FACTORS AFFECTING COMMUNITY PHARMACISTS TO ADVISE PATIENTS ABOUT HERBAL MEDICINE: A SURVEY IN INDONESIA

Miss Chilmia Nurul Fatiha

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ปัจจัยที่มีอิทธิพลต่อเภสัชกรชุมชนในการให้คำแนะนำเกี่ยวกับยาสมุนไพรกับผู้ป่วย : การสำรวจในประเทศอินโดนีเซีย

นางสาวชิลเมีย นูรัล ฟาติฮา

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By	Miss Chilmia Nurul Fatiha
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Thesis Advisor	Assistant Professor Tanattha Kittisopee, Ph.D.

Accepted by the Faculty of Pharmaceutical Sciences, Chulalongkorn University in Partial Fulfillment of the Requirements for the Master's Degree

.....Dean of the Faculty of Pharmaceutical Sciences
(Assistant Professor Rungpetch Sakulbumrungsil, Ph.D.)

THESIS COMMITTEE

.....Chairman
(Assistant Professor Puree Anantachoti, Ph.D.)
.....Thesis Advisor
(Assistant Professor Tanattha Kittisopee, Ph.D.)
.....Examiner
(Suntaree Watcharadamrongkun, Ph.D.)
.....External Examiner
(Professor Zullies Ikawati, Ph.D.)

ชิลเมีย นูรัล ฟาติฮา : ปัจจัยที่มีอิทธิพลต่อเภสัชกรชุมชนในการให้คำแนะนำเกี่ยวกับยาสมุนไพรกับผู้ป่วย : การสำรวจในประเทศอินโดนีเซีย (FACTORS AFFECTING COMMUNITY PHARMACISTS TO ADVISE PATIENTS ABOUT HERBAL MEDICINE: A SURVEY IN INDONESIA) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ. ภญ. ร.ต.อ.หญิง ดร. ฐณัฏฐา กิตติโสภี, 135 หน้า.

การใช้ยาสมุนไพร ได้เพิ่มขึ้นในทั่วโลก เภสัชกรเป็นบุคลากรทางสุขภาพคนแรกที่ผู้ป่วยจะได้พบเมื่อซื้อผลิตภัณฑ์หรือยาจากสมุนไพร ดังนั้นเภสัชกรจึงเป็นผู้ที่ต้องรับผิดชอบและต้องมีความรู้ในการให้คำปรึกษาเกี่ยวกับยาจากสมุนไพร เภสัชกรเองก็จะได้รับการยอมรับมากขึ้นในฐานะผู้ให้คำปรึกษาด้านยาจากการให้คำปรึกษาการใช้ยาจากสมุนไพรที่เหมาะสมมากขึ้น อย่างไรก็ตามเภสัชกรในประเทศอินโดนีเซียมักมีแนวโน้มที่แนะนำยาแผนปัจจุบันทั่วไปให้กับผู้ป่วยมากกว่าการแนะนำเกี่ยวกับยาจากสมุนไพร การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อสำรวจปัจจัยที่มีอิทธิพลต่อเภสัชกร ชุมชนในประเทศอินโดนีเซียในการให้คำแนะนำผู้ป่วยเกี่ยวกับยาจากสมุนไพร โดยใช้การสำรวจภาคตัดขวางกับเภสัชกรชุมชนในประเทศอินโดนีเซียด้วยการสำรวจแบบออนไลน์ในช่วงเดือนพฤษภาคม-มิถุนายน 2559 มีผู้ตอบกลับ 168 ท่านจากจำนวนอีเมลที่ส่งทั้งหมด 1044 อีเมล ผลการศึกษาพบว่าเภสัชกรมีทัศนคติที่ดีในเชิงบวกต่อการให้คำปรึกษาแก่ผู้ป่วยเกี่ยวกับยาจากสมุนไพรและมีความตั้งใจสูงในการให้คำแนะนำให้ผู้ป่วย สมการถดถ้อยลอจีสติคมีนัยสำคัญทางสถิติ ($\chi^2(5)=80.311$, $p<0.001$) ทัศนคติต่อการให้คำปรึกษาเกี่ยวกับยาจากสมุนไพร ($\exp^{\beta} = 3.93$) การรับรู้เกี่ยวกับความรู้เกี่ยวกับยาจากสมุนไพร ($\exp^{\beta} = 2.22$) และการใช้เกี่ยวกับยาจากสมุนไพรโดยส่วนตัว ($\exp^{\beta} = 1.79$) มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับความตั้งใจที่จะให้คำแนะนำเกี่ยวกับยาสมุนไพร ความตั้งใจ ($\exp^{\beta} = 1.07$) มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติต่อการให้คำปรึกษาผู้ป่วยเกี่ยวกับยาสมุนไพรของเภสัชกร โดยสรุปทัศนคติต่อการให้คำปรึกษาแก่ผู้ป่วยเกี่ยวกับยาจากสมุนไพร การรับรู้เกี่ยวกับองค์ความรู้เกี่ยวกับยาจากสมุนไพร และการใช้ส่วนตัวเป็นปัจจัยที่มีผลต่อความตั้งใจในการให้คำปรึกษาเกี่ยวกับยาจากสมุนไพรและมีผลทางอ้อมต่อการให้คำปรึกษาเกี่ยวกับยาจาสมุนไพรโดยผ่านความตั้งใจ

ภาควิชา เภสัชศาสตร์สังคมและบริหาร ลายมือชื่อนิสิต .....

สาขาวิชา เภสัชศาสตร์สังคมและบริหาร ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

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CHILMIA NURUL FATIHA: FACTORS AFFECTING COMMUNITY PHARMACISTS TO ADVISE PATIENTS ABOUT HERBAL MEDICINE: A SURVEY IN INDONESIA. ADVISOR: ASST. PROF. TANATTHA KITTISOPEE, Ph.D., 135 pp.

The uses of herbal medicine have been increasing in Indonesia. As a healthcare professional who mostly encounter patients when purchase herbal products, pharmacists are responsible and knowledgeable in herbal medicine (HM) and counseling areas. Pharmacists will be more recognized as drug expert by actively advising patients about appropriate use of herbal medicine. However, Indonesian pharmacists more likely suggest conventional medicine for patients' treatment. This study aimed to explore factors that affected Indonesian community pharmacists intention to advise and advising patients about herbal medicine. A cross-sectional self-administered questionnaire survey was conducted towards Indonesian community pharmacists by online in Indonesia from May to June 2016. Of the 1044 email sent, 168 responses were usable. The results showed that pharmacists expressed positive and strong attitudes toward advising patients about HM and had a strong intention to advise patients. The logistic regression model was statistically significant, $\chi^2(5)=80.311$, $p<0.001$. Attitude toward advising HM ($exp^{\beta} = 3.93$), perceived knowledge ($exp^{\beta} = 2.22$) about HM, and pharmacist personal use ($exp^{\beta} = 1.79$), had significant relationship with intention to advise about HM. Intention ($exp^{\beta} = 1.63$) significantly predict pharmacists' advising about HM In conclusion, pharmacist's attitude toward advising patients about herbal medicine, perceived knowledge about herbal medicine, and personal use were important factors that made pharmacists intend to advise patients about herbal medicine and indirectly affect pharmacist to advise about HM through intention to advise about HM.

Department:	Social and Administrative Pharmacy	Student's Signature	.....
		Advisor's Signature	.....
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CHAPTER 1

INTRODUCTION

1.1 Background

The use of Complementary and Alternative Medicine (CAM) including herbal medicine (HM), vitamins, minerals, and dietary supplements have been increasing in the worldwide (WHO, 2001a, 2005b) including in Africa, Europe, Australia (Xue et al., 2007) and Asian countries such as India, China, Korea, Japan, Thailand and Indonesia (Debas et al., 2006) to prevent disease and maintain health. National Center of Complementary and Integrative Health of United States define CAM as a group of various medical and healthcare system, practices, and products non-mainstream approach together with conventional medicine (NCCIH, 2008).

As a tropical country, Indonesian forest contains 28,000 plant species which cover 80% of plants in the world and 90% of plants in Asia (Pramono, 2002; Woerdenbag & Kayser, 2014). Seven thousand herbal species have been used by 40 million Indonesians to treat and protect from the disease (P. E. Indonesia, 1995), totally 283 species are officially registered as herbal medicine in National Agency of Drug and Food Control (NADFC). Based on a national survey in 2007, respondents in 33 provinces chose herbal as self-medication, increased from 15.20% in 2000 and 38.3% in 2006 (Supardi & Susyanty, 2010).

Report by Indonesian Ministry of Trade revealed that because herbal medicine are obtained from nature, public assumes that they are always safe, harmless, have no adverse effect and toxicity (Muslimin et al., 2009). Increasing use of herbal medicine

is followed by numerous adverse effect and interaction between herbal and drug in case reports, case series and clinical studies (Ismail, 2009; Izzo, 2012; Izzo & Ernst, 2009). Safety and efficacy of herbal medicine could not be assured since cases of herbal induce adverse effect have been reported. Asian herbal medicine products including *jamu* are most often implicated (Ernst & Pittler, 2002). There is always the risk of herb–drug interactions, which may influence the effectiveness of conventional drugs (Izzo & Ernst, 2009). Users, prescribers, and producers of herbal products should concern of this issue.

Patients rarely report about their use of herbal medicine to the health care professionals (Bacchini et al., 2008; Lynch & Berry, 2007). Pharmacists play a critical role in educating patients about the available evidence on the efficacy and safety of these products. Pharmacists will be more recognized as drug expert by actively advising patients about appropriate use of herbal medicine, and finally improve the quality of care (Shrivastava et al., 2007). However, Indonesian pharmacists more likely suggest conventional medicine for patients' treatment (Purwonugroho et al., 2013).

Pharmacists are primary care providers with an important role, dispense, and compound medicine and also provide information to prevent, identify and resolve drug-related problems (al-Shaqha WM, 2001). When a patient needs help from healthcare professional to identify self-medication, the pharmacist can determine appropriate and safe medication. Consequently, the pharmacist has the capacity to give evidence-based information about herbal medicine (Tiralongo & Wallis, 2008). Pharmacists can play a key role by asking patients about their use of herbal products, and by discussing this issue with healthcare professionals. Pharmacists can monitor patients who use herbal

medicine for any potential adverse effects and can counsel them to ensure appropriate use.

Professional role and responsibility of Indonesian pharmacist are clearly defined by Pharmaceutical Care Law No. PP 51 2009, to provide information about conventional and herbal medicine to the patients (R. Indonesia, 2009). Awareness about herbal medicine by pharmacist become necessary because of increased documentation of evidence on adverse effect and interaction between herbal and conventional medicine (Brown et al., 2004). A survey by Braun, et al. showed that 92% of patients expect a pharmacist to provide information about product's safety, and 90% of them expect a pharmacist to inform interaction between herbal and conventional medicine (Braun et al., 2010). Pharmacist's behavior to provide information about herbal medicine and factors behind the intention are still unknown in Indonesia.

A better understanding of health care professional's behavior can be achieved by using theories to investigate behaviors. Theory of Planned Behavior (TPB) has been used to predict many health-related behaviors and to predict intention of health care professionals including physicians' and medical students' intention to encourage CAM use and pharmacy students' intention to advise CAM to patients (Noureldin et al., 2012) because its theoretical construct is the most relevant (Godin et al., 2008). Thus, TPB is an appropriate theoretical framework for studying factors affecting pharmacist to advise patients about herbal medicine

The main constructs of TPB is behavior, intention, attitude, subjective norm, and perceived behavioral control. Personal use and perceived knowledge were added in the conceptual framework to predict pharmacist intentions and behavior of advising herbal medicine to patients since many studies show that pharmacists' knowledge and

their personal use of herbal medicine may impact to their practice (Culverhouse & Wohlmuth, 2012; Howard et al., 2001; Welna et al., 2002).

1.2 Objectives of Study

The present study explore the utility of theory of planned behavior (TPB) model in explain Indonesian community pharmacist's intention to advise patient about herbal medicine. The specific objectives of the study are to: (1) analyze the extent of Indonesian community pharmacists practice toward herbal medicine, (2) examine the effect of attitude, subjective norm, perceived behavioral control, personal use, and perceived knowledge toward Indonesian community pharmacists' intention to advise patients about herbal medicine, and (3) examine the effect of intention and perceived behavioral control toward Indonesian community pharmacists' behavior in advising patients about herbal medicine.

1.3 Research Questions

In an attempt to address gap in the literature, this study has two main research questions:

1. How is the extent of Indonesian community pharmacists practice towards herbal medicine?
2. What is the effect of attitude, subjective norm, perceived behavioral control, personal use, and perceived knowledge toward Indonesian community pharmacists' intention to advise patients about herbal medicine over the TPB construct?
3. What is the influence of perceived behavioral control and intention toward the Indonesian pharmacist' actual behavior advising patients about herbal medicine?

1.4 Expected Benefit

It will provide information regarding Indonesian community pharmacists' behavior in advising patients about herbal medicine and the factors affecting to perform it. This may provide insight regarding the role of education toward Indonesian community pharmacists' practice toward herbal medicine.

1.5 Conceptual Framework

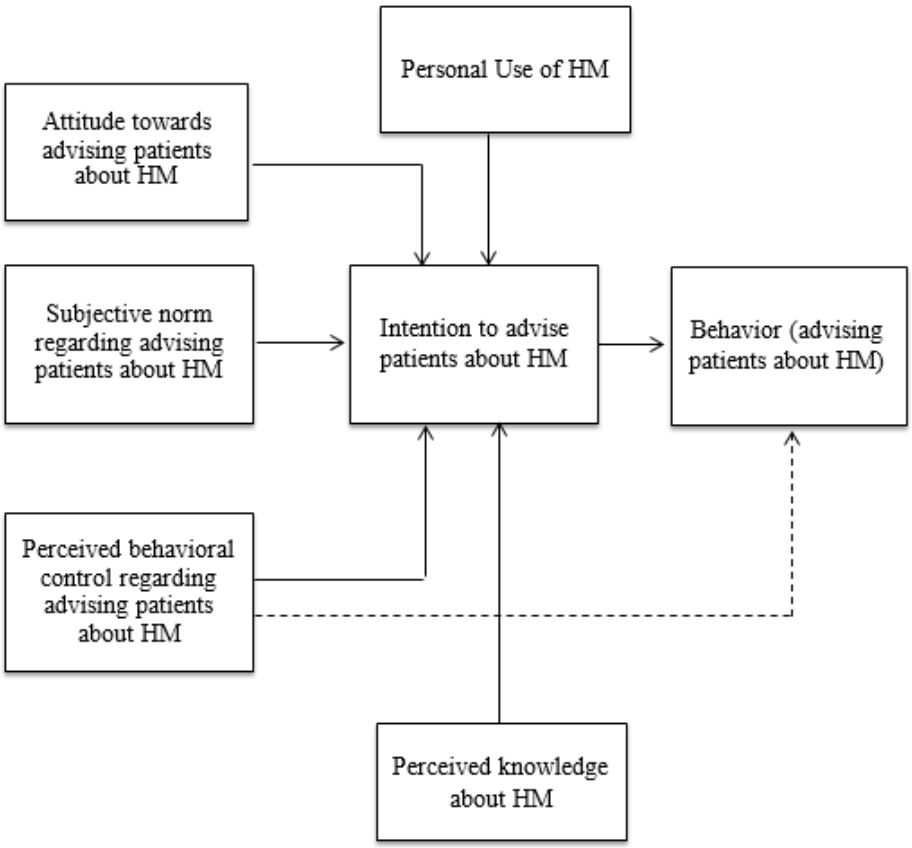

Figure 1. Conceptual Framework

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction and Definitions

Complementary and Alternative Medicine (CAM) is described as practices and products that non-mainstream approach together with conventional medicine (Debas et al., 2006). Complementary medicine is used combined with conventional medicine; meanwhile alternative medicine is used in place of conventional medicine. National Institute of Health of United States divided CAM into two main groups, natural products and mind/body practices (NCCIH, 2008). Natural products or dietary supplements include the use of vitamins, minerals, and herbal medicine. Mind/body practices include the use of meditation, yoga, massage therapy, acupuncture, and relaxation techniques to improve health by influence physical symptoms (Fouladbakhsh & Stommel, 2007). Other CAM approach, alternative medical system, as a holistic system of product and practices include traditional Chinese medicine consider (see NCCIH)

According to the Dietary Supplement Health and Education Act (DSHEA) in 1994 dietary supplement define as orally taken products that contain ingredients, for example vitamin, minerals, amino acids, enzymes, metabolite, extract, herbals or other substances which taken to complement the diet (FDA, 2015). Herbal medicine as define by WHO are herbal preparations, herbal materials, or herbal products that contain active compounds of one plant or combinations (WHO, 2005a). Herbal medicine, also known as home remedies, dietary supplement, health food and self-medication, can be sold as

over the counter medicine (OTC) or require they prescription (M. Robinson & Zhang, 2011).

Studies reported increasing use of CAM including herbal medicine in the worldwide, both in the developed and developing countries (WHO, 2001a, 2005b). Various type of CAM was used by general population of many countries, including Australia, Canada, Finland, UK and USA (Harris & Rees, 2000). Based on national survey in 1990 and 1997, there was increasing number of CAM use by adults in United States from 33.8% to 42.1% (Eisenberg et al., 1998). This trend continue where prevalence of CAM use was stable in 2002 while herbal medicine use increased from 12.1% to 18.6% (Tindle et al., 2005). Similar result showed by National Institute of Health report, where 40% of US adults population take CAM (Barnes et al., 2008). CAM use is also popular in Great Britain population (Kate Thomas & Coleman, 2004; KJ. Thomas et al., 2001), according to survey towards British adults, one fifth of them take some form of CAM, with herbal medicine as the most generally used (Ernst & White, 2000). Recent survey toward 7,630 respondents in England showed higher prevalence of use, 26.3% use on the past 12 months and 44.0% use on a lifetime (Hunt et al., 2010). In Australia, a national survey indicated that 68.9% of total 1067 adults used at least 1 of 17 CAM therapies during 12 months (Xue et al., 2007).

In 2011, WHO estimated 70%-95% of developing countries population currently use herbal medicine meanwhile 70%-90% of developed countries population have used herbal medicine (M. Robinson & Zhang, 2011). Across European countries, herbal medicine were type of CAM that most generally used especially in Turkey, Spain, Denmark, Greece and Italy (Molassiotis et al., 2005). Herbal medicine also used widely in Asian countries such as India, China, Vietnam, Japan, Thailand, (Debas HT,

2006), and Taiwan (H.-y. A. Chang et al., 2011). Among 1,475 respondents in Lebanon, 29.87% of them were CAM users during 12 months period and mostly (75%) chose herbal medicine (Naja et al., 2015). WHO reported that CAM is also popular in Indonesia, as 40% of population use CAM, and 70% in rural area (WHO, 2001a).

Widespread and growing use of herbal medicine concerns World Health Organization, in 2002 WHO suggested framework of traditional medicine plan (WHO, 2002). The traditional medicine strategy is updated in 2013 based countries' progress and challenges in herbal medicine use. The strategies are to develop basic knowledge and create national policy; promote safety, effectiveness and quality use of herbal medicine through regulation; and integrating herbal medicine into national health system and self-medication (WHO, 2013).

2.2 Herbal Medicine in Indonesia

2.2.1 Herbal Medicine History and Regulation

Indigenous herbal medicine, or jamu in Javanese language, has been used for health treatment and promotion since centuries ago. As part of culture, it was used from generation to generation and developed by community. Until in 1988, government began to introduce herbal medicine as an alternative in formal health system along with traditional practitioners (WHO, 2001b). Ministry of Health issued regulation in 1995

Herbal medicine have been used in Indonesia for health treatment since fifth century as evidenced by some relieves in Borobudur, Prambanan and Penataran temples in 8-9 centuries. The term "jamu" began to use since around 15^{th}-16^{th} centuries in old book found in Kartasuro city, Central Java. Adipati Anom Mangkunegoro III wrote

“Serat Centini”, a historical book which describes details about jamu. The term jamu or originially “djamoe” stands for “djampi” means prayer and “oesodo” means health therefore djamoe means prayer or medicine for health (Purwaningsih, 2013).

The herbal medicine potential become concerns of the government thus in 2010 Ministry of Health launched Jamu Scientification policy framework for herbal medicine development. The policy strategies consist of herbal medicine regulation; provide standardized herbal materials; promote safety, quality and efficacy of herbal products; and rational use of herbal medicine (Prapti).

As a tropical country, Indonesian forest contain 28,000 plant species which cover 80% of plants in the world and 90% of plants in Asia (Pramono, 2002; Woerdenbag & Kayser, 2014). Seven thousand herbal species have been used by 40 million Indonesians to treat and protect from the disease (P. E. Indonesia, 1995), totally 283 species are officially registered as herbal medicine in National Agency of Drug and Food Control (NADFC).

There were 1,243 jamu manufacturers in Indonesia reported in 2011, with 10% under big scale industries while the rest are small and medium scale industries, mostly located in East and Central Java provinces (BMI, 2011).

Ministry of Health in 1999 issued pharmacy supply herbals policy that strengthen the legality of pharmacy to supply herbal medicine products based on previous law PP 25/1980 and Permenkes No.992/Menkes/er/X/1993. Herbal products that sold in pharmacy must be registered to NADFC and also technical requirement such as product safety, quality, etc. (Misnar, 1999). Herbal medicine products were explored in 5 pharmacies in Jakarta. The study stated that not all of herbal products sold in pharmacies registered as traditional medicine, the rest were registered as medicine

or food. Some of the products did not provide complete information, especially adverse effects (Sukasediati et al., 1999).

Herbal medicine is used as self-medication as shown by an observational study in a healthcare center in Bandung, West Java. Total 1,277 herbal products were sold during 2014; that were mostly to treat hyperlipidemia with ingredients garlic, soy lecithin, and spirulina. Other chronic diseases treated with herbal medicine were hypertension, diabetes mellitus, heart and kidney disease. Most sold herbal products except mention above were bitter melon, ginseng, ginkgo biloba, celery, and *Centela asiatica*. Although high selling number of herbal medicine, patients rarely discussed with healthcare professional about the use which may increase potential herbal-drug interaction. Author pointed out this is pharmacists' role to educate patients and provide information about herbal medicine to prevent further problems (Destiani & Suwantika, 2015).

2.2.2 Herbal Medicine Use in Indonesia

The utilization of herbal medicine is increasing and remains popular in Indonesia, data market showed that herbal products sales value in 2013 was 7 trillion rupiahs with herbal cough and cold remedies as highest value growth (Leahy, 2014). Studies reported herbal medicine use in Herbal medicine in Indonesia is also used as complementary therapy in chronic disease patients, such as diabetes mellitus (Niswah et al., 2014), hypertension (Basuki et al., 2004), cancer (Gunawan et al., 2015), breast cancer (Yohana, 2014) and cervical cancer (Radji et al., 2010).

Annual survey was conducted to analyze traditional medicine use by Indonesian as self-medication. National survey of respondents in 25 provinces in 2001 showed that among people with illness, majority (57.7%) of them chose self-medication and 30.2%

used herbal medicine. This number is higher than previous years in 1998, 1999, 1999 that were respectively 15.2%; 15.0%; and 15.6% (Supardi et al., 2003). Based on national health survey in 2007, self-medication was chosen by 65.01% of respondents with illness in 33 provinces. Herbal medicine use also increased become 38.3% (Supardi et al., 2011; Supardi & Susyanty, 2010). Recent survey revealed that traditional medicine is still remain popular in Indonesia, 30.4% of households in 33 provinces admitted to use it during last 12 months, mainly herbal medicine (49.0%) (MoH, 2013b).

Herbal medicine is not only used by Javanese, as shown by studies consumers of herbal medicine were community in Riau (Grosvenor et al., 1995), Maduranese (Mangestuti et al., 2007), Sundanese (Roosita et al., 2008). Result of national survey showed that provinces outside Java islands take self-made herbal medicine: North Maluku, Bali, Nusa Tenggara Timur, Maluku, West Sulawesi, Nusa Tenggara Barat, Central Sulawesi, West Papua, Papua, South Kalimantan as 10 provinces with highest use of herbal medicine (Supardi et al., 2011).

Among Indonesian household who use traditional medicine during 12 months in 2013, East Java (65.2%) appear to be province with highest use of herbal medicine, followed by Yogyakarta (58.1%), Papua (55.7%), West Java (48.0%), Central Java (46.4%), and Jakarta (44.7%) (MoH, 2013b).

Herbal medicine is also popular among women to treat and maintain reproduction health, including women in pregnancy and childbirth (Handayani & Kristiana, 2011).Herbal medicine preference was increased among consumers, characteristic were women, married/divorce, live in urban area, with high economic

state (Supardi et al., 2011) different with result in 2001, that consumers lived in rural area with low socio-economic background (Supardi et al., 2003)

Herbal medicine distribute trough pharmaceutical channels such as pharmacy chains and local pharmacies, and retail channels i.e. supermarkets and traditional markets (Leahy, 2014). Ministry of Trade conducted national survey toward jamu consumers and non-consumers in 2009, result showed that 91.9% of jamu consumers perceived herbal medicine information as important. Furthermore, 72.2% of non-consumers stated that lack of information as barrier to use herbal medicine particularly dosage and composition remain unclear (Muslimin et al., 2009).

2.3 Patients Attitude and Perception towards Herbal Medicine

2.3.1 Reasons of Herbal Medicine Use

Healthy people take CAM to prevent disease and maintain health meanwhile individuals who under medical treatment take CAM to manage disease-related symptoms and improve the quality of life (Fouladbakhsh & Stommel, 2007). People often use dietary supplement to balance the diet and add nutritional intake due to lack of essentials vitamins (FDA, 2008). A study among adults in the United States concluded that improve and maintain overall health as primary reasons to use dietary supplements, other than specific reasons such as for better immunity, healthy bone and full of energy (Bailey et al., 2013).

Recent study revealed that Indonesian physician in 12 provinces practice using herbal medicine to treat patients. It was reported by survey interviewed 145 respondents who mostly in Central Java province (49%), this result related with Central Java province as main source of herbal medicine materials. Majority of the respondents

(91.2%) conducting herbal practice due to patients' demand. Common herbals utilized by physicians were ginger, *Andrographis paniculata*, celery, *Guazuma ulmifolia*, and *Sida rhombifolia* which consecutively to treat arthritis, hyperglycemia, hypertension, hyperlipidemia, and hyperuricemia (Widowati et al., 2014). Another study was conducted in 6 provinces in Java and Bali islands revealed similar result, 108 physicians practiced with herbal during 10 years period. Almost half of them (44%) were in Central Java province, where jamu industries take place and the government support use of jamu. According to 60.2% of respondents, patients satisfied with herbal medicine because symptoms relived with no adverse effects (Delima et al., 2012).

In a study at Indonesia University, authors explored medical students' perception, knowledge and attitude toward complementary and alternative medicine. Majority of respondents (79.5%) classified jamu as part of CAM, 88% of them supported Jamu Scientification Program while 72.4% will prescribe it in the future. Most of the respondents (91.2%) agreed that course about jamu can be integrated into curricula, either as a core (11.2%) or elective (80.0%). The authors suggested that physician should give advice to patients about CAM to improve quality of care (Ramadianto et al., 2015).

2.3.2 Herbal Medicine Information Source

Among 197 diabetic patients who use CAM products, physician and pharmacists play small part as CAM information provider. Taiwanese patients agreed that families (39%) and friends (27%) as the main source of information regarding CAM therapies. Similar results found in Europe, the most common CAM information source were friends (56.5%), followed by family, media, and physician respectively

29.1%, 28.4%, and 18.6% (Molassiotis et al., 2005). Survey of Australia population indicated that family, friends and book were more general as source of information about CAM rather that physician and pharmacist (Adams et al., 2011). Patients rarely rely on health care professional when decide to use dietary supplement, as most of them (77%) depend on personal choice (Bailey et al., 2013).

Studies reported patients often take CAM and conventional medicine concurrently. Among 25,208 Chinese patients, 1.9% of them used over the counter (OTC) and conventional medicine alongside with CAM, however 59.3% did not inform the health care professional (Chung et al., 2011). In England CAM is also commonly taken by 28.9% patients who get medical prescription (Hunt et al., 2010). Another survey in Taiwan concluded that majority of diabetic patients (75.4%) also take conventional medicine and CAM without informing their health care professionals (H.-y. A. Chang et al., 2011).

Authors concluded reason for patients not reporting CAM use, mainly because patients believe there was no potential interaction between herbal and drug, and the healthcare professional did not ask about medication they took (Chung et al., 2011). A study showed only 28.4% of patients reported CAM use to the physician, the reasons for not reporting were they feel not convenience to visit physician (58.3%), they perceived that CAM was not harm (15.2%), physician do not believe CAM therapies (10.5%), and visiting physician was not required (9.4%) (Naja et al., 2015). Another study revealed 74% of patients in Taiwan who use herbal medicine did not report to health care professional due to various reasons. Those reasons were patients never thought, they perceived that herbal medicine was safe, there was no inquiries about HM, they afraid that the health care professional will discourage from using HM, lack

of time and lack of knowledge from the healthcare professional (H.-y. A. Chang et al., 2011).

A systematic review of CAM user behavior who rarely inform the health care professionals indicated that patients afraid that discussion may change the decision-making. Main reasons for not reporting CAM use were patients concern about negative response from health care professionals, no question regarding CAM use from health care professional, and they perceived that health care professional don't have knowledge about CAM. It appear that, being more understand to patients is important for health care professional thus they can initiate communication and discuss further (A. Robinson & Grail, 2004).

Patients who inform their HM use appear to be more knowledgeable about ingredients of herbal medicine taken and had better attitude toward CAM use.

2.4 Herbal Medicine Safety

A study conducted in US to determine the pattern of use of herbal and dietary supplement among elderly who live in US-Mexico border. The result stated that 16.2% of respondents said taking two herbal medicine or more (polyherbacy), 26.2% of respondents mentioned taking two vitamin/mineral supplements. In addition, study reported approximately 25% of elderly have been used herbal medicine within previous 12 months, 31.5% of respondents had at least one potential interaction between their medication and herbs consumed (Loya et al., 2009).

Increasing use of herbal medicine is followed by numerous adverse effect and interaction between herbal and drug in case reports, case series and clinical studies (Ismail, 2009; Izzo, 2012; Izzo & Ernst, 2009). One third of medicine (including digitalis, morphine, atropine and some chemotherapeutic agents) were developed from

herbs therefore herbals can affect body functions and have potential interactions with drugs (Ismail, 2009).

Both herbals and conventional medicine have therapeutic and toxic dosages. The interactions between them either can increase or reduce effects of each component. As the number of herbals and conventional medicine in pharmacy greater by the time, the possibilities of drug interaction are increasing, especially over the counter product that available without prescription. Thus, healthcare professionals are supposed to increase awareness on potential interaction when patients use herbals.

A drug interaction is defined as any alteration caused by another chemical compound (drug, herb or food) in the diagnostic, therapeutic or other action of a drug in or in the body. Based on its mechanism, there are two main categories of drug interactions, pharmacokinetics and pharmacodynamics interactions. Pharmacokinetics interaction including interaction in absorption, distribution, metabolism, and excretion phase of drug, meanwhile pharmacodynamics interaction happened when combined pharmacological effects of a drug (Ismail, 2009).

Recent studies show interaction between herbals and drug used in chronic disease patients, such as in anticoagulants, diabetes, HIV, and cardiovascular medications. Narrow therapeutic index drugs (i.e. digoxin, cyclosporine, lithium, theophylline) also have high risk of interaction with herbals lead to increased adverse effect or decrease therapeutic effect (Ismail, 2009)

Report by Indonesian Ministry of Trade revealed that because herbal medicine are obtained from nature, public assumes that they are always safe, harmless, have no adverse effect and toxicity (Muslimin et al., 2009). Increasing use of herbal medicine is followed by numerous adverse effect and interaction between herbal and drug in case

reports, case series and clinical studies (Ismail, 2009; Izzo, 2012; Izzo AA, 2009). Safety and efficacy of herbal medicine could not be assured since cases of herbal induce adverse effect have been reported. Contamination, adulteration or substitutions of herbal materials have aroused concern. Asian herbal medicine products including *jamu* are most often implicated (E Ernst, 2002). Limyati documented that raw material and product of jamu are highly contaminated with bacteria (Limyati & Juniar, 1998).

Case reported adulteration in jamu contain phenylbutazone have caused agranulocytosis and citrobacterial infection (Paul J, 2005). Another study of 23 commercial *jamu* products showed the presence of natural aflatoxins that exhibit carcinogenic, teratogenic and mutagenic properties . A case report describes a 45-year-old patient who had highly elevated transaminases and elevated lactate dehydrogenase after having used *M. citrifolia*. This gave rise to the suspicion of herbal toxicity, which was confirmed by taking a liver biopsy from the patient (Millonig G, 2005). There is always the risk of herb–drug interactions, which may influence the effectiveness of conventional drugs (Izzo AA, 2009). Users, prescribers and producers of herbal products should concern of this issue.

To explore herbal consumers' attitude, an exploratory study conducted in 4 districts in different provinces in Java, Indonesia. The result showed that the respondents perceived herbal can treat all disease (45.8%), safe (57.5%), more effective than conventional medicine (39.2%), and safer than conventional medicine (65.8%). In addition, most of the herbal consumers agreed that herbal use needs monitoring and follow up from healthcare professional. The author insisted that pharmacists need to discuss about herbal medicine especially safety, efficacy, and possible interaction issues to the consumers because they need that information. Pharmacists' counseling

can increase patients' knowledge and attitude towards herbal use to be more rational and appropriate (Gitawati & Handayani, 2008).

2.5 Pharmacist Role in Herbal Medicine Use

2.5.1 Pharmacists' Role towards Herbal Medicine

People in the worldwide nowadays increasingly use herbal medicine or known as herbal products or phytomedicine, due to concern about cost and adverse effects of conventional medicine (K. Hussain et al., 2009). The widely use of herbal medicine impact to the healthcare professional to provide educated advise to patients and consider integrating it into healthcare systems.

As the availability and use of herbal medicine increased recently, pharmacist takes greater role. Pharmacists have an important role in educating and providing information to patients regarding herbal medicine, especially potential interactions with conventional medicine (Bacchini et al., 2008; Z. G. Chang et al., 2007). Awareness of cause and mechanism of

Previous studies have reported that patients need information regarding safety of herbal medicine. Herbal medicine are available as self-medication that can be taken without recommendation from health care professional (Bacchini et al., 2008). Patients usually perceived herbal medicine as safe therefore they don't inform the physician or pharmacist when take it. Lack of supervision from pharmacist or physician may leads to potential adverse events and herbal-drug interaction (Bacchini et al., 2008).

To assess community pharmacists' action if patients use CAM and conventional medicine, Brown (2005) conducted a survey in Texas. 71% of 107 pharmacists claimed

their patients use variety range of CAM, such as herbal medicine, vitamins, minerals, meditation and massage. 11% of them recorded patients' CAM use while only 39.4% reported drug related problems. Most of the respondents did not ask frequently about CAM use to their patients. They feel uncomfortable to respond inquiries in CAM yet required additional CAM knowledge. Pharmacists' actions in response to CAM use related to CAM training they had, CAM product availability in pharmacy practice, and references about evidence of effectiveness (Brown et al., 2004).

If patients use herbal medicine for self-treatment it is important for pharmacist to provide information especially potential interaction with conventional medicine (Sweileh et al., 2013). Increasing number of marketed herbal product and usage by patients require adequate information. As a healthcare professional, pharmacist should be prepared to provide information regarding safety, efficacy, and quality of herbal medicine, especially potential drug-herbs interaction (Jamal et al., 2011).

Pharmacists have important role in providing information regarding safety, efficacy and quality of herbal medicine product. However, the attitude and behavior of pharmacists towards their role in herbal medicine are still remained unknown. This study is conducted to examine the factors affecting potential role of community pharmacist to provide information about herbal medicine to patients.

It was reported that pharmacists increasingly received queries regarding herbal medicine. As a drug expert, pharmacist expected to be information source especially about drug-herbs interaction. Survey of pharmacists in Estonia concluded that patients routinely came to pharmacy either to gather information (48.5%) or to purchase herbal medicine (60.8%). Patients use advertisements as the main source for herbal information (Volmer et al., 2011).

Survey of 1,300 pharmacy consumers all over Germany resulted 75% of them acknowledge prior use of CAM more than once. When they asked about CAM consultant among healthcare professional, majority of them (50%) chose pharmacists, before physician and CAM practitioners (Ostermann et al., 2009).

Pharmacists were seen as herbal information provider, as often received question about herbal medicine both from patients and other healthcare professional (Kwan et al., 2006). A study of 2,921 pharmacists in Missouri showed that 56.9% of them get 2-4 inquiries about herbal medicine in weekly practice (Clauson et al., 2003). According to 432 respondents in Minnesota, 98% of community pharmacists receive inquiries regarding herbal medicine from patients and 63% from other healthcare professionals. Patients appear to ask question about herbal medicine to pharmacists who work in community settings rather than those in other settings. Furthermore, it was found that during 40 hours of workweek, pharmacists received 7 inquiries from patients (Welna et al., 2002).

To understand pharmacy and stakeholder leaders' perception about pharmacists' role toward natural products, interview conducted towards pharmacy schools dean, national pharmacy organizations leaders, CAM practitioner leaders, health care professional leaders, and pharmaceutical manufacture leaders in Canada. All of the interviewee agreed that pharmacists responsible to provide information about safety and identify potential interaction and adverse effects. To ensure accurate appropriate information provided, pharmacy leaders believed that pharmacists should have adequate knowledge about herbal medicine (Olatunde et al., 2010).

To identify pharmacists' role and responsibilities toward jamu scientification, a study conducted among community pharmacists in Yogyakarta, Surabaya (East Java

province), and Denpasar (Bali province). The authors conducted focus group discussion between lawyers, organization of professional pharmacists, and community pharmacists based on Pharmaceutical Law No. 51 in 2009. As a conclusion, pharmacists has important role in herbal medicine and the responsibilities as mention below; supply and store herbal products, screening of prescription, preparation of product, compounding, provide products information, counseling, monitoring, promotion and education and lastly doing home care visit. This result indicated that pharmacists should have skill and knowledge regarding herbal medicine, such as standard formulation, toxicology, adverse reaction, dosage and monitoring therapy of herbals, post marketing surveillance and counseling (Suharmiati et al., 2012).

Case studies at oncology hospital in Australia illustrated pharmacists' role in advising patient toward herbal use with conventional medicine. Author claimed that pharmacists provide information on cancer patients' treatments and advise healthcare professional about safety use of CAM. By providing information, pharmacists can determine the impact of each herbal taken to the treatment and prevent unwanted effect, such as reduce efficacy or increase adverse events. Potential drug-herb interaction in this study were found and pharmacists advice was followed by discontinuation of herbal medicine use (Mellor et al., 2012).

Similar study examined the impact of pharmacists' information provision towards patients who use CAM and conventional medicine concomitantly. Observational study was conducted towards cancer patients in hospital who use CAM such as multi-vitamins, calcium, supplements, and herbals. Thirty nine percent of 152 patients use CAM including herbals, it found that 41% of 141 number of CAM use had

potential interactions with cancer patients' medication, either increase adverse effect or decease efficacy. Evidence-based information and advices from pharmacists were to continue medication, discontinue medication, reduce dosage, stop within 48 hours and stop more than 48 hours. Pharmacists service proven effective to improve patient safety as majority of patients (98%) follow the recommendation (Thakerar et al., 2014).

To avoid potential herb-drug interactions, Hussain suggested health care provider to initiate discussion about herbal medicine use to patients, especially who take medicine with narrow therapeutic index, take medicine which act as enzyme inhibitors or inducers, poly pharmacy and the elderly patients. Pharmacists need to consider pharmacology of each medicine taken by patients to prevent pharmacodynamics interactions with herbal medicine (S. Hussain, 2011).

Pharmacists are they key personnel in provide information about herbal medicine use thus patient can use it appropriately (Kanjanarach et al., 2006). Based on observational study in Surabaya, Indonesia, patients trust pharmacists as drug information source and they expect pharmacists to give advice about medication use (82.46%), over the counter products (77.19%), adverse effects (75.44%), and herbal medicine (49.12%).

Previous study compared how pharmacists and non-pharmacists response to customers' inquiries regarding herbal medicine in retail settings in Phoenix, US. Author claimed that customers who bought herbal medicine for weight loss in pharmacies, grocery stores and health food stores frequently ask recommendation and need counseling about safety, potential drug-herbal interactions, and adverse effects. Non-pharmacists more likely perceived herbals as safe rather than pharmacists therefore 50% of them thought that drug-herbals interactions were not possible. Non pharmacists

rarely refer to health care professional although their knowledge about safety and drug interactions were lacking. It indicates that information provided by non-pharmacists were not accurate thus might harmful. Meanwhile pharmacists were hesitant to counsel and provide information about herbal medicine, possibly due to lack of time and lack of knowledge (Jordan et al., 2010).

Pharmacists professional role in primary care are to provide information, educate and guide patients about medicine, include herbal medicine. By conducting counseling about safety and rational use of herbals, pharmacists can prevent potential adverse effect. As proven in Taiwan hospital setting, pharmacists interventions in traditional medicine i.e. counseling service and medication guide ameliorate patient satisfaction significantly (Chen et al., 2012).

As herbal medicine widely marketed and dispensed, community pharmacists need to provide information regarding safety use of herbals to patients. Therefore it is crucial for pharmacist to develop knowledge about herbal medicine, especially indications, adverse effects, and potential interaction with conventional medicine.

Physician realize the rising of patient's demand of reliable information about herbal medicine, to response the issue medicine schools in US, Canada and Germany try to integrate complementary medicine course into curricula by approaching safety, efficacy and cost-effectiveness issues (Frenkel & Arye, 2001).

2.5.2 Pharmacists' Practice towards Herbal Medicine

US and Canadian pharmacists' practice toward dietary supplement was shown by a systematical review. Studies implied that pharmacists have 4 types of practice regarding dietary supplement, including asking about patients' use, making recommendation, documenting and monitoring patients' use, and looking for

information. It appears that pharmacists rarely asked, documented and monitored patients' use of dietary supplement. In terms of making recommendation, several studies concluded that pharmacists in Canada have recommended herbal medicine to patients rather than in those US. The surveys also showed that pharmacists actively learning and looking for information about herbal medicine (Kwan et al., 2006).

It is common for pharmacists in Australia to recommend CAM to patients, whether in daily (23%), weekly (20%), monthly practice (5%), or occasionally (35%). Seventy percent of the respondents provide CAM products, they believed that selling CAM is good for pharmacy business, since these can increase pharmacy' image (57%), increase annual sales (72%), and increase number of patients (87%). Majority of the respondents (83%) believed that lack of evidence as the main reason for not recommending CAM to patients (Naidu et al., 2005).

About half (40%) of total 70 clinical pharmacists in Florida reported to recommend dietary supplement to their patients, it appears that pharmacists' personal use of dietary supplement correlated with their practice behavior. The respondents mentioned clinical trials, CAM practitioners, oral communication, internet and media as top sources of information about dietary supplements. Data were obtained from convenience sample of clinical meeting participants thus might not be generalized to pharmacists in other practice settings (Howard et al., 2001).

Study of pharmacist conducted in Minnesota showed that about one third (33%) of 302 respondents stock herbal medicine in their pharmacies. Several factors considered by pharmacists when they stocked herbal medicine, mainly patient demand (70%), manufacturers' reputation (58%), physician recommendation (50%), and the ability of manufacturer's to provide quality data (40%) (Welna et al., 2002).

A study of 100 community pharmacist was conducted in Palestine to determine dispensing practice of herbal medicine. The response when they asked about dispensing herbal medicine were 10% always, 25% often, 50% sometimes, 14% rarely and 1% never dispense herbal medicine to patients. The result showed that 44% of respondents always counsel patients about herbal medicine, 29% of them often counsel, and 21% of them sometimes counsel and 6% of them rarely counsel. When dispense herbal medicine to patients, only 44% of pharmacists provide information and give advice to them (Sweileh et al., 2013).

The study of 65 community pharmacists in Kuwait revealed that about half (49%) of the respondents advise patients regarding herbal medicine use. The author found out that pharmacists who practice in private pharmacies more likely to advise patients about herbal medicine rather than those who practice in government pharmacies (Abahussain et al., 2007). Online survey of 271 registered pharmacists in Abu Dhabi show that 38.4% of them often dispensed herbal medicine. Furthermore, almost half (48.8%) of the respondents always advise patients about herbal medicine and 34.6% often received question about herbal medicine use (Fahmy et al., 2010).

Another study in Estonia toward 154 community pharmacists revealed that almost half of them (49.2%) admitted it's not feasible to counsel herbal medicine to costumers mainly due to lack of knowledge (29.5%), lack of product information (28.2%) and customer's misunderstood about herbal medicine products (25.6%). Pharmacists who practice in urban area were more likely to be critical about product information (Volmer et al., 2011).

Alternatively, Semple tried to determine perceived barriers for community pharmacists to provide information regarding CAM to patients. Survey on 211

Australian pharmacists in 2004 confirmed that majority of them (95%) received questions regarding CAM from patients. Nevertheless when they asked about their confidence level about CAM safety, efficacy, interactions, and adverse effects less than 15% feel very confident. The respondents perceived these factors as barrier to provide information about CAM: lack of proper CAM training particularly at undergraduate education, lack of adequate and accessible information sources, lack of good regulation, lack of evidence-based CAM products, patients perceived that herbals are natural totally safe, and lack of time. It is necessary to support pharmacists' need of adequate information source and proper training from educational institution and professional organizations (Semple et al., 2006).

A study compared pharmacists practice toward CAM in Thailand and Australia settings by conducting depth interview. When patients purchased CAM products, Australian pharmacists would initiate discussion by asking patients to explain about their symptoms, current medication taken, and necessity of the products. According to the respondents in both countries, pharmacists from both countries agreed that advise patients and provide information is pharmacists' professional role regarding CAM. Nevertheless, pharmacists' performance on CAM practice was still insufficient due to lack of information and lack of time. The author concluded several factors affecting pharmacists practice toward CAM, including customers' requests of product, pharmacists' perception toward their professional role towards dietary supplements, patients' trust in pharmacists' knowledge, lack of adequate evidence-based information, perceived benefit to pharmacy business, and attitude towards benefit of dietary supplement itself (Kanjanarach et al., 2006).

The same author conducted structural equation modeling to explain factors influence community in New South Wales, Australia. Generally pharmacists agreed that pharmacists' responsibility regarding CAM use was counseling to patients. It was appear that the more likely pharmacists accept their responsibilities in CAM counseling the more they will evaluate appropriate use of CAM, by asking about products' safety and effectiveness, patients' medication, health condition, lifestyle and eating behavior. Pharmacists' perception to their responsibility indirectly influenced pharmacists' practice on selling CAM products. Meanwhile other factors such as attitude towards CAM, perceived knowledge, perceived benefit income, and the characteristics of pharmacists not significantly have impact to pharmacists' decision to sell CAM (Kanjanarach et al., 2011).

Cross sectional study of 1,401 pharmacists in Riyadh, Saudi Arabia clarifies that majority (82.4%) of the participants sold herbal medicine in their practice settings. More than half of the pharmacists (59.7%) admitted that they sometimes had discussion about herbal medicine use with patients, which only 20.8% initiated by pharmacists. Furthermore, about half of the respondents (48.5%) sometimes documented patients' use of herbal medicine. Several factors mentioned by pharmacists as barriers to discuss with patients about herbal medicine, that were lack of time (46%), lack of adequate information source (30.3%), lack of scientific evidence (15.2%), lack of knowledge (13.4%) and not interested (9.1%). Participants also pointed out that pharmacists' attitude towards counseling and lack of communication skill make them reluctant to provide information. Accessibility to information source significantly correlate with pharmacists' practice regarding herbal medicine, as they more likely learned, sold, discussed and documented the use of herbal medicine (Al-Arifi, 2013).

Community pharmacists' practice towards patient inquiries toward CAM also has been examined in Texas-Mexico border cities. Majority of respondents (63.8%) claimed their patients use CAM but only 35.8% of patients reported their CAM use. Most of the pharmacists (72.7%) stocked herbal products in their work practice while only one-third of them detected possible interaction between drug and herbal with computer. Generally, respondents were not confident provide information about CAM, especially herbal products. Therefore they rarely ask and document herbal medicine use of patient. The author insisted that to prevent patients from adverse effects and improve the quality of care, pharmacists need to improve their knowledge about herbal medicine by continuing education (Brown et al., 2004).

2.5.3 Pharmacists' Attitude towards Herbal Medicine

Several studies have explored attitudes of pharmacists towards complementary and alternative medicine. Surveys concluded that pharmacists are conscious of variety type of CAM including herbal medicine. This is shown by a survey of pharmacists in Australia, that herbal medicine was perceived as useful type of CAM by 74% of the respondents (Naidu et al., 2005). Another survey towards pharmacists in Germany asked respondents to rank different type of CAM based on usefulness, and herbal medicine as the first followed by vitamin, minerals, and homeopathy. Pharmacists generally had a positive attitude toward CAM efficacy (Ostermann et al., 2009).

Pharmacists' attitudes towards CAM also have been studied in Singapore. More than half of respondents (57%) believed that if the healthcare professionals do not understand patients' health belief, the patients may disfavor or even avoid from them. Out of 420 pharmacists, 76% claimed that pharmacists have professional responsibility to patients that is providing information about herbal medicine, meanwhile 47% of the

respondents thought that this is physician' responsibility. In general, pharmacists declared their role as information providers and educators about herbal medicine to patients (Koh et al., 2003).

Pharmacists generally have positive attitude towards CAM, as concluded by a survey towards 484 pharmacists in New South Wales, Australia. When given statement about attitude, 77% of them agreed that CAM is useful as complementary therapy while 73% thought that CAM is beneficial. Majority of the respondents (95%) believed that pharmacists should be knowledgeable about CAM and 90% of them agreed that pharmacists should be able to advise patients about the most common CAM therapy. Furthermore, the respondents encouraged CAM course to be included in pharmacy school (82%) and continuing pharmacy education (87%) (Naidu et al., 2005).

Similar result was shown by a cross sectional study conducted in Palestina to determine attitude of community pharmacists toward herbal medicine. Most of the respondents (91%) believed that herbal medicine have benefit while 49% agreed that these have placebo effect. Sixty one percent of 100 pharmacists thought that herbal medicine have less adverse effects than conventional medicine and about 70% agreed that herbal medicine significantly interact with conventional medicine. Half of the respondents (56%) agreed that herbal medicine have not been studied sufficiently (Sweileh et al., 2013).

Pharmacists' attitude toward herbal medicine was also determined by a study in Virginia and North California. Among 164 respondents, mostly (68%) worked in community practice and 73.6% of them sold herbal medicine. The attitude of pharmacists towards herbal medicine varied, but more than half (64%) of the pharmacists agreed that herbal medicine should be sold in pharmacy only. Seventy three

percent of the respondents coincided that providing information is pharmacists' role in herbal medicine. It appears that pharmacists who previously completed a continuing education program or had accessibility to herbal medicine information source more likely to be aware their role as herbal educators (Z. G. Chang et al., 2000).

A self-administered survey in Nigeria on 273 pharmacists who practice in hospital, academic, industrial, and community pharmacy revealed that most of them (64%) have positive attitude towards herbal medicine use. Fifty three percent of the respondents aware about regulatory laws for herbal medicine practice. Majority of the respondents (87%) agreed that pharmacists require further knowledge about herbal medicine. Furthermore, pharmacists coincide that it needs to establish center of herbal information and national herbal research and development (Atavwoda & Gabriel, 2012).

Pharmacists' attitude toward herbal medicine was assessed in Abu Dhabi resulted half of them (51.7%) believed that herbal medicine is beneficial and 44% agreed that herbal medicine have less adverse effects (Fahmy et al., 2010).

Based on a systematical review about attitude of pharmacists in US and Canada towards dietary supplement, it appears that pharmacists' agreed to have continuing herbal education and insisted the program to be mandatory. There was strong agreement among pharmacists that herbal medicine are still lack of regulation and adequate information, especially about drug-herbs interaction. Studies indicated that pharmacists perceived their knowledge about herbal medicine was not adequate. Similarly with actual knowledge, the results implied the score was low (Kwan et al., 2006).

Pharmacists' attitude toward herbal medicine has a positive relationship with pharmacists' role as herbal medicine information provider. As pharmacists concern

toward herbal medicine are growing, they will me more likely to encourage patients to be more involve in self-care herbal medicine (Atavwoda & Gabriel, 2012). Therefore, pharmacists' attitude is important for patient care (Naidu).

To determine pharmacy students' attitude toward CAM, a cross sectional study was conducted in Australia. Result of 110 respondents indicated that 89.2% of them believed that CAM needed to be integrated into clinical care. Majority (85.5%) of the students agreed that CAM could treat disease and symptoms. When they were asked to rank barrier to use CAM, they answered lack of scientific evidence (86.5%), lack of professional skills (65.8%), lack of reimbursement (48.6%), and legal concerns (27%).

Based on interview of pharmacy students in Australia, they perceived learning CAM as important. The reasons were related to pharmacists' responsibility that pharmacists sell CAM products thus they need to be knowledgeable about evidence-based CAM and its effectiveness. Majority of the students (95.5%) stated that pharmacists should be able to advise patients about CAM, particularly fourth year students who 100% of them agreeing. Evidence was appear to be main reason for majority of the students to recommend CAM use to patients (Tiralongo & Wallis, 2008).

2.5.4 Pharmacists Personal Use of Herbal Medicine

Pharmacists reported to use various type of CAM personally as shown by survey at two pharmacists' international meetings in Singapore. From total 420 respondents, 84% of them admitted using any kind of CAM in the lifetime and 66% admitted to use CAM in the past year. Herbal medicine ranked first (72%) as type of CAM based on frequency of use, before massage, aromatherapy, and homeopathy. Pharmacists used

CAM mainly for maintenance of general health (50%), treatment of health problems (47%) and stress relieve (31%) (Koh et al., 2003).

A survey was conducted during clinical pharmacists meeting in Orlando, Florida to examine dietary supplement use patterns. The result indicated more than half (53%) of the respondents personally used dietary supplements, including vitamin, minerals, and herbals. The reasons for pharmacists to take the products were as antioxidant, to treat cold and flu, improve immunity, prevent from heart disease, and lose weight (Howard et al., 2001). Fifty one percent of pharmacists in Kuwait reported to use herbal medicine personally in the lifetime (Abahussain et al., 2007). Study of pharmacists in Abu Dhabi also reported to use herbal medicine, 6.8% of 192 respondents admitted always use, 21.3% often use, 42.5% use sometimes, 18.8% rarely use and 10.6% do not use (Fahmy et al., 2010).

More than half (57%) of 496 pharmacists in Minnesota admitted to use herbal medicine and 53% recommended these to their family members. It appears that practice settings and pharmacy ownership significantly associate with personal use. About half (56%) of the pharmacists suggested herbal medicine to patient, it was pointed out that this behavior significantly correlated with male gender, pharmacists who own pharmacy, used herbal personally, recommended to family members, worked in community pharmacy, and lived in rural area (Welna et al., 2002).

Studies also reported high percentage of pharmacy students use CAM personally. A study of 264 British students at school of pharmacy in UK reported 43% of them used CAM in previous 12 months. Herbal medicine was one type of CAM that frequently used, more than half of the respondents (58%) used at least one herbal

medicine. It was reported that herbal medicine was used to treat disease related to skin, psychological and gastrointestinal track (Freymann et al., 2006).

Survey of 160 Malaysian pharmacy students indicated that more than half of them use herbal medicine, either to cure disease (29.6%) or to prevent from disease (27.7%). Majority of students acknowledged that their family members have used herbal medicine for their health care (78.6%), authors stated that the personal use may influenced by their family (Jamal et al., 2011). Another study of pharmacy students conducted in Malaysia reported 58% of them use one or more type of CAM mainly herbal medicine. Majority of the students (93.5%) perceived lack of scientific evidence as the main reason to not use CAM, meanwhile the remainder thought of lack of skilled professionals (86.75%), lack of financial support (48.5%), legal concern (45.75%), and lack of time (39.5%). About half of the respondents asserted that they will recommend CAM to family and friends. The students also stated that they will recommend CAM to patients when they practice as pharmacists (Hasan et al., 2011).

2.5.5 Pharmacists Knowledge about Herbal Medicine

Toda believed that to provide services in pharmacy, pharmacists need to have abilities to respond in medication prescribed, advise on herbal medicine and counsel on self-medication. Therefore knowledge toward herbal medicine is important for pharmacists' future (Toda, 2012). Studies have been conducted to assess how pharmacists' knowledge was gained.

Community pharmacists' knowledge and practice regarding herbal medicine have been examined in Estonia. Cross sectional survey on 154 respondents resulted 64.1% of them perceived had a good knowledge about herbal medicine with higher score on older pharmacists (46-65 years old). About one third of the pharmacists

(35.8%) perceived continuing herbal education as important. Respondents claimed that written information (62.5%) and courses and seminars (62.5%) as the best way to learn about herbal medicine. According to the pharmacists, herbals' mechanism of action (93%) and indication (93%) are the most important information for the customers (Volmer et al., 2011).

Another study was conducted to evaluate pharmacists' knowledge about use and adverse effects of CAM. Survey of 420 pharmacists showed that only 4.5% of them perceived had sufficient knowledge about CAM. The remainder perceived had moderate knowledge (40%), did not have much information (39.8%), and knew nothing (6.7%). Eighty one percent of the pharmacists felt lack of knowledge and skills to counsel patients about herbal medicine and majority of them (90.5%) agreed that herbal medicine course should be added more in curriculum. Majority (78.3%) of the respondents declared that they concern to attend continuing education program about herbal medicine (Koh et al., 2003).

Study of pharmacists' knowledge about herbal medicine was conducted in Virginia and North California. The respondents were asked to answer question about the indication, adverse effect, drug-herb interactions, and cautions of 5 top-selling herbal medicine. The scores were appeared to be low (<50%) and the wrong answer mostly came from adverse effects and drug-herb interactions part. Higher score of knowledge was achieved by pharmacists who attended continuing education program on herbal medicine and pharmacists who had accessibility to herbal information resources. Based on the result, 67% of the respondents agreed that it is mandatory for pharmacists to continue education on herbal medicine (Z. G. Chang et al., 2000).

Similar result came from study of 65 community pharmacists in Kuwait. Knowledge test of selected herbal medicine showed that pharmacists had good result in indication part but wrong answers in adverse effects part. Thirty one percent of the respondents admitted that they did not have much information regarding drug-herbs interaction. Pharmacists in Kuwait reported to be interested in herbal information and the most (78.5%) frequently used information source was previous study at pharmacy school. The respondents also obtained information about herbal from books and magazine (53.8%), media (47.7%), and sales representative (30.8%) (Abahussain et al., 2007).

Clauson found that pharmacists in Missouri received question about herbal medicine at least 2 times in a week however only 2.4% of them always able to answer questions. Majority of the respondents feel either not satisfied (45.4%) or somewhat satisfied (44.3%) with their knowledge about herbal products. The pharmacists mostly choose to continue education (70.2%) to gain more knowledge about herbal medicine. When they asked about very important topic related to herbal medicine, respondents answered interactions (84.5%), adverse effects (80.0%), patients' information (71.2%), indications (68.2%), dosage (59.2), and mechanism of actions (30.9%). Safety information was more likely considered as important by younger pharmacists (25-45 years old) (Clauson et al., 2003).

Study was conducted in Abu Dhabi to determine pharmacists' perceived knowledge regarding herbal medicine. Indication was chosen as the most familiar topic about herbal medicine by majority of respondents (62.2%), followed by precautions (3.7%), drug-herb interactions (2.1%), and adverse effects (2.1%). Only 23.9% of them felt have sufficient knowledge with all topics. Pharmacists perceived inadequate skills

and knowledge to advise patients about herbal medicine due to lack of training therefore almost all of them (97.4%) concerned to have continuing herbal education programs. Drug-herbs interactions were chosen as topic of interest in training by 46.7% of them, before adverse effects (23.6%), precautions (11%), and indications (9.3%) (Fahmy et al., 2010).

As a future healthcare professional who will apply their knowledge in the future to provide optimum pharmaceutical care, it is important to discover pharmacy students' knowledge about herbal medicine.

Study was conducted towards 271 undergraduate students of pharmacy, nursing and biomedical science in Australia. Majority (77.9%) of the respondents used at least one type of CAM, namely aromatherapy, herbal medicine, vitamin and minerals. When students were asked to choose main source of information regarding CAM, friends appear to be the first before family, newspaper, TV/radio, magazines and physician. They will be health care professionals who advise patients in the future thus students need to acquire decent and reliable information to gain adequate knowledge about CAM (Wilkinson & Simpson, 2001).

A cross sectional study was conducted in Malaysia towards pharmacy students who enrolled herbal medicine course. As result from 160 respondents, majority of them (67.5%) agreed that herbal medicine course should be included in pharmacy curriculum, and 40.3% wanted this as core course. The course can improve students' knowledge stated by 67.5% of respondents and 47.5% of them admitted that the course motivate them to study. However, students who underwent the course were still unsure about the evidence use of herbals and were not confident to recommend or advise on herbal medicine to patients (Jamal et al., 2011).

Survey evaluated the knowledge of herbal medicine among undergraduate pharmacy students in London, UK. Students appear to use family members to obtain information about CAM use. Author concluded that knowledge about herbal medicine was inherited from grandparents and diverse across the culture (Freymann et al., 2006). Study of pharmacy students in Malaysia found that internet as the main source of information about CAM by 69% respondents, followed by family or friends and media. It was reported that only 27.4% of them chose formal education as CAM information resources. As a future pharmacist, integrating CAM course in pharmacy school curriculum can provide sufficient and adequate information to students (Hasan et al., 2011).

To identify the impact of education towards pharmacists' knowledge and attitude toward herbal medicine, a quasi-experimental study conducted in Banyumas district, Central Java province, Indonesia. Forty one community pharmacists were divided into control and treatment group then asked to fill questionnaire before and after receive self-learned module. The module consists of materials about hypertension, hyperlipidemia, and treatment with herbal medicine. Herbal medicine part contained explanation about active compound, dosage, mechanism of action and adverse effect of some herbals that scientifically proven to treat hypertension and hyperlipidemia such as garlic, ginseng, soy, etc. The result indicated that education can significantly ameliorate the pharmacists' attitude and knowledge toward herbal medicine particularly in hypertension and hyperlipidemia (Purwonugroho et al., 2013).

Recent study evaluated factors related to pharmacist practice regarding dietary supplement in Tehran, Iran. Questionnaires were filled by 500 community pharmacists, resulted there is significant relationship between pharmacists' knowledge and practice,

thus higher knowledge resulted better attitude and practice (0.43). It seems that pharmacists' experience, academic school and pharmacy ownership impact pharmacists' practice in dietary supplement. Gender show significant difference in knowledge, men pharmacists appear to be more knowledgeable and more confidence in dietary supplement than women. Pharmacists with higher education had a higher score of attitude, knowledge, and practice in dietary supplement. Ownership variable impacted pharmacists' attitude, knowledge and practice positively. In addition, most of respondents (57.6%) had weak practical knowledge about dietary supplement, 21% of them had average and 17% had an excellent score (Mehralian et al., 2014)

When asked to rate knowledge about herbal medicine indication, adverse effects, and interaction with conventional medicine, 67% of community pharmacists in Palestina perceived they had a good knowledge. On the contrary, the actual knowledge about herbal medicine was low, 50% of respondents had a problem with the indications while 80% of them cannot answer question about interaction correctly. There was significant correlation between year of experience and knowledge, which as increasing year of experience the knowledge was lower. Highest score of knowledge was shown mostly in new graduate pharmacist who took course about herbals (Sweileh et al., 2013).

2.5.6 Pharmacists Attitude toward Practice related to Herbal Medicine

Cross sectional study conducted in pharmacists in Minessota resulted 53% of total 533 respondents use herbal medicine personally, 45% of them recommend herbal medicine for their family member and 56% suggested patient to try HM. The amounts of information source are considered as inadequate by most (95%) of respondents therefore they need more. 51% of respondents thought that HM were safe, but only 19%

believed its affectivity. 78% of respondents agree that government controlling towards herbal medicine are still inadequate. Pharmacists are increasingly believed as herbal medicine information provider, as the amount of questions regarding herbal medicine are 7 times per week by patients compare to other healthcare professional who asked 1.3 times per week (Welna et al., 2002).

Holt in 2014 conducted survey toward 71 physicians and pharmacists which indicate pattern of dietary supplement recommendation to patient. New Zealand physicians and pharmacists commonly recommend products to patients that personally use by themselves. They only take and suggest herbal medicine that clinically proven, including ginger for vomiting and valerian to treat insomnia (Holt, 2014).

2.5.7 Perceived knowledge of Herbal Medicine

As a drug expert, pharmacist has important role providing rational use of herbals to patients. To be able to advise proper use of herbal medicine, pharmacists should have adequate knowledge about safety, efficacy, adverse effects and potential interaction of herbal with conventional medicine (K. Hussain et al., 2009). Some studies conducted to determine information about safety, efficacy, and quality of herbal medicine are essentials. To provide complete information in product especially composition, safety, dosage, mechanism of action and interaction with drugs, pharmacists and herbal industry should collaborate with government as regulator (K. Hussain et al., 2009).

Common information requested in information resources were general information, interaction between herbals and drug, therapeutics and adverse effects. According to one cross sectional study, herbal references and databases that provide complete evidence-based information were Natural Medicine Comprehensive Database, AltMedDex, and The Natural Pharmacists (Walker, 2002). Pharmacists has

a critical role in provision of medicine information, including herbal medicine (Purwonugroho et al., 2013).

2.6 Theory of Planned Behavior

The theory of planned behavior (TPB) is used as a basis for this study's conceptual framework. The TPB is a model to assist in predicting an individual's behavior based on his intention on performing that behavior. According to the model, the 5 intention to perform a specific behavior is based on the individual's attitudes towards the behavior, subjective norms regarding the behavior, and the individual's perceived control over performing the behavior (Ajzen, 1991). Developed from the Theory of Reasoned Action, the TPB is a well-established theory in social psychology that is used as the theoretical basis for a variety of research studies ranging from election participation, problem drinking, and weight loss (Ajzen, 1991; Francis et al., 2004).

TPB use constructs of attitude (individul's positive or negative feelings about performing behavior), subjective norm (individuals perception of whether people important to the individual think the behavior should be performed), perceived behavior control (individual's perception of the difficulty of performing behavior) (Ajzen, 1991). TPB has been used widely to predict behavior, including predicting smoking cessation, explaining vegetables diet, and identifying factors that influence antibiotic use.

Godin conducted a review of the efficiency of the TPB to explain and predict health-related behaviors. Fifty-six studies were included in the review. The TPB was found to explain intention well, with the variation in intention most often significantly explained by attitude and perceived behavioral control. The review found that TPB is a good framework to measure intention across health-related behaviors (Godin, 1996).

The core concept in the TPB is to predict an individual's behavior based on that individual's intention to perform that behavior. The TPB suggests that the stronger the intention to perform a certain behavior, the more likely the individual will perform that behavior (Ajzen 1991). According to the TPB, the intention to perform a behavior is influenced by three variables: attitudes, subjective norms, and perceived behavior control (Ajzen 1991; Francis et al. 2004). Attitudes have been defined as "a summary evaluation of a psychological object captured in such attribute dimensions as good-bad, harmful-beneficial…" (Ajzen, 1991). Therefore, attitudes represent an individual's evaluation of an idea or object in terms of a dichotomous scale, positive or negative. The expectancy-value model has been used to conceptualize attitudes as being the interaction between an individual's beliefs about a behavior and their evaluation of that behavior, and this conceptualization of attitudes is used in the TPB (Francis et al. 2004; Ajzen 1991, Fishbein and Ajzen 1975).

Table 1.Contextual Factors from Literature related to Herbal Medicine

Subject	Intention/ Behavior	Factors	Association	References
Pharmacists	Practice towards DS and herbals	Pharmacy ownership	Positively associated with knowledge, attitude, and practice	(Mehralian et al., 2014)
			Positively associated with recommending herbal	(Welna et al., 2002)
Pharmacists	Practice towards herbals	Gender	Positively associated with recommending herbal	(Welna et al., 2002)
Community pharmacists	Practice towards herbals	Age	Positively associated with knowledge about herbals	(Volmer et al., 2011)
Pharmacists	Practice towards DS	Graduated recently	Positively associated with knowledge	(Tiralongo et al., 2010)
Pharmacists	Practice towards CAM	Practice experience	Associated with practice	(Culverhouse & Wohlmuth, 2012; Mehralian et al., 2014)
			Negatively associated with knowledge	(Sweileh et al., 2013)

Table 1. Continued

Subject	Intention/ Behavior	Factors	Association	References
Pharmacists	Practice towards HM	Previous education program or training	Positively associated with knowledge	(Z. G. Chang et al., 2000, 2007; Purwonugroho et al., 2013; Tiralongo et al., 2010)
Pharmacists	Practice towards HM	Practice site	Positively associated with recommending herbal	(Abahussain et al., 2007; Welna et al., 2002)
Pharmacists	Practice towards HM	Location (rural area)	Positively associated with recommending herbal	(Culverhouse & Wohlmuth, 2012; Welna et al., 2002)
Pharmacists	Practice towards HM	Accessibility to information source	Positively associated with knowledge Positively associated with practice toward herbals	(Z. G. Chang et al., 2000) (Al-Arifi, 2013)

Table 2.Attitudinal Factors from Literature related to Herbal Medicine

Subject	Intention /Behavior	Factors	Association	Reference
Pharmacists	Practice towards DS	Attitude toward DS	Positively associated with practice	(Mehralian et al., 2014)
			Not significantly associated with pharmacists' decision to sell products	(Kanjanarach et al., 2011)
			Positively associated with attitude towards pharmacists role as information provider	(Atavwoda & Gabriel, 2012; Noureldin, 2011)
Physician and medical students	Encourage CAM use	Attitude, Moral norm, descriptive norm, PBC, and Professional status	Positively associated with intention to encourage CAM use	(Godin et al., 2007)
Pharmacy students	Advising patients about CAM	Attitude towards advising CAM, Subjective Norm, and PBC	Positively associated with intention to advise patients about CAM use	(Noureldin, 2011)

Table 2. Continued

Subject	Intention /Behavior	Factors	Association	References
Community pharmacists	Practice towards CAM	Pharmacists' perception toward their responsibility as information provider	Associated with CAM practice	(Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2011)
Community pharmacists	Counsel and provide information about CAM	Lack of knowledge	Perceived barrier	(Al-Arifi, 2013; Culverhouse & Wohlmuth, 2012; Jordan et al., 2010; Tiralongo et al., 2010; Volmer et al., 2011)
Community pharmacists	Counsel and provide information about CAM & herbals	Lack of time	Perceived barrier	(Al-Arifi, 2013; Culverhouse & Wohlmuth, 2012; Jordan et al., 2010; Semple et al., 2006; Tiralongo et al., 2010)
Community pharmacists	Provide information about CAM	Lack of education or training	Perceived barrier	(Brown et al., 2004; Semple et al., 2006)

Table 2. Continued

Subject	Intention /Behavior	Factors	Association	Reference
Community pharmacists	Provide information about herbals	Lack of scientific evidence	Perceived barrier	(Al-Arifi, 2013; Culverhouse & Wohlmuth, 2012; Naidu et al., 2005; Semple et al., 2006; Tiralongo et al., 2010)
Community pharmacists	Provide information about CAM	Patients perception about CAM safety	Perceived barrier	(Culverhouse & Wohlmuth, 2012; Semple et al., 2006; Volmer et al., 2011)
Community pharmacists	Provide information about CAM	Lack of reliable information sources	Perceived barrier	(Al-Arifi, 2013; Brown et al., 2004; Kanjanarach et al., 2006; Semple et al., 2006; Tiralongo et al., 2010; Volmer et al., 2011)

Table 2. Continued

Subject	Intention /Behavior	Factors	Association	Reference
Pharmacists	Recommend CAM to patients	Health benefit outcome	Behavioral outcome	(Culverhouse & Wohlmuth, 2012)
Community pharmacists	Sell and recommend CAM and herbals products	Customers' requests (demand)	Subjective norm	(Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2006; Welna et al., 2002)
Community pharmacists	Practice towards CAM	Customer's trust in pharmacists	Facilitating factors	(Kanjanarach et al., 2006)
Pharmacists	Sell herbals products	Physician recommendation	Subjective norm	(Culverhouse & Wohlmuth, 2012; Welna et al., 2002)
Community pharmacists	Provide information about	Lack of regulation	Perceived barrier	(Semple et al., 2006)
Pharmacists	Practice towards DS	Personal use	Associated with practice	(Culverhouse & Wohlmuth, 2012; Howard et al., 2001; Welna et al., 2002)

Table 2. Continued

Subject	Intention /Behavior	Factors	Association	Reference
Community pharmacists	Practice towards CAM	Perceived benefit for pharmacy	Behavioral outcome	(Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2006; Naidu et al., 2005)

CHAPTER 3

METHODOLOGY

The main objective of the study was to explore the utility of theory of planned behavior (TPB) in predicting Indonesian community pharmacists to advise patients about herbal medicine. By using google form, a web-based questionnaire was distributed to community pharmacists across Indonesia. The design of study, population and sample, instrumentation, data collection and data analysis methods would be explained in depth in this chapter.

3.1 Research design

The quantitative study design was used in this study to explain factors affecting Indonesian community pharmacists to advise herbal medicine to patients. This was a cross-sectional study use self-administered survey instrument conducted among pharmacist.

3.2 Population and sample

3.2.1 Study population

The population of the study was registered pharmacists who currently practiced in community pharmacies in Indonesia. Community pharmacists were chosen as target population as they are healthcare professionals who mostly encounter patients when to purchase herbal products. Pharmacists also have responsible and knowledgeable in herbal medicine and counseling areas. Currently, list of all community pharmacists in

Indonesia is not available. According to Ministry of Health data in 2013, there were 21,058 pharmacies in Indonesia (MoH, 2013a).

3.2.2 Sample size calculation

The sample size (N) was calculated using formula from Cohen's statistical power analysis considering values of factors including significance level (α), effect size (ES) and statistical power (Cohen, 1988). Significance level (α) or Type I error generally means a probability of falsely rejecting the null hypothesis (H_0) (Cohen, 1992). Alpha was set at 0.05 as this value is mostly used in studies as level of significance (Chuan, 2006). Effect size (ES) was the degree of phenomenon absent (the null hypothesis is true) or the phenomenon presents (null hypothesis is false) (Cohen, 1988). Based on statistical test, effect size value can be classified as small, medium and large (Cohen, 1992). Medium effect size was chosen in this study. Statistical power represents a probability of failing to reject false null hypothesis (H_0). If value of power lower than 0.80 it will result in Type II error while value larger than 0.80 will require larger sample size. Therefore value 0.80 is recommended as target power for general use (Cohen, 1992).

$$N = \frac{L}{f^2} + u + 1$$

N : sample size

L : non-centrality parameter from power tables (Cohen, 1988) with u independent variables, power 0.80, and α 0.05

f^2 : calculated as $\frac{1-R^2}{R^2}$

R^2 : effect size (medium: 0.15)

u : number of independent variables (5)

In order to calculate sample size, power analysis program was performed based on predetermined factors, statistical level of 0.05, medium effect size (f^2=0.15), and power value 0.80. To estimate sample size, it is important to define statistical analysis to conduct. Multiple regression analysis would be performed. Sample size was estimated for α=0.05, medium effect size, and power=0.80 by using G*power program and Cohen's power table, the results are shown in Table 3.

Table 3.Sample size for α=0.05, medium effect size, and power=0.80

Test	Cohen's table	G*power
Multiple regression analysis	91	92

To determine sample size target, sample size of 92 is chosen as it will have enough power and medium effect size. Based on previous studies that survey pharmacists by online, the response rate were 10% (Schommer et al., 2008), 25.9% (Pedersen & Gumpper, 2008) and 32% (Fahmy et al., 2010). Currently, online survey conducted towards Indonesian pharmacists is not available, therefore by using lowest response rate (10%) it is determined that 920 surveys should be mailed to result in a sample of 92.

3.2.3 Sampling technique and sample selection

A convenience sampling was used in this study. Currently, complete database of Indonesian pharmacists association (IAI) members are not available. Pharmacists association of each province were contacted by email that was obtained through IAI website (IAI, 2016). Total 5 of 34 pharmacists association replied and provided a database of members. Five provinces represented three regions of Indonesia. Based on time zones, Indonesia can be divided into three regions, west, central and east. West

Sumatera and Central Java provinces as representatives of West region of Indonesia. Bali and East Kalimantan as representatives of Central region of Indonesia. West Papua as representative of East region of Indonesia.

Participants were selected based on inclusion criteria:

1. Indonesian nationality.
2. Pharmacists who practice in a community pharmacy setting and stock herbal medicine.
3. Can speak, write, and read in *Bahasa Indonesia.*
4. Willing to participate in this study.

Participants who met the inclusion criteria were all recruited by resulted 1044 email address. In order to increase the response rate, pharmacists association in several cities were asked to announce the survey to its member through Facebook groups.

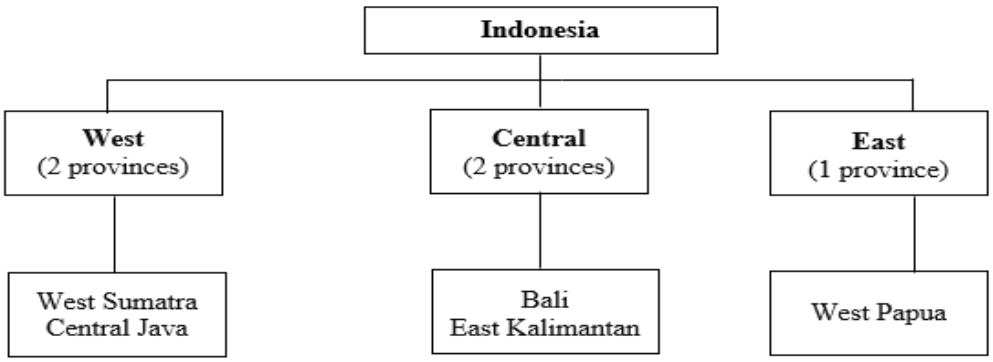

Figure 2.Sampling frame

3.3 Instrumentation

The questionnaire was developed to explore how TPB construct (attitude, subjective norms, and perceived behavior control towards advising about herbal medicine) along with additional constructs (perceived knowledge and personal use) may influence pharmacists' intention to advise patients about herbal medicine, as

outlined by conceptual framework. Implementation of the instrument involved questionnaire development, psychometric testing, and questionnaire administration.

The research instrument consists of two sections. The first section consists of 7 main constructs, (1) practice towards herbal medicine, (2) attitude towards advising patients about herbal medicine, (3) subjective norms of advising patient about herbal medicine, (4) perceived behavioral control over advising patient about herbal medicine, (5) perceived knowledge of herbal medicine, (6) personal use of herbal medicine and (7) intention to advise patient about herbal medicine. Questionnaires (2), (3), (4) and (7) were constructed based on measurement instrument database (Ajzen, 2013) and manual for constructing questionnaire based on TPB (Francis et al., 2004). The second section is intended to gather basic demographic information of the pharmacists. The detail of questionnaire development, modification, translation, validity, and reliability are presented as follows.

3.3.1 Questionnaire Development

Attitude towards advising patients about herbal medicine, subjective norms, perceived behavioral control, and intention to advise patient about herbal medicine questionnaires was constructed based on measurement instrument database (Ajzen, 2013) and manual for constructing questionnaire based on TPB. There are two methods to measure TPB components, direct and indirect measures. The direct measure was chosen due to the limitation of questionnaire length, resulted in items questionnaire. The brief form of the questionnaire was developed with items measured attitude towards advising the patient about herbal medicine, items measured subjective norms, items measure perceived behavior control, and items measured intention towards advising patients about herbal medicine.

3.3.2 Practice towards Herbal Medicine Questionnaire

Practice towards Herbal Medicine Questionnaires was developed based on surveys related with CAM and herbal medicine which previously administered to pharmacists (Kanjanarach et al., 2011; Mehralian et al., 2014; Sweileh et al., 2013; Tiralongo et al., 2010). Questions were selected and combined to form an instrument with a total of 5 questionnaire items which altered to fit the study context. The purpose of Practice towards Herbal Medicine Questionnaire was to examine the extent of Indonesian community pharmacists practice towards herbal medicine. Pharmacists practice regarding herbal medicine refers to the activity and frequency performed by Indonesian pharmacists in community practice related to herbal medicine, including stock, dispense, and advise patients about herbal medicine. Advising practice is measured by questions about the activity and frequency of pharmacists counsel and provide information about herbal medicine use and dosage administration, efficacy, adverse effects, safety, herbal-drug interaction, precautions, and contraindication.

3.3.3 Attitude towards advising patients about herbal medicine questionnaire

Attitude towards advising patients about herbal medicine is measured by questions about the degree of pharmacists has a favorable or unfavorable appraisal to perform the behavior and the outcome from advising herbal medicine to patients. Attitude towards advising patients about herbal medicine was developed by the researcher. A literature review related to attitude towards advising about herbal medicine and CAM was conducted before developing the questionnaire. Items were developed based on previous studies assessing pharmacy students' attitude towards advising CAM (Noureldin, 2011), pharmacists role & responsibility in providing information about CAM (Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2006,

2011). In addition, outcomes of advising patients about herbal medicine was also assessed, including benefit for pharmacy (Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2006; Naidu et al., 2005), bring good relationship with patients and help improve patients' health (Culverhouse & Wohlmuth, 2012; Godin et al., 2007). Behavioral outcomes were listed and converted into statements that reflect the belief that might affect the behavior of the population.

Attitude towards advising patients about herbal medicine questionnaire consisted of 8 items. The questionnaire measured pharmacists' attitude towards advising patients about herbal medicine in a 5-choice Likert-scale format from strongly disagree to strongly agree. The Likert-scale format choices were 1=strongly disagree, 2= disagree, 3=neutral, 4=agree, and 5=strongly agree. The total scores were summed up into total scores and then divided by total items of question (8) thus resulted average score ranged from 1-5. The high scores indicated a favorable attitude towards advising patients about herbal medicine while the low scores indicated an unfavorable attitude towards advising patients about herbal medicine.

3.3.4 Subjective norms related to Advising Patients about Herbal Medicine

Subjective norm is measured by questions regarding perception about the expectation of social and significant persons about advising herbal medicine to patients. The questionnaire was developed by the researcher. A literature review related to subjective norms towards advising about herbal medicine and CAM was conducted before developing the questionnaire. Items were developed based on previous studies regarding the most important individuals and group of people who would approve or disapprove pharmacists to advise patients about herbal medicine, that were physician

(Culverhouse & Wohlmuth, 2012; Welna et al., 2002), patients (Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2006; Welna et al., 2002), pharmacy owner (Mehralian et al., 2014), and pharmacist colleagues. Normative referents were listed and converted into statements that reflect the belief that might affect the behavior of the population.

Subjective norms regarding advising patients about herbal medicine questionnaire consisted of 5 items. The questionnaire measured subjective norms regarding advising patients about herbal medicine in a 5-choice Likert-scale format from strongly disagree to strongly agree. The Likert-scale format choices were 1=strongly disagree, 2= disagree, 3=neutral, 4=agree, and 5=strongly agree. The total scores were summed up into total scores and then divided by total items of question (5) thus resulted average score ranged from 1-5.

3.3.5 Perceived behavior control

Perceived behavioral control is measured by questions regarding pharmacists' abilities to advise patients about herbal medicine over facilitating factors and barriers. The questionnaire was developed by the researcher. A literature review related to facilitating factors and barriers in advising about herbal medicine and CAM was conducted before developing the questionnaire. Items were developed based on previous studies assessing facilitating factors that enable pharmacists to advise patients about herbal medicine and the barriers that prevent or make pharmacists difficult to advise patients about herbal medicine, that were lack of regulation (Semple et al., 2006), lack of information source (Al-Arifi, 2013; Brown et al., 2004; Kanjanarach et al., 2006; Semple et al., 2006), lack of scientific evidence (Al-Arifi, 2013; Culverhouse & Wohlmuth, 2012; Naidu et al., 2005; Semple et al., 2006; Tiralongo et al., 2010), lack

of education or training (Brown et al., 2004; Semple et al., 2006), and lack of time (Al-Arifi, 2013; Culverhouse & Wohlmuth, 2012; Jordan et al., 2010; Semple et al., 2006; Tiralongo et al., 2010).

List of control factors were listed and converted into statements that reflect the belief that might affect the behavior of the population. PBC regarding advising patients about herbal medicine questionnaire consisted of 7 items. The questionnaire measured PBC regarding advising patients about herbal medicine in a 5-choice Likert-scale format from strongly disagree to strongly agree. The Likert-scale format choices were 1=strongly disagree, 2= disagree, 3=neutral, 4=agree, and 5=strongly agree. The total scores were summed up into total scores and then divided by total items of question (7) thus resulted average score ranged from 1-5.

3.3.6 Intention towards advising patients about herbal medicin

Intention to advise patients about herbal medicine refers to the counseling activity performed by Indonesian pharmacists in community practice related to herbal medicine, including advise and provide information about use and dosage administration, efficiency and effectiveness, adverse effects, safety, herbal-drug interaction, precautions and contraindication. The questionnaire measured intention toward advising patients about herbal medicine in a 5-choice Likert-scale format from strongly disagree to strongly agree. The Likert-scale format choices were 1=strongly disagree, 2= disagree, 3=neutral, 4=agree, and 5=strongly agree. The total scores were summed up into total scores and then divided by total items of question thus resulted average score ranged from 1-5.

3.3.7 Perceived Knowledge about Herbal Medicine Questionnaire

Perceived knowledge is measured by questions about pharmacists' perception of their understanding of herbal medicine use and dosage administration, efficiency and effectiveness, adverse effects, safety, herbal-drug interaction, precautions and contraindication. The questionnaire measured perceived knowledge about herbal medicine in a 5-choice Likert-scale format from strongly disagree to strongly agree. The Likert-scale format choices were 1=strongly disagree, 2= disagree, 3=neutral, 4=agree, and 5=strongly agree. The total scores were summed up into total scores and then divided by total items of question thus resulted average score ranged from 1-5.

Personal Use of Herbal Medicine Questionnaire

Personal use of herbal medicine is measured by pharmacists experience with herbal medicine utilization, by him/her-self, family and society. The questionnaire wass based on (Noureldin, 2011). The questionnaire measured personal use of herbal medicine in a 5-choice Likert-scale format from strongly disagree to strongly agree. The Likert-scale format choices were 1=strongly disagree, 2= disagree, 3=neutral, 4=agree, and 5=strongly agree. . The total scores were summed up into total scores and then divided by total items of question (4) thus resulted average score ranged from 1-5.

All of these items to measure TPB constructs were included into first questionnaire draft. The mean score for each scale will be calculated in statistical analysis (Francis et al., 2004). The average score was interpreted by 5 point rating scale mean resulted by using 80% of number in scale (5x0.80=4). The detail was described below.

Table 4. Average Score Interpretation

Average Score	Interpretation
1.00-1.80	Strongly disagree
1.81-2.60	Disagree
2.61-3.40	Neutral
3.41-4.20	Agree
4.21-5.00	Strongly Agree

3.3.8 Demographic Characteristic Questionnaire

The objective of the demographic characteristic questionnaire was to collect demographic information of the participants. This was a self-reported questionnaire that consisted of 6 items of close-ended questions and 6 items of open-ended questions. The demographic information including age, gender, ethnicity, education level, year graduated as bachelor degree of pharmacy, year graduated as pharmacists, college or pharmacy school attended, year of experience as community pharmacist, location (city) of pharmacy, province, type of pharmacy, position at pharmacy, herbal medicine use, previous training and previous coursework. The items were similar to demographic items assessed in prior studies related to CAM/herbal medicine practice, as shown in Table 1.

3.4 Back translation

The questionnaire was translated from English into Bahasa Indonesia by back-translation technique. The translation was performed by the help from translator from Centre for Language Training (CLT) Unika Soegijapranata who were good at both English and Bahasa Indonesia. The translation process was performed as follows:

1. Translator translated the English version into Bahasa Indonesia version.

2. The researcher and translator discussed the Bahasa Indonesia versions in order to get drafted Bahasa Indonesia version.

3. Other translators (from CLT Unika Soegijapranata) translated from drafted Bahasa Indonesia version into English version.

4. Differences were found between English version and the original English version.

5. The researcher and translator compared and discussed the differences.

6. Important changes were made in Bahasa Indonesia version to produce the final Bahasa Indonesia version. In order to validate the translation process accuracy, it was compared to the back translated English versions.

3.5 Pretesting

A pre-test study with questionnaire draft is conducted on a convenience sample of 5 community pharmacists. The pharmacists were emailed the survey as Microsoft Word file and instructed to complete the survey, check the clarity and readability. The feedback was used to reword and modify into the final version. In the end of survey they asked to answer question about the survey, as follows:

1. What do you think about the length of the questions and the time taken to complete the survey?
2. Was the explanation of the survey clear? Is there any information that needs to be added when filling out this survey?
3. Do you have any advice regarding the format of the survey? Were the questions presented logically and coherently?
4. Were the instructions given at each section of questionnaire easy to understand? Did the response categories given make sense?

5. Do you have any problem with the overall survey or with a specific part of the survey?

Two pharmacists thought that the questionnaire was a bit too long and repetitive. A pharmacists suggested reword to prevent confusion.

3.6 Pilot Study

A pilot study with questionnaire draft is conducted on a convenience sample of 30 community pharmacists. The pharmacists were emailed the survey as Microsoft Word file and instructed to complete the survey, check the clarity, readability, and time required to complete the survey. The feedback was used to reword and modify into the final version. The result of the pilot study was also tested for reliability.

In addition, at the end of survey they asked to answer question about the survey, as follows:

1. What do you think about the length of the questions and the time taken to complete the survey?
2. Was the explanation of the survey clear? Is there any information that needs to be added when filling out this survey?
3. Do you have any advice regarding the format of the survey? Were the questions presented logically and coherently?
4. Were the instructions given at each section of questionnaire easy to understand? Did the response categories given make sense?
5. Do you have any problem with the overall survey or with a specific part of the survey?

Overall the pharmacists thought that the questionnaire was not too long and it took five to ten minutes to complete the survey. One respondent suggested revision in

scoring (previously 1=Strongly agree; 5=Strongly disagree) which later switched. Two respondents asked definitions of herbal medicine in this study and these were added.

3.7 Psychometric Properties Testing

Validity and reliability test was performed in psychometric testing phase.

3.7.1 Content Validity

The content validity concerns the extent to which an instrument has an adequate sample of items to measure the construct (Polit and Beck). For appropriate content validity, the content questionnaires were reviewed by four experts. Three of them are academic professionals from Faculty of Pharmacy, Gadjah Mada University, Yogyakarta, Indonesia who expertise in herbal medicine and community pharmacy. Another one is nurse practitioner from Thailand who expertise in social science. Experts evaluated the content validity of the instrument by placing one of the four-point scales that reflected relevance to the measure (1=not relevant, 2=somewhat relevant, 3=quite relevant, and 4=highly relevant) in each item. The experts were asked to clarify the reasons if they did not agree with any of the items. The experts also evaluated the clarity of the instrument by placing one of the four-point scales (1=not clear, 2=need some revision, 3=clear but need minor revision, and 4=very clear) in each item. Following the comments and revisions, all of the questionnaire items were approved by the experts.

Table 5.Content Validity of Instrument

Instrument	Number of Items	I-CVI	S-CVI
Attitude	8	0.50-1.00	0.91
SN	5	1.00	1.00
PBC	7	1.00	1.00

Perceived Knowledge	7	1.00	1.00
Personal Use	4	1.00	1.00
Intention	8	0.75-1.00	0.96
Advising behavior	7	0.75-1.00	0.96

The table showed the content validity of subjective norm, perceived behavioral control, perceived knowledge and personal use towards herbal medicine were (1.00) for I-CVI and (1.00) for S-CVI. However, content validity for advising behavior and intention were 0.75-1.00 for I-CVI and 0.96 for S-CVI. Meanwhile for attitude questionnaire, the content validity was I-CVI (0.50-1.00) and S-CVI (0.91).

3.7.2 Reliability

Each instrument was tested the reliability. Reliability is used as representative of stability and consistency of instruments. The acceptable of Cronbach's coefficient was greater than 0.70. The Cronbach's coefficients of each instrument were acceptable (>0.70), except the PBC instrument in pilot test. Therefore the removal of one item of PBC instrument, "It is entirely up to me whether or not I provide information about herbal medicine" increased Cronbach's alpha from 0.536 to 0.734. The summary of the results is presented in Table 5.

Table 6.Reliability of Instrument

Instrument	Number of Items	Pilot (n=30)
Attitude	8	0.911
SN	5	0.849
PBC (prior)	**7**	**0.536**
PBC (revised)	6	0.734
Perceived Knowledge	7	0.953

Personal Use	4	0.787
Intention	8	0.952
Behavior	7	0.893

3.8 Protection of human subject

This study was conducted in Indonesia with the approval of the Institutional Review Board (IRB) which was the Ethical Clearance from Faculty of Public Health, Diponegoro University, Indonesia (Approval Letter No.55/EC/FKM/2016). The researcher also got permission from pharmacists association before data collection. Official letter were acquired from 3 provinces, West Sumatera, East Kalimantan, and West Papua.

The inform consent for the participants explained the purpose of the study, benefits, risks, and type of questionnaires. The participants were also informed about their right to refuse to participate. If the participants do not want to answer the questionnaire, they can withdraw from the study anytime. The participants' name were not addressed in the data and there was no harm for them to participate in this study. To appreciate the participation, gift was sent after they complete the questionnaires.

3.9 Data collection

The questionnaires were converted into web-based survey using Google Form. To ensure the function, survey was pretested into five pharmacists. The respondents asked some word changes. Data were collected from May to June 2016. Procedures of data collection will be described as follows:

1. The study proposal was approved (Appendix A)

2. The IRB was obtained from the Ethical Clearance of Faculty of Public Health, Diponegoro University (Approval Letter No.55/EC/FKM/2016) (Appendix B).
3. The researcher contacted the head of pharmacists association in 34 provinces by email and explained the purpose of the study, importance of the study, and data collection procedures. The researcher asked for permission and cooperation particularly in providing pharmacists' email address. Five provinces responded and three provinces gave permission by issuing official letters (Appendix C).
4. The researcher contacted the community pharmacists via pre-notification email. The researcher introduce herself, explained the purpose of the study, importance of the study, and data collection procedures (Appendix D).
5. The researcher contacted the community pharmacists via initial email (Appendix E) one week after pre-notification email. The researcher asked the pharmacists to take part in the study and emphasized the confidentially or anonymity of the information. The researcher gave the survey invitation (link google form) and asked them to complete the questionnaires.
6. After completing the questionnaires, the researcher checked the completeness of the answer. If there was any missing items, participants would be contacted by email to complete it.
7. A follow up email (Appendix F) was sent one week after the first initial email, another follow up email was sent two weeks after the first initial email.
8. In order to increase the response rate, pharmacists association in several cities were asked to announce the survey to its member through Facebook groups.
9. After finished the researcher gave each participant a gift as appreciation for participating the study.

3.10 Data analysis

Data was analyzed as follow:

1. The descriptive statistics was used to describe the demographic characteristics of the participants.
2. The bivariate correlation analysis was used to examine the relationships between the factors, behavioral intention and advising behaviors.
3. The logistic regression analysis was used to examine the significant relationship between the predicting factors, behavioral intention and advising behaviors.
4. The assumption were determined by normality, linearity, and multicollinearity test.
   a. Normality of distribution

      Descriptive statistics and test of normality testing (Kolmogorov-Smirnov and Shapiro-Wilk) were used to test the distribution. The skewness of the variables ranged from -1.803 to 2.522, meanwhile the kurtosis of variables ranged from -0.645 to 7.886 which did not represent normal distribution. Shapiro-Wilk test of normality for intention and behavior variables (0.941, $p<001$; 0.738, $p<0.01$, respectively) indicated that intention variable were not normally distributed. The P-P plot also reflected variables distribution were not normal.

   b. Linearity

      The linearity relationship represented degree of change of independent variables that associated with dependent variables, which shown by residual plot. A linear relationship between dependent and independent variables were showed by scatter plot.

   c. Multicollinearity

The tolerance measures of multicollinearity was conducted among the independent variables. If the tolerance value approaches zero, it indicates multicollinearity. In this study, the tolerance ranged from 0.455 to 0.640 and VIF ranged from 1.614 to 2.196. It indicates that no violation for multicollinearity.

CHAPTER 4

RESULTS

4.1 Introduction

This study explores the utility of the theory of planned behavior to predict Indonesian community pharmacists to advise patients about herbal medicine. The survey was created and pilot tested for validity and reliability. Key construct of the Theory of Planned Behavior and demographic profile were measured by survey. In the first objective, Indonesian community pharmacists' practice towards herbal medicine is analyzed, the second objective identifies the effect of attitude, subjective norm, perceived behavioral control, perceived knowledge, and personal use towards pharmacists' intention to advise patients about herbal medicine. Finally the third objective, identify effect of perceived behavior control and intention towards pharmacists' behavior in advising patients about herbal medicine.

4.2 Response Rate

The survey was sent by email toward 1045 community pharmacists in five provinces in Indonesia, 65 of them was returned as failure message, mostly because of wrong email address. A total of 185 community pharmacists responded, 17 surveys were excluded because respondents either did not stock herbal medicine (5), work at hospital (5), or double responses (7). This resulted in 168 completed surveys, 54.2% admitted to know the survey from email, 16.1% from Facebook, and 29.8% from friends. The response rate was calculated based on total usable survey by email (91) and total email sent (980) resulted 9.29%. The response rate is lower than previous

online surveys that conducted toward pharmacists in US (Pedersen & Gumpper, 2008; Schommer et al., 2008) and another study in Uni Emirates Arab (Fahmy et al., 2010).

Initial email was sent out on the third week of May, particularly in Tuesday and Wednesday. Responses received on daily base as shown in Figure 3, most of the responses received on Wednesday. Follow up email was sent twice, one week and two weeks after initial email, on Wednesday.

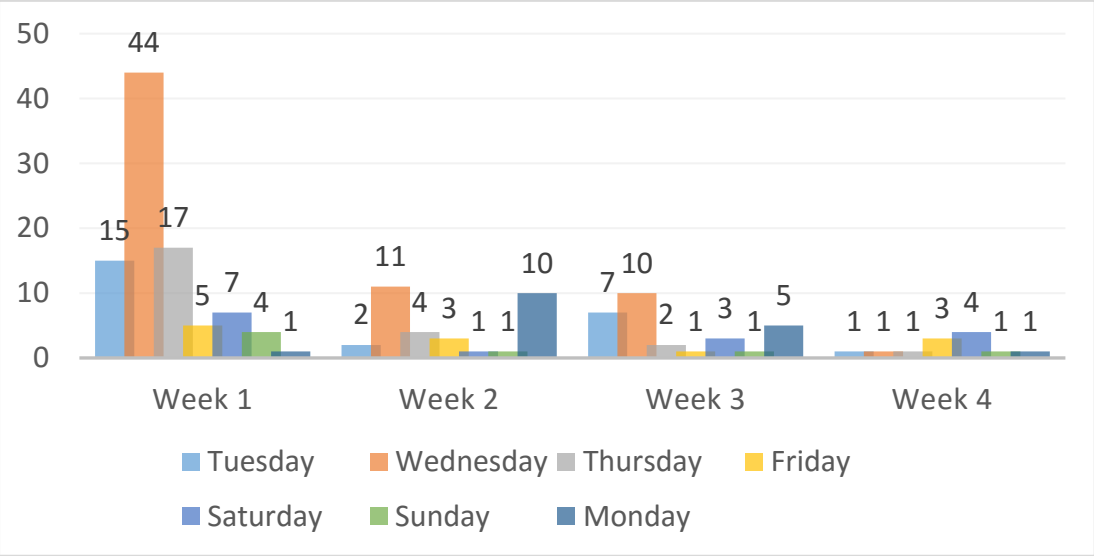

Figure 3 Daily Response

4.3 Reliability Result

Each instrument was tested again for the reliability. The Cronbach's coefficients of each instrument were acceptable (>0.70) thus the instruments represented stability and consistency. The summary of the results is presented in Table 6.

Table 7.Reliability of Instruments

Instrument	Number of Items	Cronbach's Alpha (n=168)
Attitude	8	0.917
SN	5	0.836
PBC	6	0.757
Perceived Knowledge	7	0.963

Personal Use	4	0.881
Intention	8	0.957
Behavior	7	0.904

4.4 Demographic profile of the study sample

The response received were not only from five provinces that email was sent. Respondents were mainly from Bali, Central Java and Special Region of Yogyakarta provinces. The result was represented in Table 7.

Table 8.Frequency and Percentage of Respondents by Province (n=166)

Province	**Number of Responses (n)**	**%**	**Number of Email Sent**
Bali	48	28.9	461
Central Java	46	27.7	194
East Kalimantan	15	9.0	162
West Papua	3	1.8	41
West Sumatera	6	3.6	186
Other Provinces	**N**	**%**	
Central Kalimantan	3	1.8	
Central Sulawesi	1	0.6	
East Java	10	6.0	
Gorontalo	1	0.6	
Jakarta Special Capital Region	1	0.6	
Papua	1	0.6	
South Sulawesi	1	0.6	
Southeast Sulawesi	2	1.2	
Special Region of Yogyakarta	18	10.8	
West Java	9	5.4	
West Kalimantan	1	0.6	
Unknown	2	n=166	
TOTAL	168	100.0	

The respondents' mean (±SD) age was 31.935±6.7142 years old, and 70.8 % were female, with more than half have been work at community pharmacy for less than 5 years. About half of respondents (62.5%) reported to work as main pharmacists in independent pharmacies (75.0%). The majority of the respondents' ethnicity were Javanese (42.9%). Pharmacists were equally graduated from a public university and from a private university. The demographic profile were presented in Table 8.

Table 9.Frequencies of Respondents Classified by Demographic Profile (N=168)

Demographic Characteristics	n	%
Age (years old) (N=168)		
20-29	81	48.2
30-39	64	38.1
40-49	20	11.9
50-59	3	1.8
Gender (N=168)		
Male	49	29.2
Female	119	70.8
Herbal Medicine Use (N=168)		
Use	122	72.6
Not Use	46	27.4
Work Experience as Community Pharmacist (years) (N=168)		
< 5	94	56.0
6-10	47	28.0
11-15	14	8.3
16-20	8	4.8
> 20 years	5	3.0
Type of College/Pharmacy School		
Public	84	49.7
Private	85	50.3

Table 8. Continued

Demographic Characteristics	n	%
Type of Pharmacy (N=168)		
Independent Pharmacy	126	75.0
Franchise	12	7.1
Clinic	17	10.1
Chain Pharmacy	5	3.0
Government Pharmacy	2	1.2
Other	6	3.6
Position at Pharmacy (N=168)		
Pharmacy Owner	33	19.6
Main Pharmacist	105	62.5
Secondary Pharmacist	29	17.3
Pharmacy manager	1	0.6
Education Level (N=168)		
Pharmacists	123	73.2
Master in pharmacy field	36	21.4
Master in other field	6	3.6
PhD.	3	1.8
Graduation Year (Bachelor Degree of Pharmacy) (N=162)		
≤ 1989	1	0.6
1990-1999	17	10.5
2000-2009	79	48.8
≥ 2010	65	40.1
Graduation Year (Pharmacist) (N=164)		
≤ 1989	1	0.6
1990-1999	15	9.1
2000-2009	58	36.6
≥ 2010	88	53.7

4.5 Descriptive data of Indonesian community pharmacists' practice towards herbal medicine

The first objective of the study was to analyze the extent of Indonesian community pharmacists practice toward herbal medicine. In this study, pharmacists practice regarding herbal medicine refers to the activity and frequency related to herbal medicine, including stock, dispense, and advise patients about herbal medicine for the last 30 days. All of the pharmacists stocked herbal medicine, either *jamu*, standardized herbal, or phytopharmaca.

Table 10.Frequency and Percentage of Pharmacists that stocked each Type of Herbal Medicine

Type of herbal	Number of Pharmacists	Percentage
Jamu	141	83.9%
Standardized Herbal	142	84.5%
Phytopharmaca	117	69.6%

Pharmacists were also asked about dosage form of herbal medicine stocked on the last 30 days, either it was traditional form, such as fresh herb (4.2%) and crude (73.2%) or modern form, such as liquid (60.1%), powder (47.0%), or capsule (91.1%).

Table 11. Frequency and Percentage of Pharmacists that stocked each Dosage Form of *Jamu*

Type of Jamu	Number of Pharmacists	Percentage
Fresh herb	7	4.2%
Crude	45	73.2%
Liquid	101	60.1%
Powder	79	47.0%
Capsule	153	91.1%

Overall respondents had wide variance in number of daily patients, with median 50 patients per day. Respondents showed that on average 11.819±13.2039 patients come and buy herbal medicine products. Pharmacists acquired 4.924±4.1791 inquiries from patients about herbal medicine on daily base.

Table 12.Average Number of Patients Come to Pharmacy per Day

Patients Come to Pharmacy	Mean	SD	Median	Total Number of Pharmacists	Range
Patients	75.024	83.5511	50.0	167	5-500
Patients Buy Herbal	11.819	13.2039	7.500	166	0-75
Inquiries about Herbal	4.924	4.1791	4.000	164	0-20

4.6 Descriptive data of Variables

Variables of this study was presented by the possible range, mean, and standard deviation (SD). The range of attitude towards advising about herbal medicine score was between 1 and 5, with mean score 4.32 ± 0.705. The range of subjective norms score was between 1 and 5, with mean score 3.56 ± 0.811. The range of perceived behavioral control score was between 1 and 5, with mean score 3.08 ± 0.581. The range of perceived knowledge score was between 1 and 5, with mean score 3.66 ± 0.979. The range of personal use score was between 1 and 5, with mean score 3.37 ± 0.979. Finally, the range of intention score was between 1 and 5, with mean score 3.77 ± 0.874.

4.6.1 Descriptive data of Attitude toward Advising Patients about HM

Respondents strongly agreed that advising patient about herbal medicines was beneficial (mean 4.31 ± 0.922), can prevent harmful effect (mean 4.39 ± 0.848), make

patient trust them (mean 4.25 ± 0.952), and give benefit for patients' health (mean 4.50 ± 0.797). Respondents also strongly agreed that they should be able to provide information about herbal medicines to patient (mean 4.52 ± 0.766) thus pharmacists should play greater role in it (mean 4.52 ± 0.773). Overall pharmacists had a high and positive attitude toward advising (mean = 4.32 ± 0.705).

Table 13.Descriptive Data of Attitudes towards Advising Patients about Herbal Medicine (N=168)

Survey Statement	Mean ± SD	Interpretation
Pharmacists should play a greater role in providing patients with safety and drug interaction information about herbal medicine.	4.52 ± 0.773	Strongly Agree
Pharmacists should be able counsel and provide information about herbal medicine to patients.	4.52 ± 0.766	Strongly Agree
Involvement in herbal medicine counseling will give benefit to the patients' health.	4.50 ± 0.797	Strongly Agree
Harmful effect of herbal medicine can be prevented if I advise patients.	4.39 ± 0.848	Strongly Agree
As a pharmacist, advising patients about herbal medicine will make me feel that I am doing something beneficial for patients.	4.31 ± 0.922	Strongly Agree
Providing information about herbal medicine will make my patients trust me.	4.25 ± 0.952	Strongly Agree
Providing information about herbal medicine is important to be profitable to my pharmacy.	4.10 ± 0.986	Agree
Advising patient about herbal medicine is important aspect of my professional role as information provider in pharmacy.	4.01 ± 1.015	Agree
Average Score of Attitude	4.32 ± 0.705	Strongly Agree

4.6.2 Descriptive Data of Subjective Norms related to Advising about HM

The respondents agreed that pharmacy owner (mean 3.91 ± 1.026) and patients (mean 3.71 ± 0.992) thought that pharmacists should advise about herbal medicines. Pharmacists also agreed that patients would like to see them identify problems related to herbal medicines 3.66 ± 1.049). Overall pharmacists had a moderately high and positive SN (17.78±4.056, range: 5-25).

Table 14. Descriptive Data of Subjective Norms related to Advising Patients about Herbal Medicine (N=168)

Survey Statement	Mean±SD	Interpretation
My pharmacy owner would support me to advise patients about herbal medicine.	3.91 ± 1.026	Agree
Patients at my practice site would like to see me to communicate with them about herbal medicine.	3.71 ± 0.992	Agree
Patients in my pharmacy expect me to identify problems they have with herbal medicine.	3.66 ± 1.049	Agree
Other pharmacists I know motivate me to advise my patients about herbal medicine.	3.42 ± 1.086	Agree
Physician in my community would approve me to advise patients about herbal medicine.	3.07 ± 1.064	Neutral
Total Average Score of Subjective Norms	3.56 ± 0.811	Agree

4.6.3 Descriptive Data of PBC toward Advising about HM

Pharmacists agreed that lack of scientific evidence (3.51 ± 1.199) and patients' perception about herbal medicines (3.45 ± 1.125) as barriers to advise patient about herbal medicines. Pharmacists remain neutral about reliable information source (mean

3.22 ± 1.150) and regulation (mean 3.22 ± 1.091). Overall, pharmacists had neutral PBC (mean 18.49 ± 3.488, range 6-30).

Table 15. Descriptive Data of Perceived Behavioral Control related to Advising Patients about Herbal Medicine (N=168)

Survey Statement	Mean±SD	Interpretation
I feel confident about my education and training to communicate with patients about herbal medicine.	3.51 ± 1.072	Agree
Lack of scientific evidence makes me hesitate to advise patients about herbal medicine.	3.51 ± 1.199	Agree
I have enough time to provide information about herbal medicine to patient.	3.50 ± 1.067	Agree
I find it difficult to advise patients because they perceive herbal medicine is safe.	3.45 ± 1.125	Agree
I have reliable and adequate information source to counsel patients about herbal medicine.	3.22 ± 1.150	Neutral
Different regulation in product standard and safety to the conventional health product has prevent me to advise patients about herbal medicine.	3.22 ± 1.091	Neutral
Total Average Score of PBC	3.08 ± 0.581	Neutral

4.6.4 Descriptive Data of Perceived Knowledge about HM

The respondents believed that they are knowledgeable to advise patients about herbal medicine use (mean 3.89 ± 0.975), efficacy (mean 3.75 ± 1.007), adverse effects (mean 3.62 ± 1.088), safety (3.59±1.118), herbal drug interactions (mean 3.54 ± 1.147), precaution on specific group of patients (3.64 ± 1.101), and contraindication on specific

group of patients (mean 3.60 ± 1.1123). Overall pharmacists' perceived knowledge about herbal medicine is medium (3.66 ± 0.979).

Table 16. Descriptive Data of Perceived Knowledge about Herbal Medicine (N=168)

Survey Statement	Mean ± SD	Interpretation
I am confident that I am knowledgeable to advise patients about herbal medicine use.	3.89 ± 0.975	Agree
I am confident that I am knowledgeable to advise patients about efficacy of herbal medicine.	3.75 ± 1.007	Agree
I am confident that I am knowledgeable to advise patients about indications and precautions of herbal medicine in specific group such as pregnancy and geriatric.	3.64 ± 1.101	Agree
I am confident that I am knowledgeable to advise patients about adverse effects of herbal medicine.	3.62 ± 1.088	Agree
I am confident that I am knowledgeable to advise patients about contraindication of herbal medicine in special groups of patients such as hypertension or DM.	3.60 ± 1.1123	Agree
I am confident that I am knowledgeable to advise patients about safety information of herbal medicine.	3.59 ± 1.118	Agree
I am confident that I am knowledgeable to advise patients about herbal-drug interactions.	3.54 ± 1.147	Agree
Total Average Score of Perceived Knowledge	3.66 ± 0.979	Agree

4.6.5 Descriptive Data of Personal Use of Herbal Medicine

The respondents agreed to use herbal medicine, either to cure disease (mean 3.48±1.116) or to maintain health (3.91±1.099). Respondents remain neutral about herbal medicine use in society (3.10±1.1170) and family (mean 2.98±1.097). Overall pharmacists' personal use of herbal medicine is medium (3.37 ± 0.979).

Table 17.Descriptive Data of Personal Use of Herbal Medicine (N=168)

Survey Statement	Mean±SD	Interpretation
I use herbal medicine for disease prevention and maintain health.	3.91 ± 1.099	Agree
I use herbal medicine to treat disease such as cough and cold.	3.48 ± 1.116	Agree
I am growing up in the family that uses herbal medicine, so I use it as the first choice when I feel sick.	3.10 ± 1.1170	Neutral
People in my society normally use herbal medicine. These make me more likely to use herbal medicine.	2.98 ± 1.097	Neutral
Total Average Score of Personal Use	3.37 ± 0.979	Neutral

4.6.6 Descriptive Data of Intention to Advise Patient about Herbal Medicine

The respondents intended to provide information about herbal medicines (3.80 ± 0.956), particularly about herbal medicines efficacy, adverse effects, safety, drug-herbal interactions, precaution in specific group of patients, and contraindication on special groups of patients. Overall pharmacists intended to advise patients about herbal medicines (3.77 ± 0.874).

Table 18.Descriptive Data of Intention to Advise Patient about Herbal Medicine (N=168)

Survey Statement	Mean ± SD	Interpretation
I will communicate about precautions of herbal medicine in specific group patients such as pregnancy and geriatric.	3.89 ± 0.975	Agree
I will inform about contraindication of herbal medicine in special groups of patients such as hypertension or DM.	3.83 ± 1.042	Agree
I will speak with patients about possible adverse effects of herbal medicine.	3.83 ± 0.989	Agree
I will actively inform patients about potential herbal interactions taken with their medicine.	3.82 ± 1.042	Agree
I will actively work to provide herbal medicine information.	3.80 ± 0.956	Agree
I will inform patients about the efficacy of herbal medicine.	3.74 ± 0.979	Agree
I will explain safety information of herbal medicine, such as contamination and adulteration in some products.	3.72 ± 1.026	Agree
I will advise patients about utilization of herbal medicine.	3.49 ± 0.954	Agree
Total Average Score of Intention	3.77 ± 0.874	Agree

4.7 Correlation between selected factors and intention to advise patients about herbal medicine

It was expected that pharmacists who have positive attitude toward advising about herbal medicine would be more likely to have a good intention to advise patient about herbal medicine. Coefficient correlation analysis were conducted to examine the relationship between predictors and behavioral intention. The magnitude of the

relationship was determine by the following criteria of correlation coefficient (r), with $r < 0.30$ weak or low relationship, $0.30 \geq r \leq 0.50$ moderate relationship, and $r > 0.50$ strong or high relationship (Burn & Grove, 2009). The result of the correlation coefficients of the variables as presented in Table 18.

Table 19.Spearman correlation coefficients of the variables (n=166)

Variables	**Adv HM**	**Int**	**Att**	**SN**	**PBC**	**P.Kno**	**P.Use**
Advising HM	1						
Intention	0.173*	1					
Attitude	0.178*	0.607**	1				
SN	0.086	0.521**	0.651**	1			
PBC	0.165*	0.484**	0.447**	0.501**	1		
Perceived Knowledge	0.171*	0.593**	0.402**	0.406**	0.529**	1	
Personal Use	0.138	0.538**	0.382**	0.423**	0.405**	0.576**	1

**) Correlation is significant at the 0.01 level (2-tailed)

As shown in prior table there were significant positive relationship between intention to advise patients about herbal medicine, attitude, subjective norms, perceived behavioral control, perceived knowledge, and personal use towards herbal medicine. There were strong or high relationship with intention to advise patients about herbal medicine with variables.

4.8 Predicting factors of intention to advise patients about herbal medicine

The intention data was not normally distributed thus the intention score was transformed into categorical scale using median (3.875) as cut point resulted low intention (≤3.875) and high intention (>3.876). A logistic regression was performed to explain the effects of attitude, subjective norms, PBC, perceived knowledge and personal use towards the likelihood of pharmacists have a high intention to advise patients about herbal medicine. The logistic regression model was statistically significant, $X^2(5)=80.311$ (p=0.000).

Table 20.Result of logistic regression analysis for intention

Predictors	**B**	**SE**	**Exp$^{\beta}$**	***p-value***
Constant	-13.331	2.296		0.000
Attitude	1.369	0.496	3.933	0.006
SN	0.347	0.371	1.415	0.350
PBC	0.340	0.461	1.406	0.460
Perceived Knowledge	0.798	0.266	2.222	0.003
Personal Use	0.585	0.272	1.795	0.000
2 Log Likelihood=152.205	Nagelkerke R Square=0.507		Percentage Correct=79.2	

The model explained 50.7% of the variance of pharmacists' intention to advise about herbal medicine and correctly classified 79.2% of cases. Three factors had significant associations with intention to advise patients about herbal medicine: good attitude, high perceived knowledge, and personal use of herbal medicine (p=0.006; p=0.003; p=0.031, respectively). However subjective norms and perceived behavioral control (PBC) were not statistically significant affect the intention. Attitude had the biggest impact, when pharmacists had attitude one SD above the mean were 3.9 times

more likely to intend to advise about herbal medicine rather than pharmacists with attitude one SD below mean. Similar effects was applied for the other two significant factors.

4.9 Correlation between selected factors and advising about herbal medicine behavior

Coefficient correlation analysis were conducted to examine the relationship between predictors and the behavior. The magnitude of the relationship was determine by the following criteria of correlation coefficient (r), with $r < 0.30$ weak or low relationship, $0.30 \geq r \leq 0.50$ moderate relationship, and $r > 0.50$ strong or high relationship (Burn & Grove, 2009). The result of the correlation coefficients of the variables as presented in Table 20.

Table 21.Spearman correlation coefficients of the variables (N=166)

r / Variables	Advising behavior	Intention	PBC
Advising behavior	1		
Intention	0.173*	1	
PBC	0.165*	0.484**	1

*) Correlation is significant at the 0.05 level (2-tailed)
**) Correlation is significant at the 0.01 level (2-tailed)

4.10 Predicting factors of behavior advising patients about herbal medicine

The advising behavior data was not normally distributed thus the score was transformed into categorical scale using median (1.43) as cut point resulted low frequency of behavior (≤1.43) and high frequency of behavior (>1.44). A logistic regression was performed to explain the effects of intention and PBC towards the likelihood of pharmacists to perform advising patients about herbal medicine. The

logistic regression model was statistically significant, $X^2(2)=9.746$ (p=0.008). The model explained 7.6% of the variance of pharmacists' behavior in advising patients about herbal medicine and correctly classified 58.2% of cases. Intention had significant associations with pharmacists' behavior in advising patients about herbal medicine (B=0.489; $Exp^{\beta}=1.630$; p=0.025), meanwhile perceived behavioral control (PBC) were not statistically significant affect the intention. It indicates that when pharmacists had intention one SD above the mean were 1.63 times more likely to advise patients about herbal medicine rather than pharmacists with intention one SD below mean.

Table 22.Result of logistic regression analysis for advising about herbal medicine

Predictors	**B**	**SE**	**Exp$^{\beta}$**	***p-value***
Constant	-2.630	0.959		0.006
Intention	0.489	0.218	1.630	0.025
PBC	0.234	0.315	1.264	0.457
2 Log Likelihood=218.841	Nagelkerke R Square=0.076		Percentage Correct=58.2	

4.11 Post Hoc Analysis

Post Hoc analysis was conducted to analyze the correlation between attitude, SN, PBC, perceived knowledge, personal use and demographic variables including previous training taken by pharmacists. Qualitative analysis from open ended question was also performed.

4.11.1 Correlation between Variables and Demographic Characteristic

Non-parametric analyses were performed to determine differences in attitude, SN, PBC, perceived knowledge, and personal use of herbal medicine by demographic

characteristics (age, gender, ethnicity, education level, year of graduate, years of work experience, province, type of pharmacy, position at pharmacy, and type of school).

4.11.1.1 Comparison of Variables by Gender

A Wilcoxon-Mann Whitney U test was conducted to determine whether male and female pharmacists had the same attitude, subjective norms, PBC, perceived knowledge, and personal use of HM. The test revealed that the attitude was significantly different between males and females. Attitudes toward advising about herbal medicine was higher on males than females. Similar result was shown on subjective norms related to advising about HM. The other variables did not significantly different by gender.

Table 23. Wilcoxon-Mann Whitney Test Comparison of Variables by Gender

Variables	Gender	N=168	Mean Rank Score	p-value
Attitude	Male	49	97.66	0.023*
	Female	119	79.08	
SN	Male	49	95.99	0.049*
	Female	119	79.77	
PBC	Male	49	93.30	0.131
	Female	119	80.88	
Perceived Knowledge	Male	49	92.94	0.147
	Female	119	81.03	
Personal Use	Male	49	95.82	0.052
	Female	119	79.84	
Intention	Male	49	85.70	0.836
	Female	119	84.00	
Behavior	Male	49	87.52	0.429
	Female	116	81.09	

4.11.1.2 Comparison of Variables by HM use

A Wilcoxon-Mann Whitney U test was conducted to determine whether pharmacists who use HM and not use HM had the same attitude, subjective norms, PBC, perceived knowledge, and personal use of HM. The test revealed that the intention to advise patients about HM was significantly different between pharmacists who use HM and not use HM. The intention was higher on pharmacists who use HM than pharmacists who did not use. Similar result was shown on SN, PBC, perceived knowledge, and personal use. The attitude and behavior did not significantly different by HM use.

Table 24.Wilcoxon-Mann Whitney Test Comparison of Variables by HM Use

Variables	HM Use	N=168	Mean Rank Score	p-value
Attitude	Use	122	88.54	0.077
	Not Use	46	73.79	
SN	Use	122	89.55	0.028*
	Not Use	46	71.12	
PBC	Use	122	90.13	0.014*
	Not Use	46	69.57	
Perceived Knowledge	Use	122	90.06	0.015*
	Not Use	46	69.75	
Personal Use	Use	122	97.53	0.000**
	Not Use	46	49.93	
Intention	Use	122	90.38	0.010*
	Not Use	46	68.90	
Behavior	Use	122	81.39	0.464
	Not Use	43	87.58	

4.11.1.3 Comparison of Variables by Type of School

A Wilcoxon-Mann Whitney U test was conducted to determine whether pharmacists who graduated from public school and private school had the same attitude, subjective norms, PBC, perceived knowledge, and personal use of HM. The test revealed that perceived knowledge about HM was significantly different between pharmacists graduate from public school and private school. Perceived knowledge was higher on pharmacists from public school than private school. Similar result was shown on perceived behavioral control (PBC). The attitude, SN, personal use and behavior did not significantly different by type of school.

Table 25. Wilcoxon-Mann Whitney Test Comparison of Variables by Type of School

Variables	Type of School	N=167	Mean Rank Score	p-value
Attitude	Public	83	90.49	0.082
	Private	84	77.58	
SN	Public	83	91.31	0.051
	Private	84	76.78	
PBC	Public	83	97.13	0.000**
	Private	84	71.03	
Perceived Knowledge	Public	83	95.07	0.003**
	Private	84	73.06	
Personal Use	Public	83	85.12	0.765
	Private	84	82.89	
Intention	Public	83	90.54	0.081
	Private	84	77.54	
Behavior	Public	83	82.13	0.920
	Private	84	82.87	

4.11.1.4 Comparison of Variables by Age

A Kruskal-Wallis test was conducted to determine whether age had correlation with attitude, subjective norms, PBC, perceived knowledge, and personal use of HM. The test revealed that attitude, SN, PBC, perceived knowledge, personal use, intention, and behavior did not significantly different by age.

Table 26. Kruskal Wallis Test Comparison of Variables by Age

Variables	Age	N=168	Mean Rank Score	p-value
Attitude	20-29 yo.	81	81.13	0.205
	30-39 yo.	64	82.04	
	40-49 yo.	20	100.30	
	≥ 50 yo.	3	122.67	
Subjective Norm	20-29 yo.	81	79.21	0.156
	30-39 yo.	64	83.71	
	40-49 yo.	20	105.05	
	≥ 50 yo.	3	107.17	
Perceived Behavioral Control	20-29 yo.	81	81.11	0.060
	30-39 yo.	64	80.37	
	40-49 yo.	20	112.13	
	≥ 50 yo.	3	80.00	
Perceived Knowledge	20-29 yo.	81	77.33	0.181
	30-39 yo.	64	87.58	
	40-49 yo.	20	99.95	
	≥ 50 yo.	3	109.50	
Personal Use	20-29 yo.	81	85.80	0.512
	30-39 yo.	64	80.79	
	40-49 yo.	20	85.40	
	≥ 50 yo.	3	122.67	

Intention	20-29 yo.	81	83.12	0.920
	30-39 yo.	64	85.45	
	40-49 yo.	20	89.05	
	≥ 50 yo.	3	71.17	
Behavior	20-29 yo.	80	81.66	0.554
	30-39 yo.	64	88.49	
	40-49 yo.	20	71.16	
	≥ 50 yo.	3	78.50	

4.11.1.5 Comparison of Variables by Position at Pharmacy

A Kruskal-Wallis test was conducted to determine whether pharmacists' position at pharmacy had correlation with attitude, subjective norms, PBC, perceived knowledge, and personal use of HM. The test revealed that attitude, SN, PBC, perceived knowledge, personal use, intention, and behavior did not significantly different by pharmacists' position.

Table 27. Kruskal Wallis Test Comparison of Variables by Position

Demographic Variables	**Position at Pharmacy**	**N=168**	**Mean Rank Score**	**Chi-square**	**p-value**
Attitude	Owner	33	93.58	2.397	0.494
	Main Pharmacist	105	83.18		
	Secondary Pharmacist	29	77.69		
	Other	1	121.00		
Subjective Norm	Owner	33	95.86	4.673	0.197
	Main Pharmacist	64	83.84		
	Secondary Pharmacist	20	72.29		
	Other	3	133.0		
	Owner	81	81.56	5.131	0.162
	Main Pharmacist	64	89.48		

Perceived Behavioral Control	Secondary Pharmacist	20	72.21		
	Other	3	15.50		
Perceived Knowledge	Owner	81	80.83	2.611	0.456
	Main Pharmacist	64	88.44		
	Secondary Pharmacist	20	75.90		
	Other	3	41.00		
Demographic Variables	**Position at Pharmacy**	**N=168**	**Mean Rank Score**	**Chi-square**	**p-value**
Personal Use	Owner	81	81.17	0.259	0.967
	Main Pharmacist	64	84.85		
	Secondary Pharmacist	20	86.69		
	Other	3	94.00		
Intention	Owner	81	86.23	0.160	0.984
	Main Pharmacist	64	84.75		
	Secondary Pharmacist	20	81.95		
	Other	3	75.50		
Behavior	Owner	80	83.94	1.126	0.771
	Main Pharmacist	64	83.53		
	Secondary Pharmacist	20	78.55		
	Other	3	127.00		

4.11.1.6 Comparison of Variables by Type of Pharmacy

A Kruskal-Wallis test was conducted to determine whether pharmacists' pharmacy type had correlation with attitude, subjective norms, PBC, perceived knowledge, and personal use of HM. The test revealed that PBC was significantly

different based on different pharmacy type. Pairwise comparisons showed that there was significant difference of PBC between pharmacists who practice in chain pharmacy and independent pharmacy (p=0.006) and between pharmacists who practice in chain pharmacy and government pharmacy (p=0.014). The attitude, SN, perceived knowledge, personal use and behavior did not significantly different by type of school.

Table 28. Kruskal Wallis Test Comparison of Variables by Type of Pharmacy

Demographic Variables	Type of Pharmacy	N=168	Mean Rank Score	Chi-square	p-value
Attitude	Independent Pharmacy	126	87.43	4.616	0.464
	Franchise	12	78.46		
	Clinic	17	63.18		
	Chain Pharmacy	5	94.70		
	Government Pharmacy	2	67.50		
	Other	6	92.58		
Subjective Norm	Independent Pharmacy	126	88.19	4.271	0.511
	Franchise	12	64.17		
	Clinic	17	71.26		
	Chain Pharmacy	5	78.30		
	Government Pharmacy	2	92.50		
	Other	6	87.75		
Perceived Behavioral Control	Independent Pharmacy	126	89.35	11.886	0.036**
	Franchise	12	71.50		
	Clinic	17	75.65		
	Chain Pharmacy	5	29.00		

	Government Pharmacy	2	128.75		
	Other	6	65.25		
Perceived Knowledge	Independent Pharmacy	126	88.79	5.820	0.324
	Franchise	12	77.46		
	Clinic	17	71.62		
	Chain Pharmacy	5	59.00		
	Government Pharmacy	2	105.00		
	Other	6	59.33		
Personal Use	Independent Pharmacy	126	86.82	5.025	0.413
	Franchise	12	73.38		
	Clinic	17	76.44		
	Chain Pharmacy	5	94.40		
	Government Pharmacy	2	128.25		
	Other	6	58.00		
Intention	Independent Pharmacy	126	86.05	2.465	0.782
	Franchise	12	82.25		
	Clinic	17	69.26		
	Chain Pharmacy	5	101.60		
	Government Pharmacy	2	85.00		
	Other	6	85.17		
Behavior	Independent Pharmacy	126	83.48	0.171	0.999
	Franchise	12	82.08		
	Clinic	17	81.32		

	Chain Pharmacy	5	75.80		
	Government Pharmacy	2	83.50		
	Other	6	86.00		

4.11.1.7 Comparison of Variables by Education level

A Kruskal-Wallis test was conducted to determine whether pharmacists' education level had correlation with attitude, subjective norms, PBC, perceived knowledge, and personal use of HM. The test revealed that attitude, SN, PBC, perceived knowledge, personal use, intention, and behavior did not significantly different by the education level.

Table 29. Kruskal Wallis Test Comparison of Variables by Education Level

Demographic Variables	Education Level	N=168	Mean Rank Score	Chi-square	p-value
Attitude	Bachelor Degree & Pharmacist Professional Degree	123	83.40	2.213	0.529
	Master in Pharmacy Field	36	91.28		
	Master in Other Field	6	83.08		
	PhD.	3	51.17		
Subjective Norm	Bachelor Degree & Pharmacist Professional Degree	123	85.99	1.210	0.751
	Master in Pharmacy Field	36	82.90		

	Master in Other Field	6	76.92		
	PhD.	3	57.83		
Perceived Behavioral Control	Bachelor Degree & Pharmacist Professional Degree	123	82.31	3.060	0.382
	Master in Pharmacy Field	36	86.31		
	Master in Other Field	6	97.17		
	PhD.	3	127.33		
Perceived Knowledge	Bachelor Degree & Pharmacist Professional Degree	123	81.50	2.340	0.505
	Master in Pharmacy Field	36	89.97		
	Master in Other Field	6	104.33		
	PhD.	3	102.17		
Personal Use	Bachelor Degree & Pharmacist Professional Degree	123	86.35	4.647	0.200
	Master in Pharmacy Field	36	75.58		
	Master in Other Field	6	114.17		
	PhD.	3	56.50		

Intention	Bachelor Degree & Pharmacist Professional Degree	123	83.54	1.736	0.629
	Master in Pharmacy Field	36	89.68		
	Master in Other Field	6	88.67		
	PhD.	3	53.50		
Behavior	Bachelor Degree & Pharmacist Professional Degree	123	85.07	1.236	0.744
	Master in Pharmacy Field	36	76.91		
	Master in Other Field	6	72.00		
	PhD.	3	92.67		

4.11.1.8 Comparison of Variables by Years of Experience

A Kruskal-Wallis test was conducted to determine whether pharmacists' years of experience had correlation with attitude, subjective norms, PBC, perceived knowledge, and personal use of HM. The test revealed that perceived knowledge significantly different based on years of experience. Pairwise comparisons showed that there was significant difference of perceived knowledge between pharmacists who practice less than 5 years and who practice 6-10 years (p=0.001) and between pharmacists who practice less than 5 years and who more than 20 years (p=0.028). Attitude, SN, PBC, personal use, intention, and behavior did not significantly different by the years of experience.

Table 30. Kruskal Wallis Test Comparison of Variables by Years of Experience

Demographic Variables	Years of Experience	N=168	Mean Rank Score	Chi-square	p-value
Attitude	Less than 5 years	94	78.66	6.911	0.141
	6-10 years	47	93.74		
	11-15 years	14	83.54		
	16-20 years	8	75.25		
	More than 20 years	5	124.90		
Subjective Norm	Less than 5 years	94	77.13	8.194	0.085
	6-10 years	47	95.078.194		
	11-15 years	14	80.93		
	16-20 years	8	89.38		
	More than 20 years	5	125.80		
Perceived Behavioral Control	Less than 5 years	94	80.09	4.923	0.295
	6-10 years	47	94.50		
	11-15 years	14	80.93		
	16-20 years	8	89.38		
	More than 20 years	5	125.80		
Perceived Knowledge	Less than 5 years	94	73.47	13.930	0.008**
	6-10 years	47	101.04		
	11-15 years	14	92.57		
	16-20 years	8	79.13		
	More than 20 years	5	122.40		
Personal Use	Less than 5 years	94	81.18	7.304	0.121
	6-10 years	47	92.49		
	11-15 years	14	77.54		
	16-20 years	8	62.75		
	More than 20 years	5	126.10		
Intention	Less than 5 years	94	80.82	2.958	0.565
	6-10 years	47	91.41		
	11-15 years	14	89.14		

	16-20 years	8	69.19		
	More than 20 years	5	100.20		
Behavior	Less than 5 years	94	82.78	6.516	0.614
	6-10 years	47	90.93		
	11-15 years	14	84.71		
	16-20 years	8	45.50		
	More than 20 years	5	70.90		

4.11.2 Correlation between previous training and Perceived Knowledge

Pharmacists were asked to list about previous training they had related to herbal medicine, previous coursework was chosen by majority of the respondents (78.0%), followed by self-learning (66.7%). Formal study about herbal medicine with certificate or degree and work experience were least chosen by the respondents.

Table 31.Frequencies for pharmacists' previous training related to herbal medicine.

Type of Training	N	%
Self-Learning	112	66.7
Coursework	131	78.0
Seminar by Pharmacists Association	98	58.3
Seminar by Herbal Product	48	28.6
Work Experience	4	2.4
Formal Study	15	8.9

T-test comparison showed that type of previous training had significant relationship with perceived knowledge about herbal medicine. Pharmacists who had work experience and formal study had highest perceived knowledge score.

Table 32.T-Test Comparison of Perceived Knowledge about Herbal Medicine and Previous Training

Type of Training	t	df	P-value	Mean Diff	SE Difference	95% CI of Difference	
						Lower	Upper
Seminar by Pharmacists Association	2.235	166	0.027*	2.369	1.060	0.276	4.462
Seminar by Herbal Product	2.531	166	0.012*	2.917	1.152	0.642	5.192
Work Experience	2.280	166	0.024*	7.811	3.426	1.046	14.576
Formal Study	3.059	166	0.003**	5.536	1.810	1.962	9.109

4.11.3 Pharmacists' Responses to Open Ended Questions

Open ended question was asked in the end of survey to elicit any pharmacists' opinion or suggestion about herbal medicine. Pharmacists did not seem hesitant to share their opinion as evidence by numerous of open ended answers (n=76). The most frequent keyword can be classified into five main points.

4.11.4 Previous course

The respondents had their own opinion regarding previous coursework taken in college or pharmacy school. Overall, pharmacists felt the benefit from the course, they could understand the basic knowledge of herbal medicine. It explained herbal medicine in general, how to identify and extract crude herbal. However, the respondents also concerned felt insufficient knowledge gained from previous coursework as it was not

enough for practical level. Pharmacists agreed that the course did not provide adequate course regarding efficacy and safety of HM particularly about adverse effect, interactions, and contraindication in specific group of patients.

"Coursework with general material related to the use of herbal medicine is enough, but the herbal products with a particular brand that has been circulating in the pharmacy, I feel not yet fully understand the quality and safety."(83)

"HM course was interesting for me. But not sufficient to counsel patient in pharmacy. The HM theory and practice obtained were not something that can be counselled to patients. Knowledge about the efficacy, side effects and interactions are needed, and it can be obtained by self-learning and it would need special training."(170)(176)

*"Indonesian pharmacists do not fully understand about herbal medicine, because in college' course and researches only explain the benefits of herbal medicine, without explain efficacy of the extracts, merely the side effects or drug interactions, and contraindications in certain patients."(*125)

"The focus of lesson in lectures in college was how to identify the crude herbal, not focus on indication of the active compounds." (75)

"Previous course from pharmacy school is not relevant because resources and knowledge of herbal medicine is not as much as conventional medicine." (140)

"The previous subject discussed everything about herbals, but for counseling seems not enough because the subjects of these courses do not specifically address herbal-related counseling" (176)

"Lectures for general material related to herbal medicine plants is enough but the herbal medicine with particular brand that has been circulating around in the pharmacy, I feel not yet fully understand the quality and safety of the products." (83)

"Courses at college was very general and it was more likely only give insight about herbal. This is probably because I took interest in community clinics. Moreover I think that self-learning will enhance our knowledge rather than just rely on previous lectures. And for me who interested in clinical practice, it would be much nicer if the herbal sciences can be related to clinical. Therefore, it would give a distinct advantage for pharmacist." (139)

4.11.5 Lack of information source

Pharmacists perceived their knowledge about herbal medicine on the practical level was still lacking thus they tried to improve their knowledge. The respondents was looking for other information source to update their knowledge by attending seminar or continuing professional development (CPD), reading books and journal articles or discussing with other herbal experts. In addition, primary and secondary literature about herbal medicine was still lacking. Even though the information source was available, but it had limited access regarding constraint number of journal articles about herbal medicine with free access.

"I still need to add my knowledge by reading journal articles."(22)

"My understanding in the practical level is still not adequate so I need to learn by my-self and take courses related to herbal medicine."(70)

"I have to look for the other information to improve my knowledge of herbal medicine."(181)

"Sources of primary and secondary literature about herbal are still lacking."(154)

"Previous coursework at the college can just give basic knowledge, the latest information often can be obtained from reading books and journals."(27)

"Subject materials that were given in college is not enough for counseling, thus I attended some seminars to get updated knowledge."(172)(24)(28)

"I learn more about herbal medicine not only from the literature, but also having discussions with other herbalist like physician."(180)

"Herbal medicine is certainly one solution for degenerative diseases. But still difficult to access information about herbal medicine in Indonesia either about indications, interaction or side effects. Besides, in the Indonesian physician rarely prescribe herbal medicine."(112)

"*I still need to participate in seminars and discussions related to herbal medicine, and obtain information related to herbal that has been proven by clinical trials and have good formulation.*

"As community pharmacist and clinical pharmacist need to cooperate and establish communication with industrial pharmacist that produce herbal to increase self-efficacy in counsel."(123)

4.11.6 Lack of knowledge

Pharmacists expressed their concerns about their insufficient knowledge level which made them rarely perform counseling about HM to patients. Pharmacists generally agreed that in order to provide information to patients, they supposed to update their knowledge. The respondents thought that some compounds in HM could not be predicted particularly in interaction and adverse effects.

"I have limited information and understanding thus I rarely do counseling on herbal medicine."(48)(67)

"I do not have enough information about safety use of herbal remedies for any purpose."(131)

"We need to update our knowledge about herbal medicine in regard to provide better counseling to patient."(23)(88)

"My knowledge is still not sufficient, because sometimes there are adverse effects that have not been adequately explained in detail. Some complementary and substitution effects from multiple herbals."(33)

"Obstacles often faced in community and clinic-related to herbal medicine is its safety, particularly many components/compounds contained in herbal medicine that cause interactions or side effects and it is difficult to be predicted."(96)

"The main barrier is exploring the possibility of herbal drug-interactions."(97)

4.11.7 Patients' perception about herbal medicine

Pharmacists thought that patients' perception about herbal medicine as barrier to advise them. Patients that perceived herbal medicine as natural products thought that it's totally safe thus it is difficult to educate them. Report by Indonesian Ministry of Trade revealed that because herbal medicine are obtained from nature, public assumes that they are always safe, harmless, have no adverse effect and toxicity (Muslimin et al., 2009).

"There are still many people around me, even my family believe that herbal are totally safe thus it is still difficult to educate and communicate with them."(171)

"I think claim of herbal medicine in Indonesia is too bombastic. Many patients of mine who have chronic disease, that supposed to be treated with conventional medicine, switch to herbal medicine and mostly experienced worse effects."(46)

"Patients usually still consider that herbs do not have side effects, so as pharmacists should have sufficient knowledge to provide information relating to the use of herbal medicine by patients, this survey is very good so that future expected pharmacists have the motivation to learn continuously, especially regarding herbal medicine, where in Indonesian herbal medicine is still widely used by the public as the main option."(158)

"Patients do not understand the classificationg of herbal medicine. They only believe the advertising…"(166)

"Patients' perception that herbal medicine is safe should be removed first, because of that mindset a lot of patients come with complaints after using herbal products from Multi Level Marketing (MLM) stating that herbal remedies safe while actually there is a mismatch with the patient's condition. Herbal products should include information about what condition and contraindication to take products."(25)

4.11.8 Lack of Scientific Evidence

Pharmacists concerned about lack of scientific evidence either preclinical or clinical trials as a barrier for the to advise patients about HM. Pharmacists expected increasing number of clinical trials and its publication in the future. One pharmacists suggested cooperation and communication between industrial and community pharmacists.

"Counseling about herbal medicine is difficult due to insufficient scientific evidence."(105)

"Clinical data of herbal medicines adverse effects are still lacking."(32)

"There is still lack of clinical evidence about herbal medicine."(90)

"Clinical evidence of herbal remedies should be increased."(11)

"Increasing use of herbal medicine use need to be followed by clinical trials and counselling."(77)

"Please include the results of preclinical and clinical trials in herbal products' brochure in order to educate patients about the product."(87)

"Clinical evidence is important to explain when there are questions from patients regarding the validity of herbal drug trials."(71)

4.11.9 Adulteration of Herbal Products

Pharmacists has important role to educate patients about this. Some pharmacists concerns were related to adulteration of chemical compounds in HM products. Lack of supervision made the illegal products easily distributed in pharmacy. Recent public warning was announced by The National Agency of Drug and Food Control (NA-DFC) regarding chemical compounds in 54 herbal medicine products, mainly contain Acetaminophen and Phenylbutazone (BPOMRI, 2015). Pharmacists believed that this is pharmacists' role to educate patients considering safety use of HM products.

"Many herbal products that currently available are still 'illegal' because it contains chemicals compounds. Wide distribution and lack of supervision of these products make patients who consumed it perceived good effects. Thus educating patients about

the harmful effects, prohibit its use and advise them to change into safe products is very difficult."(163)

"In Indonesia misuse of herbal products that chemicals compounds were added to the herbal medicine is still high. It becomes one of the considerations the use of herbal medicine needs pharmacists' direction."(175)

4.11.10 Expectation and future recommendation

Pharmacists have high expectation to their role in herbal medicine in the future.

"Herbal medicine is supposed to be taken as prevention and patient does not need to wait for pain to consume… The HM use is still need to be observed." (141)

"In providing information about herbal medicine, we need to know the history of chronic disease because sometimes there are some herbals that are contraindicated with certain patients and circumstances. Herbal medicine is should be adjuvant therapy only."(29)

"Herbal medicine need to be increased, either the utilization, socialization, and production, therefore all of HM products can be standardized herbal or phytopharmaca."(113)

"Pharmacists nowadays are less familiar with herbal medicine, even though Indonesia is rich with herbals. My recommendation for pharmacist to not to stop learning about herbal medicine especially our own herbals."(93)

"Some barriers were exist, such as not many medical recommendations for HM use and phytopharmaca products were also limited. In addition, the culture of people who wants to quickly recover make herbal medicine use is less."(114)

"Hopefully development of herbal drugs continue in the future, and pharmacists are given adequate training about HM use and efficacy so that it can be applied and help the community."

"It is good to analyze pharmacists' role and potential to develop in supporting the herbal medicine use and integrate into national health system." (110)

"I hope in the future there is higher education that focus on herbal medicine to maintain local wisdom and invent ethno-medicine, which is equivalent to the pharmacy and medical school therefore HM can be integrated into the national health systems."(80)

"There is a newly established clinical pharmacy in Bali which will favor on the herbal therapy to support tourism. We hope there will be more information about herbal medicine that are published thus we could provide sufficient scientific evidence when communicate with physician."(124)

CHAPTER 5

CONCLUSION, DISCUSSION, AND SUGGESTION

This chapter provides discussion and summaries the major findings and relates to the theory and previous research. Major findings from this study can be concluded and explained to the implication in pharmacy practice and propose future research. Finally, the recommendations of the study will be proposed.

5.1 Conclusion

This study was a cross-sectional design, aimed to analyze the extent of Indonesian community pharmacists practice toward herbal medicine, identify factors that could affect Indonesian community pharmacists' intention to advise patients about herbal medicine, and examine the factors that could affect advising about herbal medicine behavior of Indonesian community pharmacists. The data collection was performed from May to June 2016 after obtained the approval letter from Institutional Review Board (IRB) and permission letters from selected provinces. Random sampling was used to identify the sample. There were total 168 community pharmacists from 16 provinces in Indonesia as respondents. The respondents' age was 31.935±6.795 years, and 70.5 % were female, with more than half have been work at community pharmacy for less than 5 years.

The instruments used in this study were (1) practice towards herbal medicine, (2) attitude towards advising patients about herbal medicine, (3) subjective norms of advising patient about herbal medicine, (4) perceived behavioral control over advising patient about herbal medicine, (5) perceived knowledge of herbal medicine, (6)

personal use of herbal medicine and (7) intention to advise patient about herbal medicine. All of the instruments disclose satisfactory validity and reliability. Data was analyzed by descriptive statistics, bivariate correlation, and multiple regression analyses.

This was first study to examine pharmacists' high intention to advise patients about HM by using behavioral theory. The theory of planned behavior was shown to be a good model that predict pharmacists' intention to advise patient about herbal medicine, it could explain 61.7% variance of the intention to advise patients about herbal medicine. Pharmacists had positive attitude, positive subjective norms, and neutral perceived behavioral control. Additional constructs, perceived knowledge and personal use were shown add the prediction of high intention. The findings also showed that intention to advise patient about herbal medicine significantly affect the pharmacists' behavior in advising patients about herbal medicine.

Educational and training for pharmacists regarding HM should contain materials that enhance pharmacists' attitude and provide sufficient knowledge. Based on the answer provided in open ended question, majority of the respondents committed to their role as HM information provider and concerned lack of knowledge, lack of scientific evidence, and patients' perception about herbal medicine as barriers to advise about HM.

5.2 Discussion

World Health Organization defined herbal medicine as herbal preparations, herbal materials, or herbal products that contain active compounds of one plant or combinations (WHO, 2005b). Based on national health survey, traditional medicine is used by 30.4% of respondents in 33 provinces, especially herbal medicine (49.0%)

(MoH, 2013b). As a healthcare professional who mostly encounter patients when purchase herbal products, pharmacists can play an active role in provide information about safety and efficacy of herbal medicine. However, Indonesian pharmacists' behavior to advise patients about herbal medicine and factors behind were still unknown.

5.2.1 Objective 1

The discussion part of this study was based on the objectives of the study. The first objective of the study was to analyze the extent of Indonesian community pharmacists practice toward herbal medicine. In this study, pharmacists practice regarding herbal medicine refers to the activity and frequency performed by Indonesian pharmacists in community practice related to herbal medicine, including stock, dispense, and advise patients about herbal medicine. Advising practice is measured by questions about the activity and frequency of pharmacists counsel and provide information about herbal medicine use, efficacy, adverse effects, safety, herbal-drug interaction, precautions and contraindication. Firstly, the behavior was collected as continuous data which later transformed into categorical data due to not normally distributed. The total score was classified into two groups, low and high levels of the behavior by using 10 as cut point.

The result show that three types of herbal medicine were stocked at pharmacy, jamu (83.9%), standardized herbal (84.5%), and phytopharmaca (69.6%). Majority of pharmacists stocked herbal medicine in modern form, either it was liquid (60.1%) or pill and capsules (91.1%). Based on descriptive analysis, the majority of Indonesian community pharmacists (69.0%) performed a low level of advising about herbal medicine behavior. On daily basis 11.819±13.2039 patients buy herbal medicine

products form pharmacy and pharmacists receive 4.924±4.1791 inquiries about herbal medicine.

5.2.2 Objective 2

The second objective of this study was examine the effect of attitude, subjective norm, perceived behavioral control, personal use, and perceived knowledge toward Indonesian community pharmacists' intention to advise patients about herbal medicine. Pearson correlations between TPB constructs and intention to advise about herbal medicine indicates that the relationships were statistically significant. Further statistical analysis was conducted to examine the relationships. Because of intention data was not normally distributed, logistic regression was conducted.

The theory of planned behavior predict intention to perform behaviors accurately based on attitudes towards that behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). The TPB constructs was used to explain pharmacists' intention to advise patients about HM. In this study, main constructs of TPB were found to be positive predictors of the intention. This supports previous study, including meta-analysis of the theory of planned behavior (Armitage & Conner, 2001; Godin et al., 2008; Riebla et al., 2015).

Prior study by Godin found that TPB could explained 75% of the variance of physicians' intention to encourage CAM use (Godin et al., 2007). Likewise, Noureldin conducted study regarding pharmacy students' intention to advise about CAM. It found that three main variables (A, SN, and PBC) were significant factors and it could explain 57.1% of variance in intention.

The utility of the study can be measured by percent of variance explained or R^2. Nagelkerke R^2 value was used in this study, resulted 50.7% of the variance of

pharmacists' intention to advise about HM explained. Model p-values also can be another way to assess the usefulness of the model. The TPB model was useful in predicting pharmacists' high intention by highly significant model: Model X^2=80.311, df=5, p<.0.01. In addition, three constructs significantly predicted high intention, Attitude (OR=3.93, p<0.01), Perceived knowledge (OR=2.22, p<0.01), and Personal Use (OR=1.79, p<0.05). Meanwhile two constructs did not significantly predict the intention, SN (OR=1.41, p=0.350), PBC (OR=1.41, p=0.460). Each construct of TPB will be discussed below.

Pharmacists' attitude toward advising about HM

Pharmacists' attitude toward advising about HM was significantly predicted the high intention (OR=3.93, p<0.01), which supported the hypothesis. Overall pharmacists' intention were positive (4.32 ± 0.705, range 1-5) which may indicate that pharmacists recognize the outcome of advising about HM. Pharmacists with a positive attitude toward advising about HM were almost four times likely to have a high intention (OR 3.93). Attitude shown as strongest predictor of intention. A systematic review also found that healthcare professionals' attitude toward the behavior was the strongest predictors for the intention and the behavior (Godin et al., 2008).

Other studies also reported favorable attitude and perception related to CAM. Godin conducted a study of general physician (N=500) and medical students (N=904) related to the intention to encourage CAM use to patients. Attitude (β=0.22, p<0.01) significantly predicted the intention. The majority of respondents perceived recommending CAM use as approach to create good relationship with patients (Godin et al., 2007). In a survey of pharmacy students they believed that by giving advice about CAM, it will be useful for their future practice and make them do something beneficial.

The attitude can predict (β=0.46, $p<0.01$) the intention to advise patients about CAM (Noureldin, 2011).

Upon the examination of behavioral belief and behavioral outcomes in this study, pharmacists believed that beneficial, prevent harmful effect, make patients trust them, profitable for pharmacy and give benefit for patients' health were all reported as outcomes of advising about HM and the outcome evaluations indicated there were viewed to be positive. Respondents also believed that they should be able to provide information about herbal medicines to patient (mean 4.52 ± 0.773) and it is important aspect of their professional role as information provider (mean 4.01 ± 1.015) thus pharmacists should play greater role in it (mean 4.52 ± 0.773).

Prior studies reported the importance of attitude related with pharmacists' intention or behavior related to HM. Pharmacists' attitude toward dietary supplement (DS) shown to be positively associated with their practice toward DS (Mehralian et al., 2014). Their attitude toward DS also positively associated with pharmacists' attitude toward pharmacists' role as information provider (Atavwoda & Gabriel, 2012). Another studies also reported the association between pharmacists' perception about their responsibility as information provider and their CAM practice (Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2011).

When considering the pharmacist's role in providing information about HM, pharmacists can discuss about their use of HM, educate them with evidence based on safety and efficacy of products, monitor it and prevent potential adverse effects and interactions, which may lead to more rational use of HM thus overall improve quality of care of patients. Educational materials and training for pharmacists regarding HM should contain materials that enhance pharmacists' attitude.

The attitude was the strongest (TPB) predictor of intention. As part of the responsibility, Indonesian pharmacists follow law PP 51 in 2009 about Pharmaceutical Care. It was stated that pharmaceutical care including provide information of medicine, either conventional or traditional medicine. Thus, the importance of attitude in the affect intentions to advise patients may be explained by the fact that advising about herbal medicine perceived as pharmacists' responsibility and had positive outcomes. These findings imply that attitude is a critical antecedent for advising herbal medicine intention. If the government wants to encourage herbal medicine utilization, they need to change pharmacists' attitude toward advising herbal medicine to their patients in order to increase more advice to patients.

Pharmacists' subjective norms toward advising about HM

Pharmacists' subjective norm toward advising about HM was not significantly predicted the high intention (OR=2.22, $p<0.01$), which did not support the hypothesis. Overall pharmacists had a positive SN (3.56 ± 0.811), which may indicate that pharmacists had perception about the expectation of social and significant persons to perform advising about HM. The previous study found that SN was the weakest predictor of intention (Armitage & Conner, 2001). In contrary to the previous study in US, SN was a significant and strong predictor ($\beta=0.24$, $p<0.01$) of pharmacy students' intention to advise about CAM (Noureldin, 2011).

Regarding the subjective norms, physician was mainly to be neutral (3.07 ± 1.064) to support pharmacists to advise about HM. Meanwhile pharmacy owners and patients were believed to be somewhat likely to support pharmacists to advise about HM (3.91 ± 1.026, 3.71 ± 0.992, range: 1-5, respectively) and the respondents were moderately likely to comply with other pharmacists (3.42 ± 1.086, range 1-5).

Prior studies reported important person that impact pharmacists' practice related to herbal medicine. Physician was reported to be associated with pharmacists' decision to sell HM products (Culverhouse & Wohlmuth, 2012; Welna et al., 2002). Other study revealed that demand from consumer associated with community pharmacists' practice in recommending herbal medicine products (Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2006; Welna et al., 2002).

The bivariate correlation between intention and SN was statistically significant but the correlation were fairly weak. In conclusion, pharmacy owner were influential in encouraging pharmacists to advise about HM. Pharmacists also believe that patients would want them to communicate with them about HM and identify potential problems with HM. Conversely, pharmacists were somewhat unlikely to believe that physician would approve them to advise about HM.

Pharmacists' perceived behavioral control toward advising about HM

PBC was not a significant predictor of the high intention (OR=1.41, p=0.460), which did not support the hypothesis. Overall pharmacists in our study reported a neutral perceived behavioral control (3.08 ± 0.581), which means that pharmacists had a neutral perception toward facilitating factors and barriers related to advising about HM. Contrary to the previous study where PBC was the most significant predictors in the TPB model (Notani, 1998). The previous study of pharmacy students in US, PBC was a significant and strong predictor (β=0.16, $p<0.01$) toward the intention to advise about CAM (Noureldin, 2011). Similar study also shown that PBC significantly predicted (β=0.29, $p<0.01$) physician's intention to encourage CAM use (Godin et al., 2007).

Pharmacists were moderately confident about their education and training to communicate with patients (3.51 ± 1.072). Contrary to the previous study, lack of education and training was reported as barrier to provide information about CAM (Brown et al., 2004; Semple et al., 2006). Other factors that would make it moderately easy to advise about HM were sufficient time (3.50 ± 1.067) and lack reliable and adequate information source (3.22 ± 1.150). Although previous study reported lack of time as the main barrier to not advise patients (Al-Arifi, 2013; Culverhouse & Wohlmuth, 2012; Jordan et al., 2010; Semple et al., 2006; Tiralongo et al., 2010), in this study respondents were mainly disagree regarding time constraints. Pharmacists generally agreed that there is insufficient number of information source about herbal medicine and it was a barrier for them to advise patients about HM. This result supports previous study that lack of reliable information sources as barrier to provide information about CAM (Al-Arifi, 2013; Brown et al., 2004; Semple et al., 2006; Volmer et al., 2011).

Several factors make pharmacists difficult to advise about HM, that were lack of scientific evidence (3.51 ± 1.199), patients' perception about HM (3.45 ± 1.125), and different regulation (3.22 ± 1.091). Lack of scientific evidence was also reported by prior studies as barrier for community pharmacists to provide information about HM (Al-Arifi, 2013; Culverhouse & Wohlmuth, 2012; Naidu et al., 2005; Semple et al., 2006; Tiralongo et al., 2010). Patients usually perceived HM as natural product and totally safe therefore it become barrier to advise them, as reported by previous research (Culverhouse & Wohlmuth, 2012; Semple et al., 2006; Volmer et al., 2011). This result was supported by respondents' answer on open-ended question.

The bivariate correlations between intention and PBC were statistically significant but the correlation were fairly weak.

Additional Predictor Variables

Perceived knowledge and personal use were included as predictors of intention to advise about HM in addition to the TPB constructs.

Perceived Knowledge

Perceived Knowledge was a significant predictor of the high intention (OR=2.22, $p<0.01$), which supported the hypothesis. It was hypothesized that pharmacists who confident to be knowledgeable about HM may have higher intention to advise about HM. Overall pharmacists in our study reported moderately high perceived knowledge (3.66 ± 0.979), which indicated that pharmacists agreed to be knowledgeable about HM. Pharmacists with a high perceived knowledge about HM were two times likely to have a high intention. Asking pharmacists about their knowledge may prove to be a useful measure for future studies involving pharmacists' intention and behavior related to HM.

Perceived knowledge construct was derived from previous literature where pharmacists' specific topic of knowledge about dietary supplement was measured (Mehralian et al., 2014). It was reported that pharmacists' knowledge was associated with their attitude and practice regarding herbal medicine ($p<0.01$). Previous studies reported lack of knowledge as barrier for community pharmacists to counsel and provide information about CAM (Al-Arifi, 2013; Culverhouse & Wohlmuth, 2012; Jordan et al., 2010; Tiralongo et al., 2010; Volmer et al., 2011).

Overall, respondents agreed to be knowledgeable about HM use, efficacy of HM, indications and precautions of HM in specific group such as pregnancy and

geriatric, adverse effects of HM, contraindication of HM in special groups of patients such as hypertension or DM, safety information of HM, and herbal-drug interactions. Contrary to the previous study, Iranian pharmacists were mainly neutral about being knowledgeable about specific topics of dietary supplement, while they felt confident on general information only (Mehralian et al., 2014).

Educational materials and training for pharmacists regarding HM should contain contents that improve pharmacists' knowledge. If pharmacists' high intention is increased based on perceived knowledge, the behavior may be higher.

Personal Use

Personal use was a significant predictor of the high intention (OR=1.79, $p<0.05$), which supported the hypothesis. It was hypothesized that pharmacists who have a good perception about HM use by him/herself, family and culture may have higher intention to advise about HM. Overall pharmacists in our study reported neutral personal use (3.37 ± 0.979), which indicated that pharmacists mainly neutral about HM use by him/herself, family and culture. Pharmacists with a high personal use were almost two times likely to have a high intention.

This construct was derived from personal interest which become a part of attitudes toward CAM on previous study (Noureldin, 2011). In this study the scale was constructed with four items, asking pharmacists about their perception about herbal medicine utilization by him/her-self, family and society. Prior studies found that personal use of DS had significant relationship with practice toward DS (Culverhouse & Wohlmuth, 2012; Howard et al., 2001; Welna et al., 2002).

Respondents were agreed about their herbal medicine use, either for disease prevention and maintain health (3.91 ± 1.099) or to treat disease (3.48 ± 1.116). The

respondents were mainly neutral about the family culture in using HM (3.10 ± 1.1170) and society use (2.98 ± 1.097). Considering pharmacist's personal use of HM which may lead to higher intention to advise about herbal medicine.

Pharmacists' Intention

In this study, respondents intended to advise patients about herbal medicine (mean intention score 3.77 ± 0.874). This finding was higher than (Harjanti, 2014) where community pharmacists in Yogyakarta province had a neutral intention (3.03, range 1-5) to recommend phytopharmaca to patients. Pharmacists responded to this study may frequently encounter with patients who buy or ask about herbal products in their practice. Nevertheless, among the survey respondents there is a strong intention to advise patients about herbal medicine.

The perceived knowledge was significant in the regression model. Thus, providing pharmacists with herbal medicine education may significantly increase their intentions to advise patients in the future. In addition, interventions to improve herbal medicine advising should focus on those who have not advised the patient in the past. Finally, personal use significantly predicts intention thereby pharmacists use of herbal medicine is an important predictor of intention.

Even though, perceived behavioral control did not significantly predict advising patients about HM in the regression model but there was a significant correlation with advising patients about HM and intention to advise patients about HM. Thus, the facilitating factors and barriers such as previous education and training, scientific evidence, and reliable and adequate information source of HM were still the important factor that could lead pharmacists to advise patients about HM. The social norm which was people around pharmacists did not significant predict advising patients about HM

and did not significant correlate with advising patients about HM. However, social norm was significantly correlated with intention. This showed that social norm did not have a direct effect on advising patients about HM but it may have an indirect effect on advising patients about HM through intention.

Our data showed a large number of pharmacists indicated that they had a good attitude toward advising patients about herbal medicine. This study was the first to examine the TPB construct of intention to advise patients about HM by pharmacists. The finding suggests that HM advising is perceived as an important role for Indonesian community pharmacists.

Open Ended Question Finding

Open ended question was asked in the end of survey to elicit any pharmacists' opinion or suggestion about herbal medicine. Pharmacists did not seem hesitant to share their opinion as evidence by numerous of open ended answers (n=76). The most frequent keyword can be classified into five main points.

Firstly, respondents were concerned about the previous course about HM that taken in college or pharmacy school. Pharmacists believed that the coursework was beneficial and interesting. It explained herbal medicine in general, how to identify and extract crude herbal. Furthermore, the respondents felt insufficient knowledge gained from previous coursework as it was not relevant to be counselled to patients. Pharmacists agreed that the course did not provide adequate course regarding efficacy and safety of HM particularly about adverse effect, interactions, and contraindication in specific group of patients.

Pharmacists expressed their concerns about their insufficient knowledge level which made them rarely perform counseling about HM to patients. Pharmacists

generally agreed that in order to provide information to patients, they supposed to update their knowledge. The respondents thought that some compounds in HM could not be predicted particularly in interaction and adverse effects. Pharmacists perceived their knowledge about herbal medicine on the practical level was still lacking thus they tried to improve their knowledge. The respondents was looking for other information source to update their knowledge by attending seminar or continuing professional development (CPD), reading books and journal articles or discussing with other herbal experts. In addition, primary and secondary literature about herbal medicine was still lacking. Even though the information source was available, but it had limited access regarding constraint number of journal articles about herbal medicine with free access. Pharmacists expected increasing number of clinical trials and its publication in the future. One pharmacists suggested cooperation and communication between industrial and community pharmacists.

Some pharmacists concerns were related to adulteration of chemical compounds in HM products. Lack of supervision made the illegal products easily distributed in pharmacy. Recent public warning was announced by The National Agency of Drug and Food Control (NA-DFC) regarding chemical compounds in 54 herbal medicine products, mainly contain Acetaminophen and Phenylbutazone (BPOMRI, 2015). Pharmacists believed that this is pharmacists' role to educate patients considering safety use of HM products.

Pharmacists thought that patients' perception about herbal medicine as barrier to advise them. Patients that perceived herbal medicine as natural products thought that it's totally safe thus it is difficult to educate them. Previous report by Indonesian Ministry of Trade revealed that because herbal medicine are obtained from nature,

public assumes that they are always safe, harmless, have no adverse effect and toxicity. This is pharmacists' role in educating patients about herbal medicine safety (Muslimin et al., 2009).

5.3 Implication for pharmacy practice

Based on the study result, attitude towards advising about herbal medicine, perceived knowledge about herbal medicine, and personal use could explain pharmacists' intention to advise patients about herbal medicine. Pharmacists are in a position to provide appropriate information about HM patients. It is critical that pharmacists obtain the necessary education and training. Therefore, herbal medicine education should guide pharmacists to promote the advising herbal medicine that could encourage pharmacists' attitude toward the behavior itself and increase knowledge about herbal medicine. Pharmacist had favorable attitude toward advising about HM. Thus it may be helpful for the Indonesian Pharmacists Association to provide pharmacists with training materials about HM, which may impact the attitude and impact on the intention in the end. The education materials should aim to at pharmacists should appeal to increase their attitude.

5.4 Limitations

This study has several limitations that could impact the study result and significance. Firstly, the response rate was relatively low (<10%) and the unique variability of responses. In addition there were too small sample size to represent all Indonesian community pharmacists and based on the demographic data, there were provinces with small representatives. Therefore this study cannot be generalized to

broader population. Secondly, study was collected as a self-report and some pharmacists could be affected by social desirability, but the study was anonymous to mitigate the threat. Thirdly, there were also limitation with the study instrument. Since this is the first online survey conducted among Indonesian pharmacists, the respondent might not be familiar with the system. There were also chance that respondents did not understand certain question and may affect the response.

5.5 Recommendation for future research

Despite the limitation, this study found that the attitude towards advising about herbal medicine, perceived knowledge about herbal medicine, and personal use could explain 50.7% of pharmacists' intention to advise patients about herbal medicine. In order to generalize the findings of study, sample size may be increased on the future study. Pharmacists' advising about herbal medicine behavior in this study was not show normal distribution, thus it may be modified to be more practical and get valid result.

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APPENDIX

Appendix A

Approval of thesis proposal

Appendix B

Approval of ethical clearance

COMMISSION ON HEALTH RESEARCH ETHICS
FACULTY OF PUBLIC HEALTH DIPONEGORO UNIVERSITY

Secretariat : Dekanat FKM UNDIP
Jl. Prof. Soedarto, SH – Tembalang,
Semarang 50239 Telp. 7460044

ETHICAL CLEARANCE

No : 55 /EC/FKM/2016

Commission on Health Research Ethics Faculty of Public Health Diponegoro University Semarang after reviewing research proposal entitled :
With the following :

Title	: Factors Affecting Indonesia Community Pharmacists to Advise Patiens About Herbal Medicine.
Principle Investigator	: Chilmia Nurul Fatiha, S.Farm., Apt.
Advisor	: Asst. Prof.Pol.Capt. Tanattha Kittisopee, PhD.
Site of Study	: Indonesia

Stated the research has met ethical requirements to be implemented, based on The Indonesian National Guideliness on Health Reasearch Ethics, Ministery of Health 2007.

Semarang, 28th March 2016

Faculty of Public Health
Diponegoro University
Dean,

Hanifa Maher Denny, SKM., MPH., PhD.
NIP 196901021994032001

Commission on Health Research Ethics
Faculty of Public Health Diponegoro University
Chairman,

Prof. Dr. dr. Anies, M.Kes., PKK
NIP 19450742219850110001

KOMISI ETIK PENELITIAN KESEHATAN
FAKULTAS KESEHATAN MASYARAKAT
UNIVERSITAS DIPONEGORO

KETERANGAN KELAIKAN ETIK

(ETHICAL CLEARANCE)

No. 55/EC/FKM/2016

Komisi Etik Penelitian Kesehatan Fakultas Kesehatan Masyarakat Universitas Diponegoro setelah membaca dan menelaah usulan penelitian dengan judul :

"Factors Affecting Indonesia Community Pharmacists to Advise Patiens About Herbal Medicine".

Nama Mahasiswa/Peneliti	: Chilmia Nurul Fatiha, S.Farm., Apt.
NIM	: 5776351933
Pembimbing	: Asst. Prof.Pol.Capt. Tanattha Kittisopee, PhD.
Tempat Penelitian	: Indonesia

Dengan ini menyatakan penelitian tersebut telah memenuhi persyaratan etik dan setuju untuk dilaksanakan dengan memperhatikan prinsip-prinsip yang dinyatakan dalam Pedoman Nasional Etik Penelitian Kesehatan (PNEPK) Departemen Kesehatan RI 2007.

Semarang, 28 Maret 2016

Fakultas Kesehatan Masyarakat
Universitas Diponegoro
Dekan,

Hanifa Maher Denny, SKM, MPH, Ph.D.
NIP 196901021994032001

Komisi Etik Penelitian Kesehatan
Fakultas Kesehatan Masyarakat UNDIP
Ketua,

Prof. Dr. dr. Anies, M.Kes, PKK.
NIP. 195407221985011001

Appendix C

Official Letter from Indonesia Pharmacists Association (IAI)

PENGURUS DAERAH
IKATAN APOTEKER INDONESIA (IAI)
SUMATERA BARAT
Sekretariat: Jl. Raya Siteba No. 49 C Padang
Telp. 082391540496 Fax.0752-6218244 Email:sekretariat@iaisumbar.net
Website: www.iaisumbar.net

Nomor : 303/PD.IAI-SUMBAR/IV/2016
Lampiran : -
Perihal : **Permintaan menjadi Responden**

Kepada Yth :
Bapak / Ibu Sejawat Apoteker
Se Sumatera Barat
di
Tempat

Dengan hormat,

Doa dan harapan kami semoga Sejawat selalu dalam lindungan-Nya, dan diberi kemudahan dalam menjalankan aktivitas. Aamiin.

Sehubungan dengan penelitian Mahasiswa S2 Farmasi Cholalongkorn University, Thailand atas nama Chilmia Nurul Fatiha, S.Farm, Apt mengenai **"Peran Apoteker Komunitas dalam Konseling Obat Herbal"** yang pengambilan datanya dilakukan secara online, maka kami mengharapkan kepada semua Sejawat untuk dapat memberikan partisipasinya sebagai Responden apabila dihubungi melalui email.

Demikianlah surat ini kami sampaikan, atas perhatiannya dan kerjasamanya diucapkan terima kasih..

Padang, 01 April 2016

Ketua

H. Zulkarni R., S.Si, MM, Apt
NA.30121968003239

Sekretaris

Dasrul B., S.Si, Apt
NA.14121978027328

Pengurus Daerah Kalimantan Timur
IKATAN APOTEKER INDONESIA
Sekertariat : Jl. Palang Merah Indah No. 01 Samarinda
Telp. (0541) 742055 Psw. 206 | Fax . – | e-mail: pdiai.kaltim@yahoo.co.id
Website : http://iaikaltim.or.id

Nomor : B2-164/PD IAI/KALTIM/IV/2016
Lamp : -
Hal : **REKOMENDASI PD IAI KALTIM**

Kepada Yth.
Chilmia Nurul Fatiha, Apoteker
Di
Tempat

Sehubungan dengan surat elektronik saudara tentang permohonan data email Anggota IAI Kaltim ke PD IAI Kaltim, bersama ini kami memberikan **Rekomendasi** sejawat :

Nama : **Chilmia Nurul Fatiha, Apoteker**
Jenis Kelamin : Perempuan
Pekerjaan : Mahasiswa Tugas Akhir Program Magister Farmasi Klinik
Program Studi : *Social and Administrative Pharmacy Department*
Fakultas : *Pharmaceutical Science*
Universitas : Chulalongkorn, Thailand

Rekomendasi ini bertujuan untuk pengambilan data penelitian tugas akhir melalui kuisioner *on line* kepada Apoteker Komunitas Wilayah Kalimantan Timur. Berkaitan dengan hal tersebut, PD IAI Kaltim telah menyampaikan data email anggota IAI Kaltim kepada pemohon, serta memohon kepada sejawat apoteker di wilayah Kaltim kiranya dapat membantu sejawat untuk tujuan pendidikannya. Kerahasiaan data dan identitas anggota dijamin kerahasiaannya.

Demikianlah surat pengantar ini untuk digunakan sebagaimana mestinya.

Samarinda, 11/04/2016

IKATAN APOTEKER INDONESIA
PENGURUS DAERAH KALIMANTAN TIMUR
PERIODE 2014-2018

Ketua,

Drs. M. Nasrudin, Apt
NA : 19091966 020166

Sekretaris,

Arsyik Ibrahim, S.Si., M.Si., Apt
NA : 20081974020036

Tembusan ;
1. Ketua DEWAS, Ketua MEDAI IAI Kaltim
2. Ketua Bidang Pendidikan & Penelitian PD IAI kaltim
3. File

Pengurus Cabang
IKATAN APOTEKER INDONESIA KOTA SORONG
Sekretariat :
Jl. Malibela,gudang farmasi Km.10 Sorong Timur | E-mail : pciaikotasorong@yahoo.com
Hp. 081355483703- 082238621656

Nomor : SE-002/PC IAI/ KOTA SORONG/III/201
Lampiran : -
Perihal : Partisipasi dalam mengisi quisoner

Kepada Yth.
Teman Sejawat
Di –
Tempat
Dengan Hormat,

Sesuai dengan permohonan yang disampaikan kepada kami pada Hari Kamis, tanggal 10 Maret 2016 oleh :

Nama	: Chilmia Nurul Fatiha,S.Farm.,Apt.
Studi	: Master Student (Social and Administrative Pharmacy)
Tempat Studi	: Faculty of Pharmaceutical Science Chualalongkorn University, Bangkok,Thailand
Judul Thesis	: Factors Affecting Indonesian Community Pharmacists to advise Patients about Herbal Medicines
Advisor	: Asst. Prof. Tanattha Kittisopee,Ph.D.
External examiner	: Prof.Dr.Zullies Ikawati.,Apt.

Maka diharapkan kepada seluruh anggota untuk dapat memberikan bantuan respon terkait quisoner yang akan dikirimkan oleh beliau ke email masing-masing anggota terkait thesis yang sedang dikerjakan atas perhatian dan kerja samanya kami ucapkan terimakasih.

Sorong 10 maret 2016
Mengetahui

Ketua PC IAI Kota Srong

H.Rudin,S.si.,M.kes.,Apt
NA 18061976017692

IKATAN APOTEKER INDONESIA
PENGURUS CABANG
KOTA SORONG

Sekretaris II

Irwanda,S.Farm.,Apt
NA 18011988017726

Appendix D

Pre-notification Email

Dear Fellow Community Pharmacists
in West Sumatra,

We would like to invite you to participate in a survey about pharmacists' practice in herbal medicine. This survey is part of our thesis in the Master's program in Pharmaceutical Science Faculty, Chulalongkorn University, Bangkok, Thailand.

Within a week, you'll get an email with a link asking you to participate in surveys. This survey will be distributed to community pharmacists throughout Indonesia and will take 10-15 minutes to complete. This survey will ask your opinion about a community pharmacist counseling practice in the field of herbal and the factors behind.

We respect and protect your identity, we also ensure confidentiality and does not include personal information. The survey results will be analyzed and are reported in summary form in general.

Your participation is voluntary, but we hope you can take the time to give your opinion. For best results, we hope all pharmacists can participate and give an honest answer. Please complete the survey when you receive next email, your contribution is important for pharmacist's role in the future.

As a thank you, all participants who have filled out a survey to complete up to May 18th, 2016 will get balance as prizes.

If you have any questions regarding the survey, please contact Chilmia Nurul Fatiha (MIA) via telephone (+66) 992 815 100, Whatsapp (+62) 81329679820, email cnfatiha@gmail.com, ID line: mia_chil.

Thank you in advance for the help given, the attached letter from the Pharmacists Association West Sumatera Province.

Best regards,
Chilmia Nurul Fatiha, S.Farm., Apt.
Master Student (Social and Administrative Pharmacy)
Faculty of Pharmaceutical Science
Chulalongkorn University
Phayathai Road, Pathumwan, Bangkok, Thailand

Appendix E

Initial Email

Dear. Fellow Community Pharmacists
in the province of Bali

As one of the health care professionals who are easily accessed by patients, pharmacists often get questions about medications, including herbal remedies. We would like to invite you to participate in a survey on pharmacists' practice in herbal medicine. This survey is part of our thesis in the Master's program in Pharmaceutical Science Faculty, Chulalongkorn University, Bangkok, Thailand.

This survey will be distributed to community pharmacists throughout Indonesia and will take 10-15 minutes to complete. This survey will ask your opinion on the practice of community counseling in herbal medicine. The response that you give will help us to understand how the practice of pharmacists Indonesia in providing information to patients on herbal medicine and the factors behind.

We respect and protect your identity, we also ensure confidentiality and does not include personal information. Your participation is voluntary, but we hope you can take the time to give your opinion. For best results, we hope all pharmacists can participate and give an honest answer.
You can access the survey at: http://goo.gl/forms/Hh1VaiwgwZ

Please complete the survey when you receive the link, your contribution is important to the pharmacist's role in the future.

As a thank you, all participants who have answered the survey with complete until May 25, 2016 will receive balance IDR 10,000,- please provide active phone number at the end of the questionnaire.

If you have any questions regarding the survey, please contact Chilmia Nurul Fatiha (MIA) via telephone (+66) 992 815 100, Whatsapp (+62) 81329679820, email cnfatiha@gmail.com, ID line: mia_chil.
Thanks in advance for any help given.

Best regards,
Chilmia Nurul Fatiha, S.Farm., Apt.
Master Student (Social and Administrative Pharmacy)
Faculty of Pharmaceutical Science
Chulalongkorn University

Appendix F

Follow Up Email

Dear. Fellow Community Pharmacists
in East Kalimantan

Approximately one week ago, we sent you a link to the survey on the pharmacists' practice on herbal medicine, which is targeted on community pharmacists across Indonesia.

This email is a reminder, if you have not had the opportunity to complete the survey, we invite you to do it now. The survey takes about 10-15 minutes. If you have completed the survey, we thank you for your feedback and please ignore this email.

Links to the survey are provided below. Your answers are confidential and anonymous. Your participation is voluntary, but we hope you can take the time to give your opinion.

You can access the survey at: http://goo.gl/forms/VMOpndVH126gIoVy1

If you have any questions regarding the survey, please contact Chilmia Nurul Fatiha (MIA) via telephone (+66) 992 815 100, Whatsapp (+62) 81329679820, email cnfatiha@gmail.com, ID line: mia_chil.

Thanks in advance for any help given.

Best regards,

Chilmia Nurul Fatiha, S.Farm., Apt.
Master Student (Social and Administrative Pharmacy)
Faculty of Pharmaceutical Science
Chulalongkorn University

Appendix G

Survey on Google Form

Factors Affecting Community Pharmacists to Advise Patients about Herbal Medicine

Factors Affecting Community Pharmacists to Advise Patients about Herbal Medicine

Kepada
Yth. Rekan Sejawat Apoteker Komunitas
di Indonesia

Kami ingin mengundang Anda untuk dapat berpartisipasi dalam survei mengenai praktek apoteker komunitas pada obat herbal. Survei ini merupakan bagian dari thesis kami di program Master di Pharmaceutical Science Faculty, Chulalongkorn University, Bangkok, Thailand. Kami akan sangat menghargai jika Anda dapat meluangkan waktu 10-15 menit untuk menyelesaikan survei.

Kami menghormati dan melindungi identitas Anda, kami juga menjamin kerahasiaan dan tidak mencakup informasi pribadi. Partisipasi Anda bersifat sukarela, tetapi kami berharap Anda dapat meluangkan waktu untuk memberikan pendapat Anda. Anda dipersilahkan untuk menarik diri dari kuesioner setiap saat.

Jika memiliki pertanyaan terkait dengan survei, mohon untuk menghubungi Chilmia Nurul Fatiha (MIA) via telepon (+66)992815100, Whatsapp (+62)81329679820, email cnfatiha@gmail.com, ID line: mia_chil.

Sebagai ucapan terima kasih, seluruh partisipan yang telah menjawab survei dengan lengkap sampai dengan 25 Mei 2016 akan memperoleh pulsa senilai Rp 10,000,- ; dimohon dapat memberikan nomer hp (aktif) di akhir kuesioner.

Terima kasih sebelumnya atas bantuan yang diberikan.

Hormat Kami,

Chilmia Nurul Fatiha, S.Farm., Apt.
Graduate Student
Faculty of Pharmaceutical Science
Chulalongkorn University

Tanattha Kittisopee, PhD.
Assistant Professor of Social Pharmacy
Faculty of Pharmaceutical Science
Chulalongkorn University

Dengan mengklik tombol Next/Selanjutnya Anda setuju untuk mengikuti survei ini.

*Required

Praktek Apoteker di bidang Herbal

Mohon dapat menjawab pertanyaan berikut dengan jawaban yang sudah disediakan. Mohon menggunakan definisi obat herbal berikut untuk membantu menjawab.

Jamu adalah sediaan obat bahan alam yang belum dibuktikan keamanan dan khasiatnya, hanya berdasarkan bukti empiris, digunakan secara tradisional dan turun-temurun.

Obat Herbal Terstandar adalah sediaan obat bahan alam yang telah dibuktikan keamanan dan khasiatnya secara ilmiah dengan uji pra klinik dan bahan bakunya telah distandarisasi.

Fitofarmaka adalah sediaan obat bahan alam yang telah dibuktikan keamanan dan khasiatnya secara ilmiah dengan uji pra klinik dan klinik, bahan baku dan produk jadinya telah distandarisasi.

Obat herbal yang dimaksud dalam survei ini mencakup tiga jenis herbal di atas, yang dalam bentuk sediaan ORAL.

1. **Apakah apotek Anda menyediakan produk obat herbal?** *
   Mark only one oval.

- [ ] Iya
- [ ] Tidak

2. **Jika tidak, kami ucapkan terima kasih telah mengikuti survei ini, sampai jumpa di survei lainnya. Semoga sukses bagi rekan sejawat apoteker.**

.....

3. **Jika iya, jenis produk apa yang disediakan? (tandai semua jawaban yang sesuai)** *
Tick all that apply.

- [ ] Jamu
- [ ] Obat Herbal Terstandar
- [ ] Fitofarmaka

4. **Berdasarkan bentuk sediaannya, jenis produk jamu apa yang tersedia di apotek Anda? (tandai semua jawaban yang sesuai)** *
Tick all that apply.

- [ ] Jamu (simplisia) segar/basah
- [ ] Jamu (simplisia) kering
- [ ] Jamu cair
- [ ] Jamu serbuk (untuk diseduh)
- [ ] Jamu pil/kapsul
- [ ] Other: .....

5. **Berdasarkan kegunaan/efek farmakologinya, jenis produk jamu apa yang tersedia di apotek Anda?**

.....

.....

.....

.....

.....

Praktek Apoteker di bidang Herbal 2

Mohon dapat menjawab pertanyaan berikut dengan jawaban yang sudah disediakan sesuai dengan keadaan.

6. **Berapa rata-rata jumlah pasien di apotek Anda dalam sehari?** *

.....

7. **Berapa banyak pasien yang datang dan membeli produk obat herbal dalam sehari?** *

.....

8. **Berapa banyak pertanyaan tentang obat herbal Anda peroleh dari pasien dalam sehari?** *

.....

9. **Jenis informasi apa yang Anda berikan pada pasien yang membeli dan menanyakan tentang obat herbal?** *

Tick all that apply.

- [ ] Penggunaan obat herbal
- [ ] Efikasi Obat Herbal
- [ ] Efek samping obat herbal
- [ ] Informasi keamanan obat herbal, seperti kontaminasi dan pencampuran pada beberapa produk
- [ ] Interaksi herbal-obat
- [ ] Indikasi dan peringatan obat herbal pada pasien kelompok tertentu seperti pada kehamilan dan geriatri
- [ ] Kontraindikasi obat herbal pada pasien kelompok tertentu seperti hipertensi atau DM
- [ ] Other: .....

Dalam sehari berapa kali Anda memberi saran pasien mengenai.....

Mohon dapat menjawab pertanyaan berikut dengan angka, dalam sehari rata-rata berapa kali Anda memberikan saran atau informasi pada pasien mengenai topik berikut...

10. **Penggunaan obat herbal** *

.....

11. **Efikasi obat herbal** *

.....

12. **Efek samping obat herbal** *

.....

13. **Informasi keamanan obat herbal, seperti kontaminasi dan pencampuran pada beberapa produk** *

.....

14. **Interaksi herbal-obat** *

.....

15. **Indikasi dan peringatan obat herbal pada pasien kelompok tertentu seperti pada kehamilan dan geriatri** *

.....

16. **Kontraindikasi obat herbal pada pasien kelompok tertentu seperti hipertensi atau DM** *

.....

Part 1. Sikap Anda terhadap pemberian informasi pada pasien tentang

obat herbal

Dari skala 1 (sangat tidak setuju) hingga 5 (sangat setuju) harap menunjukkan persetujuan Anda mengenai pernyataan berikut ini.

17. **Sebagai seorang apoteker, memberikan saran pada pasien tentang obat herbal membuat saya merasa melakukan sesuatu yang bermanfaat bagi pasien.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

18. **Apoteker seharusnya mampu untuk mengkonseling dan memberikan informasi tentang obat herbal pada pasien.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

19. **Menyarankan pasien tentang obat herbal adalah aspek penting pada peran professional saya sebagai penyedia informasi di apotek.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

20. **Efek berbahaya dari obat herbal dapat dicegah jika saya memberitahukannya pada pasien.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

21. **Apoteker seharusnya memainkan peran lebih besar dalam menyediakan informasi pada pasien mengenai keamanan dan interaksi obat dengan herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

22. **Menyediakan informasi tentang obat herbal penting untuk memberikan keuntungan bagi apotek saya.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

23. **Menyediakan informasi tentang obat herbal akan membuat pasien percaya pada saya.** *

Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

24. **Keterlibatan dalam konseling obat herbal akan memberikan manfaat bagi kesehatan pasien.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

Norma Subyektif Terkait Memberikan Informasi Mengenai Obat Herbal

Dari skala 1 (sangat tidak setuju) hingga 5 (sangat setuju) harap menunjukkan persetujuan Anda mengenai pernyataan berikut ini.

25. **Dokter di komunitas saya menyetujui saya untuk memberi saran pada pasien mengenai obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

26. **Pemilik apotek saya mendukung saya untuk memberi saran pada pasien mengenai obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

27. **Pasien di tempat praktek saya ingin melihat saya untuk berkomunikasi dengan mereka tentang obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

28. **Pasien di apotek saya mengharapkan saya untuk mengidentifikasi masalah yang mereka miliki berkaitan dengan obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

29. **Apoteker lain yang saya tahu memotivasi saya untuk memberi tahu pasien saya tentang obat herbal.** *
Mark only one oval.

	1	2	3	4	5

Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

Sikap Dalam Memberikan Informasi Mengenai Obat Herbal

Dari skala 1 (sangat tidak setuju) hingga 5 (sangat setuju) harap menunjukkan persetujuan Anda mengenai pernyataan berikut ini.

30. **Peraturan yang berbeda mengenai standar produk dan keamanan pada produk obat konvensional membuat saya ragu untuk memberikan informasi mengenai obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

31. **Saya memiliki sumber informasi yang memadai dan terpercaya untuk mengkonseling pasien tentang obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

32. **Saya merasa sulit untuk memberi saran pada pasien karena mereka menganggap obat herbal aman.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

33. **Kurangnya bukti ilmiah membuat saya ragu untuk menyarankan pasien tentang obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

34. **Saya merasa yakin tentang pendidikan dan pelatihan saya untuk berkomunikasi dengan pasien tentang obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Snagat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

35. **Saya memiliki waktu yang cukup untuk memberikan informasi tentang obat herbal pada pasien.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

36. **Ini sepenuhnya terserah kepada saya apakah saya memberikan informasi tentang obat herbal atau tidak.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

Saya yakin bahwa saya memiliki pengetahuan yang cukup untuk menasehati pasien tentang.....

Berikan opini Anda dari skala 1 (sangat tidak setuju) hingga 5 (sangat setuju) mengenai pengetahuan yang cukup untuk memberikan informasi pasien tentang hal berikut ini....

37. **Penggunaan obat herbal** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

38. **Efikasi obat herbal** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

39. **Efek samping obat herbal** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

40. **Informasi keamanan obat herbal (kontaminasi dan pencampuran)** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

41. **Interaksi herbal-obat** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

42. **Indikasi dan peringatan obat herbal pada pasien kelompok tertentu seperti pada kehamilan dan geriatri.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

43. **Kontraindikasi obat herbal pada pasien kelompok tertentu seperti hipertensi atau DM.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

Penggunaan Obat Herbal Pribadi

Berikan opini Anda dari skala 1 (sangat tidak setuju) hingga 5 (sangat setuju) mengenai pernyataan berikut ini.

44. **Saya menggunakan obat herbal untuk mengobati penyakit, seperti batuk dan demam.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

45. **Saya menggunakan obat herbal untuk pencegahan penyakit dan menjaga kesehatan.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

46. **Saya tumbuh di keluarga yang menggunakan obat herbal, sehingga saya menggunakannya sebagai pilihan utama ketika sakit.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

47. **Orang-orang di lingkungan masyarakat saya biasanya menggunakan obat herbal. Hal ini membuat saya lebih cenderung menggunakan obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

48. **Dalam 30 hari terakhir, apakah Anda menggunakan obat herbal?** *
Mark only one oval.

- ☐ Yes
- ☐ No

49. **Jika iya, obat herbal apa saja yang Anda gunakan?** *

.....

.....

.....

.....

.....

50. **Apa tujuan penggunaan obat herbal tersebut?** *

.....

.....

.....

.....

.....

Untuk pasien selanjutnya yang membeli dan menanyakan tentang obat herbal, saya akan.....

Berikan opini Anda dari skala 1 (sangat tidak setuju) hingga 5 (sangat setuju) mengenai aktivitas berikut ini....

51. **aktif bekerja untuk menyediakan informasi mengenai obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

52. **menyarankan pasien tentang penggunaan obat herbal** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

53. **menginformasikan pada pasien mengenai efikasi obat herbal.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

54. **berbicara dengan pasien tentang kemungkinan efek samping obat herbal** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

55. **menjelaskan informasi keamanan obat herbal, seperti kontaminasi dan pencampuran di beberapa produk** *

Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

56. **aktif menginformasikan pasien tentang potensi interaksi antara herbal yang diminum dengan obat mereka** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

57. **berkomunikasi tentang peringatan penggunaan obat herbal pada pasien kelompok tertentu seperti kehamilan dan geriatrik.** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

58. **menginformasikan tentang kontraindikasi obat herbal pada pasien kelompok tertentu seperti hipertensi atau DM** *
Mark only one oval.

	1	2	3	4	5	
Sangat tidak setuju	☐	☐	☐	☐	☐	Sangat setuju

Informasi Demografi

Berikan jawaban untuk pertanyaan berikut ini..

59. **Berapa usia Anda?** *

.....

60. **Apa jenis kelamin Anda?** *
Mark only one oval.

- ☐ Laki-laki
- ☐ Perempuan

61. **Apa etnik atau suku Anda?** *

.....

62. **Apa pendidikan terakhir Anda?** *
Mark only one oval.

- ☐ Apoteker (Apt.)
- ☐ Master di bidang farmasi

- [ ] Master di bidang lainnya
- [ ] PhD.
- [ ] Other: .....

63. **Pada tahun berapa Anda lulus dari pendidikan S1 Farmasi?** *

.....

64. **Pada tahun berapa Anda lulus dari pendidikan profesi Apoteker?** *

.....

65. **Apa nama sekolah/universitas almamater Anda?** *

.....

.....

.....

.....

.....

66. **Berapa lama Anda bekerja sebagai Apoteker komunitas?** *

.....

67. **Lokasi (kota) praktek apotek Anda....** *

.....

68. **Apa jenis apotek Anda?** *
Mark only one oval.

- [ ] Apotek mandiri
- [ ] Waralaba (franchise)
- [ ] Klinik
- [ ] Other: .....

69. **Apa posisi Anda di apotek?** *
Mark only one oval.

- [ ] Pemilik
- [ ] Apoteker penanggungjawab (APA)
- [ ] Apoteker pendamping (APing)
- [ ] Other: .....

70. **Apa tingkat pelatihan yang pernah Anda tempuh terkait dengan obat herbal?** *
Tick all that apply.

- [ ] Belajar mandiri

- [ ] mata kuliah di program S1 Farmasi
- [ ] Seminar dari produsen obat herbal
- [ ] Seminar dari organisasi profesi, seperti Ikatan Apoteker Indonesia (IAI)
- [ ] Studi formal (dengan sertifikat/diploma/gelar)
- [ ] Other: .....

71. **Mata kuliah di program S1 Farmasi/Apoteker apa yang anda peroleh terkait dengan obat herbal?** *
Tick all that apply.

- [ ] Farmakognosi
- [ ] Fitokimia
- [ ] Herbal Medicine
- [ ] Other: .....

72. **Jika Anda memiliki komentar tentang survei ini, atau tentang segala aspek dalam memberikan informasi tentang obat herbal pada pasien, silakan tulis di sini:**

.....

.....

.....

.....

.....

Terima kasih

Terima kasih telah berpartisipasi dan memberikan pendapatnya pada survei kami, kami sangat menghargai bantuan yang diberikan.

73. **Alamat email** *

.....

74. **Darimana Anda memperoleh link untuk mengikuti survei ini?** *
Mark only one oval.

- [ ] Email
- [ ] Teman
- [ ] Facebook
- [ ] Other: .....

Appendix H

List of Experts

1. Assistant Professor Dr. Saovaluck Jirathummakoon

   Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

2. Dr. rer. Nat. Triana Hertiani, M.Si., Apt.

   Faculty of Pharmacy, Gadjah Mada University, Yogyakarta, Indonesia

3. Dr. Susi Ari Kristina, M.Kes., Apt.

   Faculty of Pharmacy, Gadjah Mada University, Yogyakarta, Indonesia

4. Dr. Dwi Endarti, M.Sc., Apt.

   Faculty of Pharmacy, Gadjah Mada University, Yogyakarta, Indonesia

Appendix I.

Concept and Items Measured

Construct	Concept	Items measured
Attitude toward advising herbal medicine	the degree pharmacists has favorable or unfavorable appraisal of outcome from advising herbal medicine to patients	- Attitude towards advising herbal medicine (Noureldin, 2011) - Pharmacist role & responsibility in provide information about herbal medicine (Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2006) - Benefit for pharmacy (Culverhouse & Wohlmuth, 2012; Kanjanarach et al., 2006; Naidu et al., 2005) - Good relationship with patients - Help improve patient's health (Culverhouse & Wohlmuth, 2012; Godin et al., 2007) Question 5-12
Subjective Norm	Perceptions of community pharmacists about expectation of social and significant persons to advise herbal medicine to patients	- Physician - My pharmacy owner - Patients Pharmacists colleague Question 13-17

Construct	Concept	Items measured
Perceived behavioral control	the extent to which pharmacist feels he/she able to advice patients about herbal medicine over facilitating factors and barriers	- Better regulation - Pharmacy protocols (Culverhouse & Wohlmuth, 2012) - Lack of scientific evidence - Lack of training and education - Lack of reliable and accessible information - Lack of time - Patient perception about herbal safety (Semple et al., 2006) Question 18-24
Personal use of herbal medicine	Pharmacist personal experience with herbal medicine utilization	- Personal use - Family use - Society use (Noureldin, 2011; Welna et al., 2002) Question 31-33
Perceived knowledge about herbal medicine	Pharmacist perception about their knowledge toward herbal medicine	- General knowledge of herbal medicine - Knowledge about efficiency and effectiveness of herbal medicine. - Knowledge about adverse effect of herbal medicine. - Knowledge about indications and precautions of herbal medicine in specific groups such as pregnancy, pediatric, and geriatric. - Knowledge about herbal-drug interaction. - Knowledge about contraindication of herbal medicine in special groups of patient such as hypertension or kidney disease. (Mehralian et al., 2014) Question 25-30

Construct	Concept	Items measured
Intention towards advising herbal medicine to patients	Pharmacist intention to advise herbal medicine to patients for the next patients	Intention to inform and advise the next patients about - the effectiveness of herbal medicine. - possible adverse effects of herbal medicine. - dosage and administration of herbal medicine. - herb-drug interaction taken with their medicine. Question 34-40

Appendix J

Questionnaire

Thank you for participating and sharing your thoughts on herbal medicine. This survey is for Pharmaceutical Sciences thesis (in Master degree) of Chulalongkorn University. Your information is very important to help us understand how the role of pharmacists in advising herbal medicine to patients.

- All information you provide will be treated as confidential.
- It will take about 10-15 minutes to complete this survey.
- If you have any questions about this questionnaire, please call Chilmia Nurul Fatiha, phone number (+66)992815100/ (+62)87832478282, email address cnfatiha@gmail.com, ID line: chilmia

Please tick to the answer that best describes what you think or your experience in relation to advise herbal medicine to patients. There are no right or wrong answers. Some questions and statements are similar.

Part I. Pharmacists' current practice regarding herbal medicine

No.	Items	Answer
1.	Does your pharmacy stock herbal medicine products?	Yes/No
2.	If yes, what kind of herbal products stocked?	
3.	On the last 30 days, on average how many patients in your pharmacy in a day?	
4.	On the last 30 days, on average how many patients buy herbal medicine products in a day?	

5.	On the last 30 days, on average how many inquiries about herbal medicine in a day?	
6.	On average, how many times do you give advice to patients in a day regarding…	
	a. About herbal medicine use	
	b. About efficacy of herbal medicine	
	c. About adverse effects of herbal medicine.	
	d. Safety information about herbal medicines, such as contamination and adulteration in some products.	
	e. About herbal-drug interactions.	
	f. About indications and precautions of herbal medicine in specific group such as pregnancy, pediatric, and geriatric.	
	g. About contraindication of herbal medicine in special groups of patients such as hypertension or kidney disease.	

Part II. Pharmacists' attitude toward the responsibility to advise patients about herbal medicine

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
7.	As a pharmacist, advising patients about herbal medicine will make me feel that I am doing something beneficial for patients					
8.	Pharmacists should be able counsel and provide information about herbal medicine to patients.					
9.	Advising patient about herbal medicine is important aspect of my professional role as information provider in pharmacy					

10.	Harmful effect of herbal medicine can be prevented if I advise patients					
11.	Pharmacists should play a greater role in providing patients with safety and drug interaction information about herbal medicines					
12.	Providing information about herbal medicine is important to be profitable to my pharmacy.					
13.	Providing information about herbal medicines will make my patients trust me.					
14.	Involvement in herbal medicine counseling will give benefit to the patients' health.					

Part III. Subjective Norm of Advising Patient about Herbal Medicine

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
15.	Physician in my community would approve me to advise patients about herbal medicine.					
16.	My pharmacy owner would support me to advise patients about herbal medicine.					
17.	Patients at my practice site would like to see me to communicate with them about herbal medicine.					
18.	Patients in my pharmacy expect me to identify problems they have with herbal medicine.					
19.	Other pharmacists I know intend to advise their patients about herbal medicine and it motivates me to do so.					

Part IV. Perceived Behavioral Control related to Advising Patients about Herbal Medicine

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
20.	It is entirely up to me whether or not I provide information about herbal medicine.					
21.	I have enough time to provide information about herbal medicine to patient.					
22.	I feel confident about previous education and training to communicate with patients about herbal medicine.					
23.	Lack of scientific evidence makes me hesitate to advise patients about herbal medicine.					
24.	I find it difficult to advise patients because they perceive herbal medicine is safe.					
25.	I have reliable and adequate information source to counsel patients about herbal medicine.					
26.	Different regulation in product standard and safety to the conventional health product has prevent me to advise patients about herbal medicine.					

Part V. Perceived Knowledge of Advising Patients about Herbal Medicine

No.	I am confident that I am knowledgeable to advise patients about	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
27.	herbal medicines use.					
28.	efficacy of herbal medicines					
29.	adverse effects of herbal medicine.					
30.	safety information of herbal medicines (contamination and adulteration)					
31.	herbal-drug interactions.					
32.	indications and precautions of herbal medicine in specific group such as pregnancy, pediatric, and geriatric.					
33.	contraindication of herbal medicine in special groups of patients such as hypertension or kidney disease.					

Part VI. Personal Use of Herbal Medicine

No.	Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
34.	I use herbal medicine to treat disease such as cough and cold.					
35.	I use herbal medicine for disease prevention and maintain health.					
36.	I am growing up in the family that uses herbal medicine, so I use it as the first choice when I see sick.					
37.	People in my society normally use herbal medicine. These make me more likely to use herbal medicine.					

Part VI. Intention to advise patients about herbal medicine

No.	For the next patients who purchase and ask about herbal medicine, I will….	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
38.	actively work to provide herbal medicine information.					
39.	advise patients about utilization of herbal medicines.					
40.	inform patients about the efficacy of herbal medicines.					
41.	speak with patients about possible adverse effects of herbal medicines					
42.	explain safety information of herbal medicines, such as contamination and adulteration in some products.					
43.	actively inform patients about potential herbal interactions taken with their medicines.					
44.	communicate about precautions of herbal medicines in specific group patients such as pregnancy and geriatric..					
45.	inform about contraindication of herbal medicines in special groups of patients such as hypertension or DM.					

Section 2. Demographic Information

46. What is your age? _____ years
47. What is your gender

☐ Male ☐ Female

48. What is your highest education?

☐ Pharmacist (Apt.)
☐ Master in pharmacy field

☐ Master in other field
☐PhD
☐ Other (please specify) .....

49. What year did you graduate from pharmacy school?_____
50. What is the name of undergraduate pharmacy institution? _____
51. How long have you worked as community pharmacist .....years
52. Locationof your pharmacy practice .....
53. What is type of your pharmacy?

☐ Independent pharmacy
☐ Franchise
☐Clinic
☐ Other (please specify).....

54. What is your position in pharmacy?

☐ Owner
☐ Manager
☐Staff pharmacist
Other (please specify).....

55. What level of training have you had about herbal medicine? (Mark all that apply)

☐ None
☐ Self-directed learning
☐ Lectures in undergraduate course
☐ Seminars by product manufacturers
☐ Seminars by a professional organization e.g. Pharmacy Association (IAI)
☐ Formal study (e.g. certificate, diploma, degree)
☐ Other (please specify) _____

If you have any comments about this questionnaire, or about any aspect of advising herbal medicine to patients, please write them here:

Thank you very much for completing this questionnaire. Your help with this survey is greatly appreciated

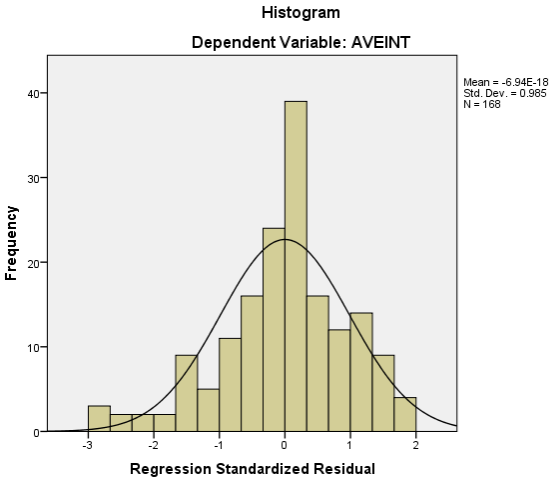
Appendix K

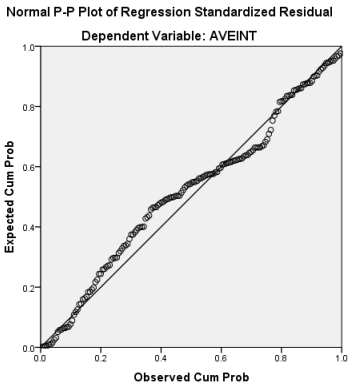
Normality, Linearity, and Multicollinearity Test

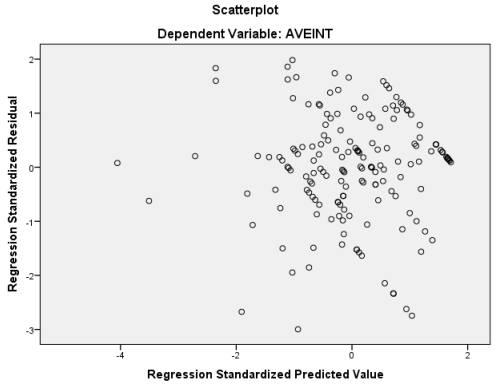
Descriptive Statistics

Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
AVEATT	168	4.3251	.70540	-1.803	.187	5.264	.373
AVESN	168	3.5560	.81113	-.402	.187	.114	.373
AVEPBC	168	3.0823	.58137	.197	.187	-.273	.373
AVEKNO	168	3.6607	.97928	-.224	.187	-.645	.373
AVEUSE	168	3.3661	.96181	-.318	.187	-.135	.373
AVEINT	168	3.7664	.87362	-.587	.187	.547	.373
AVEADV	165	2.0660	2.21223	2.522	.189	7.886	.376
Valid N (listwise)	165						

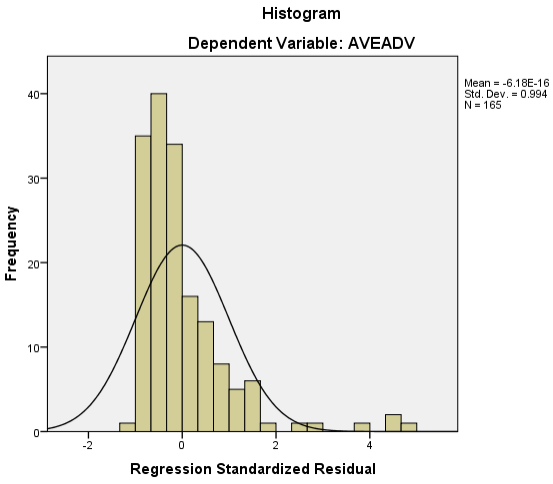


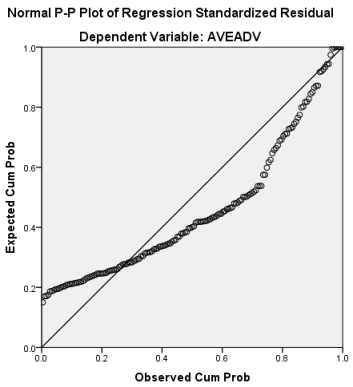


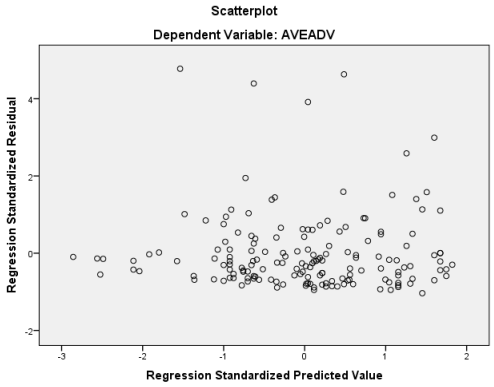


Collinearity Statistics

Model		Correlations			Collinearity Statistics	
		Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)					
	AVEATT	.660	.387	.256	.507	1.974
	AVESN	.590	.111	.068	.455	2.196
	AVEPBC	.472	.057	.035	.620	1.614
	AVEKNO	.614	.348	.226	.601	1.663
	AVEUSE	.598	.278	.176	.640	1.562







Appendix L

Data Analysis for Intention

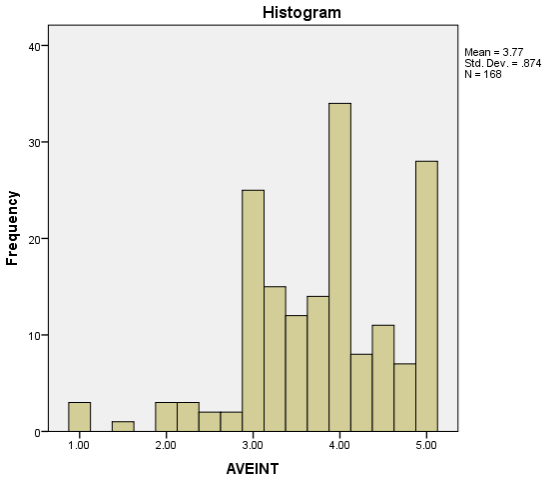
Descriptives

			Statistic	Std. Error
AVEINT	Mean		3.7664	.06740
	95% Confidence Interval for Mean	Lower Bound	3.6333	
		Upper Bound	3.8994	
	5% Trimmed Mean		3.8176	
	Median		3.8750	
	Variance		.763	
	Std. Deviation		.87362	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		1.25	
	Skewness		-.587	.187
	Kurtosis		.547	.373

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
AVEINT	.089	168	.002	.941	168	.000

a. Lilliefors Significance Correction



Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	168	100.0
	Missing Cases	0	.0
	Total	168	100.0
Unselected Cases		0	.0
Total		168	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
1.00	0
2.00	1

Block 1: Method=Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	80.311	5	.000
	Block	80.311	5	.000
	Model	80.311	5	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	152.205[a]	.380	.507

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Logit INT		Percentage
	Observed		1.00	2.00	Correct
Step 1	Logit INT	1.00	71	17	80.7
		2.00	18	62	77.5
	Overall Percentage				79.2

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	AVEATT	1.369	.496	7.626	1	.006	3.933
	AVESN	.347	.371	.874	1	.350	1.415
	AVEPBC	.340	.461	.545	1	.460	1.406
	AVEKNO	.798	.266	8.985	1	.003	2.222
	AVEUSE	.585	.272	4.630	1	.031	1.795
	Constant	-13.331	2.296	33.719	1	.000	.000

a. Variable(s) entered on step 1: AVEATT, AVESN, AVEPBC, AVEKNO, AVEUSE.

Appendix L

Data Analysis for Advising Behavior

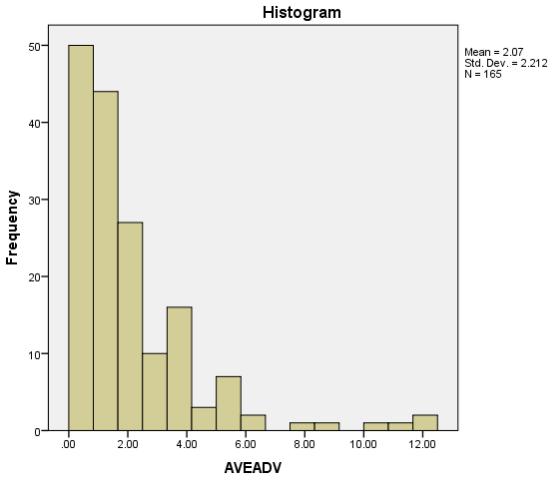
Descriptives

			Statistic	Std. Error
AVEADV	Mean		2.0660	.17222
	95% Confidence Interval for Mean	Lower Bound	1.7260	
		Upper Bound	2.4061	
	5% Trimmed Mean		1.7667	
	Median		1.4286	
	Variance		4.894	
	Std. Deviation		2.21223	
	Minimum		.00	
	Maximum		12.43	
	Range		12.43	
	Interquartile Range		1.95	
	Skewness		2.522	.189
	Kurtosis		7.886	.376

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
AVEADV	.189	165	.000	.738	165	.000

a. Lilliefors Significance Correction



Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	165	98.2
	Missing Cases	3	1.8
	Total	168	100.0
Unselected Cases		0	.0
Total		168	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
< 1.43 times/day	0
> 1.44 times/day	1

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	9.746	2	.008
	Block	9.746	2	.008
	Model	9.746	2	.008

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	218.841[a]	.057	.076

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			CADV		Percentage
	Observed		< 1.43 times/day	> 1.44 times/day	Correct
Step 1	CADV	< 1.43 times/day	54	31	63.5
		> 1.44 times/day	38	42	52.5
	Overall Percentage				58.2

a. The cut value is .500

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)

Step 1[a]	AVEINT	.489	.218	5.015	1	.025	1.630
	AVEPBC	.234	.315	.553	1	.457	1.264
	Constant	-2.630	.959	7.528	1	.006	.072

a. Variable(s) entered on step 1: AVEINT, AVEPBC.

REFERENCES

APPENDIX

VITA

Chilmia Nurul Fatiha was born is Semarang, October 16th 1988 as the first daughter of Mochamad Agus Mulyadi and Nurul Khayati. She holds B.Pharm and pharmacist professional degree (Apotheker) from STIFAR Yayasan Pharmasi Semarang. She completed her internship program at RSUD Salatiga (hospital) and Pamularsih pharmacy in 2011.

She is a registered pharmacist in Semarang and has 2 years' experience in community pharmacy. She later worked as teaching assistant in Pharmacology courses for 3 years. In 2014, she entered Master program at Social and Administrative Pharmacy Department, Faculty of Pharmaceutical Science, Chulalongkorn University and received International Graduate Scholarship for ASEAN countries (ASEAN Scholarship).