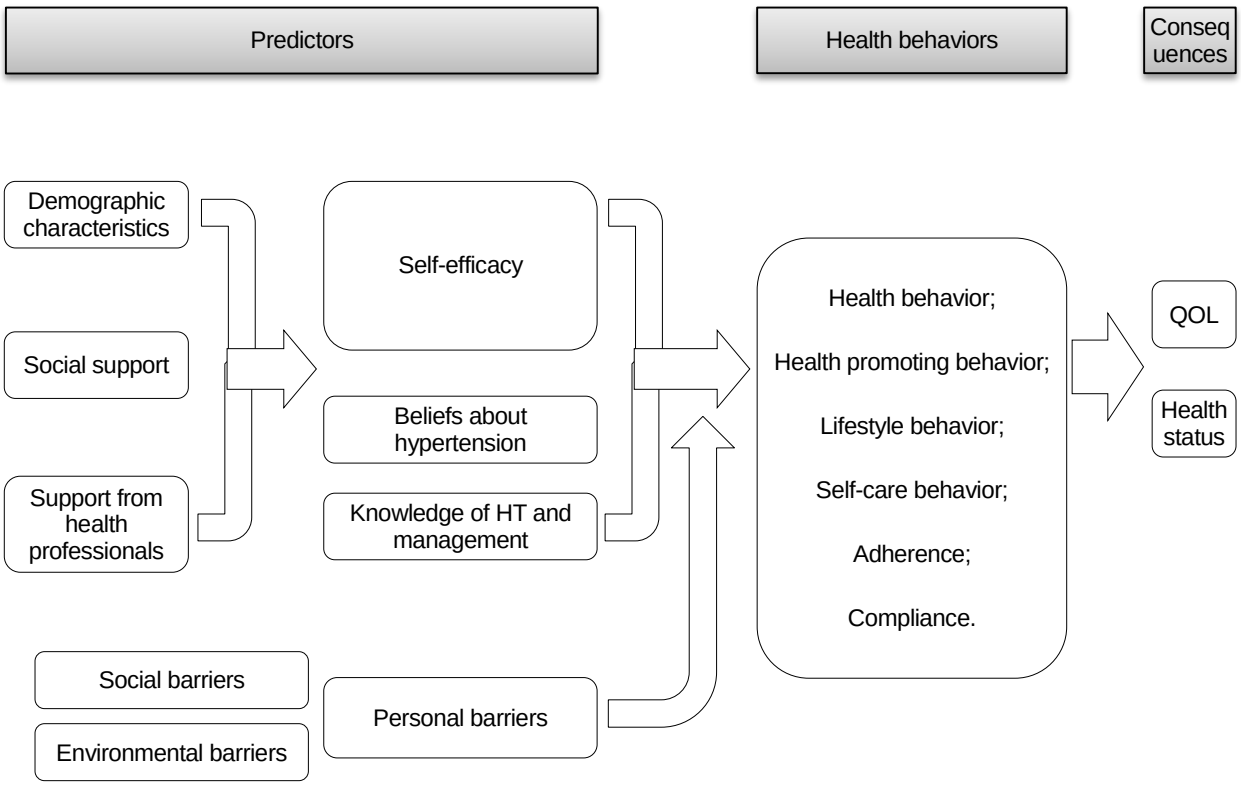

Figure 2. 3. **Synthesis of the literature review: A model of health behaviors and the predictors of adults with hypertension worldwide.**

health behaviors. Support from health professionals is an enabling factor, which facilitates the motivation for health behaviors to be realized. Personal barriers are predisposing or enabling factors. Social barriers are reinforcing or enabling factors. Environmental barriers are enabling or environmental factors, which influence health and behaviors.

IV. Implications for the Study

The term of 'preventive and promotive health behaviors' will be used for this study. Health behaviors are referred to variously as: self-care behaviors, adherence, compliance, lifestyle behaviors, health promoting behaviors, and health behaviors. However, preventive and promotive health behaviors will be used for this study based on the Indonesian people's need. Indonesian Ministry of Health is now prioritizing preventive and promotive health care at the primary health care level (Kementerian Kesehatan Republik Indonesia, 2009b). Recently, studies started to focus on preventive and promotive health behaviors. A study conducted in Indonesia reported that Indonesian health behaviors included preventative health behaviors and promotive health behaviors (Lubis, Takwin, & Panggabean, 2011).

Based on the literature review it is important to find predictors of health behaviors for hypertension prevention and health promotion. These predictors were personal, social, and environmental factors. Statistically significant correlation coefficients between the predictors and health behaviors ranged from r = .19 to r = .31 (Peters & Templin, 2008; Pickett et al., 2014), which will be considered when determining sample size for the main study. Most of the studies in the literature review were from high-income countries like USA. Recently, there has been increasing evidence from middle-income countries such as Brazil, China, Ghana, Indonesia, and Iran. However, there are very few studies about health behaviors and the predictors for middle-aged people with hypertension in any rural district of West Java, Indonesia.

According to Bandura (1986), human behavior is the product of the dynamic interplay of personal, behavioral, and environmental influences. Because of the multiplicity of interacting influences, the same factor can be a part of different blends of conditions that have different effects (Bandura, 1986). Moreover, a research synthesis, which explored motivators for health behaviors pointed out that motivators were different for Eastern and

Western cultures (Coburn & Weismuller, 2012). Therefore, it was necessary to describe perceptions of preventative and promotive health behaviors and the predictors for middle-aged people with hypertension in a rural district of West Java, Indonesia as a preliminary study.

In the preliminary study, 'health lifestyle behaviors' was used as health behaviors because it was necessary for NCDs prevention and health promotion and they were modifiable behaviors in the individual's life. World Health Organization recommends 'healthy lifestyles' including healthy diet, physical activity, limiting tobacco and alcohol consumption to prevent hypertension (World Health Organization Regional Office for South-East Asia, 2013). In addition, 'lifestyle' is also understood as discretionary activities that are a part of an individual's daily pattern of life and that significantly impacts on one's health status (Pender, Murdaugh, & Parsons, 2011).

Chapter 3.
Preliminary Study

A preliminary study was conducted to describe perceptions of 'health lifestyle behaviors' and 'the reasons to practice the behaviors' of middle-aged people with hypertension in a rural district of West Java, Indonesia. This chapter describes the aim, methods, results, discussion, and implications for the main study.

I. Aim

This preliminary study aimed to describe perceptions on 'health lifestyle behaviors' and 'related reasons to practice the behaviors' of middle-aged people with hypertension in a rural district of West Java in order to construct a study framework as well as to develop questionnaires for the main study.

II. Methods

1. Design.

The design was a descriptive case study using Yin's (2008) method because little was known regarding health lifestyle behaviors and the related reasons in the district of West Java. Yin's case study design provides for a complete systematic description of a phenomenon within its context and relies on the multiple sources of evidence including documents, interviews, and observations.

2. Participants and recruitment.

Twelve married couples who were visiting the community health centers were purposively recruited. Inclusion criteria were: 1) men and women; 2) either or both of them were aged 40-64 years with hypertension; 3) any blood pressure control status; 4) either or both on antihypertensive medication; 5) being able to communicate; 6) not pregnant and 7) willing to participate.

3. Study team.

The study was conducted in collaboration with four Indonesian researchers. This author led the study and was responsible for the study planning, ethical consideration for

the participants, data gathering and storing, data analysis, and publication of the results. The Indonesian researchers coordinated with the relevant institution to conduct a study, facilitated interviews in Indonesian language and advised the author about social context and health system in Indonesia.

4. Data collection.

The data was collected from December 11 to December 28 in 2013.

The participants' information about characteristics, health lifestyle behavior and reasons that relate to health lifestyle behavior were collected from interviews and direct observations. Semi-structured interviews were conducted with participants according to an interview guide. The main questions were: *Apakah Anda merasa sehat?* (Do you feel healthy now?); *Apa arti kesehatan yang baik menurut Anda?* (What does good health mean according to you?); *Apakah yang Anda lakukan untuk menjaga atau menpromosi kesehatan?* (Is there anything that you practice to maintain or promote health?); *Siapa atau apa yang membantu Anda untuk melakukan pola hidup yang sehat?* (Who or what helps you to practice healthy lifestyle?); *Apakah ada pola hidup sehat yang Anda ingin lakukan meskipun Anda tidak bisa?* (Is there any healthy lifestyle that you cannot practice although you would like to do?) and *Apa atau siapa yang menghalangi Anda untuk pola hidup yang sehat?* (What or who hinders or prevents your healthy lifestyle?) . The interview guide was developed by this author and based on two previous studies, Mizutani (2012) and Mizutani et al. (2015) and the work of World Health Organization's (n.d.) STEPwise approach to chronic disease risk factor surveillance (STEPS). The native Indonesian collaborator who was a PhD nurse-researcher checked the interview guide for cultural appropriateness and understandability and revised accordingly. Interviews were conducted in a location of participant's choice and in the Indonesian language by the researchers, and the bilingual Indonesian research partners translated the participant's responses into English. The data was audio-recorded with participants' consent and field notes were taken and both were transcribed and then translated from Indonesian language to English. Direct observations during home-visits were conducted with the permission of each participant. The researchers observed participant's health lifestyle behavior and collected data by field notes based on the following seven aspects of

observation: physical setting, participants, activities and interactions, frequency and duration, precipitating factors, organization, and intangible factors (i.e. nonverbal communication) (Polit & Beck, 2012). Each interview lasted about 55 minutes on average.

5. Data analysis.

Based on Yin (2008), the data was analyzed to stipulate a presumed set of causal links about it and "how" or "why" something happened to "explain" a phenomenon. The process was:

1. Describe the participants' characteristics.
2. Describe the participants' health lifestyle behaviors.
3. Describe the participants' perceived reasons that relate to health lifestyle behaviors.
4. Synthesize the findings and explain how or why their health lifestyle behaviors are practiced.
5. Compare these findings against the existing literature

6. Ethical consideration.

A proposal and a request for study collaboration were sent to the Dean of the Faculty of Medicine and Health Science, Islamic State University Syarif Hidayatullah Jakarta, and an agreement for study collaboration was made in January 2013. A proposal and a request for study permission were also sent to *Kepala Badan Kesatuan Bangsa, Politik dan Perlindungan Masyarakat* [the Director of the Agency for National Unity, Politics, and Community Protection] and *Kepala Dinas Kesehatan Kabupaten* [the Director of the District Health Office], and a permission was obtained in January 2013 (No.070-021 and No. 070-209). The researcher obtained approval from the Research Ethics Committee of St. Luke's College of Nursing in March 2013 (Approval No.12-083).

This researcher (author) ensured the individual autonomy and confidentiality of the research participants and organization. The researchers invited the eligible participants to cooperate in the research in written format in the Indonesian language and in advance informed them about the research purpose, method, requests, and ethical consideration. In addition, in order to collect information from medical records of participants at health centers, we made a request to the district health office in written format and obtained permission in advance. Written informed consent obtained from participants prior to their participation and

the refusal form was provided to the participants. In order that participants were not forced by the power or authority of the researchers during recruitment, the researchers told institutions not to check the participation status of eligible participants when the researchers requested that the institutions recommend someone for research participation. The researchers also told eligible participants that we do not inform the institution about their participation status. The researcher explained to the Indonesian research partners about confidentiality and instructed them not to reveal information that they obtained during the research. The collected data was coded and securely stored in a locked place only accessible by this researcher. All data will be destroyed three years after the publication.

III. Results

1. Participants' characteristics.

Twelve couples (i.e. 24 people) participated in this study. Table 3.1 indicates characteristics of the participants. The mean age was 51.2 (SD = 8.1). Among them, 14 people (58%) were diagnosed with hypertension. The mean systolic blood pressure was 148.1 mmHg (SD = 22.7). From the body mass index, 12 people (50%) were overweight or obese. All of their religious affiliations were Muslim. Regarding educational attainment, 13 people (54%) had not completed primary school. Slightly over half of them (58%) earned less than 1 million rupiah per month. Half of them (50%) had *Jamkesmas*, which is a community health insurance for the poor or nearly poor.

2. A model of health lifestyle behaviors and related reasons to practice the behaviors of middle-aged people with hypertension in a rural district of West Java.

Participants' health lifestyle behaviors were reported in response to the guided interview. Two categories for health lifestyle behaviors (Table 3.2) and nine categories for the reasons to practice health lifestyle behavior (Table 3.3) were derived. A model of health lifestyle behaviors and related reasons to practice the behaviors of middle-aged people with hypertension in a rural district of West Java were derived from a synthesis of the findings (Figure 3.1). The author explains the detail of categories and sub-categories as follows.

3. Perceived health lifestyle behaviors.

Perceived health lifestyle behaviors were described as: (1) eating practice, (2) physical

Table 3. 1. ***Participants' Characteristics of Middle-Aged People with Hypertension in a Rural District of West Java, Indonesia (N=24)***

Characteristics	Measure
	Mean (SD)
Age	51.2 (8.1)
Blood pressure (mmHg)	
Systolic blood pressure	148.1 (22.7)
Diastolic blood pressure	91.0 (20.4)
Body Mass Index	Number
~ 18.4	2
18.5~24.9	10
25.0~	12
Religion	
Islam	24
Household composition	Mean (SD)
Total number of children	3 (1.6)
Number of children staying together	1.1 (0.6)
Educational level	Number
Less than primary school	13
Completed primary school	9
Completed junior high school	1
Completed college/university	1
Employment status	
Farmer	7
Other work	7
Farmer + other work	3
Homemaker or no job	7
Family income per month (rupiah)	
0-999,999	14
1,000,000-2,999,999	10
Payment of medical fee	
Jamkesmas (community health insurance)	12
Self	12
Transportation to Puskesmas	
Walk	1
Bicycle	1
Angkot (public mini-bus)	9
Private motorbike	12
Private car	1

Table 3. 2. ***Category List of Perceived Health Lifestyle Behavior of Middle-Aged People with Hypertension in a Rural District of West Java, Indonesia***

Category	Sub-category	Code
1) Perceived health lifestyle behaviors currently practicing	(1) Eating behaviors	①Controlling eating salty food
		②Controlling eating sweets
		③Eating vegetables
		④Eating fruits
		⑤Eating soybeans products
		⑥Eating and drinking for energy
		⑦Drinking traditional herb
	(2) Physical activity	①Exercise during work
		②Exercise for my physical body
	(3) Resting	①Reducing duration of work to avoid tiredness
		②Taking enough sleep
		③Resting when I get tired
		④Resting when I have symptoms
		⑤Receiving massage when I have myalgia
	(4) Not smoking	①Not smoking
	(5) Managing stress	①Taking rest to reduce stress
		②Doing something to be relaxed
	(6) Seeking health information	①Obtaining health information.
		②Receiving health check-up
	(7) Seeking health care	①Buying medicine for symptom
		②Going to public health service
		③Going to private health service
		④Going to a hospital
		⑤Following suggestion of health professionals
		⑥Taking prescribed medicine
	(8) Caring for others	①Working for my family's life
		②Having concern about health of people
		③Keeping good relationships with people
		④Discussing about health with people
		⑤Supporting community activity
	(9) Fulfilling obligation to God	①Praying five times a day
		②Praying more than obligation
		③Practicing additional fasting
		④Reciting Qur'an
		⑤Accepting any difficult situation
		⑥Begging God for help

Table 3.2. ***Category List of Perceived Health Lifestyle Behavior of Middle-Aged People with Hypertension in a Rural District of West Java, Indonesia (Cont.)***

Category	Sub-category	Code
2) Perceived health lifestyle behaviors NOT practicing	(1) Eating behaviors	①Cannot control eating salty food
		②Cannot control eating sweets
		③Cannot eat fruits
		④Cannot eat meats
		⑤Cannot eat fish
		⑥Cannot eat variety of food
	(2) Physical activity	①Cannot do exercise
	(3) Not smoking	①Cannot stop smoking
	(4) Managing stress	①Cannot stop thinking so much
	(5) Seeking health information	①Cannot obtain health information
	(6) Seeking health care	①Cannot go to public health service
		②Cannot go to private health service
		③Cannot go to a hospital
	(7) Caring for others	①Cannot work for my family
		②Cannot support community activity
	(8) Fulfilling obligation to God	①Cannot pray five times a day
		②Cannot pray in correct position
		③Cannot go on pilgrimage

Table 3. 3. ***Category List of Perceived Reasons to Practice Health Lifestyle Behavior of Middle-Aged People with Hypertension in a Rural District of West Java, Indonesia***

Category	Sub-category	Code
1) Behavioral beliefs	(1) Belief in God	①To fulfill obligation to God
		②To receive blessing from God
	(2) Belief in community	①To work for the community
	(3) Belief in family	①To work for family
		②To promote family's health
	(4) Belief in myself	①To be happy
		②To be healthy
2) Competence	(1) Knowledge	①Knowing the necessity of healthy behaviors
		②Recognizing my health status
	(2) Ability	①Having ability to practice healthy behaviors
	(3) Positive attitude	①Feeling my effort will be positive impact to my health
		②Being confident to practice healthy behaviors
	(4) Resource utilization	①Communicating with people about health
		②Seeking health care
3) Religious support	(1) Support from God	①God gives me everything
		②God gives me health
		③God helps my health problem
4) Social support	(1) Support from family	①Emotional support
		②Informational support
		③Financial support
		④Material support
		⑤Physical support
	(2) Support from neighbors/friends	①Informational support
		②Physical support
	(3) Support from community leader	①Emotional support
		②Informational support
		③Physical support
5) Health system support	(1) Support from health volunteer	①Emotional support
		②Informational support
		③Material support
		④Physical support
	(2) Support from health professionals	①Informational support
		②Material support
	(3) Support from health insurance	①Financial support
6) Prior experience	(1) Experience of having disease	①My experience of having disease
		②Other's experience of having disease
	(2) Experience of Improved health status	①My experience of improved health status
		②Other's experience of improved health status

Table 3.3. ***Category List of Perceived Reasons to Practice Health Lifestyle Behavior of Middle-Aged People with Hypertension in a Rural District of West Java, Indonesia (Cont.)***

Category	Sub-category	Code
7) Personal barriers	(1) Physical barriers	①Physical symptom
	(2) Emotional barriers	①Joyful feeling
		②Feeling scared
	(3) Time barriers	①Busy
	(4) Habit	①Habit
	(5) Informational barriers	①Limited information
	(6) Economical barriers	①Expensive living expenses
		②Limited income
8) Social barriers	(1) Interpersonal barriers	①People's encouragement
		②Limited companionship
		③Respect for others
	(2) Situational barriers	①After working
		②At social gatherings
		③Limited opportunity
	(3) Health system barriers	①Limited health services
		②Expensive medical fees
9) Environmental barriers	(1) Geographical barriers	①Hot weather
		②Long distance
	(2) Transportation barriers	①Limited transportation

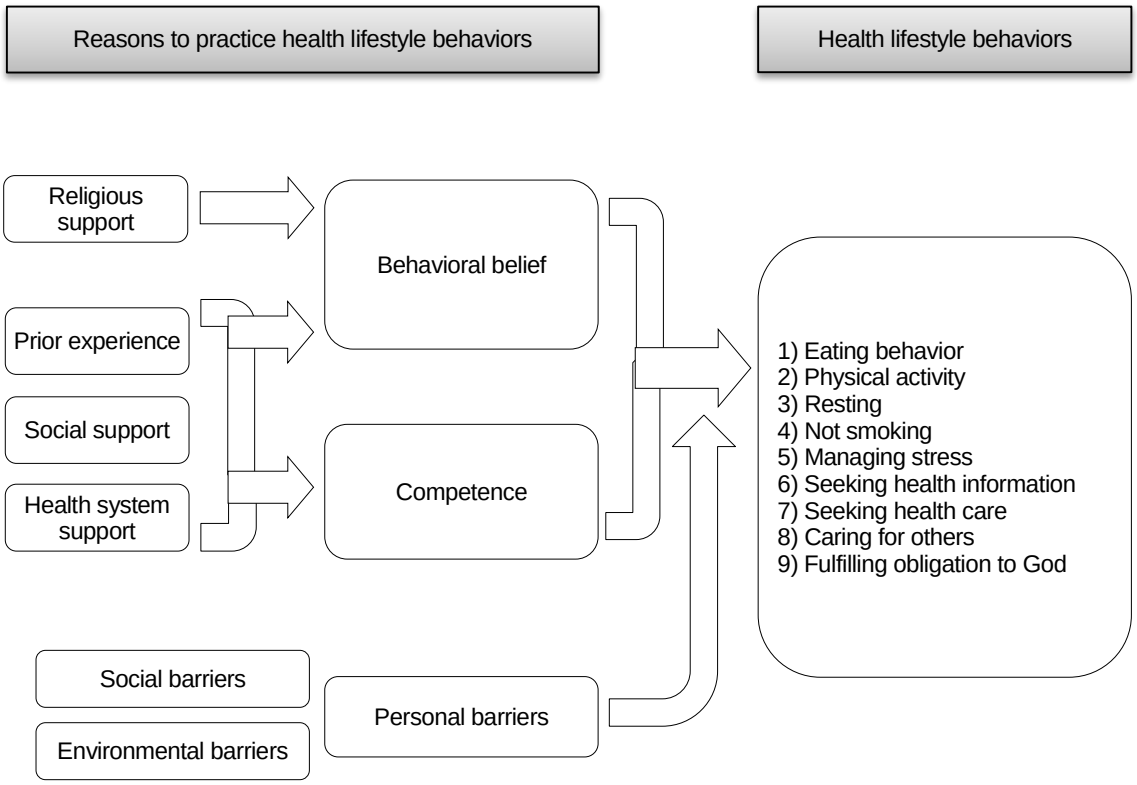

Figure 3. 1. **Synthesis of the preliminary study: A model of health lifestyle behaviors of middle-aged people with hypertension in a rural district of West Java, Indonesia.**

activity, (3) resting, (4) not smoking, (5) managing stress, (6) seeking health information, (7) seeking health care, (8) caring for others and (9) fulfilling obligation to God. Some of the behaviors were currently practiced, while others were currently not practiced (Table 3.2).

1) Perceived health lifestyle behaviors currently practicing.

(1) Eating behaviors. This included: controlling eating salty food; controlling eating sweet; eating vegetables; eating fruits; eating soybeans products; eating and drinking for energy; and drinking traditional herb. Participants who would like to be healthy and to gain physical energy for working, who were aware the necessity of the behaviors, who obtained the information from health professionals, family, and friends, and who had prior experience of having disease and improved health status reported this perception.

① Controlling eating salty food. This meant that participants controlled eating salty food to prevent or control hypertension. Participants who were aware the necessity of reducing salt for controlling blood pressure, who obtained the information from health professionals, and who had prior experience of having disease and improved health status reported this perception.

"After I got a stroke, I reduced the amount of food especially salty and sweet food. I know a lot of salt is dangerous. The information is from a private doctor. It is really helpful because now I can move." (10-M)

②Controlling eating sweets. This meant that participants controlled eating sweet food and drinks to prevent or control hypertension. Participants who were aware the necessity of reducing sweets for controlling blood pressure, who obtained the information from health professionals, and who had prior experience of having disease and improved health status reported this perception.

"I have hypertension for a year. Four months ago, my mother got sick, diabetes, and I realized I have a problem. After that, I reduced salt and sweets." (06-M)

③ Eating vegetables. This meant that participants ate vegetables to control hypertension, to prevent common cold, or for their vision (eye problem). Participants who were aware of the necessity of vegetables for controlling blood pressure, who obtained the information from health professionals, family or friends reported this perception.

"I take gemblak (vegetables). According to my wife, it is good for my vision." (07-M)

④ *Eating fruits.* This meant that a participant ate fruits to control hypertension. A participant who was aware the necessity of fruits for controlling blood pressure and who obtained the information from health professionals and friends reported this perception.

"I take leaves, papaya, and beans because I heard it can reduce my hypertension from bidan (midwives) and my friends." (07-F)

⑤ *Eating soybeans products.* This meant that a participant ate soy beans products to control hypertension. The participant obtained the information from her family.

"My husband tells me tempeh (fermented soybeans cake) and tofu are good for my hypertension." (04-F)

⑥ *Eating and drinking for energy.* This meant that participants drank sweet coffee or tea, milk, and ate rice and *indomie* (instant noodle) to have energy and spirit for working and to be healthy.

"(I drink) sweet coffee and tea twice a day. Without these, I will have less spirit to work." (02-F)

⑦ *Drinking traditional herb.* This meant that participants drink *jamu* (traditional herb) to prevent or control tiredness and myalgia. A participant who is a farmer reported this perception.

"I know when I have complain like myalgia. (When I have complaint) I buy medicine and jamu (traditional herb)." (08-M)

(2) Physical activity. This included: exercise during work and exercise for my physical body. Participants who would like to be healthy and to gain physical energy for working, who were aware the necessity of the behaviors, who obtained the information from health professionals, family, and friends and who had prior experience of having disease and improved health status reported this perception. Participants were practicing physical activity for their physical health and for their family. Some participants perceived physical activity as a part of their work.

① *Exercise during work.* This meant that participants practiced exercise during work. They considered working as physical activity. For example, digging and planting in a rice field was a physical activity for a farmer, riding a bicycle was physical activity for a bicycle-taxi driver. Cleaning house, washing clothes, and feeding poultry were physical activities for

homemakers.

"Before morning prayers, I go to a farm, plant banana, and dig for one hour, almost everyday at least four times a week." (04-M)

"Every morning, I catch chickens and give them food. That is exercise. Every evening, I catch chickens to throw them into a cage." (10-F)

② *Exercise for my physical body.* This meant that a participant practiced exercise for strengthening physical body. A participant who had stroke and semi-paralysis reported this.

"After I got a stroke three years ago, I had paralysis. But I tried to walk around a lot and exercise left hand using ball like this (gripping ball). I did by myself, my idea." (10-M)

(3) Resting. This included: reducing duration of working to avoid tiredness, taking enough sleep, resting when I get tired, resting when I have symptoms and receiving massage when I have myalgia. Participants who had vigorous-intensity work, who recognized physical signs, and wanted to maintain health reported this perception.

① *Reducing duration of working to avoid tiredness.* This meant that a participant reduced the duration of working not to be tired. A farmer who had vigorous-intensity work reported this perception.

"I reduce activity in working. I make bricks. Previously, I made 300-400 bricks. Now I reduced the amount of bricks to 200. Previously, I worked until 15:00 or 16:00. But now I work until 12:00 and I rest. I feel difference. If I worked until 15:00, I feel so tired. If I work until 12:00, I feel segur (fresh)." (11-M)

② *Taking enough sleep.* This meant that a participant took enough sleep not to be dizzy. A carpenter who had vigorous-intensity work reported this perception.

"Resting and sleeping. Duration of sleeping. Not too much, not too short. If too much sleeping, I will become dizzy. If too short sleeping, I will become dizzy." (06-M)

③ *Resting when I get tired.* This meant that participants take a rest during working when they get tired. A farmer, a shopkeeper, and homemakers who noticed physical signs of tiredness and who wanted to maintain their health reported this perception.

"I need to work but I also need to rest when I get tired. I take rest to maintain my health." (02-F)

④ *Resting when I have symptoms.* This meant that a participant took a rest when they felt dizziness or headache during working. A farmer, a carpenter, a bicycle-taxi driver, and a homemaker who recognized the dizziness and who wanted to maintain health reported this perception.

"If I recognize dizziness during working, I stop working. Because health is the most important." (06-M)

⑤ *Receiving massage when I have myalgia.* This meant that a participant received massage when he had myalgia. A farmer reported this perception.

"Myalgia. I am thinking how to reduce this back pain. I buy medicine for myalgia at a shop. I sometimes have massage but it is rare because it is expensive, 40,000 rupiah." (01-M)

(4) Not smoking. This meant they did not smoking or tried not to smoking. Male participants whose friend had a prior experience of having this disease, who obtained information from health professionals about the harm of smoking and who wanted to be healthy reported this perception.

"I can live without smoking. My belief comes from the depth (bottom) of my heart. Around here, there are many people who got illness from smoking, for example, severe continuous coughing. My friend went to a doctor because of the cough. The doctor was angry with him and told him, 'If you want to be a long life, you have to stop smoking'. But after coming back from the doctor, my friend is still smoking. I already stopped smoking three years ago. Myself wants to be healthy." (11-M)

(5) Managing stress. This included: taking rest to reduce stress and doing something to be relaxed. Participants were practicing stress management in order to maintain their mental health.

① *Taking rest to reduce stress.* This means that a participant took a rest to reduce her stress and to maintain her health.

"I take rest to maintain my health. If there is no rest, I will gain stress." (02-F)

② *Doing something to be relaxed.* This means that a participant did something like walking and shopping to be relaxed and to maintain his mental health.

"Mentally calm and relaxed. To be relaxed, I go for a walk and shopping with my wife

at a supermarket." (03-M)

(6) Seeking health information. This included: obtaining health information and receiving health check-ups. Participants who had access to television, neighbors, and health professionals, who wanted to be healthy and who had hypertension reported this perception.

① Obtaining health information. This meant that participants obtained health information about hypertension, healthy behaviors, and health services from television, neighbors, and health professionals.

"[I get health information from] Television. In local television, there is a program of talk show on health information like hypertension, exercise like aerobic, and how to make a menu of food." (03-M)

"From social gatherings, I get information about the schedule of Posyandu Lansia (community health post)." (11-F)

② Receiving health check-up. This meant that participants received health check-up for blood pressure at *Posyandu Lansia* or *Posbindu* (community health post), which is held once a month at a village. Participants who had hypertension and who wanted to be healthy reported this perception.

"I go to Posyandu Lansia or Posbindu (community health post) every month to check my blood pressure. They [health workers] give me information not to take salty food. Information from Posbindu is useful for me. Because it can control my condition." (08-F)

(7) Seeking health care. This included: buying medicine for symptoms; going to public health service; going to private health service; going to a hospital; following suggestion of a health professionals and taking prescribed medicine. Participants who noticed they had health problems, who noticed the necessity of health care and who had prior experience of improved health reported this perception.

① Buying medicine for symptoms. This meant that participants bought medicine at *warung* (small community shop which sells miscellaneous daily goods including some medicine like painkillers) to relieve symptoms like myalgia.

"I know when I have complain like myalgia. [When I have complaint] I buy medicine." (08-M)

② *Going to public health service.* This meant that participants went to public health services like *Posbindu* (community health post) and *Puskesmas* (community health center) especially when their symptom cannot be controlled by medicine at *warung* (small community shop).

"I buy medication like Paracetamol (painkiller) at warung (small community shop). If I am not really good for one or two days, I go to Puskesmas (community health center)." (02-F)

③ *Going to private health service.* This meant that participants went to private health services like a clinic held by a private doctor, *mantri* (private community nurse), or *bidan* (community midwife). Although participants need to pay more than for public health services, they chose the private health services because their neighbors experienced improved health status.

"People told me many success stories. It was also proved by my husband [My husband has also improved health status]. People who got stroke went to this doctor and [were] relieved. They can drive again. We wanted to have such experience. That is why we went to the doctor." (09-F)

④ *Going to a hospital.* This meant that participants went to a hospital in the district or other district when they had a serious health problem.

"When having stroke about seven years ago, we went to a hospital in another city because there are good doctors. At the time I worked as chicken seller and we had money. My wife regularly took me to the hospital." (09-M)

⑤ *Following suggestion of health professionals.* This meant that participants followed suggestion of health professionals when they had health problems.

"Information comes from bidan (village midwife) and doctor of Puskesmas (community health center) regarding hypertension. Helpful. If I follow the suggestion from a doctor, I feel relief from symptoms." (06-M)

⑥ *Taking prescribed medicine.* This meant that participants took medicine, which was prescribed by health professionals. Participants who noticed they had health problems and the necessity of taking medicine reported this perception.

"I have hypertension since 2013. It was found when I was checked at Posyandu

Lansia or Posbindu (community health post). My blood pressure is usually 160 (mmHg). I take medication for hypertension from Posbindu." (10-F)

(8) Caring for others. This included: working for my family's life; having concern about the health of other people; keeping good relationships with people; discussing health matters with people and supporting community activity. Participants who had a willingness to work for community people reported this perception.

① Working for my family's life. This meant that a participant worked to fulfill the needs of his family's life. He defined health as having money for his children's education.

"I need to fulfill [my] obligation to family and God. I economically support [the] life of my family like food and education." (04-M)

② Having concern about the health of other people. This meant that female participants expressed their involvement and worry about the health of people in their community.

"I want to help community and bidan (village midwife). If there is anyone who did not come [to monthly community health post], I will call them to come." (04-F)

"I often get angry at husband because eating at night will develop obesity. Obesity is not good for health. Visually, I recognize if my husband gains weight." (05-F)

③ Keeping good relationships with people. This meant that a participant kept good relationships with health workers who worked for *Posyandu* (community health post).

"Posyandu and Posbindu (community health post) are implemented here for a long time since 1980. …Confident [to practice healthy behaviors] because we have already have good relationship with Posyandu people." (04-M)

④ Discussing about health with people. This meant that a participant discussed health problems and shared health information with community people. A participant who had higher education reported this perception.

"In local television, there is a program talk show on health information like hypertension, exercise like aerobic, and how to make a food menu. The information is helpful. I can understand and I can discuss with neighborhood. Neighborhood also give me information, for example, how to prevent gastritis, not to eat spicy food." (03-M)

⑤ *Supporting community activity.* This meant that participants supported community activity like *Posyandu* (community health post) and cleaning activity. Male and female participants who had a willingness to work for their community reported this perception.

"Sometimes there is community cleaning activity. Together we pick-up waste. Even if there is no cleaning activity, I cut grass because I need to care about my community." (04-M)

"Posyandu and Posbindu (community health post) are implemented here for a long time, since 1980. … I always cooperate with bidan (village midwives). There are four kader (health volunteers) in this Posyandu and Posbindu. … I commit as a kader to help people even though there is no money (payment). I want to help community and bidan." (04-F)

(9) Fulfilling obligation to God. This included: praying five times a day; praying more than obligation; practicing additional fasting; reciting the Qur'an; accepting any difficult situation and begging God for help. This perception was reported by a participant who had beliefs in God, who had prior experience of having disease and who had a willingness to be healthy.

①*Praying five times a day.* This meant that participants practice ritual prayer five times a day, which is one of the Five Pillars of Islam.

"I need to fulfill my obligation to family and God. For God, spiritually is Ibadah (worship to God) and praying five times a day. Obligation to God is really important to Islamic society. I am a Muslim and I need to complete my obligation to God." (04-M)

②*Praying more than obligation.* This meant that a participant practiced praying more than the obligation. A participant whose health behaviors are practiced for worship to God, who had prior experience of having stroke and who had a willingness to be healthy reported this perception.

"Ibadah (worship to God) is number one. Health is for Ibadah. Eating for health is also for Ibadah. Sholat (praying) obligation is five times a day. I added more Sholat Fasbih (praying) at night. I also added a number of prayers. I want to improve my health." (09-M)

③ *Practicing additional fasting.* This meant that a participant practiced fasting in

addition to Ramadan (the fasting month). This perception was reported by a participant whose family had prior experience of having stroke, who had a willingness to be healthy and who had beliefs that health was brought from God.

"After my husband got sick, I had a bad experience and had hypertension. My blood pressure is usually 170 (mmHg). Since then, I have been implementing fasting (during day time) everyday unless during period. … I prefer not to eat for my husband. I believe that I can manage health by managing eating. Diseases come from God, and sometimes from food. I believe that if I have a belief in God, health will be brought from God." (09-F)

④ *Reciting Qur'an.* This meant that a participant studied about Islam in order to obtain enough knowledge to meet God after the end of his life. The participant reported that it is the most important thing in his life.

"I started to study about religion. I believe in God. I gather at mosque and study about religion. [It is important because] I am preparing to meet God. I believe when we die, our soul go and meet God. To meet God, we need knowledge. That is why I am studying religion." (01-M)

⑤ *Accepting any difficult situation.* This meant that a participant accepted difficult situations for example – a health problem, which was given from God. She regarded any good things like work and money and all bad things like diseases are from God.

"Having blessing from God (is the most important thing in my life). God gives me work and money. My husband has been unable to walk for four years. But I can accept this condition because I am healthy and I have been supporting my family's life for four years. I can work because I am healthy." (07-F)

⑥ *Begging God for help.* This meant that a participant begged God for help when he had a health problem. This perception was reported by a participant who had a prior experience of having a stroke and who had a willingness to be healthy.

"I should make a self-belief and motivation that it will get better. Previous experience (of having stroke) was so horrible. I thought that I was going to die. I asked God to help me. I gradually got better and I am very happy now." (10-M)

2) Perceived health lifestyle behaviors not practicing.

(1) Eating behavior. This included: cannot control eating salty food; cannot control eating sweets; cannot eat fruits; cannot eat meats; cannot eat fish and cannot eat a variety of foods.

① Cannot control eating salty food. This meant that participants were not able to control eating salty food to prevent or control hypertension.

"I know that smoking and salty food are not good for my health. I know they are bad for hypertension and cardiovascular diseases. For salty food, [it is difficult to stop] because food is prepared by my wife. And because it is not tasty if there is no salt." (02-M)

②Cannot control eating sweets. This meant that participants were not able to control eating sweet food and drinks to prevent or control hypertension.

"Many times my son told me not to eat too much, not to take sweets, not to take salt. I want to follow the suggestion but I cannot." (05-M)

③Cannot eat fruits. This meant that a participant was not able to eat fruits to maintain or promote her health.

"I want to buy fruits like durian. I think it is good for health because it is tasty and fresh. But it is expensive, 100,000 (rupiah)." (02-F)

④ Cannot eat meats. This meant that a participant was not able to eat meat like chicken and lamb to maintain or promote her health.

"I know healthy food like chicken and lamb soup. But I am not taking it. No money." (04-F)

⑤Cannot eat fish. This meant that a participant was not able to eat fish to maintain or promote her health.

"I need to buy fish. [But] Everyday I use vegetables and tempeh. I do not have money." (07-F)

⑥ Cannot eat a variety of food. This meant that a participant was not able to eat a variety of foods such as vegetable, fish and soybeans to maintain or promote her health.

"I want variation in the menu. But I cannot afford. I have similar menu for breakfast, lunch, and dinner. For example, I eat onde-onde (rice cake) for breakfast, rice and fish for lunch and rice and fish for dinner. I want to eat fish for breakfast, sour vegetable

soup for lunch, and other menus like tempeh (fermented soybean cake) for dinner." (03-M)

(2) Physical activity. This included cannot do exercise.

① Cannot do exercise. This meant that participants were not able to do exercises although they would like to do.

"I cannot [do sports] because I am busy working." (02-F)

(3) Not smoking. This included cannot stop smoking.

① Cannot stop smoking. This meant they were not able to stop smoking although they would like to or tried to do so.

"I want to stop smoking. It is difficult to stop. I feel better if I stop smoking. I want to stop smoking because buying cigarettes is expensive. If I buy expensive cigarettes, it will not be healthy. I smoke half a package (six cigarettes) per day. It is 4,000 rupiah." (12-M)

(4) Managing stress. This included cannot stop thinking so much.

① Cannot stop thinking so much. This meant that a participant was not able to stop thinking so much although she would like to stop.

"I do not [want to] think too much. But I cannot do it. If I have money, I do not need to think too much." (08-F)

(5) Seeking health information. This included cannot obtain health information.

① Cannot obtain health information. This meant that a participant was not able to obtain information regarding health.

"I want to do anything to be healthy. But I have less information. So I do not know what to do to be healthy." (11-M)

(6) Seeking health care. This included: cannot go to public health service; cannot go to private health service; and cannot go to a hospital.

① Cannot go to public health service. This meant that a participant was not able to go to public health services like *Posbindu* (community health post) and *Puskesmas* (health center).

"[I] Never go to Puskesmas or Posbindu. I want to go to Posbindu but [my] schedule does not match because I am working." (09-F)

② *Cannot go to private health service.* This meant that participants were not able to go to private health services like a clinic held by a private doctor.

"I want to go to a good doctor. But I do not have money so I just can go to Puskesmas (community health center). I do not know where there is a good doctor but [still that is what] I want. I want to find a good doctor to solve my problem." (04-F)

③ *Cannot go to a hospital.* This meant that participants were not able to a hospital in the district or other district when they had a serious health problem.

"I went to a doctor. Because of no money, I cannot follow the doctor's suggestion. The doctor recommended I have an operation but it is expensive. For one eye, it cost 7~10 million rupiah. Not only operation but also just eating is hard." (07-M)

(7) Caring for others. This included: cannot working for my family and cannot support community activity.

① *Cannot work for my family.* This meant that participants were not able to work to fulfill needs of their family's life.

"I want to have an operation. I want to be like before, have a job and support my wife, daughter and grandchild." (07-M)

② *Cannot support community activity.* This meant that a participant was not able to support community activity like a celebration ceremony.

"Health is important. I want to have good vision because when we have a gathering, I cannot get involved in the occasion because I have limited vision. When someone invites me to work for a celebration like circumcision, I cannot join in to help it." (01-F)

(8) Fulfilling obligation to God. This included: cannot pray five times a day; cannot pray in proper position and cannot go on pilgrimage.

① *Cannot pray five times a day.* This meant that a participant was not able to practice ritual prayer five times a day, which is one of the Five Pillars of Islam.

"For living healthy, I have to have a high level of spiritualty, Ibadah. But until now, I have not got the high level of Ibadah. For the high level of Ibadah, obligation of praying for five times has to be fulfilled. But I cannot do it because I am busy on finding money to fulfill daily needs." (09-F)

② *Cannot pray in correct position.* This meant that a participant was not able to

practice ritual prayer in the proper position.

"But physically not healthy (I have stroke and paralysis). Because I cannot pray perfectly (in the correct position)." (09-M)

③ Cannot go on pilgrimage. This meant that a participant was not able to go to pilgrimage, which is one of the Five Pillars of Islam.

"My concern is money to go on pilgrimage; I want to go. I believe that being a pilgrim will help health and happiness comes." (02-F)

4. Perceived reasons to practice health lifestyle behaviors.

Participants practiced the health lifestyle behaviors for the following reasons: behavioral beliefs, competence, religious support, health system support and prior experience. However, they were not able to practice the health lifestyle behaviors due to the following reasons: personal barriers, social barriers and environmental barriers (Table 3.3).

1) Behavioral beliefs. Participants practiced health lifestyle behaviors based on their behavioral beliefs including: belief in God, belief in community, belief in family and belief in self. Participants who had religious support, social support, support from the health system and prior experience reported behavioral beliefs.

(1) Belief in God. This included fulfilling obligations to God and receiving blessings from God.

① To fulfill obligation to God. This meant that a participant practiced a healthy lifestyle behavior to fulfill the obligation to God, which is the most important thing for Islam.

"I need to fulfill my obligation to family and God. ... Obligation to God is really important to Islamic society. I am a Muslim and I need to complete my obligation to God." (04-M)

② To receive blessings from God. This meant that a participant believed and practiced a health lifestyle behavior to receive blessings from God.

"I believe that if I have a belief in God, health will be brought from God." (09-F)

(2) Belief in community. This included working for the community.

① To work for the community. This meant that participants practiced healthy lifestyle behaviors to be able to contribute to and give support to their community activity. Both a male and a female participant reported this perception.

"I commit as kader (health volunteer) (to community health post service) to help people even though there is no money (reward). I want to help the community and bidan (midwife)." (04-F)

(3) Belief in family. This included to work for family and to promote family's health.

① To work for family. This meant that participants practice health lifestyle behaviors to work for their family.

"If my stomach is full of food, I can be healthy. The most important food is rice. Health is for working. If my body is healthy, I will have more spirit to work [for family]. … I think about my family. I have to work. My son is not independent. He still depends on me. I have to be healthy to work [for family]." (12-M)

② To promote family's health. This meant that a participant practiced a health lifestyle behavior to promote her family's health. A female participant reported this perception.

"[The most important is] Family, health and work. Because if I have headache, I cannot work for my family. I work for my family. I look after my family for their health." (02-F)

(4) Belief in myself. This included to be happy and to be healthy.

① To be happy. This meant that participants [would like to] practice health lifestyle behaviors to be happy.

"My concern is money to go on pilgrimage, I want to go. I believe that pilgrimage will help health and happiness come." (02-F)

② To be healthy. This meant that participants practice health lifestyle behaviors not only to prevent hypertension but also to be healthy.

"[I practice health lifestyle behaviors because] I wants to be healthy. No one educates me about healthy life. Information about health comes from my friends who met a doctor. Doctor suggested my friend stop smoking. But initiative to stop smoking comes from me. I stopped smoking three years ago." (11-M)

2) Competence. Participants who perceived having competence perceived practicing health lifestyle behaviors. These competencies include: knowledge, ability, positive attitude, and resource utilization.

(1) Knowledge. This included: knowing the necessity of health lifestyle behaviors and recognizing my health status.

①Knowing the necessity of healthy behaviors. This meant that participants were able to recognize the necessity of health behaviors like nonsmoking.

"I know that smoking and salty food are not good for my health. I know they are bad for hypertension and cardiovascular diseases." (02-M)

②Recognizing my health status. This meant that participants were able to recognize their own physical signs like dizziness and assess their own health status.

"I notice my signs [for example] If I feel dizziness, I recognize it." (05-F)

(2) Ability. This included: having the ability to practice healthy behaviors.

①Having the ability to practice healthy behaviors. This meant that participants had the ability to practice health lifestyle behaviors like healthy eating by utilizing their knowledge.

"I am sure because I have ability. Ability to manage myself, for example, food." (06-F)

(3) Positive attitude. This included: feeling my effort will provide a positive impact to my health and being confident to practice healthy behaviors.

①Feeling my effort will provide positive impact to my health. This meant that a participant felt that his effort to practice health lifestyle behaviors would provide a positive impact on his health.

"Confident. I also realize all effort is positive for my health." (05-M)

②Being confident to practice healthy behaviors. This meant that participants were confident to practice healthy behaviors like reducing salty food and practicing exercise.

"[I am] Confident. I believe I can reduce salty food and do exercise. The belief comes from myself." (12-F)

(4) Resource utilization. This included: communicating with people about health and seeking health care when needed.

①Communicating with people about health. This meant that participants were able to communicate with people e.g. their family members about their health when necessary.

"I can. [I am] Confident [to practice health lifestyle behaviors]. I need to be confident. By following my wife's suggestion, I can." (07-M)

②Seeking health care. This meant that participant was able to seek health care like buying medicine or going to health institution when necessary.

"[I am] Confident [to practice health lifestyle behavior]. Confidence comes from myself.

I recognize complain and go to seek health." (08-F)

3) Religious support. Participants' behavioral beliefs are based on religious support including support from God.

(1) Support from God. This included: God gives me everything; God gives me health and God helps my health problem.

①God gives me everything. This meant that everything in her life came from God.

"I am confident, I can manage [to practice health lifestyle behaviors]. I believe in God. Everything comes from God." (02-F)

②God gives me health. This meant that her health came from God.

"[My health lifestyle behavior is supported from] Only God. I believe that if I have a belief in God, health will be given from God." (09-F)

③God helps my health problem. This meant that God improved his health problem.

"Confident by myself [to practice health lifestyle behaviors]. I should make self-belief and motivation that it will get better. Previous experience [of having stroke] was so horrible. I thought that I was going to die. I asked God to help me. I gradually got better and I am very happy now." (10-M)

4) Social support. As a background of behavioral beliefs and competence, participants reported that they received social support to practice health lifestyle behaviors.

(1) Support from family. This included: emotional support, informational support, financial support, material support, and physical support.

①Emotional support. This meant that participants received caring and empathy from their family.

"My wife reminds me not to work so hard." (05-M)

②Informational support. This meant that participants received information from their family when they had health problems.

"My husband tells me not to take salty fish or salty vegetables. Because of my hypertension they are not good. He tells me tempeh (fermented soybeans cake) and tofu are good. " (04-F)

③Financial support. This meant that participants received financial assistance from their family when they had health problems.

"My husband [supports me]. Because we need money for life. If there is no rice, there is nothing to sell at market. So even if I feel tired, dizziness, and not healthy, my husband goes to work for money. He works from 7:00 to 17:00." (01-F)

④ *Material support.* This meant that participants received tangible goods from their family like medicine and *jamu* (traditional herbs) when they had health problems.

"My wife provides food like breakfast, coffee. She also gives me medicine when I am sick." (03-M)

⑤ *Physical support.* This meant that participants received tangible aids from their family when they had health problems. For example, their family assisted they go to *Puskesmas* (community health centers) by vehicle, gave assistance with housework when they were sick, and to did massage when they were tired.

"My family helps me. My husband recommends I buy medicine and escorts me to Puskesmas (community health center)." (08-F)

(2) Support from neighbors/friends. This included: informational support and physical support.

① *Informational support.* This meant that participants received information from their neighbors or friends when they had health problems.

"My friends who had experience of sickness tell me about sickness and a good doctor. Information from my friends is useful because they recommend I go to a good doctor." (09-F)

②*Physical support.* This meant that participants received tangible aids from their neighbors or friends when they had health problems. For example, their neighbors assisted them to go to *Puskesmas* (community health centers) by vehicle.

"I recognize myself when I am not well. I ask my neighbor for help. My neighbor escorts me to go to Puskesmas (community health center) by becak (bicycle taxi)." (10-F)

(3) Support from community leader. This included: emotional support, informational support and physical support.

① *Emotional support.* This meant that participants received caring and empathy from their RW/RT (community leader).

"When I feel weak, I go to RT to seek health. ... The RT couple is very kind to me."

(01-F)

② *Informational support.* This meant that participants received information from their RW/RT (community leader) when they had health problems.

"Information comes from ibu RT (community leader). It is about Posbindu (community health post) activity. There are health services at Posbindu." (07-F)

③ *Physical support.* This meant that participants received tangible aids from their RW/RT (community leader) when they had health problems. For example, RW/RT accompanied them to go to a hospital by vehicle, to assist housework when they are sick, and to do massage when they are tired.

"I seek health. I ask RT (community leader) to take me to a hospital because I have no money. When I feel weak, I go to RT to seek health. I have already gone to a hospital in a city twice by escort of RT." (01-F)

5) Health system support. As a background of behavioral beliefs and competence, participants reported that they received support from the health system to practice health lifestyle behaviors.

(1) Support from health volunteer. This included: emotional support, informational support, material support and physical support.

① *Emotional support.* This meant that participants received caring and empathy from *Kader* (health volunteers).

"Kader are good and friendly. Kader call us to come to Posyandu Lansia (community health post)." (11-F)

② *Informational support.* This meant that participants received information from *Kader* (health volunteers) when they had health problems.

"Kader promotes me to go to Posbindu (community health post). She announces community people." (07-F)

③ *Material support.* This meant that participants received tangible goods or health services from *Kader* (health volunteers) when they had health problems.

"Kader promotes [healthy] lifestyle because Posyandu and Posbindu (community health services) are implemented here (Kader's house) for a long time since 1980." (04-M)

④ *Physical support.* This meant that participants received tangible aids from *Kader* (health volunteers) when they had health problems. For example, *Kader* accompanied them to go to community health post.

"Kader is really helpful. If I need to take medication, it is given from Posbindu (community health post). She also guides me to walk." (07-M)

(2) Support from health professionals. This included: informational support and material support.

① *Informational support.* This meant that participants received information from health professionals when they had health problems.

"Bidan (village midwife) gives me information about reducing salt and sweet and moving my body [increase physical activity] to reduce hypertension. [The information is] Useful. The information makes me healthy." (11-F)"

② *Material support.* This meant that participants received tangible services from health professionals like examination and medicine when they had health problems.

"It is helpful for my wife because Bidan (village wife) gives my wife medication and examination." (08-M)

(3) Support from health insurance. This included: financial support.

① *Financial support.* This meant that participants received financial assistance from health insurance when they had health problems.

"I had experience of operation and long history of health. At second operation, I had to stay in a hospital for 17 days. It was long and expensive. It was about 7 million rupiah although I was supported by surat keterangan miskin (information letter of the poor). If I do not have it, it may cost 20 million rupiah." (06-F)

6) Prior experience. As a background of behavioral beliefs and competence, participants reported that they had prior experience of having disease or improved health status of themselves or others.

(1) Experience of having disease. This includes: my experience of having disease and other's experience of having disease.

① *My experience of having disease.* This meant that participants practiced health behaviors because they had experience of having stroke and did not want the experience

again.

"Confident [to practice health lifestyle behaviors]. I experienced a bad thing [stroke] before. For six months before having stroke, I had gastritis. After that I had stroke. I am confident because I had a bad experience [stroke]." (09-M)

② *Other's experience of having disease.* This meant that participants practiced health behaviors because someone like participants' family or neighbors had experience of having stroke and they did not want that experience.

"I have hypertension for a year. Four months ago, my mother got sick, diabetes, and I realized I have a problem. After that, I reduced salty and sweet." (06-M)

(2) Experience of improved health status. This includes: my experience of improved health status and other's experience of improved health status.

① *My experience of improved health status.* This meant that participants practiced health behaviors because they had experience of improved health status by practicing the health lifestyle behaviors.

"Information comes from Bidan (village midwife) and doctor of Puskesmas (community health center) regarding hypertension. [The information was helpful. If I follow the suggestion from a doctor, I feel relief from symptoms." (06-M)

② *Other's experience of improved health status.* This meant that participants practiced health behaviors because someone like participants' family or neighbors had experience of improved health status by practicing the health lifestyle behaviors.

"People told me many success stories and it was proved by my husband. People who got a stroke went to this doctor and relieved like can drive again. We wanted to have such an experience; that is why we went to the doctor. " (09-F)

7) Personal barriers. Personal barriers refer to difficulty in practicing health lifestyle behaviors because of oneself. These difficulties include: physical barriers, emotional barriers, time barriers, habit, informational barriers and economical barriers.

(1) Physical barriers. This includes physical symptoms.

① Physical symptoms. This meant that participants had difficulty in practicing health lifestyle behaviors because of their physical symptoms like paralysis and numbness of legs.

"I got a stroke seven years ago. I feel numbness and heaviness in right leg." (09-M)

(2) Emotional barriers. This includes: joyful feeling and feeling scared.

① Joyful feeling. This meant that participants had difficulty practicing health lifestyle behaviors because they enjoyed unhealthy lifestyle behaviors. They were not able to stop smoking or taking sweet drinks because they enjoy taking them.

"I really enjoy smoking and drinking sweets like coffee. Smoking and drinking sweets give me a joyful moment. Even if I am alone, I enjoy smoking and drinking sweets. After hard work, I rest. Smoking and drinking during rest are also good." (05-M)

② Feeling scared. This meant that a participant had a difficult time to practice health lifestyle behaviors because she felt scared to practice it. She was not able to go to a hospital because she was afraid of having a health problem.

"(I have) lymphoma 3 cm on my back. [I had] operation one year ago at my house by health staff from a hospital. My family is concerned about a lymphoma because when I lie down, I feel pain. When I move, it is also a bit painful. Although I have a pain, I do not go to a hospital. Because I am scared I have a problem." (06-F)

(3) Time barriers. This includes being busy.

① Busy. This meant that participants had a difficulty to practice health lifestyle behaviors because they did not have time to do physical activity, seek health information, or fulfill obligation to God.

"Olahraga (exercise). I am too busy for my life. I am too busy to make firecrackers. I work from 9:00 to 17:00. I want to walk in the morning before working. But I cannot because I am busy. In the morning, I do housework, clean, sweep, and prepare my grandchild to go to school." (11-F)

(4) Habit. This includes habit.

① Habit. This meant that participants had difficulty to practice health lifestyle behaviors because they had been engaged in smoking and eating salty food everyday for a long period of their life.

"I know that smoking and salty food are not good for my health. I know they are bad for hypertension and cardiovascular diseases. But I cannot stop them. It is difficult to stop smoking because it is habit, I do everyday for a long time." (02-M)

(5) Informational barriers. This includes limited information.

① *Limited information.* This meant that participants had difficulty to practice health lifestyle behaviors because they had limited information about the behaviors.

"I want to go to a good doctor. … I do not know where there is a good doctor but I want." (04-F)

(6) Economical barriers. This includes: expensive living expenses and limited income.

① *Expensive living expenses.* This meant that a participant had difficulty to practice health lifestyle behaviors because living expenses such as food and travel for pilgrimage are expensive.

"I want a variation of menu. But I cannot afford it. I have similar menu for breakfast, lunch, and dinner. For example, I eat onde-onde (rice cake) for breakfast, rice and fish for lunch and rice and fish for dinner. I want to eat fish for breakfast, sour vegetable soup for lunch, and other menu like tempeh (fermented soybean cake) for dinner." (03-M)

"My concern is money to go to pilgrim, I want to go." (02-F)

②*Limited income.* This meant that a participant had difficulty to practice health lifestyle behaviors because of her limited income. She would like to stop thinking [about income] so much but she cannot. Limited income causes her to worry about her life.

"I do not (want to) think too much. But I cannot do it. If I have money, I do not need to think so much." (08-F)

8) Social barriers. Participants found it difficult to practice health lifestyle behaviors because of their interpersonal relations, social situation, or health system. These difficulties included: interpersonal barriers, situational barriers, and health system barriers.

(1) Interpersonal barriers. This included people's encouragement, limited companionship and respect for others.

① *People's encouragement.* This meant that participants had difficulty practicing health lifestyle behaviors because they could not decline if people encouraged them to smoke or take a sweet drink.

"If people provide sweet tea, I drink." (01-F)

②*Limited companionship.* This meant that a participant had difficulty practicing health lifestyle behaviors because she had no one to join her for physical activity.

"I want to join an aerobics group. I do not have any friends to go with. I have joined an aerobics group in this district. Later on, my friends one by one dropped out." (06-F)

③ *Respect for others.* This meant that a participant had difficulty practicing health lifestyle behaviors because he had to smoke to show his respect to other people.

"(I smoke) Only three cigarettes per day when gathering with friends. Smoking is not good (taste). I smoke just to respect my friends. If [someone does] not smoke, [they are] not a man. I am not addictive to smoking." (06-M)

(2) Situational barriers. This includes: after working, at social gatherings and limited opportunity.

① *After working.* This meant that a participant had difficulty practicing health lifestyle behaviors e.g. stop smoking or reducing salty food and sweet food particularly after they work.

"Many times my son told me not to eat too much, not to take sweets, not to take salt. I want to follow the suggestion but I cannot. Especially after working, I often take them. I eat a lot for energy." (05-M)

② *At social gatherings.* This meant that a participant had difficulty practicing health lifestyle behaviors e.g. stop smoking and drinking sweet drinks particularly at social gatherings.

"I already addicted to smoking and drinking sweet [drinks] especially when gathering. During gathering we smoke and drink sweet [drinks]." (05-M)

③ *Limited opportunity.* This meant that a participant had difficulty practicing health lifestyle behaviors for example physical activity because there was little opportunity in the community.

"I want to join an aerobics group. There is no exercise group in this community." (06-F)

(3) Health system barriers. This includes: limited health services and expensive medical fees.

① *Limited health services.* This meant that a participant had difficulty practicing health lifestyle behaviors because of limited health services and her schedule does not match the public health services.

"[I] Never go to Puskesmas or Posbindu (community health post). I want to go to Posbindu but schedule does not match because I am working." (09-F)

② *Expensive medical fees.* This meant that a participant had difficulty to practice health lifestyle behaviors because medical fee is expensive.

"I already went to a hospital in a city. I needed to come back every three months. But I cannot do it because of no money for treatment and transportation. The treatment costs one million per one visit. I cannot afford that. So I stay here." (01-F)

9) Environmental barriers. Participants found difficulty practicing health lifestyle behaviors because of their environmental situation. These difficulties included: geographical barriers and transportation barriers.

(1) Geographical barriers. This included: hot weather and long distance.

① *Hot weather.* This meant that a participant had difficulty practicing health lifestyle behaviors e.g. physical activity because of hot weather.

"I should work. But with very hot condition, I cannot stand. Hot weather and hard-working will impact my health." (06-M)

② *Long distance.* This meant that a participant had difficulty practicing health lifestyle behaviors e.g. physical activity because she needed to travel long distance to go to the place.

"I want to join an aerobics group. But the distance (to the aerobics place) is far. It is about 30 km." (06-F)

(2) Transportation barriers. This included limited transportation.

① *Limited transportation.* This meant that a participant had difficulty practicing health lifestyle behaviors e.g. physical activity because there was limited safe transportation to go to the place.

"I want to join an aerobics group. It is about 30 km. I am scared to ride a motorbike [to go to the aerobic place]." (06-F)

IV. Discussion

From the synthesis of the findings (Figure 3.1), health lifestyle behaviors of the people with hypertension in rural West Java were predicted by personal predictors such as behavioral beliefs and competence. These personal predictors were reinforced by prior

experience, religious support, social support, and health system support. However, the health lifestyle behaviors were prevented by personal barriers, social barriers and environmental barriers.

The participants recognized caring for others and fulfilling obligation to God as health lifestyle behaviors. These behaviors are more than healthy lifestyle such as eating behaviors, physical activity, and not smoking which were recommended by World Health Organization (World Health Organization, 2013a). These unique behaviors were based on religious beliefs and religious support. The Holy Text, the Qur'an, indicates that people shall do good practice to their parents, the near relatives, alien neighbors, and the needy. And whoever believes in Allah and does good will be rewarded (Ali, 1987). Existing literature reported that believes about hypertension predicted health behaviors (Pickett et al., 2014; Ross et al., 2004). For the people with hypertension in rural West Java, health lifestyle behaviors were based on not only believes about hypertension but also on cultural and religious beliefs dictating behaviors toward family, community, and God.

An important predictor for the participants was having competency. Having competency is similar to self-efficacy, which was consistent with existing literature (Burke, Beilin et al., 2008; Burke, Mansour et al., 2008; Lee et al., 2010; Lewis et al., 2012; Schoenthaler, Ogedegbe et al., 2009). However, competency is more than self-efficacy, which include knowledge and ability. According to Bandura & Shunk (1981), self-efficacy means judgments about how well one can perform series of action required to deal with prospective situations including many ambiguous, unpredictable, and often stressful elements. Competence involves a capability that is organized into a series of action (Bandura & Shunk, 1981) and involves not only judgment about one's performance but also knowledge and capacity (Smith, 2004). The participants perceived knowledge and ability as important to practice health lifestyle behaviors. Therefore, for the people with hypertension in rural West Java, health lifestyle behaviors were based on competence.

Participants who had social support, health system support, and prior experience of having disease are more likely to perceive practicing health lifestyle behaviors. These findings are consistent with existing literature. Social support (Burke, Mansour et al., 2008), support from health professionals (Roumie et al., 2011; Schoenthaler, Chaplin et al., 2009;

Stavropoulou, 2012; Viera et al., 2008), and prior experience of having diseases (Peters & Templin, 2008; Wook et al., 2012) predicted healthy behaviors.

However, people who had barriers were less likely to practice health lifestyle behaviors. In particular, many people reported economical barriers, which is consistent with other studies conducted in middle-income countries (Reichert, Barros, Domingues, & Hallal, 2007). Since the prevalence of poverty was high (18%) in this district (Pemerintah Kabupaten Indramayu, 2013), this social determinant of health (World Health Organization, 2013a) may have a negative impact on people's behaviors and development of hypertension.

In the Precede-Proceed Model, behavioral beliefs, competence, and prior experience are predisposing factors. Social and religious support are reinforcing factors. Health system support is an enabling factor. Personal barriers are predisposing or enabling factors. Social barriers are reinforcing or enabling factors. Environmental barriers are enabling or environmental factors, which influence health and behaviors.

V. Implications for the Main Study

This was the first study, which described the health behaviors of people with hypertension in the district from the perspective of health promotion. The strengths of the case study were that it gave voice to rural inhabitants and detail to their perceptions and experiences for the first time (personal communication, Dr. Porter, May 2, 2014). It was necessary to conduct a quantitative study with a bigger sample in order to examine the structure among the health behaviors and the predictors for middle-aged people with hypertension in a rural district of West Java.

The term, 'preventive and promotive health behaviors' will be used for the main study. This is because the people with hypertension in rural West Java reported the wide-range of health lifestyle behavior. Their health lifestyle behaviors included not only controlling hypertension but also caring for others and fulfilling obligations to God. 'Behavioral beliefs' was used for the main study because the participants perceived not only belief about hypertension but also belief in family, community, and God. 'Competence' was used for the main study because the participants perceived not only self-efficacy but also knowledge and ability.

Chapter 4.
Methods for the Main Study

This chapter describes the design, study framework, sample, study instruments, study team, recruitment, data collection, ethical consideration, and data analysis for the main study to examine a perceived preventive and promotive health behaviors (PPHBs) model of middle-aged people with hypertension in a rural district of West Java, Indonesia.

I. Design

The study design was a cross-sectional descriptive study. A structural equation model was used to evaluate the proposed model for perceived PPHBs and the predictors of middle-aged people with hypertension in the rural district of West Java, Indonesia.

II. Study Framework

A theoretical framework (Figure 4.1) was developed based on the preliminary study and the literature review. Based on the model derived from the preliminary study, concepts of demographic characteristics, quality of life (QOL) and health status were added.

In the Precede-Proceed Model, behavioral beliefs, competence, demographic characteristics and prior experience are predisposing factors. Religious and social support are reinforcing factors. Health system support is an enabling factor. Personal barriers are predisposing or enabling factors. Social barriers are reinforcing or enabling factors. Environmental barriers are enabling or environmental factors, which influence health and behaviors. QOL and health are increased by implementing preventive and promotive health behaviors.

Based on the framework, a theoretical and operational framework (Figure 4.2) was developed using substruction (Dulock & Holzemer, 1991). This framework showed the concepts of predictors, PPHBs, consequences, along with the questionnaire and existing scales to measure the concepts.

III. Sample

The researchers planned to recruit at least 221 middle-aged people with hypertension

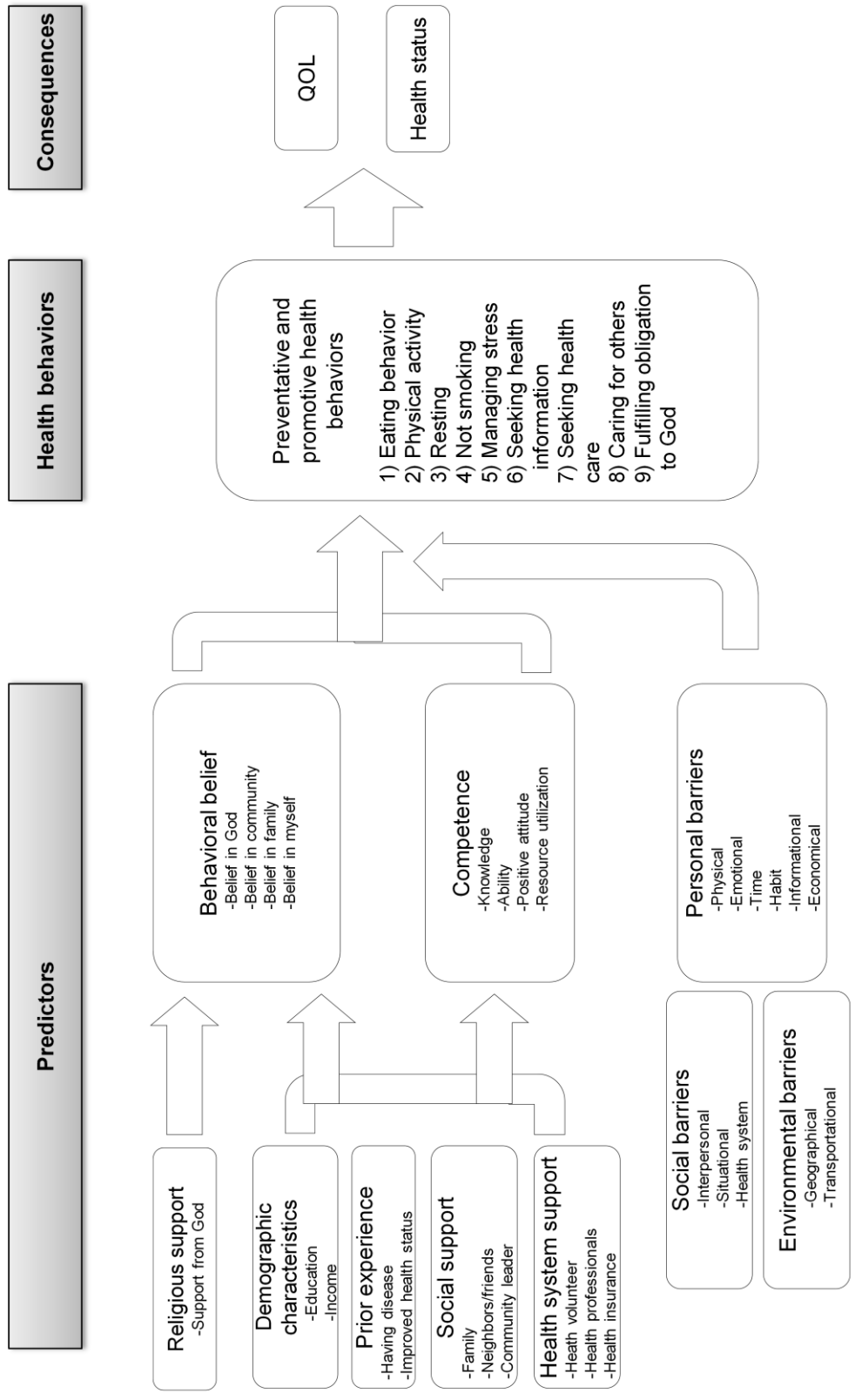

Figure 4.1. **A theoretical framework for main study:**
A preventive and promotive health behaviors model for middle-aged people with hypertension in rural West Java, Indonesia

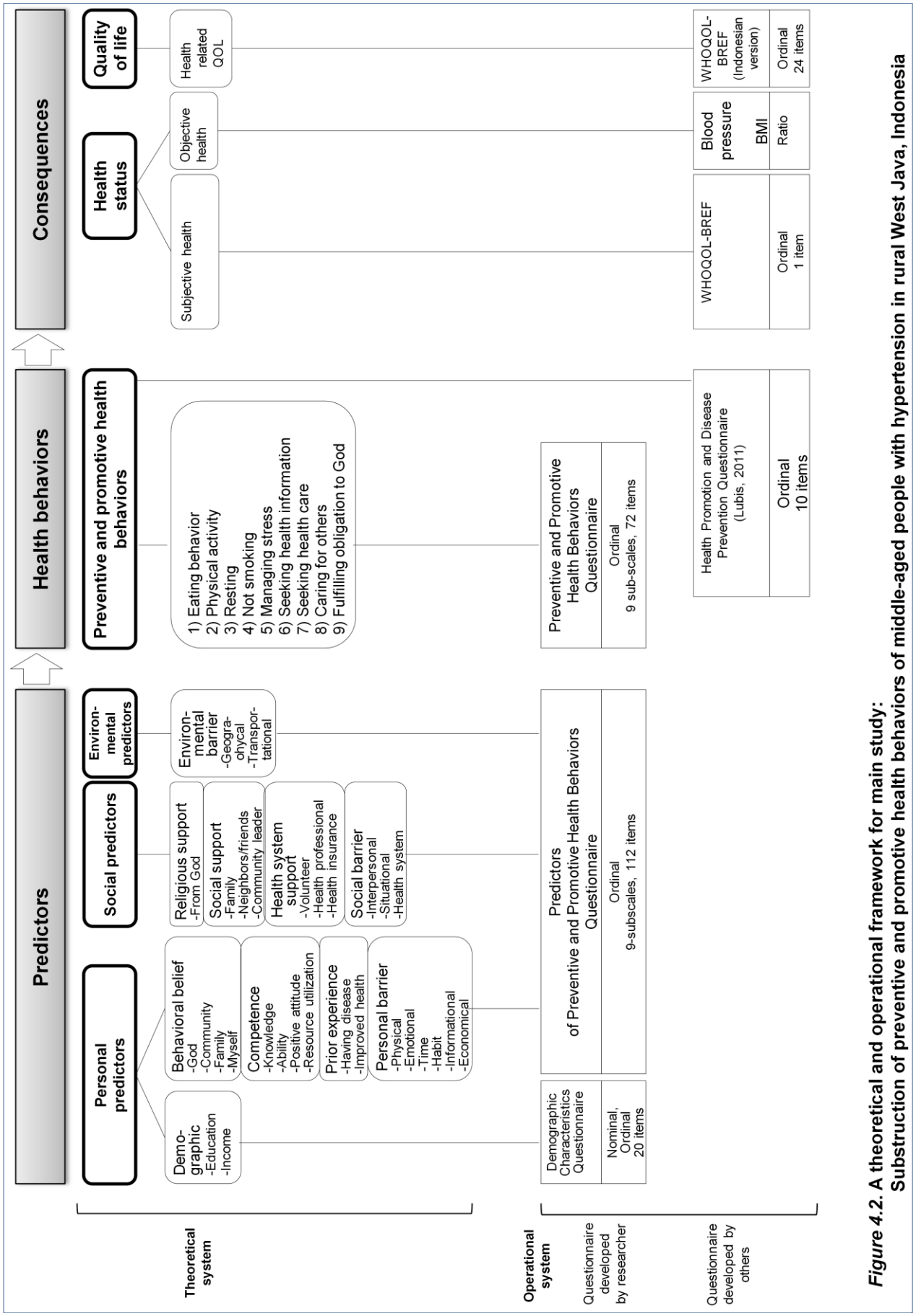

Figure 4.2. **A theoretical and operational framework for main study: Substruction of preventive and promotive health behaviors of middle-aged people with hypertension in rural West Java, Indonesia**

in the district based on the following criteria and computations.

1. Inclusion criteria.

Inclusion criteria for the study was: 1) aged 40-64 years; 2) with hypertension; 3) any blood pressure control status; 4) both on or off antihypertensive medication; 5) Muslim; 6) being able to communicate; 7) not pregnant and 8) willing to participate.

2. Required sample size.

1) Estimated number of people to meet the criteria in the district.

At least 4,410 middle-aged people with hypertension were estimated to exist in the district.

In the district health profile, there was no detailed information about people with hypertension aged 40-64. In the year 2012, 10,849 people (aged 15-44) and 49,036 people (aged 45-74) with hypertension came to outpatient department of *Puskesmas* (community health centers) in the district (Dinas Kesehatan Kabupaten Indramayu, 2013).

From the preliminary study conducted by the author, 14 middle-aged people with hypertension stayed in one village. Since there were 315 villages in the district, 4,410 eligible participants were estimated to exist in the district.

2) Required sample size for correlation analysis. The required sample size when using a correlational coefficient was calculated using the following formula (Cohen, 1988; Hulley et al., 2001):

$N = [(Z_\alpha + Z_\beta) \div C]^2 + 3$

N = Required sample size

Z_α = the standard normal deviate for α. (Z_α = 1.96 when α = 0.05)

Z_β = the standard normal deviate for β. (Z_β = 0.84 when β = 0.2)

$C = 0.5 \times \ln[(1+r)/(1-r)]$

The author expected the correlation coefficient (r) to be minimal (.19) based on existing literature; therefore, the required sample size was calculated as 215. The author adopted this number since it was important to detect the correlation between the PPHBs and the predictors in the study.

3) Estimated response rate from existing studies. There was no study published in English in Indonesia using structural equation modeling that explored health behaviors

and the predictors regarding noncommunicable diseases. The response rate of a study for a similar topic and in a similar cultural context, which was about predictors of physical activity in Malaysia using a face-to-face questionnaire, was 97.5% (Kaur et al., 2014). Assuming a similar rate, the sample size of 221 was judged sufficient for this main study.

IV. Study Instruments

1. Preliminary questionnaires developed by researchers.

A questionnaire was developed based on the study framework and in collaboration with the Indonesian research partners. A total of 134-items for the questionnaire in the Indonesian language was constructed. This questionnaire was administered to measure: 1) socio-demographic characteristics; 2) perceived PPHBs of middle-aged adults with hypertension in a rural district of West Java, Indonesia and 3) perceived predictors to the PPHBs.

2. Pilot test.

A pilot test was conducted to test feasibility of the study methods including testing content validity and face validity of the developed questionnaire. The study design was a cross-sectional study.

1) Pilot test conducted with health professionals for content validity.

Six experts (three faculty members in Indonesia and three nurses from Puskesmas of the study field) were recruited. The data were collected in August 2014 from the self-administered questionnaire. The researcher invited eligible participants to cooperate in the study and informed them about the study purpose, method, requests, and ethical consideration in written format. After obtaining an informed consent, the researcher gave the Questionnaire Assessment Form. The assessment form included questions of items about item clarity, relevance of the item to the construct (sub-concepts and concept) using a four-point Likert-type response format from 1 (*not relevant*) to 4 (*highly relevant*), and other necessary items to capture the construct of the scale. A content validity index at the item level (I-CVI) was calculated by rating either 3 or 4 on the four-point relevance scale, divided by the number of raters. The I-CVI is recommended to be .78 or higher (Polit & Beck, 2012). Items with lower than desired I-CVIs was revised or omitted in collaboration with Indonesian

researchers. Other necessary items were added by discussing with Indonesian researchers.

2) Pilot test conducted to people for face validity.

A reasonable number of participants for this pilot study of a preliminary survey (Johanson & Brooks, 2010) was established as 122. Eligible participants were recruited from the *Puskesmas* (community health center) in the district. The researcher invited the community members to participate in the study and informed them about the study purpose, method, requests, and ethical consideration in written format. After obtaining an informed consent (N=122), research assistants (either nursing students or public health students of a bachelor's program) administered face-to-face questionnaires with each participant using the Questionnaire. The questionnaire included questions about clarity (whether the question is understandable or not). Ambiguous items were revised based on the researchers' comment. Items with no variability (e.g. Everyone agrees or disagrees) were revised or omitted in collaboration with the Indonesian researchers.

3. Revised questionnaire.

A total of 204 items for the revised questionnaire in the Indonesian language was developed (Annex A).

1) Socio-demographic characteristics.

A number of socio-demographic characteristics were measured by single items. These included gender, age, educational level, employment status, monthly family income, household composition (number of spouse, children, grandchildren, parents living together), body mass index (height and weight), current systolic and diastolic blood pressure, duration of having hypertension, status of taking anti-hypertensive, transportation to Puskesmas (a community health center), possession of health insurance (payment of medical fee), and any other health problems.

2) Perceived preventive and promotive health behaviors.

Perceptions regarding PPHBs that individuals practice were measured by the Preventive and Promotive Health Behaviors Questionnaire (PPHBQ) (Annex A) developed for this study. The questionnaire consisted of nine sub-concepts with a total of 72 items that used a five-point Likert-type response format from 1 (*never*) to 4 (*routinely*). The nine sub-concepts were as follows:

(1) Eating behaviors. Perceptions on courses of actions on food intake and drinking to maintain or promote the participant's health were measured by 17 items.

(2) Physical activity. Perceptions on courses of actions requiring physical effort, practiced to maintain or promote the participant's health were measured by six items.

(3) Resting. Perceptions on ceasing working or activity to maintain or promote the participant's health were measured by four items.

(4) Not smoking. Perceptions on actions of inhaling and exhaling tobacco smoke to maintain or promote the participant's health were measured by six items.

(5) Managing stress. Perceptions about actions for releasing mental or emotional strain resulting from negative circumstances in order to maintain or promote the participant's health were measured by seven items.

(6) Seeking health information. Perceptions about actions for attempting to find information to maintain or promote the participant's health were measured by 10 items.

(7) Seeking health care. Perceptions about actions of attempting to find health services provided by public and private health institutions were measured by nine items.

(8) Caring for others. Perceptions about actions for providing serious attention or consideration directed toward family or other people were measured by six items.

(9) Fulfilling obligation to God. Perceptions about actions for attempting to achieve one's duty to God, particularly regarding the 'Five Pillars of Islam' were measured by seven items.

3) Perceived predictors of preventive and promotive health behaviors.

Perceptions about predictors of PPHBs were measured by Predictors of Preventive and Promotive Health Behaviors Questionnaire (PPPHBQ) (Annex A) developed for this study. The questionnaire consisted of nine sub-concepts with total of 112 items that used a five-point Likert-type response format from 1 (*strongly disagree*) to 5 (*strongly agree*).

Based on the study framework, predictors which support PPHBs were named as positive predictors. The questionnaire consisted of six sub-concepts (behavioral belief, competence, prior experience, religious support, social support and health system support) with 53 items.

Predictors which hinder PPHBs were named as negative predictors. These predictors

include: personal barriers, social barriers and environmental barriers. The questionnaire consisted of three sub-concepts (personal barriers, social barriers, and environmental barriers) with 59 items.

The nine sub-concepts were as follows:

(1) Behavioral beliefs. Perceptions about one's psychological state of which preventive and promotive health behaviors are associated with certain attributes or outcomes were measured by seven items.

(2) Competence. A judgment of the individual's knowledge, ability, and performance related to practicing PPHBs were measured by six items.

(3) Religious support. Perceptions about aid and assistance given from God or religious activities to practice PPHBs were measured by 10 items.

(4) Social support. Perceptions about assistance and encouragement from others (family, neighbors and friends, and village leader) to practice PPHBs were measured by 15 items.

(5) Health system support. Perceptions about assistance and encouragement from Kader (community health volunteers), health professionals (doctors, nurses, and midwives) and health insurance to practice PPHBs were measured by 11 items.

(6) Prior experience. Perceptions regarding past experience of people (myself, family, and community people) on practicing PPHBs were measured by four items.

(7) Personal barriers. Perceptions of personal difficulty, discomfort, and inconvenience of practicing PPHBs were measured by 35 items.

(8) Social barriers. Perceptions of difficulty, discomfort, inconvenience of practicing PPHBs due to social relationships and interpersonal interactions were measured by 16 items.

(9) Environmental barriers. Perceptions of difficulty, discomfort, inconvenience of practicing PPHBs due to an environmental situation were measured by eight items.

4) Existing questionnaires.

There was a total of 36 items from two existing questionnaire was used to measure health behaviors, health status, and quality of life.

(1) Health behaviors.

Kuesioner Perilaku Promosi Kesehatan-Prevensi Penyakit (Health Promotion and Disease Prevention Behaviors Questionnaire) (Lubis et al., 2011) was a 10-item questionnaire to measure health behaviors, which included questions such as: (1) I do not smoke; (2) I limit drinking alcohol; and (3) I never use the phone while driving a vehicle. This questionnaire had a Cronbach's alpha of .531 and was used to assess the convergent validity of the PPHBs Questionnaire. Dr. B. Takwin the questionnaire originator provided permission to use the questionnaire [personal communication Dr. Bagus Takwin by e-mail on August 13, 2014].

(2) Health status and quality of life.

WHOQOL-BREF (Indonesian version) (World Health Organization, 2004) is a 26-item questionnaire to measure perceived health status and perceived quality of life (QOL). This questionnaire was used to examine the correlation with the PPHBs Questionnaire. This WHOQOL was also used to assess concurrent validity of the PPHBs Questionnaire.

V. Study Team

This study was conducted in collaboration with the same four Indonesian researchers from the preliminary study. The author informed and obtained consent from the Indonesian researchers that the study would be conducted for the dissertation. This author led the study. The author was responsible for the study planning, orienting the Indonesian researchers, ethical consideration for the participants, data gathering and storing, data analysis, and publication of the results. The Indonesian researchers coordinated with relevant institutions to conduct the study, facilitated face-to-face questionnaires in the Indonesian language, and advised the author about social context and health system in Indonesia. Regarding the data sharing, the data (questionnaire) was collected by the author as soon as possible after the Indonesian research assistants conducted a questionnaire. The data was stored in a locked place by the author. The result of analyzed data was shared with Indonesian researchers.

VI. Recruitment

Figure 4.3 shows the flow of the sampling procedure. After obtaining permission from *Kepala Badan Kesatuan Bangsa, Politik dan Perlindungan Masyarakat* [the Director of the

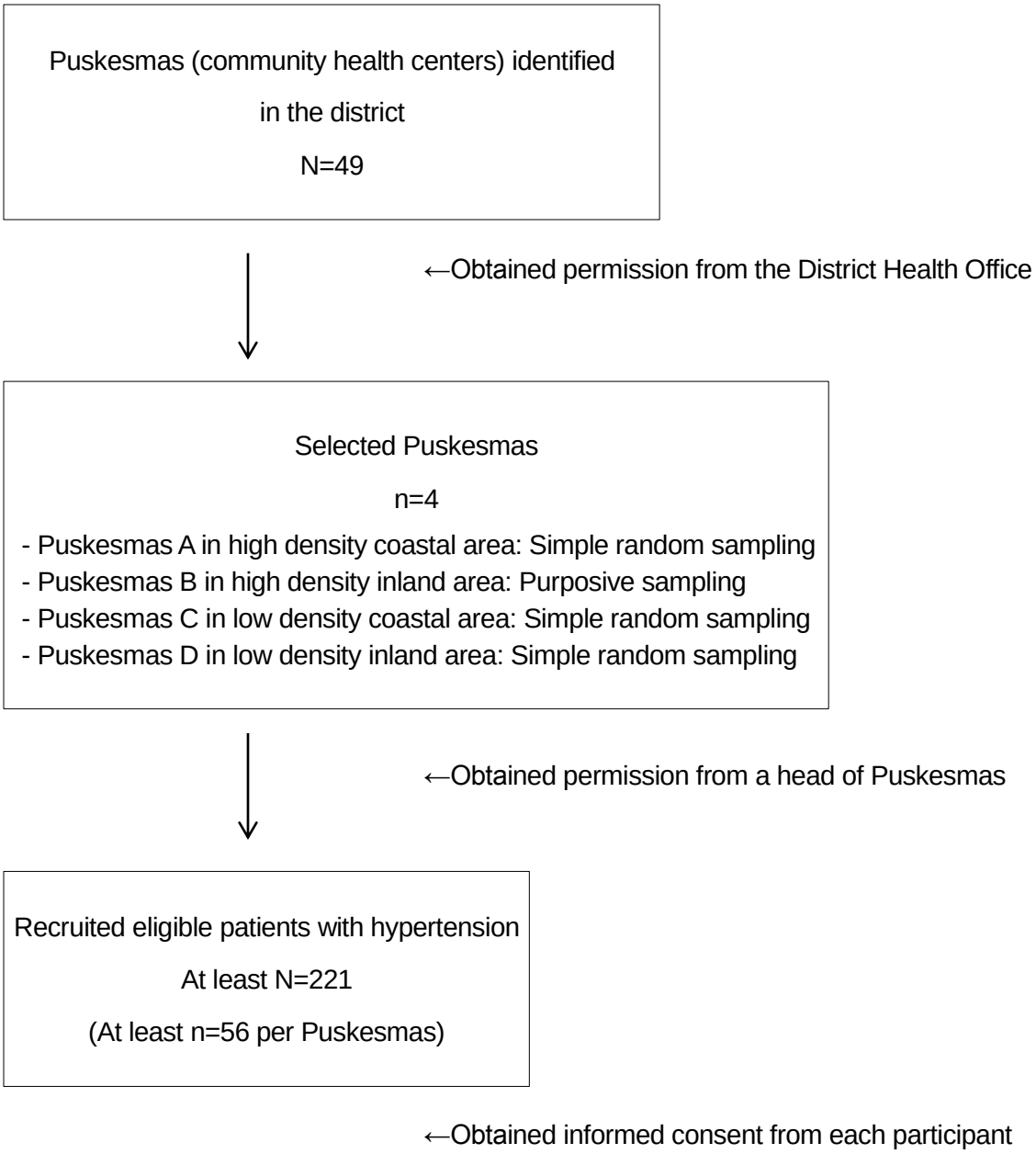

***Figure 4. 3*. Flowchart of sampling procedure for the main study of a preventive and promotive health behaviors model for middle-aged people with hypertension in rural West Java, Indonesia.**

Agency for National Unity, Politics, and Community Protection] and *Kepala Dinas Kesehatan Kabupaten* [the Director of the District Health Office], four *Puskesmas* (community health centers) were selected using the list of 49 community health centers in the district (Table 4.1 as follows: the list was developed by the author from the information on the list of community health centers (Kementerian Kesehatan Republik Indonesia, 2013b), the population density (Pemerintah Kabupaten Indramayu, 2013), and the map of the district (Komisi Pemilihan Umum, 2014)). The Puskesmas were first divided into four strata by considering population density of the sub-districts (high: >=1,000 pop./km^2 or low: <1,000 pop./km^2) and area (coast or inland). Three Puskesmas were selected from each strata using simple random sampling and one was selected by purposive sampling to assure that the area would be safe for the researchers and research assistants. After obtaining permission from a head of the *Puskesmas*, at least 56 eligible participants on a patient list were recruited from each selected community health centers.

VII. Data Collection

The data was collected in September, 2014 using the study instruments (questionnaires). A face-to-face questionnaire interview was conducted in a location of participant's choice (e.g. participants' house). The Indonesian researchers recommended this method because of the low literacy rate of the district (male 89%, female 71% (Dinas Kesehatan Provinsi Jawa Barat, 2012)) and low educational background of people (22 among 24 participants (92%) from the preliminary study either completed or did not complete only primary school.). Research assistants who were nursing students or public health student of a bachelor's program in the district conducted all the questionnaire interviews. The researchers trained the research assistants for two days about the study purpose, methods, ethical consideration and safety for students before entering the field.

VIII. Ethical Consideration

A proposal and a request for study collaboration was sent to the Dean of the Faculty of Medicine and Health Science, Islamic State University Syarif Hidayatullah Jakarta, and *Sekolah Tinggi Ilmu Kesehatan Indramayu* [Indramayu College of Health Science].

Table 4. 1. ***Sample Frame of Sub-District and Puskesmas in the Rural District of West Java, Indonesia***

NO	Name of sub-district	Number of Puskesmas (N=49)	Population density (Pop./km^2)	(High or low)	Coast or Inland
	Puskesmas in high-density coastal area (n=13)				
1	[redacted]	2 (Puskesmas A)	2,083	High	Coast
2	[redacted]	2	1,691	High	Coast
3	[redacted]	2	1,513	High	Coast
4	[redacted]	2	1,509	High	Coast
5	[redacted]	2	1,110	High	Coast
6	[redacted]	1	1,383	High	Coast
7	[redacted]	2	1,048	High	Coast
	Puskesmas in high-density inland area (n=15)				
8	[redacted]	2 (Puskesmas B)	1,577	High	Inland
9	[redacted]	3	1,466	High	Inland
10	[redacted]	2	1,458	High	Inland
11	[redacted]	1	1,362	High	Inland
12	[redacted]	1	1,332	High	Inland
13	[redacted]	2	1,077	High	Inland
14	[redacted]	2	1,050	High	Inland
15	[redacted]	2	1,016	High	Inland
	Puskesmas in low-density coastal area (n=6)				
16	[redacted]	1	998	Low	Coast
17	[redacted]	1	993	Low	Coast
18	[redacted]	2	464	Low	Coast
19	[redacted]	1 (Puskesmas C)	279	Low	Coast
20	[redacted]	1	248	Low	Coast
	Puskesmas in low-density inland area (n=15)				
21	[redacted]	1	999	Low	Inland
22	[redacted]	2	996	Low	Inland
23	[redacted]	1	949	Low	Inland
24	[redacted]	1	861	Low	Inland
25	[redacted]	2	840	Low	Inland
26	[redacted]	1	666	Low	Inland
27	[redacted]	2	562	Low	Inland
28	[redacted]	2 (Puskesmas D)	528	Low	Inland
29	[redacted]	1	454	Low	Inland
30	[redacted]	1	307	Low	Inland
31	[redacted]	1	300	Low	Inland

Agreements for study collaboration were obtained. A proposal and a request for study permission was also sent to *Kepala Badan Kesatuan Bangsa, Politik dan Perlindungan Masyarakat* [the Director of the Agency for National Unity, Politics, and Community Protection] and *Kepala Dinas Kesehatan Kabupaten* [the Director of the District Health Office], and permissions were obtained (No.647/070/Rekomlit/Kesbangpol/2014, No.070/2040/Um.Peg) (Annex B & C). The researcher obtained approval from the Research Ethics Committee of St. Luke's International University (No.14-029).

The researcher, following the guidelines of the Helsinki Declaration, ensured the individual autonomy and confidentiality of the research participants and organization. The researcher informed the head of each selected Puskesmas (community health center) about the research purpose, method, requests, and ethical consideration in oral or written format (if necessary) (Annex D) and sought his/her cooperation. The researchers invited the eligible participants to cooperate in the research in written format (Annex E) and in advance informed them about the research purpose, method, requests, and ethical consideration. The content of ethical consideration included voluntary participation, protection of privacy, data security, advantage and disadvantage of participation. In addition, in order to collect information from medical records of participants at health centers, we made a request to the district health office in written format and obtained permission in advance. Written informed consent (Annex F) was obtained from participants prior to their participation and the refusal form (Annex G) was provided to the participants. The researchers prepared the request form and informed consent form in the Indonesian language. In order that participants were not forced by the power or authority of the researchers during recruitment, the researchers told the community health center not to check the participation status of eligible participants when the researchers requested the center to recommend someone for research participation. The researchers also told eligible participants that we did not inform the center about their participation status. When the researchers requested research assistants in Indonesia, we explained to them about the research purpose, method, requests, and ethical consideration using the research proposal. We explained to the research assistants that if participants told research assistants about any complaint which was unusual and continuous during the interviews, encourage the participants to go to the *Puskesmas* (community health center) or

clinic to seek assistance. We also explained confidentiality and instructed them not to leak or divulge information that they obtained during the research and obtain informed consent form in written format (Annex H). The data (questionnaires) were collected anonymously, therefore, participants could be identified with their questionnaire. The collected data were coded and securely stored in a locked place only accessible by the author. All data will be destroyed three years after the publication.

IX. Data Analysis

The data were analyzed by the following procedures using SPSS and Amos (version 21; An IBM Company, Chicago, IL, USA).

1. Analysis for participants' characteristics.

Response rate was calculated. Missing data below 10% for individual case or variable can be ignored (Hair, Black, Babin, & Anderson, 2010). Therefore, the cases or variables with missing data of 10% or above were considered for omission from the analysis. Other missing values were compensated for by substituting the average value of the item.

Descripted statistics (e.g. percentage distribution, mean, standard deviation) were used to describe each item's and variable's score. The mean or distribution differences among the four Puskesmas were compared by one-way analysis of variance (ANOVA) or Kruskal-Wallis test.

2. Analysis for preventive and promotive health behaviors.

1) Descriptive statistics.

Descripted statistics (e.g. mean, standard deviation, maximum, minimum) were used to describe each item's and variable's score. The mean difference between genders was measured by the t-test.

2) Principal component analysis and exploratory factor analysis.

A principal component analysis or an exploratory factor analysis was performed to investigate the factor structure of the variables of preventive and promotive health behaviors.

In Indonesia, "CERDIK" behaviors are recommended for prevention of noncommunicable diseases and its risk factors and for health promotion (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik

Indonesia, 2013), which is in accordance with the World Health Organization's recommendation (World Health Organization, 2013a). CERDIK means *Cek kesehatan secara berkala* (periodical health check-ups), *Enyahkan asap rokok* (non-smoking), *Rajin aktifitas fisik* (diligent physical activity), *Diet sehat dan seimbang* (healthy and balanced diet), *Istirahat cukup* (enough rest), and *Kendalian stress* (stress management). Healthy diet includes salt reduction, fat reduction, and eating vegetables and fruits (World Health Organization, 2013a). Items of these behaviors were assessed using principal component analysis in order to assess unidimensionality of the component.

The following criteria were used to determine the unidimensionality of the component: 1) The first extracted component explained at least 40% of the total variance (Carmines & Zeller, 1979); 2) The eigenvalue of the first component was much larger than subsequent components (Watanabe & Noguchi, 1999); and 3) All of the items had loadings of at least .30 on the first component (Carmines & Zeller, 1979). Items that did not meet the criteria were considered for deletion.

Seeking health information, seeking health care, caring for other people, and fulfilling obligation to God were unique health behaviors of Indonesian people with hypertension. These behaviors were analyzed using exploratory factor analysis in order to uncover the underlying structure among the items.

The procedure of exploratory factor analysis was as follows: 1) Normality of the distribution of each item was assessed. Items which showed ceiling effect or floor effect were considered for omission; 2) Factorability of items was assessed. One of two items which showed partial correlation (negative value of the anti-image correlation) above .7 (Hair, et al., 2010) was omitted. The Bartlett's test of sphericity was conducted to confirm the existence of sufficient correlations among the items. Items with Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) values less than .50 (Hair, et al., 2010) was omitted from the factor analysis; 3) Communality of the items was assessed in an unrotated factor matrix. There are some variations suggested for appropriate cut-off points of communalities. Hair et al., (2010) suggested variables should have communalities greater than .50 while .20 was recommended by Tabachnick & Fidell (2014). Based on these suggestions, items with communalities less than .30 was considered for omission; 4) The number of factors to be

retained was decided by considering the following: the number of categories in the preliminary study, factors with eigenvalues greater than 1.0, and factors shown by scree test; 5) Factor matrix loading was examined in a rotated factor matrix. Since factor loading of .30 is significance for sample sizes of 350 or greater (Hair, et al., 2010), items with factor loading below .30 were deleted; 6) Each factor was named based on discussion with Indonesian researchers to assure cultural relativity and to mesh with the study framework.

3) Validity of the questionnaire.

Convergent validity of the questionnaire was assessed by evaluating the association between sum scores of the PPHBs Questionnaire and the 10-item *Kuesioner Perilaku Promosi Kesehatan-Prevensi Penyakit* [Health Promotion and Disease Prevention Questionnaire] (Lubis et al, 2011).

Concurrent validity was assessed by evaluating the association between sum scores of the PPHBs Questionnaire and the 26-item WHOQOL-BREF (Indonesian language version) (World Health Organization, 2004).

4) Reliability of the questionnaire.

To assess internal consistency reliability of each behavior (sub-scale) and total concept (total scale), Cronbach's alpha was calculated. At least .60 or .70 was desired for this exploratory study (Hair, et al., 2010).

5) One-way ANOVA

To assess regional differences of PPHBs among four Puskesmas, one-way ANOVA was performed.

3. Analysis for predictors of preventive and promotive health behaviors.

1) Descriptive statistics.

Descripted statistics (e.g. mean, standard deviation, maximum, minimum) were used to describe each item's and variable's score. The mean difference between genders was measured by the t-test.

2) Principal component analysis and exploratory factor analysis.

A principal component analysis or an exploratory factor analysis was performed to investigate the factor structure of the variables of the predictors. The procedure of analysis was similar to that of the PPHBs.

3) Reliability of the questionnaire.

To assess internal consistency reliability of each predictor (sub-scale) and total concept (total scale), Cronbach's alpha was calculated.

4. Analysis for health status and quality of life.

Descripted statistics (e.g. mean, standard deviation, maximum, minimum) were used to describe each item's and variable's score. The mean difference between gender was measured by the t-test. Reliability analysis using Cronbach's alpha was calculated and compared to the value of the existing study, which was conducted in Indonesia (Nugroho, Fujimura, & Inaoka, 2012).

5. General linear model.

To examine factors, which predict PPHBs, a general linear model was performed based on the study framework.

6. Structural equation modeling.

Structural equation modeling was used to assess the association between variables based on the study framework. Model fit was assessed using indexes of chi-square, CFI (Comparative Fix Index), RMSEA (Root Mean Square Error of Approximation), and AIC (Akaike's Information Criterion). The value of RMSEA was of particular importance. This was because the developed model had large degrees of freedom; the CFI becomes low when the degree of freedom is large (Toyoda, 2002), and RMSEA expresses fit of the model per degree of freedom. RMSEA with .05 or below indicates good fit (Browne & Cudeck, 1993).

Chapter 5.
Results

This chapter describes participants' characteristics, preventive and promotive health behaviors (PPHBs), positive and negative predictors of PPHBs of people with hypertension, perceived health status and quality of life. This chapter also describes results of structural equation modeling to examine a perceived PPHBs model of middle-aged people with hypertension in a rural district of West Java, Indonesia.

I. Participants' Characteristics

Of the 450 people contacted, all (100%) agreed to participate in the study. The percentage of cases with missing data for each variable was less than 3.2%. Based on Hair and colleagues' advice (2010), three cases which had missing data more than 10% were excluded from the analysis. The percentage of variables with missing data for other 447 cases was less than 3.8%. The missing values of the 447 cases were compensated for by substituting the average value of the item.

The mean age was 54.1 years old (SD=7.2). Majority of participants were female (77.2%). Regarding educational attainment, 62.0% had not completed primary school. The majority were in traditional occupations; 44.3% were farmers and 31.3% were homemakers. The mean systolic blood pressure was 169 mmHg and it differed significantly among the four Puskesmas (health centers) by Games-Howell test (p = .00). Puskesmas C in a low-density coastal area had the highest mean of systolic blood pressure. The mean hypertension history was 2.5 years. Slightly over half of participants (59.7%) chose Puskesmas as the health institution to control their hypertension. Although the national health insurance system started in January 2014, the prevalence of the national insurance was only 2.2%. Many people paid the medical fee themselves (40.7%) or used *Jamkesmas* (33.3%), which is a community health insurance for the poor. (See Table 5.1 for characteristics of the participants.)

Table 5. 1. ***Participants' Characteristics (N=447)***

	Total N=447 (100%)		Puskesmas A (high-density coastal) n=120 (26.8%)		Puskesmas B (high-density inland) n=118 (26.4%)		Puskesmas C (low-density coastal) n=90 (20.1%)		Puskesmas D (low-density inland) n=119 (26.6%)		p-value
	N	%	N	%	N	%	N	%	N	%	
Gender											
Female	345	77.2	97	80.8	83	70.3	61	67.8	104	87.4	
Male	102	22.8	23	19.2	35	29.7	29	32.2	15	12.6	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	
Age (years)											
	54.1	7.2	53.5	7.7	56.1	5.7	49.8	7.8	55.6	6.4	A&B: *g A&C: **g B&C: ***g C&D:.000
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Education											***k
Not completed P/S	277	62.0	68	56.7	58	49.2	60	66.7	91	76.5	
Completed P/S	99	22.1	33	27.5	28	23.7	22	24.4	16	13.4	
Completed JHS	43	9.6	11	9.2	21	17.8	3	3.3	8	6.7	
Completed H/S	24	5.4	7	5.8	11	9.3	4	4.4	2	1.7	
Completed D3/bachelor	2	0.4	1	0.8	0	0	1	1.1	0	0	
Missing value	2	0.4	0	0	0	0	0	0	2	1.7	
Occupation											
Farmer	198	44.3	37	30.8	47	39.8	48	53.3	66	55.5	
Homemaker	140	31.3	48	40.0	33	28.7	35	38.9	24	20.2	
Trader	34	7.6	8	6.7	8	7.0	3	3.3	15	12.6	
Company worker	29	6.5	9	7.5	14	12.2	4	4.4	2	1.7	
Government worker	3	0.7	1	0.8	1	0.9	0	0	1	0.8	
Other	39	8.7	17	14.2	12	10.4	0	0	10	8.4	
Missing value	4	0.9	0	0	3	2.5	0	0	1	0.8	
Monthly income											***k
< 1 million rupiah	327	73.2	113	94.2	55	46.6	65	72.2	94	79.0	
< 2 million rupiah	94	21.0	5	4.2	51	43.2	19	21.1	19	16.1	
< 3 million rupiah	16	3.6	1	0.8	9	7.6	3	3.3	3	2.5	
>= 3 million rupiah	6	1.3	1	0.8	1	0.8	2	2.2	2	1.7	
Missing value	4	0.9	0	0	2	1.7	1	1.1	1	0.8	
Spouse											
Stay at the same place	323	72.3	76	63.3	84	71.2	83	92.2	80	67.2	
Stay at different place	10	2.2	6	5.0	1	0.8	2	2.2	1	0.8	
Passed away	105	23.5	36	30.0	29	24.6	5	5.6	35	29.4	
Divorced	9	2.0	2	1.7	4	3.4	0	0	3	2.5	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	
Children											
Total number	3.3	1.8	3.7	2.0	3.2	1.6	3.3	1.6	3.2	2.0	
Number in school	0.5	0.9	0.6	1.0	0.5	0.7	1.0	1.0	0.3	0.8	A&C: *g B&C: ***g C&D: ***g
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	
Grandchildren											
Stay at the same place	179	40.0	61	50.8	42	35.6	26	28.9	50	42.0	
Stay at different place	132	29.5	28	23.3	41	34.7	22	24.4	41	34.5	
I do not have	127	28.4	31	25.8	33	28	39	43.3	24	20.2	
Missing value	9	2.0	0	0	2	1.7	3	3.3	4	3.4	
Parents											
Stay at the same place	44	9.8	11	9.2	9	7.6	16	17.8	8	6.7	
Stay at different place	92	20.6	28	23.3	17	14.4	28	31.1	19	16.0	
Passed away	305	68.2	79	65.8	89	75.4	46	51.1	91	76.5	
Missing value	6	1.3	2	1.7	3	2.5	0	0	1	0.8	

***k: p=.00, Kruskal-Wallis test
*g: p<.05, **g: p<.01, ***g: p=.00, Games-Howell test

Table 5.1. ***Participants' Characteristics (Cont.)***

	Total N=447 (100%)		Puskesmas A (high-density coastal) n=120 (26.8%)		Puskesmas B (high-density inland) n=118 (26.4%)		Puskesmas C (low-density coastal) n=90 (20.1%)		Puskesmas D (low-density inland) n=119 (26.6%)		p-value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Blood pressure											
Systolic	169.3	19.5	167.7	20.8	170.1	18.0	181.4	10.4	160.9	20.1	A&C: ***g B&C: ***g B&D: **g C&D: ***g
Diastolic	92.2	10.7	95.1	12.3	96.0	12.3	87.0	7.3	89.6	6.7	
Body mass index	25.5	5.1	26.0	4.7	24.9	5.6	25.6	4.5	25.6	5.4	
Hypertension history (years)	2.5	3.5	2.7	3.4	2.1	2.9	2.4	1.6	2.8	5.0	
	N	%	N	%	N	%	N	%	N	%	
Hypertension medication											
Yes, routinely	153	34.2	59	49.2	31	26.3	7	7.8	56	47.1	
Yes, but not routinely	204	45.6	41	34.2	75	63.6	63	70.0	26	21.0	
Stopped by health worker's judgment	11	2.5	2	1.7	3	2.5	1	1.1	8	6.7	
Stopped by my judgment	25	5.6	3	2.5	0	0	14	15.6	5	4.2	
No	52	11.6	14	11.7	8	6.8	5	5.6	25	21.0	
Missing value	2	0.4	1	0.8	1	0.8	0	0	0	0	
Health institution to control HT											
Puskesmas	267	59.7	68	56.7	95	80.5	74	82.2	30	25.2	
Puskesmas + other	14	3.1	11	9.2	2	1.7	0	0	1	0.8	
Posyandu/Posbindu	36	8.1	8	6.7	13	11.0	0	0	15	12.6	
Private midwife	53	11.9	3	2.5	2	1.7	2	2.2	46	38.7	
Private doctor	43	9.6	19	15.8	5	4.2	8	8.9	11	9.2	
Other	34	7.6	11	9.2	1	0.8	6	6.7	16	13.4	
Transportation to the health institution											
Motorbike	210	47.0	21	17.5	73	61.9	69	76.7	47	39.5	
Walk	103	23.0	34	28.3	22	18.6	2	2.2	45	37.8	
Bicycle	46	10.3	8	6.7	10	8.5	17	18.9	11	9.2	
Becak (tricycle)	46	10.3	39	32.5	5	4.2	0	0	2	1.7	
Angkot (mini-bus)	32	7.2	16	13.3	8	6.8	2	2.2	6	5.0	
Other	9	2.0	2	1.7	0	0	0	0	7	5.9	
Missing value	1	0.2	0	0	0	0	0	0	1	0.8	
Payment of medical fee											
By oneself	182	40.7	66	55.0	30	25.2	30	33.3	56	47.1	
Jamkesmas (community health insurance)	149	33.3	23	19.2	49	41.5	28	31.1	49	41.2	
BOK (government assistance)	100	22.4	30	25.0	27	22.9	32	35.6	11	9.2	
JKN/BPJS (national health insurance)	10	2.2	0	0	10	8.5	0	0	0	0	
Askes (government insurance)	4	0.9	0	0	2	1.7	0	0	2	1.7	
Jamsostek (company insurance)	1	0.2	1	0.8	0	0	0	0	0	0	
Missing value	1	0.2	0	0	0	0	0	0	1	0.8	
Health problem											
Yes	418	93.5	113	94.2	105	89.0	90	100.0	111	93.3	
No	28	6.3	7	5.8	13	11.0	0	0	8	6.7	
Missing value	1	0.2	0	0	0	0	0	0	1	0.8	

**g: p<.01, ***g: p=.00, Games-Howell test

II. Preventive and Promotive Health Behaviors

1. Descriptive statistics.

Table 5.2 shows the descriptive statistics of the PPHBs, which was measured by the developed questionnaire. The author explains the PPHBs, which were less frequently practiced as follows:

1) Eating behavior. Mean scores of reducing salty food (HB07) and reducing salty when cooking (HB08) were low both in men (2.39 and 2.20, respectively) and women (2.43 and 2.41, respectively). Male participants less frequently reduced salt than female participants when he (or his spouse) cooked *(p < .05)*. Mean scores of reducing fried food (HB10) and reducing sweet food (HB09) were low both in men (2.22 and 2.27, respectively) and women (2.31 and 2.36, respectively).

2) Physical activity. Mean scores of walking around house (HB21), walking in the morning (HB22), moving body (HB23) were lower in men (2.25, 2.20, and 2.27, respectively) than in women (2.73, 2.59, and 2.57, respectively) (p < .01 ~ p = .00).

3) Not smoking. Mean scores of non-smoking (HB28, HB29, HB30, HB31, HB32, HB33) were lower in men (2.41 ~ 2.53) than women (3.97 ~ 3.98) (p = .00).

4) Seeking health information. Mean score of health check-up was lower in men (2.31) than in women (2.59) (p < .01).

5) Fulfilling obligation to God. The mean score of praying five times a day (HB66) was higher in women (3.13) than in men (2.73) (p = .00). Mean scores of praying more than obligation (HB67), practicing additional fasting (HB69), and reciting Qur'an (HB70) did not have a statistically significant difference between men and women.

2. Principal component analysis and exploratory factor analysis.

As a result of principal component analysis and exploratory factor analysis, 16 sub-concepts (factors) were extracted from 58 items that measured PPHBs (Table 5.3). The 16 sub-concepts are as follows:

1) Reducing salty food. One component was extracted with two items that measured this concept. The extracted component explained 86.6% of the total variance.

2) Eating vegetables and fruits. One component was extracted with three items that measured this concept. The extracted component explained 69.0% of the total variance.

Table 5. 2. ***Descriptive Statistics of Preventive and Promotive Health Behaviors***

Concept	Item	N	Min.	Max.	Total N=447 (100%)		Female n=345 (77.2%)		Male n=102 (22.8%)		p-value
					Mean	SD	Mean	SD	Mean	SD	
1) Eating behavior	HB01_Crackers_R	446	1	4	2.34	.75	2.35	.78	2.32	.66	
	HB02_SourVegetable_R	447	1	4	2.27	.71	2.30	.73	2.16	.64	
	HB03_SoybeanCake	447	1	4	3.11	.71	3.13	.72	3.02	.67	
	HB04_MeatballSoup_R	447	1	4	3.07	.63	3.10	.66	2.97	.48	
	HB05_ChickenSoup_R	446	1	4	3.00	.63	3.03	.62	2.90	.64	
	HB06_ChickenNoodle_R	445	1	4	3.14	.63	3.21	.65	2.92	.52	***t
	HB07_ReduceSaltyFood	441	1	4	2.42	.83	2.43	.85	2.39	.75	
	HB08_ReduceSaltWhenCooking	445	1	4	2.36	.88	2.41	.90	2.20	.78	*t
	HB09_ReduceSweetFood	447	1	4	2.34	.88	2.36	.88	2.27	.86	
	HB10_ReduceFriedFood	446	1	4	2.29	.77	2.31	.78	2.22	.74	
	HB11_ReduceAmountFood	446	1	4	2.20	.77	2.22	.78	2.12	.75	
	HB12_Vegetable	446	1	4	2.58	.72	2.57	.74	2.59	.64	
	HB13_FruitsRainySeason	447	1	4	2.47	.68	2.49	.67	2.40	.71	
	HB14_FruitsDrySeason	447	1	4	2.45	.66	2.46	.66	2.39	.65	
	HB15_Tofu	444	1	4	2.96	.71	2.98	.72	2.88	.67	
	HB16_Meat_R	446	1	4	3.07	.66	3.13	.63	2.84	.69	***t
	HB17_FreshFish	447	1	4	2.47	.78	2.44	.78	2.59	.80	
2) Physical activity	HB18_CleanHouse	447	1	4	2.66	1.02	2.91	.93	1.83	.86	***t
	HB19_WashClothes	447	1	4	2.63	1.10	2.97	.95	1.48	.77	***t
	HB20_WashPlates	447	1	4	2.49	1.13	2.82	1.02	1.39	.72	***t
	HB21_WalkAroundHouse	447	1	4	2.62	.87	2.73	.85	2.25	.83	***t
	HB22_WalkMorning	447	1	4	2.50	.89	2.59	.88	2.20	.87	***t
	HB23_MoveBody	445	1	4	2.50	.90	2.57	.87	2.27	.96	**t
3) Resting	HB24_EnoughSleep	446	1	4	2.93	.72	2.94	.72	2.90	.72	
	HB25_Nap	447	1	4	2.31	.82	2.34	.83	2.22	.78	
	HB26_RestWhenNeed	447	1	4	2.79	.51	2.81	.51	2.70	.50	*t
	HB27_ReduceWorking	447	1	4	2.57	.63	2.58	.63	2.53	.64	
4) Not smoking	HB28_SmokeInside_R	447	1	4	3.64	.81	3.97	.24	2.53	1.04	***t
	HB29_SmokeOutside_R	447	1	4	3.62	.84	3.97	.21	2.41	1.05	***t
	HB30_SmokeWheneverLike_R	447	1	4	3.62	.85	3.97	.19	2.41	1.07	***t
	HB31_SmokeAfterWork_R	447	1	4	3.62	.86	3.97	.25	2.44	1.10	***t
	HB32_SmokeSomeonePromote_R	447	1	4	3.64	.81	3.97	.23	2.51	1.02	***t
	HB33_SmokeDuringGathering_R	447	1	4	3.63	.84	3.98	.21	2.46	1.09	***t
5) Managing stress	HB34_RestToReduceStress	447	1	4	2.62	.64	2.61	.64	2.64	.64	
	HB35_DoSomethingToRelax	446	1	4	2.53	.64	2.52	.63	2.58	.67	
	HB36_StopThinking	443	1	4	2.55	.63	2.56	.63	2.49	.64	
	HB37_ChatWithPeople	442	1	4	2.79	.66	2.81	.65	2.71	.69	
	HB38_WatchTV	446	1	4	2.50	.85	2.53	.85	2.39	.86	
	HB39_SleepToReduceStress	445	1	4	2.47	.75	2.48	.74	2.42	.79	
	HB40_EatToReduceStress	440	1	4	1.99	.79	2.00	.80	1.93	.76	

Note: "R" at the end of item means reverse-scoring item.
*t: p<.05, **t: p<.01, ***t: p=.00, t-test

Table 5.2. ***Descriptive Statistics of Preventive and Promotive Health Behavior (Cont.)***

Concept	Item	N	Min.	Max.	Total N=447 (100%)		Female n=345 (77.2%)		Male n=102 (22.8%)		p-value
					Mean	SD	Mean	SD	Mean	SD	
6) Seeking health information	HB41_TryToObtainHealthInfo	447	1	4	2.38	.78	2.39	.77	2.32	.81	
	HB42_HealthInfoFromFamily	447	1	4	2.40	.75	2.39	.74	2.46	.79	
	HB43_HealthInfoFromFriend	447	1	4	2.23	.75	2.23	.76	2.22	.74	
	HB44_HealthInfoFromPuskesmas	445	1	4	2.38	.72	2.37	.72	2.42	.74	
	HB45_AskKaderAboutHealth	447	1	4	1.96	.81	1.95	.82	1.98	.76	
	HB46_AskDoctorAboutHealth	447	1	4	1.97	.83	1.95	.82	2.02	.88	
	HB47_AskMidwifeAboutHealth	447	1	4	1.90	.83	2.00	.83	1.57	.71	***t
	HB48_AskNurseAboutHealth	446	1	4	1.92	.75	1.92	.74	1.93	.80	
	HB49_HealthCheckup	446	1	4	2.53	.75	2.59	.76	2.31	.70	**t
	HB50_HealthInfoFromTV	447	1	4	1.88	.80	1.86	.81	1.96	.74	
7) Seeking health care	HB51_BuyMedicine	447	1	4	2.46	.80	2.45	.81	2.49	.79	
	HB52_GoToPosyandu	447	1	4	1.77	.81	1.83	.83	1.56	.68	**t
	HB53_GoToPuskesmas	447	1	4	2.38	.73	2.38	.73	2.37	.74	
	HB54_GoToDoctor	445	1	4	1.91	.78	1.92	.79	1.87	.73	
	HB55_GoToMidwife	445	1	4	1.67	.78	1.74	.79	1.43	.67	***t
	HB56_GoToNurse	446	1	4	1.86	.73	1.86	.74	1.86	.72	
	HB57_GoToHospital	447	1	4	1.45	.67	1.42	.66	1.53	.70	
	HB58_FollowSuggestions	446	1	4	2.93	.68	2.94	.64	2.90	.78	
	HB59_TakeMedicine	446	1	4	3.06	.62	3.07	.60	3.04	.69	
8) Caring for others	HB60_WorkForFamily	447	1	4	2.55	.95	2.36	.91	3.18	.80	***t
	HB61_ConcernHealthOfPeople	447	1	4	2.38	.69	2.37	.71	2.41	.62	
	HB62_GoodRelationship	447	1	4	3.05	.55	3.03	.52	3.12	.66	
	HB63_DiscussAboutHealth	445	1	4	2.45	.72	2.46	.73	2.41	.68	
	HB64_SupportCommunityActivity	445	1	4	2.78	.71	2.75	.69	2.86	.75	
	HB65_ProvideFoodToOther	442	1	4	2.05	.84	2.09	.87	1.91	.73	
9) Fulfilling obligation to God	HB66_PrayFiveTimes	447	1	4	3.04	.92	3.13	.91	2.73	.88	***t
	HB67_PrayMoreThanObligation	447	1	4	2.21	.93	2.24	.94	2.14	.89	
	HB68_PrayInCorrectPosition	447	1	4	3.02	.73	3.03	.73	2.98	.74	
	HB69_AdditionalFasting	445	1	4	1.87	.86	1.90	.91	1.76	.70	
	HB70_ReciteQuran	447	1	4	1.90	.91	1.90	.93	1.90	.80	
	HB71_BegGodForHelp	447	1	4	3.22	.62	3.27	.60	3.05	.67	**t
	HB72_AcceptDifficultSituation	447	1	4	3.13	.57	3.15	.56	3.08	.59	

**t: p<.01, ***t: p=.00, t-test

Table 5. 3. ***Component Matrix and Factor Matrix of Preventive and Promotive Health Behaviors***

Concept	Sub-concept	Variables	Component	Alpha	Mean score			p-value
					Total	Female	Male	
Eating behaviors	**1) Reducing salty food**	HB08_ReduceSaltWhenCooking	.931	.855	2.40	2.43	2.30	
		HB07_ReduceSaltyFood	.931					
		Eigenvalue	1.7					
		% of Variance	86.6					
	2) Eating vegetables and fruits	HB13_FruitsRainySeason	.931	.752	2.50	2.51	2.47	
		HB14_FruitsDrySeason	.923					
		HB12_Vegetable	.591					
		Eigenvalue	2.1					
		% of Variance	69.0					
	3) Reducing meat	HB06_ChickenNoodle_R	.839	.702	3.07	3.12	2.93	**t
		HB04_MeatballSoup_R	.808					
		HB05_ChickenSoup_R	.725					
		Eigenvalue	1.9					
		% of Variance	62.7					
	4) Reducing sweet and fatty food	HB09_ReduceSweetFood	.729	.466	2.27	2.30	2.20	
		HB11_ReduceAmountFood	.680					
		HB10_ReduceFriedFood	.678					
		Eigenvalue	1.5					
		% of Variance	48.4					
Physical activity	**5) Household labor**	HB19_WashClothes	.942	.919	2.60	2.90	1.57	***t
		HB20_WashPlates	.937					
		HB18_CleanHouse	.900					
		Eigenvalue	2.6					
		% of Variance	86.1					
	6) Exercise	HB22_WalkMorning	.938	.908	2.54	2.63	2.24	***t
		HB23_MoveBody	.910					
		HB21_WalkAroundHouse	.906					
		Eigenvalue	2.5					
		% of Variance	84.3					
Non-smoking	**7) Non-smoking**	HB30_SmokeWheneverLike_R	.983	.989	3.63	3.97	2.46	***t
		HB31_SmokeAfterWork_R	.978					
		HB33_SmokeDuringGathering_R	.976					
		HB32_SmokeSomeonePromote_R	.970					
		HB29_SmokeOutside_R	.969					
		HB28_SmokeInside_R	.968					
		Eigenvalue	5.7					
		% of Variance	94.8					
Stress management	**8) Stress management**	HB35_DoSomethingToRelax	.843	.751	2.57	2.57	2.57	
		HB34_RestToReduceStress	.831					
		HB36_StopThinking	.776					
		Eigenvalue	2.0					
		% of Variance	66.8					
Resting	**9) Enough rest**	HB25_Nap	.723	.563	2.57	2.58	2.52	
		HB24_EnoughSleep	.676					
		HB39_SleepToReduceStress	.665					
		HB27_ReduceWorking	.556					
		Eigenvalue	1.7					
		% of Variance	43.3					

Note: Principal component method without rotation

**t: p<.01, ***t: p=.00, t-test

Table 5.3. ***Component Matrix and Factor Matrix of Preventive and Promotive Health Behaviors (Cont.)***

Concept	Sub-concept	Variables	Factor				Comm unality	Alpha	Mean score			p-value
			1	2	3	4			Total	Female	Male	
Seeking health information and seeking health care	10) Seeking health information	HB44_HealthInfoFromPuskesmas	.755	-.107	-.010	.065	.532					
		HB41_TryToObtainHealthInfo	.633	.037	.027	.120	.519					
		HB53_GoToPuskesmas	.572	-.218	.060	.000	.281					
		HB43_HealthInfoFromFriend	.565	.143	-.051	.004	.409	.801	2.32	2.32	2.30	
		HB42_HealthInfoFromFamily	.562	.076	-.009	.006	.367					
		HB45_AskKaderAboutHealth	.496	.211	.028	-.015	.423					
		HB49_HealthCheckup	.434	-.036	.161	.140	.288					
	11) Seeking private health care	HB54_GoToDoctor	-.314	.715	.052	.148	.417					
		HB46_AskDoctorAboutHealth	.156	.553	-.007	.205	.689	.682	1.92	1.91	1.92	
		HB56_GoToNurse	.124	.515	.010	-.197	.946					
		HB48_AskNurseAboutHealth	.356	.465	-.058	-.212	.461					
	12) Seeking community health care	HB55_GoToMidwife	-.210	.100	.877	.001	.751					
		HB47_AskMidwifeAboutHealth	.246	-.060	.669	-.034	.548	.683	1.78	1.86	1.52	***t
		HB52_GoToPosyandu	.250	-.026	.397	-.061	.253					
	13) Following suggestions of health professionals	HB59_TakeMedicine	.079	-.023	-.012	.763	.615					
		HB58_FollowSuggestions	.103	.013	-.054	.670	.617					
							Total	.762	3.00	3.00	2.97	
		% of Variance	25.0	8.6	6.2	5.0	44.7					
Caring for others and Fulfilling obligation to God	14) Beg God and accept current situation	HB71_BegGodForHelp	.855	-.043	-.080		.646					
		HB72_AcceptDifficultSituation	.802	-.102	-.034		.599	.697	3.11	3.12	3.06	
		HB68_PrayInCorrectPosition	.427	.315	.138		.499					
		HB62_GoodRelationship	.339	-.116	.126		.357					
	15) Fulfilling obligation to God	HB67_PrayMoreThanObligation	.015	.716	.017		.526					
		HB70_ReciteQuran	-.146	.615	-.052		.298	.697	2.26	2.29	2.14	*t
		HB69_AdditionalFasting	-.130	.599	.040		.325					
		HB66_PrayFiveTimes	.352	.497	-.061		.512					
	16) Caring for others	HB63_DiscussAboutHealth	.094	-.004	.621		.415					
		HB64_SupportCommunityActivity	.037	-.054	.568		.390					
		HB61_ConcernHealthOfPeople	.144	-.082	.519		.348	.616	2.41	2.42	2.40	
		HB65_ProvideFoodToOther	-.248	.136	.467		.396					
							Total					
		% of Variance	24.4	8.5	7.0		39.9					
							Total	**.885**				

Note: Principal factor method with promax rotation

*t: p<.05, ***t: p=.00, t-test

3) Reducing meat. One component was extracted with three items that measured this concept. The extracted component explained 62.7% of the total variance.

4) Reducing fatty and sweet food. One component was extracted with three items that measured this concept. The extracted component explained 48.4% of the total variance.

Two components were extracted from six items which measured the concept of physical activity: household labor and exercise.

5) Household labor. One component was extracted with three items that measured the concept of household labor. The extracted component explained 86.1% of the total variance.

6) Exercise. One component was extracted with three items that measured the concept of exercise. The extracted component explained 84.3% of the total variance.

7) Non-smoking. One component was extracted with six items that measured this concept. The extracted component explained 94.8% of the total variance.

8) Stress management. One component was extracted with three items that measured this concept. The extracted component explained 66.8 % of the total variance.

9) Enough rest. One component was extracted with four items that measured this concept. The extracted component explained 43.3% of the total variance.

Four factors were extracted with 16 items that measured concept of seeking health information and care: seeking health information, seeking private health care. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. Each pair of items showed the anti-image correlation as less than .70. The Bartlett's test of sphericity showed a chi-square of 2413.406 (df = 171, p = .00). The overall Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) was .789. Every item measured by KMO-MSA was greater than .50. Six items showed a communality less than .30. However the Items periodical health checkup (HB49) (.297), going to Posyandu (HB52) (.257), going to Puskesmas (HB53) (.275) were kept for the analysis because they are important for hypertension prevention and health promotion in community settings. On the other hand, items of obtaining health information from TV (HB50) (.231), buying medicine (HB51) (.093), going to a hospital (HB57) (.164) were omitted because these are not appropriate for this population with limited educational level and income. The number of factors were decided

by considering the number of categories in the preliminary study (2), factors with eigenvalues greater than 1.0 (5), and the scree test (1). The exploratory factor analysis with principal factor method and promax rotation yielded four factors as the most interpretable. All the items loaded greater than 3.0. The four factors explained 44.7% of the total variance.

10) Seeking health information. Seven items were included in this concept. The items were about seeking health information from someone or some health institution so that the factor was named as 'seeking health information'.

11) Seeking private health care. Four items were included in this concept. A doctor means a doctor who owns a private clinic. A nurse (*manteri*) means a nurse who owns a private clinic. So that the factor was named as 'seeking private health care'.

12) Seeking community health care. Three items were included in this concept. A village midwife means a midwife who is working for the village or a community. *Posyandu* is a community health post. So that the factor was named as 'seeking community health care'.

13) Following suggestions from health professionals. Two items were included in this concept. Both items were about following suggestions that were given from health professionals so that the factor was named as 'following suggestions from health professionals'.

Three factors were extracted with 12 items that measured concept of caring for other people and fulfilling obligation to God: beg God and accept current situation, fulfilling obligation to God, and caring for other people. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. Each pair of items showed the anti-image correlation of less than .70. The Bartlett's test of sphericity showed a chi-square of 1291.067 (df = 78, p = .000). The overall KMO-MSA was .768. Each item measured by the KMO-MSA was greater than .50. One item of working for family (HB60) showed a low communality (.061), and was therefore omitted. The number of factors were decided by considering the number of categories in the preliminary study (2), factors with eigenvalues greater than 1.0 (5), and the scree test (1). The exploratory factor analysis with a principal factor method and promax rotation yielded three factors as the most interpretable. All the items loaded greater than 3.0. The four factors explained 39.9% of the total variance.

14) Beg God and accept current situation. Four items are included in this concept.

From the two items which had larger factor loadings, this factor was named ‘beg God and accept current situation’.

15) Fulfilling obligation to God. Four items are included in this concept. This factor was named as ‘fulfilling obligation to God’ because the items were from this concept of the study framework.

16) Caring for other people. Four items were included in this concept. This factor was named as caring for other people because the items were from this concept in the study framework.

3. Validity of the questionnaire.

The developed questionnaire was validated by convergent and concurrent validity.

1) Convergent validity of the developed questionnaire.

Table 5.4 shows the health behaviors, which were measured by the *Kuesioner Perilaku Promosi Kesehatan-Prevensi Penyakit* (Health Promotion and Disease Prevention Behaviors Questionnaire) (Lubis et al., 2011). Female participants ate vegetables and fruits more frequently than male (p = .00). Cronbach’s alpha of the questionnaire was .567, which was similar to the study conducted in an urban area of Indonesia (α = .531) (Lubis et al., 2011).

Sum score of the PPHBs and that of *Kuesioner Perilaku Promosi Kesehatan-Prevensi Penyakit* [Health Promotion and Disease Prevention Questionnaire] (Lubis et al, 2011) showed a weak correlation (r = .392) (p < .01) (Table 5.5). This result supported the convergent validity of the developed questionnaire.

2) Concurrent validity of the developed questionnaire.

Sum score of PPHBs and an item score of the health status in the World Health Organization Quality of Life (WHOQOL)-BREF (Indonesian language version) (World Health Organization, 2004) showed weak correlation (r = .310) (p < .01). Sum score of PPHBs and item scores of QOL in the WHOQOL-BREF (Indonesian language version) (World Health Organization, 2004) showed weak correlation (r = .345) (p < .05) (Table 5.5). These result supported the concurrent validity of the developed questionnaire.

4. Reliability of the questionnaire.

Internal consistency reliability. Cronbach’s alpha for each sub-concept was higher

Table 5. 4. ***Descriptive Statistics of Health Behaviors***

Item	Alpha	N	Min.	Max.	Total N=447 (100%)		Female n=345 (77.2%)		Male n=102 (22.8%)		p-value
					Mean	SD	Mean	SD	Mean	SD	
T01_NotSmoke		446	1	6	4.78	1.88	5.30	1.50	2.98	1.95	***t
T02_NotAlcohol		447	1	6	5.21	1.50	5.35	1.47	4.75	1.52	***t
T03_NormalWeight		447	1	6	4.35	1.12	4.31	1.16	4.46	0.99	
T04_PhoneWhileDriving		446	1	6	4.52	1.61	4.49	1.66	4.59	1.41	
T05_WarmClothes	.567	446	1	6	3.59	1.62	3.42	1.64	4.14	1.40	***t
T06_FruitsVegetable		445	1	6	4.34	1.10	4.43	1.03	4.01	1.25	**t
T07_VitaminC		447	1	6	2.93	1.36	2.90	1.38	3.03	1.26	
T08_Exercise		444	1	6	3.34	1.53	3.32	1.58	3.38	1.35	
T09_BrushTeeth		446	1	6	5.11	0.81	5.14	0.81	5.03	0.80	
T10_Helmet		447	1	6	3.73	1.67	3.58	1.74	4.26	1.28	***t

**t: p<.01, ***t: p=.00, t-test

Table 5. 5. ***Correlation among Preventive and Promotive Health Behaviors Questionnaire and Existing Questionnaires***

	Health Promotion and Disease Prevention Behaviors (Lubis et al., 2011)	Satisfied Health (WHO, 2004)	QOL (WHO, 2004)
PPHBs Questionnaire	.392**	.310**	.345**

Note: ** P<.01

than .600 except for reducing fatty and sweet food (α = .466) and stress management (α = .563) (Table 5.3). Cronbach's alpha for total concept was .885. This results supported the reliability of the developed questionnaire.

5. Regional Difference of PPHBs.

Since the Indonesian Ministry of Health recommended 'CERDIK' (health check-ups, non-smoking, exercise, healthy diet, rest, stress management) for noncommunicable diseases (NCDs) prevention and health promotion, the author focused on the following 10 PPHBs (factors): reducing salty food, eating vegetables and fruits, reducing meat, reducing fat and sweets, household labor, exercise, non-smoking, stress management, rest, and seeking health information.

Table 5. 6 shows descriptive statistics of the 10 PPHBs for four Puskesmas (community health centers). Puskesmas A (high-density coastal area) had the highest score on eight PPHBs i.e. reducing salt, eating vegetables and fruits, reducing fatty and sweet food, household labor, exercise, stress management, enough rest, and seeking health information.

The subsets were not homogeneous based on Levene's test (p =.000~.037). Therefore, Welch's ANOVA was performed to explore differences of the mean score of the PPHBs among four Puskesmas.

There were statistically significant differences among four Puskesmas (p = .000 ~ .029) for eight PPHBs (i.e. eating vegetable and fruits, reducing meat, reducing fatty and sweet food, household labor, exercise, non-smoking, stress management, and seeking health information) (Table 5.7). Games-Howell post-hoc test revealed that Puskesmas A had a statistically significantly higher score on eating vegetables and fruits, reducing meat, exercise, and stress management compared to Puskesmas B, C, and D. Puskesmas A had statistically significantly higher scores on non-smoking compared to Puskesmas B and C. Puskesmas A and B had statistically significantly higher scores on seeking health information compared to Puskesmas D (Table 5.8). There were no statistically significant differences on reducing salty food and enough rest among four Puskesmas (p = .077 ~ .121) (Table 5.7).

Table 5. 6. ***Descriptive Statistics of Preventive and Promotive Health Behaviors for Four Puskesmas***

		N	Mean	SD
1) Reducing salty food	Puskesmas A (high-density coastal)	120	2.50	0.89
	Puskesmas B (high-density inland)	118	2.29	0.58
	Puskesmas C (low-density coastal)	90	2.33	0.55
	Puskesmas D (low-density inland)	119	2.44	0.99
2) Eating vegetables and fruits	Puskesmas A	120	2.88	0.39
	Puskesmas B	118	2.38	0.44
	Puskesmas C	90	2.29	0.44
	Puskesmas D	119	2.39	0.70
3) Reducing meat	Puskesmas A	120	3.14	0.55
	Puskesmas B	118	2.82	0.29
	Puskesmas C	90	2.94	0.49
	Puskesmas D	119	3.36	0.46
4) Reducing fatty and sweet food	Puskesmas A	120	2.36	0.63
	Puskesmas B	118	2.18	0.44
	Puskesmas C	90	2.32	0.49
	Puskesmas D	119	2.25	0.63
5) Household labor	Puskesmas A	120	2.79	1.08
	Puskesmas B	118	2.34	0.82
	Puskesmas C	90	2.57	0.97
	Puskesmas D	119	2.67	1.08
6) Exercise	Puskesmas A	120	2.94	0.74
	Puskesmas B	118	2.17	0.56
	Puskesmas C	90	2.61	0.84
	Puskesmas D	119	2.45	0.89
7) Non-smoking	Puskesmas A	120	3.78	0.63
	Puskesmas B	118	3.51	0.86
	Puskesmas C	90	3.31	1.11
	Puskesmas D	119	3.83	0.53
8) Stress management	Puskesmas A	120	2.79	0.39
	Puskesmas B	118	2.41	0.48
	Puskesmas C	90	2.43	0.48
	Puskesmas D	119	2.60	0.61
9) Enough rest	Puskesmas A	120	2.65	0.45
	Puskesmas B	118	2.58	0.43
	Puskesmas C	90	2.48	0.49
	Puskesmas D	119	2.55	0.56
10) Seeking health information	Puskesmas A	120	2.43	0.61
	Puskesmas B	118	2.40	0.43
	Puskesmas C	90	2.27	0.30
	Puskesmas D	119	2.17	0.56

Table 5. 7. ***Test for Group Differences on PPHBs Among Four Puskesmas (Welch's ANOVA)***

	F	df1	df2	Sig.
1) Reducing salty food	1.956	3	241.884	.121
2) Eating vegetables and fruits	46.342	3	237.756	.000
3) Reducing meat	42.029	3	228.320	.000
4) Reducing fatty and sweet food	3.046	3	239.841	.029
5) Household labor	5.210	3	238.422	.002
6) Exercise	28.368	3	232.766	.000
7) Non-smoking	8.507	3	226.059	.000
8) Stress management	18.843	3	236.825	.000
9) Enough rest	2.314	3	238.058	.077
10) Seeking health information	6.037	3	245.123	.001

Table 5. 8. ***Multiple Comparisons for Group Differences on PPHBs (Games-Howell Test)***

	Group I	Group J	Mean Difference (I-J)	Sig.
1) Reducing salty food	Puskesmas A (high-density coastal)	Puskesmas B	.213	.129
		Puskesmas C	.173	.307
		Puskesmas D	.060	.960
	Puskesmas B (high-density inland)	Puskesmas A	-.213	.129
		Puskesmas C	-.040	.959
		Puskesmas D	-.152	.475
	Puskesmas C (low-density coastal)	Puskesmas A	-.173	.307
		Puskesmas B	.040	.959
		Puskesmas D	-.113	.724
	Puskesmas D (low-density inland)	Puskesmas A	-.060	.960
		Puskesmas B	.152	.475
		Puskesmas C	.113	.724
2) Eating vegetables and fruits	Puskesmas A	Puskesmas B	.502	.000
		Puskesmas C	.587	.000
		Puskesmas D	.492	.000
	Puskesmas B	Puskesmas A	-.502	.000
		Puskesmas C	.086	.505
		Puskesmas D	-.010	.999
	Puskesmas C	Puskesmas A	-.587	.000
		Puskesmas B	-.086	.505
		Puskesmas D	-.096	.622
	Puskesmas D	Puskesmas A	-.492	.000
		Puskesmas B	.010	.999
		Puskesmas C	.096	.622
3) Reducing meat	Puskesmas A	Puskesmas B	.314	.000
		Puskesmas C	.194	.035
		Puskesmas D	-.222	.004
	Puskesmas B	Puskesmas A	-.314	.000
		Puskesmas C	-.120	.170
		Puskesmas D	-.536	.000
	Puskesmas C	Puskesmas A	-.194	.035
		Puskesmas B	.120	.170
		Puskesmas D	-.416	.000
	Puskesmas D	Puskesmas A	.222	.004
		Puskesmas B	.536	.000
		Puskesmas C	.416	.000
4) Reducing fatty and sweet food	Puskesmas A	Puskesmas B	.189	.038
		Puskesmas C	.041	.950
		Puskesmas D	.115	.493
	Puskesmas B	Puskesmas A	-.189	.038
		Puskesmas C	-.148	.112
		Puskesmas D	-.074	.724
	Puskesmas C	Puskesmas A	-.041	.950
		Puskesmas B	.148	.112
		Puskesmas D	.074	.775
	Puskesmas D	Puskesmas A	-.115	.493
		Puskesmas B	.074	.724
		Puskesmas C	-.074	.775
5) Household labor	Puskesmas A	Puskesmas B	.458	.002
		Puskesmas C	.224	.392
		Puskesmas D	.122	.818
	Puskesmas B	Puskesmas A	-.458	.002
		Puskesmas C	-.234	.258
		Puskesmas D	-.336	.038
	Puskesmas C	Puskesmas A	-.224	.392
		Puskesmas B	.234	.258
		Puskesmas D	-.102	.891
	Puskesmas D	Puskesmas A	-.122	.818
		Puskesmas B	.336	.038
		Puskesmas C	.102	.891

Table 5. 8. ***Multiple Comparisons for Group Differences on PPHBs (Cont.)***

	Group I	Group J	Mean Difference (I-J)	Sig.
6) Exercise	Puskesmas A (high-density coastal)	Puskesmas B	.772	.000
		Puskesmas C	.332	.016
		Puskesmas D	.492	.000
	Puskesmas B (high-density inland)	Puskesmas A	-.772	.000
		Puskesmas C	-.439	.000
		Puskesmas D	-.280*	.021
	Puskesmas C (low-density coastal)	Puskesmas A	-.332*	.016
		Puskesmas B	.439*	.000
		Puskesmas D	.160	.546
	Puskesmas D (low-density inland)	Puskesmas A	-.492*	.000
		Puskesmas B	.280*	.021
		Puskesmas C	-.160	.546
7) Non-smoking	Puskesmas A	Puskesmas B	.276*	.027
		Puskesmas C	.475*	.002
		Puskesmas D	-.043	.939
	Puskesmas B	Puskesmas A	-.276*	.027
		Puskesmas C	.199	.495
		Puskesmas D	-.319*	.004
	Puskesmas C	Puskesmas A	-.475*	.002
		Puskesmas B	-.199	.495
		Puskesmas D	-.518*	.000
	Puskesmas D	Puskesmas A	.043	.939
		Puskesmas B	.319*	.004
		Puskesmas C	.518*	.000
8) Stress management	Puskesmas A	Puskesmas B	.379*	.000
		Puskesmas C	.355*	.000
		Puskesmas D	.193*	.021
	Puskesmas B	Puskesmas A	-.379*	.000
		Puskesmas C	-.024	.985
		Puskesmas D	-.186*	.047
	Puskesmas C	Puskesmas A	-.355*	.000
		Puskesmas B	.024	.985
		Puskesmas D	-.163	.137
	Puskesmas D	Puskesmas A	-.193*	.021
		Puskesmas B	.186*	.047
		Puskesmas C	.163	.137
9) Enough rest	Puskesmas A	Puskesmas B	.062	.693
		Puskesmas C	.169	.052
		Puskesmas D	.098	.444
	Puskesmas B	Puskesmas A	-.062	.693
		Puskesmas C	.107	.352
		Puskesmas D	.035	.947
	Puskesmas C	Puskesmas A	-.169	.052
		Puskesmas B	-.107	.352
		Puskesmas D	-.072	.756
	Puskesmas D	Puskesmas A	-.098	.444
		Puskesmas B	-.035	.947
		Puskesmas C	.072	.756
10) Seeking health information	Puskesmas A	Puskesmas B	.037	.947
		Puskesmas C	.158	.068
		Puskesmas D	.263*	.003
	Puskesmas B	Puskesmas A	-.037	.947
		Puskesmas C	.121	.087
		Puskesmas D	.226*	.003
	Puskesmas C	Puskesmas A	-.158	.068
		Puskesmas B	-.121	.087
		Puskesmas D	.106	.300
	Puskesmas D	Puskesmas A	-.263*	.003
		Puskesmas B	-.226*	.003
		Puskesmas C	-.106	.300

III. Predictors of Preventive and Promotive Health Behaviors

Predictors of PPHBs were measured by the developed predictor questionnaire. Based on the study framework, predictors which support PPHBs were named as positive predictors. These predictors included: behavioral belief, competence, prior experience, religious support, social support and health system support. Predictors that hinder PPHBs were named as negative predictors. These predictors included: personal barriers, social barriers and environmental barriers.

1. Positive predictors of preventive and promotive health behaviors.

1) Descriptive statistics.

Table 5.9 shows the descriptive statistics of the positive predictors of PPHBs. The difference between genders was measured by the t-test.

(1) Religious support. Mean scores of religious support (PP18, PP19, PP20, PP21) were high (4.19~4.27) both in men and women.

(2) Behavioral beliefs. Mean scores of practicing health behaviors to fulfilling obligation to God (PP04) and practicing health behaviors to receive blessings from God (PP05) were high (4.09~4.10) both in men and women. Female participants more likely to have these behavioral beliefs than male participants ($p < .05$).

(3) Social support from family. Mean scores of support from family (PP29, PP30) were high (4.01) both for men and women.

2) Exploratory factor analysis.

A total of 10 factors (sub-concepts) were extracted from 45 items that measured positive predictors of PPHBs Table 5.10. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. Four pair of items showed the anti-image correlation greater than .70, *Imam* (religious leader) helps me to understand Islam (PP22) and *Imam* makes me closer to God (PP23): -.732; *Pengajian* (gatherings to recite Qur'an) helps me to understand Islam (PP25) and *Pengajian* makes me closer to God (PP26): -.768; Friend concerns my health (PP36) and Friend encourages me to practice healthy behaviors (PP37): -.780; Health service is affordable by health insurance (PP52) and Enough health service is available by health insurance (PP53): -.797). One of the pairs (PP23, PP26, PP36, PP53) was omitted from the analysis. The Bartlett's test of sphericity showed a chi-square

Table 5. 9. ***Descriptive Statistics of Positive Predictors***

Concept	Item	N	Min.	Max.	Total		Mean		p-value
					Mean	SD	Female	Male	
1) Behavioral belief	PP01_HBtoWorkForFamily	444	2	5	3.96	.54	3.94	4.05	
	PP02_HBtoPromoteFamilyHealth	447	2	5	3.93	.48	3.95	3.85	
	PP03_HBtoWorkForCommunity	446	1	5	3.47	.80	3.51	3.36	
	PP04_HBtoFulfillObligationGod	447	2	5	4.10	.50	4.13	4.00	*t
	PP05_HBtoReceiveBlessingGod	447	2	5	4.09	.50	4.12	3.98	*t
	PP06_HBtoBeHealthy	447	2	5	4.09	.39	4.08	4.10	
	PP07_HBtoBeHappy	447	2	5	4.02	.40	4.03	3.98	
2) Competence	PP08_RecognizeHealthStatus	447	2	5	3.94	.63	3.96	3.87	
	PP09_KnowNecessityHB	445	1	5	3.91	.51	3.91	3.92	
	PP10_ConfidentToPracticeHB	447	2	5	3.85	.54	3.86	3.82	
	PP11_HaveAbilityToPracticeHB	446	2	5	3.85	.49	3.87	3.75	*t
	PP12_CanCommunicateWithPeople	447	1	5	3.76	.60	3.77	3.73	
	PP13_CanSeekHealthCare	446	1	5	3.80	.67	3.80	3.80	
3) Prior experience	PP14_HBcosExperienceDisease	447	1	5	3.61	.84	3.60	3.62	
	PP15_HBcosPeopleExperienceDisease	447	1	5	3.53	.86	3.55	3.48	
	PP16_HBcosExperienceImprovedHealth	447	1	5	3.72	.65	3.74	3.63	
	PP17_HBcosPeopleExperienceImprovedHealth	445	1	5	3.66	.70	3.71	3.50	**t
4) Religious support	PP18_GodHelpWhenProblem	446	1	5	4.24	.54	4.26	4.19	
	PP19_GodGiveGoodHealth	447	2	5	4.19	.55	4.21	4.13	
	PP20_GodGiveEverything	447	3	5	4.20	.50	4.22	4.14	
	PP21_PrayingGodHelp	444	1	5	4.27	.53	4.29	4.22	
	PP22_ImamHelpUnderstandIslam	447	1	5	3.89	.82	3.88	3.93	
	PP23_ImamMakeCloserGod	447	1	5	3.85	.82	3.83	3.91	
	PP24_ImamHelpUnderstandHealth	446	1	5	3.54	.92	3.60	3.34	*t
	PP25_PengajianHelpUnderstandIslam	447	1	5	3.86	.74	3.87	3.84	
	PP26_PengajianMakeCloserGod	446	1	5	3.88	.75	3.89	3.87	
	PP27_PengajianHelpUnderstandHealth	446	1	5	3.48	.90	3.55	3.26	**t
5) Social support	PP28_FamilySuggestHealth	446	1	5	3.93	.64	3.91	4.01	
	PP29_FamilyConcernHealth	447	1	5	4.01	.56	3.99	4.08	
	PP30_FamilyEncourageHB	446	2	5	4.01	.51	4.01	3.99	
	PP31_FamilyAccompanyHealthInstitution	447	1	5	3.94	.69	3.90	4.06	*t
	PP32_FamlyProvideGoods	447	1	5	3.86	.75	3.83	3.97	
	PP33_FamilySupportWork	447	1	5	3.90	.68	3.92	3.86	
	PP34_FamilyDoesMassage	446	1	5	3.87	.74	3.82	4.04	*t
	PP35_FriendSuggestHealth	447	1	5	3.73	.70	3.74	3.70	
	PP36_FriendConcernHealth	445	1	5	3.57	.75	3.63	3.38	**t
	PP37_FriendEncourageHB	444	1	5	3.60	.72	3.68	3.34	***t
	PP38_FriendAccompanyHealthInstitution	443	1	5	3.39	.84	3.42	3.31	
	PP39_RWRTSuggestHealth	444	1	5	2.84	1.06	2.79	2.99	
	PP40_RWRTConcernHealth	445	1	5	2.82	1.04	2.81	2.88	
	PP41_RWRTEncourageHB	446	1	5	2.77	1.05	2.75	2.85	
	PP42_RWRTAccompanyHealthInstitution	446	1	5	2.66	1.04	2.62	2.80	
6) Health system support	PP43_KaderSuggestHealth	447	1	5	3.16	1.07	3.12	3.31	
	PP44_KaderConcernHealth	447	1	5	3.05	1.06	3.05	3.06	
	PP45_KaderEncourageHB	447	1	5	3.07	1.04	3.05	3.14	
	PP46_KaderAccompanyHealthInstitution	447	1	5	2.89	1.06	2.87	2.97	
	PP47_KaderProvidePosyandu	447	1	5	3.14	1.05	3.12	3.19	
	PP48_HPsSuggestHealth	446	1	5	3.74	.77	3.74	3.75	
	PP49_HPsConcernHealth	445	1	5	3.70	.72	3.79	3.42	***t
	PP50_HPsEncourageHB	446	1	5	3.72	.72	3.79	3.47	**t
	PP51_HPsProvideHealthService	447	1	5	3.82	.63	3.86	3.71	*t
	PP52_HealthServiceAffordableByInsurance	447	1	5	3.71	.94	3.69	3.76	
	PP53_EnoughHealthServiceByInsurance	445	1	5	3.60	1.02	3.58	3.65	

*t: p<.05, **t: p<.01, ***t: p=.00, t-test

Table 5. 10. ***Exploratory Factor Analysis of Positive Predictors***

Sub-concept	*Variables*	*Factor*										*Commu*	Alph	Mean score			p-
		1	2	3	4	5	6	7	8	9	10	*nality*	a	Total	F	M	value
1) Support from health volunteers	PP45_KaderEncourageHB	.959	.011	-.027	-.004	-.015	.007	-.032	-.010	-.033	.077	.910	.956	3.06	3.04	3.13	
	PP44_KaderConcernHealth	.915	.010	.006	.025	.032	.016	-.014	.009	.001	-.022	.889					
	PP47_KaderProvidePosyandu	.902	-.038	-.037	-.036	.023	.003	.045	.006	.012	-.070	.768					
	PP43_KaderSuggestHealth	.898	.031	.070	.007	-.055	-.055	.022	-.071	-.008	-.011	.805					
	PP46_KaderAccompanyHealthInstitution	.810	.048	-.032	-.053	.027	.093	-.012	.035	.032	.003	.752					
2) Support from community leaders	PP40_RWRTConcernHealth	-.010	.985	-.013	-.011	.019	.008	.035	.015	-.025	-.020	.954	.966	2.78	2.74	2.88	
	PP41_RWRTEncourageHB	-.004	.956	-.005	-.011	.006	.017	.006	.029	-.013	.047	.931					
	PP39_RWRTSuggestHealth	.013	.913	.006	.001	-.031	-.004	.043	.015	.049	-.017	.865					
	PP42_RWRTAccompanyHealthInstitution	.084	.815	-.019	-.042	-.015	.077	-.037	.050	.006	.011	.774					
3) Support from family	PP28_FamilySuggestHealth	.031	-.061	.808	.052	-.051	.060	-.094	.013	-.052	.022	.623	.827	3.93	3.91	4.00	
	PP29_FamilyConcernHealth	.062	-.078	.767	-.025	.004	-.001	.053	-.002	-.039	.028	.607					
	PP30_FamilyEncourageHB	.047	-.070	.698	.042	.049	.007	.027	.061	.028	-.009	.560					
	PP32_FamlyProvideGoods	.074	.018	.593	-.136	-.004	.017	.090	.060	.036	-.078	.406					
	PP31_FamilyAccompanyHealthInstitution	.015	-.003	.569	.086	-.092	-.083	-.110	.024	.109	.002	.343					
	PP33_FamilySupportWork	-.178	.051	.567	-.076	.003	.062	.033	.030	.064	.048	.357					
	PP34_FamilyDoesMassage	-.089	.139	.527	-.056	.059	.020	.064	-.096	.001	-.021	.317					
4) Islamic spiritual support	PP19_GodGiveGoodHealth	.036	.007	-.071	.819	-.054	.091	-.046	.057	-.033	.031	.714	.870	4.23	4.24	4.17	
	PP20_GodGiveEverything	-.040	-.015	-.046	.798	-.015	-.008	.035	-.014	.064	.015	.631					
	PP18_GodHelpWhenProblem	-.003	-.019	-.045	.784	-.001	-.022	.024	.050	-.007	.008	.616					
	PP21_PrayingGodHelp	-.059	-.038	.110	.689	.029	.076	.066	-.036	-.006	-.029	.591					
5) Support from health professionals	PP50_HPsEncourageHB	-.066	.027	-.072	-.039	.931	.039	-.012	-.001	.024	.023	.847	.865	3.74	3.79	3.59	**t
	PP49_HPsConcernHealth	-.040	-.046	.013	-.026	.907	.073	-.033	.043	-.048	-.019	.770					
	PP51_HPsProvideHealthService	.053	-.041	-.021	-.013	.682	-.038	-.020	-.090	.140	.107	.558					
	PP48_HPsSuggestHealth	.176	.067	.076	.068	.593	-.122	.043	.056	-.086	-.042	.505					
6) Support from Islamic activity	PP24_ImamHelpUnderstandHealth	.045	.014	.023	.025	-.021	.828	-.022	.012	-.041	.013	.712	.799	3.65	3.68	3.55	
	PP27_PengajianHelpUnderstandHealth	.034	-.013	-.050	.035	.057	.745	-.021	.040	.059	-.079	.603					
	PP25_PengajianHelpUnderstandIslam	-.011	.041	.070	-.006	-.021	.715	-.009	-.121	-.023	-.012	.527					
	PP22_ImamHelpUnderstandIslam	-.046	.117	.134	.125	.032	.568	-.049	-.106	-.087	.060	.478					
	PP03_HBtoWorkForCommunity	.040	-.054	-.185	-.038	-.041	.380	.122	.158	.192	-.018	.254					
7) Behavioral beliefs	PP07_HBtoBeHappy	.005	.035	.041	-.131	-.066	-.017	.804	-.024	.045	.041	.601	.800	4.05	4.06	3.98	*t
	PP06_HBtoBeHealthy	.011	.107	.052	.021	-.031	-.110	.742	-.064	-.071	.079	.576					
	PP05_HBtoReceiveBlessingGod	.005	-.012	-.056	.160	.033	-.009	.727	.011	-.046	-.067	.598					
	PP04_HBtoFulfillObligationGod	.030	-.003	.004	.214	.044	.005	.615	-.012	.006	-.084	.519					
	PP02_HBtoPromoteFamilyHealth	-.051	-.133	-.022	-.097	-.004	.170	.437	.052	.157	.078	.306					
8) Prior experience	PP15_HBcosPeopleExperienceDisease	-.104	.130	.042	.020	.088	-.021	-.044	.755	-.029	-.155	.550	.783	3.63	3.65	3.55	
	PP17_HBcosPeopleExperienceImprovedHealth	.042	-.040	-.052	-.022	-.065	.058	-.027	.713	.009	.154	.561					
	PP14_HBcosExperienceDisease	.000	.100	.038	.066	-.013	-.161	-.047	.654	.072	-.050	.485					
	PP16_HBcosExperienceImprovedHealth	.035	-.094	.068	.003	-.019	.028	.076	.628	-.069	.148	.513					
9) Support from friends	PP37_FriendEncourageHB	.019	-.076	-.030	.004	.042	-.010	.040	-.007	.865	-.017	.730	.729	3.60	3.63	3.52	
	PP38_FriendAccompanyHealthInstitution	-.048	.158	.031	-.010	-.081	.033	-.022	-.028	.749	.007	.608					
	PP35_FriendSuggestHealth	.014	-.066	.142	-.009	.077	-.021	.010	.060	.571	-.041	.409					
	PP52_HealthServiceAffordableByInsurance	.100	.176	.061	.204	.051	-.093	-.092	-.108	.313	.109	.287					
10) Competence	PP10_ConfidentToPracticeHB	.009	.013	-.041	.003	.001	-.040	-.057	-.009	.027	.838	.661	.722	3.87	3.88	3.83	
	PP11_HaveAbilityToPracticeHB	-.036	.019	-.019	-.029	.057	.023	.134	.032	-.084	.658	.518					
	PP09_KnowNecessityHB	-.011	.000	.088	.066	.031	-.024	.007	.019	.017	.492	.311					
												Total					
	% of Variance	20.3	9.5	6.5	5.5	4.6	3.4	3.2	2.6	2.3	1.9	59.8					
												Total	**.911**				

Note: Principal factor method with promax rotation
*t: p<.05, **t: p<.01, t-test

of 16749.323 (*df* = 1378, *p* = .000). Overall the KMO-MSA was .834. Each item for the KMO-MSA was greater than .50. Two items, practicing health behaviors for family (PP01) and health service is affordable by health insurance (PP52) showed low communality (.294 and .299, respectively). However, the items were kept for the analysis because these are important for hypertension prevention and health promotion. The number of factors were decided by considering the number of categories in the preliminary study (6), factors with eigenvalues greater than 1.0 (12), and the scree test (5). The exploratory factor analysis with principal factor method and promax rotation yielded 10 factors as most interpretable. Four items which loaded less than .30 were omitted (Can communicate with people (PP12), Can seek health care (PP13), Recognize health status (PP8), and Practice health behavior to work for family (PP1)). The 10 factors were named based on the preliminary study and the theoretical framework. These factors were similar to the predictors as expected by the theoretical framework. The author explains as follows:

(1) Support from health volunteers. Five items were included in this concept. This factor was named as 'support from health volunteers (*Kader*)' because the included items were about emotional, informational, material, or physical support from health volunteers.

(2) Support from community leaders. Four items were included in this concept. This factor was named as 'support from community leaders (RW/RT)' because the included items were about emotional, informational or physical support from community leaders.

(3) Support from family. Seven items were included in this concept. This factor was named as 'support from family' because the items were about emotional, informational, material or physical support from family.

(4) Islamic spiritual support. Four items were included in this concept. This factor was named as 'Islamic spiritual support' because the items were about emotional, informational, material or physical support from family.

(5) Support from health professionals. Four items were included in this concept. This factor was named as 'support from health professionals' because the items were about emotional, informational, and material support from health professionals.

(6) Support from Islamic activity. Five items were included in this concept. This factor was named as 'support from Islamic activity' because the items were about support from

Imam (religious leader) and *Pengajian* (gatherings to recite the holy text of Qur'an).

(7) Behavioral beliefs. Five items were included in this concept. This factor was named as 'behavioral beliefs' because the items were from this concept of the study framework.

(8) Prior experience. Four items were included in this concept. This factor was named as 'prior experience' because the items were from this concept of the study framework.

(9) Support from friends. Four items were included in this concept. This factor was named as 'support from friends' because the items were about emotional, informational, and physical support from friends.

(10) Competence. Three items were included in this concept. This factor was named as 'competence' because the items were from this concept of the study framework.

3) Reliability of the questionnaire.

Cronbach's alpha for each sub-concept was higher than .70 (Table 5.10). Cronbach's alpha for total concept was .911. This result supported the reliability of the developed questionnaire.

2. Negative predictors of preventive and promotive health behaviors.

1) Descriptive statistics.

Table 5.11 shows the descriptive statistics of the negative predictors of PPHBs. The author stated notable negative predictors that participants received. The difference between genders was measured by the t-test.

(1) Personal barriers. Mean scores of personal difficulty for exercise (NP07, NP08, NP09, NP10, NP12) were high (3.21~3.43) both in men and women. Female participants were more likely to have these difficulties (NP10, NP12) than male ($p < .05$ ~.01). Mean scores of economical difficulty for practicing health behaviors (NP34, NP35) were high (3.28~3.30) both in men and women.

(2) Environmental barriers. Mean scores of environmental difficulty for accessing health care (NP58, NP59) were high (3.20~3.38) both in men and women. Female participants were more likely to have this difficulty (NP59) than male ($p < .05$).

2) Exploratory factor analysis.

As a result of exploratory factor analysis, a total of 10 sub-concepts (factors) were extracted with 52 items that measured negative predictors of PPHBs (Table 5.12). The 10

Table 5. 11. ***Descriptive Statistics of Negative Predictors***

Concept	Item	N	Min.	Max.	Total		Mean		p-value
					Mean	SD	Female	Male	
1) Personal barriers	NP01_DifficultStopEatingIfTired	447	1	5	2.83	.98	2.82	2.86	
	NP02_DifficultStopEatingCosEnjoy	447	1	5	2.80	1.01	2.79	2.82	
	NP03_DifficultReduceSaltCosEnjoy	446	1	5	2.90	1.03	2.87	3.02	
	NP04_DifficultReduceSaltCosLongTime	447	1	5	2.86	1.04	2.85	2.90	
	NP05_DifficultEatHealthyCosNoInfo	446	1	5	2.91	.98	2.92	2.86	
	NP06_DifficultEatHealthyCosExpensive	447	1	5	3.10	1.03	3.10	3.12	
	NP07_DifficultExerciseIfTired	447	1	5	3.43	.94	3.39	3.54	
	NP08_DifficultExerciseCozNotEnjoy	447	1	5	3.26	.93	3.26	3.28	
	NP09_DifficultExerciseCozBusy	447	1	5	3.22	.99	3.23	3.22	
	NP10_DifficultEerciseCozNotLongTime	447	1	5	3.21	.99	3.27	3.04	t*
	NP11_DifficultExerciseCozNoInfo	446	1	5	3.14	.99	3.18	3.01	
	NP12_DifficultExerciseCozExpensive	447	1	5	3.22	1.11	3.32	2.91	t**
	NP13_DifficultRestCozBusy	444	1	5	2.97	.97	2.98	2.94	
	NP14_DifficultRestCozLotOfWork	445	1	5	2.91	1.02	2.89	2.99	
	NP15_DifficultStopSmokeCozEnjoy	447	1	5	1.92	1.32	1.45	3.51	t***
	NP16_DifficultStopSmokeCozLongTime	447	1	5	1.87	1.28	1.41	3.41	t***
	NP17_DifficultStopSmokeCozNoInfo	447	1	5	1.84	1.25	1.46	3.15	t***
	NP18_DifficultStopSmokeCozAffordable	447	1	5	1.81	1.21	1.43	3.11	t***
	NP19_DifficultStopSmokingCozCanAnywhere	447	1	5	1.87	1.27	1.44	3.35	t***
	NP20_DifficultStopThinkingCozLimitedIncome	447	1	5	2.95	1.08	2.96	2.90	
	NP21_DifficultObtainHealthInfoCozBusy	447	1	5	2.84	.98	2.86	2.80	
	NP22_DifficultObtainHealthInfoCozNoInfo	447	1	5	2.77	1.01	2.79	2.69	
	NP23_DifficultGoHealthInstitutionCozScared	447	1	5	2.79	1.04	2.80	2.73	
	NP24_DifficultGoHealthInstitutionCozBusy	447	1	5	2.85	1.02	2.86	2.81	
	NP25_DifficultBetterServiceCozNoInfo	446	1	5	2.76	.96	2.77	2.75	
	NP26_DifficultBetterServiceCozExpensive	447	1	5	3.16	1.08	3.19	3.06	
	NP27_DifficultObligationGodCozBusy	446	1	5	2.58	1.07	2.56	2.67	
	NP28_DifficultHBifTired	447	1	5	2.85	.99	2.81	2.96	
	NP29_DifficultHBifNotEnjoy	446	1	5	2.93	.97	2.90	3.02	
	NP30_DifficultHBifBusy	446	1	5	2.93	.98	2.87	3.13	t*
	NP31_DifficultHBifLotOfWork	447	1	5	2.92	1.01	2.86	3.13	t*
	NP32_DifficultHBifNeverDone	447	1	5	2.99	1.00	2.97	3.03	
	NP33_DifficultHBifNoInfo	447	1	5	3.13	.99	3.12	3.17	
	NP34_DifficultHBifExpensive	446	1	5	3.28	1.06	3.27	3.32	
	NP35_DifficultHBifNoMoney	447	1	5	3.30	1.02	3.27	3.39	
2) Social barriers	NP36_DifficultStopEatingIfProvided	447	1	5	2.65	.93	2.60	2.82	t*
	NP37_DifficultStopSweetIfProvided	447	1	5	2.66	.96	2.59	2.92	t**
	NP38_DifficultStopEatingAfterWork	447	1	5	2.63	.96	2.55	2.89	t**
	NP39_DifficultStopSweetAfterWork	447	1	5	2.81	1.01	2.72	3.11	t**
	NP40_DifficultStopEatingSocialGathering	447	1	5	2.47	.89	2.41	2.71	t**
	NP41_DifficultStopSweetSocialGathering	447	1	5	2.62	.93	2.52	2.94	t***
	NP42_DifficultExerciseIfNoOneWith	447	1	5	2.80	1.01	2.85	2.64	
	NP43_DifficultExerciseCozLimitedOpportunity	446	1	5	2.92	1.01	2.88	3.05	
	NP44_DifficultStopSmokingIfProvided	447	1	5	2.03	1.27	1.63	3.38	t***
	NP45_DifficultStopSmokingAfterWork	447	1	5	1.97	1.31	1.55	3.41	t***
	NP46_DifficultStopSmokingSocialGathering	446	1	5	1.95	1.27	1.52	3.37	t***
	NP47_DifficultGoHealthInstitutionCozOnlyDaytime	446	1	5	2.88	1.04	2.85	3.00	
	NP48_DifficultGoHealthInstitutionAffordableCare	447	1	5	2.89	.97	2.88	2.93	
	NP49_DifficultGoHealthInstitutionGoodCare	447	1	5	2.88	.99	2.87	2.92	
	NP50_DifficultHBifPeopleNotPractice	447	1	5	2.93	1.01	2.91	2.99	
	NP51_DifficultHBCozLimitedOpportunityLearn	447	1	5	3.00	.98	2.97	3.08	
3) Environmental barriers	NP52_DifficultEatHealthyCozFewStoreProvide	447	1	5	2.95	1.02	2.93	3.02	
	NP53_DifficultEatHealthyCozNoNutritionLabel	447	1	5	3.12	1.05	3.13	3.06	
	NP54_DifficultPAcozHotWeather	444	1	5	3.11	1.02	3.11	3.10	
	NP55_DifficultExerciseCozLimitedPlace	447	1	5	3.00	1.05	2.99	3.03	
	NP56_DifficultExerciseCozPlaceFar	447	1	5	2.98	1.07	2.98	2.96	
	NP57_DifficultExerciseCozLimitedTransportation	446	1	5	2.93	1.07	2.95	2.84	
	NP58_DifficultGoHospitalCozFar	447	1	5	3.38	1.08	3.41	3.25	
	NP59_DifficultGoHospitalCozLimitedTrasportation	446	1	5	3.20	1.08	3.25	3.00	t*

*t: p<.05, **t: p<.01, ***t: p=.00, t-test

factors were named based on the preliminary study and the theoretical framework. These factors were similar to the predictors as expected by the theoretical framework. The author explains as follows:

(1) Difficulties practicing health behaviors. One factor was extracted with 8 items that measured this concept. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. Two pair of items showed the anti-image correlation greater than .70 (Difficult to practice health behavior if it is expensive (NP34) and Difficult to practice health behavior if no money (NP35): -.731; Difficult to practice health behavior if people do not practice (NP50) and Difficult to practice health behavior because limited opportunity to learn (NP51)). One of the pairs (NP35, NP50) was omitted from the analysis. The Bartlett's test of sphericity showed a chi-square of 3993.012 (df = 45, p = .000). Overall, the KMO-MSA was .884. Each item analyzed by the KMO-MSA was greater than .50. All items showed communalities greater than .30. The exploratory factor analysis with principal factor method and promax rotation yielded one factor. All the items loaded greater than 3.0.

Three factors were extracted with 13 items that measured concept of difficulties related to healthy eating: social difficulties for healthy eating, environmental difficulties for healthy eating, and personal difficulties for healthy eating. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. Each pair of items showed the anti-image correlation of less than .70. The Bartlett's test of sphericity showed a chi-square of 2413.406 (df = 171, p = .000). Overall the KMO-MSA was .789. All items examined by KMO-MSA were greater than .50 and all items showed communalities greater than .30. The exploratory factor analysis with principal factor method and promax rotation yielded three factors as most interpretable. All the items loaded greater than 3.0. The three factors explained 54.8% of the total variance.

(2) Social difficulties for healthy eating. Six items were included in this concept. This factor was named, 'social difficulties for healthy eating' because the items were about difficulties to achieve healthy eating due to interpersonal relationships and social gatherings.

(3) Environmental difficulties for healthy eating. Four items were included in this concept. This factor was named as 'environmental difficulties for healthy eating' because the items were about difficulties for healthy eating due to limited information on healthy food,

Table 5. 12. ***Factor Analysis of Negative Predictors***

Concept	Sub-concept	Variables	Factor 1	Factor 2	Factor 3	Communality	Alpha	Mean score Total	Mean score Female	Mean score Male	p-value
Difficulties to practice health behaviors	1) Difficulties to practice health behaviors	NP30_DifficultHBifBusy	.870				.932	3.00	2.97	3.11	
		NP31_DifficultHBifLotOfWork	.861								
		NP29_DifficultHBifNotEnjoy	.853								
		NP32_DifficultHBifNeverDone	.826								
		NP28_DifficultHBifTired	.826								
		NP33_DifficultHBifNoInfo	.804								
		NP51_DifficultHBCozLimitedOpportunityLearn	.732								
		NP34_DifficultHBifExpensive	.591								
		% of Variance	64.0								
Difficulties related to healthy eating	2) Social difficulties for healthy eating	NP37_DifficultStopSweetIfProvided	.858	-.032	-.065	.677	.856	2.64	2.56	2.90	***t
		NP39_DifficultStopSweetAfterWork	.804	-.031	-.024	.614					
		NP38_DifficultStopEatingAfterWork	.768	.065	-.008	.627					
		NP36_DifficultStopEatingIfProvided	.742	.026	-.033	.547					
		NP40_DifficultStopEatingSocialGathering	.659	-.048	.193	.545					
		NP41_DifficultStopSweetSocialGathering	.548	.023	.025	.323					
	3) Environmental difficulties for healthy eating	NP53_DifficultEatHealthyCozNoNutritionLabel	.021	.822	-.150	.615	.810	3.02	3.02	3.02	
		NP52_DifficultEatHealthyCozFewStoreProvide	.035	.765	-.096	.557					
		NP06_DifficultEatHealthyCosExpensive	-.055	.657	.111	.471					
		NP05_DifficultEatHealthyCosNoInfo	-.020	.594	.295	.562					
	4) Personal difficulties for healthy eating	NP02_DifficultStopEatingCosEnjoy	-.008	-.105	.967	.862	.701	2.83	2.82	2.86	
		NP01_DifficultStopEatingIfTired	.003	.013	.653	.434					
		NP04_DifficultReduceSaltCosLongTime	.066	.231	.368	.290					
						Total					
		% of Variance	34.5	12.0	8.4	54.8					
Difficulties related to physical activity	5) Social difficulties to exercise	NP56_DifficultExerciseCozPlaceFar	.951	-.116		.791	.897	2.99	3.02	2.92	
		NP57_DifficultExerciseCozLimitedTransportation	.867	-.076		.682					
		NP55_DifficultExerciseCozLimitedPlace	.837	.001		.702					
		NP42_DifficultExerciseIfNoOneWith	.659	-.038		.407					
		NP43_DifficultExerciseCozLimitedOpportunity	.582	.136		.449					
		NP12_DifficultExerciseCozExpensive	.565	.164		.454					
		NP11_DifficultExerciseCozNoInfo	.493	.352		.568					
	6) Personal difficulties to exercise	NP08_DifficultExerciseCozNotEnjoy	-.071	.925		.785	.882	3.28	3.29	3.27	
		NP07_DifficultExerciseIfTired	-.134	.872		.644					
		NP10_DifficultExerciseCozNotLongTime	.100	.728		.623					
		NP09_DifficultExerciseCozBusy	.162	.681		.617					
					Total						
		% of Variance	49.4	11.7	61.1						
Difficulties to stop smoking	7) Difficulties to stop smoking	NP15_DifficultStopSmokeCozEnjoy	.835				.977	2.03	1.65	3.29	***t
		NP16_DifficultStopSmokeCozLongTime	.851								
		NP17_DifficultStopSmokeCozNoInfo	.845								
		NP18_DifficultStopSmokeCozAffordable	.885								
		NP19_DifficultStopSmokingCozCanAnywhere	.899								
		NP44_DifficultStopSmokingIfProvided	.792								
		NP45_DifficultStopSmokingAfterWork	.862								
		NP46_DifficultStopSmokingSocialGathering	.766								
		% of Variance	84.2								
Difficulties related to seeking health information and health care	8) Personal difficulties to seek health information and care	NP25_DifficultBetterServiceCozNoInfo	.806	-.035		.615	.865	2.86	2.88	2.81	
		NP24_DifficultGoHealthInstitutionCozBusy	.771	-.012		.583					
		NP22_DifficultObtainHealthInfoCozNoInfo	.745	.002		.557					
		NP21_DifficultObtainHealthInfoCozBusy	.732	-.011		.525					
		NP26_DifficultBetterServiceCozExpensive	.595	.176		.518					
		NP23_DifficultGoHealthInstitutionCozScared	.521	.114		.360					
	9) Social difficulties to seek health care	NP48_DifficultGoHealthInstitutionAffordableCare	-.075	.940		.800	.844	2.89	2.87	2.95	
		NP49_DifficultGoHealthInstitutionGoodCare	.062	.829		.756					
		NP47_DifficultGoHealthInstitutionCozOnlyDaytime	.098	.601		.446					
					Total						
		% of Variance	48.4	8.9	57.3						
Difficulties to rest	10) Difficulties to rest	NP13_DifficultRestCozBusy	.899				.732	2.94	2.93	2.96	
		NP14_DifficultRestCozLotOfWork	.793								
		NP20_DifficultStopThinkingCozLimitedIncome	.438								
		% of Variance	54.3								
						Total	**.959**				

***t: p=.00, t-test

Note: Principal factor method with promax rotation

limited food with affordable price, and limited availability of store with healthy food.

(4) Personal difficulties for healthy eating. Three items were included in this concept. This factor was named as 'personal difficulties for healthy eating' because the items were about difficulties for healthy eating due to personal emotions, tiredness, and prior experience.

Two factors were extracted with 11 items that measured the concept of difficulties related to physical activity. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. One pair of items showed the anti-image correlation greater than .70 (Difficult to reduce salt because I enjoy (NP03) and difficult to reduce salty because I have been doing it for a long time (NP04): -.768). One of the pairs (NP03) was omitted from the analysis. The Bartlett's test of sphericity showed a chi-square of 3483.340 (df = 66, p = .000). Overall KMO-MSA was .876. Each item for KMO-MSA was greater than .50. One item, difficulty to practice physical activity because of hot weather (NP54) showed low communality (.175), and therefore was omitted. The exploratory factor analysis with principal factor method and promax rotation yielded two factors as most interpretable. All the items loaded greater than 3.0. The two factors explained 61.1% of the total variance.

(5) Social difficulties for exercise. Seven items were included in this concept. This factor was named as 'social difficulties to exercise' because the items were on difficulties to exercise due to distance, limited transportation, limited place for exercise, and limited people to exercise together.

(6) Personal difficulties to exercise. Four items were included in this concept. This factor was named as personal difficulties to exercise because the items were on difficulties to exercise due to personal emotion, tiredness, and prior experience.

(7) Difficulties to stop smoking. One factor was extracted with eight items that measured this concept. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. All items showed the anti-image correlation less than .70. The Bartlett's test of sphericity showed a chi-square of 6041.424 (df = 28, p = .000). Overall the KMO-MSA was .909. Each item for KMO-MSA was greater than .50. All items showed communalities greater than .30. The exploratory factor analysis with principal factor method and promax rotation yielded this one factor. All the items loaded greater than 3.0.

Two factors were extracted with nine items that measured concept of difficulties related

to seeking health information and care. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. One pair of items showed the anti-image correlation greater than .70 (Difficult to go to a hospital because it is far (NP58) and Difficult to go to a hospital because of limited transportation (NP59): -.708). One item (NP58) was omitted from the analysis. The Bartlett's test of sphericity showed a chi-square of 2677.823 (*df* = 55, *p* = .000). Overall the KMO-MSA was .830. Each item for the KMO-MSA was greater than .50. One item (NP59) showed a low communality (.197), and was therefore omitted. The exploratory factor analysis with principal factor method and promax rotation yielded two factors as most interpretable. All the items loaded greater than 3.0. The two factors explained 57.3% of the total variance.

(8) Personal difficulties to seek health information and care. Six items were included in this concept. This factor was named as 'personal difficulties to seek health information and care' because the items were on difficulties to seeking health information and care due to limited information and busyness.

(9) Social difficulties to seek health care. Three items were included in this concept. This factor was named as 'personal difficulties to seek health care' because the items were on difficulties seeking health care due to limited affordability and availability of health care.

(10) Difficulties to rest. One factor was extracted with three items that measured this concept. Before the exploratory factor analysis, no items showed ceiling effect or floor effect. All items showed the anti-image correlation of less than .70. The Bartlett's test of sphericity showed a chi-square of 395.968 (*df* = 3, *p* = .000). Overall the KMO-MSA was .607. Each item for the KMO-MSA was greater than .50. One item (Difficult to stop thinking because limited income) showed communality of .192. This item was retained in the analysis because it expressed the difficulty of people with low income, which were the majority of the study participants. The exploratory factor analysis with principal factor method and promax rotation yielded one factor. All the items loaded greater than 3.0.

3) Reliability of the questionnaire.

Cronbach's alpha for each sub-concept was higher than .70 (Table 5.12). Cronbach's alpha for the total concept was .959. This results supported the reliability of the developed questionnaire.

IV. Perceived Health Status and Quality of Life

Perceived health status and quality of life (QOL) was measured by WHOQOL-BREF (World Health Organization, 2004). Table 5.13 shows the descriptive statistics. The difference between genders was measured by the t-test. Female participants rated higher mean of satisfaction of health status (3.33) than male (3.13) ($p < .05$). The highest mean of the item was about mobility (3.82), followed by feeling (3.70). The lowest mean of the item was about leisure activity (2.98), followed by financial resource (2.90) and information (2.96). Cronbach's alpha of the physical health domain was low (.491), which was similar to the study conducted in Indonesia (.41 ~ .59) (Nugroho et al., 2012). Cronbach's alpha of the total questionnaire was .881.

V. General Linear Model

The factors which predicted PPHBs were examined using a general linear model. Since the Indonesian Ministry of Health recommended 'CERDIK' (health check-ups, non-smoking, exercise, healthy diet, rest, stress management) for NCDs prevention and health promotion, the author focused on the following six PPHBs: reducing salty food, exercise, non-smoking, seeking health information, stress management, and rest. Each of the six PPHBs was entered as an objective variable. Based on the study framework and results of the bivariate correlation and ANOVA, 42 possible explanatory variables were appropriate for entering into the general linear model. These variables were: 15 PPHBs (excluding one PPHB which was analyzed as an objective variable), 10 positive predictors, 10 negative predictors, perceived health status, physical QOL, psychological QOL, social QOL, and environmental QOL, gender, and the area of the Puskesmas.

1. Factors which predict reducing salty food.

A general linear model was run to predict reducing salty food from possible explanatory variables. Six variables accounted for 22% of the total variance in reducing salty food ($R^2 = .224$) (Table 5.14). Five variables including seeking health information had positive statistically significant influence on reducing salty food ($p = .000$~$.019$). While, one variable, environmental difficulty for healthy eating had negative statistically significant influence on reducing salty food ($p = .002$) (Table 5.15).

Table 5. 13. ***Descriptive Statistics of Perceived Health Status and Quality of Life***

Domain	Item	Alpha	N	Min.	Max.	Mean	SD	Subscale mean			p-value
								Total	Female	Male	
Overall QOL	WHO01_QOL	-	447	1	5	3.26	.80	-	3.25	3.28	
General health	WHO02_SatisfiedHealth	-	447	1	5	3.28	.84	-	3.33	3.13	*t
Physical health	WHO03_PainPreventDoing_R		447	1	5	3.08	.87				
	WHO04_NeedMedicalTreatmentToFunction_R		447	1	5	3.30	.92				
	WHO10_HaveEnoughEnergy		447	1	5	3.16	.87				
	WHO15_AbleToGetAround	.491	444	1	5	3.82	.75	3.35	3.34	3.41	
	WHO16_SatisfiedSleep		447	1	5	3.53	.81				
	WHO17_SatisfiedAbilityADL		447	2	5	3.34	.66				
	WHO18_SatisfiedCapacityWork		446	1	5	3.30	.74				
Psychological	WHO05_EnjoyLife		447	1	5	3.38	.76				
	WHO06_FeelLifeMeaningful		446	1	5	3.47	.79				
	WHO07_AbleToConcentrate	.705	444	1	5	3.27	.76	3.46	3.44	3.53	
	WHO11_AcceptBodilyAppearance		446	1	5	3.42	.81				
	WHO19_SatisfiedMyself		445	1	5	3.53	.72				
	WHO26_HaveNegativeFeeling_R		446	1	5	3.70	1.07				
Social relationships	WHO20_SatisfiedPersonalRelationship		447	1	5	3.53	.66				
	WHO21_SatisfiedSexLife	.654	445	1	5	3.17	.83	3.36	3.34	3.45	
	WHO22_SatisfiedSupportFromFriend		447	1	5	3.39	.71				
Environment	WHO08_FeelSafe		447	1	5	3.49	.67				
	WHO09_HealthyPhysicalEnvironment		447	1	5	3.41	.68				
	WHO12_HaveEnoughMoney		446	1	5	2.90	.86				
	WHO13_InformationIsAvailable	.789	447	1	5	2.96	.76	3.15	3.15	3.16	
	WHO14_HaveOpportunityForLeisureActivity		447	1	5	2.48	.97				
	WHO23_SatisfiedConditionLivingPlace		447	1	5	3.45	.73				
	WHO24_SatisfiedAccessHealthService		447	1	5	3.39	.76				
	WHO25_SatisfiedTransport		447	1	5	3.16	.83				
	Total	**.881**									

Note: "R" at the end of item means reverse-scoring item.

*t: p<.05, t-test

Table 5. 14. ***Tests of Between-Subjects Effects for Reducing Salty Food***

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	59.637*	6	9.939	20.171	.000
Intercept	.873	1	.873	1.771	.184
D03_ReduceMeat	9.244	1	9.244	18.761	.000
D04_ReduceSweetFat	11.103	1	11.103	22.533	.000
D10_SeekHealthInfo	5.202	1	5.202	10.557	.001
D15_FulfillObligationGod	2.751	1	2.751	5.582	.019
I_PP08_PriorExperience	8.310	1	8.310	16.865	.000
I_NP03_EnvironmentalDifficultyHealthyEating	4.979	1	4.979	10.104	.002
Error	206.465	419	.493		
Total	2710.750	426			
Corrected Total	266.102	425			

Note: Dependent Variable: D01_ReduceSaltyFood

*R Squared = .224 (Adjusted R Squared = .213)

Table 5. 15. ***Parameter Estimates for Reducing Salty Food***

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-.518	.389	-1.331	.184	-1.283	.247
D03_ReduceMeat	.301	.070	4.331	.000	.164	.438
D04_ReduceSweetFat	.299	.063	4.747	.000	.175	.422
D10_SeekHealthInfo	.233	.072	3.249	.001	.092	.374
D15_FulfillObligationGod	.126	.053	2.363	.019	.021	.231
I_PP08_PriorExperience	.247	.060	4.107	.000	.129	.365
I_NP03_EnvironmentalDifficultyHealthyEating	-.136	.043	-3.179	.002	-.220	-.052

Note: Dependent Variable: D01_ReduceSaltyFood

2. Factors which predict exercise.

A general linear model was run to predict exercise from possible explanatory variables. Seven variables including the Puskesmas area accounted for 41% of the total variance in exercise (R^2 = .409) (Table 5.16). Even controlling for the factor of the Puskesmas area, five variables including caring for others and fulfilling obligation to God had positive statistically significant influence on exercise (p = .000~.028). While, one variable, social difficulty for exercise had negative statistically significant influence on exercise (p = .008) (Table 5.17).

3. Factors which predict non-smoking.

A general linear model was run to predict non-smoking from possible explanatory variables. Five variables including gender and the Puskesmas area accounted for 79% of the total variance in reducing non-smoking (R^2 = .788) (Table 5.18). Even controlling for the factor of gender and the Puskesmas area, one variable, support from health professionals had positive statistically significant influence on non-smoking (p = .002). One variable, difficulty to stop smoking had negative statistically significant influence on non-smoking (p = .000) (Table 5.19).

4. Factors which predict seeking health information.

A general linear model was run to predict seeking health information from possible explanatory variables. Nine variables including the Puskesmas area accounted for 50% of the total variance in seeking health information (R^2 = .501) (Table 5.20). Even controlling for the factor of the Puskesmas area, eight variables including seeking community health care had positive statistically significant influence on seeking health information (p = .000~.003) (Table 5.21).

5. Factors which predict stress management.

A general linear model was run to predict stress management from the possible explanatory variables. Five variables including Puskesmas area accounted for 30% of the total variance in stress management (R^2 = .298) (Table 5.22). Even controlling for the factor of the Puskesmas area, four variables including seeking health information and having competence had positive statistically significant influence on stress management (p = .000~.024) (Table 5.23).

Table 5. 16. ***Tests of Between-Subjects Effects for Exercise***

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	116.435*	9	12.937	32.320	.000
Intercept	.097	1	.097	.243	.622
AreaPuskesmas	15.715	3	5.238	13.086	.000
D05_HouseholdLabor	39.796	1	39.796	99.420	.000
D15_FulfillObligationGod	5.801	1	5.801	14.492	.000
D16_CareOtherPeople	7.245	1	7.245	18.099	.000
I_PP08_PriorExperience	4.053	1	4.053	10.125	.002
I_NP05_SocialDifficultyExercise	2.868	1	2.868	7.164	.008
I_NP09_SocialDifficultySeekHealthCare	1.952	1	1.952	4.877	.028
Error	168.521	421	.400		
Total	3072.000	431			
Corrected Total	284.956	430			

Note: Dependent Variable: D06_Exercise

*R Squared = .409 (Adjusted R Squared = .396)

Table 5. 17. ***Parameter Estimates for Exercise***

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	.079	.289	.273	.785	-.490	.647
[AreaPuskesmas=1]	.312	.091	3.406	.001	.132	.491
[AreaPuskesmas=2]	-.221	.087	-2.526	.012	-.393	-.049
[AreaPuskesmas=3]	.151	.093	1.619	.106	-.032	.335
[AreaPuskesmas=4]	0*	.	.	.	.	.
D05_HouseholdLabor	.314	.031	9.971	.000	.252	.376
D15_FulfillObligationGod	.193	.051	3.807	.000	.093	.293
D16_CareOtherPeople	.273	.064	4.254	.000	.147	.399
I_PP08_PriorExperience	.165	.052	3.182	.002	.063	.267
I_NP05_SocialDifficultyExercise	-.124	.046	-2.676	.008	-.215	-.033
I_NP09_SocialDifficultySeekHealthCare	.094	.042	2.208	.028	.010	.177

Note: Dependent Variable: D06_Exercise

Independent variable: Puskesmas 1=A, Puskesmas 2=B, Puskesmas 3=C, Puskesmas 4=D

*This parameter is set to zero because it is redundant.

Table 5. 18. ***Tests of Between-Subjects Effects for Non-Smoking***

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	231.726*	9	25.747	178.852	.000
Intercept	130.443	1	130.443	906.109	.000
Gender	33.112	1	33.112	230.008	.000
AreaPuskesmas	6.787	3	2.262	15.715	.000
Gender * AreaPuskesmas	9.278	3	3.093	21.482	.000
I_NP07_DifficultyStopSmoking	28.443	1	28.443	197.580	.000
I_PP05_SupportHealthProfessional	1.355	1	1.355	9.414	.002
Error	62.334	433	.144		
Total	6112.639	443			
Corrected Total	294.060	442			

Note: Dependent Variable: D07_NonSmoking

*R Squared = .788 (Adjusted R Squared = .784)

Table 5. 19. ***Parameter Estimates for Non-Smoking***

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	4.134	.130	31.884	.000	3.879	4.389
[Gender=1]	-.416	.109	-3.815	.000	-.630	-.202
[Gender=2]	0*	.	.	.	.	.
[AreaPuskesmas=1]	-.037	.055	-.681	.496	-.145	.070
[AreaPuskesmas=2]	.058	.057	1.026	.306	-.054	.171
[AreaPuskesmas=3]	.043	.061	.706	.481	-.077	.164
[AreaPuskesmas=4]	0*	.	.	.	.	.
[Gender=1] * [AreaPuskesmas=1]	-.235	.137	-1.709	.088	-.504	.035
[Gender=1] * [AreaPuskesmas=2]	-.634	.131	-4.847	.000	-.890	-.377
[Gender=1] * [AreaPuskesmas=3]	-.997	.138	-7.233	.000	-1.267	-.726
[Gender=1] * [AreaPuskesmas=4]	0*	.	.	.	.	.
[Gender=2] * [AreaPuskesmas=1]	0*	.	.	.	.	.
[Gender=2] * [AreaPuskesmas=2]	0*	.	.	.	.	.
[Gender=2] * [AreaPuskesmas=3]	0*	.	.	.	.	.
[Gender=2] * [AreaPuskesmas=4]	0*	.	.	.	.	.
I_PP05_SupportHealthProfessional	.096	.031	3.068	.002	.035	.158
I_NP07_DifficultyStopSmoking	-.326	.023	-14.056	.000	-.372	-.281

Note: Dependent Variable: D07_NonSmoking

Independent variable: Gender 1=Male, Gender 2=Female,

Puskesmas 1=A, Puskesmas 2=B, Puskesmas 3=C, Puskesmas 4=D

*This parameter is set to zero because it is redundant.

Table 5. 20. ***Tests of Between-Subjects Effects for Seeking health information***

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	56.663*	11	5.151	37.299	.000
Intercept	3.126	1	3.126	22.638	.000
AreaPuskesmas	2.243	3	.748	5.413	.001
D12_SeekCommunityHealthCare	4.663	1	4.663	33.764	.000
D11_SeekSpecificHealthCare	3.222	1	3.222	23.333	.000
D01_ReduceSaltyFood	2.116	1	2.116	15.320	.000
D13_FollowSuggestion	3.965	1	3.965	28.709	.000
I_PP09_SupportFriend	3.811	1	3.811	27.593	.000
D08_StressManagement	3.085	1	3.085	22.341	.000
I_PP03_SupportFamily	1.259	1	1.259	9.115	.003
I_PP01_SupportHealthVolunteer	1.324	1	1.324	9.588	.002
Error	56.347	408	.138		
Total	2383.041	420			
Corrected Total	113.010	419			

Note: Dependent Variable: D10_SeekHealthInfo

*R Squared = .501 (Adjusted R Squared = .488)

Table 5. 21. ***Parameter Estimates for Seeking Health Information***

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-1.156	.216	-5.342	.000	-1.582	-.731
[AreaPuskesmas=1]	.181	.061	2.958	.003	.061	.301
[AreaPuskesmas=2]	.187	.056	3.326	.001	.077	.298
[AreaPuskesmas=3]	.227	.063	3.599	.000	.103	.352
[AreaPuskesmas=4]	0*	.	.	.	.	.
D01_ReduceSaltyFood	.093	.024	3.914	.000	.047	.140
D08_StressManagement	.173	.037	4.727	.000	.101	.245
D11_SeekSpecificHealthCare	.194	.040	4.830	.000	.115	.273
D12_SeekCommunityHealthCare	.211	.036	5.811	.000	.139	.282
D13_FollowSuggestion	.178	.033	5.358	.000	.113	.243
I_PP01_SupportHealthVolunteer	.071	.023	3.097	.002	.026	.115
I_PP03_SupportFamily	.136	.045	3.019	.003	.047	.224
I_PP09_SupportFriend	.176	.034	5.253	.000	.110	.242

Note: Dependent Variable: D10_SeekHealthInfo

Independent variable: Puskesmas 1=A, Puskesmas 2=B, Puskesmas 3=C, Puskesmas 4=D

*This parameter is set to zero because it is redundant.

Table 5. 22. ***Tests of Between-Subjects Effects for Stress Management***

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	34.299*	7	4.900	25.734	.000
Intercept	.648	1	.648	3.405	.066
AreaPuskesmas	6.466	3	2.155	11.320	.000
D09_Rest	13.582	1	13.582	71.333	.000
D10_SeekHealthInfo	2.413	1	2.413	12.671	.000
D15_FulfillObligationGod	.977	1	.977	5.131	.024
I_PP10_Competence	1.913	1	1.913	10.047	.002
Error	80.920	425	.190		
Total	2967.556	433			
Corrected Total	115.219	432			

Note: Dependent Variable: D08_StressManagement

*R Squared = .298 (Adjusted R Squared = .286)

Table 5. 23. ***Parameter Estimates for Stress Management***

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	.481	.235	2.049	.041	.019	.942
[AreaPuskesmas=1]	.109	.060	1.815	.070	-.009	.226
[AreaPuskesmas=2]	-.215	.060	-3.592	.000	-.332	-.097
[AreaPuskesmas=3]	-.114	.064	-1.786	.075	-.239	.011
[AreaPuskesmas=4]	0*	.	.	.	.	.
D09_Rest	.373	.044	8.446	.000	.286	.460
D10_SeekHealthInfo	.153	.043	3.560	.000	.069	.238
D15_FulfillObligationGod	.078	.035	2.265	.024	.010	.146
I_PP10_Competence	.167	.053	3.170	.002	.063	.270

Note: Dependent Variable: D08_StressManagement

Independent variable: Puskesmas 1=A, Puskesmas 2=B, Puskesmas 3=C, Puskesmas 4=D

*This parameter is set to zero because it is redundant.

6. Factors which predict resting.

A general linear model was run to predict resting from possible explanatory variables. Four variables including gender * Puskesmas area accounted for 22% of the total variance in resting (R^2 = .218) (Table 5.24). Even controlling for the factor of gender * Puskesmas area, three variables including stress management and physical QOL had positive statistically significant influence on resting (*p* = .000~.019) (Table 5.25).

VI. Structural Equation Modeling

The relationships among PPHBs, predictors, health status, and quality of life were examined by structural equation model (SEM) based on the study framework. Since the Indonesian Ministry of Health recommended 'CERDIK' (health check-ups, non-smoking, exercise, healthy diet, rest, stress management) for NCDs prevention and health promotion, the author focused on the following six PPHBs: reducing salty food, exercise, non-smoking, seeking health information (including health check-ups), stress management, and rest. At first, relationships among each PPHBs and its predictors were examined. Then, relationships among quality of life, PPHBs and its predictors were examined. Finally, the six PPHBs and its predictors were integrated and examined. In total, 36 latent variables (16 PPHBs, 10 positive predictors, and 10 negative predictors) and 10 observed variables (perceived health status, physical QOL, psychological QOL, social QOL, and environmental QOL, gender, age, educational level, household income level, years of hypertension history) were entered into the model.

1. Relationships among reducing salty food and its predictors.

The result of the SEM presented here is the one which showed the best fit indices (Figure 5. 1). The fit indices indicated a good fit (*chi-square* = 652.059, *df* = 351, *p* = .000, *CFI* = .912, *RMSEA* = .044, *AIC* = 820.059). All path coefficients were statistically significant (*p* < .05). Prior experience (β = .26) and seeking health information (.24) had a weak positive influence on reducing salty food. Seeking health information was increased by fulfilling obligation to God (.25) and health professional support (.23). Environmental difficulty to practice healthy eating had a slight negative influence on reducing salty food (-.15).

Table 5. 24. ***Tests of Between-Subjects Effects for Resting***

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	22.140*	10	2.214	11.881	.000
Intercept	3.432	1	3.432	18.418	.000
Gender * AreaPuskesmas	2.857	7	.408	2.190	.034
D08_StressManagement	10.427	1	10.427	55.955	.000
QOL_PhysicalHealth	2.372	1	2.372	12.730	.000
D11_SeekSpecificHealthCare	1.025	1	1.025	5.499	.019
Error	79.573	427	.186		
Total	3004.125	438			
Corrected Total	101.713	437			

Note: Dependent Variable: D09_Rest

*R Squared = .218 (Adjusted R Squared = .199)

Table 5. 25. ***Parameter Estimates for Resting***

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	.940	.203	4.624	.000	.540	1.339
[Gender=1] * [AreaPuskesmas=1]	-.178	.101	-1.767	.078	-.377	.020
[Gender=1] * [AreaPuskesmas=2]	-.098	.086	-1.135	.257	-.267	.072
[Gender=1] * [AreaPuskesmas=3]	.030	.092	.321	.748	-.152	.211
[Gender=1] * [AreaPuskesmas=4]	-.202	.123	-1.635	.103	-.445	.041
[Gender=2] * [AreaPuskesmas=1]	-.023	.067	-.348	.728	-.154	.108
[Gender=2] * [AreaPuskesmas=2]	.090	.067	1.341	.181	-.042	.223
[Gender=2] * [AreaPuskesmas=3]	-.114	.072	-1.571	.117	-.256	.029
[Gender=2] * [AreaPuskesmas=4]	0*	.	.	.	.	.
D08_StressManagement	.324	.043	7.480	.000	.239	.409
D11_SeekSpecificHealthCare	.094	.040	2.345	.019	.015	.173
QOL_PhysicalHealth	.193	.054	3.568	.000	.087	.299

Note: Dependent Variable: D09_Rest

Independent variable: Puskesmas 1=A, Puskesmas 2=B, Puskesmas 3=C, Puskesmas 4=D

*This parameter is set to zero because it is redundant.

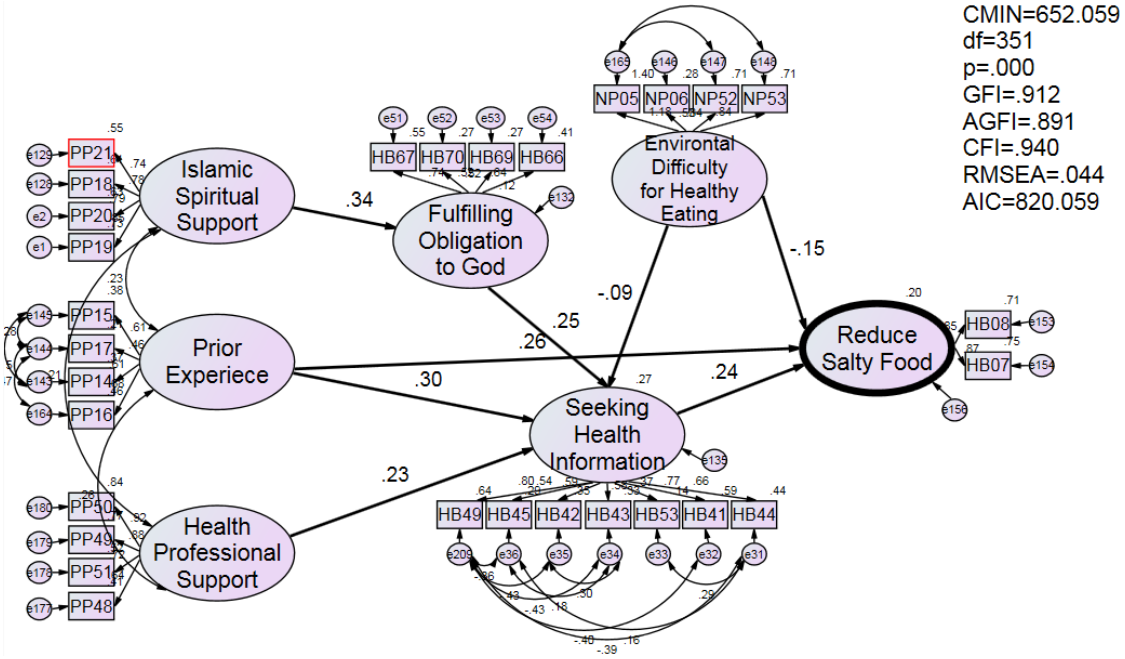

Figure 5. 1. **Relationships among reducing salty food and its predictors.**

2. Relationships among exercise and its predictors.

The SEM result presented is the one which showed the best fit indices (Figure 5. 2). The fit indices indicated a good fit (*chi-square* = 200.141, *df* = 119, *p* = .000, *CFI* = .967, *RMSEA* = .039, *AIC* = 304.141). All path coefficients were statistically significant (*p* < .05). Caring for other people (β = .33) and fulfilling obligation to God (.20) positively influenced exercise. Seeking health information increased the likelihood of fulfilling obligation to God (.22).

3. Relationships among non-smoking and its predictors.

The SEM result presented is the one which showed the best fit indices (Figure 5. 3). The fit indices indicated a good fit (*chi-square* = 784.359, *df* = 391, *p* = .000, *CFI* = .978, *RMSEA* = .047, *AIC* = 994.359). All path coefficients were statistically significant (*p* < .05). Difficulty in stop smoking had a moderate negative influence on non-smoking (β = -.58). Female sample was associated with non-smoking (.38). Support from health professional had a slight positive influence on non-smoking (.08). Support from health professional was related to support from Kader (community health volunteer) (.46) and family (.14).

4. Relationships among seeking health information and its predictors.

The SEM result presented is the one which showed the best fit indices (Figure 5. 4). The fit indices indicated a good fit (*chi-square* = 746.713, *df* = 433, *p* = .000, *CFI* = .955, *RMSEA* = .040, *AIC* = 936.713). All path coefficients were statistically significant (*p* < .05). Support from Kader (community health volunteer) had a moderate positive influence on seeking health information (β =.40). Fulfilling obligation to God (.13) and behavioral beliefs (.12) had a slight positive influence on seeking health information. Support from Kader, fulfilling obligation to God, and behavioral belief were associated with support from family and/or Islamic spiritual support.

5. Relationships among stress management and its predictors.

The SEM result presented is the one which showed the best fit indices (Figure 5. 5). The fit indices indicated a good fit (*chi-square* = 216.501, *df* = 127, *p* = .000, *CFI* = .970, *RMSEA*= .040, *AIC* = 304.501). All path coefficients were statistically significant (*p* < .05). Having competence (β = .30) and fulfilling obligation to God (.25) had a weak positive influence on stress management. Support from health professional increased the likelihood

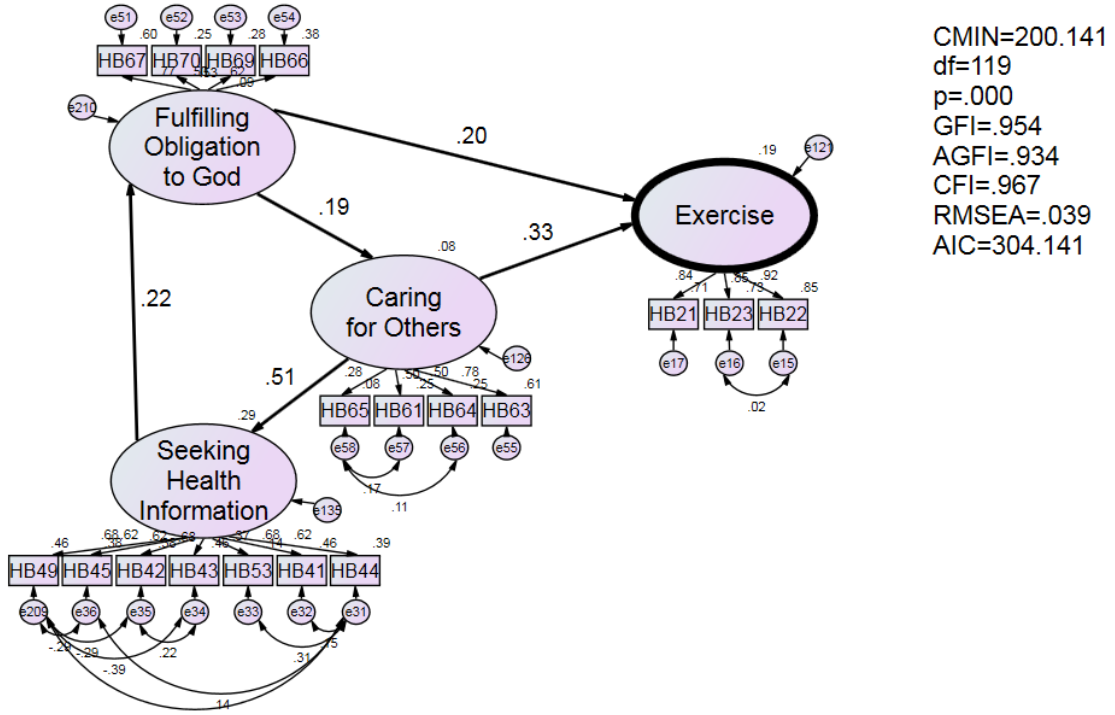

Figure 5. 2. **Relationships among exercise and its predictors.**

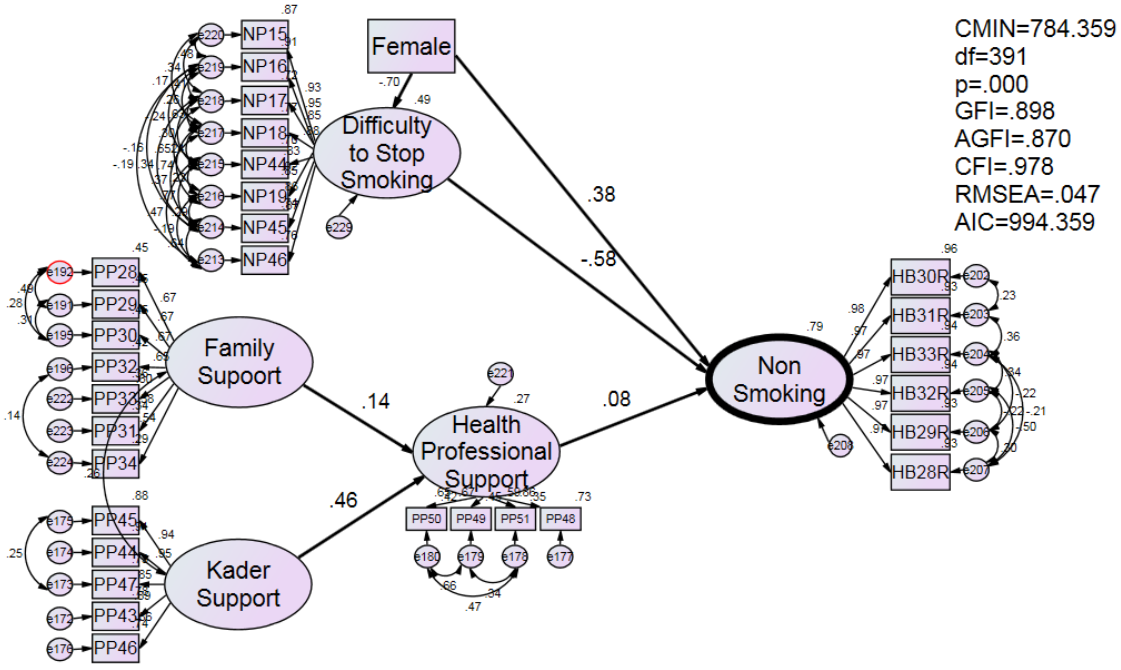

Figure 5. 3. **Relationships among non-smoking and its predictors.**

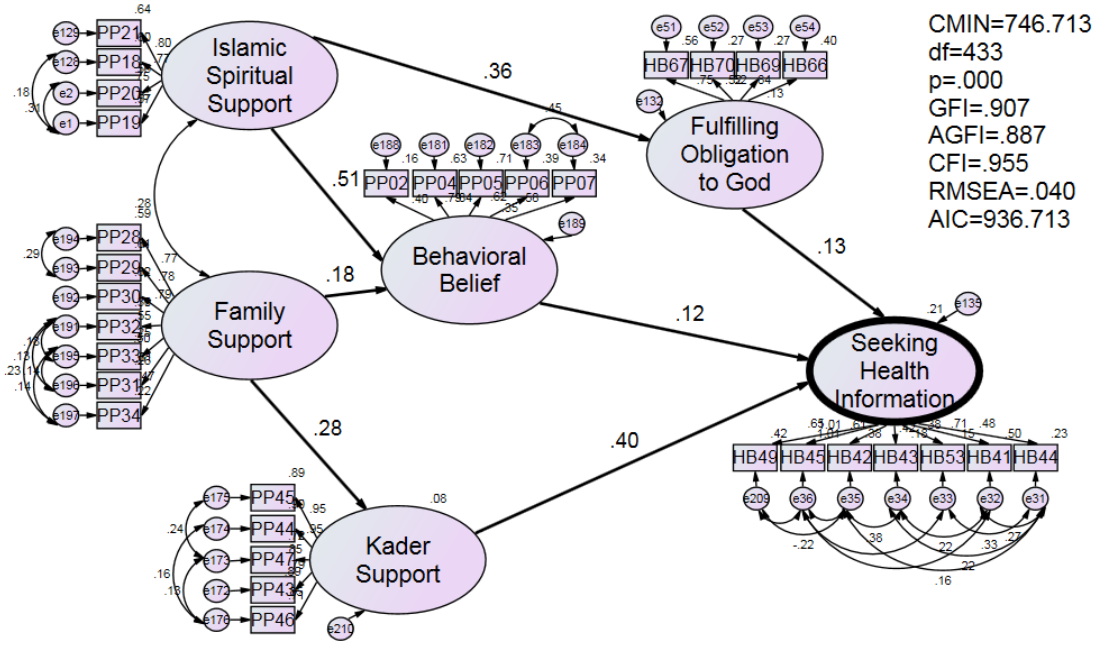

Figure 5. 4. **Relationships among seeking health information and its predictors.**

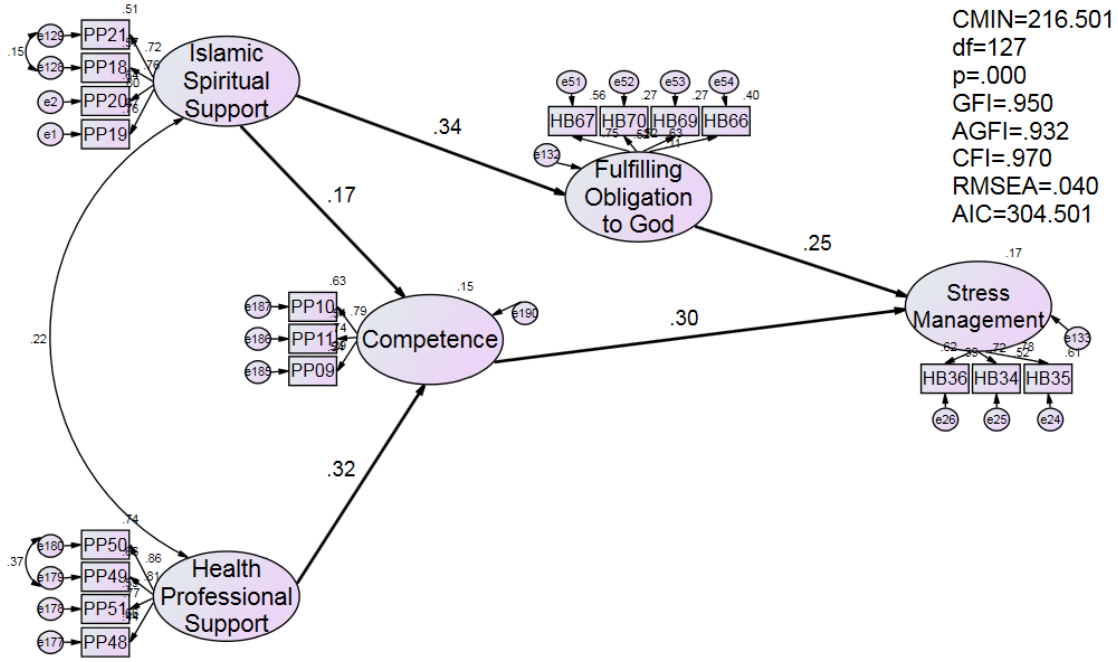

Figure 5. 5. **Relationships among stress management and its predictors.**

of having competence (.32). Islamic spiritual support was associated with fulfilling obligation to God (.34).

6. Relationships among rest and its predictors.

The SEM result presented is the one which showed the best fit indices (Figure 5. 6). The fit indices indicated a good fit (*chi-square* = 341.666, *df* = 198, *p* = .000, *CFI* = .956, *RMSEA* = .040, *AIC* = 451.666). All path coefficients were statistically significant ($p < .05$). The predictors of resting were similar to those of stress management. Stress management had a strong positive influence on resting ($\beta = .71$). Other predictors associated with resting were only through stress management.

7. Relationships among QOL and its predictors.

The SEM result presented was the one which showed the best fit indices (Figure 5. 7). The fit indices indicated a good fit (*chi-square* = 95.623, *df* = 66, *p* = .010, *CFI* = .990, *RMSEA* = .032, *AIC* = 173.623). All path coefficients were statistically significant ($p < .05$). Eating vegetables had a moderate and weak positive influence on environmental QOL ($\beta = .40$) and perceived health status (.35). Stress management had a weak positive influence on psychological QOL (.23). Exercise associated positively with eating vegetables (.39) and stress management (.23).

8. Relationships among PPHBs, predictors, and QOL.

The SEM result presented was the one that showed the best fit indices (Figure 5. 8). The fit indices indicates a good fit (*chi-square* = 4818.690, *df* = 2699, *p* = .000, *CFI* = .903, *RMSEA* = .042, *AIC* = 5272.690). The RMSEA, fit of the model per degree of freedom, was .042, which, according to Brown & Cudeck (1993), indicates a good fit. All path coefficients were statistically significant ($p < .05$). All items loaded were statistically significantly ($p < .05$) on the theorized latent variables.

Some PPHBs were positively influenced by fulfilling obligation to God and/or seeking health information. Reducing salty food was influenced by fulfilling obligation to God ($\beta = .19$) and seeking health information (.18) and negatively influenced by environmental difficulty to practice healthy eating (-.24). Eating vegetables and fruits was influenced by seeking health information (.20). Exercise was influenced by fulfilling obligation to God (.32). Stress management was influenced by fulfilling obligation to God (.24) and seeking health

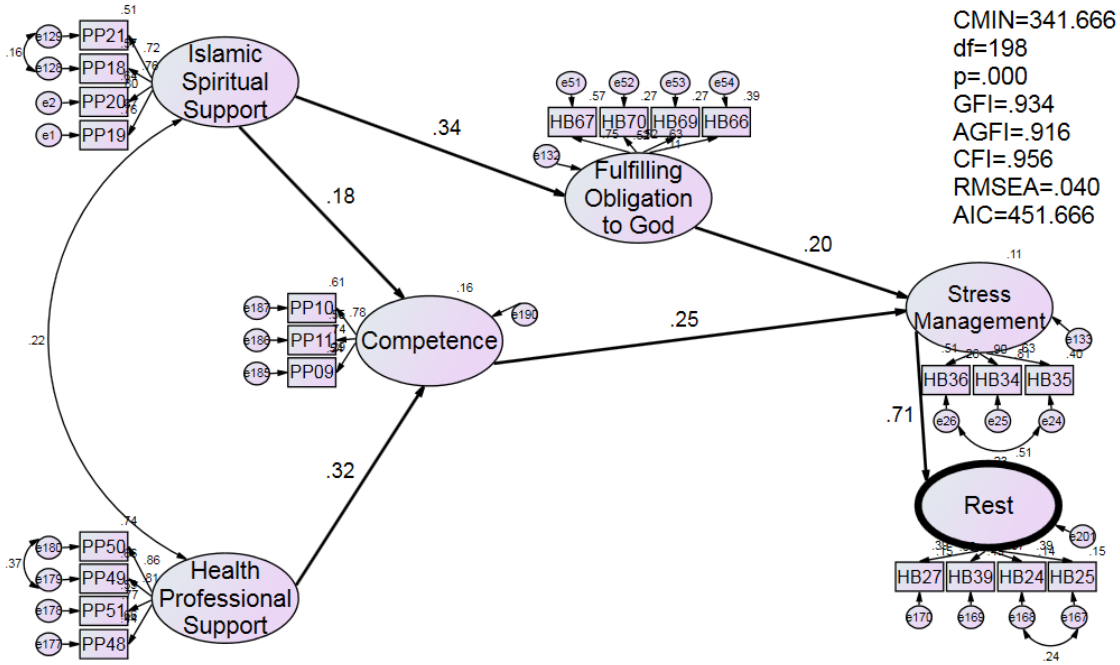

Figure 5. 6. **Relationships among rest and its predictors.**

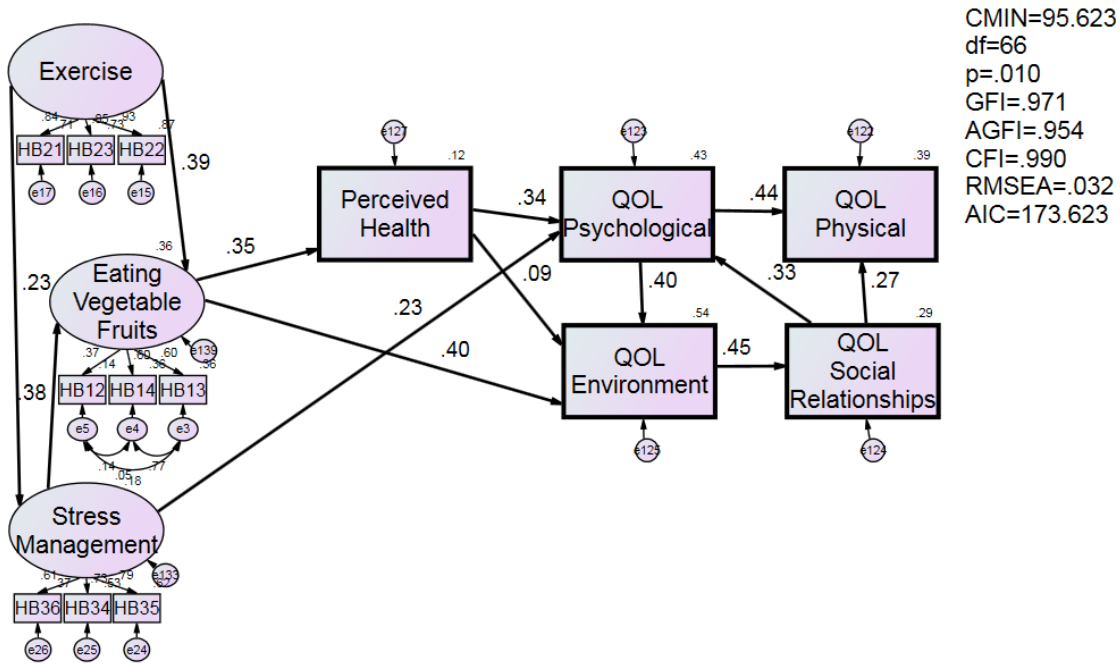

Figure 5. 7. **Relationships among QOL and its predictors.**

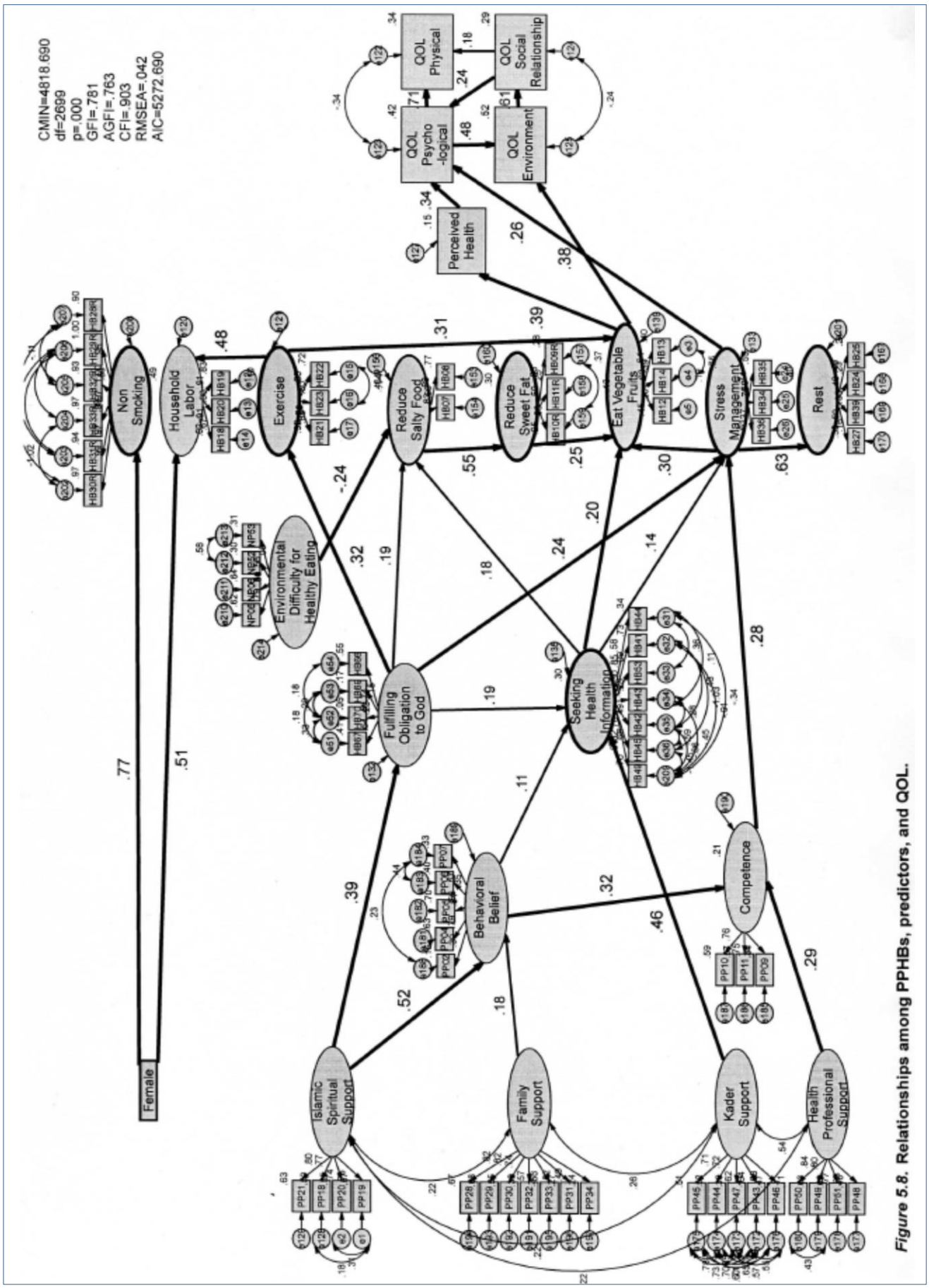

Figure 5.8. **Relationships among PPHBs, predictors, and QOL.**

information (.14).

Stress management and seeking health information were positively influenced by competence or behavioral beliefs. Stress management was influenced by competence (.28). Seeking health information was influenced by behavioral beliefs (.11).

Social supports positively influenced fulfilling obligation to God, seeking health information, behavioral beliefs and/or competence. Islamic spiritual support influenced fulfilling obligation to God (.39) and behavioral beliefs (.52). Support from family influenced behavioral beliefs (.18). Support from health professionals influenced competence (.29). Support from Kader (community health volunteer) influenced seeking health information (.46).

Perceived health status and QOL were positively influenced by some PPHBs. Eating vegetables and fruits influenced perceived health (.39) and environmental QOL (.38). Stress management influenced psychological QOL (.26).

VII. Summary of the Results

Descriptive statistics indicated that the people with hypertension practiced limited PPHBs. These were: limited salt, fat and sweet reduction both in men and women, limited smoking cessation, limited exercise, and limited health check-ups in men. Principal component analysis and exploratory factor analysis yielded 16 PPHBs practiced by people with hypertension. Regarding regional differences of PPHBs, the people from Puskesmas A (high-density coastal area) practiced eating vegetables and fruits, exercise, stress management, and seeking health information more frequently than other areas.

Principal component analysis and exploratory factor analysis yielded 10 positive predictors and 10 negative predictors of PPHBs. These factors were similar to the predictors as expected by the theoretical framework.

Factors that predict each PPHBs were examined using the general linear model. Reducing salty food was influenced by predictors like seeking health information and environmental barriers. Exercise was influenced by predictors like Puskesmas area, caring for others and fulfilling obligation to God. Non-smoking was influenced by predictors like gender, Puskesmas area, support from health professionals and difficulty to stop smoking.

Seeking health information was influenced by predictors like Puskesmas area, seeking community health care, and support from Kader (community health volunteers). Stress management was influenced by predictors like Puskesmas area, resting and having competence. Resting was influenced by predictors like Puskesmas area and stress management.

Relationships among PPHBs, predictors, and QOL were examined using structural equation modeling. The model fit was good (*RMSEA* = .042). Healthy eating behavior, exercise, and stress management were statistically predicted by fulfilling obligation to God, seeking health information, and environmental difficulty of healthy eating. These behaviors were predicted by personal predictors like behavioral beliefs and competence and social predictors such as support from Islamic spirituality, family, health professional and Kader. QOL including perceived health status was predicted by eating vegetables and fruits and stress management.

Chapter 6.
Discussion

This chapter discusses the results reported in Chapter 5. The discussion includes the following four areas: (I) preventive and promotive health behaviors (PPHBs) of middle-aged Muslims with hypertension in rural West Java; (II) a PPHBs model for middle-aged people with hypertension in rural West Java; (III) implications for the district's health programs and nursing education to improve noncommunicable (NCDs) prevention and health promotion for the people, and (IV) strengths and limitations of the study.

I. Preventive and Promotive Health Behaviors of Middle-Aged Muslim With Hypertension in Rural West Java, Indonesia

Participants reported limited practice of PPHBs, which are important for hypertension prevention and health promotion. These limited PPHBs were: salt reduction, smoking cessation, exercise and health check-ups.

1. Limited salt reduction both in women and men.

Both male and female participants reported limited practice of salt reduction. As a background, there was an abundance of salty food in the district. In Indonesia, it is estimated that people consume 15 grams of salt per day (Kementerian Kesehatan Republik Indonesia, 2009a). This amount is higher than the salt consumption of people in most countries, which is 9 ~ 12 grams of salt per day (World Health Organization, 2013a). High consumption of salt in Indonesia is due to nutritional changes based on economic growth, globalization and industrialization. These changes brought nutritional shifts from traditional food which are high in fiber to processed food which are low in fiber and contains higher levels of salt, fat, and sugar (Kementerian Kesehatan Republik Indonesia, 2011).

Salt reduction is a paramount issue to prevent and control hypertension (World Health Organization, 2013a). Several research syntheses found that salt reduction decreased blood pressure (Graudal, Hubeck-Graudal, & Jurgens, 2011; He, Li, & MacGregor, 2013; Hooper, Bartlett, Davey, & Ebrahim, 2004;). Globally, 5 grams of salt consumption per day is recommended (World Health Organization, 2013a) and 6 grams of salt consumption per

day (one teaspoon) is recommended in Indonesia (Kementerian Kesehatan Republik Indonesia, 2009a). Global NCDs target recommends a 30% reduction of salt intake (World Health Organization, 2013b). According to the target, lower salt reduction to 10.5 grams per day is an appropriate and feasible target for the people in Indonesia.

2. Limited smoking cessation in men.

Male participants reported a limited practice of smoking cessation. This is similar to the situation in Indonesia, which has a higher prevalence of smoking among men (67%) than women (3%) (World Health Organization, 2014). In particular, the West Java province has higher prevalence of smoking (33%) than the national average (28%) (Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan Republik Indonesia, 2013). This is because smoking behaviors are influenced by social role model (e.g. religious leaders smoke) and social norms (e.g. smoking at social gatherings) (Forum discussions with the district's health professionals on December 12, 2014).

Smoking cessation is necessary to prevent and control hypertension (World Health Organization, 2013a). Global NCDs target recommend 30% reduction of smoking prevalence (World Health Organization, 2013b). According to this target, reducing the smoking prevalence from 67% to 47% for men can be a target for the people in Indonesia.

3. Limited exercise in men.

Male participants reported a limited practice of exercise. In Indonesia, almost half (48.2%) of people are physically inactive. The rate of physical inactivity is higher in females (54.5%) than males (41.4%) (Kementerian Kesehatan Republik Indonesia, 2011). This physical activity is due to advance in technology (Kementerian Kesehatan Republik Indonesia, 2011). High technology has made it easier for people to travel by vehicles and to work (Kementerian Kesehatan Republik Indonesia, 2011).

Exercise and physical activity are necessary to prevent and control hypertension (World Health Organization, 2013a). A meta-analysis found that exercise reduced blood pressure (Whelton, Chin, Xin, & He, 2002). Globally, 150 minutes of exercise per week is recommended (World Health Organization, 2010c). In Indonesia, 150 minutes of exercise per week or 30 minutes of exercise per day are recommended (Kementerian Kesehatan Republik Indonesia, 2011). In low- and middle-income countries including Indonesia, people

engage in physical activity in their occupations, transportation, and housework (World Health Organization, 2010c). Not only leisure physical activity but also this work-related physical activity should be counted to measure their amount of physical activity.

4. Limited health check-up in men.

Male participants reported a limited practice of health check-ups. This may be related to lack of accessibility to Puskesmas (community health center) or Posbindu (community health post). Public health institutions are only open in the daytime and it is difficult for people who have work to access the institutions (The preliminary study).

Monitoring of blood pressure is also necessary to prevent and control hypertension (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2013). People can measure blood pressure at the Posbindu, which is a community health post to help prevent and control this NCDs risk factor. Indonesian Ministry of Health recommends that people measure their blood pressure once every year for people without risk of NCDs and three times a year for people with a risk of NCDs (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2012). However, the implementation of this recommendation is limited. The percentage of provinces, which implement NCDs prevention is 76% (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2012). It is necessary for people to monitor their blood pressure periodically and understand their health status.

5. Regional differences in practicing preventive and promotive health behaviors.

The results indicated that there were regional differences in practicing PPHBs. Respondents from Puskesmas A (high-density coastal area) practiced healthy behaviors (e.g. eating vegetables and fruits, exercise, stress management and seeking health information) more frequently than people from other Puskesmas. This is an example of Greenberg's (2014) concept of 'Healthography' emphasizing that where people live impacts their health and wellbeing. Basic healthography includes: 1) demographics; 2) health and environmental monitoring; 3) the environment; 4) assets and hazards like health care facilities; and 5) the social context that support public communication like community centers and schools (Greenberg, 2014). The area of Puskesmas A is located on the border between

districts and next to an urban district of West Java. The catchment area of Puskesmas A (i.e. area divided by one Puskesmas) is 15.4 square kilometers (Badan Pusat Statistik Kabupaten Indramayu, 2013) (by comparison - one and a half times as big as Chuo City in Tokyo), which is the smallest among the four Puskesmas. Moreover, there are three high schools in the area of Puskesmas A (Direktorat Jenderal Pendidikan Menengah, Kementerian Pendidikan dan Kebudayaan, 2014), which is highest among the four areas. Therefore, people in the area of Puskesmas A can easily access resources such as health information, healthier food, and health care services. In order to strengthen NCDs prevention and health promotion for people in other areas, it is important to implement community health activities by utilizing community health resources like Posbindu (community health post for NCDs prevention) and Kader (community health volunteer).

II. A Preventive and Promotive Health Behaviors Model for Middle-Aged People With Hypertension in Rural West Java, Indonesia

A PPHBs model middle-aged people with hypertension in rural West Java was developed (Figure 6.1) from the result of structural equation modeling (Figure 5.8). This model supported the study framework (Figure 4.1) that PPHBs were predicted by positive predictors such as behavioral beliefs, competence, Islamic spiritual support, prior experience, social support, and health system support. PPHBs were influenced by negative predictors like environmental difficulty to practice healthy eating. These findings were similar to the Precede-Proceed Model (PPM), in which predisposing factors, reinforcing factors, enabling factors, and the environment promote or hinder health behaviors of people. The results also supported the study framework that perceived health status and quality of life (QOL) were predicted by PPHBs such as eating vegetables and fruits and stress management.

Moreover, this study indicated that fulfilling one's obligation to God and seeking health information were core PPHBs that influence the other PPHBs, which were important for hypertension prevention and health promotion.

1. Fulfilling one's obligation to God and seeking health information are core PPHBs that influence other PPHBs.

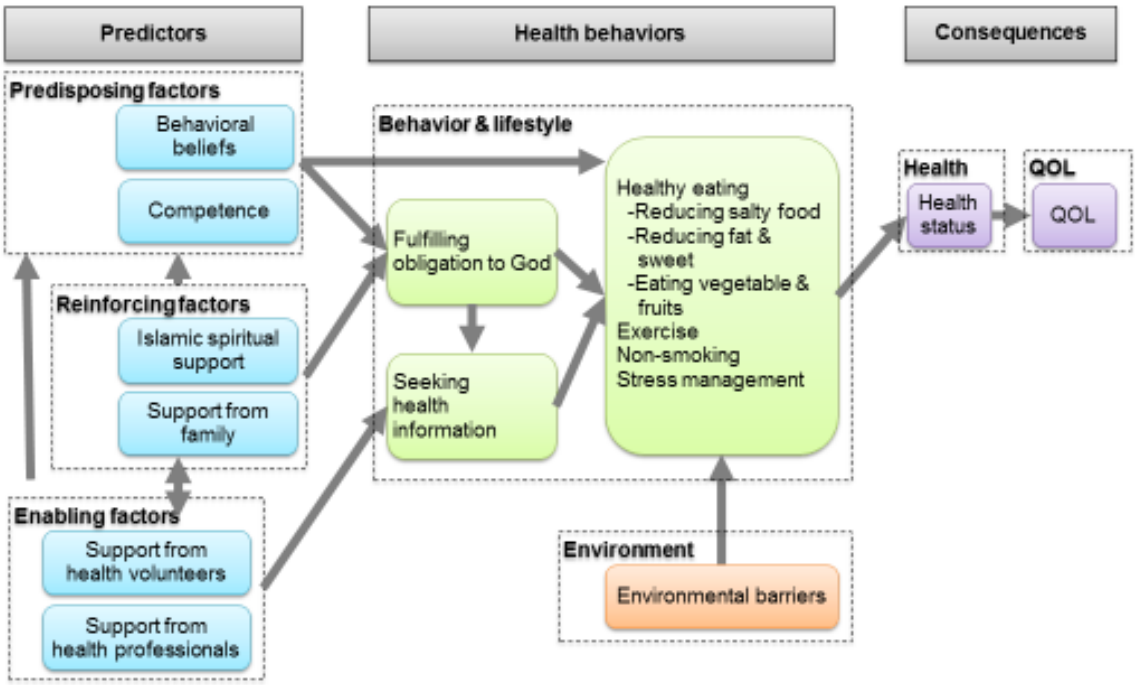

Figure 6. 1. **A preventive and promotive health behaviors model for middle-aged people with hypertension in rural West Java, Indonesia.**

Fulfilling one's obligation to God was a unique core PPHB for middle-aged Muslim with hypertension in West Java. This behavior either directly or indirectly (through seeking health information) relate to other PPHBs such as salt reduction, eating vegetable and fruits, exercise and stress management. As a background context of this core PPHB, there were two characteristics of Indonesian society: 1) the national philosophy of believing in God; and 2) social roles of middle-aged women in an Indonesian Islamic society.

Indonesia has the national philosophy of '*Ketuhanan Yang Maha Esa* (Believing in One Supreme God' (Atqa, 2010) and Muslims are required to practice the Five Pillars of Islam (Penny, 1999). The two core health behaviors are similar to the Two Pillars of Islam, that is, *Salat* (praying five times a day) and *Zakat* (giving money to people who are poor or in need). In the Holy Text of the Qur'an, Muslims are required to practice obligations of prayer, and if people obey the obligations, they will be rewarded by God (Ali, 1987). Moreover, if people do good for others such as family, neighbors, and the needy, they will be rewarded by God (Ali, 1987). This national and Islamic philosophy are the people's basis to 'fulfill obligation to God'.

Indonesian middle-aged people have social roles of taking care their family members and community members. Globally, middle-aged people have the responsibility and roles of taking care of their family (Brown, Dodgeon, & Goodman, 2014). In the Qur'an, men are regarded as defenders of women (Ali, 1987). In the twentieth century, women should have become "good wives, and mothers" and they should have control of their family and home (Robinson & Bessell, 2002). However, modernization brought shifts in the role of women in Indonesian society from a domestic role to a more public role (Ingham, n.d.). In Indonesian Muslim women's organizations, some women work as preachers providing religious messages to groups of women in mosques and community buildings (van Doorn-Harder, 2006). Recently their activities have evolved and now encompass health activities like advocacy for women's reproductive rights (van Doorn-Harder, 2006). Therefore, women have a potential to take leadership in their community particularly in religious and health activities.

This study also found that seeking health information directly predicted salt reduction, eating vegetables and fruits, and stress management. The Indonesian Ministry of Health

pointed out that lack of knowledge about healthy food prevented people from practicing healthy eating behavior (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2013). This situation is influenced by educational level and socio-economic status (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2013).

2. Behavioral beliefs and competence are key personal predictors: Predisposing factors

Behavioral beliefs and competence were personal predictors of PPHBs, which supported either seeking health information or stress management. These findings were similar to the PPM, in which predisposing factors like beliefs and competence provide people motivation to practice healthy behaviors. Moreover, existing studies reported that beliefs and competence were important predictors. Beliefs about exercise predicted physical activity (Burke, Mansour et al., 2008), beliefs about hypertension predicted medication adherence (Pickett et al., 2014), and beliefs about hypertension management predicted lifestyle behaviors (Heymann, Gross, Tabenkin, Porter, & Porath, 2011). Self-efficacy predicted reduced salt intake (Warren-Findlow & Seymour, 2011), decreased fat intake, increased exercise (Burke, Beilin et al., 2008; Burke, Mansour et al., 2008; Warren-Findlow & Seymour, 2011), smoking cessation (Mansyur et al., 2013; Warren-Findlow, & Seymour, 2011), and improved medication adherence (Lewis et al., 2012; Warren-Findlow & Seymour, 2011; Schoenthaler, Ogedegbe et al., 2009).

3. Islamic spiritual support and family support are key social predictors: Reinforcing factors.

Islamic spiritual support and support from family were indirect social predictors of PPHBs, which supported fulfilling obligation to God and behavioral beliefs. This findings was similar to the PPM, in which reinforcing factors like social support provided people with incentives to continue healthy behaviors. Islamic spiritual support was a unique predictor for this Indonesian population. As aforementioned, Indonesian behaviors can be influenced by Islamic philosophy. In addition, their values embedded in their social life can also be influenced by community leaders (Tandos, 2013) including religious leaders. It is important for people to be supported with Islamic spiritual support in order to practice health behaviors.

Social support from family was an important predictor, which was similar to existing studies, which found that social support predicted decreased fat intake and increased exercise (Burke, Mansour et al., 2008) and effort to control hypertension in Indonesia (Dalyoko, Kusumawati, & Ambarwati, 2011).

4. Support from Kader and health professionals are key social predictors: Enabling factors.

Support from Kader (community health volunteers) and health professionals were indirect social predictors of PPHBs, which supported seeking health information and competence. These findings were similar to the PPM, in which enabling factors like health system support facilitated the accessibility and availability of the health behaviors. Support from the health system was an important predictor, which was also similar to an existing study that found trust in physician predicted medication adherence (Cufee et al., 2013).

5. Environmental barriers to healthy eating was key environmental predictors.

Environmental barriers to healthy eating directly predicted salt reduction behavior. These barriers included stores with a limited supply of healthy food, limited food that had nutritional labels, and healthy food that was too expensive. These findings were similar to the PPM, in which environmental factors impacted people's health behaviors. The Indonesian Ministry of Health pointed out that various media promoted processed and fast food, which are high in salt, fat and sugar (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2013). These environmental barriers affected people's behavior and was also similar to an existing study which found participants had difficulties to go to the clinic and was associated with medical non adherence (Martin et al., 2011).

6. Eating vegetables and fruits, stress management and perceived health status were key predictors for quality of life.

Eating vegetables and fruits, stress management and perceived health status predicted QOL for the participants with hypertension. These findings were similar to the PPM, in which healthy behaviors led to improved health and QOL. Perceived health status predicted QOL, which was also similar to an existing theoretical model (Ferrans, Zerwic, Wilbur, & Larson, 2005). This theoretical model is one frequently used as a health-related

QOL model (Bakas et al., 2012).

III. Implications

In Indonesia, NCDs are an emerging health issue due to aging society and economic growth. The district health professionals regarded the difficulties in the implementation of health programs as due to limited human resources for health promotion and a limited budget for the health sector (Mizutani et al., 2015). In order to achieve the district's health vision of "Healthy Community Which is Independent and Equitable" (Dinas Kesehatan Kabupaten Indramayu, 2014), it is important to implement activities for NCDs prevention and health promotion at the personal, community, and district level.

For the personal level, it is important for the district's individuals to increase awareness of their health status and to prevent NCDs and to promote their health. This study indicated that there were limitations in health check-ups, salt reduction, exercise, and smoking cessation. Thus, it is especially important for individuals to check their health status periodically, practice salt reduction, exercise, and smoking cessation.

For the community and district level, it is important for the district health professionals to create an environment so that the district's people can choose healthy behaviors. According to the World Health Organization (2010a), educational and income level are important social determinants of health. Most of participants of this study had a low educational level and family income. Therefore, it is important for the district to create an environment whereby socially disadvantaged people can choose healthy behaviors. This study indicated that the participants were supported by Islamic spiritual and activity support, social support, and health professional support. This study also found that the salt-reduction behavior of people was prevented by environmental barriers. Thus, it is important for people to be supported with these predictors in order to practice healthy behaviors at community settings. The author proposed as follows:

1. Development of health programs to improve NCDs prevention and health promotion

1) Promotion of PPHBs particularly for salt reduction by providing information at community settings.

In Indonesia, ‘CERDIK’ behaviors (i.e. health check-up, non-smoking, physical activity, healthy diet, rest, stress management) are recommended in order to prevent NCDs and promote health (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2013). However, there are issues in community health activities in Indonesia for the prevention of NCDs and promotion of health. These are: limited implementation of NCDs prevention programs and activities (Direktorat Jenderal Pengendalian Penyakit dan Penyehatan Lingkungan, Kementerian Kesehatan Republik Indonesia, 2012); and health promotion for NCDs is not integrated into primary health care programs (Kementerian Kesehatan Republik Indonesia, 2011).

As a primary health care program, it is important to provide health education focusing on salt reduction at community settings like Puskesmas (community health center) and Posbindu (community health post).This is because there is evidence that salt reduction decreases blood pressure (Graudal et al., 2011; He et al., 2013; Hooper et al., 2004). This is also because our study indicated seeking health information is a key for salt reduction, which is similar to a literature review conducted in low- and middle-income countries that health education focusing on salt reduction was a key element for controlling hypertension (van de Vijver, Oti, Addo, de Graft-Aikins, & Agyemang, 2012). Heath professionals who work at Puskesmas and Posbindu should provide the community people with concrete information about salt reduction and hypertension e.g. relation of salt and raised blood pressure, the amount of salt in food in the district, choosing food by checking nutritional label, and choosing food that can be a substitution for salty food.

2) Supporting core health behaviors to promote necessary health behaviors for NCDs prevention and health promotion in collaboration with social and religious leaders.

It is important for people to seek health information with support from the *Kader* (health volunteer). This study indicated that the *Kader* supported people in seeking health information. This result is similar to an existing randomized control trial which showed that community health workers supported salt reduction of Mexican American people (Balcazar, Byrd, Ortiz, Tondapu, & Chavez, 2009). Thus, it is necessary for community

health nurses to work with the *Kader* for NCDs prevention and health promotion in community settings.

It is also important for the people to be supported by social and religious leaders. Our study indicated that fulfilling obligation to God, one of the core health behaviors, was influenced by Islamic spiritual support. The district's health professionals pointed out that unhealthy behavior like smoking was influenced by social role models like religious leaders. Indonesian Ministry of Health regarded the importance of increasing awareness and participation of religious leaders for health promotion (Kementerian Kesehatan Republik Indonesia, 2011). In Indonesian within the Muslim women's community, female preachers provide not only religious advice but also family counseling, education, care for the poor, and medical services (van Doorn-Harder, 2006). Moreover, there is a project in which ulama (Islamic religious leaders) work as mediators and discuss HIV/AIDS problem with Muslims at mosques, schools and community centers to increase awareness of people's attitudes towards HIV/AIDS issues (Wagener, 2006). Therefore, it is important for community health nurses to work with social and religious leaders to provide health care program for people for NCDs prevention and health promotion at community settings.

3) Creating healthy environment to reduce salt intake.

The study results indicated that reducing salty food was influenced by environmental barriers to practice healthy eating. Actually, during the author's stay in the district, it was difficult to find salt-reduced food or sugar-reduced drinks at stores and restaurants in the district. It is important not only to provide health information for individuals but also to create a healthy environment for people to choose healthy behaviors. Existing studies found that salt reduction of food had effect in reduction of blood pressure (Ferrante et al., 2011; Nakamura, Aoki, Yamada, & Kubo, 2003; Peng, 2014) and is a cost-effective intervention (Wang & Labarthe, 2011). Because restriction of salt can impact people who are not interested in their health and healthy eating, a broader public health approach should be taken and therefore it is important for health sector to cooperate with industry and food sector to provide people accessibility to healthier food.

2. Strengthening nursing education to improve the health program of NCDs prevention and health promotion.

Nurses play an important role for NCDs prevention and health promotion at community settings. For example, there is evidence that nurses contributed to smoking cessation and health promotion in community settings (World Health Organization, 2012a). In order to improve health programs for NCDs prevention and health promotion in the district, competence of nurses should be strengthened. The author explains implications as follows:

1) Including noncommunicable disease as a national standard of the role for community health.

In Indonesia, NCDs prevention and control are not clearly included in the national standards of the six community health programs. The six programs include: health promotion, maternal and child health, nutrition, communicable diseases, healthy environment, and treatment (Kementerian Kesehatan Republik Indonesia, 2006a). Therefore, it is necessary to integrate NCDs into the national standard of community health programs.

2) Including adult nursing, nursing for noncommunicable diseases and interprofessional education into the district's basic nursing curriculum.

Globally and nationally, health care with a life-course perspective is important for NCDs prevention and health promotion (Kementerian Kesehatan Republik Indonesia, 2011; World Health Organization, 2013c). Consistent with other countries, risk for NCDs increase with people aged over 40 years in Indonesia (Kementerian Kesehatan Republik Indonesia, Politeknik Kesehatan Palembang & Prodi Keperawatan Lubuklinggau Palembang, 2012). Thus, it is important to provide health education for adults especially middle-aged people. However, there is no subject addressing adult nursing in the national standard of basic nursing education curriculum (Departmen Kesehatan Badan Pengembangan dan Pemberdayaan Sumber Dana Manusia Kesehatan, 2006). The subject of medical surgical nursing includes nursing care for people with diseases. Therefore, it is important to include adult nursing into the basic nursing curriculum which provides education such as stages of human development, NCDs prevention and health promotion, and andragogy to provide health education for an adult population.

Moreover, the district's basic nursing education curriculum should include nursing care for the specific district's health needs in order for nurses to address the district's own health

needs. In Indonesia, in addition to the national standard of subject and credits, there are 14-24 credits that can be added by each institution (Departmen Kesehatan Badan Pengembangan dan Pemberdayaan Sumber Dana Manusia Kesehatan, 2006). Thus, it is important to include nursing care for the emerging district health needs i.e. NCDs into the additional credits.

Further, recently, there is an increasing necessity of interprofessional collaboration to work together with community to provide the highest quality of care (World Health Organization, 2010b; World Health Organization Country Office for Indonesia, 2013). As aforementioned, it is important to work collaboratively with the *Kader* and social and religious leaders. Community health nurses in West Java also regarded that collaboration with other health professionals were key for effective community health activities (Personal interviews with community health nurses at Bandung, West Java during internship at WHO-Indonesia, June 2013). In Indonesia, University of Indonesia began implementing interprofessional education in 2013 (World Health Organization Country Office for Indonesia, 2013). Subsequently, other universities have also started to integrate interprofessional education to bachelor's program in nursing (Personal interviews with nursing faculties at Padjadjaran University and Muhammadiyah University Yogyakarta, June & December, 2014). The bachelor's program in nursing in this district also needs to include the education in order for nursing students to prepare to work together with health professionals at community settings.

3) Including nursing for noncommunicable diseases at community setting and nursing research into the district's advanced-level nursing curriculum.

Although NCDs are an increasing health issue, community health nurses in West Java perceived a limited opportunity to learn about NCDs (Personal interviews with community health nurses at Bandung, West Java during internship at WHO-Indonesia, June 2013). Compared to the previous national basic nursing curriculum (Kementerian Pendidikan dan Kebudayaan Republik Indonesia, 1999), credits for community nursing have decreased in the current national basic nursing curriculum (Departmen Kesehatan Badan Pengembangan dan Pemberdayaan Sumber Dana Manusia Kesehatan, 2006). The World Health Organization (2013a) recommends, practicing a population-based approach, community-wide changes in unhealthy behaviors targeting community, and a focus on the

worksite to reduce hypertension. Therefore, it is necessary for community health nurses to be competent not only in case management of risk groups but also in NCDs prevention and health promotion for the whole community. Continuous education such as the burden of NCDs, behavioral counseling, NCDs prevention and health promotion in community settings should be provided at an advanced-level of nursing education.

In addition, the district's health professionals pointed out that there were limited surveys regarding health behaviors related to NCDs (Tashiro et al., 2014). Globally, it is necessary for nurses to conduct surveys on risky health behaviors, evaluation of current practice, and best strategies to address NCDs (World Health Organization, 2012a). Therefore, it is important for nurses in the district or province to have competence in nursing research at advanced-level of nursing education.

IV. Strength and Limitations of the Study

The strength of this study was that it was the first one to provide information about PPHBs and its predictors of middle-aged Muslim with hypertension in rural West Java from the perspective of that population.

Limitation of this study was that most of the sample (77%) were female because participants were recruited at Puskesmas (community health centers) during the daytime and the men were working. In order to understand perceptions of male participants, it is necessary to conduct a study with larger sample of male participants. It is also necessary to add questions to grasp men's health behaviors (e.g. occupational labor and transportation as physical activity).

Another strength of this study was that this study indicated positive predictors of the PPHBs of the participants with hypertension as was expected in the study framework. However, the limitation was that negative predictors appeared only for healthy eating behaviors by using structural equation modeling. This may be because majority of participants were female and they may have perceived negative predictors only for healthy eating. This also may be because of the difficulty in understanding the wording of questions about negative predictors. Since 62% of participants had not completed primary school, health literacy may be more of an issue than was anticipated. Therefore, it may be better to

develop a questionnaire with easier wording.

Furthermore, this study found the perceptions of middle-aged Muslim with hypertension in the district. However, Indonesian people's perceptions can be influenced by community leaders (religious leaders, village leaders) (Discussion forum with the district's health professionals on December 12, 2014). Thus, further study is needed to grasp the perceptions of community leaders in order to understand the perceptions of individuals.

Chapter 7.
Conclusion

This study developed a perceived preventative and promotive health behaviors (PPHBs) model of middle-aged people with hypertension in a rural district of West Java. It revealed the relationships among the PPHBs and its predictors using a questionnaire survey and structural equation modeling.

A study framework was developed by this researcher based on the Precede-Proceed Model (PPM), a literature review (research synthesis) and a preliminary study. The framework proposed that perceived PPHBs were predicted by perceived predictors. The study framework was examined using structural equation modeling.

The middle-aged Muslim with hypertension indicated limited PPHBs for salt reduction, smoking cessation, exercise, and health check-ups although these behaviors are important for noncommunicable diseases (NCDs) prevention and health promotion. People from Puskesmas A (high-density coastal area) practiced healthier behaviors such as eating vegetables and fruits, exercise, stress management, and seeking health information.

This study indicated core health behaviors that promoted the important health behaviors. Seeking health information predicted salt reduction (β =.18), eating vegetable and fruits (.20), and stress management (.14). Fulfilling obligations to God predicted salt reduction (.19) and stress management (.24).

Moreover, this study indicated that the core behaviors were positively predicted by other predictors as expected in the study framework. These predictors were: behavioral beliefs, competence, Islamic spiritual support, family's support and support from health professionals and Kader (community health volunteers). These findings supported the PPM, in which behavioral beliefs and competence are predisposing factors, Islamic and family's support are reinforcing factors, and support from health professionals and Kader is enabling factors. Furthermore, this study indicated that PPHBs like eating vegetables and fruits predicted perceived health status and stress management, which also support the PPM.

Therefore, it is necessary for the people to be supported with the core health behaviors and the predictors in order to practice those limited health behaviors. It is necessary for

community health nurses to promote healthy behaviors particularly salt reduction by providing information, to support their healthy behaviors in collaboration with the *Kader* (health volunteer) and social and religious leaders, and to create healthy environment to choose healthy behaviors in cooperation with industry and food sector. Basic and advanced nursing education needs to be strengthened in order to enhance community health nurses ability to enact NCDs prevention and health promotion for the middle-aged people at community settings and to better work with other health professionals.

This study was the first of its kind to provide the information about PPHBs and its predictors of middle-aged Muslim with hypertension in rural West Java based on their perspective. Future studies should include more men and in general a larger sample size.

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Annex A. Developed Questionnaires (Indonesian language)

Kuesioner Karakteristik Partisipan

Petunjuk untuk Reviewer Kuesioner: Pertanyaan di bawah ini dibuat untuk mengukur karakteristik partisipan penderita hipertensi yang berusia "middle-aged" (antara 40 – 64 tahun) di daerah pedesaan Jawa Barat, Indonesia.

Petunjuk untuk Partisipan: Kuesioner ini berisi pernyataan tentang karakteristik Saudara. Silahkan berikan jawaban untuk setiap pertanyaan seakurat mungkin, dan usahakan jangan ada pertanyaan yang terlewat. Berikan jawaban dengan memberikan lingkaran:

1	(Periksa tekanan darah partisipan)	/ mmHg				
2	(Periksa tinggi badan partisipan)	cm				
3	(Periksa berat badan partisipan)	kg				
4	(Jenis kelamin partisipan pria atau wanita?)	Pria	Wanita			
5	Berapa usia saudara?	tahun				
6	Pendidikan terakhir yang diikuti?	Tidak lulus SD	Lulus SD	Lulus SMP	Lulus SMA	Lulus Perguruan Tinggi (D3/S1)
7	Apa pekerjaan Saudara?	Petani	Pegawai Negeri Sipil	Perusahaan/ Swasta	Ibu Rumah Tangga	Lainnya ( )
8	Berapa pendapatan keluarga Saudara? (Diisi sendiri oleh Partisipan)	< Rp.999,999	Rp.1,000,000 s.d. < Rp.2,000,000	Rp. 2,000,000 s.d. < Rp.3,000,000	≥ Rp.3,000,000	
9	Apakah Saudara hidup bersama suami/istri?	Ya	Tinggal terpisah	Sudah meninggal	Sudah cerai	
10	Berapa jumlah anak kandung yang masih hidup?	anak				
11	Berapa jumlah anak yang masih sekolah?	anak				
12	Apakah Saudara hidup bersama cucu?	Ya	Tinggal terpisah	Tidak ada		
13	Apakah Saudara hidup bersama orang tua?	Ya	Tinggal terpisah	Sudah meninggal		
14	Apa nama Puskesmas yang terdekat dengan tempat tinggal Saudara?	Karangampel	Jatibarang	Pasekan	Kroya	Lainnya
15	Sudah berapa lama Saudara menderita hipertensi (tekanan darah tinggi)?	Sejak.....tahun yang lalu (jika kurang dari 1 tahun, sejak.....bulan yang lalu)				
16	Apakah Saudara meminum obat hipertensi?	Ya, rutin	Ya, tapi tidak rutin	Sudah berhenti karena saran petugas kesehatan	Sudah berhenti karena keputusan sendiri	Tidak
17	Dimana tempat Saudara memeriksakan hipertensi?	Puskesmas	Posyandu	Bidan	Dokter	Lainnya ( )
18	Dengan cara apa Saudara pergi ke tempat tersebut?	Jalan kaki	Naik sepeda	Naik sepeda motor	Naik angkot	Lainnya ( )
19	Bagaimana Saudara membayar biaya pengobatannya?	Bayar sendiri	BOK (Bantuan Pemerintah)	Jamkesmas	Asuransi dari Perusahaan (eg. Jamsostek)	Asuransi Pemerintah (eg. Askes)	Jaminan Kesehatan National / BPJS
20	Apakah Saudara mempunyai keluhan masalah kesehatan yang lain?	Tidak	Nyeri otot	Pusing	Sakit Kepala	Masalah penglihatan
			Lumpuh	Lainnya ( )		

Kuesioner Perilaku Pencegahan dan Peningkatan Kesehatan

Petunjuk: Kuesioner ini berisi pernyataan tentang perilaku yang Saudara lakukan untuk menjaga dan meningkatkan kesehatan. Berikan jawaban untuk setiap pertanyaan seakurat mungkin, dan jangan ada pertanyaan yang terlewat. Tandai jawaban sesuai dengan frekuensi kegiatan yang Saudara lakukan, dengan cara melingkari:
T untuk (Tidak Pernah), **K** untuk (Kadang-Kadang), **S** untuk (Sering), **R** untuk (Rutin, setiap hari)

			Penilaian Frekuensi			
			Tidak pernah	Kadang-kadang	Sering	Rutin
Perilakiu makan	HB 01	Saya makan krupuk.	T	K	S	R
	HB 02	Saya makan sayur asam.	T	K	S	R
	HB 03	Saya makan tempeh	T	K	S	R
	HB 04	Saya makan bakso.	T	K	S	R
	HB 05	Saya makan sop ayam.	T	K	S	R
	HB 06	Saya makan mie ayam.	T	K	S	R
	HB 07	Saya mengurangi makan makanan asin	T	K	S	R
	HB 08	Saya (suami/istri atau keluarga saya) mengurangi garam saat memasak	T	K	S	R
	HB 09	Saya mengurangi makanan manis (cth. kue/roti manis, teh manis, kopi manis)	T	K	S	R
	HB 10	Saya mengurangi gorengan	T	K	S	R
	HB 11	Saya mengurangi jumlah porsi makanan	T	K	S	R
	HB 12	Saya makan sayuran (cth. bayam, kangkung, wortel, kol, daun singkong)	T	K	S	R
	HB 13	Saya makan buah-buahan selama musim hujan (cth. pisang, jeruk, mangga, pepaya)	T	K	S	R
	HB 14	Saya makan buah-buahan selama musim kemarau (cth. pisang, jeruk, mangga,pepaya)	T	K	S	R
	HB 15	Saya makan tahu	T	K	S	R
	HB 16	Saya makan daging (cth. daging ayam, sapi, kambing)	T	K	S	R
	HB 17	Saya makan ikan segar / basah	T	K	S	R

Aktivitas Fisik	HB 18	Saya membersikan rumah lebih dari 30 menit.	T	K	S	R
	HB 19	Saya mencuci pakaian lebih dari 30 menit.	T	K	S	R
	HB 20	Saya mencuci piring lebih dari 30 menit.	T	K	S	R
	HB 21	Saya berjalan-jalan di sekitar rumah lebih dari 30 menit.	T	K	S	R
	HB 22	Saya berjalan-jalan pagi lebih dari 30 menit.	T	K	S	R
	HB 23	Saya menggerak-gerakkan badan lebih dari 30 menit	T	K	S	R
Istirahat	HB 24	Saya tidur dengan cukup	T	K	S	R
	HB 25	Saya tidur siang.	T	K	S	R
	HB 26	Saya beristirahat ketika saya perlu istirahat (cth. pada saat kelelahan, pusing,sakit kepala)	T	K	S	R
	HB 27	Saya mengurangi lama waktu kerja untuk menghindari kelelahan	T	K	S	R
Tidak merokok	HB 28	Saya merokok didalam rumah	T	K	S	R
	HB 29	Saya merokok diluar rumah	T	K	S	R
	HB 30	Saya merokok kapan pun saya ingin	T	K	S	R
	HB 31	Saya merokok setelah bekerja	T	K	S	R
	HB 32	Saya merokok ketika ada orang yang mengajak	T	K	S	R
	HB 33	Saya merokok selama ada pertemuan/berkumpul dengan orang lain	T	K	S	R
Mengelola stress	HB 34	Saya beristirahat untuk mengurangi stress.	T	K	S	R
	HB 35	Saya melakukan sesuatu untuk bersantai	T	K	S	R
	HB 36	Saya berhenti berpikir terlalu banyak untuk mengurangi stress	T	K	S	R
	HB 37	Saya mengobrol dengan orang lain (cth. suami/istri, keluarga, teman) untuk mengurangi stress.	T	K	S	R
	HB 38	Saya menonton TV untuk mengurangi stress.	T	K	S	R
	HB 39	Saya tidur untuk mengurangi stress.	T	K	S	R
	HB 40	Saya makan untuk mengurangi stress.	T	K	S	R
Mencari informasi kesehatan	HB 41	Saya mencoba untuk mendapatkan informasi kesehatan	T	K	S	R
	HB 42	Saya dapat informasi kesehatan dari keluarga saya	T	K	S	R
	HB 43	Saya dapat informasi kesehatan dari teman.	T	K	S	R
	HB 44	Saya dapat informasi kesehatan dari puskesmas	T	K	S	R
	HB 45	Saya bertanya kepada kader tentang kesehatan.	T	K	S	R
	HB 46	Saya bertanya kepada dokter praktek tentang kesehatan.	T	K	S	R
	HB 47	Saya bertanya bidan tentang kesehatan.	T	K	S	R
	HB 48	Saya bertanya mantri/perawat tentang kesehatan.	T	K	S	R
	HB 49	Saya memeriksakan kesehatan (cth. tekanan darah, berat badan)	T	K	S	R
	HB 50	Saya dapat informasi kesehatan dari TV.	T	K	S	R

Mencari layanan kesehatan	HB 51	Saya membeli obat di warung bila saya sakit (cth. sakit kepala, nyeri otot)	T	K	S	R
	HB 52	Saya pergi ke posyandu bila saya sakit (cth. sakit kepala, nyeri otot)	T	K	S	R
	HB 53	Saya pergi ke puskesmas bila saya sakit (cth. sakit kepala, nyeri otot)	T	K	S	R
	HB 54	Saya pergi ke dokter swasta bila saya sakit (cth. sakit kepala, nyeri otot)	T	K	S	R
	HB 55	Saya pergi ke bidan bila saya sakit (cth. sakit kepala, nyeri otot)	T	K	S	R
	HB 56	Saya pergi ke mantri/perawat bila saya sakit (cth. sakit kepala, nyeri otot)	T	K	S	R
	HB 57	Saya pergi ke rumah sakit ketika saya sakit (cth. sakit kepala, nyeri otot)	T	K	S	R
	HB 58	Saya mengikuti saran dari petugas kesehatan	T	K	S	R
	HB 59	Saya gunakan obat yang diberikan oleh petugas kesehatan	T	K	S	R
Kepedulian kepada orang lain	HB 60	Saya bekerja untuk menafkahi/menghidupi keluarga	T	K	S	R
	HB 61	Saya memikirkan kesehatan orang lain	T	K	S	R
	HB 62	Saya menjaga hubungan baik dengan orang lain	T	K	S	R
	HB 63	Saya berdiskusi tentang kesehatan dengan orang lain.	T	K	S	R
	HB 64	Saya mendukung kegiatan kemasyarakatan (cth. Posyandu, opsih, perayaan)	T	K	S	R
	HB 65	Saya menyediakan makanan untuk orang lain	T	K	S	R
Memenuhi kewajiban kepada Tuhan	HB 66	Saya sholat sehari 5 kali	T	K	S	R
	HB 67	Saya sholat lebih dari yang diwajibkan (cth. Melaksanakan sholat sunah)	T	K	S	R
	HB 68	Saya sholat dengan cara yang benar	T	K	S	R
	HB 69	Saya melaksanakan puasa sunah. (cth. puasa Senin-Kamis)	T	K	S	R
	HB 70	Saya mengaji Qur'an	T	K	S	R
	HB 71	Saya memohon pertolongan Allah ketika saya mempunyai masalah	T	K	S	R
	HB 72	Saya ikhlas menerima segala cobaan hidup.	T	K	S	R

Terima kasih banyak untuk kerjasama Saudara

Kuesioner Prediktor Perilaku Pencegahan & Peningkatan Kesehatan

Petunjuk untuk partisipan: Kuesioner ini berisi pernyataan tentang alasan Saudara mengapa berperilaku sehat. Silahkan berikan jawaban untuk setiap pertanyaan seakurat mungkin, dan jangan ada pertanyaan yang terlewat. Tandai tingkat persetujuan Saudara dengan melingkari:
STS untuk Sangat Tidak Setuju, **TS** untuk Tidak Setuju, **RR** untuk Ragu-Ragu, **S** untuk Setuju, **SS** untuk Sangat Setuju.

			Penilaian Persetujuan				
		Prediktor Positif	Sangat tidak setuju	Tidak setuju	Ragu-ragu	Setuju	Sangat setuju
Keyakinan berperilaku	PP 01	Saya berperilaku sehat supaya bisa bekerja untuk keluarga saya	STS	TS	RR	S	SS
	PP 02	Saya berperilaku sehat supaya bisa meningkatkan kesehatan keluarga	STS	TS	RR	S	SS
	PP 03	Saya berperilaku sehat supaya bisa bekerja untuk masyarakat	STS	TS	RR	S	SS
	PP 04	Saya berperilaku sehat supaya bisa melaksanakan ibadah kepada Allah	STS	TS	RR	S	SS
	PP 05	Saya berperilaku sehat supaya mendapatkan berkah dari Allah	STS	TS	RR	S	SS
	PP 06	Saya berperilaku sehat supaya bisa sehat	STS	TS	RR	S	SS
	PP 07	Saya berperilaku sehat supaya bahagia	STS	TS	RR	S	SS
Kompetensi	PP 08	Saya menyadari kondisi kesehatan ketika saya sakit	STS	TS	RR	S	SS
	PP 09	Saya tahu pentingnya berperilaku sehat	STS	TS	RR	S	SS
	PP 10	Saya yakin untuk berperilaku sehat.	STS	TS	RR	S	SS
	PP 11	Saya mampu untuk berperilaku sehat.	STS	TS	RR	S	SS
	PP 12	Saya bisa berkomunikasi dengan orang lain tentang kesehatan saya	STS	TS	RR	S	SS
	PP 13	Saya bisa mencari pelayanan kesehatan untuk menjaga kesehatan diri saya	STS	TS	RR	S	SS
Pengalaman seberumnya	PP 14	Saya berperilaku hidup sehat karena saya pernah sakit (cth. hipertensi,stroke).	STS	TS	RR	S	SS
	PP 15	Saya berperilaku sehat karena melihat orang lain yang pernah mengalami sakit (cth. hipertensi,stroke)	STS	TS	RR	S	SS
	PP 16	Saya berperilaku sehat karena mengalami peningkatan status kesehatan	STS	TS	RR	S	SS
	PP 17	Saya berperilaku sehat karena orang lain mengalami peningkatan status kesehatan	STS	TS	RR	S	SS

Dukungan agama	PP 18	Allah menolong saya ketika saya mempunyai masalah kesehatan	STS	TS	RR	S	SS
	PP 19	Allah memberi saya kesehatan yang baik	STS	TS	RR	S	SS
	PP 20	Allah menganugerahi segalanya dalam kehidupan saya	STS	TS	RR	S	SS
	PP 21	Berdoa kepada allah akan menolong saya.	STS	TS	RR	S	SS
	PP 22	Ustadz menbantu saya memahami agama.	STS	TS	RR	S	SS
	PP 23	Ustadz mendekatkan saya kepada Allah.	STS	TS	RR	S	SS
	PP 24	Ustadz menbantu saya memahami kesehatan.	STS	TS	RR	S	SS
	PP 25	Pengajian menbantu saya memahami agama.	STS	TS	RR	S	SS
	PP 26	Pengajian mendekatkan saya kepada Allah.	STS	TS	RR	S	SS
	PP 27	Pengajian menbantu saya memahami kesehatan.	STS	TS	RR	S	SS
Dukungan sosial	PP 28	Keluarga saya memberikan nasihat/saran untuk kesehatan saya	STS	TS	RR	S	SS
	PP 29	Keluarga saya peduli tentang kesehatan diri saya	STS	TS	RR	S	SS
	PP 30	Keluarga saya memberikan semangat kepada saya untuk mempraktekkan perilaku sehat.	STS	TS	RR	S	SS
	PP 31	Keluarga mengantar saya ke layanan kesehatan (cth. Puskesmas).	STS	TS	RR	S	SS
	PP 32	Keluarga mendukung saya dengan menyediakan barang/bahan (cth. jamu, obat, makanan)	STS	TS	RR	S	SS
	PP 33	Keluarga membantu kerja saya ketika saya sakit	STS	TS	RR	S	SS
	PP 34	Keluarga memijat saya ketika saya lelah	STS	TS	RR	S	SS
	PP 35	Teman/tetangga saya memberi nasihat/saran tentang kesehatan saya.	STS	TS	RR	S	SS
	PP 36	Teman-teman /tetangga saya memperhatikan kesehatan saya.	STS	TS	RR	S	SS
	PP 37	Teman-teman/tetangga saya memberikan semangat kepada saya untuk mempraktekkan perilaku sehat.	STS	TS	RR	S	SS
	PP 38	Teman/tetangga saya mengantar saya ke layanan kesehatan.	STS	TS	RR	S	SS
	PP 39	Ketua RW/RT memberi saran/nasihat tentang kesehatan saya.	STS	TS	RR	S	SS
	PP 40	Ketua RW/RT peduli terhadap kesehatan saya.	STS	TS	RR	S	SS
	PP 41	Ketua RW/RT memberikan semangat kepada saya untuk mempraktekkan perilaku sehat	STS	TS	RR	S	SS
	PP 42	Ketua RW/RT mengantar saya ke tempat layanan kesehatan.	STS	TS	RR	S	SS

Dukungan sistem kesehatan	PP 43	Kader kesehatan memberi saran/nasihat tentang kesehatan saya.	STS	TS	RR	S	SS
	PP 44	Kader kesehatan peduli terhadap kesehatan saya.	STS	TS	RR	S	SS
	PP 45	Kader Kesehatan memberikan semangat kepada saya untuk mempraktekkan perilaku sehat	STS	TS	RR	S	SS
	PP 46	Kader kesehatan mengantar saya ke tempat layanan kesehatan.	STS	TS	RR	S	SS
	PP 47	Kader kesehatan mendukung saya dengan menyediakan layanan Posyandu.	STS	TS	RR	S	SS
	PP 48	Petugas kesehatan (cth. dokter, bidan, mantri/perawat) memberi nasihat/saran tentang kesehatan saya.	STS	TS	RR	S	SS
	PP 49	Petugas kesehatan (cth. dokter, bidan, mantri/perawat) peduli terhadap kesehatan saya.	STS	TS	RR	S	SS
	PP 50	Petugas Kesehatan (cth. dokter, bidan, perawat) memberikan semangat kepada saya untuk mempraktekkan perilaku sehat.	STS	TS	RR	S	SS
	PP 51	Petugas kesehatan mendukung saya dengan menyediakan layanan kesehatan (cth. obat-obatan, memeriksa tekanan darah)	STS	TS	RR	S	SS
	PP 52	Pelayanan kesehatan menjadi terjangkau dengan asuransi kesehatan (cth. Jamkesmas /BPJS /Askes /Jamsostek /Surat miskin).	STS	TS	RR	S	SS
	PP 53	Dengan asuransi kesehatan (cth. Jamkesmas /BPJS /Askes /Jamsostek /Surat miskin)pelayanan kesehatan saya memadai.	STS	TS	RR	S	SS

Terimakasih banyak untuk kerjasama Saudara

		Prediktor Negatif	Penilaian Persetujuan				
			Sangat tidak setuju	Tidak setuju	Ragu-ragu	Setuju	Sangat setuju
Hambatan personal	NP 01	Sulit untuk berhenti makan banyak jika saya lelah (capek)	STS	TS	RR	S	SS
	NP 02	Sulit untuk berhenti makan banyak, karena saya menikmatinya	STS	TS	RR	S	SS
	NP 03	Sulit untuk mengurangi makanan asin karena saya menikmatinya	STS	TS	RR	S	SS
	NP 04	Sulit untuk mengurangi makanan asin, karena saya sudah lama mengkonsumsi makanan asin.	STS	TS	RR	S	SS
	NP 05	Sulit makan makanan sehat karena saya tidak mempunyai informasi tentang makanan sehat.	STS	TS	RR	S	SS
	NP 06	Sulit untuk memakan makanan yang sehat karena makanan sehat itu mahal.	STS	TS	RR	S	SS
	NP 07	Sulit untuk berolahraga jika saya lelah (capek)	STS	TS	RR	S	SS
	NP 08	Sulit untuk berolahraga karena saya tidak menikmatinya/nyaman	STS	TS	RR	S	SS
	NP 09	Sulit untuk berolahraga, karena saya sibuk.	STS	TS	RR	S	SS
	NP 10	Sulit untuk berolahraga karena saya sudah tidak melakukannya dalam jangka waktu yang lama	STS	TS	RR	S	SS
	NP 11	Sulit untuk berolahraga karena saya tidak mempunyai informasi tentang olahraga.	STS	TS	RR	S	SS
	NP 12	Sulit untuk berolahraga karena peralatannya mahal.	STS	TS	RR	S	SS
	NP 13	Sulit untuk beristitrahat karena saya sibuk	STS	TS	RR	S	SS
	NP 14	Sulit untuk beristirahat karena saya mempunyai banyak pekerjaan	STS	TS	RR	S	SS
	NP 15	Sulit berhenti merokok, karena saya menikmatinya.	STS	TS	RR	S	SS

Hambatan personal	NP 16	Sulit berhenti merokok, karena saya sudah lama merokok.	STS	TS	RR	S	SS
	NP 17	Sulit untuk berhenti merokok karena saya tidak mempunyai pengetahuan tentang bagaimana cara berhenti merokok.	STS	TS	RR	S	SS
	NP 18	Sulit untuk berhenti merokok karena harganya terjangkau.	STS	TS	RR	S	SS
	NP 19	Sulit untuk berhenti merokok karena saya bisa merokok di sembarang tempat.	STS	TS	RR	S	SS
	NP 20	Sulit untuk berhenti berpikir terlalu banyak, karena ketebatasan penghasilan.	STS	TS	RR	S	SS
	NP 21	Sulit untuk mendapatkan informasi kesehatan, karena saya sibuk.	STS	TS	RR	S	SS
	NP 22	Sulit untuk mendapatkan informasi kesehatan karena saya tidak tahu dimana mendapatkannya	STS	TS	RR	S	SS
	NP 23	Sulit pergi ke pelayanan kesehatan, karena saya khawatir bermasalah.	STS	TS	RR	S	SS
	NP 24	Sulit untuk pergi ke tempat pelayanan kesehatan karena saya sibuk	STS	TS	RR	S	SS
	NP 25	Sulit untuk pergi ke pelayanan kesehatan yang lebih baik, karena saya tidak mempunyai informasinya.	STS	TS	RR	S	SS
	NP 26	Sulit untuk mendapat pelayanan kesehatan yang lebih baik, karena layanan kesehatan yang baik itu mahal. (cth. dokter yang baik, rumah sakit)	STS	TS	RR	S	SS
	NP 27	Sulit untuk memenuhi ibadah wajib, karena saya sibuk	STS	TS	RR	S	SS
	NP 28	Sulit untuk mempraktekkan perilaku sehat karena saya lelah.	STS	TS	RR	S	SS
	NP 29	Sulit untuk mempraktekkan perilaku sehat jika saya tidak menikmatinya/nyaman	STS	TS	RR	S	SS
	NP 30	Sulit untuk mempraktekkan perilaku sehat jika saya sibuk	STS	TS	RR	S	SS
	NP 31	Sulit untuk mempraktekkan perilaku sehat jika saya punya banyak pekerjaan	STS	TS	RR	S	SS
	NP 32	Sulit untuk mempraktekkan perilaku sehat jika saya belum pernah melakukannya	STS	TS	RR	S	SS
	NP 33	Sulit untuk mempraktekkan perilaku sehat jika saya tidak mempunyai informasi tentang perilaku sehat.	STS	TS	RR	S	SS
	NP 34	Sulit untuk mempraktekkan perilaku sehat jika mahal	STS	TS	RR	S	SS
	NP 35	Sulit untuk mempraktekkan perilaku sehat jika saya tidak punya cukup uang	STS	TS	RR	S	SS

Hambatan sosial	NP 36	Sulit untukberhenti makan terlalu banyak jika ada orang yang menyediakannya.	STS	TS	RR	S	SS
	NP 37	Sulit untuk berhenti mengkonsumsi makanan/minuman manis jika ada orang yang menyediakannya.	STS	TS	RR	S	SS
	NP 38	Sulit untuk berhenti makan terlalu banyak setelah bekerja.	STS	TS	RR	S	SS
	NP 39	Sulit untuk berhenti mengkonsumsi makanan/minuman manis setelah bekerja.	STS	TS	RR	S	SS
	NP 40	Sulit untuk berhenti makan terlalu banyak saat menghadiri pertemuan sosial.	STS	TS	RR	S	SS
	NP 41	Sulit untuk berhenti mengkonsumsi makanan/minuman manis saat menghadiri pertemuan sosial.	STS	TS	RR	S	SS
	NP 42	Sulit untuk berolahraga, karena saya tidak punya teman.	STS	TS	RR	S	SS
	NP 43	Sulit untuk berolahraga karena keterbatasan kesempatan.	STS	TS	RR	S	SS
	NP 44	Sulit untuk berhenti merokok jika ada orang yang menyediakan rokoknya.	STS	TS	RR	S	SS
	NP 45	Sulit untuk berhenti merokok setelah bekerja.	STS	TS	RR	S	SS
	NP 46	Sulit untuk berhenti merokok saat pertemuan sosial. (cth. Rapat RT, tahlilan)	STS	TS	RR	S	SS
	NP 47	Sulit untuk pergi ke pelayanan kesehatan, karena hanya melayani di siang hari	STS	TS	RR	S	SS
	NP 48	Sulit untuk pergi ke tempat pelayanan kesehatan yang memberikan layanan yang terjangkau	STS	TS	RR	S	SS
	NP 49	Sulit untuk pergi ke tempat pelayanan kesehatan yang memberikan layanan yang baik	STS	TS	RR	S	SS
	NP 50	Sulit untuk mempraktekkan perilaku sehat jika orang lain tidak melakukannya	STS	TS	RR	S	SS
	NP 51	Sulit untuk mempraktekkan perilaku sehat karena ada keterbatasan kesempatan mempelajarinya.	STS	TS	RR	S	SS
Hambatan lingkungan	NP 52	Sulit untuk makan makanan sehat karena sedikit toko yang menyediakan makanan sehat.	STS	TS	RR	S	SS
	NP 53	Sulit untuk makan makanan sehat karena tidak adanya label pada makanan	STS	TS	RR	S	SS
	NP 54	Sulit untuk beraktivitas fisik karena cuaca panas.	STS	TS	RR	S	SS
	NP 55	Sulit untuk berolahraga karena keterbatasan tempat.	STS	TS	RR	S	SS
	NP 56	Sulit untuk berolahraga karena tempatnya jauh.	STS	TS	RR	S	SS
	NP 57	Sulit untuk pergi ke tempat olahraga karena keterbatasan transportasi.	STS	TS	RR	S	SS
	NP 58	Sulit untuk pergi ke rumah sakit karena jauh.	STS	TS	RR	S	SS
	NP 59	Sulit untuk pergi ke rumah sakit karena keterbatasan transportasi.	STS	TS	RR	S	SS

Terimakasih banyak untuk kerjasama Saudara

Annex A. Developed Questionnaires (Cont.) (English)

Socio-demographic Characteristics Questionnaire

Directions for research assistant: Please confirm that the participant is: 1) diagnosed with hypertension; 2) aged 40-64; 3) Muslim; 4) not pregnant and 5) signed consent inform.

Directions: This questionnaire contains statements about your characteristics. Please respond to each question as accurately as possible. Indicate the response by circling:

1	(Please check participant's blood pressure.)	/ mmHg				
2	(Please check the participant's height)	cm				
3	(Please check the participant's weight)	kg				
4	(Is the participant male or female?)	Male	Female			
5	How old are you?	years old				
6	What is your last educational attainment?	Less than primary school	Completed primary school	Completed junior high school	Completed high school	Completed diploma /bachelor
7	What is your job?	Farmer	Government worker	Hired by company	Homemaker	Other ( )
8	How much is your family income? (Participants circle by themselves.)	-999,999	1,000,000 -2,000,000	2,000,000 -3,000,000	3,000,000-	
9	Do you stay with your spouse?	Yes	Stay at different place	Passed away	Divorced	
10	How many total children do you have?	children				
11	How many children are still going to school?	children				
12	Do you stay with your grandchildren?	Yes	Stay at different place	I don't have		
13	Do you stay with your parents?	Yes	Stay at different place	Passed away		
14	What is the name of nearest Puskesmas (health center)?					
15	How long have you had hypertension?	Since years ago (->if less than one year, since month ago)				
16	Do you take medicine for hypertension?	Yes	Stopped by health worker's judgment	Stopped by my judgment	No	
17	Where do you go to control hypertension?	Puskesmas (health center)	Posyandu (health post)	Midwife	Doctor	Other ( )
18	How do you go to there?	Walk	Bicycle	Motorbike	Angkot (bus)	Other ( )
19	How do you pay your medical fee?	By oneself	Insurance for the poor (Jamkesmas)	Government assistance (BOK)	Company's insurance (e.g. Jamsostek)	Government insurance (e.g. Askes)	National health insurance (JKN)
20	Do you have any other health problem now?	No	Myalgia	Dizziness	Headache	Vision problem
			Paralysis	Other ( )		

Preventive and Promotive Health Behaviors Questionnaire

Directions: This questionnaire contains statements about your behaviors that you practice to maintain or promote your health. Please respond to each question as accurately as possible. Indicate the frequency with which you practice each behavior by circling:
T for *tidak pernah* (never), **K** for *kadang-kadang* (sometimes), **S** for *sering* (often), **R** for *rutin* (routinely, every day)

			Frequency Rating			
			Never	Sometimes	Often	Routinely
Eating behavior	HB 01	I eat *krupuk* (salty cracker).	T	K	S	R
	HB 02	I eat *sayur asam* (sour vegetable soup).	T	K	S	R
	HB 03	I eat *tempeh* (furmented soybean cake).	T	K	S	R
	HB 04	I eat *bakso* (meat ball soup).	T	K	S	R
	HB 05	I eat *sop ayam* (chicken soup).	T	K	S	R
	HB 06	I eat *mie ayam* (chicken noodle).	T	K	S	R
	HB 07	I reduce salty food.	T	K	S	R
	HB 08	I (my husband/wife or family) reduce salt when cooking.	T	K	S	R
	HB 09	I reduce sweet food (e.g. *kue/roti manis* (sweet cake/bread), *teh manis* (sweet tea), *kopi manis* (sweet coffee)).	T	K	S	R
	HB 10	I reduce *gorengan* (fried food).	T	K	S	R
	HB 11	I reduce amount of food.	T	K	S	R
	HB 12	I eat vegetables (e.g. spinach, kale, cabbage, carrots, cassava leaves).	T	K	S	R
	HB 13	I eat fruits during rainy season (e.g. banana, orange, mango, papaya).	T	K	S	R
	HB 14	I eat fruits during dry season (e.g. banana, orange, mango, papaya).	T	K	S	R
	HB 15	I eat *tahu* (tofu).	T	K	S	R
	HB 16	I eat meat (e.g. chicken, beef, goat).	T	K	S	R
	HB 17	I eat fresh fish.	T	K	S	R

Physical activity	HB 18	I clean house more than 30 minutes.	T	K	S	R
	HB 19	I wash clothes more than 30 minutes.	T	K	S	R
	HB 20	I wash dishes more than 30 minutes.	T	K	S	R
	HB 21	I walk around house more than 30 minutes.	T	K	S	R
	HB 22	I walk around in the morning more than 30 minutes.	T	K	S	R
	HB 23	I try to move body more than 30 minutes.	T	K	S	R
Resting	HB 24	I take enough sleep.	T	K	S	R
	HB 25	I take a nap.	T	K	S	R
	HB 26	I rest when I feel I need to (e.g. tired, dizziness, headache).	T	K	S	R
	HB 27	I reduce duration of working to avoid tiredness.	T	K	S	R
Non-smoking	HB 28	I smoke tobacco inside house.	T	K	S	R
	HB 29	I smoke tobacco outside house.	T	K	S	R
	HB 30	I smoke whenever I want.	T	K	S	R
	HB 31	I smoke after work.	T	K	S	R
	HB 32	I smoke when someone promote me.	T	K	S	R
	HB 33	I smoke during gaterings with other people.	T	K	S	R
Stress management	HB 34	I take rest to reduce stress.	T	K	S	R
	HB 35	I do something to be relaxed.	T	K	S	R
	HB 36	I stop thinking so much to reduce stress.	T	K	S	R
	HB 37	I chat with other people (e.g. husband/wife, family, friends) to reduce stress.	T	K	S	R
	HB 38	I watch TV to reduce stress.	T	K	S	R
	HB 39	I sleep to reduce stress.	T	K	S	R
	HB 40	I eat to reduce stress.	T	K	S	R
Seeking health information	HB 41	I try to obtain health information.	T	K	S	R
	HB 42	I obtain health informatino from my family.	T	K	S	R
	HB 43	I obtain health information from friends.	T	K	S	R
	HB 44	I obtain health information from Puskesmas (community health center).	T	K	S	R
	HB 45	I ask a *Kader* (health volunteer) about health.	T	K	S	R
	HB 46	I ask a private doctor about health.	T	K	S	R
	HB 47	I ask a midwife about health.	T	K	S	R
	HB 48	I ask a private nurse about health.	T	K	S	R
	HB 49	I go to health check-up (e.g. blood pressure, body weight).	T	K	S	R
	HB 50	I obtain health information from TV.	T	K	S	R

Seeking health care	HB 51	I buy medicine at a small shop when I am sick (e.g. headache, myalgia).	T	K	S	R
	HB 52	I go to Posyandu (community health post) when I am sick.	T	K	S	R
	HB 53	I go to Puskesmas (community health center) when I am sick.	T	K	S	R
	HB 54	I go to a private doctor when I am sick.	T	K	S	R
	HB 55	I go to a midwife when I am sick.	T	K	S	R
	HB 56	I go to a private nurse when I am sick.	T	K	S	R
	HB 57	I go to a hospital when I am sick.	T	K	S	R
	HB 58	I follow suggestions of health professionals.	T	K	S	R
	HB 59	I take medicine given to me by health professionals.	T	K	S	R
Caring other people	HB 60	I work for my family's life.	T	K	S	R
	HB 61	I am concerned about health of other people.	T	K	S	R
	HB 62	I keep good relationships with other people.	T	K	S	R
	HB 63	I discuss about health with other people.	T	K	S	R
	HB 64	I support community activity (e.g. Posyandu, cleaning, celebration).	T	K	S	R
	HB 65	I provide food to other people.	T	K	S	R
Fulfilling obligation to God	HB 66	I pray five times a day.	T	K	S	R
	HB 67	I pray more than obligation (*sholat sunnah*).	T	K	S	R
	HB 68	I pray in correct position.	T	K	S	R
	HB 69	I practice additional fasting (*puasa Senin-Kamis*).	T	K	S	R
	HB 70	I recite Qur'an.	T	K	S	R
	HB 71	I beg God for help when I have a problem.	T	K	S	R
	HB 72	I accept any difficult situation (*ikhlas*).	T	K	S	R

Thank you very much for your cooperation.

Predictors of Preventive and Promotive Health Behaviors Questionnaire

Directions: This questionnaire contains statements about your reasons to practice the health behaviors. Please respond to each question as accurately as possible. Indicate the degree of agreement by circling:
STS for *sangat tidak setuju* (strongly disagree), **TS** for *tidak setuju* (disagree), **RR** for *ragu-ragu* (undecided), **S** for *setuju* (agree), **SS** for *sangat setuju* (strongly agree),

			Penilaian Persetujuan				
		Positive Predictors	Sangat tidak setuju	Tidak setuju	Ragu-ragu	Setuju	Sangat setuju
Behavioral beliefs	PP 01	I practice PPHBs to work for my family.	STS	TS	RR	S	SS
	PP 02	I practice PPHBs to promote my family's health.	STS	TS	RR	S	SS
	PP 03	I practice PPHBs to work for the community.	STS	TS	RR	S	SS
	PP 04	I practice PPHBs to fulfill obligation to God.	STS	TS	RR	S	SS
	PP 05	I practice PPHBs to receive blessing from God.	STS	TS	RR	S	SS
	PP 06	I practice PPHBs to be happy.	STS	TS	RR	S	SS
	PP 07	I practice PPHBs to be healthy.	STS	TS	RR	S	SS
Competence	PP 08	I recognize my health status when I am sick.	STS	TS	RR	S	SS
	PP 09	I know the necessity of PPHBs.	STS	TS	RR	S	SS
	PP 10	I am confident to practice PPHBs.	STS	TS	RR	S	SS
	PP 11	I have the ability to practice PPHBs.	STS	TS	RR	S	SS
	PP 12	I can communicate with other people about my health.	STS	TS	RR	S	SS
	PP 13	I can seek health care to maintain my health.	STS	TS	RR	S	SS
Prior experience	PP 14	I practice PPHBs because I experienced having disease (e.g. stroke).	STS	TS	RR	S	SS
	PP 15	I practice PPHBs because other people experienced having disease (e.g. stoke).	STS	TS	RR	S	SS
	PP 16	I practice PPHBs because I have experienced improved health status.	STS	TS	RR	S	SS
	PP 17	I practice PPHBs because other people have experienced improved health status.	STS	TS	RR	S	SS

Religious support	PP 18	God helps me when I have a health problem.	STS	TS	RR	S	SS
	PP 19	God gives me a good health.	STS	TS	RR	S	SS
	PP 20	God gives me everything in my life.	STS	TS	RR	S	SS
	PP 21	Praying to God helps me.	STS	TS	RR	S	SS
	PP 22	*Ustadz* (Imam) helps me to understand religion.	STS	TS	RR	S	SS
	PP 23	*Ustadz* (Imam) helps me to be closer to God.	STS	TS	RR	S	SS
	PP 24	*Ustadz* (Imam) helts me to understand health.	STS	TS	RR	S	SS
	PP 25	*Pengajian* (gathering to recite Qur'an) helps me to understand Islam.	STS	TS	RR	S	SS
	PP 26	*Pengajian* (gathering to recite Qur'an) helps me to be closer to God.	STS	TS	RR	S	SS
	PP 27	*Pengajian* (gathering to recite Qur'an) helps me to understand health.	STS	TS	RR	S	SS
Social support	PP 28	My family gives me suggestions about my health.	STS	TS	RR	S	SS
	PP 29	My family is concerned about my health.	STS	TS	RR	S	SS
	PP 30	My family encourages me to practice healthy behaviors.	STS	TS	RR	S	SS
	PP 31	My family accompanies me to health institutions (e.g. *Puskesmas*).	STS	TS	RR	S	SS
	PP 32	My family supports me by providing goods (e.g. *jamu*, medicine, food).	STS	TS	RR	S	SS
	PP 33	My family supports my work when I am sick.	STS	TS	RR	S	SS
	PP 34	My family does massage on me when I am tired.	STS	TS	RR	S	SS
	PP 35	My friends/neighbors give me suggestion/advice about my health.	STS	TS	RR	S	SS
	PP 36	My friends/neighbors are concerned about my health.	STS	TS	RR	S	SS
	PP 37	My friends/neighbors encourages me to practice healthy behaviors.	STS	TS	RR	S	SS
	PP 38	My friends/neighbors accompany me to health institutions.	STS	TS	RR	S	SS
	PP 39	*RW/RT* (community leader) gives me suggestion/advice about my health.	STS	TS	RR	S	SS
	PP 40	*RW/RT* (community leader) is concerned about my health.	STS	TS	RR	S	SS
	PP 41	RW/RT (community leader) encourages me to practice healthy behaviors.	STS	TS	RR	S	SS
	PP 42	*RW/RT* (community leader) accompanies me to health institutions.	STS	TS	RR	S	SS

Health system support	PP 43	*Kader* (health volunteers) give me suggestion/advice about my health.	STS	TS	RR	S	SS
	PP 44	*Kader* (health volunteers) are concerned about my health.	STS	TS	RR	S	SS
	PP 45	*Kader* (health volunteers) encourage me to practice healthy behaviors.	STS	TS	RR	S	SS
	PP 46	*Kader* (health volunteers) accompany me to health institutions.	STS	TS	RR	S	SS
	PP 47	*Kader* (health volunteers) support me by providing *Posyandu* (health post).	STS	TS	RR	S	SS
	PP 48	Health professionals (e.g. doctor, midwife, nurse) give me suggestion/advice about my health.	STS	TS	RR	S	SS
	PP 49	Health professionals (e.g. doctor, midwife, nurse) are concerned about my health.	STS	TS	RR	S	SS
	PP 50	Health professionals (e.g. doctor, midwife, nurse) encourage me to practice healthy behaviors.	STS	TS	RR	S	SS
	PP 51	Health professionals support me by providing health services (e.g. medicine, blood pressure check).	STS	TS	RR	S	SS
	PP 52	Health insurance (e.g. *Jamkesmas, JKN*) support me by providing health service at low cost.	STS	TS	RR	S	SS
	PP 53	Health insurance (e.g. *Jamkesmas, JKN*) support me by providing enough health service.	STS	TS	RR	S	SS

Thank you very much for your cooperation.

		Negative Predictors	Penilaian Persetujuan				
			Sangat tidak setuju	Tidak setuju	Ragu-ragu	Setuju	Sangat setuju
Personal barriers	NP 01	It is difficult to stop eating a lot if I am tired.	STS	TS	RR	S	SS
	NP 02	It is difficult to stop eating a lot because I enjoy.	STS	TS	RR	S	SS
	NP 03	It is difficult to reduce salty food because I enjoy.	STS	TS	RR	S	SS
	NP 04	It is difficult to reduce salty food because I have been doing it for a long time.	STS	TS	RR	S	SS
	NP 05	It is difficult to reduce salty food because I do not have information on healthy food.	STS	TS	RR	S	SS
	NP 06	It is difficult to eat healthy food because it is expensive.	STS	TS	RR	S	SS
	NP 07	It is difficult to do exercise if I am tired.	STS	TS	RR	S	SS
	NP 08	It is difficult to do exercise because I do not enjoy.	STS	TS	RR	S	SS
	NP 09	It is difficult to do exercise because I am busy.	STS	TS	RR	S	SS
	NP 10	It is difficult to do exercise because I have not been doing it for a long time.	STS	TS	RR	S	SS
	NP 11	It is difficult to do exercise because I do not have information on exercise.	STS	TS	RR	S	SS
	NP 12	It is difficult to do exercise because the equipment is expensive.	STS	TS	RR	S	SS
	NP 13	It is difficult to rest because I am busy.	STS	TS	RR	S	SS
	NP 14	It is difficult to rest because I have a lot of work.	STS	TS	RR	S	SS
	NP 15	It is difficult to stop smoking because I enjoy.	STS	TS	RR	S	SS

Personal barriers	NP 16	t is difficult to stop smoking because I have been doing it for a long time.	STS	TS	RR	S	SS
	NP 17	It is difficult to stop smoking because I do not have knowledge on how to stop smoking.	STS	TS	RR	S	SS
	NP 18	It is difficult to stop smoking because the price is affordable.	STS	TS	RR	S	SS
	NP 19	It is difficult to stop smoking because I can smoke anywhere.	STS	TS	RR	S	SS
	NP 20	It is difficult to stop thinking so much because of limited finance.	STS	TS	RR	S	SS
	NP 21	It is difficult to obtain health information because I am busy.	STS	TS	RR	S	SS
	NP 22	It is difficult to obtain health information because I do not know where I can get the information.	STS	TS	RR	S	SS
	NP 23	It is difficult to go to health institution because I am scared to have a problem.	STS	TS	RR	S	SS
	NP 24	It is difficult to go to health institution because I am busy.	STS	TS	RR	S	SS
	NP 25	It is difficult to go to a better health service because I do not have information.	STS	TS	RR	S	SS
	NP 26	It is difficult to receive a better health service because it is expensive (e.g. good doctor, hospital).	STS	TS	RR	S	SS
	NP 27	It is difficult to fulfill obligation to God because I am busy.	STS	TS	RR	S	SS
	NP 28	It is difficult to practice healthy behaviors because I am tired.	STS	TS	RR	S	SS
	NP 29	It is difficult to practice healthy behaviors if I do not enjoy.	STS	TS	RR	S	SS
	NP 30	It is difficult to practice healthy behaviors if I am busy.	STS	TS	RR	S	SS
	NP 31	It is difficult to practice healthy behaviors if I have a lot of work.	STS	TS	RR	S	SS
	NP 32	It is difficult to practice healthy behaviors if I have never done.	STS	TS	RR	S	SS
	NP 33	It is difficult to practice healthy behaviors if I do not have information about healthy behaviors.	STS	TS	RR	S	SS
	NP 34	It is difficult to practice healthy behaviors if it is expensive.	STS	TS	RR	S	SS
	NP 35	It is difficult to practice healthy behaviors if I do not have enough money.	STS	TS	RR	S	SS

Social barriers	NP 36	It is difficult to stop eating a lot if it is provided by someone.	STS	TS	RR	S	SS
	NP 37	It is difficult to stop eating sweet food/drink t if it is provided by someone.	STS	TS	RR	S	SS
	NP 38	It is difficult to stop eating a lot after I work.	STS	TS	RR	S	SS
	NP 39	It is difficult to stop eating sweets after I work.	STS	TS	RR	S	SS
	NP 40	It is difficult to stop eating a lot at social gatherings.	STS	TS	RR	S	SS
	NP 41	It is difficult to stop eating sweets at social gatherings.	STS	TS	RR	S	SS
	NP 42	It is difficult to do exercise if I do not have someone to exercise with.	STS	TS	RR	S	SS
	NP 43	It is difficult to do exercise because there is limited opportunity.	STS	TS	RR	S	SS
	NP 44	It is difficult to stop smoking tobacco if it is provided by someone.	STS	TS	RR	S	SS
	NP 45	It is difficult to stop smoking after I work.	STS	TS	RR	S	SS
	NP 46	It is difficult to stop smoking at social gatherings (e.g. *Rapat RT, tahlilan*).	STS	TS	RR	S	SS
	NP 47	It is difficult to go to health institution because it opens only during daytime.	STS	TS	RR	S	SS
	NP 48	It is difficult to go to health institution which provide affordable care.	STS	TS	RR	S	SS
	NP 49	It is difficult to go to health institution that provides good care.	STS	TS	RR	S	SS
	NP 50	It is difficult to practice healthy behaviors if there is no one who practice.	STS	TS	RR	S	SS
	NP 51	It is difficult to practice healthy behaviors because there is limited opportunity.	STS	TS	RR	S	SS
Environmental barriers	NP 52	It is difficult to eat healthy food because few store provides healthy food.	STS	TS	RR	S	SS
	NP 53	It is difficult to eat healthy food because there is no label on the food.	STS	TS	RR	S	SS
	NP 54	It is difficult to do physical activity because of hot weather.	STS	TS	RR	S	SS
	NP 55	It is difficult to do exercise because of limited place.	STS	TS	RR	S	SS
	NP 56	It is difficult to do exercise because the place is far.	STS	TS	RR	S	SS
	NP 57	It is difficult to do exercise because there is limited transportation to go to the place.	STS	TS	RR	S	SS
	NP 58	It is difficult to go to a hospital because it is far.	STS	TS	RR	S	SS
	NP 59	It is difficult to go to a hospital because there is limited transportation.	STS	TS	RR	S	SS

Thank you very much for your cooperation.

Annex B. Study Permission from the Agency for National Unity, Politics, and Community Protection

PEMERINTAH KABUPATEN INDRAMAYU
KANTOR KESATUAN BANGSA DAN POLITIK
Jl. Letjend. S. Parman No. 8 Telp/Fax (0234) 272540
INDRAMAYU

SURAT KETERANGAN

Nomor : 647/070/Rekomlit/Kesbangpol/2014

1.Yang bertanda tangan dibawah ini :

Kepala Kantor Kesatuan Bangsa dan Politik Kabupaten Indramayu

Berdasarkan Surat dari : Wakil Dekan Fakultas Kedokteran Dan Ilmu Kesehatan Universitas Islam Negeri (UIN) Syarif Hidayatullah Jakarta Nomor :Un.01/F10/OT.01.6/3327/2014 Tanggal 21 Juli 2014 Perihal Permohonan Ijin Penelitian

Menerangkan bahwa :

a	Nama	:	**MAFTUHAH,M.Kep,Ph.D (Ketua Tim)**
b	No HP/Email	:	0811936164
c	Tempat/Tgl lahir	:	Indramayu, 08 Agustus 1968
d	Agama	:	Islam
e	Pekerjaan	:	PNS (Dosen)
f	Alamat	:	Komplek PTB Blok DI No.11 Kelurahan.Kepala Dua wetan RT/RW.003/005 Kecamatan Ciracas Kota Jakarta Timur
g	Peserta/Anggota	:	**MAYUMI MIZUTANI,RN,PHN,MSN**
h	Maksud	:	Permohonan Ijin Penelitian Tentang Survey Hipertensi di Indramayu
i	Untuk Keperluan	:	Penelitian
j	Lokasi	:	Kabupaten Indramayu
k	Lembaga/Instansi Yang dituju	:	1.Ka.Dinas Kesehatan Kab.Indramayu 2.Ka.UPTD Puskesmas Di Wilayah Kab.Indramayu

2.Sehubungan dengan maksud tersebut, diharapkan agar pihak yang terkait dapat memberikan bantuan/fasilitas yang diperlukan.

3.Demikian Surat Keterangan ini dibuat untuk dipergunakan sebagaimana mestinya, dan Berlaku dari tanggal 20 Agustus 2014 sampai dengan tanggal 20 Februari 2015.

Indramayu,23 Juli 2014

KANTOR KESATUAN BANGSA DAN POLITIK
KABUPATEN INDRAMAYU
Kasi Kewaspadaan Nasional
dan Ketahanan Masyarakat

KHOMARIYAH ETY, SH, M.Si
Penata
NIP. 19650809 198603 2 009

Tembusan disampaikan Kepada Yth :
1. Bupati Indramayu (Sebagai Laporan);
2. Kepala Badan Kesatuan Bangsa dan Politik Prov. Jabar di Bandung;
3. Wakil Dekan Fakultas Kedokteran Dan Ilmu Kesehatan Universitas Islam Negeri (UIN) Syarif Hidayatullah Jakarta;
4. Arsip.

Annex C. Study Permission from the District Health Office

PEMERINTAH KABUPATEN INDRAMAYU
DINAS KESEHATAN
Jl. MT. Haryono No. 9 Fax / Telp (0234) 272125 Indramayu 45212

S U R A T I Z I N
Nomor : 070 / 2040 /Um.Peg

Tentang

Pemberian Izin Penelitian

KEPALA DINAS KESEHATAN KABUPATEN INDRAMAYU

Dasar :
1. Surat dari Fakultas Kedokteran dan Ilmu Kesehatan Universitas Islam Negeri Syarif Hidayatullah Jakarta, tanggal 21 Juli 2014 nomor : Un.01/F10/OT.01.6/3327/2014 Perihal : Permohonan Izin Penelitian
2. Surat dari Kantor Kesatuan Bangsa dan Politik Indramayu, tanggal 23 Juli 2014 nomor : 647/070/Rekomlit/Kesbangpol/2014 Perihal : Surat Keterangan Iiin Penelitian.

MENGIZINKAN

Kepada :
Nama : MAFTUHAH, M.Kep,Ph.D (Ketua Tim)
Anggota : MAYUMI MIZUTANI, RN, PHN, MSN
Alamat : Komplek PTB Blok D I No. 11 Kel. Kepala Dua Wetan Rt/Rw. 003/005 Kec. Ciracas – Jakarta Timur.
Judul Penelitian : Survey Hipertensi di Indramayu

Untuk : Melakukan Penelitian di Puskesmas wilayah kerja Dinas Kesehatan Kabupaten Indramayu sesuai dengan judul penelitian tersebut diatas.

Dikeluarkan di : Indramayu
Pada tanggal : 06 Agustus 2014

Kepala Dinas Kesehatan
Kabupaten Indramayu

dr.H. DEDI ROHENDI, MARS
Pembina Utama Muda
NIP. 19600810 198911 1 001

Tembusan :
Kepada Yth :
1. Dekan Fakultas Kedokteran dan Ilmu Kesehatan Syarif Hidayatullah Jakarta
2. Kepala Bidang Yankes
3. Kepala UPTD Puskesmas Se- wilayah Kabupaten Indramayu.

Annex D. Request Letter for Study Cooperation to Puskesmas (Indonesian language)

St. Luke's International University, Japan
Akashi-cho 10-1, Chuo-ku, Tokyo, 104-0044, Japan

.....2014

Kepada yang terhormat
Kepala Puskesmas .....

Permohonan untuk Kerjasama Penelitian
Request for Research Cooperation

Kami bermaksud untuk melaksanakan penelitian dengan judul: Pengembangan Model Perilaku Pencegahan dan Peningkatan Kesehatan Penduduk Usia Pertengahan yang Menderita Hipertensi di Wilayah Indramayu Jawa Barat, Indonesia. yang bekerjasama dengan STIKes Indramayu, UIN Syarif Hidayatullah Jakarta (Indonesia) dan Universitas Internasional St Luke (Jepang). Izin penelitian sudah didapatkan dari Dinas Kesehatan Kabupaten Indramayu.

Tujuan: Tujuan dari penelitian ini adalah untuk mengembangkan model pencegahan dan peningkatan perilaku kesehatan pada penduduk usia pertengahan yang menderita hipertensi di Indramayu, Jawa Barat, Indonesia, dalam rangka memberi rekomendasi kepada program kesehatan kabupaten, praktek keperawatan dan pendidikan untuk memperkuat pencegahan dan peningkatan perilaku kesehatan pada penduduk.

Metode: Penelitian kuantitatif survei cross-sectional akan dilaksanakan menggunakan kuesioner. Sekitar 75 orang berusia 40-64 tahun yang menderita hipertensi akan diilibatkan dari setiap puskesmas yang terpilih sebagai sampel. Kriteria inklusinya adalah sebagai berikut: 1) terdiagnosis hipertensi; 2) berusia 40-64 tahun; 3) Muslim dan 4) tidak sedang hamil. Dalam penelitian ini digunakan kuesioner dengan 134 item pertanyaan dalam bahasa Indonesia dikembangkan oleh peneliti untuk mengukur persepsi perilaku pencegahan dan peningkatan kesehatan dan prediktornya pada penduduk usia pertengahan yang menderita hipertensi di Indramayu, Jawa Barat

Permohonan: Kami mohon petugas kesehatan di Puskesmas untuk menunjukkan partisipan yang memenuhi syarat. Kami akan menjelaskan kepada mereka tujuan, metode penelitian dan pertimbangan etika penelitian. Kami tidak akan memaksa orang untuk berpartisipasi dalam penelitian ini. Kami mohon saudara tidak perlu memeriksa status partisipasi dari partisipan yang memenuhi syarat. Kami juga mohon Saudara mengizinkan kami untuk mengambil data dari rekam medis partisipan (seperti: diagnosis, pengobatan, tinggi badan, berat badan, tekanan darah) setelah mendapatkan izin dari setiap partisipan.

Pertimbangan Etika:
1. Pernyataan Persetujuan: sebelum mengisi kuesioner, kami akan menjelaskan kepada partisipan tentang tujuan penelitian, metode, dan manfaat menggunakan lembar pernyataan persetujuan. Apabila partisipan memutuskan untuk berpartisipasi dalam penelitian ini, maka akan diminta untuk menandatangani lembar pernyataan persetujuan sebelum dilakukan wawancara.

2. Partisispasi sukarela: kami akan menjelaskan kepada partisipan bahwa mereka bebas memilih untuk berpartisipasi atau tidak dan bebas untuk berhenti kapan pun. Meskipun telah setuju untuk berpartisipasi sebelumnya, mereka diperbolehkan mengundurkan diri kapan pun. Dalam rangka menjaga partisipasi sukarela, jangan tanyakan apakah mereka berpartisipasi atau tidak.

3. Proteksi kerahasiaan: Pengisisan kuesioner akan dilaksanakan di tempat yang dipilih oleh partisipan untuk menjaga kerahasiaan mereka. Pada saat hasil penelitian ini dipublikasikan atau didiskusikan dalam konferensi, identitas partisipan tidak akan ikut dipublikasikan.

4. Keamanan Data: Data yang tertulis akan disimpan secara aman dalam lemari yang terkunci yang hanya dapat dibuka oleh peneliti. Semua data akan dimusnahkan setelah 3 tahun penelitian selesai.

5. Keuntungan dan kerugian:
Keuntungan: Informasi yang diberikan akan dipublikasikan atau dipresentasikan pada konferensi profesi sebagai hasil penelitian dalam rangka untuk memperkuat perilaku kesehatan penduduk di Indramayu, Jawa Barat, Indonesia.
Kerugian: Partisipan akan meluangkan waktu untuk diwawancarai. Ada kemungkinan merasa tidak nyaman karena menyampaikan persepsi mereka, mereka bisa berhenti kapan pun mereka inginkan.

Terimakasih banyak telah meluangkan waktu untuk mempertimbangkan permohonan kami. Apabila saudara ada saran terkait penelitian ini, silahkan beri tahu kami.
Hormat kami,

Lily Yulaikhah Edy Susanto, M.Mid.
Ketua Sekolah Tinggi Ilmu Kesehatan Indramayu
Mobile: E-mail:
Maftuhah, Ph.D.
Dosen, Universitas Islam Negeri Syarif Hidayatullah Jakarta
Mobile: E-mail:
Mayumi Mizutani, RN, PHN, MSN
Mahasiswa Program Doktor, Universitas Internasional Saint Luke, Jepang.
E-mail:
Supervisor: Dr. Junko Tashiro, RN, PHN, MW, PhD
Profesor, Global Health Nursing, Universitas Internasional Saint Luke, Tokyo, Jepang

Annex D. Request Letter for Study Cooperation to Puskesmas (Cont.) (English)

St. Luke's International University, Japan
Akashi-cho 10-1, Chuo-ku, Tokyo, 104-0044, Japan

(Date)_____, 2014

Dr. / Mr. / Ms. _____
Director, Puskesmas (name of the health center).

Request for Research Cooperation

We would like to conduct a study titled: "Development of a Perceived Preventive and Promotive Health Behaviors Model of Middle-Aged People with Hypertension in a District of Rural West Java, Indonesia" through the collaboration with the Indramayu College of Health Science, Islamic State University Syarif Hidayatullah Jakarta, Indonesia and St. Luke's International University, Japan. Study permission will be (was) obtained from the District Health Office.

Purpose: The purpose of the study is to develop a preventive and promotive health behaviors model of middle-aged people with hypertension in a rural district of West Java, Indonesia, in order to recommend it to the district's health programs, nursing practice and education to strengthen preventive and promotive health behaviors of the people.

Methods: A quantitative cross-sectional survey study will be conducted using questionnaire. About 65 people ages 40-64 with hypertension will be recruited from each health center. Inclusion criteria are: 1) diagnosis of hypertension; 2) age 40-64; 3) Muslim and 4) not pregnant. The 134-item questionnaire in the Indonesian language developed by researchers to measure perceived preventive and promotive health behaviors and the predictors of middle-aged adults with hypertension in a rural district of West Java will be used. This survey uses a face-to-face questionnaire and will be conducted by trained Indonesian researchers or research assistants in August and September 2014.

Request: We would like health professionals in the health center to introduce us to eligible participants. We will tell them the purpose and method of study and ethical considerations. We will not force people to participate in the study. We would like you not to check the participation status of eligible participants. We also would like you to permit us to collect information from medical records of participants (e.g. diagnosis, treatment, height, weight, blood pressure) after obtaining permission from each participant.

Ethical considerations:

1. Informed consent: Before the questionnaire starts, we will explain to the participants the study purpose, methods, and utility of findings using the informed consent form. If the participant decides to participate in this research, he/she will be asked to sign the consent form before the interview.
2. Voluntary participation: We will explain the participants that participation is by free choice and they are free to quit at any time. Even after he/she agreed to participate in the research, he/she may withdraw at any time. In order to secure voluntary participation, please do not ask whether he/she participated or not.
3. Protection of privacy: The questionnaire will be done in a location of the participant's choice to keep his/her privacy. When the results of the research are published or discussed in conferences, no information will be included that would reveal the participant's identity.
4. Data security: The written data will be securely stored in a locked cabinet only accessible to the researchers. All data will be destroyed after three years of the study completion.
5. Advantage and disadvantage:

Advantage; The provided information will be published or presented at professional conferences as a study in order to strengthen health behaviors of people in West Java, Indonesia.

Disadvantage: The participant will spend their precious time for the interview. There is a slight possibility that he/she may feel uncomfortable by telling their perceptions, he/she can stop anytime they want.

Thank you very much for taking time to consider my request. If you have any concerns regarding this, please let me know.

Sincerely,

Lily Yulaikhah Edy Susanto, M.Mid.
Director, Indramayu College of Health Science
Mobile: E-mail:
Maftuhah, Ph.D.
Lecturer, Islamic State University Syarif Hidayatullah Jakarta
Mobile: E-mail:
Mayumi Mizutani, RN, PHN, MSN.
Doctoral program student, St. Luke's International University, Tokyo, Japan
Email:
Supervisor: Dr. Junko Tashiro, RN, PHN, MW, PhD
Professor, Global Health Nursing, St. Luke's International University, Tokyo, Japan

Annex E. Request for Questionnaire Study (Indonesian language)

Untuk Partisipan

Permohonan untuk Mengisi Kuesioner Penelitian
Request for Questionnaire Study

Saya adalah mahasiswa program doktor Universitas Saint Luke Internasional, Jepang, yang akan meneliti tentang “Pengembangan Model Perilaku Pencegahan dan Peningkatan Kesehatan Penduduk Usia Pertengahan yang Menderita Hipertensi di Wilayah Indramayu Jawa Barat, Indonesia”. Kami mengharapkan partisipasi Saudara dalam penelitian ini.

Tujuan: dalam rangka meningkatkan layanan keperawatan untuk penduduk Jawa Barat, Indonesia, saya bermaksud untuk menggambarkan bagaimana penduduk Indonesia berpikir tentang perilaku mereka untuk menjaga dan meningkatkan kesehatan.

Metode: Pengisian kuesioner ini diisi oleh pewawancara dari Indonesia yang sudah terlatih

Permohonan:
1) Pengisian kuesioner dengan cara wawancara: Saya mohon saudara untuk menjawab pertanyaan mengenai bagaimana Saudara berpikir tentang perilaku Saudara untuk menjaga atau meningkatkan kesehatan. Pengisian ini akan membutuhkan waktu sekitar 60 menit. Seorang asisten peneliti dari Indonesia akan bertanya kepada Saudara. Saudara tidak harus menjawab semua pertanyaan. Apabila Saudara tidak merasa nyaman pada saat wawancara, tolong beri tahu kami , kami akan menghentikan wawancara.
2) Rekam medis: Mohon izinkan kami untuk memeriksa kondisi kesehatan saudara, khususnya diagnosis, pengobatan, tinggi badan, berat badan, tekanan darah.
3) Merekam/mencatat: Izinkan kami untuk merekam/mencatat selama wawancara dan pengukuran.

Keuntungan dan Kerugian dari Partisipasi:
1) Keuntungan: Informasi yang diberikan akan dipublikasikan atau dipresentasikan sebagai hasil penelitian untuk meningkatkan kualitas layanan keperawatan di Jawa Barat. Insentif sebesar Rp. 30.000,- akan diberikan setelah wawancara.
2) Kerugian: Saudara akan membuang waktu untuk wawancara. Ada kemungkinan Saudara akan merasa tidak nyaman, Saudara boleh berhenti berpartisipasi kapan pun Saudara mau.

Etika Penelitian yang diperhatikan:

1) Partisipasi sukarela: Partisipasi diberikan secara sukarela (bebas memilih) dan Saudara bebas untuk berhenti kapan pun. Saudara tidak akan memperoleh akibat negatif apa pun bahkan jika Saudara tidak berpartisipasi.
2) Proteksi kerahasiaan: Wawncara akan dilakukan di tempat yang Anda pilih untuk menjaga kerahasiaan. Informasi yang Anda berikan akan ditulis sebagai anonim dan hanya digunakan untuk keperluan penelitian. Hasil penelitian ini akan dipublikasikan, tetapi nama kerahasiaan Anda akan dijaga.
3) Keamanan Data: Data tertulis akan disimpan secara aman di lemari yang terkunci. Semua data akan dimusnahkan setelah 3 tahun penelitian diselesaikan.

Apabila ada pertanyaan dan saran terkait penelitian ini, mohon beri tahu kami.
Hormat kami,

Mayumi Mizutani, RN, PHN, MSN
Mahasiswa Program Doktor, Universitas Internasional Saint Luke, Jepang.
E-mail:
Lily Yulaikhah Edy Susanto, M.Mid.
Ketua Sekolah Tinggi Ilmu Kesehatan Indramayu
Heri Sugiarto, MPH
Dosen, Sekolah Tinggi Ilmu Kesehatan Indramayu
Mobile:
Maftuhah, Ph.D.
Dosen, Universitas Islam Negeri Syarif Hidayatullah Jakarta
Mobile:
Supervisor: Dr. Junko Tashiro, RN, PHN, MW, PhD
Profesor, Global Health Nursing, Universitas Internasional Saint Luke, Tokyo, Jepang

Annex E. Request for Questionnaire Study (Cont.) (English)

To Participant:

Request for Questionnaire Study

I am a doctoral program student at St. Luke's International University, Japan. I am going to study the "Development of a Perceived Preventive and Promotive Health Behaviors Model of Middle-Aged People with Hypertension in a District of Rural West Java, Indonesia". We invite you to participate in this study.

Purpose: In order to improve nursing care for people in West Java, Indonesia, I would like to describe how Indonesian people think about their behaviors to maintain or promote health.

Method: Questionnaire by trained Indonesian interviewer.

Request:
1) Questionnaire by interview: I would like you to reply to questions about your thoughts about your behaviors to maintain or promote your health. It will take about 60 minutes. An Indonesian research assistant will ask you questions. You do not have to reply to all the questions if you do not want. If you feel uncomfortable during the interview, please tell us so that we can stop.
2) Medical record: Please let us check your health status especially your diagnosis, treatment, height, weight, blood pressure.
3) Recording: Please let us take notes during the interview and measurement.

Advantage and disadvantage of participation:
1) Advantage: The provided information will be presented or published as a study in order to improve the quality of nursing care in West Java, Indonesia. Indonesian Rp. 20,000 will be given to you as an incentive after the interview.
2) Disadvantage: You will spend your precious time for the interview. Although you may feel uncomfortable by telling your perception, you can stop anytime you want.

Ethical issues to be concerned:
1) Voluntary participation: Participation is a free choice and you are free to quit at any time. You will not have any negative reactions from anyone even if you do not consent to participate.
2) Protecting privacy: The interview will be done at a location of your choice to keep your privacy. The information you provide will be treated anonymously and used only for the purpose of study. The results of this study may be published, but your anonymity will be protected.
3) Data security: The written data will be securely stored in a locked cabinet. All data will be destroyed after three years of the study completion.

If you have any question or concerns about this study, please let us know.
Sincerely yours,

Mayumi Mizutani, RN, PHN, MSN
Doctoral Program Student, St. Luke's International University, Japan
E-mail:
Lily Yulaikhah Edy Susanto, M.Mid.
Director, Indramayu College of Health Science
Heri Sugiarto, MPH
Director, Indramayu College of Health Science
Mobile:
Maftuhah, Ph.D.
Lecturer, Islamic State University Syarif Hidayatullah Jakarta
Mobile:
Supervisor: Dr. Junko Tashiro, RN, PHN, MW, PhD
Professor, Global Health Nursing, St. Luke's International University, Tokyo, Japan

Annex F. Consent for Questionnaire Study (Indonesian language)

Form Persetujuan untuk Mengisi Kuesioner Penelitian
Consent Form for Questionnaire Study

Saya sudah diberi penjelasan tentang “Permohonan untuk Mengisi Kuesioner” pada Penelitian “Pengembangan Model Pencegahan dan Peningkatan Perilaku Kesehatan Penduduk Usia Pertengahan yang Menderita Hipertensi di Indramayu, Jawa Barat, Indonesia, dan bersedia untuk berpartisipasi.

Tangal _____, 2014

Nama partisipan: _____

Tanda tangan partisipan: _____

Nama peneliti (mahasiswa): _____

Tanda tangan peneliti (mahasiswa): _____

Komite Etik Penelitian, Universitas Internasional St. Luke, Jepang
Nomor persetujuan: 14-029

Annex F. Consent for Questionnaire Study (Cont.) (English)

Prof. Toshiko Ibe, RN, DNSc
Dean, St. Luke's International University, Japan

Consent Form for Questionnaire Study

I have been informed about the "Request for Questionnaire" of the study on "Development of a Preventive and Promotive Health Behaviors Model of Middle-Aged People with Hypertension in Rural West Java, Indonesia", and consented to participate.

Date: _____, 2014

Name of the participant: _____

Signature of the participant: _____

Name of the research assistant: _____

Signature of the research assistant: _____

Research Ethics Committee, St. Luke's International University, Japan
Approval number: 14-029

Annex G. Refusal of Questionnaire Study (Indonesian language)

Prof. Toshiko Ibe, RN, DNSc
Ketua, Universitas Internasional St. Luke, Jepang

Pernyataan Tidak Bersedia Mengisi Kuesioner Penelitian
Refusal of Questionnaire Study

Meskipun saya bersedia berpartisipasi dalam penelitian “Pengembangan Model Perilaku Pencegahan dan Peningkatan Perilaku Kesehatan pada Penduduk Usia Pertengahan yang Menderita Hipertensi di Indramayu, Jawa Barat, Indonesia, dengan hormat saya sampaikan bahwa saya mengundurkan diri dari penelitian ini.

Tanggal _____, 2014

Nama partisipan: _____

Tanda tangan partisipan: _____

Annex G. Refusal of Questionnaire Study (Cont.) (English)

Prof. Toshiko Ibe, RN, DNSc
Dean, St. Luke's College of Nursing, Japan

Refusal of Questionnaire Study

Although I consented to participate in the study on "Development of a Preventive and Promotive Health Behaviors Model of Middle-Aged People with Hypertension in Rural West Java, Indonesia", I hereby inform you that I withdrawal from the study.

Date: _____, 2014

Name of the participant: _____

Signature of the participant: _____

Annex H. Consent for Research Cooperation (Indonesian language)

Prof. Toshiko Ibe, RN, DNSc
Dekan, Universitas Internasional Saint Luke, Tokyo, Jepang

Lembar Pernyataan Persetujuan untuk Kerjasama Penelitian
Consent Form for Research Cooperation

Saya telah mendapat penjelasan tentang Penelitian ""Pengembangan Model Perilaku Pencegahan dan Peningkatan Kesehatan Penduduk Usia Pertengahan yang Menderita Hipertensi di Wilayah Indramayu Jawa Barat, Indonesia" menggunakan proposal penelitian, dan bersedia untuk bekerjasama. Saya tidak akan membocorkan informasi partisipan yang saya dapatkan selama penelitian kepada orang lain.

Tanggal , 2014

Nama asiten peneliti (mahasiswa):

Tanda tangan asisten peneliti (mahasiswa):

Tanda tangan peneliti:

Komite Etika Penelitian, Universitas Internasional St Luke, Jepang.
Nomor persetujuan: 14-029

Annex H. Consent for Research Cooperation (Cont.) (English)

Prof. Toshiko Ibe, RN, DNSc
Dean, St. Luke's International University, Japan

Consent Form for Research Cooperation

I have been informed about the study on "Development of a Preventive and Promotive Health Behaviors Model of Middle-Aged People with Hypertension in Rural West Java, Indonesia" using the research proposal, and consented to cooperate. I will not leak or divulge participant's information to other people that I obtained during the research.

Date: _____, 2014

Name of the research assistant: _____

Signature of the research assistant: _____

Signature of the researcher: _____

Research Ethics Committee, St. Luke's International University, Japan
Approval number: 14-029