

博士論文

**COMPREHENSIVE STUDY ON TRADITIONAL HERBAL MEDICINE
UNDER THE UNIVERSAL HEALTH COVERAGE
IN INDONESIA**

(国民皆保険下のインドネシアにおける伝統的な薬草療法に関する総合
的研究)

イエン イェン サリ ラハユ
Yen Yen Sally Rahayu

TABLE OF CONTENT

CHAPTER 1. INTRODUCTION.....	1
I. Background.....	1
II. Research Objectives and Questions.....	4
III. Research Methodology.....	4
IV. Research Framework.....	6
CHAPTER 2. LITERATURE REVIEW.....	7
I. Studies related to traditional herbal medicine use: global context.....	7
II. Studies related to traditional herbal medicine use: Indonesian context.....	10
III. Traditional Medicine in the Indonesian Health Care System.....	14
IV. The Universal Healthcare System in Indonesia.....	29
CHAPTER 3. FACTORS AFFECTING THE USE OF HERBAL MEDICINES IN THE UNIVERSAL HEALTH COVERAGE SYSTEM IN INDONESIA	32
1. Introduction.....	33
2. Materials and methods.....	34
3. Results.....	37
4. Discussion.....	44
5. Conclusion and recommendations.....	47
CHAPTER 4. PREDICTORS OF THE USE OF TRADITIONAL MEDICINES IN THE UNIVERSAL HEALTH COVERAGE SYSTEM IN INDONESIA	49
1. Introduction.....	50
2. Methods.....	51
3. Results.....	54
4. Discussion.....	58
5. Conclusion.....	62

CHAPTER 5. TRADITIONAL MEDICINES PRACTICE IN THE HEALTHCARE SERVICE DELIVERY	63
1. Introduction.....	64
2. Methods.....	67
3. Results.....	68
4. Discussion	76
5. Conclusion	78
CHAPTER 6. GENERAL DISCUSSION AND POLICY RECOMMENDATIONS.....	79
CHAPTER 7. CONCLUSION.....	84
APPENDIX.....	86
REFERENCES.....	91

SUMMARY

Traditional medicine (TM) is a form of primary health care used in many parts of the world, particularly African, Asian and Pacific nations, and it is foundational to attaining Universal Health Coverage (UHC). WHO has advocated countries to develop national policies and strategies to amplify TM contribution in their national healthcare system to advance UHC. Indonesia has just introduced the UHC system in 2014 through the implementation of the universal health insurance program. Within this UHC system, TM could play more roles as expected by WHO. However, how TM should be positioned within this new health system is a matter of empirical question. In addition, the dynamics between traditional and conventional healthcare in Indonesia has not been investigated in the context of UHC. Therefore, this study was structured to examine the current practice of traditional medicines, especially herbal medicine, at the community and institutional levels.

The community-level examination focused on understanding the current local use pattern of herbal medicines and underlying factors of their use. Ethnobotany and cross-sectional survey based on semi-structured interviews were conducted to examine the extent of herbal medicine (medicinal plants) used by locals (prevalence use, frequently used plant and its health indication, method of preparation) and how herbal medicine use varied with socio-economic and demographic factors taking account the universal health insurance effect under UHC system. The significant result was that traditional herbal medicine remains a significant aspect of healthcare for rural communities. We found that 102 medicinal plants were used in 68% of households. The use of herbal medicine was ubiquitous but more frequent in rural areas, elders, informal workers, and lower education. However, more importantly, herbal medicine use was not associated with the availability of public healthcare services within the UHC system (**Rahayu et al., 2020**).

The important finding of follow up work focusing on the analysis of determinant (predictor) of traditional medicine use revealed that the perception of efficacy and traditional knowledge of medicinal plants, rather than dissatisfaction with conventional medicines, serves as the main reason why under the UHC, traditional medicines, in particular, herbal use remains popular (**Rahayu et al., 2021**). The last part of the study, institutional level investigation, focused on understanding TM practice among conventional healthcare providers and how TM is currently regulated in the national health policy. The investigation was conducted on the basis of qualitative and policy analysis methods. The key finding was that the conventional healthcare professionals support the incorporation of TM, with specific attention to promote herbal medicine in mainstream medical education, establish guidelines for herbal medicine prescription, and address the standardization of herbal medicines. Drawing insight from the community and institutional level, the results of this study propose the way how traditional herbal medicine can be leveraged and maximized to advance the UHC with the implication for integrative healthcare.

CHAPTER 1. INTRODUCTION

I. Background

Traditional medicine (TM) is a form of primary health care used in many parts of the world, particularly African, Asian and Pacific nations. Primary health care is foundational to attaining universal health coverage (UHC). Through the declaration of Alma Alta in 1978, the World Health Organization (WHO) advocated its member countries to strengthening the role of traditional medicine to attain acceptable levels of health for all (WHO, 1978). Since then, there have been many pledges, resolutions, and strategies urging for integration, where appropriate, of traditional medicine with national healthcare systems, partly as a means to achieve UHC (Katoch et al., 2017; WHO, 2008, 2013b, 2017). Many governments, particularly in East Asian countries, such as China, North Korea, Vietnam, Taiwan, and Japan, have developed national policies and strategies to incorporate TM into the national healthcare system (Bodeker et al., 2005; WHO, 2001). TM was included in the national health care systems of the three countries and developed in national policies based on the historical and cultural background that differs from that of complementary and alternative medicine (CAM) in Western society (WHO, 2008). Experience from these countries suggests that integration of traditional and conventional health care systems can solve many problems by providing basic health care services (Torri, 2013a).

Indonesia has a history of reliance on various forms of TM (Chaerani and Amar, 2010; Elfahmi et al., 2014; Jennifer and Saptutyningsih, 2015; Pengpid and, 2018; Supardi et al., 2011) including diverse health practices, approaches, knowledge, and beliefs. These incorporate plants, animals, and/or mineral-based medicines, spiritual therapies, manual techniques, and exercises applied singly or in combination to maintain well-being and prevent, diagnose or treat illness (WHO, 2000). Thus, Indonesian has been used TM not only for curative but also preventive, promotive, and rehabilitative purposes. TM use in Indonesia has increased in recent years (Peltzer & Pengpid, 2015). According to a national survey in 2018, 44.2% of households utilize traditional healthcare, which increased from 30.1% in 2013 (MoH RI, 2018a). While self-made and self-applied healing techniques are common, TM products and services are also commercially available. In 2018, 31.4% of Indonesian households used the paid services of TM, 44.3% of households utilized TM, and 48% bought commercial/ready-made herbal medicines (MoH of Indonesia, 2020).

On the other hand, global economic growth and international initiatives have greatly promoted advances in medicine and increased the availability of biomedicine. Particularly in the last two decades, commitment to universal health coverage (UHC) has generated intense global action to provide biomedicine-based healthcare services (WHO, 2013).

UHC aims to ensure that comprehensive healthcare services are equally accessible to the entire population. Accordingly, following nearly a decade of policy development, Indonesia introduced the national health insurance scheme in 2014 to provide healthcare services as a commitment to universal health coverage (UHC) (Mboi, 2015). The national health insurance (*Jaminan Kesehatan Nasional, JKN*) has very significant implications for the management and delivery of health services. The JKN unified several previously fragmented public health insurances, including *Askes* (public formal sector employees), *Jamsostek* (private formal sector employees), and *Jamkesmas* (the poorest population). The fundamental difference that set apart JKN from the previous public health insurance schemes is in shifting from tax-funded fee waiver schemes for poor people to a contribution (premium)-based mandatory health insurance system (Presiden RI, 2013). It has been one of the largest single-payer social health insurance programs in the world (Erlangga et al., 2019). The JKN targeted the coverage of all people by 2019; however, only about 222 million Indonesians are joining the insurance, which accounts for 81.9% of the total population (Simonev-DJSN, 2021). One of the most important challenges in the JKN rollout is to cover the people in the informal sector. Of total JKN subscribers, 59.4% are premium waivers (categorized as poor): 24.9% are formal workers, and 13.8% are informal workers. Of informal workers subscribers (about 30 million people), only 40.6% of them are paying the premium regularly. The JKN rollout has brought out the “missing middle” problem in which the non-poor informal sectors have remained uncovered from the insurance due to the necessity of self-enrollment (Dartanto et al., 2015). This segment may prompt to resort to the alternative system of TM as a safety net for healthcare. Thus, the dissemination process of the UHC in Indonesia would affect the role of traditional herbal medicines (*jamu*) as an alternative medical system or a safety net in the long run.

At the same time, Indonesia is undergoing a rapid epidemiological transition. At almost 70 percent, non-communicable diseases account for the largest share of the disease burden, which is expected to grow in the coming years (Pinto et al., 2016). Additionally, a demographic transition is projected in the near future, including a rapid increase among the population aged 65 and above. These new challenges are expected to increase the burden on the health system for which there is currently a low level of utilization, uneven distribution of services and is largely focused on providing curative rather than promotive and preventative care. Therefore, it is deemed necessary to consider a local alternative form, like TM, to augment the mainstream conventional practice, closing the current gap in UHC’s healthcare delivery services. The very basis of sustainable healthcare systems is to draw on existing resources to ensure adequate service coverage and access (Park & Canaway, 2019).

The implementation of JKN has created renewed momentum for the institutionalization of TM in Indonesia. Within the new system, TM could play more role as expected by WHO.

However, how TM should be positioned within this new health system is a matter of empirical question. At this point, the dynamic between traditional and conventional healthcare has not been investigated yet. Therefore, it is important to understand the current situation of TM practice and how TM is positioned and valued in national policy. Accordingly, this study aimed to determine how TM may be more effectively leveraged to strengthen primary healthcare and advance the UHC.

The overall contribution of the research can be divided into three parts:

1. This study can provide baseline information on traditional herbal medicines during the transition to the universal healthcare system in Indonesia. Policymakers pay constant efforts to improve the national healthcare system. This information is important because new reformed policies and strategies cannot be as effective and sustainable if it is neglected the role of the alternative healthcare system that is still pervasively used by the public.
2. It is crucial to understand why a significant portion of the population remains outside the conventional healthcare system and may identify the areas where the current healthcare system may be failing to meet people's healthcare needs adequately. The results would provide deeper insight into the multitude of forces at play in the interaction between traditional and conventional medicines and help forge better integration at the institution level as expected by the WHO.
3. Finally, some developed countries' UHC system has successfully covered all people and decrease the mortality rate, but later facing serious financial and social difficulties due to aging society. As Indonesia has just started the UHC system, it is important to shine a light on the potential role of TM. The national healthcare delivery can be a stepping stone for developing a bottom-up strategy. It is needed to better the current healthcare system and prevent and respond to future scenario where the demographic will inevitably be shifted from bonus to aging society.

Understanding traditional healthcare use (pattern) and motivation to use TM could also provide better insight into the multitude of forces at play in the interaction between traditional and conventional medicines and help forge better integration of both. Integration of TM in the national health system, particularly in developing countries, may offer pathways to moving towards UHC. Integration of TM, particularly herbal, in the UHC system has been a great deal of recent discourse among Indonesian policymakers, health expertise, and health-related stakeholders. As policymakers and health care professionals continue to debate reforms of the present health care system, it seems important to understand why a significant portion of the population is going outside the conventional healthcare system and may suggest areas where the current health care system may be failing to meet peoples' healthcare needs adequately.

II. Research Objectives and Questions

The general aim of this thesis was to determine how TM may be more effectively leveraged to strengthen primary healthcare in the UHC system. TM is existing parallel with conventional medicine. However, the latter receives government support and funding and has become the official medical model with developed infrastructures and human resources. Traditional healthcare potential should be maximized to advance the UHC, as it is still widely used and remains a significant part of healthcare for many Indonesians. The very basis of a sustainable healthcare system is to draw on existing resources to ensure adequate service coverage and access. We argue that the institutionalization of TM in the UHC will achieve this goal.

It is important to understand the current situation of TM practice and how TM is positioned and valued in national policy to achieve its research purpose. This study was structured to examine the current use of herbal medicines at the community and institutional level as follow:

1. How is the current local community pattern use of TM?
2. What are the underlying factors of TM use in local communities?
3. How is TM currently practiced in the health service delivery and valued in the national policies?

III. Research Methodology

This study takes an interdisciplinary approach to address three key research questions, as shown in Fig. 1.1. The study examined the first research question on “How is current local pattern use of TM?” through ethnobotanical study in the West Java region in Indonesia to understand the indigenous and traditional knowledge about plants use for healthcare. In the context of the UHC system in Indonesia, we explored the utilization of medicinal plants in rural West Java by examining how herbal medicine use varies with socio-economic and demographic factors and whether herbal medicine use remains important when modern healthcare becomes available. A semi-structured questionnaire was also administered in addition to an ethnobotanical survey.

For the second research question on “What are the underlying factors of TM use in local communities?”. The study examined factors predicting the likelihood of using TM, which might account for the pervasive use among the rural and urban community in the UHC system in Indonesia by considering the predisposing, enabling, and need factors. A semi-structured questionnaire was administered in addition to in-depth interviews.

For the third research question on “How is TM currently practiced in the health service delivery and valued in the national policies? The study examined the use of TM in the healthcare delivery practice through exploration of knowledge, perception, and attitudes of conventional healthcare workers (professionals) as well as related national policies analysis. For the examination, a qualitative design composed of semi-structured interviews was conducted with 31 conventional healthcare professionals comprising physician, nurses, midwives, pharmacists, dieticians from 28 healthcare institutions in 4 cities in 7 provinces, in addition to 3 in-depth interviews with doctors practicing *jamu* (herbal doctors).

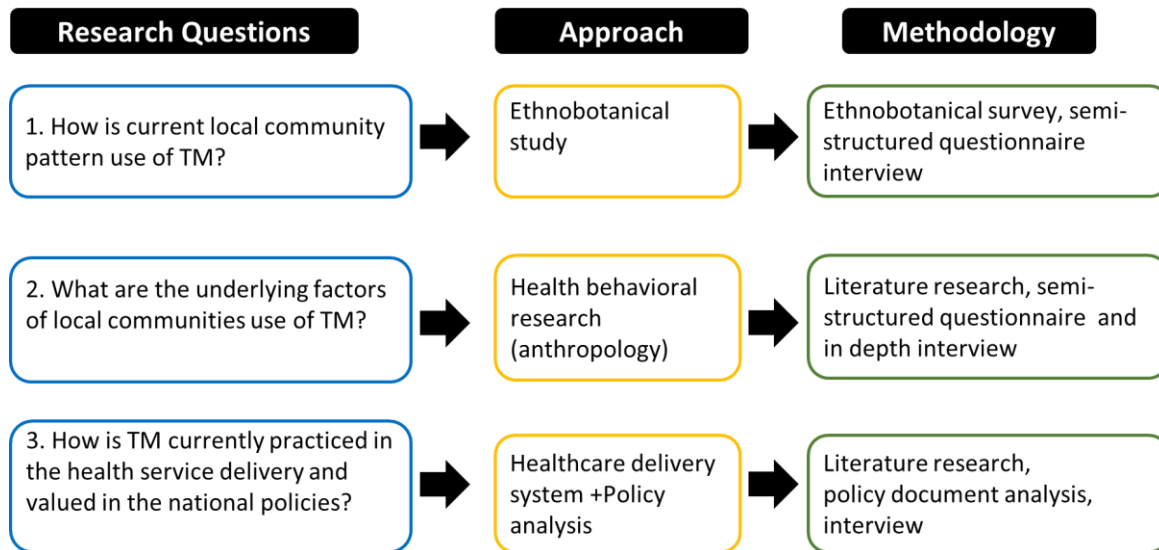


Fig. 1.1. Research methodology

IV. Research Framework

The conceptual framework of the thesis research is organized as shown in Figure 1.2. The findings of the abovementioned research questions, conducted under three chapters, were then discussed to provide new academic perspectives and policy recommendations for understanding current TM use practice in the UHC context in Indonesia.

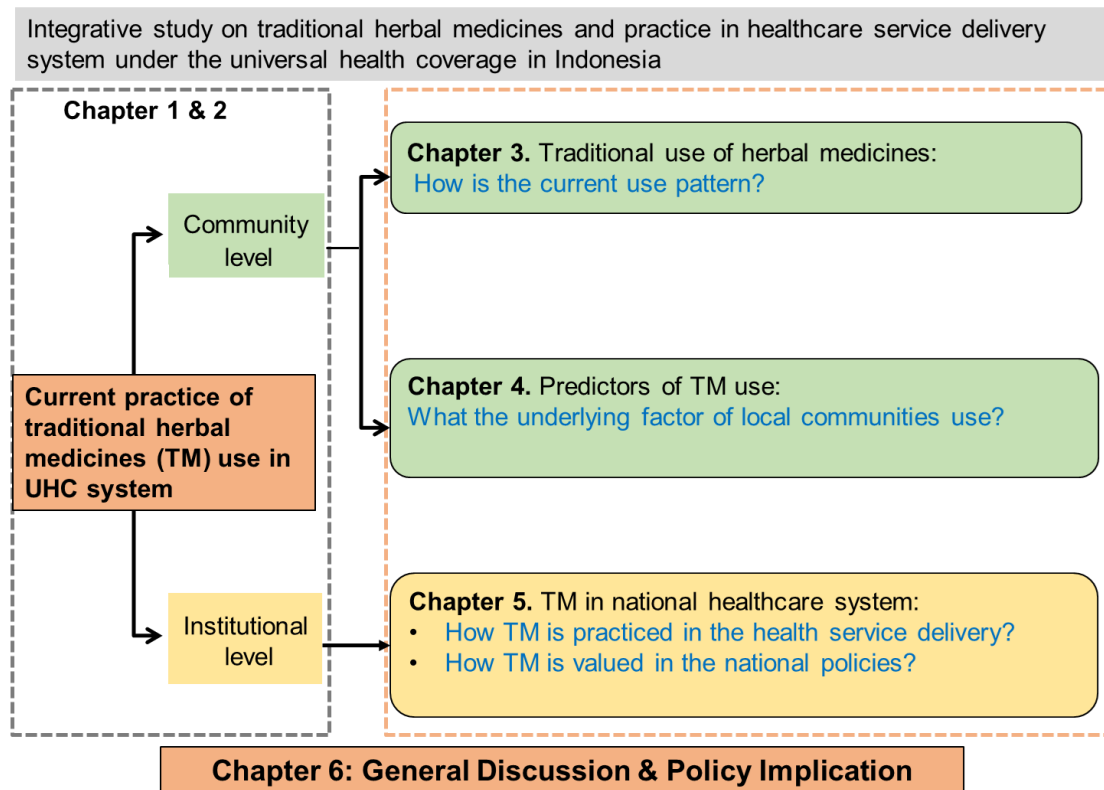


Fig.1.2. Research framework of the thesis research

CHAPTER 2. LITERATURE REVIEW

I. Studies related to traditional herbal medicine use: global context

Studies of traditional use of plants for healthcare

Ethnobotanical studies of medicinal plants abound that list plants used in healthcare by different cultures (Vandebroek, 2013). Ethnobotany research of traditional medicine has primarily dealt with the botanical identification of plants commonly used by local communities and the identification of health conditions treated with these plants (e.g., (Benítez, 2010; Jain et al., 2005; Uniyal et al., 2006)), whereas ethnopharmacology has focused on the bioactivity of traditional remedies (e.g., (Bourdy et al., 2008; Busmann et al., 2011; Tshikalange et al., 2008)). Studies in and around these disciplines have provided extensive insights into how people use medicinal plants. The results of these reports were varied, depending on cultural context. Some studies found that medicinal plants are still used for medical purposes, indicating their importance for primary healthcare in some developing countries (Estomba et al., 2006; Kitula, 2007; Lozada et al., 2006). A study in Peru reported extensive medicinal plant use by an Amazonian ethnic group, including uses other than medical purposes (Valadeau et al., 2010). In addition to compiling inventories, several studies also investigate the influence of psychosocial variables on plant knowledge, including age, gender, schooling, occupation, religion, the incidence of illness, and others. Some studies have begun to make a clear distinction between plant knowledge and use (Ceuterick et al., 2008) since people tend to use fewer plants than they actually know (Albuquerque, 2006; Srithi et al., 2009). For example, knowledge and more use of medicinal plants are often correlated with older ages (Case et al., 2005; Quinlan & Quinlan, 2007; Silva et al., 2011; Teklehaymanot, 2009). The influence of gender on ethnobotanical knowledge was varied across studies. The gender who has more use and knowledge of medicinal plants than the other gender can be male (Case et al., 2005; Teklehaymanot, 2009) or female (Silva et al., 2011; Voeks, 2007), yet, there can be no difference between the two (Meretika et al., 2010; Vandebroek et al., 2004). Another factor that reported to be associated with knowledge loss, and thus declining medicinal plant utilization are modernization (Benz et al., 2000; Quinlan & Quinlan, 2007; Srithi et al., 2009; Voeks, 2007) and urbanization (Case et al., 2005; Meretika et al., 2010; Monteiro et al., 2006).

Anthropology, along with other social science-oriented studies, generally provides much-needed insights into healthcare-seeking choices of community members, especially in relation to their use of traditional medicine versus biomedicine (De Mello Amorozo, 2004; Giovannini et al., 2011; Vandebroek et al., 2004). The indigenous community is mainly subjected to such studies, describing how cultural beliefs, identity, emotions, as well as

social, political, environmental, and spiritual relationships between communities and their environment, shape the culture-specific experience and meanings of illness (Greenway, 1998). For example, (Quinlan, 2010) shows how cultural beliefs influence local Caribbean preference for traditional medicine. Some studies juxtapose both healthcare systems, whereby biomedicine is believed to displace traditional medicine (Caniago & Siebert, 1998; Meretika et al., 2010), whereas others have found that biomedicine and traditional medicine can co-exist and complement each other (Giovannini et al., 2011; Vandebroek et al., 2008). For example, Mathez-Stiefel (2012) found that the health-seeking strategies of Andean households were independent of their level of access to biomedicine (in terms of quality of services provided, physical accessibility, and financial affordability). This study showed that local people's minds, traditional medicine, and biomedicine were complimentary and used interchangeably (Mathez-Stiefel et al., 2012). Similarly, (Toda et al., 2017) reported that the presence of modern medicine does not necessarily lessen medicinal plant use among local communities in the Peruvian Amazon. Other social science-oriented studies have also reported on the perceptions and opinions of different stakeholders in relation to the integration of traditional medicine in public health (Birhan et al., 2011; Gyasi et al., 2011; Kayombo et al., 2012).

Studies on associates of TM use: the healthcare utilization model

Other studies regarding associates of TM use included a more comprehensive set of factors that might be the underlying people's decision of using TM, following the theory of healthcare utilization. Majority of these studies targeting non-indigenous communities. The "behavioral model" developed by Andersen –further modified several times– is one of the most widely used in healthcare research to determine factors that lead to the use of healthcare services (Aday & Andersen, 2005). It is a multilevel model that incorporates both individual and contextual determinants of health services use. In the review of Andersen's models, Babitsch et al. (2012) described three major components explicate in the most recent modification of the model, as follows:

1) Predisposing factor

- Individual predisposing factors include the demographic characteristics of age and sex as "biological imperatives."
- Social factors such as education, occupation, ethnicity, and social relationships (e.g., family status), and mental factors in health beliefs (e.g., attitudes, values, and knowledge related to health and health services).
- Contextual factors predisposing individuals to the use of health services include the demographic and social composition of communities, collective and organizational values, cultural norms, and political perspectives.

2) Enabling factors

- Financing and organizational factors are considered to serve as conditions enabling service utilization.
- Individual financing factors involve the income and wealth at an individual's disposal to pay for health services and the effective price of health care which is determined by the individual's health insurance status and cost-sharing requirements.
- Organizational factors entail whether an individual has a regular source of care and the nature of that source. They also include means of transportation, travel time to and waiting time for health care. Health policies also fall into the category of contextual enabling factors.

3) Need factors

- At the individual level, there is a difference between the perceived need for health services (i.e., how people view and experience their own general health, functional state, and illness symptoms) and evaluated need (i.e., professional assessments and objective measurements of patients' health status and need for medical care).
- At the contextual level, there is a distinction between environmental need characteristics and population health indices. Environmental need reflects the health-related conditions of the environment (e.g., occupational and traffic and crime-related injury and death rates). Population health indices are overall measures of community health, including epidemiological indicators of mortality, morbidity, and disability.

Applying Andersen's behavioral model, various explanations and motivations have been proposed to explain the use of TM (Aday & Andersen, 2005). In the context of traditional healthcare use, predisposing factors may include demographic factors, including female gender, old age (Bishop & Lewith, 2010; Hughes et al., 2013; Pengpid & Peltzer, 2018), and certain ethnicity (Aziz & Tey, 2009; Kuo et al., 2004; Trotter, 1981). Psychosocial factors are cultural attitudes, belief system (Astin, 1998; Gyasi et al., 2016; Hollenberg et al., 2013; Sato & Costa-i-Font, 2012), perceived efficacy, side effects, and quality of TM (Clement et al., 2007)(Gyasi et al., 2011). Examples of enabling factors include socio-economic factors, such as education, income, the nature of the occupation, urban or rural residence, and insurance status (Allabi et al., 2011; Gyasi et al., 2018; Peltzer et al., 2016; Pengpid & Peltzer, 2018; Picking et al., 2011)). Need factors may include: health-related factors, such as chronic disease, poor physical and mental health (Astin, 1998; James et al., 2019; Kelner & Wellman, 1997; Liebert, 1998; Wiles & Rosenberg, 2001), inadequate health care access (Wilson et al., 2012) and issues of satisfaction with conventional treatment (Furnham & Kirkcaldy, 1996; McGregor & Peay, 1996; Vincent & Furnham, 1996).

II. Studies related to traditional herbal medicine use: Indonesian context

Existing literature on traditional medicine use in healthcare in Indonesia can be roughly classified into three orientations: (1) ethnobotanical studies of traditional medicine in local communities and ethnopharmacological research of the bioactivity of plants used in traditional medicine, (2) anthropological studies of local health beliefs, healthcare-seeking behavior and other social aspects, including the associates of TM use (3) studies that address the role traditional medicine and public health, including prevalent of use. Table 1 compiles some previous studies related to TM use in Indonesia. The compiled literature are selected publications written in English and Indonesian language.

Studies of traditional use of medicinal plants in Indonesia

Indonesia has a history of reliance on traditional medicine involving a diverse use of plants, animal products, and minerals. However, the practice is predominantly based on the traditional use of plants. Some 40 million Indonesians have historically used herbal medicines to protect from and treat diseases, and the Indonesian community uses around 6000 plant species (Elfahmi et al., 2014). As an archipelagic state with thousands of islands, Indonesia is endowed with rich and unique biodiversity. The area of Indonesian tropical forests covers about 143 million hectares and is home to about 80% of the world's medicinal plants. It is estimated that the Indonesian tropical forests contain 28,000 plant species. Based on this rich source of medicinal plants, most Indonesian people, especially in rural areas, use traditional herbal medicines known as *jamu* to treat disease. *Jamu* is a word in the Javanese tribal language, meaning the traditional medicine from plants. Indonesians mostly refer to *jamu* as a mixture of multiple plants, with the number of plant species used for a particular kind of *jamu* usually ranges from five to 10 species (Torri, 2016).

Table 2.1. Compilation of some previous studies related to TM use in Indonesia

Theme category	Previous studies
Herbal medicine (<i>jamu</i>): introduction/ overview	(Soedarsono & Harini, 2002); (Nurdin et al., 2018); (Welsch & Afdhal, 1988); (Chaudhury & Rafei, 2001);
Documentation	Plants used in healthcare (Medicinal plants) <u>West Java</u> : (Roosita et al., 2008); (Nisfiyanti, 2012); (Rahayu & Kazuhiro, 2004) <u>Kalimantan</u> : (Zumsteg & Weckerle, 2007); (Caniago & Siebert, 1998); (Leaman et al., 1995)[Malaria remedies] <u>Sumatra</u> : (Grosvenor et al., 1995a); (Grosvenor et al., 1995b) (Silalahi et al., 2015)[sources: trader]; (Mahyar et al., 1991) <u>Sumatera/Sulawesi/Bali</u> : (Muktiningsih et al., 2001) <u>Aceh</u> : (Elliott & Brimacombe, 1987);

	<u>Bali:</u> (Sujarwo et al., 2015) <u>Indonesia:</u> (Hirschhorn, 1983); (Oktoba, 2018); (Hidayat & Hardiansyah, 2012); (Wulandari & Azrianingsih, 2014)[source: Jamu gendong seller] <u>Indigenous community:</u> (Permana, 2009)[Baduy]; (Rahayu et al., 2006) [Wawoni]; (Balitbang TOOT, 2015)[Suku Osing]; (Himmi et al., 2014); (Fathurrahman et al., 2016); (Gailea et al., 2016); (Mangestuti et al., 2007); (Nulfitriani et al., 2013)
Ethnopharmacology	(Elfahmi, 2006); (Sangat & Larashati, 2002); (Limyati & Juniar, 2012)[jamu gendong]; (Elfahmi et al., 2014) [review]
Anthropological aspect	(Szuter, 2015); (Zumsteg & Weckerle, 2007); (Torri, 2016); (Murni et al., 2012) (Rasna, 2010)
Sociological aspect	(Torri, 2013a); (Duaja et al., 2011); (Rosmanita & Saharuddin, 2017); (Saraswati, 2018); (Torri, 2013b); (Christina et al., 2019); (Triratnawati, 2010); (Liem & Newcombe, 2020); (Purwadianto et al., 2019); (Djamaluddin et al., 2021); (Jabbar et al., 2017); (Wijaya, 2012); (Ramadianto et al., 2015) <u>Socio-economic:</u> (Mirza et al., 2017); (Adi Nugroho et al., 2016); (Torri, 2016); (Hikmat et al., 2011); (Torri, 2012b); (Liem, 2019)
TM use pattern	<u>Panel Data:</u> (Pengpid & Peltzer, 2018); (Peltzer & Pengpid, 2015)[ASEAN]; (Supardi & Susyanty, 2010); (Supardi et al., 2011); (Nurhayati & Widowati, 2017); (Supardi et al., 2003); (Jennifer & Saptutyningsih, 2015); (Suswardany et al., 2017) <u>Original survey:</u> (Helmi, 2017); (Maryani et al., 2016) [SJ]; (Kristina et al., 2007); (Supardi et al., 2002); (Dewi & Nisa, 2019); (Setyoningsih & Artaria, 2016); (Adi Nugroho et al., 2016); (Purnama, 2016)(Lestaris & Keman, 2018) (Diana Sari et al., 2015); (Umamah et al., 2015); (Murni et al., 2012)(Suryana & Iskandar, 2014)
Implementation of TM program / policy in public healthcare	(Kristiana et al., 2017)[SJ]; (Suharmiati et al., 2020) [yenkestrad integrasi]; (Herman et al., 2013); (Oktarina & Rukmini, 2021); (Torri, 2012a); (Suharmiati et al., 2018); (Siahaan & Aryastami, 2018); (Kurniawan & Aprilianto, 2020); (Yuningsih, 2012); (Bagiastra & Sudantra, 2019); (Kurniawan & Aprilianto, 2020)
TM development	(Pribadi, 2009); (Sumarni et al., 2019); (Raymond, 2020); (Siswanto, 2018); (Bahar, 2016); (Hartanti et al., 2020)

Most ethnobotanical research in Indonesia has been focused mainly on the utilization of plant diversity as traditional medicine. The topic of the study of ethnomedicinal becomes very broad (interdisciplinary), e.g., the social concept and perception on the body condition (health and illness), plant diversity, kind of diseases, sociocultural aspect, technological aspect concerning traditional medicine practice, phytochemistry, and all aspects of those related with ecological health aspects (Walujo, 2008).

Through extensive ethnobotanical studies, abundant plant species in Indonesia are recognized as medicinal plants, and the use of the plants by various ethnic groups is well reported (Table 1). Through these studies, it was confirmed that in their herbal medicine use, Indonesians either utilize a single plant or multiple plants, occasionally also employing minerals when preparing remedies. While most traditional herbal medicine practices and treatments require healers or herbalists, self-medication through herbal medicine is also common in Indonesia (Rahayu et al., 2006). Thus, the source of knowledge to gather such information was varied. While most of them targeting the indigenous community as the source of knowledge, a few studies were conducted in the non-indigenous local community (e.g., (Gailea et al., 2016), (Nisfiyanti, 2012)). It was also common to acquire traditional knowledge of medicinal plants from traditional healers (Roosita et al., 2008), jamu sellers (Wulandari & Azrianingsih, 2014), and traders of medicinal plants (Silalahi et al., 2015). The data of the number of medicinal plants also vary. Dictionary of Indonesian Medicinal Herbs lists more than 2500 plant species, which principally can be developed for medicinal purposes, while Zuhud et al. (2001) identified 1845 species with medicinal potential in the forests of Indonesia (Elfahmi et al., 2014). These numbers are potentially updated due to the continuing inventory and investigation of yet unidentified species. According to the National Agency of Drug and Food Control (BPOM), 283 plant species have been officially registered for their medicinal use; the larger remainder is used traditionally.

Many studies also reported the ethnopharmacological aspect of many medicinal plants. In this respect, Elfahmi (2014) comprehensively reviewed the most frequent plants used in *jamu* that have also been investigated regarding their constituents and pharmacological effects as well as known risks and side effects of medicinal plants used in *jamu*. It reviewed the bioactivities of 27 medicinal plants that have promising effects in the area of curative therapy, such as anticancer, antiviral, antimalarial and antiparasitic, anti-inflammatory, antirheumatic, antipyretic and analgesic, antidiabetic and antihypertensive.

Studies on associates of TM use in public health setting in Indonesia

In addition to compiling inventories (ethnobotanical studies), investigation of bioactivity of medicinal plant, and development of TM, some studies related to traditional herbal medicine use in Indonesia (although rather scanty) focused on the anthropological and sociological aspect of TM use, including local health beliefs, healthcare-seeking behavior and the associates of TM use. The prevalence and associates of TM use investigated in most studies were based on panel data. Here, sociodemographic variables were almost exclusively considered, including age, gender, schooling, occupation, religion, ethnicity, the incidence of illness, and others. For example, based on Indonesia Family Life Survey in 2014–15, Pengpid & Peltzer (2018) reported prevalence of TM use was 24.4%, with being of older age, being a Muslim, residing in an urban area or on Java, being unhealthy,

having a chronic condition, having depression symptoms, experiencing sleep disturbance, and having high social support were associated with TM/CAM use. While these studies well-covered the prevalence of TM use nationwide, they could not provide much-needed insights into healthcare-seeking choices of community members, especially in relation to their use of traditional medicine versus biomedicine, as personal attributes and social-cultural context are lack in the panel data. The original survey-based studies on TM use usually explored such information. For example (Maryani et al., 2016) reported the high prevalence of herbal medicine use among old age (45-55 years), and being educated was motivated by poor health status and perception that *jamu* is safe.

Another study on local community in Malang, East Java, reported that the choice between traditional and conventional medicine was based on trust, the severity of illness, and the cause of the disease (Setyoningsih & Artaria, 2016). Nonetheless, there is a lack of comprehensive analysis on the correlations among the factors relevant to the use of TM, considering all the factors (predisposing, enabling, and need factors) in Andersen's healthcare utilization model, especially in the context of the current universal healthcare system in Indonesia. One study that considered these factors was conducted by Dewi & Nisa (2019), investigating factors affecting the choice of TM use among hypercholesterolemia patients. It was reported that knowledge and perception of TM were significant predictors in choosing TM, in addition to age, occupation, travel time, and price of medicine. This study showed that the information of perception, personal attributes towards TM, and knowledge on medicinal plants significantly influence the choice of healthcare and thus important in understanding people's underlying motivation of using TM.

Other studies in social sciences related to TM use in Indonesia have reported on knowledge, perceptions, and opinions of different stakeholders in relation to traditional medicine in public health. For example, Torri (2013) reported perception and belief of traditional *jamu* medicine among urban consumers, while Ramadianto et al. (2015) investigated perspective from medical students. Several studies focused on the assessment of policy implementation on TM in a public health facility. Herman et al. (2013) reported a lack of compliance with licensing regulations among TM practitioners in public health facilities. Based on gray data, Yuningsih (2012) concluded that TM use was still lacking in Indonesian clinical practice. These studies were conducted before the UHC system; thus, the investigation was under the pre-UHC delivery system. Within the UHC system, exploration of TM roles in public health in relation to healthcare delivery is lacking, although a few studies seem to be catching up on this subject (e.g., (Suharmiati et al., 2020); (Kristiana et al., 2017)).

Most studies in this area evaluated the general implementation policy of TM in conventional healthcare settings in different regions (e.g., (Bagiastra & Sudantra, 2019;

Oktarina & Rukmini, 2021; Suharmiati et al., 2018). Some of them specifically evaluated certain policies or programs; for example, Suharmiati (2020) assessed patient's perspectives of the implementation of *yankestrad integrasi* program in some healthcare facilities. The program is part of government efforts in providing TM service in a conventional healthcare facility, but to this date, its implementation is limited to a flagship facility. Implementation of *Scientification of Jamu* program in appointed healthcare facilities was also commonly reported (Kristiana et al., 2017; Sumarni et al., 2019)). The policy analysis on TM roles in public health was also covered broad issues in relation to its potential development and use in formal healthcare settings (e.g., (Raymond, 2020; Siswanto, 2018)). Considering its economic potential, in his report Raymond (2020) advocated for the inclusion of standardized herbal medicines (OMAI) in the UHC system. Nonetheless, the much-needed discussion on how TM could be integrated within the UHC framework is not found in previous studies.

Literature reviews show that prior studies on traditional herbal medicine in Indonesia have been fragmented within ethnobotany and anthropology disciplines. While ethnobotany studies mostly focused on the inventory of plants, anthropology mainly dealt with associates of use without capturing local usage of herbal medicine. Furthermore, most prior studies of TM roles in the public health system in Indonesia were conducted before the implementation of the UHC and thus disregarded the significant changes in the national healthcare delivery system. However, as mentioned above, the few investigations of TM practice within the UHC system focus on the TM policy assessment but lacks insight on how to integrated TM into the mainstream practice under the new UHC system. Therefore, this study filled the gap by using both ethnobotanical, anthropological/social approach as well as policy analysis to obtain comprehensive insight of current TM use practice in the UHC system in Indonesia from community and institutional level investigation.

III.Traditional Medicine in the Indonesian Health Care System

Indonesian traditional medicine

Many different varieties of traditional healthcare practiced in Indonesia, are all associated to a greater or lesser extent with the different ethnic groups and the historical developments that have shaped the nation. According to Indonesian law, traditional healthcare is defined as a practice or medicament used in the treatment of illness and/or the maintenance of health based on empirical experiences and skills passed down through generations. In general, traditional healthcare in Indonesia can be classified into three categories: 1) herbal-based medicines 2) manual skill-based treatment including practices involving the use of some tools (e.g., acupuncture, bekam (cupping), acupressure), without tools (e.g., massage, bone setting) and 3) energy and mind/spiritual healing (e.g., rukiyah, dukun/shaman/faith

healer) (MoH RI, 2013). Of those, herbal-based medicine/ *jamu* is the main component and backbone of the traditional medicine system of Indonesia. Thus, the term Indonesian traditional medicine system generally refers to the traditional use of medicinal plants or herbal medicines or *jamu*.

Jamu tradition claimed to have originated in the Medang or Mataram Kingdom, a Hindu-Buddhist kingdom that flourished between the 8th and 10th centuries CE and was based in Central Java, and later in East Java (Purwaningsih, 2013). Although heavily influenced by Indian Ayurveda, the vast Indonesian archipelago makes both its practices and plants variable. Each of more than 300 major ethnic groups of Indonesia has its own repertoire of traditional recipes, ingredients, and methods of use for these varied herbal preparations, which are mixed together as needed by a member of the family or a *dukun* (traditional healer). It is largely ‘live knowledge’ in the sense that it is orally transmitted, although there are some texts (Torri, 2013a). The traditional pharmacopeia (*jamu*) in Indonesia, Java, includes a huge range of herbal preparations. *Jamu* is also sold by ambulant sellers (*jamu gendong*) that normally produce *jamu* from fresh ingredients (mainly fresh leaves, roots, fruits, and rhizomes) and sell their products on the streets or in the city markets. While most TM practices and treatments require healers or herbalists, self-medication with TM is also common in Indonesia (Rahayu et al., 2006). A recent national survey reported that 44.2% of households in Indonesia utilized traditional healthcare, with 79.8% use based on herbal (MoH RI, 2018a). Herbal medicine use in Indonesia has increased in recent years (Peltzer and Pengpid, 2015). Among traditional medicine users, 70% live in rural areas (Harmanto and Subroto, 2007). The highest prevalence of current herbal medicine use is for cancer or malignant tumors (14.4%), followed by arthritis/ rheumatism (11.3%), high cholesterol (11.3%), stroke (10.2%), diabetes (9.9%), and kidney disease (9.7%) (Pengpid and Peltzer, 2018).

Jamu has experienced further development and modernization over time. The National Food and Drugs Administration (BPOM) had introduced regulations to provide standardization of raw materials and their end products and guidelines of good manufacturing practices. Based on the preparation method and verification of its efficacy, the Indonesian government classified herbal products into three categories; i.e., *jamu*, standardized herbal medicines (*OHT*), and phytomedicines (*fitofarmaka/FF*) (BPOM RI, 2004). While the efficacy of standardized herbals and phytomedicines has been proved in pre-clinical and clinical trials, the therapeutic effects of *jamu* are only supported by empirical data. Unlike *jamu*, standardization of active ingredients is required for standardized herbal and phytomedicine. Thus, in this literature review, the term “herbal medicine” included *jamu* and its standardized forms (i.e., OHT and FF). Hereafter the term “Traditional medicine/ TM” is interchangeable with “herbal medicines” or “traditional herbal medicines.”

Indonesia healthcare system

Currently, conventional (western) medicine is the mainstream medical practice in the Indonesian healthcare delivery system. TM is existing parallel with conventional medicine, the government recognizes traditional and alternative medicine as one of the country's healthcare systems, but conventional medicine receives support and funding with more developed infrastructures and human resources.

The Indonesian health system has a mixture of public and private providers and public and private financing. Following decentralization reform in 1999, health services were decentralized to provincial and district governments under the Ministry of Home Affairs (MoA). This change resulted in the decentralization of responsibility for planning and managing service delivery from the Ministry of Health (MoH) to local governments. The MoH retained and continued to operate some tertiary and specialist hospitals but has shifted much of its function to regulation, ensuring the availability of resources, including personnel, and taking an increasingly lead role in the supervision of social insurance schemes. Provincial governments are responsible for managing provincial-level hospitals, provide technical oversight and monitoring of district health services, and coordinate cross-district health issues within the province. District/municipality governments are responsible for managing district/city hospitals and the district public health network of community health centers (*puskesmas*) and associated subdistrict facilities. A range of private providers, including networks of hospitals and clinics, are managed by not-for-profit and charitable organizations, for-profit providers, and individual doctors and midwives who engage in the dual practice (i.e., have a private clinic as well as a public facility role)(Mahendradhata et al., 2017).

In the last decade, Indonesia has introduced a number of reforms affecting different aspects of the health system, while the health system has also been affected by multisectoral reforms of government and public administration. Key multisectoral reforms include the delegation of authority for certain government functions from central to local governments, responsibility for the management and provision of public health services, and the progressive introduction of greater autonomy in management of public service organizations such as hospitals. The introduction of the national health insurance/NHI (*Jaminan Kesehatan Nasional/JKN*) scheme is the most fundamental reform. Following nearly a decade of policy development, the JKN was introduced in 2014, with significant implications for managing and delivering health services.

TM in the national health policy

Traditional healthcare first gained formal recognition in the State Policy Guidelines (*Garis-garis Besar Haluan Negara/GBHN*) in 1983 through the statement on National Healthcare

System. Traditional healthcare was then considered as part of the country's healthcare systems in 1992 (President of RI, 1992). The law was then amended in 2009 to adjust with the change in national health: from curative to promotive and preventive orientation, and the decentralization policy (Law No.32/2004 on Local Government) (President of RI, 2009). Since then, Law no. 36/2009 on "health system" has been a foundation for the Indonesian government to develop regulations and strategies of TM products and practices. However, before 2009, the government issued several policies and regulations considered significant in the development of TM products and practices in Indonesia. The MoH was the first regulated registration and permitted for the traditional herbal medicines industry in 1990 (MoH RI, 1990).

The development of TM then reached an important milestone when the National Policy of Traditional Medicines (KONTRANAS) was issued in 2007 as an inter-agencies guideline to develop TM products in Indonesia, with a special focus on herbal medicines (MoH, 2007). In 1995 the MoH established Central of Development and Implementation of Traditional Medicine Practice (SP3T) as an organization consisting of traditional and conventional healthcare practitioners, including medical doctors, pharmacists, and traditional healers, to monitor and supervise TM practice in the informal sectors (MoH RI, 1995). Several related regulations had been issued to provide a legal basis and guidelines for informal TM practitioners with more than 280,000 have been officially registered (Mahendradhata et al., 2017).

In public health facilities, TM practice was first regulated through issuance of MoH decree on Standard Service of Herbal Medic in 2008 (MoH RI, 2008). TM practice and development in Indonesia are mandated by the MoH. Then, as advocated in the WHO strategy in the traditional health (WHO, 2002)(WHO, 2013b), in 2015, the MoH established a new structure within its body: Directorate of Traditional, Alternative and Complementary Health Services (*Dirjen Yankestrad*) to oversee the practice of traditional health care providers (MoH RI, 2015a). The *Dirjen Yankestrad* set an annual goal to provide of TM products/services at the public (government) health facilities (hospitals). In accordance with the paradigm change of national healthcare from curative orientation (law 23/1992) to preventive and promotive orientation (law 36/2009), TM policy is mainly positioned in primary care settings. The prevention and promotion of health programs are emphasized at the community level; thus, implementation mainly focuses on the community health center (*puskesmas*) than at referral health facilities.

Under the law, traditional healthcare in Indonesia is categorized into empirical, complementary, and integrated traditional healthcare. The difference lies in the provider qualification and the degree of institutionalization (MoH RI, 2014). While empirical one is provided by a licensed traditional healer who does not have a formal medical background,

complementary one is provided by a physician that has been formally trained on TM. On the other hand, integrated one combines complimentary one and conventional care. Its provision has been promoted on the basis of the Strategic Plan 2010-2014 (*Rencana Strategis—Renstra*) (MoH RI, 2017b).

Regulation related to TM product

The production of TM products is also being developed on an industrial scale. Herbal medicines are sold in pharmacies as over-the-counter medicines, in special outlets, by licensed practitioners, and without restriction. BPOM introduced regulations to provide standardization of raw materials and end products and certification of good manufacturing practices. Based on the preparation method and verification of its efficacy, BPOM classified herbal products into three categories; i.e., *jamu*, standardized herbal medicines (OHT), and phytomedicines (*fitofarmaka*) (BPOM RI, 2004). While the efficacy of standardized herbals and phytomedicines has been proved in pre-clinical and clinical trials, the therapeutic effects of *jamu* are only supported by empirical data. Unlike *jamu*, standardization of active ingredients is required for standardized herbal and phytomedicine. There are currently 13462 herbal medicines products officially registered at BPOM, with only 87 are classified as standardized products (62 OHT and 25 *fitofarmaka*)(BPOM RI, 2020). Just recently, the standardized herbal medicines: OHT & *fitofarmaka* are named OMAI (Indonesian Original Modern Medicine)(BPOM RI, 2020; Raymond, 2020).

Special GMP rules are required for the manufacture of herbal medicines called CPOTB (*Cara Pembuatan Obat Tradisional yang Baik*), including *jamu*, OHT, and phytomedicines. The implementation of these requirements is ensured through inspection and certification. Safety requirements include traditional use without demonstrated harmful effects, reference to documented scientific research on similar products, toxicity data, and laboratory testing. According to BPOM, in 2020, among 129 Traditional Medicine Industry (IOT) in total, most are extract producers, and only 22 IOTs are OHT (standardized herbal medicine) producers, and among them, only 5 IOTs produced OHT and *fitofarmaka* (phytomedicines) products, respectively. Compliance with these requirements is ensured through post-marketing surveillance, inspection, sampling, laboratory testing, investigation, monitoring of adverse effects, and law enforcement. The standardization of herbal medicines should refer to standard references of *Farmakope Herbal Indonesia* (total of three editions) with the most recent dating from 2009, in addition to the *Materia Medica Indonesia* containing 246 of the national monographs, which was published between 1977 and 1995 (total of six editions). The post-marketing surveillance system was established in 2002, including adverse effect monitoring. The procurement of medicine in the national healthcare delivery system refers to the national essential drug list (DOEN), and the

National Formulary (FORNAS) was established as a reference to be used within the JKN system since 2014. No herbal medicines are currently included on both lists.

Research and Development of TM

According to WHO Indonesia, herbal medicines annual sales in 2000 totaled US\$ 144 million, in 2001 sales reached US\$ 167 million, and in 2002, sales reached US\$ 189 million (WHO, 2005). With increasing popular demand for medicinal plants, both in Asia and internationally, this trade grew to US\$786 million in the year 2010 (Torri, 2013). The Indonesian government, industry, and academia recognize that to further the development of TM. Extensive research is required to establish the safety and efficacy of the many unstandardized TM products (i.e., *jamu* preparations).

In this regard, research institutions and other relevant bodies have been set up to ensure evidence-based TM products and practices. In 1975, under the MoH structure, the National Research Institutes on Traditional Medicine and Herbal Medicine (*Balitbangkes*) was established to address issues of quality and safety in herbal drug use by scientifically validating the therapeutic effects of herbal preparations. The Indonesian government also launched the Centre for Development and Implementation of Traditional Treatment (Sentra P3T) in 1995. The Centre's activities include research on herbal medicines, education and training of human resources, and service of herbal medicines-based treatment. Other programs include selecting, testing, certifying, registration/licensing, inventory, screening, clinical testing, utilization and evaluation of traditional medicine, and compilation of laws applicable to traditional treatment.

In 2010, to promote evidence-based TM practice in a clinical setting, the *Balitbangkes*, through B2P2OOT, introduces the “Scientification of Jamu/ SJ” program to provide scientific evidence of herbal medicine (*jamu*) through service-based research in flagship healthcare facilities (MoH RI, 2010a). The program also includes herbal medicine training for conventional healthcare professionals, including physicians and pharmacists. There are about 500 medical doctors trained in the program – *Dokter Saintifikasi Jamu*. While Farmakope Herbal and Materia Medica were issued as reference for standardization of herbal product quality, several other official documents of herbal medicines have also been published to promote rational use of herbal medicines. For example, Vedemicum, providing information on medicinal plants, can be used in formulating an herbal concoction by a healthcare practitioner involved in the SJ program. Another example is FOHAI (information of medicinal plants) (MoH RI, 2016a) and FROTI (information of herbal formula/jamu) (MoH RI, 2017a). Both documents include information regarding safety (LD₅₀) and intended for public use. The most recent documentation was published in 2020 as a response to the COVID-19 pandemic: *Informatorium OMAI* (BPOM RI, 2020). It

provides the public with a list of OHT and phytomedicines that can be used in maintaining health stamina. Main events related to TM in Indonesia healthcare system is summarized in Figure 2.1.

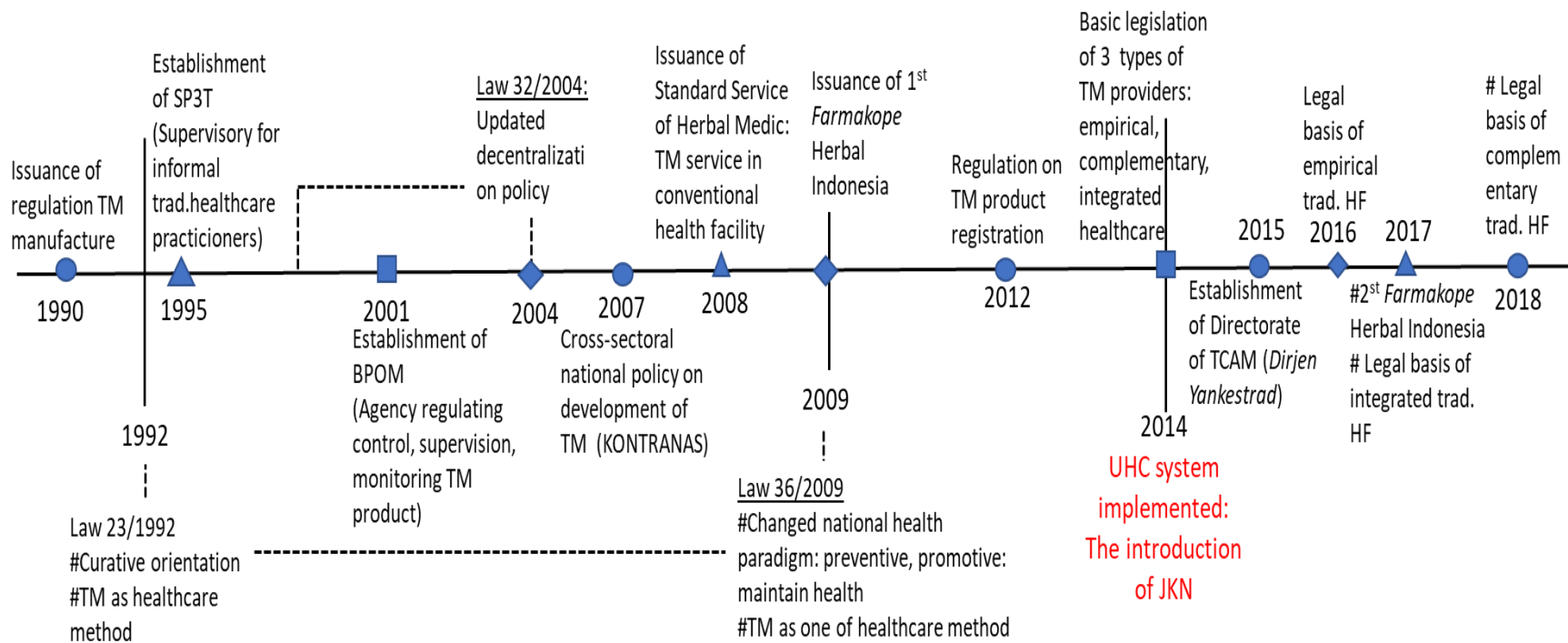


Figure 2.1. Main historical events related to traditional medicine in Indonesia healthcare system

IV. The Universal Healthcare System in Indonesia

Indonesia introduced national health insurance (*Jaminan Kesehatan Nasional, JKN*) to provide healthcare services as a commitment to universal health coverage (UHC) (Mboi, 2015). It is one of the largest single-payer social health insurance programs in the world (Erlangga et al., 2019). Universal health coverage aims to ensure that comprehensive healthcare services are equally accessible to the entire population. While the Ministry of Health (MoH) is responsible for setting clinical guidelines and technical norms of the JKN system, its financial affairs are run by a semi-government agency: *BPJS Kesehatan* (BPJS-Health, Social Security Agency for Health). *BPJS Kesehatan* manages the new health insurance system, including recruitment of members, payment to service providers, and collection of fees (Mboi, 2015).

The JKN unified several previously fragmented public health insurances, including *Askes* (public formal sector employees), *Jamsostek* (private formal sector employees), and *Jamkesmas* (the poorest population). The fundamental difference that set apart JKN from the previous public health insurance schemes is in shifting from tax-funded fee waiver schemes for poor people to a contribution (premium)-based mandatory health insurance system (Presiden RI, 2013). The Ministry of Health, Finance, Social and Welfare, along with the legislatures and BPJS board members, collectively set the amount of premium, which regularly is reviewed every two years (Dartanto et al., 2015)(Kartika, 2015; Sibarani, 2014; Suryahadi et al., 2014).

Participants

In general, there are two big groups of JKN enrollees: (1) the subsidized group or *Penerima Bantuan Iuran* (PBI)/premium waiver including the poor population and disabled individuals, and (2) the contributory group consisting of *Peserta Pekerja Penerima Upah* (PPU)/salaried employees (government and private), *Peserta Pekerja Bukan Penerima Upah* (PBPU)/non-salaried workers, and *Peserta Bukan Pekerja*/non-workers. While the salaried employees are required to contribute a certain percentage of their salaries, the other two groups are required to contribute by paying a fixed amount of premium based on their chosen inpatient ward class (BPJS Health, 2020).

Currently, nearly 223 million Indonesians joined the JKN, which accounted for 82.4% of the total population (Yuniartha, 2020). As insurance subscriptions are increasing, it was reported that health-facilities utilization had increased 77.8% in two years since its start, with an average of 400,000 visitations to healthcare facilities in a year (BPJS Health, 2019). Although disparities persist between regions and social strata regarding healthcare service providers under the JKN, it has expanded health coverage in some rural and poor areas (Rolindrawan, 2015).

Contribution and Informal sector

In the JKN, while formal sector workers are easily covered by payroll deductions, and the poorest are often covered through government subsidies, the big challenge is to expand coverage to non-poor informal sector workers. The informal worker who meets the criteria of “poor” in reference to Government Regulation No. 101 of 2013 could be included in the subsidized scheme. However, the non-poor informal sector is mandated to join through contributory/ non-subsidized/involuntary schemes. Considering the high number of people working in the informal sector in Indonesia, collecting contributions from informal workers is extremely challenging. Indonesia’s economy and labor market are dominated by the informal sector. The 2012 National Labor Force Survey (*Sakernas*) found that of the 120 million people of working age, about 95 % (114 million) can be classified as having work. Out of those employed, about 68 million (or approximately 62%) work in the informal sector, yet recent data shows that the number of self-enrollments of informal sectors was only 26 million, which accounted for 14% of the total participants. The data indicated that around 40 million informal workers had not been covered by the JKN program yet. This type of problem is a common challenge for developing countries, which have a large share of informal sector workers. This population group is typically unwilling to participate in insurance schemes, including social health insurance (Bitran, 2014; Mahendradhata et al., 2017).

Healthcare service delivery

Health care delivery depends on a mix of public and private providers. The physical infrastructure for delivering health services includes hospitals, health centers, and a range of lower-level facilities. The public sector categorizes its facilities as hospitals (general and specialty), which provide both inpatient and outpatient services, health centers (*pusat kesehatan masyarakat, puskesmas*), which focus on outpatient care but can also operate beds and provide inpatient services, and auxiliary health centers. The private sector operates hospitals providing both inpatient and outpatient services, and health centers/clinics providing outpatient care.

JKN uses a referral system for healthcare delivery. The patient is not allowed to seek treatment directly at a hospital or specialist clinic, without a referral letter from the primary care facilities, except in an emergency.

JKN scheme employs a capitation payment model for primary care providers and a case-based for referral healthcare facilities (i.e., hospitals). Under the capitation mechanism, primary care providers receive a fixed amount per participant, paid in advance. The amount is based on the number of members registered without taking into account the types and amount of health services provided. Primary care has full authority to use capitation funds to manage its own affairs, including allocation for expenses related to medical services, such as health-workers payment, medicines provision, and non-medical related activities. The capitation funds are expected to be managed efficiently not only for curative and rehabilitative services, but also promotive and preventive measures (Mahendradhata et al., 2017; Mboi, 2015).

Medicine provision

The government has a role and responsibility to ensure the accessibility and affordability of pharmaceuticals, as well as the rational use of medicines. In ensuring access to pharmaceutical care, the MoH is responsible for ensuring the availability of 484 essential drugs for primary care, the national health program-related drugs, and vaccines. Currently, there are two existing drug lists in the national health system: (1) the National Essential Medicines List (DOEN), serving as the base for medicines procurement; and (2) the National Formulary (FORNAS). The medicines covered within the JKN system are listed in the FORNAS (Mboi, 2015; Presiden RI, 2013). The list should be consistent with the standard treatment guidelines (STGs). The JKN patients are able to obtain medicines from healthcare facilities free of charge. Nevertheless, some patients still have to buy (OOP) medicines that are not listed on the FORNAS from pharmacies.

Registered drugs dominated the Indonesian pharmaceutical market in 2013 with a market share of 59% or US\$ 3.2 billion, while OTC drugs came second with 41% market share, or US\$ 2.2 billion. The amount of drug sales is expected to decline as community coverage of the JKN increases since the JKN encourages the use of generic drugs. Furthermore, the production costs of drugs will increase because 95% of raw materials are imported from overseas (International Pharmaceuticals Manufacturers Group, 2013).

TM product/service is not included within the JKN scheme. Under the current regulatory system, JKN provides healthcare services on the basis of conventional medicine/ treatment. JKN covers only medication listed on the national formulary (FORNAS) that exclusively consists of biomedicine/conventional medicine (MoH RI, 2018c). Within JKN, TM can be used in a PHC, and its provision is admissible through the capitation payment mechanism (Mboi, 2015). However, its provision through the capitation mechanism requires a special circumstance: when the necessary medication is not listed in FORNAS with approval from the head of the local health authority.

CHAPTER 3. FACTORS AFFECTING THE USE OF HERBAL MEDICINES IN THE UNIVERSAL HEALTH COVERAGE SYSTEM IN INDONESIA

This chapter explored the healthcare potential of herbal medicine under the influence of healthcare service provision through a case study conducted in West Java, Indonesia. It first examined to what extent the local community in healthcare uses herbal medicines based on an ethnobotanical survey of medicinal plants. Subsequently, it discussed the findings of a semi-structured interview survey on factors affecting the use of herbal medicines in the universal health coverage (UHC) system. This study site, West Java, was purposively chosen because it has many medicinal users and JKN subscribers. Thus, an ambivalent health seeking condition in West Java provides an ideal environment for this study to examine whether changes in herbal medicine use patterns occur when a healthcare service within the UHC system becomes available.

Abstract

Ethnopharmacological relevance: Medicinal plants play an essential role in primary healthcare practices in Indonesia, particularly in rural areas. While medicinal plants are broadly used in Indonesia, the country has made a commitment to healthcare services based on modern medicine through the provision of universal health coverage (UHC).

Aim of the study: In the context of the UHC system in Indonesia, we explore the utilization of medicinal plants in rural West Java by examining how herbal medicine use varies with socio-economic and demographic factors and whether herbal medicine use remains important when modern healthcare becomes available.

Methods: A total of 634 households in the two rural communities were randomly selected to participate in the survey. A semi-structured questionnaire was administered to a randomly selected adult in each household.

Results: Herbal medicine use prevalence was found to be 68% (431/634). Out of 549 total respondents with perceived illness, 40% (219/549) self-medicated with herbal medicines in the last six months. A total of 102 medicinal plant species belonging to 43 families were reported, each with their local names, medicinal use, and parts used. We found that herbal medicine use was significantly associated with the area of residence, age, education level and occupation, and was not correlated to gender or health insurance possession.

Conclusion: Medicinal plant remains a significant aspect of healthcare for rural communities in the West Java area. The presence of healthcare services under the UHC system is not a critical determining factor for treatment- seeking and may have less impact on the pervasive practice of herbal medicine use in rural areas.

1. Introduction

Indonesia has a history of reliance on traditional medicine involving diverse plants, animal products, and minerals. However, the practice is predominantly based on the traditional use of plants. Over 2500 species in Indonesia are recognized as medicinal plants (Elfahmi et al., 2014) through extensive ethnobotanical studies (Grosvenor et al., 1995a), and the use of the plants by various ethnic groups is well reported (Silalahi et al., 2015; Zumsteg & Weckerle, 2007). Indonesians either utilize a single plant or multiple plants in their herbal medicine use—known as *jamu*—occasionally employing minerals when preparing remedies. While most traditional herbal medicine practices and treatments require healers or herbalists, self-medication through herbal medicine is also common in Indonesia (Rahayu et al., 2006).

Herbal medicine use in Indonesia has increased in recent years (Peltzer & Pengpid, 2015). According to a national survey in 2018, 44.2% of households utilize traditional healthcare, which increased from 30.1% in 2013 (MoH RI, 2018a). Among traditional medicine users, 70% live in rural areas (Harmanto & Subroto, 2007). The highest prevalence of current traditional medicine use is for cancer or malignant tumors (14.4%), followed by arthritis/rheumatism (11.3%), high cholesterol (11.3%), stroke (10.2%), diabetes (9.9%), and kidney disease (9.7%) (Pengpid & Peltzer, 2018). Acknowledging medicinal plant use importance in primary healthcare in Indonesia, various Indonesian government institutions, including the Ministry of Health, Ministry of Forestry, Ministry of Environment, Ministry of Agriculture, the National Development Planning Agency (BAPPENAS), and the National Agency of Drug and Food Control (NADFC or BPOM) are engaged in research directed at medicinal plant development. A medicinal plant development guideline has been formulated in the National Policy of Traditional Medicines (KONTRANAS) (Siahaan & Aryastami, 2018).

While medicinal plants are widely used in healthcare, there has been intense global action to provide healthcare services based on modern medicine through the commitment to universal health coverage (UHC) by all member countries of the WHO, which has resulted in medical pluralism (WHO, 2013a). Thus, while medicinal plants continue to serve an essential primary healthcare role in some areas (Toda et al., 2017), reliance on modern medicine has increased in other areas (Caniago & Siebert, 1998; Vandebroek & Balick, 2012). The choice between traditional and modern medicine is dependent on various factors. Janes (1999) and Wayland (2004) state that it depends on how the users' social and cultural values are attached to each type of medicine or their knowledge of medicinal plants (Dahlberg & Trygger, 2009). Traditional medicine use can depend on sociodemographic factors—such as age, gender, occupation, education, or area of residence—and health-related factors, including chronic disease and poor physical and mental health (Pengpid & Peltzer, 2018; Quinlan & Quinlan, 2007). Healthcare service presence also affects knowledge loss and, consequently, medicinal plant use. However, it was also reported that modern medicine does not necessarily lessen medicinal plant use (Toda et al., 2016).

Indonesia introduced the National Health Insurance (Jaminan Kesehatan Nasional, JKN) in 2014 to provide healthcare services based on modern medicine as a commitment to universal

health coverage (UHC). This insurance program is intended to provide health services by prioritizing the poorer sections of the population (Mboi, 2015). Currently, nearly 222 million Indonesians joined the JKN. As subscriptions are increasing, it was reported that health-facilities utilization had increased 77.8% in two years since its start, with an average of 400,000 visitations to healthcare facilities in a year (BPJS Health, 2019). Although disparities persist between regions and social strata regarding healthcare service providers under the JKN, it has expanded health coverage in some rural and poor areas (Rolindrawan, 2015). Considering the possible repercussions of initiatives to support modern and traditional medicine systems raises a question about the condition for herbal medicine use for people in Indonesia's rural areas today.

Java Island, where the central government is located, is the most economically developed area in Indonesia. Consequently, the provision of healthcare services and facilities is more expanded than on other islands. In West Java, the most populous province in Indonesia, the ratio of JKN subscribers reached 84% of the total population in 2019 (Kasumaningrum, 2019), yet it is one of the top four provinces with the most herbal medicine (*jamu*) users. The high number of medicinal users and JKN subscribers makes West Java an interesting case to research whether changes in herbal medicine use patterns occur when a healthcare service within the UHC system becomes available.

We aim to elucidate the healthcare potential of herbal medicine under the influence of healthcare service provision through a case study conducted in West Java. Specifically, the study involved 1) determining whether herbal medicine continues to be used when a healthcare service is available, 2) assessing the factors associated with herbal medicine use, and 3) examining whether healthcare service provision under the UHC system influences herbal medicine use and treatment-seeking patterns. We contribute to this literature through an investigation of household-level herbal medicine use by focusing on the self-medication practices performed by laypeople rather than by professional healers. Our focus lay on herbal medicine, which includes any plant used to prepare home remedies rather than a labeled or unlabeled commercial herbal medicine product. Understanding the factors involved in different treatment option selection at the household level is also vital for health service planning and the incorporation of herbal medicine in a country's healthcare delivery system.

2. Materials and methods

2.1 Study area

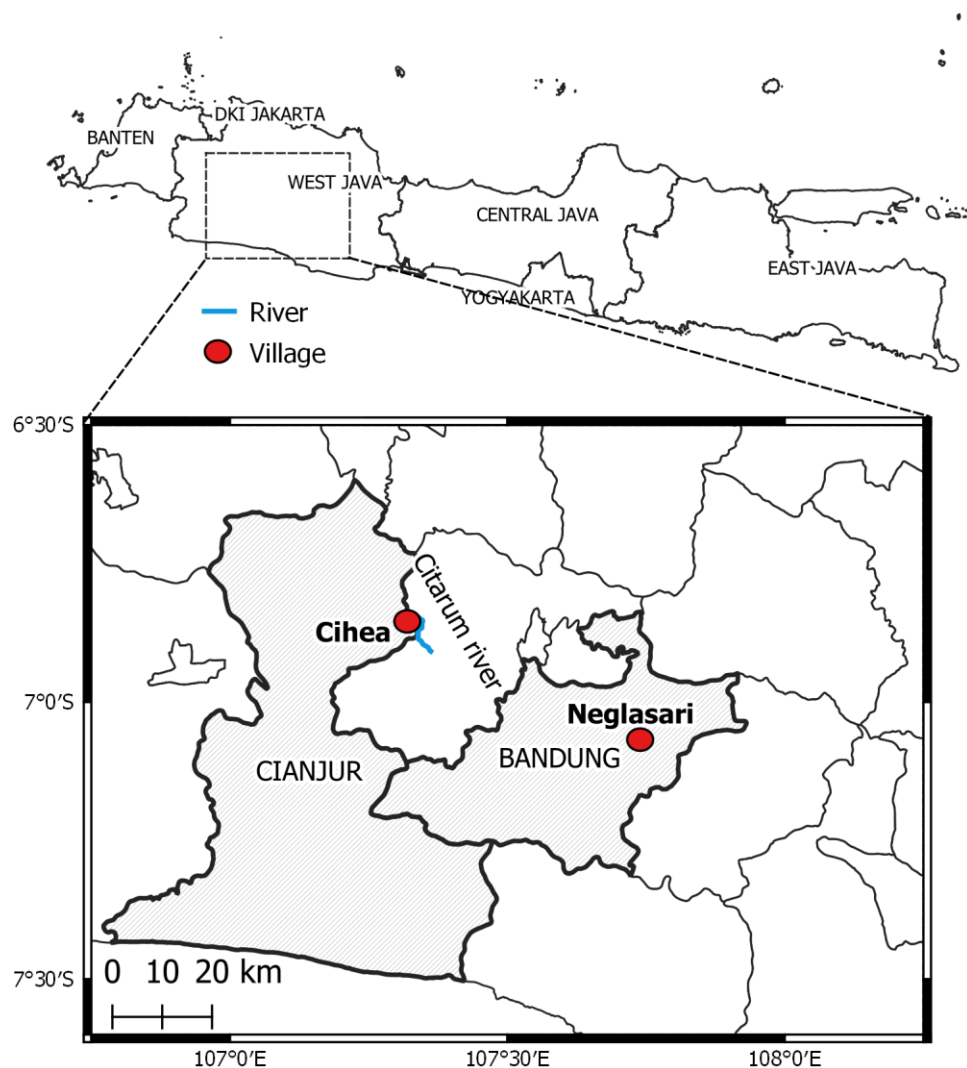


Fig. 1. The location of Cihea and Neglasari village in West Java, Indonesia.

The present study was conducted in West Java Province, which is located 150 km from the Indonesian capital of Jakarta. The survey took place in Sundanese rural communities, which is the dominant ethnic group in West Java. For comparison purposes, fieldwork was conducted in two villages located in Bandung regency and Cianjur regency (Fig.1). Two villages were chosen for their differing characteristics; Cihea is classified as a rural village, while Neglasari is classified as an urban village (Table 1) in terms of population density, percentage of agricultural households, certain urban facilities, and access to infrastructures such as roads, formal education facilities and public health facilities (scored 1 to 10), while rural villages do not meet such requirements (Clasification of Urban and Rural in Indonesia, 2010).

Neglasari village is in Bandung regency, adjacent to the capital of West Java Province, Bandung city. As an urban village, Neglasari is more integrated and populated than Cihea. The community in Neglasari village has easy access to nearby villages and the closest market town of Majalaya district. Cihea village is situated in a mountainous area and is more isolated than

Neglasari village. Electricity is poorly provided, especially in public buildings and on the village's roads. However, one midwife practice and some health posts are present, while the closest community health center and clinic are in a neighboring village and could be reached within 30 minutes by motorbike.

Table 1
Profiles of villages surveyed.

	Rural village Cihea	Urban village Neglasari
Total area (ha)	2401	200.7
Number of households	2740	4133
Infrastructures and access		
Public transportation	Not available	Available
Quality of road	Poor (dirt)	Good (asphalt-covered)
Distance to capital city of Bandung (km)	60	29
Distance to hospital (km)	28	7.8
Available health care facilities within village	Midwife practice, health post	Health center, midwife practice, health post

The JKN can be used to receive healthcare services in a health center. However, no public hospital is available in either of the villages. If there is insufficient pharmaceuticals stock in the village health facilities—or if further medical treatment is needed—patients must travel to a public hospital in the city. Unlike a health center, a public hospital can manage surgical, obstetric emergencies, and in-patient treatment. However, a referral from a health center is necessary to use the JKN in a hospital. While no pharmacies are present in either of the villages, commercial drugs are available at many small retailers in Neglasari village. Major public health problems in these villages include dengue fever, diarrheal diseases, high blood pressure among elderly members, and stunted growth due to malnutrition among children. Although this study focused on the self-medication practices performed by laypeople rather than by professional healers, traditional healers seem to have a much less pronounced role in the studied villages than expected, and none of the respondents were healers.

2.2 Data collection and analysis

Information on demographic characteristics, history of perceived illness, the extent and type of herbs used in self-care, and factors associated with treatment option choice were collected using semi-structured interviews from 634 households: 317 in the rural village and 317 in the urban village. Each village consists of ten hamlets (a smaller administrative division). The data

were collected with permission from the village heads and each hamlet's authority. The households were chosen randomly by drawing a number assigned to each hamlet in the village, and one adult (over 15 years old living in the house) per household was selected at random.

The data were collected in March 2018 in Neglasari village and in July 2018 in Cihea village. Specimen collection and proper medicinal plant identification were completed in April 2020. A total of 10 Indonesian interviewers were recruited and trained on the data collection process to undertake the exercise. Before starting the interview, the research's nature and the purpose of the research were explained to obtain oral consent from each respondent. Interviews were conducted in Sundanese and Indonesian languages and transcribed in English by the first author, who is Indonesian and native Sundanese. In this study, medicinal plants/herbal medicines were defined as any plant or part of plants used to prepare remedies to treat illness and maintain health.

The medicinal plants cited by respondents were recorded by their vernacular names in Sundanese and/or Indonesian language. The plants were collected through guided tours in home gardens, allotment lands, and surrounding fields. Collected plants were identified by comparing their characteristics in the literature obtained from the *Flora Malesiana* and *Flora of China* available online at DAR (2020), BHL (2020), and eFlora (2020) as well as Thonner (1981) and Holttum (1950). Species that authors could not identify were vouchered and identified by the curators at Herbarium Bandungense (FIPIA) of the School of Life Sciences and Technology, Institut Teknologi Bandung (ITB), using the *Flora of Java* (Backer & Bakhuizen van den Brink Jr., 1963). The specimens were deposited at the Herbarium Bandungense (FIPIA). The *Plant Resources of South East Asia* database (PROSEA, 2020), which provides species' information as well as their English, Indonesian, and Sundanese names, was also used to verify the description and medicinal purposes of plants cited by respondents. The scientific names were updated according to Kew's database: Medicinal Plant Name Services (MPNS, 2020) and WCSP (2020).

SPSS version 11.0 statistical software was used for data entry and analysis to provide measures of frequency and association between variables.

3. Results

3.1 Herbal medicine use

Respondents, which used herbal medicine in the last six months, comprised 68% of total responses in both villages; 267 in rural village Cihea and 164 in urban village Neglasari. Lack of knowledge, difficulty in finding certain herbal medicine and preferred self-medication with OTC drugs were among the reasons cited by those who had not used herbal medicine in the last six months. The herbal medicine users cited a total of 102 species belonging to 43 families, out of which 62% were cited in the rural village and 38% in the urban village. Table 2 lists the top 50 with the most frequently cited in both villages being *Curcuma longa* (koneng). This was followed by *Zingiber officinale* (jahe), *Andrographis paniculata* (sambiloto), *Citrus*

aurantiifolia (jeruk mipis) and *Psidium guajava* (jambu batu) in the rural village. Whilst in the urban village, next to *C. longa* were *Momordica charantia* (paria), *Erythrina subumbrans* (dadap), *Anredera cordifolia* (binahong) and *Cymbopogon citratus* (sereh). The top five represents 37% and 24% of total citations in the rural and urban villages respectively. These plants were mostly planted around the houses or in allotment gardens, and only few can be found wild, including *Blumea balsamifera* (sembung), *Centella asiatica* (antan), *Crassocephalum crepidioides* (sintrong), *Acmella paniculata* (jotang), *Plantago major* (ki urat), *Lantana camara* (saliara) and *Zingiber zerumbet* (lampuyang). Small vendors in the villages sold some plants that were also commonly used as spices, including *C. longga*, *Z. officinale*, *C. aurantiifolia*, *C. citratus*, *Allium sativum* and *Allium cepa*.

Generally, the plants were used for multiple purposes. For example, *C. longa* was used to treat gastritis, irregular menstrual cycle, stomachache and post-partum healing. The much-cited herb, *A. cordifolia*, was cited in relation to eight different health uses: to treat fever, diabetes, pertussis, gout, irregular menstrual cycle, mouth ulcer, sprain, and wound healing. Among the different plant parts used, the leaves, solely or in mixtures with other plants, were most prominently used herbal medicine preparation (48%), followed by the fruits (12%) and rhizomes (10%). The most common preparation method was by decoction in water with or without heat.

3.2 Perceived illness

A total of 634 respondents participated in the survey: 317 from the rural village and 317 from the urban village. Table 3 presents the distribution of illness and the corresponding action taken to treat the illness. A total of 549 subjects in the study population reported having an illness episode during the six-month recall period preceding the interview date, accounting for 87% of total respondents. The result showed that the most frequently reported illnesses in both villages were fever, hypertension, gastritis and rheumatic diseases, such as arthritis and gout. While there were no statistically significant associations between morbidity and demographic attributes—including the area of residence, gender and age—a strong association was found with health insurance possession. Being insured was associated with high morbidity.

Table 2

The top fifty medicinal plants most commonly used by herbal medicine users in the last six months (n = 431).

Family	Species names	Collection no.	Local name	Part used	Number of citations		Purpose	Preparation/ application method
					Cihea	Neglasari		
<i>Zingiberaceae</i>	^{1C,N} <i>Curcuma longa</i> L.	RM 06/M	Koneng	Rhizome	39 25 15 11	62 20 9	Gastritis Irregular menstrual cycle Stomachache Post-partum healing	dc or sq/oi
<i>Zingiberaceae</i>	^{2C} <i>Zingiber officinale</i> Roscoe	RM 08/M	Jahe	Rhizome	31 18 10 2 7 8	7 5 3 1	Cough Cold Muscle sore Nauseous Stomachache Post-partum healing	dc or sq/oi
<i>Cucurbitaceae</i>	^{2N} <i>Momordica charantia</i> L.	RM 11/M	Paria	Leaf, fruit	1	57	Gout	dc/oi (leaf), nn/cs (fruit)
<i>Fabaceae</i>	^{3N} <i>Erythrina subumbrans</i> (Hassk.) Merr.	RM 20/M	Dadap	Leaf	2	30 7 5 2	Fever Stomachache Post-partum healing Typhoid	dc/oi
<i>Myrtaceae</i>	^{5C} <i>Psidium guajava</i> L.	RM 25/M	Jambu batu	Leaf Fruit	23 2	20	Diarrhea Dengue fever	dc/oi sq/oi
<i>Amaryllidaceae</i>	<i>Allium sativum</i> L.	RM 22/M	Bawang bodas	Bulb sap Leaf	15 3	19 6	Hypertension Ulcer Acne	dc/oi nn/ta
<i>Acanthaceae</i>	^{3C} <i>Andrographis paniculata</i> (Burm.f.) Nees	RM 37/C	Sambiloto	Leaf, stem	19 9 7 3 1	3	Fever Urinary disease Asthma Lack of appetite Diabetes	dc/oi
<i>Amaryllidaceae</i>	<i>Allium cepa</i> L.	RM10/M	Bawang beureum	Bulb	22	17	Fever	sq/ta
<i>Poaceae</i>	^{5N} <i>Cymbopogon citratus</i> (DC.) Stapf	RM 01/M	Sereh	Roots	9	14 9 4	Toothache Itchy skin Bad body odor	pd/gg nn/hb
<i>Basellaceae</i>	^N <i>Anredera cordifolia</i> (Ten.) Steenis ⁴	RM 03/M	Binahong	Leaf	2	13 6 3 1 1 4 2 2	Fever Gout Cough Irregular menstrual cycle Diabetes Mouth ulcer Wound Sprain	dc/oi or nn/cw pd/gg pd/ta
<i>Piperaceae</i>	<i>Piper betle</i> L.	RM 02/M	Seureuh	Leaf	12 4	10 4	Vaginal discharge Post-partum healing Bad breath	dc/ws dc/oi
<i>Rutaceae</i>	^{4C} <i>Citrus × aurantiifolia</i> (Christm.) Swingle	RM 07/C	Jeruk mipis	Fruit	12 5 4 2 3	2	Cough Sore throat Cold Stamina Post-partum healing	sq/oi sq/ta
<i>Caricaceae</i>	<i>Carica papaya</i> L.	RM 13/M	Gedang	Leaf	5 3 1	9 4 3	Arthritis Joint pain Hypertension	dc/oi or cs
<i>Crassulaceae</i>	<i>Kalanchoe pinnata</i> (Lam.) Pers.	RM 09/M	Cocor bebek	Leaf	6	11 5 2	Fever Toothache Wound	pd/ta

(continues on next page)

Table 2 (continued)

Family	Species names	Collection no.	Local name	Part used	Number of citations		Purpose	Preparation/ application method
					Cihea	Neglasari		
Lamiaceae	<i>Orithosphon aristatus</i> (Blume) Miq.	RM 33/C	Kumis ucing	Leaf	8	5	Genito-urinary (bladder, cystitis)	dc/oi
					4		Muscle sore	
					3	2	Hypertension	
					1		Back pain	
					1		Gout	
Apiaceae	<i>Apium graveolens</i> L.	RM 12/M	Saledri	Whole part	7	8	Hypertension	dc/oi
						6	Headache	
					2		Muscle sore	
Menispermaceae	<i>Tinospora crispa</i> (L.) Hook. f. & Thomson	RM 31/C	Bratawali	Stem	11	2	Lack of appetite	dc/oi
					6		Fever	
					3		Diabetes	
					1		Genito-urinary (bladder, cystitis)	
Phyllanthaceae	<i>Breynia androgyna</i> (L.) Chakrab. & N.P.Balakr	RM 26/M	Katuk	Leaf	8	3	Stimulate breast milk production	dc/oi or co/cs
					6	3	Post-partum healing	
						2	Fever	
Annonaceae	<i>Annona muricata</i> L.	RM 16/M	Sirsak	Leaf	5	4	Sore throat	dc/oi
					3	2	Hypertension	
					2		Back pain	
						2	Prostate problems	
Lamiaceae	<i>Plectranthus scutellarioides</i> (L.) R.Br.	RM 30/C	Jawer kotok	Leaf	5		Constipation	dc/oi
					4		Itchy skin	
					4		Hemorrhoids	
					2		Post-partum healing	
Fabaceae	<i>Abrus precatorius</i> L.	RM 29/M	Saga	Leaf	14	1	Mouth ulcer	nn/cw
Malvaceae	<i>Abelmoschus manihot</i> (L.) Medik.	RM 34/C	Gedi	Leaf	10		Back pain	dc/oi
					4		Indigestion	
					1		Hypertension	
Fabaceae	<i>Leucaena leucocephala</i> (Lam.) de Wit	RM 04/M	Lam toro	Seed		5	Diabetes	rs, dc/oi
				Leaf		5	Wound	
						4	Edema	
Asteraceae	<i>Gynura divaricata</i> (L.) DC.	RM 05/M	Dewa	Leaf		8	Hypertension	dc/oi
					1	5	Genito-urinary (bladder, cystitis)	
Asteraceae	<i>Blumea balsamifera</i> (L.) DC.	RM 32/C	Sembung	Leaf	13		Fever	dc/oi
Cucurbitaceae	<i>Cucumis sativus</i> L.	RM 19/M	Bonteng	Fruit	6	4	Hypertension	nn/cs
Malvaceae	<i>Hibiscus rosa-sinensis</i> L.	RM 43/C	Wera	Flower, roots	6		Wet cough	mc or dc/oi
					3		Fever	
Oxalidaceae	<i>Averrhoa bilimbi</i> L.	RM 17/M	Calincing	Fruit		9	Hypertension	sq/oi
Meliaceae	<i>Aglaia odorata</i> Lour.	RM 14/M	Pacar cina	Leaf, flower		2	Hemorrhage	dc/oi
						1	Diarrhea	
						1	Bloated	
						1	Headache	
						1	Cough	
						1	Bruises	
						1	Ulcer	
Myrtaceae	<i>Syzygium aromaticum</i> (L.) Merr. & L.M.Perry	RM 35/C	Cengkeh	Flower	8		Toothache	dc/oi
Apiaceae	<i>Centella asiatica</i> (L.) Urb.	RM 42/C	Antanan	Leaf	3		Fever	dc/oi or nn/cs
					1		Arthritis	
					1		Anemia	
					1		Hypertension	
					1		Genito-urinary, (bladder, cystitis)	

(continues on next page)

Table 2 (continued)

Family	Species names	Collection no.	Local name	Part used	Number of citations		Purpose	Preparation/ application method
					Cihea	Neglasari		
<i>Myrtaceae</i>	<i>Syzygium polyanthum</i> (Wight) Walp.	RM 36/C	Salam	Leaf	4 2	1	Gastritis High cholesterol	dc/oi
<i>Zingiberaceae</i>	<i>Kaempferia galanga</i> L.	RM 53/N	Cikur	Rhizome	3 1	3	Cough Stomachache	sq/oi
<i>Euphorbiaceae</i>	<i>Manihot esculenta</i> Crantz	RM 62/N	Sampeu	Tuber	3	2 1	Gastritis Mouth ulcer	sq/oi
<i>Moringaceae</i>	<i>Moringa oleifera</i> Lam.	RM 28/M	Kelor	Root	2	3 1	Toothache Headache	pd/ta
<i>Piperaceae</i>	<i>Piper retrofractum</i> Vahl	RH 91/S	Cabe jawa	Fruit	3		Blood circulation problem	dc/oi
						2 1	Cough Asthma	
<i>Muntingiaceae</i>	<i>Muntingia calabura</i> L.	RM 79/R	Kersen	Leaf	6		High cholesterol	dc/oi
<i>Rubiaceae</i>	<i>Morinda citrifolia</i> L.	RM 47/C	Cangkudu	Fruit	6		Hypertension	sq/oi
<i>Arecaceae</i>	<i>Arenga pinnata</i> (Wurmb) Merr.	RM 38/C	Aren	Sap	5		Gout	nn/ta
<i>Moraceae</i>	<i>Artocarpus heterophyllus</i> Lam.	RM 23/M	Nangka	Leaf		3 1 1	Fever Cold Stimulate breast milk production	dc/oi
<i>Oxalidaceae</i>	<i>Averrhoa carambola</i> L.	RH 99/S	Balingbing	Fruit		4 1	Hypertension Headache	sq/oi
<i>Pandanaceae</i>	<i>Pandanus amaryllifolius</i> Roxb. ex Lindl	RM 59/C	Pandan	Leaf	2 1 1 1		Hypertension Muscle sore Diabetes Lack of appetite	dc/oi
<i>Piperaceae</i>	<i>Piper sarmentosum</i> Roxb.	RM 58/C	Karuk	Leaf	2 2 1		Cough Eye-care Vaginal discharge	dc/oi dc/ws dc/ws
<i>Piperaceae</i>	<i>Piper nigrum</i> L.	RH 92/S	Pedes	Fruit	1 2	2	Blood circulation problem Cough	dc/oi
<i>Zingiberaceae</i>	<i>Alpinia galanga</i> (L.) Willd.	RM 39/M	Langkoas/laja	Rhizome	2	3	Joint pain	pd/ta
<i>Asteraceae</i>	<i>Acmella paniculata</i> (Wall. ex DC.) R.K.Jansen	RM 63/N	Jotang	Flower	4		Toothache	dc/oi or cs
<i>Asteraceae</i>	<i>Crassocephalum crepidioides</i> (Benth.) S.Moore	RH 81/S	Sintrong	Leaf	3 1		Hypertension Shiver	nn/cs
<i>Verbenaceae</i>	<i>Lantana camara</i> L.	RM 60/N	Saliara	Root, leaf	2 2		Hypertension Gastritis	dc/oi
<i>Zingiberaceae</i>	<i>Curcuma zedoaria</i> (Christm.) Roscoe	RM 55/N	Koneng bodas	Rhizome	3 1		Gastritis Lack of appetite	dc or sq/oi
<i>Zingiberaceae</i>	<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	RM 69/S	Lampuyang	Rhizome	2 2		Hypertension Gastritis	dc or sq/oi

Notes: preparation method—dc: decocting (in water, with or without heat); ht: heating (not in water); mc: macerating; nn: none; pd: pounding; rs: roasting; sq: squeezing (not heated, with or without water), and for application method—co: consume; cw: chew; gg: gargle; hb: hot bath oi: oral ingestion; ta: topical application; ws: washing with water in which the plant is admixed; *directly used as fracture's support, **fold then directly stuffed into nose. ^{1,2,3,4,5}Rank of top five most frequently used plants in each village: ^CCihea, ^NNeglasari.

3.3 Treatment-seeking options

As shown in Table 3, 98.6% (541) of respondents who reported perceived illness took steps to treat the illness. Among them, 39.9% of them used herbal medicine, 40.8% self-medicated with over-the-counter (OTC) drugs and 17.9% went to a modern healthcare facility. Respondents mostly visited health centers, clinics and midwife practices, with visitation purpose including hypertension, gastritis, fever, toothache, vaccination for infants and regular checks for contraception patients (family planning program).

Table 3

The types of action taken by those with a perceived illness within a six-month recall period in the study sample.

Category	Sample size (%)				Total ill
	Visited modern health facilities	Self-medicated with OTC-drugs	Self-medicated with medicinal plants	No action	
Residence					
Cihea (rural village)	46 (16.4)	108 (38.6)	123 (43.9)	3 (1.1)	280 (51.0)
Neglasari (urban village)	52 (19.3)	116 (43.1)	96 (35.7)	5 (1.9)	269 (49.0)
Gender					
Male	33 (15.8)	84 (40.2)	88 (42.1)	4 (1.9)	209 (38.1)
Female	65 (19.1)	140 (41.2)	131 (38.5)	4 (1.2)	340 (61.9)
Age group (years)					
≤20	12 (33.3)	15 (41.7)	9 (25.0)	0 0	36 (6.6)
21-39	33 (14.1)	117 (50.0)	77 (32.9)	7 (3.0)	234 (42.6)
≥40	53 (19.0)	92 (33.0)	133 (47.7)	1 (0.4)	279 (50.8)
Occupation					
Domestic	47 (17.8)	106 (40.2)	110 (41.7)	1 (0.4)	264 (48.1)
Informal sector	36 (16.7)	82 (38.1)	93 (43.3)	4 (1.9)	215 (39.2)
Formal sector	9 (24.3)	20 (54.1)	7 (18.9)	1 (2.7)	37 (6.7)
Student	4 (25.0)	10 (62.5)	2 (12.5)	0 0	16 (2.9)
Unemployed	2 (11.8)	6 (35.3)	7 (41.2)	2 (11.8)	17 (3.1)
Education level					
Primary or lower	53 (16.9)	114 (36.4)	144 (46.0)	2 (0.6)	313 (57.0)
Secondary	26 (18.2)	69 (48.3)	46 (32.2)	2 (1.4)	143 (26.0)
Post-secondary	19 (20.4)	41 (44.1)	29 (31.2)	4 (4.3)	93 (16.9)
JKN subscription					
Yes	75 (19.1)	165 (42.0)	147 (37.4)	6 (1.5)	393 (71.6)
No	23 (14.7)	59 (37.8)	72 (46.2)	2 (1.3)	156 (28.4)

Table 4

A comparison of subgroups of respondents who used medicinal plants to treat illness in the study sample.

Category	Number of ill respondents	Self-medicated with medicinal plants (%)	Chi ² value	df	p-value
Residence			3.8857	1	0.0487
Cihea (rural village)	280	43.9			
Neglasari (urban village)	269	35.7			
Gender			0.6902	1	n.s.
Male	209	42.1			
Female	340	38.5			
Age group (years)			15.1321	2	0.0005
≤20	36	25.0			
21-39	234	32.9			
≥40	279	47.7			
Education level			11.3803	2	0.0034
Primary or lower	313	46.0			
Secondary	143	32.2			
Post-secondary	93	31.2			
Occupation			13.1673	4	0.0105
Domestic	264	41.7			
Informal sector	215	43.3			
Formal sector	37	18.9			
Student	16	12.5			
Unemployed	17	41.2			
JKN subscription			3.5651	1	n.s.
Yes	393	37.4			
No	156	46.2			

n.s., not significant ($p > .05$)

The proportion of those with a perceived illness that used herbal medicine to treat the illness was compared between subgroups (e.g., among the area of residence, different ages, and genders) using chi-square tests (Table 4). Herbal medicine use varies significantly between the rural village of Cihea and urban villages of Neglasari ($p < 0.05$). The further isolated community of Cihea has significantly more herbal medicine users when compared with the community of Neglasari. No statistically significant difference was observed between females and males ($p > 0.05$). There was a significant association between age and herbal medicine use ($p < 0.001$). Those aged 40 and older were more likely than younger people to use herbal medicine. Occupation ($p < 0.05$) and education level ($p < 0.001$) were also significantly

associated with herbal medicine use. The tendency to use herbal medicine was high among informal workers and those with primary-level education or below.

There was no significant difference between insured and uninsured group ($p > 0.05$). The prevalence of herbal medicine use among the insured was 70.3 %. Among those with a perceived illness, 34.2% of the insured group chose herbal medicine as their first therapeutic itinerary. When asked why they used herbal medicine as their first choice, most of them answered that they believed herbal medicine to be more efficacious and safer than pharmaceutical drugs. This followed by dissatisfaction toward the services within the JKN, particularly related to referral procedure, uncertain availability and negative perception of the enlisted drug. Other reasons cited included those medicinal plants were readily available and knowledge about how to prepare the remedies.

4. Discussion

4.1. Herbal medicine use

This study shows that herbal medicine use is common in the study population, as over half of them used it in the previous six months to treat illness and maintain health. Prior research in other rural areas in Indonesia also noted the variety of medicinal plants used by local communities (Rahayu et al., 2006; Silalahi et al., 2015; Zumsteg & Weckerle, 2007). However, the number of medicinal plants used in this study is less than those reported by Roosita et al. (2008), who recorded 117 species from Sundanese communities in Sukajadi village in Bogor of West Java. This may be because, in the Sukajadi village study, the medicinal plant inventory was based on traditional healers' knowledge, who are considered specialists regarding medicinal plants, while our study focused on laypeople's knowledge.

The reliance of Sundanese on herbal medicines to promote good health is seen mostly in their habit of consuming freshly picked leaves of certain plants or herbs as a salad (*lalab*) in their daily meals. Leaves were indeed the most frequently used plant part in herbal medicine preparation in this study. This tendency was also observed in previous ethnobotanical surveys among ethnic communities of Talang Mamak and orang Melayu (Mahyar et al., 1991) and Kaban Jahe (Silalahi et al., 2015) in Sumatra island of Indonesia. However, while both villages use various plants for medicinal purposes, their usages disproportionally slant towards the top five plants. This tendency can be interpreted as a decline in medicinal plant usage or knowledge, as other studies have shown (Meretika et al., 2010; Voeks & Leony, 2004).

Although the respondents recognize that some remedies involve mixtures of plant species, which is the very definition of *jamu*, most of them use the species solely to treat a specific illness. Only a few respondents mentioned using multiple plants to prepare remedies. For example, they described two concoctions to treat hypertension: decoction of garlic (*A. sativum*) and celery leaves (*Apium graveolens*) mixture and infusion of *Gynura divaricata* leaves in *Morinda citrifolia* juice. A mixture of leaves from *Syzygium polyanthum* and *Muntingia calabura* was mentioned as a remedy for diabetes and high cholesterol. The preparation of

some remedies also involves minerals: i.e., salt was mixed with *C. longa* extract to treat stomachache and a mixture of lime paste (CaCO_3) and *C. aurantiifolia* juice was used topically on the stomach area for post-partum healing. The tendency to use single plant remedies appears general among the laypeople of Sundanese communities (Nisfiyanti, 2012; Permana, 2009). This trend differs from the herbal practice among Javanese in the Central Java region, where multiple plant use remedies—*jamu*—are more frequent. In the Javanese herbal practice, where the concept of *jamu* was first introduced, the number of plant species used for a particular kind of *jamu* usually ranges from five to 10 species (Torri, 2016).

4.2. Factors associated with treatment-seeking options

Morbidity pattern

Different from previous studies (Allabi et al., 2011; Gedif & Hahn, 2003) in this study, the associations between morbidity and demographics attributes—including the area of residence, gender, and age—were not statistically significant. This could be due to morbidity patterns also being influenced by non-demographic factors such as genetics, lifestyle patterns, environmental considerations and structural factors (e.g., access to healthcare) (McGinnis et al., 2002; Thomas, 2016). Environmental factors, such as household sanitation, toilet facilities, and disposal systems were among significant morbidity causes in Indonesia (Dinarta & Purhadi, 2013). It is worth noting that the burden of illness was less pronounced among the uninsured than the insured, which is likely due to people with better health status (healthier) being less likely to be enrolled in the JKN than those who are ill. Those who meet income and other eligibility standards may not feel the need to voluntarily enroll if they do not have unmet healthcare needs.

Factors associated with herbal medicine use

The study showed that respondents chose self-medication as their first treatment option for illness, using herbal medicine in the rural village (39.9%) and OTC-drug in the urban village (40.8%). Together, this reveals the high incidence of self-medication in both communities. These results are consistent with other studies on herbal medicine used in self-care, which found that most patients' first treatment choice was self-medication with modern or traditional medicine (Allabi et al., 2011). Herbal medicine use prevalence rates in this study were similar to that of the national households' survey, which reported 38.3% and 30.4% traditional medicine use in Indonesia in 2007 and 2013, respectively (Nurhayati & Widowati, 2017; Sudibyo & Andi, 2010).

In line with previous studies (Bishop and Lewith, 2010; Peltzer et al., 2016), this study found that sociodemographic factors (rural residence, older age, primary education level and being in an informal sector) were associated with herbal medicine use. This study confirms earlier findings regarding high use of herbal medicine among rural residences (Delgoda et al., 2004; Jennifer & Saptutyningsih, 2015). It is commonly reported that a lack of transportation

facilities and economic resources needed to access medical assistance is a primary reason for the frequent herbal medicine use in rural areas (Weckmüller et al., 2019). However, this does not entirely apply to the rural community in this study. Although the village has a poor road with no public transportation, primary healthcare is available. It is possible that the high prevalence of herbal medicine use is due to the presence of community participation centering on herbal medicine in the rural village, which was not observed in the urban village. This community-based activity focuses on implementation of government programs to promote the utilization of home garden or allotment land as media for the cultivation of medicinal plants for primary healthcare needs (Hikmat et al., 2011; Suryana & Iskandar, 2014).

Several studies found that being female was associated with traditional medicine (Bishop & Lewith, 2010; Peltzer et al., 2016), but this study did not find any association. Insignificant differences between genders in traditional medicine use were also found in a study in Malaysia, a country with cultural similarities with Indonesia (Hasan et al., 2009). Notably, education and occupation had a significant association with herbal medicine use. In this regard, we found high use of herbal medicine among informal workers and those with low education. The National Socio-Economic Surveys has been consistently reporting that education and occupation were the main factors seemingly influencing self-medication with herbal medicine in Indonesia (Sudibyo & Andi, 2010).

4.3. Influence of health insurance subscription on herbal medicine use

It is widely believed that the presence of healthcare services reduces the prevalence of herbal medicine use. In the context of the Indonesian UHC system, we expected that the insured would be less likely to use herbal medicine than the uninsured. However, this study's result does not clearly show the relationship between herbal medicine use and health insurance status. This trend may be due to healthcare-seeking behaviors being influenced by cultural and organizational factors (Grundy & Annear, 2010; Shaikh & Hatcher, 2005). The majority of the insured indicated that they consider medicinal plants to be safe and effective. This is not different from an increasing number of people from other parts of the world that report using medicinal plants because they feel they are free from side-effects (Ramzan et al., 2017).

This result could also suggest a possible uniform behavior toward modern medicine, since visiting healthcare facilities was not preferable by both insured and uninsured groups. This indicates that health insurance under the UHC has not effectively increased healthcare service utilization as intended. The JKN subscribers in this study hesitated to use their insurance in getting medical care. Most of them mentioned that the JKN referral system was one of the main reasons for their reluctance to visit health facilities when facing illness. Complaints regarding the three-tier referral system have also been repeatedly reported, mainly due to its rigid mechanism that decreases health-care facility choice flexibility and reduces employee productivity while increasing costs and health risks (Handayani et al., 2018). These are also among the reasons why informal workers hesitate to self-enroll in the JKN (Dartanto et al.,

2016a; Kartika, 2015) and might contribute to the high prevalence of herbal medicine use in treating illness among informal workers in this study.

The findings do not clearly illustrate the relationship between health insurance status and herbal medicine use or treatment-seeking behavior. However, we could not entirely reject the assumption that the UHC system increases access to healthcare facilities, as highlighted by a previous study (Rolindrawan, 2015) and observed in both of the rural villages in this study. Although health insurance status may not fully explain healthcare services' influence, it represents access to use health services in the context of UHC implementation. Thus, it is safe to suggest that the presence of a healthcare service is not a critical determining factor for treatment-seeking and may have less of an impact on the pervasive practice of herbal medicine use in a rural area. This finding supports the health policy discourse focus on expanding the coverage of the UHC system for traditional medicine practice in Indonesia. The high prevalence of herbal medicine use also indicates the necessities of health departments and governments across the region to consider and familiarize themselves with the current role of herbal medicine and its future possibilities within the broader healthcare system.

One of the limitations of this study is the short-time fieldwork, as pertains to many survey-based quantitative studies (Kelley et al., 2003). Consequently, an in-depth study to examine people's attitudes towards herbal medicine use versus utilization of modern healthcare would be a logical follow-up of this study. Another limitation of this study is the lack of information on commercial or labeled herbal medicine use made by the industry because individuals living in the city—who are likely to use industrial herbal medicine—were not the target population. This study attempted to highlight herbal medicine use among the rural population. Although the survey was limited to only two sites, we believe that the results sufficiently represent laypeople's current herbal practices in rural West Java but may not be necessarily generalizable to other populations in Indonesia. Therefore, replication of this research based on a case study in other regions is advisable to elucidate a more comprehensive dynamic in parallel healthcare system use by minority communities in Indonesia.

5. Conclusion and recommendations

Herbal medicine use remains a significant part of healthcare for rural communities in the West Java area under the current universal healthcare system. Herbal medicine use was associated with the area of residence, age, education level and occupation of residents while being unassociated with gender and health insurance status. This study underlines, that even when modern healthcare services become more physically available in a rural area, people do not necessarily make exclusive use of this system, thereby abandoning healthcare based on traditional plant knowledge. Herbal medicine is not only a necessity but also a deeply rooted cultural preference. Given the frequent use of herbal medicine, the potential risks and benefits of herbal medicine should become a major focus within the national public health agenda of Indonesia. At the same time, to increase the utilization of the JKN, efforts toward increasing access to modern health facilities in rural areas should be accompanied by increasing efforts to

provide well-planned services that include appropriate work schedules for rural populations and health education on contemporary medical services.

CHAPTER 4. PREDICTORS OF THE USE OF TRADITIONAL MEDICINES IN THE UNIVERSAL HEALTH COVERAGE SYSTEM IN INDONESIA

Chapter 4 addresses the second research question on “*Possible predictors of traditional health care use: Why local communities use TM when modern healthcare under UHC system becomes available?*”. This chapter examines factors predicting the likelihood of using TM, which might account for the pervasive use among the rural and urban community in the UHC system in Indonesia by considering the predisposing, enabling, and need factors. A semi-structured questionnaire was administered in addition to an in-depth interview.

Abstract

Background: Indonesia has committed to achieving Universal Health Coverage (UHC) and introduced national health insurance (JKN) to meet that commitment. Despite the increasing availability of healthcare services under the JKN scheme, traditional medicine (TM) continues to be a significant part of healthcare for Indonesians. In the context of the UHC system, this study aims to examine the predictors of TM use among urban and rural communities in Indonesia.

Methods: A cross-sectional survey was conducted using a semi-structured questionnaire targeting urban and rural communities. A total of 926 households were randomly selected to participate in the survey. Multivariate logistic regression analysis was used to identify the significant predictors of TM use.

Results: Multivariate analysis revealed the following variables to be predictive of TM use, namely, rural residence, being more educated, experiencing some health problem, demonstrating ethnomedical knowledge, having a favourable opinion about the safety and efficacy of TM, and holistic orientation to health. On the other hand, working in the formal sector was associated with lower odds of using TM than those employed in the informal sector.

Conclusion: People’s experience, personal attributes, and attitude towards TM, rather than dissatisfaction with healthcare service, predicted the likelihood of using TM in the UHC system in Indonesia. This finding also implies the underutilisation of JKN services by the insured TM users living in rural areas. Considering the community’s strong preferences for TM, this paper argues that its inclusion in the JKN system may increase the utilisation of the JKN service.

1. Introduction

The use of traditional medicine (TM) in primary health care has been endorsed to compensate for the insufficient penetration of biomedicine, especially in remote or marginalized areas in developing countries (WHO, 1978). On the other hand, global economic growth and international initiatives have greatly promoted advances in medicine and increased the availability of biomedicine. Particularly in the last two decades, commitment to universal health coverage (UHC) has generated intense global action to provide biomedicine-based healthcare services (WHO, 2013a). Indonesia has launched a national insurance scheme within the UHC framework called the *Jaminan Kesehatan Nasional* (JKN, National Health Insurance). Currently, nearly 223 million Indonesians are members of the JKN, which accounts for 82.4% of the total population (Kasumaningrum, 2019). With an average of 400,000 visitations in a year, healthcare service utilization has increased by 77.8% in two years since it was launched (BPJS Health, 2019).

Indonesia has a history of reliance on various forms of TM (Amar, 2010; Elfahmi et al., 2014; Jennifer & Saptutyningasih, 2015; Pengpid & Peltzer, 2018; Sudibyo & Andi, 2010), including diverse health practices, approaches, knowledge, and beliefs. These incorporate plants, animals, and/or mineral-based medicines, spiritual therapies, manual techniques, and exercises applied singly or in combination to maintain well-being and prevent diagnosis or treat illness (WHO, 2000). Despite the increasing provision of healthcare services under the UHC, TM continues to be a significant aspect of healthcare for Indonesians. A recent national survey reported that 44.3% of households in Indonesia utilized TM, 79.8% used herbal remedies, and 69.3% used forms of manual treatment, including spiritual healing (MoH RI, 2018a). While self-made and self-applied healing techniques are common, TM products and services are also commercially available. In 2018, 31.4% of Indonesian households used the paid services of TM, 44.3% of households utilized TM, and 48% bought commercial/ready-made herbal medicines (MoH RI, 2020).

When faced with the pervasive use of TM and the fact that people seem willing to pay for these products and services even though they were covered by health insurance, one asks, what are the factors underlying a person's decision to use TM? Various explanations and motivations have been proposed to explain the use of TM. According to the behavioural model, the use of healthcare is a function of population characteristics categorized into three types of factors; predisposing, enabling, and need (Aday & Andersen, 2005). In the context of TM use, predisposing factors may include demographic factors (female gender, old age (Bishop & Lewith, 2010; Hughes et al., 2013; Pengpid & Peltzer, 2018), ethnicity (Aziz & Tey, 2009; Kuo et al., 2004; Trotter, 1981), psychosocial factors (cultural attitudes, belief system (Astin, 1998; Gyasi et al., 2016; Hollenberg et al., 2013; Sato & Costa-i-Font, 2012), perceived efficacy, side effects and quality of TM (Clement et al., 2007)(Gyasi et al., 2011). Examples of enabling factors include socio-economic factors, such as education, income, the nature of the occupation, urban or rural residence, and insurance status (Allabi et al., 2011; Gyasi et al., 2018; Peltzer et al., 2016; Pengpid & Peltzer, 2018; Picking et al., 2011). Need factors may

include health-related factors (chronic disease, poor physical and mental health (Astin, 1998; James et al., 2019; Kelner & Wellman, 1997; Liebert, 1998; Wiles & Rosenberg, 2001), inadequate health care access (Wilson et al., 2012) and issues of satisfaction with conventional treatment (Furnham & Kirkcaldy, 1996; McGregor & Peay, 1996; Vincent & Furnham, 1996).

At present, in the context of the UHC system in Indonesia, there is a lack of comprehensive analysis of the correlations among the factors relevant to TM use. Accordingly, considering the predisposing, enabling, and need factors, this study aims to examine factors predicting the likelihood of using TM, which might account for the pervasive use of TM among the rural and urban communities in the UHC system in Indonesia.

2. Methods

2.1 Study location and data collection

We conducted a cross-sectional household survey covering both rural and urban areas in the province of West Java on Java Island, where the central government is located. Economically, it is the most developed area in Indonesia. Consequently, the healthcare services and facilities are more widespread than on other islands of Indonesia. The ratio of JKN subscribers in West Java reached 84% of the total population in 2019, which placed it among the regions with the largest number of subscribers (Kasumaningrum, 2019). At the same time, West Java is also one of the top four provinces with the most TM users (MoH RI, 2010b). West Java was selected deliberately because the region seems to provide ambivalent conditions for choosing health care methods. While there is sufficient provision of healthcare services and a high number of JKN subscribers, there is also a high prevalence of TM users. Thus, it provides an ideal environment in which to identify the determinants for the use of TM when access to healthcare service within the UHC system is more easily available than elsewhere.

Several rural and urban areas in the region were selected to represent various geographical, demographic, and socioeconomic situations in the region. The data were collected during eight months spread over 2018 and 2019. A total of 926 households, 473 in the rural areas and 453 in the urban areas, were selected to be included in the household survey with the necessary permission from the local authority. The households were chosen randomly by drawing a number assigned to each hamlet in the district or village. One adult member (over 15 years old) from each household was selected at random and interviewed using a semi-structured questionnaire to gather information on socio-demographic characteristics, health problems, healthcare service access, and satisfaction level with healthcare service. The participants were asked about their knowledge of medicinal plants, perceived efficacy and safety of TM compared to conventional medicine, their belief, and philosophical view of health. In-depth interviews were subsequently conducted with survey participants who agreed to be further interviewed to elaborate on their answers to the questionnaire. Sixteen Indonesian interviewers were recruited and trained by the first author on the data collection process to undertake the exercise. Before starting the interview, the nature and purpose of the research were explained, and then verbal consent from each respondent was obtained. Interviews were conducted in

Sundanese and Indonesian languages and transcribed into English by the first author, an Indonesian and a native Sundanese.

In this study context, the term ‘traditional medicine’ (TM) was used interchangeably with traditional healthcare and included unconventional medicines/treatments commonly practiced in Indonesia. TM used by the study population included products and services, both self-prepared/self-treated and commercially available. Following (MoH of Indonesia, 2013), TM used in this study was categorized based on the method applied: 1) herbal-based medicines (*jamu*) made by individual or industry (ready-made/instant), and 2) manual-technique-based treatment including practices involving the use of some tools (e.g., acupuncture, *bekam* (cupping), acupressure), without tools (e.g., massage, bone setting) and spiritual healing (e.g., *rukiah*, *dukun*/shaman/faith healer). The term conventional medicine (CM) was used interchangeably for conventional treatment and included biomedicine/ drug, healthcare service based on biomedicine.

2.2 Variables and statistical analysis

The dependent variable, TM use, was operationalised as the use in the past 12 months. The variable was a dichotomous measure coded as 0 (no use) and 1 (use). In the behavioural model of healthcare utilization (Aday & Andersen, 2005), it is assumed that people’s use of healthcare is a function of their predisposition to use (predisposing variables), factors that enable or impede use (enabling variables), and their need for care (need variables). Accordingly, independent variables of possible predictors of TM use in the context of this study were selected and categorized as follows:

1. Predisposing factors: age and sex (as demographic variables); ethnomedical knowledge, health belief, perceived efficacy, and safety of TM (as psychosocial variables)
2. Enabling factors: level of education, residential status, nature of the occupation, household income level, and JKN status (as socio-economic variables)
3. Need factors: health problem, a perceived problem in accessing healthcare service, and satisfaction level with healthcare service.

Independent variables were operationalized and coded as indicated in Table 1.

Data analysis was conducted using SPSS version 11.0 statistical software: descriptive statistics, frequency distributions, Chi-square analysis, and binary logistic regression analysis. Only factors found to be significant in Chi-square analysis were included in the logistic regression analysis table. The conventional $p < 0.05$ level was used to determine statistical significance.

Table 1
Operationalization and coding of independent variables

Independent Variable	Operational definition	Coding
Predisposing Factors		
Gender	Being male or female	0 = Male; 1= Female
Age	Number years of life	*0 = ≤ 20 ; 1= 21-39; 2= ≥ 40
Perception of TM quality	TM efficacy and safety are equal or better than conventional treatment	*0 = No; 1= Yes
Belief system	Perceived that health of body, mind, and spirit are related (holistic orientation)	*0 = No; 1= Yes
Ethnomedical knowledge	Demonstrated traditional knowledge of medicinal plants (the most widely used for TM in the study), which assessed through questions regarding the most frequently used medicinal plants and use purpose. The participants considered demonstrating ethnomedical knowledge if they cited at least one type of plant and its medicinal purpose.	*0 = No; 1= Yes
Enabling Factors		
Residence	Being rural or urban resident	*0 = Rural; 1= Urban
Education level	Highest level of education completed	*0 = Elementary or lower; 1= Secondary; 2 = High school; 3 = College or more
Occupation	Economic activity that generate income	*0 = Informal; 1= Formal; 2= Student; 3= Other
Household income	Income of household per month	0 = IDR 2000K or less; 1 = IDR 2100K-5000K; 2 =More than IDR 5K
National Health Insurance	Being insured by the JKN	*0 = No; 1= Yes
Need Factors		
Health problem	Experienced health problem during the previous 12 months.	*0 = No; 1= Yes
Problem of healthcare service access	Perceived access to healthcare to be a problem in their community.	*0 = No; 1= Yes
Satisfaction level with healthcare service	Defined as perceived by participants.	0 = Dissatisfied; 1= Somewhat dissatisfied; 2= Neither satisfied nor dissatisfied; 3= Somewhat satisfied; 4= Satisfied

* Reference group in multivariate analysis

3. Results

3.1 Socio-demographic characteristics

A total of 926 people participated in the study: 473 (51.1 %) from rural communities and 453 (48.9 %) from urban communities. The majority of participants were female (58.7 %), aged 40 years or over (55.8 %), and had an education of primary school level or lower (47.5%). Two-thirds of the total study population (636 participants) were covered by JKN. Most participants were engaged in the informal sector (82.5 %). Low-income participants (monthly incomes less than IDR 2000K (US\$140)) constituted 50.6 % of the sample. The majority of participants (85.3 %) had experienced health problems during the preceding 12 months. The most frequently reported illnesses were fever, hypertension, gastritis, and rheumatic diseases. Most participants (79.5%) did not perceive that any problem existed with access to healthcare services. In response to the question regarding the degree of satisfaction with healthcare services, most participants (71.2 %) said they were ‘neither satisfied nor dissatisfied’, followed by ‘somewhat satisfied’ (17.8 %) and ‘somewhat dissatisfied’ (9.3 %).

3.2 Knowledge, perception, and attitude related to TM practice

Participants, who used some form of TM in the previous year, comprised 69.8 % (646) of the total number of respondents. Overall, the majority of individuals had a positive perception of the efficacy and safety of TM. TM safety and efficacy were perceived equal or better compared to CM by 73.3 % (679) of participants. Most participants (72.7 %) held a holistic view of health (“the health of my body, mind, and spirit are related”).

The most used four TM categories were homemade herbal medicines – which included single-ingredient and mixture concoctions/jamu (55.7 %), massage (14.8 %), industrial (instant) herbal medicines – including jamu and supplements (12.3 %); and the bone-setters (7.5 %). The majority of participants (82.1 %) demonstrated knowledge of traditional herbal medicine (i.e., knowing at least one medicinal plant and its medicinal purpose), with the most frequently cited being *Curcuma longa* (koneng), *Zingiber officinale* (jahe), *Momordica charantia* (paria), *Erythrina subumbrans* (dadap) and *Psidium guajava* (jambu batu), and decoction prepared by the most commonly used method. Of 39 cited health problems treated with TM, the most frequently cited were digestion related problems (13.5 %), headaches and common cold (both 12.7 %), cough (8.9 %), muscle-related problems (7.7 %), fever and toothache (5.4 %), and hypertension (4.6 %).

3.3 Associates and predictors of TM use in bivariate and multivariate analyses

Table 2 shows the results of bivariate and chi-square analyses of TM use and each of the predisposing, enabling, and need factors. A statistically significant response was found for most variables. TM use was associated with age (40 years and older), favourable perception of TM safety and efficacy, holistic orientation to health, having ethnomedical knowledge, area of residence (rural), education (low), occupation (informal), health insurance status (enrolled), having experienced health problem during the preceding one year, and access to healthcare service not perceived as a problem. Gender ($p= 0.943$), household income ($p= 0.369$), and satisfaction level ($p= 0.832$) with healthcare service were not statistically significant indicators of TM use. Thus, they were not included in the subsequent multivariate analysis.

Table 2. Characteristic of participants by traditional medicines use status (n = 926).

Category	Sample size (%)						p value
	Non-User TM		User TM		Total		
Predisposing Factors							
<i>Demographic factors</i>							
Gender							
Male	116	(30.4)	266	(69.9)	382	(41.3)	0.943
Female	164	(30.1)	380	(69.9)	544	(58.7)	> .05
Age group (years)							
≤20	32	(40.5)	47	(59.5)	79	(8.5)	< .001*
21-39	122	(37.0)	208	(63.0)	330	(35.6)	
≥40	126	(24.0)	391	(75.6)	517	(55.8)	
<i>Psychosocial factors</i>							
Believe TM efficacy and safety							
No	148	(59.9)	99	(40.1)	247	(26.7)	< .001*
Yes	132	(19.4)	547	(80.6)	679	(73.3)	
Holistic orientation of health							
No	199	(78.7)	54	(21.3)	253	(27.3)	< .001*
Yes	81	(12.0)	592	(88.0)	673	(72.7)	
Ethnomedical knowledge							
No	135	(81.3)	31	(18.7)	166	(17.9)	< .001*
Yes	145	(19.1)	615	(80.9)	760	(82.1)	

Enabling Factors						
<i>Socioeconomic factors</i>						
Residence						
Rural	88	(18.6)	385	(81.4)	473	(51.1)
Urban	192	(42.4)	261	(57.6)	453	(48.9)
						< .001*
Education						
Elementary or lower	103	(23.4)	337	(76.6)	440	(47.5)
Secondary	86	(39.1)	134	(60.9)	220	(23.8)
High school	80	(38.6)	127	(61.4)	207	(22.4)
College or more	11	(18.6)	48	(81.4)	59	(6.4)
						< .001*
Occupation						
Informal sector	215	(28.1)	549	(71.9)	764	(82.5)
Formal sector	24	(36.9)	41	(63.1)	65	(7.0)
Student	22	(56.4)	17	(43.6)	39	(4.2)
Other	19	(32.8)	39	(67.2)	58	(6.3)
						0.001* < .05
Household income						
IDR 2000K or less	150	(32.0)	319	(68.0)	469	(50.6)
IDR 2100K-5000K	104	(27.7)	272	(72.3)	376	(40.6)
More than IDR 5K	26	(32.1)	55	(67.9)	81	(8.7)
						0.369 > .05
National Health Insurance (JKN)						
No	112	(38.6)	178	(61.4)	290	(31.3)
Yes	168	(26.4)	468	(73.6)	636	(68.7)
						< .001*
Need Factors						

Health problem					
No	63	(46.3)	73	(53.7)	136 (14.7)
Yes	217	(27.5)	573	(72.5)	790 (85.3)
					< .001*
Problem to access healthcare service					
No	166	(22.6)	570	(77.4)	736 (79.5)
Yes	114	(60.0)	76	(40.0)	190 (20.5)
					< .001*
Satisfaction with healthcare service					
Dissatisfied	2	(25.0)	6	(75.0)	8 (0.9)
Somewhat dissatisfied	29	(33.7)	57	(66.3)	86 (9.3)
Neither satisfied nor dissatisfied	193	(29.3)	466	(70.7)	659 (71.2)
Somewhat satisfied	54	(32.7)	111	(67.3)	165 (17.8)
Satisfied	2	(25.0)	6	(75.0)	8 (0.9)

*Statistical significance, $p < .05$

Table 3 shows multivariate analysis results using binary logistic regression of ten significant variables in the bivariate analysis. The test of the full model against a constant-only model was statistically significant, indicating that the predictors, as a set, reliably distinguished between TM users and the non-users (chi-square = 510.439, $p < .001$ with $df = 11$). The model has a Cox and Snell $R^2 = 0.424$ and Nagelkerke $R^2 = 0.600$, which means that it can explain 42%–60 % of the variability in the odds of using TM.

The following variables made significant contributions to the prediction model: area of residence, occupation, education, belief in the safety and efficacy of TM, health problem, holistic view of health, and ethnomedical knowledge. While participants residing in a rural location ($p < .001$) and being more educated ($p < .001$) were likely to use TM, those working in the formal sector were less likely to use TM ($p = 0.001$). Participants who perceived TM safety and efficacy to be equal or better than CM were associated with using TM ($p = 0.001$). Those who reported having experienced health problems in the past year were almost two times more likely to use TM ($p = 0.007$). Participants holding holistic orientation to health ($p < .001$) and possessing traditional knowledge of herbal medicine ($p < .001$) had higher odds of using TM. Age, perception about access to healthcare service, and JKN enrolment were statistically

significant in bivariate and chi-square analyses. Those aged 40 and more opined that access to healthcare service was not a problem and even though they had been insured, they were more likely to use TM. However, these three variables were not highly significant in predicting TM use in the multivariate model.

Table 3. Significant predictors of TM use in the binary logistic regression (n =926).

Variable	Coefficient	<i>p</i> value	Odds Ratio*
Residence	-1.844	< .001	0.158 (0.10–0.26)
Occupation (formal)	-1.26	0.001	0.284 (0.13–0.61)
Education (college or more)	2.436	< .001	11.42 (3.62–36.06)
Believe in TM safety and efficacy	0.839	0.001	2.313 (1.42–3.77)
Health problem	0.758	0.007	2.135 (1.231–3.70)
Holistic orientation to health	2.474	< .001	11.87 (7.2–19.56)
Ethnomedical knowledge	1.87	< .001	6.485 (3.35–12.54)

*95% Confidence Interval

4. Discussion

4.1. Prevalence of TM use

The present study examined predictors of TM use and was the first study to be carried out in the context of the Indonesian UHC system. In this study, we targeted the general population in rural and urban communities. The results revealed that TM use is common among the studied population because more than half of them (69.8%) used it in the previous year. The prevalence of TM use in this study is higher than that reported in the recent national survey. In it, 44.2% of households in Indonesia were found to have used TM (MoH RI, 2018a). However, the pattern of the most frequently used type of TM is similar to that found in this study. The type used by the majority of users was herbal medicine-based. West Java was reported as one of the top four provinces with the most herbal medicine/*jamu* users (Rahayu et al., 2020), which probably contributes to the high prevalence of TM use in this study.

4.2. The significant predictors of TM use

A clearer picture of TM users is generally revealed by the multivariate analysis. Factors found to predict TM use include the area of residence, occupation, education, health status, health

belief, perception, and knowledge related to TM. Our bivariate analysis results agree with those of other studies (Bishop & Lewith, 2010; Peltzer et al., 2016) in terms of the identified associations of socio-demographic characteristics with TM use. However, our multivariate analysis highlighted some differences, too. For example, age was found to be significantly associated with TM use in the bivariate analysis; however, no significant effect of age in the multivariate analysis. Previous studies have shown consistently that rural people were more likely to be users of TM than their urban counterparts (Delgoda et al., 2004; Jennifer & Saptutyningsih, 2015; Pengpid & Peltzer, 2018), and our result is consistent with that finding. However, the common notion that widespread use of TM is attributable to poor access to health care services, especially in rural areas (Weckmüller et al., 2019) is not fully supported by this study. Primary health care (e.g., community health centres (*puskesmas*), midwives, and private clinics) are available and can be reached within an average of 15 minutes by motorcycle. This fact may affect perceived access to care as the majority of participants did not perceive a problem with access to healthcare services in their community. In this regard, residents of rural areas, from their points of view, may perceive access to local primary healthcare services as sufficient to satisfy them (Wilson et al., 2012). On the other hand, it was common for the rural community in this study to use their home garden or allotment land as the medium for the cultivation of medicinal plants. Thus, in this study, the easier access to TM in a rural area may explain the likelihood of rural participants to use TM (Sato & Costa-i-Font, 2012).

The nature of occupation was a significant predictor of TM use. While the bivariate analysis showed that informal workers were more likely to use TM than those in other occupations, the multivariate analysis does not indicate that. However, working in the formal sector was associated with fewer odds in favour of using TM as compared with those working in the informal sector. The high prevalence of TM use among the workers in the informal sector in this study may be associated with being uninsured. The JKN rollout has brought out the “missing middle” problem in which the non-poor informal sectors have remained uncovered from the insurance due to the necessity of self-enrolment (Dartanto et al., 2015). Being uninsured may have prompted informal workers to resort to TM as a safety net for healthcare.

The utilization of TM in developing countries is generally associated with a lack of education (Agyemang-Duah et al., 2020; Bishop & Lewith, 2010; Gyasi et al., 2015; Peltzer et al., 2016; Quinlan & Quinlan, 2007). Thus, our finding that TM users tend to be better educated may be counterintuitive. The preference of educated people for more natural treatments with fewer side effects (Aziz & Tey, 2009) may explain this. Along with the “back to nature” trend in lifestyle among people living in the city, there is also a growing trend of artisan ready-to-drink herbal (*jamu*) in Indonesia (Lim & Pranata, 2020; Putro et al., 2020). Such high-end *jamu* product is seemingly popular among urban consumers who tend to have better education. Furthermore, education may increase the likelihood of using TM because educated people will be exposed to various traditional forms of health care through their reading on the subject (Astin, 1998). The majority of participants in this study demonstrated ethnomedical knowledge, and thus it is also possible that more educated people obtained such knowledge through their reading.

The multivariate analysis showed health status to be a predictor of TM use. The odds of being a TM user are about two times higher among those who experienced some health problem in the previous year. Since those in poor health may have had less success in treating their health problems with CM, their continued suffering may have prompted them to seek traditional healthcare alternatives (Astin, 1998). Similarly, those with chronic illness and those who classify their sickness as ‘serious’ appear to have tried TM more than those with non-chronic illnesses and individuals who perceive their illnesses to be less serious (Sato & Costa-i-Font, 2012).

Various studies have shown that psychosocial factors, such as cultural attitudes and beliefs, influence traditional healthcare use (Gyasi et al., 2015; Hollenberg et al., 2013; Lee et al., 2004; Sato & Costa-i-Font, 2012). In this study, almost all the psychosocial factors related to TM practice were predictive of its use. The odds of someone using TM would increase two-folds if the person considered the safety and efficacy of TM favourably. Other studies (Astin, 1998; Caniago & Siebert, 1998; Clement et al., 2007) have reported similar findings. The results of in-depth interviews confirmed that many participants considered the experienced of relief from symptoms as the determinant of the use of TM.

Our finding further showed that belief in a holistic philosophy of health strongly predicted the use of TM. Notably, many participants perceived TM to be more in line with their own beliefs and holistic view of health (i.e., belief in the relatedness of physical, spiritual, and mental health). They often described that TM is not only effective as preventive care but also for curative and rehabilitative reasons. It was also commonly believed that spiritual healing cured physical illness and brought about spiritual and mental well-being. TM users also tended to believe in the equal importance of body, mind, and spirit (Astin, 1998; Gyasi et al., 2016; Sato & Costa-i-Font, 2012). It is not surprising that ethnomedical knowledge should facilitate TM practice in everyday healthcare (Weckmüller et al., 2019). In this study, such knowledge is also a significant predictor of TM use. The odds of those who demonstrated ethnomedical knowledge being users were about six times higher than those who lacked that knowledge. Compared to other forms, herbal medicine was the most frequently used TM in this study. The majority of participants showed knowledge of the traditional use of plants, including the plants’ type, medicinal effect, and how to prepare home remedies from the plants. Having greater knowledge and extensive family history of such knowledge about medicinal plants were strongly predictive of practicing TM when the respondents were influenced by environmental factors and the access to modern health care was limited (Patwardhan et al., 2005).

4.3. Influence of healthcare service within the UHC system on TM use

Variables related to conventional healthcare in this study were not significant predictors of TM use. Although there was a trend in the direction of being more likely to use TM among those who were insured and did not perceive a problem with accessing health services, this variable was not a significant predictor of TM use as previously reported (Caniago & Siebert, 1998; Toda et al., 2017; Vandebroek & Balick, 2012). This finding supports our previous finding that there was no clear relationship between health insurance status and herbal medicines use

among the rural population in West Java (Rahayu et al., 2020). Contrary to many previous findings (Avina & Schneiderman, 1978; Lee et al., 2004; McGregor & Peay, 1996; Schäfer et al., 2002), our finding also showed that a negative attitude toward healthcare service was not predictive of TM use. Among those who reported being satisfied with healthcare service (165), 67.3% used TM, while 66.3% of those who reported dissatisfaction (86) were TM users, indicating that TM users were no more dissatisfied with the service than nonusers were. Most of the insured TM users whose responses converged toward a neutral tone (neither dissatisfied nor satisfied) mainly comprised of rural residents, suggesting the possibility of underutilisation of JKN by this segment. This indicates that the health insurance has not effectively increased healthcare service utilization as intended, particularly by the most vulnerable segment, which mainly resided in rural areas. Notably, the procedure to use JKN at the referral health facility was widely perceived as complicated, particularly by those of rural participants. Complaints regarding the three-tier referral system have also been repeatedly reported, mainly due to its rigid mechanism that decreases healthcare facility choice flexibility and reduces employee productivity while increasing costs and health risks (Handayani et al., 2018). These are also among the reasons why informal workers hesitate to self-enroll in the JKN (Dartanto et al., 2016b; Kartika, 2015) and might contribute to the high prevalence of traditional medicine use among informal workers in this study. Even though insurance may ease the financial burden and primary care facilities may be conveniently located, these factors might be inadequate to overcome the other barriers to access associated with the JKN procedure at healthcare facilities, such as long waiting time, short working hours, and complicated referral system (Ekawati et al., 2017; Penchansky & Thomas, 1981).

The findings from this study revealed that people's experience and personal attributes related to TM were the underlying factors of a person's decision to use TM, even though they were covered by health insurance. Results of this study make several contributions to our understanding of TM use. It is crucial to understand why a significant portion of the population remains outside the conventional healthcare system and may identify the areas where the current healthcare system may be failing to adequately meet people's healthcare needs, considering the constant effort of policymakers to improve the JKN system. The results would provide deeper insight into the multitude of forces at play in the interaction between traditional and conventional medicines and help forge better integration at the institution level.

The findings of this study should be interpreted in the context of the following three limitations. First, the cross-sectional nature prevents drawing a definitive conclusion regarding the causal relationship between the associated variables and TM use. Second, the reliance on self-report may weaken the internal validity due to the possibility of a recall bias. Third, the classification of users and non-users of TM may also pose a problem. Participants classified as TM users probably included infrequent or irregular users because the information about frequency and duration of use was not assessed. Therefore, future studies examining predictors of traditional health care use need to consider the frequency of use in a certain period so that infrequent/irregular users are distinguished from those frequent/regular users. Factors affecting the utilization of JKN by insured TM users are another significant area of interest for future studies.

5. Conclusion

A significant portion of rural and urban communities in Indonesia continues to rely on TM even when healthcare services have become more easily available under the universal healthcare insurance system – JKN. Being a rural resident, more educated, experiencing health problems, holding a holistic view of health, having knowledge and favourable perception of TM serve as significant predictors of TM use. This study highlights that people's experience and personal attributes related to TM, such as beliefs about health, knowledge, perception, or attitude toward TM, rather than dissatisfaction with conventional care, were largely responsible for the pervasive use of TM. The finding that TM users are no more dissatisfied with healthcare services than nonusers also implies the underutilisation of JKN services by the insured TM users living in rural areas. Given the prevalent use and favourable perception of TM, providing scientific evidence on the safety and efficacy of TM should become a major focus of the national public health agenda. Furthermore, as the policymakers and health care practitioners debate on integrating TM in the JKN system, considering the community's strong preferences for TM, this paper argues that its inclusion in the JKN system may increase the utilisation of the JKN service. That would be the best way people can better afford necessary and desired healthcare services – a fundamental element of the UHC.

CHAPTER 5. TRADITIONAL MEDICINES PRACTICE IN THE HEALTHCARE SERVICE DELIVERY

This chapter examines the third research question on “*Perception and attitude of TM among conventional healthcare practitioners: To what extent TM is used in the conventional healthcare practice?*”. This chapter explores the knowledge, perception and attitude of healthcare professionals towards TM and the integration of aspects of TM with conventional care. A qualitative design composed of semi-structured interviews was conducted with 31 conventional healthcare professionals comprising physicians, pharmacists, midwives, and nurses from 28 health facilities, including hospitals, clinics, and community health centers in 14 cities or regencies in Indonesia.

Abstract

Objective: While cooperation between traditional and conventional healthcare is increasingly promoted, traditional medicine (TM) remains poorly integrated into the healthcare system of Indonesia. The implementation Universal Health Coverage (UHC) system in Indonesia has created renewed momentum for integrating TM in the national healthcare system. However, at present, it is not clear if practitioners of mainstream medicine favor the integration of two health systems. The present study sought to explore the perceptions of conventional healthcare professionals on integrative medicine.

Methods: A qualitative semi-structured interviews were conducted with 31 conventional healthcare professionals comprising medical doctors, pharmacists, midwives, nurses, and technical medic staff from 28 conventional healthcare facilities in 7 provinces of Indonesia.

Result & Conclusion: While participants familiar with herbal medicine, only a few evaluated their herbal medicines knowledge as high. Most participants perceived that TM, in particular herbal, was positive. TM was widely perceived as an alternative form of patient care and complementary to conventional medicines in curative therapy. While most participants have experience recommending herbal medicines informally to their patients/clients, only some of them had formally prescribed them. The practitioners interviewed support for more cooperation between traditional and conventional medicine within the UHC system in Indonesia. However, for TM to be successfully integrated into mainstream conventional healthcare, the results point to some necessary policy improvements and actions to ameliorate: knowledge base of these practitioners, regulation of TM practice in conventional practice, and provision of scientific evidence of safety and efficacy of herbal medicines.

1. Introduction

Many populations widely use Traditional medicine (TM) and complementary and alternative medicine (CAM) as part of their primary and traditional healthcare, where spiritual and cultural beliefs are emphasized. The prevalence and types of TM-CAM use have progressively increased over the years in many countries (Frass et al., 2012) and vary among and within countries as a result of socio-economic and cultural factors (Ernst, 2000)(Harris & Rees, 2000). Existing literature indicates that the prevalence of CAM use in European countries ranges from 0.3% to 86% (Fischer et al., 2014). It was reported that 9% to 76% of the general population in developing countries frequently used TM for primary healthcare, with being readily available, accessible, and affordable were observed as the main reasons using traditional healthcare, particularly for people living in rural areas (Abuduli & Aljunid, 2011; Payyappallimana, 2009; Peltzer, 2009; Pengpid & Peltzer, 2018). In Indonesia, despite the increasing provision of healthcare services, TM use continues to be ubiquitous (Amar, 2010; Elfahmi et al., 2014; Jennifer & Saptutyningsih, 2015; Pengpid & Peltzer, 2018; Supardi et al., 2011). A recent national survey reported that 44.3% of Indonesian households utilized TM of these, 79.8% used herbal remedies, and 69.3% used forms of manual treatment, including spiritual healing (MoH RI, 2018a).

Through the declaration of Alma Alta in 1978, the World Health Organization (WHO) advocated for its member countries to strengthen the role of traditional medicine to attain acceptable levels of health for all (WHO, 1978). Since then, there have been many pledges, resolutions, and strategies urging for integration, where appropriate, of traditional medicine with national healthcare systems, partly as a means to achieve UHC (WHO, 2002, 2008). Many governments, particularly in Asian countries, have developed national policies and strategies to incorporate TM into the national healthcare system (Bodeker et al., 2005; WHO, 2001, 2013b). Based on the level of institutionalization of T&CM in national health care systems, two models of integration in Asian countries' context can be identified as countries with 1) well-established integration strategies and 2) in-process of developing and implementing integration policies (WHO, 2015). Countries with well-established integration have recognized and institutionalized T&CM at the state level, such as China, Japan, and the Republic of Korea. These countries have stringent and well-implemented regulatory systems for many T&CM products, practices, and practitioners and education systems for T&CM practitioners (Park & Canaway, 2019). Countries in-process of developing integration within their national healthcare systems tend to have long histories of traditional medicine use but are yet to attain the level of support and institutionalization seen in the well-established countries (Assan et al., 2009; WHO, 2001). This model does not usually involve formal educational training and may also not be supported by health insurance systems. This model is commonly found in South Asia, like India, and South-East Asian countries such as Malaysia, Cambodia, and Indonesia.

TM has been incorporated in the Indonesian health policy since the issuance of the law on health, where it first gained formal recognition as one of the national healthcare systems (President of RI, 2009). It has been a foundation for the Indonesian government to develop

regulations and strategies to maximize the potential contribution of TM products and practices to public health care (BPOM RI, 2005; MoH RI, 2003, 2010a, 2016). It reached an important milestone when the MoH issuing the National Policy of Traditional Medicines (*KONTRANAS*) envisaged a cross-sectoral guideline covering various aspect of TM development, in particular herbal medicine, from cultivation and conservation, research and development, monitoring and supervision to industrialization and commercialization (MoH, 2007). Furthermore, research institutions and other relevant bodies have been set up to ensure evidence-based TM products and practices. In 1975, the National research institutes on traditional medicine and herbal medicine (*Balitbangkes*) was established to address quality and safety issues in herbal drug use by scientifically validating the therapeutic effects of herbal preparations. Control, supervision including GMP (Good Manufacturing Practice) of TM, is administered by the National Agency of Drug and Food Control (BPOM); it was established in 2001. In 2010, as an initial step toward integrating TM in the national healthcare system, the *Balitbangkes*, through B2P2OOT, introduces the “Scientification of Jamu/ SJ” program to develop scientific evidence of herbal medicine (*jamu*) through service-based research in flagship healthcare facilities (MoH RI, 2010a). The program also includes herbal medicine training for conventional healthcare professionals, including physicians and pharmacists. Recent integration policy in Indonesia has been aligned with the WHO strategy in traditional health (WHO, 2002)(WHO, 2013b), including the establishment of Directorate of Traditional, Alternative and Complementary Health Services (*Dirjen Yankestrad*) (MoH RI, 2015a) oversee the practice of traditional healthcare providers. Under the law, traditional health care in Indonesia categorized into empirical, complementary, and integrated traditional healthcare. The difference lies in the provider qualification and the degree of institutionalization (MoH RI, 2014). While empirical one is provided by a licensed traditional healer who does not have a formal medical background, complementary one is provided by a physician that has been formally trained on TM. On the other hand, integrated one combines complementary one and conventional care. Its provision has been promoted on the basis of the Strategic Plan 2010-2014 (Rencana Strategis—Renstra) (MoH RI, 2017b).

Although collaboration between traditional and mainstream conventional medicine is increasing, TM remains poorly integrated into the national healthcare system (Siswanto, 2018). The use of TM in the healthcare delivery services in Indonesia is lower than in other countries (Delima et al., 2012). Many programs aiming to promote the integration of TM and CM have yet to achieve their objective. For example, the adoption of the SJ program is only limited to certain regions, particularly central Java (Kristiana et al., 2017; Purwaningsih, 2013). The issues including the lack of standard medicinal plants required for herbal medicine preparation in the facilities. Similarly, regardless of continued being target to be improved under the latest Strategic Plan 2014–2019, the provision of TM in the public health facilities has been slowly progressing. Currently, approximately 50% of primary healthcare facilities provide TM service, which is lower than the targeted plan at 75% (MoH RI, 2020) (MoH RI, 2015b). The percentage was much lower for its provision at the public hospitals (11%), illustrating that the government effort to incorporate TM in the national healthcare system is not enough. Along with other countries worldwide, the safety and efficacy issues of TM are also still major challenges in

Indonesia, as it is complicated to evaluate its clinical effects. Although it is widely known that western medical methodology such as randomized clinical trials (RCT), may not be appropriate to evaluate TM since it requires individualized treatment based on the diagnosis of each patient, there is not any innovative evaluation design available (Siswanto, 2018; Terasawa, 2004; Xu & Yang, 2009). As a result, very few herbal medicines are regarded as having “rigorous” scientific evidence of efficacy and thus limit their use in the formal healthcare delivery service system.

Views on TM use differ among biomedical health professionals. A study reported that, while 41 % of physicians in Nigeria believed that herbal medicine could be effective for some of the chronic diseases, most of them perceived that it could only be effective as a complementary medicine (Awodele et al., 2012). Other reviews have found positive attitudes of nurses, doctors, and pharmacists towards TM-CAM, although pharmacists tend to be unaware of the use of these products by their patients (Alnaim et al., 2018; Gyasi et al., 2017b; Kwan et al., 2006; Leach, 2004). On the other hand, many practitioners of allopathic medicine also were reported to know little about TM-CAM and often stigmatize the practices and practitioners (Astin et al., 2006; Pengpid & Peltzer, 2018). Some common tags for TM-CAM, such as “alternative,” “unconventional,” and “unproven,” have been described as pejorative and may impede collaborative efforts towards integration (Kretchy et al., 2016). Furthermore, some studies showed that although some community health workers had personal experience with traditional or herbal medicine, they were less likely to recommend it to patients (Boateng et al., 2016; Bodeker, 2001). In Japan, the perceptions and attitudes towards *Kampo* medicines (Japanese medicines) among physicians varied greatly depending on the specialty of with higher usage were seen in those with a more positive perception of *Kampo* (Moschik et al., 2012). The difference was attributed to the nature of the conditions commonly seen by each specialty as well as the history of *Kampo* use in each. The literature provides further evidence that the views and attitudes of physicians and other medical practitioners towards TM largely control the extent to which integration between traditional and conventional medicine can be realized (Ben-Arye et al., 2008).

Indonesia introduced the National Health Insurance (*Jaminan Kesehatan Nasional*, JKN) in 2014 to provide healthcare services as a commitment to universal health coverage (UHC). Currently, TM services/products are not reimbursed under the JKN scheme. Notably, the insurance only covers medication listed on the national formulary (FORNAS) that exclusively consists of biomedicine/conventional medicine (MoH RI, 2018c). There has been a great deal of discourse to incorporate TM in particular herbal medicines in the JKN system among Indonesian policymakers, health expertise, and health-related stakeholders (Mahadi, 2020; Maharani, 2016). However, most discussions lack perspectives of conventional healthcare professionals, which the evidence suggested plays an important role in any collaborative efforts towards integration. At present, it is not clear whether practitioners of mainstream conventional medicine in Indonesia favor the integration of these two healthcare systems. The attitudes of conventional healthcare professionals toward TM and its consistency with their conceptualization of health and illness will largely determine their preference for the

integration of the systems. Thus, the objective of the current study was to explore the knowledge and attitude of healthcare professionals towards TM and to explore their perception of the integration of aspects of TM with conventional care, with the central focus on herbal medicine.

2. Methods

2.1 Study Design and Participants

This study employed a qualitative method to gain an in-depth understanding of the knowledge and perception of healthcare providers towards traditional medicines and their integration into mainstream conventional care in Indonesia.

A total of 31 respondents who participated in the study were purposively selected to maximize the variation in the healthcare profession, number of years in practice, and represent the major cities in Indonesia. The selected participants have been practicing for at least one year because the study sought to relate herbal medicine with practice. A semi-structured interview was administered to sixteen medical doctors, five pharmacists, five midwives, four nurses, and one technical medic staff from 28 conventional healthcare facilities, including clinics, community centers, hospitals in 14 cities in seven provinces of Indonesia. The service in these healthcare facilities is based on conventional medication. Thus, the responses from the participants are well in line with the objectives of the study. In addition, three in-depth individual interviews were conducted with medical doctors practicing in herbal-based health facilities to obtain insight into their practice.

2.2 Data collection and analysis

The data were collected between February and March 2021. The questionnaire used for semi-structured interviews was modified from (Kretchy et al., 2016). Before starting the interview, the research nature and the purpose of the research were explained to obtain oral consent from each participant. The interview questions cover areas such as level of knowledge, perceptions, and beliefs about herbal medicine, perspective on herbal medicine education in the medical education in Indonesia, as well as issues of efficacy, safety, and the perceived impact of herbal medicine use on conventional care. Incorporating herbal medicine into conventional practice was explored from the perspective of the UHC system. Other areas included the level of personal and professional experience with herbal medicine vis-à-vis practices. Additional inquiries were used to obtain further responses regarding the integration in the UHC system. Some examples of the questions were: ‘What is your view about their collaboration with conventional medicine?’ ‘During your practice, what are some of the TM-CAM discussions you have with your patients?’ The interviews were conducted online individually and lasted from 30 to 40 min. Each participant was anonymized and identified by a unique number in presenting the results to ensure the privacy and confidentiality of participants. All interviews were digitally recorded and transcribed in English. A thematic analysis was employed in order

to identify the themes emerging from the responses of participants. The responses were coded before grouping into themes, summarized, and further analyzed.

3. Results

Characteristics of participants

The interviews were conducted among sixteen medical doctors, five pharmacists, five midwives, four nurses, and one technical medic staff. The ages of the participants ranged from 25 years to 55 years, with the majority between the ages 25 and 38 (Table 1). There were more females than males. The majority of participants work in the hospital, followed by private clinics, and a few of them work in a community health center and open a private practice. Some participants had a Bachelor's degree in their respective professions, and others had been awarded post-graduate degrees (Table 1).

Table 1. Characteristics of participants

ID	Age (year)	Gender	Profession	Qualification	Years of practice	Practice facility
1	38	F	Physician	BGP	10	Private clinic
2	24	F	Technical medic staff	DTr	4	Community health center
3	37	F	Midwife	BNr	16	General hospital
4	34	M	Physician	BGP	5	Private clinic
5	28	F	Nurse	BNr	3	General hospital
6	30	F	Pharmacist	BPh	5	General hospital
7	33	F	Pharmacist	BPh	10	General hospital
8	28	F	Midwife	BMw	5	General hospital
9	28	F	Midwife	BMw	2.5	Private practice
10	26	F	Dentist	BDt	2	Private clinic, Community health center
11	32	F	Nurse	BNr	10	Private hospital
12	31	F	Physician	BGP	8	Private hospital
13	30	F	Physician	BGP	6	General hospital

14	28	M	Physician, educator	BGP	2	General hospital
15	32	F	Dentist, educator	MMEd	5	Private clinic
16	32	F	Pediatrician	BGP, SPd	5	General hospital
17	44	F	Physician	BGP	19	General hospital
18	25	F	Pharmacist	BPh	> 1 year	General hospital
19	25	F	Nurse	BNr	2.5	General hospital
20	25	F	Nurse	BNr	> 1 year	General hospital
21	33	F	Midwife	BNr	9	General hospital
22	31	F	Pharmacist	BPh	5	Private clinic
23	31	F	Midwife	DMw	10	Private clinic
24	26	F	Physician	BGP	1	General hospital
25	55	M	Physician, educator	BGP, SPh	28	Private practice
26	44	M	Pharmacist	BPh	4	Private clinic
27	31	F	Physician	BGP	8	University hospital
28	35	F	Physician	BGP	10	General hospital
29	40	F	Physician	BGP	16	Private practice
30	37	F	Physician	BGP, herbal ed	10	Herbal Reseach Hospital
31	37	F	Physician	BGP, SPh	4	Private clinic

M: male; F: female; BGP: bachelor in general practice; DTr: diploma in traditional healthcare; BNr: bachelor in nursing; BPh: bachelor in pharmacy; BMw: bachelor in midwifery; BDt: bachelor in dentistry; MMEd: master in medical education; DMw: Diploma in midwifery; SPd: Specialized in pediatrics; SPh: Specialized in pharmacology

Knowledge

Based on informants' self-assessment, half of them reported a high level of knowledge about herbal medicine, while the other half demonstrated otherwise. Those physicians and midwives mostly know several medicinal plants and the purpose in healthcare.

Some herbal medicines use in the clinical practice, for example, guava extract to increase thrombosis level in dengue fever patients, and curcuma extract to maintain the level condition of patients with hepatitis. (ID 12)

I know enough about herbal medicines. Some rhizomes and herbal [leaves] use as complementary in some treatment of certain diseases. (ID 5)

I know a lot about herbal because I have been trained in herbal medicine and involved in its research and practice since 2006. (ID 29)

Most participants had no formal training in herbal medicine. However, few of them were introduced to some herbal medicines as part of curricula of their formal education, and traditional practitioners were educated based on traditional medicine practice, including herbal medicines.

When I was in midwifery school, I attended a pharmacology class, during which I received a brief introduction to herbal medicines. (ID 8)

I received several government training programs on herbal such as "TOT herbal" and "Jamu Scientification" [Doctor of Scientification Jamu] in 2010 and acupuncture in 20116. The training was intended for medical doctors, and ever since I have been involved in the Training of Trainers (TOT) herbal program, where I trained another medical doctor interested in practicing herbal in their clinical practice. (ID 25)

The source of self-learning of herbal medicine information was mainly through online media, academic articles, and family.

Jamu (herbal medicines) is a regular thing in the family. I know several types of jamu concoction because my mother and grandmother consume them almost daily to maintain health. When I have my own family, I continue this habit. (ID 3)

I often get the information from my personal reading of academic journals. (ID 23)

Perception on herbal medicines

The perceptions of participants about the efficacy, safety of herbal medicines, and their roles were explored. Perception of the role of herbal medicine in conventional care was varied among participants, but they agreed that herbal medicines had both positive and negative effects. In a positive view, herbal medicine was understood to serve as an alternative form of patient care and adjuvant/ complementary to conventional medicines in conventional care.

In my opinion, as each medicine [TM and CM] has different role, a collaboration between traditional and conventional medicine would be beneficial. For example, patients with headache due to hypertension could take ginger to reduce the headache while also taking biomedicine drugs to lower the blood pressure. So, TM can alleviate the symptom or pain, while CM can control the system (blood pressure). (ID 2)

Generally, the participants agreed on several notions regarding the efficacy of herbal medicine. First that that herbal medicine is perceived to be effective in treating ailments in their early development stage. Second, that herbal medicine usage is effective in preventive and promotive health purposes. Third, that herbal medicine is effective as complementary/ adjuvant to conventional medicine in curative therapy, particularly treating degenerative disease, metabolic syndrome, and palliative care.

[Herbal medicines] very good [effective] for disease prevention, health promotion and complementary in curative therapy. (ID 25)

In curative therapy, herbal therapy effectively treats mild illnesses such as mild hypertension, mild hyperuricemia, mild diabetes, and mild hypercholesterolemia, but for severe cases, it can be used as a complementary therapy to support conventional treatment. (ID 30)

For long-term use (treatment), herbal medicine is relatively safer than a drug, as long as it [herbal medicine] is used rationally. (ID 4)

The responses demonstrated that while the participants acknowledged that no medicine is without side effects or entirely safe for long-term use, it was widely perceived that herbal medicine was safer when compared to conventional medicine as it generally shows fewer side effects or adverse reactions. There was a consensus among participants across all professions regarding the importance of rational use of herbal medicines and their preference for standardized herbal medicine over self-prepared herbal medicine or *jamu*.

Apart from these positive roles for herbal medicines, some negative attributes to herbal medicines in healthcare delivery in Indonesia were also reported. Herbal medicine was perceived to promote non-adherence to conventional medical therapy. Its usage was deemed the main reason for the delay in help-seeking behavior among patients with conditions that need immediate care. This delay often led to most likely preventable complications.

Indeed, some TMs have a positive role in supporting conventional therapies, but sometimes information on the interaction between TM and [biomedicine] drug is unclear. It would be better if we can easily know such information. Sometimes, patients focus on herbal use, neglect the conventional therapy, and are reluctant to check their (chronic) illness routinely. Some alternative [therapy] could also hamper the treatment of conventional therapy. For instance, in a cancer patient who does consultation [with a medical doctor] when it is too late and the patient with a bone fracture who had inappropriate treatment from a bonesetter. (ID 1)

TM has a positive and important role in allopathic care, but it should be used rationally or regulated. In this regard, the government's role is important in supervising TM practitioners, including doctor practicing herbal and developing referral system to create harmonious cooperation between the two practitioners to improve management of the patient, thus could reduce the case when TM use is blamed for the delay of treatment of the emergency patient. (ID 27)

Experience of personal and professional use

This section examined participants' experience of using TM. The majority of participants used herbal medicines personally or within their family and received some benefit from a given treatment. In terms of professional use, while most participants have experience recommending herbal medicines informally to their patients/clients, only some of them had formally recommended (prescribed) them.

The responses indicated that the major barrier of TM use in clinical practice might be their lack of knowledge and the perception that TM products/services were inadequately supported by scientific evidence. The most common explanations such as "I do not know about herbal medicine," "I am not confident," and "I am not sure with herbal medicine safety and efficacy," suggesting that their reservation to recommend herbal medicine to their patients was stem from their lack of confidence in its use, in particular for curative purpose. Nonetheless, it indicates that adequate knowledge of evidence-based TM practice might change this pattern.

I am not confident about TM. The therapeutic dosage of herbal medicine is not commonly known. I never learned about this during my medical education. (ID 12)

I do not really recommend [TM] because I do not have enough knowledge on the rational use and side effect. The dosage and efficacy of TM are also different for each individual, and I do not have knowledge about these matters. (ID 16)

I do not use it [TM] in my practice because I am not sure on its quality as far as I know. There is little scientific evidence for the safety and efficacy of many herbal medicines. (ID 15)

...may be if I can get the information or proper knowledge on herbal medicine and other traditional healthcare, I will be confident enough to recommend or prescribe TM to a patient. (ID 10)

I do not know information about the indication of herbal medicine, its pharmacodynamics, and pharmacokinetic. I would like to understand all those things before using them for patients. (ID 13)

Some medical doctor participants also cited that the lack of knowledge on a legal basis in practicing TM as their reason for hesitation in using herbal medicine to a patient. Most of them have no knowledge regarding regulation or guidelines to use TM in conventional healthcare practice. Only a few participants had herbal medicines training or joined an association

advocating in herbal medicine practice, acknowledged TM practice legislations. Nonetheless, all participants agreed that current regulations on TM use in formal clinical practice are unclear and outdated.

Is there any regulation? I do not know about that. I only prescribed the standardized herbal medicine to my patients just to be safe. (ID 31)

While most participants rarely prescribe herbal medicine to their patients/clients, giving an informal recommendation seems to be general across all professions. They had experience recommending herbal medicine to their patients at some points during their years of practice. In general, these practitioners use herbal medicine in their practice when: 1) they were convinced that it was safe and efficacious, 2) it was appropriate for patient's conditions, in accordance with its indications and therapeutic purposes. It was also indicated that personal use and perceived benefits were considered as important determining factors to recommend herbal medicine to their patient.

Not writing [herbal medicine] in a prescription, but when it is appropriate, I do explain alternative therapy to patients, especially herbal. The preference usually comes from me. I usually make a recommendation based on my own experience receiving a benefit. For example, I recommended a hypertension patient to use bay leaves decoction. I have recommended a decoction of binahong leaves as complementary to help accelerate the wound healing process in the post-surgery patient, but of course, this was done without leaving the main conventional treatment (ID 1).

I consume jamu (herbal medicine) regularly to maintain health, so it is natural for me to recommend it to my patient, sometimes they initiate to ask me for [jamu]. I usually recommend herbal medicine for my patient with degenerative diseases (ID 25)

It is worth noting that all participants agreed that the fact that herbal medicine is not covered by the National Health Insurance (JKN) schemes, reserved them to use it in their clinical practice.

In some cases, the patients are interested in using herbal medicine instead [of biomedicine drug], then we should get the herbal medicines listed on the JKN's medicine list to have the treatment they want without having to pay again. (ID 31)

In this facility [herbal research hospital], the treatments are based on herbal medicines, so patients who come here know that they need to pay out of their pocket, and sometimes they asked me if there is a chance that the insurance can reimburse their herbal prescription. I wish JKN can cover at least the standardized herbal medicine. (ID 30)

Perception on integration

This section examined the perception of participants on integrating TM into conventional health care systems in Indonesia. Overall, participants were welcoming and supportive of the

call for incorporating TM into conventional medical care but stressed the importance of improving knowledge, training, and addressing safety and efficacy concerns. Participants recognized that each mode of healthcare has its own advantage and conventional medicine does not have the solution to all our healthcare needs. Thus, it is considered necessary to consider the alternative forms to complement the mainstream conventional practice. Notably, TM can take more part in preventive, promotive, and palliative purposes.

It was suggested that the integration could facilitate effective service delivery by negating the potential increase in irrational TM use. In addition to people reaching out to traditional healers in an informal setting, self-medication with TM is becoming increasingly popular in Indonesia. It is also common for people to combine both methods of medication without consulting medical professionals. A regulated integration could help people access reliable herbal medicine services and reduce the dependency on biomedical drugs.

I support integration as it will help streamline the rational use of herbal medicines, and it will also eliminate fraud from the system. (ID 3)

While the cases of irrational use of TM exist, the cases of inappropriate use of drugs also happen. Many people use drugs not in accordance with its indication, the conditions which should be given TM instead. Something like these can be eliminated if TM can be integrated into our practice to ensure rational use of TM while reducing patient dependency on drug, especially in promotive, preventive, and palliative therapy. (ID 25)

Nonetheless, participants indicated a need to address many concerns associated with education, research, and regulation to accept integration.

Formal education of conventional healthcare professionals in herbal medicines was reported as an important issue, guiding any efforts towards integration. The relevance of such education would not only give them the necessary information/ knowledge in using TM for their patient but also for consultation purposes, as many of their patients self-medicated using TM.

It is essential that we familiar with herbal medicine. We should acknowledge the prevalence of the use of this traditional medicine in Indonesia. As it is part of the culture of Indonesia, it is hard to separate it from their daily life. In addition, the “back to nature” lifestyle is making a comeback in recent years with the proliferation mindset that nature is safe. As a doctor, it is very important for me to also know about it because it is more common where patients to ask about herbal therapies, and I should be in a very good position to explain it to them whether or not it is safe or suitable for their condition to get such therapies. (ID 31)

In my opinion, in the Indonesian context, we need to know the knowledge of herbal medicines. While people mostly resort to traditional before us, the conventional. In some cases, the opposite also happens. Patients ask for herbal medicines because they “gave up” with conventional medication or they want to use TM in conjunction with CM. For instance, it is common for patients who undergo chemotherapy for cancer treatment and ask for alternative

solutions to relieve the effect of the chemo. It is true that over the time herbal medicines particularly concoction has been proven to be effective for this condition, but we need to be knowledgeable about this to be able to give the patient with the safe practice and aware with the possible interactions (ID 30)

Moreover, in light of the call for incorporating herbal medicines into mainstream medical practice, participants emphasize the need for herbal medicine to be incorporated in the current mainstream medical education.

I think we need a standard herbal medicine education for health care professionals. The training program should be more promoted and disseminated not only in certain provinces. (ID 6)

The incorporation of herbal medicine in conventional medical education is a very good idea. Although I understand that current curricula have been already overloaded, herbal medicine can be introduced briefly to understand the basic knowledge. (ID 31)

The government has recognized the importance of herbal education. As part of an active member of the association [of herbal medicine advocacy in Indonesia], I know that the discourse is currently being intensively discussed among health and education policymakers. The feasibility of implementing several models of integration herbal medicine educations in Indonesia (refereeing to some countries such as China and Japan) is currently being examined. I hope we can get the result soon and can see the improvement in the herbal medicine education system. (ID 25)

Other important issues that were expected to affect integration were efficacy and safety concerns. The participants mentioned that limited scientific evidence on efficacy and safety has led to limited use of herbal medicine in the clinical practice and, thus, poor accessibility of herbal medicine. All participants agreed to better documentation on the efficacy and safety of the herbal remedies and emphasized the necessity for more extensive research to provide more scientific evidence.

All forms of medications used by the public should have scientific evidence on their safety and efficacy, including herbal medicines. The herbal should not be based only on empirical evidence, on the testimonies of use. However, currently, scientific evidence on herbal efficacy and safety is still limited, and thus research related to herbal medicine safety and efficacy needs to be promoted and facilitated more if it were to be integrated. (ID 29)

There is a lack of evidence regarding the safety and efficacy of herbal medicines. Especially not all currently available herbal medicines in the market comply with the regulations. We can see that it is common for herbal mixture, like jamu, are easy to be found in the market, not in a drug store sell by someone who has a credential in making formula of this mixture, and we cannot assure its safety. (ID 13)

A third issue that was stressed as important in driving integration of TM and conventional practice was regulatory issues. While most participants considered the integration of herbal medicine in the conventional practice as an important step towards the institutionalization of TM in Indonesia, they perceived a lack of clear regulation and guideline of the government policy on integration, which hindered implementation. Although they were aware of the existence of statutory bodies to help streamline and regulate TM practice in Indonesia, participants were unsure of the regulatory basis in using or prescribing herbal medicines. Such regulations should be optimized if TM were to be formally integrated with the conventional system. Most participants agreed that a clear regulation to guide internal prescription of TM by the conventional medical worker in a conventional healthcare facility would ensure greater confidence in TM procedures and enable conventional medicine practitioners to endorse certain TM practices and refer to their practitioners.

It is currently uncertain for us as a doctor. There is a need to set up a clear guideline. (ID 15)

I know that herbal medicines have been recognized in the healthcare system in Indonesia. There is also common knowledge among doctors allowing the prescription of herbal medicines but limited to standardized products. However, as far as I know, the regulations for herbal medicine services for medical personnel (doctors) have not been made yet. It makes us uncertain in prescribing herbal medicines. So, it is necessary to have a clear regulation to guide the internal dispensing of herbal medicines in conventional healthcare facilities. (ID 17)

4. Discussion

The interest in and utilization of TM has increased in recent years. Understanding the knowledge and attitude of healthcare professionals about TM is a critical step towards the successful implementation of policies and strategies to incorporate TM in the healthcare delivery system. This study explored the knowledge and perceptions of healthcare providers—physicians, pharmacists, nurses, and dieticians—on integrative healthcare.

While participants familiar with herbal medicine, only a few of them evaluated their herbal medicine knowledge as high. Most of them rated their knowledge of herbal medicines as inadequate and felt only know superficially. Even those who personally use herbal medicines were hesitant to claim that they are knowledgeable about herbal medicines. Similarly, previous studies reported that conventional health professionals had little or no knowledge of TM-CAM (Boateng et al., 2016; Gyasi et al., 2017a; Kretchy et al., 2016), which is because most participants never received any formal training on herbal medicine. This observation confirmed that TM lacks in the curricula of current healthcare professionals or medical education programs in Indonesia.

Nonetheless, the fact that all participants across the professions were willing to learn about TM, particularly herbal medicines, could be interpreted as an indication of their preparedness to accept the much-discussed integration of TM into conventional practice. It has been reported that knowledge about TM-CAM in Ghana and Saudi Arabia was predictive of interest, attitude,

and positive behavior towards it and had consequences for integrative care in that setting (Albedah et al., 2012; Gyasi et al., 2017b, 2017a; Kretchy et al., 2016a). However, in interpreting this result, it is acknowledged that the self-reported level of knowledge is only perceived.

Most of the participants' perceptions of TM, particularly herbal, were positive, with a few exceptions. TM was widely perceived as an alternative form of patient care and complementary to conventional medicines. Generally, they agreed that herbal medicine is effective in disease prevention, rehabilitation, and health promotion and an adjuvant to conventional medicine in curative therapy. Notably, herbal medicine was perceived to effectively complement the conventional treatment of degenerative disease, metabolic syndrome and palliative care. Opinions of integration between conventional and traditional healthcare received positive responses, with evidence suggesting that integrating the two systems would enhance care delivery in Indonesia and advance universal health coverage (Ben-Arye et al., 2008). The provision of TM in healthcare facilities is necessary to augment the challenge associated with conventional care.

Indonesia's policy on traditional healthcare is a policy of coexistence instead of integration. In a country with a parallel integration model, TM does not usually incorporate in the formal educational training and may also not be supported by health insurance systems (Bodeker, 2001; WHO, 2013b). This model is commonly found in African countries like Nigeria, Guinea, Ghana, and some Asian countries, including Indonesia. Despite a global desire for the modernization and eventual integration of TM into the national healthcare delivery system, the integration process in Indonesia has not been optimal. The national policies on traditional medicine regulatory system for TM products and practitioners are in place, but weak implementation effort (Alawiya et al., 2017; Kristiana et al., 2017; MoH RI, 2014, 2016b, 2017b, 2018b; Oktarina & Rukmini, 2021; Suharmiati et al., 2018). Attempts have also have been made to promote the development of TM education, but the quality was widely perceived as substandard and insufficiently disseminated (Herman et al., 2013; MoH RI, 2010a; Purwaningsih, 2013; Siswanto, 2018). TM is existing parallel with conventional medicine. However, the latter receives state support and funding and has become the official medical model with developed infrastructures and human resources. In order to achieve integration, the participants emphasize the necessity of developing herbal medicine education and clear guideline on TM practices for conventional healthcare providers and advocating the issue of evidence-based TM to be addressed. Legislation on TM, either for regulation or for promotion, as well as proper institutional arrangements for its implementation, is essential in developing TM and integrating it into the national health system.

This study acknowledges the following limitations: first, the results in the study will not allow for generalization because a qualitative approach was adopted. It is suggested that in the future, a study be conducted to investigate the perception of a larger number of conventional healthcare professionals with regards to the practice of herbal medicines and their integration into the formal healthcare system. Second, because of the difficulty of organizing participants

together, focus group discussions were not conducted to help complement the individual interviews.

5. Conclusion

Most of the participants' perceptions of TM, in particular herbal, were positive. TM was widely perceived as an alternative form of patient care and complementary to conventional medicines. The conventional healthcare professionals support more cooperation between TM and CM and integration TM in the mainstream healthcare delivery system within the UHC framework. However, they also indicated some challenges that should be addressed to facilitate integration, namely improving the knowledge base of these practitioners, regulation of evidence-based practice in conventional practice, issues of safety and efficacy of herbal medicines. Accordingly, this study makes recommendations such as a need for developing a standard education program for herbal medicine; a need for a revised policy on herbal medicine use by medical doctors in the clinical practice; the need to promote and facilitate the scale-up of research on evidence of safety and efficacy of herbal medicine.

CHAPTER 6. GENERAL DISCUSSION AND POLICY RECOMMENDATIONS

From the findings from Chapter 3, it can be concluded that the use of traditional herbal medicine (TM) at the community level was ubiquitous even when healthcare services have become more easily available under the universal healthcare insurance system–JKN. The finding suggested that the community's use of TM was not associated with the JKN subscription. People do not necessarily make exclusive use of this system, thereby abandoning traditional healthcare. Furthermore, Chapter 4 showed that TM is an important source of care (sometimes used over and above their potential curative effects) for the local community, especially for rural residents and informal workers where formal institutions may have failed to fulfill health needs. According to Afolabi et al. (2000), TM was considered complementary when used in addition to treating an illness by modern medicine, and it was an alternative when used because of lack of money to go to the hospital for treatment. The findings from Chapter 4 further supports the view that conventional health care systems are not perfect substitutes for TM (Sato, 2012). The currently dominant model of healthcare utilization is based on the paradigm that medicines are valued for their biomedical properties and little else, but we argue that health-seeking behavior is shaped by much more than purely the goal of obtaining medicines. As such, policymakers must carefully consider whether individuals are using TM due to choosing or inaccessibility of conventional medicines. Some evidence exists to support the 'choice' reason: along with being more educated and reporting poorer health status, the majority of TM users appear to be doing so not so much as a result of being dissatisfied with conventional medicine but largely because they find these health care alternatives to be more congruent with their values, beliefs, and philosophical orientations toward health and life. In this case, policies that disregard TM or attempt to replace TM with conventional medicines may prove politically unpopular.

The finding of Chapter 3 indicated the ubiquity of self-medication practice with herbal medicines. Home remedies practice occurs at the household level under the care of non-specialist family members, particularly mothers. We found that several self-limiting diseases, such as the common cold, flu, acute musculoskeletal problem, indigestion problem, uncomplicated diarrhea, and others, are successfully managed at the household level through herbal home remedies. Furthermore, another group of illnesses commonly treated at home with herbal remedies consists of chronic health conditions such as high blood pressure, diabetes, arthritis, and asthma. It would be opportune to favor home remedies as one of the priority areas for intervention programs, considering the important role of herbal medicines for community healthcare. Through such intervention programs, TM could be leveraged to strengthen primary healthcare at the community level. While Indonesian policy on TM development acknowledges the importance of TM use at the household level through the program such as "Family medicine/TOGA" (Siahaan & Aryastami, 2018), the policy does not indicate clear support for supervision of the safe practice of self-medication with TM. Instead, it emphasizes the promotion of its cultivation through the provision of seeds. Given the favourable perception of TM, providing scientific evidence on the safety and efficacy of TM should also become a major

focus of the national public health agenda. Regarding the supervision aspect of home remedies intervention, the basic requirement would be for public health authorities to familiarize themselves with information regarding herbal medicines, including the potential side effects, safe dosage, and potential interactions. Official documentation such as the Indonesian Herbal Medicines Formulary/FOHAI (MoH RI, 2016a) and Traditional Herbal Medicine Formulary/FROTI (MoH RI, 2017a) could be used as references for the health authorities.

While a significant portion of rural and urban communities in Indonesia continues to rely on TM, at the institutional level, TM use in formal healthcare delivery is rather scarce. In the daily lives, many people often spontaneously use traditional medicine and biomedicine together, either subsequently or jointly, and consider them as complementary systems instead of being mutually exclusive, which stands in sharp contrast to the difficult institutional relationship between traditional medicine and biomedicine (Vandebroek, 2013). Regardless of being continuously endorsed by the WHO since the seventies, implementing intercultural healthcare in practice has proven a difficult task for most countries to date, which may be due, in part, to the strained institutional relationships between both healthcare systems. Except for some countries, for example, China, the Republic of Korea, and Vietnam, the position of traditional medicine with the predominance of the biomedical healthcare system remains much debated (Payyappallimana, 2009). At the institutional level, several barriers to integrative healthcare are its general acceptance by biomedical healthcare providers, and issues related to the safety, efficacy, quality and rational use of traditional medicine.

The finding of Chapter 5 implies that the national healthcare system undervalues TM roles, and the healthcare professionals do not fully grasp its potential benefit. Nonetheless, the conventional healthcare professional's positive perception and attitude toward TM use, willingness to acquire formal knowledge of TM. In addition, their acceptance for more cooperation between traditional and conventional medicine could be interpreted as an indication of their preparedness to accept the much-discussed integration of TM into conventional practice. It has been reported that knowledge about TM-CAM was predictive of interest, attitude, and positive behavior towards it and has consequences for integrative care in that setting (Albedah et al., 2012; Gyasi et al., 2017b, 2017a)(Kretchy et al., 2016). Thus, the findings of three sub-studies have implications for integrative healthcare within the UHC in Indonesia.

However, while we argue that the integration of TM in the UHC system could maximize TM contribution and enhance healthcare delivery, some challenges should be addressed to facilitate the integration of TM at the institutional level. The efficacy of TM as a lever to enhance healthcare delivery depends on a range of enabling and constraining factors. As discussed in Chapter 5, Indonesia's policy on traditional healthcare is a policy of coexistence, instead of integration, characterized by the absence of TM in the formal educational training and exclusion in the health insurance systems (Bodeker, 2001; WHO, 2013b). In general, although a set of health legislation to promote TM roles in the national health system is in place, the policy guidelines and programs are far from being clear for implementation at the institutional

level. Findings from this research provide key insights and recommendations for how TMs may be more effectively leveraged to strengthen primary care and healthcare delivery in the UHC system. Specifically, these insights emphasize how healthcare professionals may be better supported to improve public health delivery service through evidence-based TM practice.

1. Developing a standard education program for herbal medicine

Generally, there is a need for a standard education on herbal medicine in Indonesia. In current medical education curricula, herbal medicine is taught as an elective course. In addition, there is only five universities have vocational traditional healthcare faculty (Dikti, 2021). Most participants in the study agreed that herbal medicine should be given more portion than it is now, incorporating herbal medicine in collegium medical education. From the education policy perspective, as current medical curricula have already overload, tailoring a collegium for herbal medicines separately from the conventional medical collegium seems to be more feasible. Policy stakeholders are currently discussing the plan on designing an herbal collegium in medical education, such as Indonesian Medical Council (KKI), doctor's association (IDI) and association of medical education institution (AIPKI) (PDHMI, 2021). Accordingly, Siswanto (2018) argued that the development of traditional Indonesian healthcare should be developed within its boundary, namely "*penyehatan/* to make healthy" (promotive-preventive, complementary area, and palliative) separated from conventional healthcare concept (to cure). When the knowledge of herbal medicine is promoted, healthcare practitioners' competence in herbal medicine will be improved, and better counsel their patients appropriately on herbal medicine use. Thus, herbal medicine use in clinical practice could be promoted based on evidence-based practice.

2. Establishing legal regulatory for herbal medicine use by medical doctor in a clinical practice

As mentioned in Chapter 5, the medical doctor participants desired that its practice in conventional healthcare facilities could be properly and clearly regulated. While legislation to regulate traditional healthcare practitioners and providers exists (MoH RI, 2016b, 2017b, 2018b), there has not been any clear guideline regulating traditional medicine practice by conventional healthcare workers, in particular regarding prescribing herbal medicine. For some participants in this study, the lack of guidelines on internal prescription for herbal medicine has held them back in prescribing or recommending it for patients even when they know that herbal medicine would be more effective in treating the health problem. The *Ministerial Decree No.121/2008* is the closest thing to provide a standard of herbal medical service (MoH RI, 2008), but the regulation was not widely known, perceived to be unclear, and outdated. In this regard, the association of herbal medic doctors (PDHMI) has encouraged the government to make legislation that regulated the permit for a medical doctor to prescribe herbal medicines (Jamu Digital, 2021). The PDHMI views that such legislation is necessary to promote acceptance of herbal medicine use among medical doctors, hence promoting its use in formal health facilities. In Japan, where under the law, western medical-educated physicians may practice *kampo* medicine (Japan traditional medicine), currently, more than 70% of physicians

are using *kampo* medicine in their daily practice together with modern medical treatments (Iwase et al., 2012). Thus, it would be meaningful to establish legislation to regulate and provide guidelines for TM practice in the context of conventional healthcare providers. Having greater confidence in regulatory procedures will enable conventional practitioners to have greater confidence in endorsing herbal medicines.

3. Promoting research on evidence of safety and efficacy of herbal medicine

The abundance of traditional knowledge and herbal medicine use in Indonesia is the strength toward the integration effort. However, this study suggested that the limited scientific evidence on safety and efficacy has led to the limited use of herbal medicine in clinical practice. (Vandebroek, 2013) stated that issues related to the safety, efficacy, quality, and rational use of TM are among the important barriers known to remain for intercultural healthcare at the institutional level. The limited evidence of TM safety, efficacy, and quality was also hindered its inclusion in the JKN scheme. Certain standard safety, efficacy, and quality should be met in order for herbal medicine to be included in the JKN's medicine list (National Formulary /FORNAS). Based on the preparation method and verification of its efficacy, BPOM classified herbal products into three categories; i.e., *jamu*, standardized herbal medicines (*OHT*), and phytomedicines (*fitofarmaka*) (BPOM RI, 2004). While the efficacy of standardized herbals and phytomedicines has been proved in pre-clinical and clinical trials, the therapeutic effects of *jamu* are only supported by empirical data. Unlike *jamu*, standardization of active ingredients is required for standardized herbal and phytomedicine. Of 13462 herbal-based products officially registered at BPOM, there are only 87 were classified as standardized products (62 *OHT* and 25 *fitofarmaka*)(BPOM RI, 2020). Most medicinal plant products currently available in Indonesia, predominantly *jamu*, are yet to meet appropriate standards of safety, quality and efficacy (Yulianingsih, 2016). This study also indicated that the exclusion of herbal medicine in the JKN scheme had hampered the use of herbal medicine by medical doctors. Similarly, the directorate of traditional healthcare services admitted that this issue is among the factors hindering success in achieving the Traditional Healthcare Strategic Plan (*Renstra*) to promote TM in formal/public health facilities (THSD-MoH Indonesia, 2018).

There is limited scientific evidence in Indonesia and other developing economies, mainly due to limited funding for efficacy and safety research and trials (Appiah et al., 2018; WHO, 2000). Given the importance of providing evidence on quality, safety, and efficacy, developing a strategy to promote and facilitate its research should become a major focus within the Indonesian national public health agenda. In this respect, the establishment of the inter-agency special task force by BPOM has initiated the effort to accelerate the development and availability of scientifically proven herbal medicines (Siregar, 2021). The government needs to do more to accelerate the implementation of its agenda. Furthermore, it may be worth revisiting the "Scientification of *Jamu*" program. Through service-based research, this program aims to provide scientific evidence of the safety and efficacy of herbal medicines (Siswanto, 2012). Despite the potential contribution of this program, it has been progressing slowly due to unsynchronized cooperation between associated institutions and the lack of

research funding and promotion at the local government level (Siswanto, 2018). Addressing these challenges and making it a priority to promote its implementation can revitalize the program and accelerate its scale-up across the country, hence increase the scientific evidence of the safety and efficacy of herbal medicines.

The findings of this study have also shed light on other possible areas for future research. Regarding the use pattern of TM, replication of this research based on a case study in other regions is advisable to elucidate a more comprehensive dynamic in parallel healthcare system use by local communities in Indonesia. On healthcare utilization, future studies examining predictors of traditional health care use need to consider the frequency of use in a certain period so that infrequent/irregular users are distinguished from those frequent/regular users. Factors affecting the utilization of JKN by insured TM users are another significant area of interest for future studies. Future research could provide more directly relevant results to the clinical practice for TM use at the institutional level. For example, observational studies, interventions, or collecting basic clinical data from patients about the beneficial and adverse effects of the given herbal medicines. As for policies on TM, we can explore perspectives specific to the integrative healthcare systems, compare with other countries, and construct indicators or evaluations in understanding the value of TM in the national healthcare systems.

CHAPTER 7. CONCLUSION

The thesis examined the current situation of traditional medicine (TM) practice at the community and institutional level in the context of the Universal Health Coverage (UHC) system in Indonesia through examining: 1) how is current local community pattern use of TM, 2) what are the underlying factors of local communities use of TM, 3) how is TM currently practiced in the health service delivery and valued in the national policies.

On community-level examination, through the ethnobotanical study of rural West Java, Indonesia, it was found that traditional herbal medicine remains a significant aspect of healthcare for rural communities under the current UHC system. We found that 102 medicinal plants were used in 68% of households. The use of herbal medicine was ubiquitous but more frequent in rural areas, elders, informal workers, and lower education. However, more importantly, herbal medicine use was not associated with the availability of public healthcare services within the UHC system. Herbal medicine use remains a significant part of healthcare for rural communities in the West Java area under the current universal healthcare system. Herbal medicine use was associated with the area of residence, age, education level, and occupation of residents while being unassociated with gender and health insurance status. This study underlines that even when modern healthcare services become more physically available in a rural area, people do not necessarily make exclusive use of this system, thereby abandoning traditional healthcare.

The study further examined the determinant of TM use through a case study of the general population (rural and urban communities) in West Java to understand the underlying factors of community use of TM. It was revealed that being a rural resident, more educated, experiencing health problems, holding a holistic view of health, having knowledge and favorable perception of TM serve as significant predictors of TM use. It is worth noting that people's experience and personal attributes related to TM, such as beliefs about health, knowledge, perception, or attitude toward TM, rather than dissatisfaction with conventional care, were largely responsible for ongoing TM use in the community. The finding that TM users are no more dissatisfied with healthcare services than nonusers also imply the underutilization of JKN services by the insured TM users living in rural areas.

On examination of TM use at the institutional level, through a qualitative study of conventional healthcare professionals and policy analysis, it was revealed that the perception and attitudes of the practitioners of TM use in the clinical practice were generally positives. While only a few prescribed TM, most of them have experience recommending TM informally to their patient. These conventional healthcare practitioners also support the idea of more cooperation between traditional and conventional medicine in the mainstream healthcare delivery system, and to anticipate this, they are willing to learn more about herbal medicines, as most of them rated their knowledge as low. The policy analysis further indicated that TM use in the formal healthcare delivery is undervalued in the current national policy. Thus, the result pointed some challenges that should be addressed to facilitate and anticipated the integration of the two

healthcare systems, namely improving the knowledge base of these practitioners, regulation of evidence-based practice in conventional practice, and issues of safety and efficacy of herbal medicine.

Drawing insight from the community and institutional level, we conclude that traditional herbal medicine can be leveraged and maximized to advance “healthcare for all” through integrating TM in the conventional delivery system within the JKN scheme and the intervention programs with the priority area of domestic remedies. The implications of this study results for institutional level integration are the need for developing a standard education program for herbal medicine; a revised policy on herbal medicine use by medical doctors in the clinical practice, and the need to promote and facilitate the scale-up of research on evidence of safety and efficacy of herbal medicine.

APPENDIX

Medicinal plants used by residents in Cihea and Neglasari village in the last six months (102 species).

Family and species names	Collection no.	Local name	Part used	Total number of citations	Purpose	Preparation/ application method
<i>Acanthaceae</i>						
<i>Andrographis paniculata</i> (Burm.f.) Nees	RM 37/C	Sambiloto	Leaf, stem	42	Diabetes, lack of appetite, fever, urinary disease, asthma	dc/oi
<i>Graptophyllum pictum</i> (L.) Griff.	RH 102/S	Handeuleum	Leaf	2	Hemorrhoid	dc/oi
<i>Hemigraphis crispa</i> (L.) T.Anderson	RH 100/S	Pecah beling	Leaf	2	Low back pain, genito-urinary (bladder, cystitis)	dc/oi
<i>Amaranthaceae</i>						
<i>Achyranthes aspera</i> L.	RH 95/S	Jarong	Leaf	1	Wound healing	mc/ta
<i>Amaryllidaceae</i>						
<i>Allium cepa</i> L.	RM10/M	Bawang beureum	Bulb	39	Fever	sq/ta
<i>Allium sativum</i> L.	RM 22/M	Bawang bodas	Bulb sap Leaf	43	Ulcer, acne Hypertension	nn/ta dc/oi
<i>Annonaceae</i>						
<i>Annona muricata</i> L.	RM 16/M	Sirsak	Leaf	18	Sore throat, back pain, hypertension, prostate problems	dc/oi
<i>Apiaceae</i>						
<i>Apium graveolens</i> L.	RM 12/M	Saledri	Whole part	23	Hypertension, muscle sore, headache	dc/oi
<i>Centella asiatica</i> (L.) Urb.	RM 42/C	Antanan	Leaf	7	Hypertension, genito-urinary, (bladder, cystitis), arthritis, fever, anemia	dc/oi or
<i>Coriandrum sativum</i> L.	RM 40/C	Katuncar	Seed	1	Headache	dc/oi
<i>Apocynaceae</i>						
<i>Alstonia angustiloba</i> Miq.	RH 84/S	Pulai / Lame	Sap	3	Toothache	nn/ta
<i>Arecaceae</i>						
<i>Areca catechu</i> L.	RH 87/S	Jambe	Seed	2	Hookworm, low stamina, strengthen teeth	dc/oi or nn/cw
<i>Arenga pinnata</i> (Wurmb) Merr.	RM 38/C	Aren	Sap	5	Gout	nn/ta
<i>Asphodelaceae</i>						
<i>Aloe vera</i> (L.) Burm.f.	RM 18/M	Lidah buaya	Leaf gel	3	Burn injury, acne	nn/ta
<i>Asteraceae</i>						
<i>Acmella paniculata</i> (Wall. ex DC.) R.K.Jansen	RM 63/N	Jotang	Flower	4	Toothache	dc/oi or cs
<i>Ageratum conyzoides</i> L.	RM 21/M	Babadotan	Leaf	3	Burn injury	sq/ta
<i>Blumea balsamifera</i> (L.) DC.	RM 32/C	Sembung	Leaf	13	Fever	dc/oi
<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	RH 90/S	Kirinyuh	Leaf	1	Gout, low back pain Wound, burn injury	dc/oi sq/ta
<i>Erigeron sumatrensis</i> Retz.	RH 83/S	Jalantir	Leaf	2	Headache	sq/ta
<i>Crassocephalum crepidioides</i> (Benth.) S.Moore	RH 81/S	Sintrong	Leaf	4	Hypertension, shiver	nn/cs
<i>Elephantopus scaber</i> L.	RH 85/S	Tapak liman	Leaf	1	Asthma, cough, tuberculosis	dc/oi
<i>Gynura divaricata</i> (L.) DC.	RM 05/M	Dewa	Leaf	14	Hypertension, genito-urinary (bladder, cystitis)	dc/oi

(continued on next page)

(continued)

Family and species names	Collection no.	Local name	Part used	Total number of citations	Purpose	Preparation/ application method
<i>Basellaceae</i>						
<i>Anredera cordifolia</i> (Ten.) Steenis	RM 03/M	Binahong	Leaf	34	Fever, diabetes, cough, gout, irregular menstrual cycle Mouth ulcer Wound, sprain	dc/oi or pd/gg pd/ta
<i>Campanulaceae</i>						
<i>Hippobroma longiflora</i> (L.) G.Don	RH 88/S	Korejat	Flower	1	Eye diseases	mc/ws
<i>Caricaceae</i>						
<i>Carica papaya</i> L.	RM 13/M	Gedang	Leaf	25	Arthritis, joint pain, hypertension	dc/oi or cs
<i>Calophyllaceae</i>						
<i>Calophyllum inophyllum</i> L.	RM 73/S	Bintangur	Leaf, root	2	Gout	dc/oi
<i>Convolvulaceae</i>						
<i>Ipomoea aquatica</i> Forssk.	RM 66/S	Kangkung	Leaf, stem	2	Jaundice, liver disease	nn/cs
<i>Crassulaceae</i>						
<i>Kalanchoe pinnata</i> (Lam.) Pers.	RM 09/M	Cocor bebek	Leaf	24	Fever, wound, toothache	pd/ta
<i>Cucurbitaceae</i>						
<i>Cucumis sativus</i> L.	RM 19/M	Bonteng	Fruit	10	Hypertension	nn/cs
<i>Momordica charantia</i> L.	RM 11/M	Paria	Leaf, fruit	58	Gout	dc/oi (leaf), nn/cs (fruit)
<i>Sicyos edulis</i> Jacq.	RM 15/M	Waluh	Fruit	1	Fever	sq/oi
<i>Euphorbiaceae</i>						
<i>Jatropha curcas</i> L.	RM 45/C	Jarak	Latex	2	Toothache, mouth ulcer	nn/ta
<i>Jatropha multifida</i> L.	RM 57/N	Betadin	Leaf	2	Wound healing	nn/ta
<i>Manihot esculenta</i> Crantz	RM 62/N	Sampeu	Tuber Leaf	6	Mouth ulcer, gastritis Anemia	sq/oi co/cs
<i>Ricinus communis</i> L.	RM 70/N	Kaliki	Leaf	2	Fever, bruises Post-partum healing	pd/ta ht/ta
<i>Fabaceae</i>						
<i>Abrus precatorius</i> L.	RM 29/M	Saga	Leaf	15	Mouth ulcer	nn/cw
<i>Archidendron jiringa</i> (Jack) I.C.Nielsen	RM 78/S	Jengkol	Fruit	3	Diabetes, genito-urinary (bladder, cystitis)	nn/cs
<i>Erythrina subumbrans</i> (Hassk.) Merr.	RM 20/M	Dadap	Leaf	46	Fever, post-partum healing, stomachache, typhoid	dc/oi
<i>Leucaena leucocephala</i> (Lam.) de Wit	RM 04/M	Lamtoro	Seed Leaf	14	Diabetes Wound, edema	rs, dc/oi pd/ta
<i>Tamarindus indica</i> L.	RM 48/C	Asem	Fruit	1	Cough	dc/oi
<i>Lamiaceae</i>						
<i>Mentha spicata</i> L.	RH 98/S	Daun min	Leaf	1	Bad breath	dc/oi or
<i>Orthosiphon aristatus</i> (Blume) Miq.	RM 33/C	Kumis ucing	Leaf	24	Back pain, muscle sore, hypertension, gout, genito-urinary (bladder, cystitis)	dc/oi
<i>Plectranthus scutellarioides</i> (L.) R.Br.	RM 30/C	Jawer kotok	Leaf	15	Constipation, itchy skin, hemorrhoids Post-partum healing	dc/oi dc/ws

(continued on next page)

(continued)

Family and species names		Collection no.	Local name	Part used	Total number of citations	Purpose	Preparation/ application method
<i>Lauraceae</i>							
	<i>Cinnamomum iners</i> (Reinw. ex Nees & T.Nees) Blume	RM 80/S	Ki teja	Bark	1	Fever	dc/oi
<i>Magnoliaceae</i>							
	<i>Magnolia × alba</i> (DC.) Figlar	RM 74/S	Cempaka bodas	Bark	2	Fever	dc/oi
<i>Malvaceae</i>							
	<i>Abelmoschus manihot</i> (L.) Medik.	RM 34/C	Gedi	Leaf	15	Back pain Indigestion, hypertension	dc/oi dc/oi
	<i>Hibiscus rosa-sinensis</i> L.	RM 43/C	Wera	Flower, roots	9	Wet cough, fever	mc or dc/oi
	<i>Melochia umbellata</i> (Houtt.) Stapf	RH/97/S	Bintinu	Bark	2	Bone fracture	nn*
	<i>Sterculia oblongata</i> R.Br.	RM 76/S	Hantap	Leaf, seed	2	Indigestion	dc/oi
<i>Meliaceae</i>							
	<i>Aglaia odorata</i> Lour.	RM 14/M	Pacar cina	Leaf, flower	8	Hemorrhage, diarrhea, bloated, headache, cough Bruises, ulcer	dc/oi pd/ta
	<i>Sandoricum koetjape</i> (Burm.f.) Merr.	RM 75/N	Kacapi	Root	1	Low back pain, stomachache	pd, dc/oi
	<i>Swietenia macrophylla</i> King	RM 65/N	Mahoni	Seed	2	Body aches, itchy skin	nn/oi
<i>Menispermaceae</i>							
	<i>Cyclea barbata</i> Miers	RM 67/S	Cincau	Leaf	1	Fever	dc/oi
	<i>Tinospora crispa</i> (L.) Hook. f. & Thomson	RM 31/C	Bratawali	Stem	23	Lack of appetite, diabetes, fever, genito-urinary (bladder, cystitis)	dc/oi
<i>Moraceae</i>							
	<i>Artocarpus altilis</i> (Parkinson) Fosberg	RM 71/S	Sukun	Leaf, roots	3	Laxative, headache, mild skin disease	dc/oi
	<i>Artocarpus heterophyllus</i> Lam.	RM 23/M	Nangka	Leaf	5	Stimulate breast milk production, cold, fever	dc/oi
	<i>Ficus carica</i> L.	RH 96/S	Buah Tin	Fruit	1	Indigestion	sq/oi
	<i>Ficus septica</i> Burm.f.	RH 89/S	Ki ciyat	Sap	1	Skin diseases such as heloma (corn), wart, callus	nn/ta
<i>Moringaceae</i>							
	<i>Moringa oleifera</i> Lam.	RM 28/M	Kelor	Root	6	Toothache, headache	pd/ta
<i>Muntingiaceae</i>							
	<i>Muntingia calabura</i> L.	RM 79/R	Kersen	Leaf	6	High cholesterol, diabetes	dc/oi
<i>Musaceae</i>							
	<i>Musa acuminata</i> Colla	RH 93/S	Cau	Bud sap Young fruit	2	Wound healing Stomachache	nn/ta nn/cs
<i>Myrtaceae</i>							
	<i>Psidium guajava</i> L.	RM 25/M	Jambu batu	Leaf Fruit	45	Diarrhea Dengue fever	dc/oi sq/oi
	<i>Syzygium aromaticum</i> (L.) Merr. & L.M.Perry	RM 35/C	Cengkeh	Flower	8	Toothache	dc/oi
	<i>Syzygium cumini</i> (L.) Skeels	RM 77/S	Duwet	Seed, fruit	2	Diabetes	dc/oi, nn/cs (fruit)
	<i>Syzygium polyanthum</i> (Wight) Walp.	RM 36/C	Salam	Leaf	7	Gastritis, high cholesterol	dc/oi

(continued on next page)

(continued)

Family and species names	Collection no.	Local name	Part used	Total number of citations	Purpose	Preparation/ application method
<i>Oxalidaceae</i>						
<i>Averrhoa bilimbi</i> L.	RM 17/M	Calincing	Fruit	4	Hypertension	sq/oi
<i>Averrhoa carambola</i> L.	RH 99/S	Balingbing	Fruit	5	Hypertension, headache	sq/oi
<i>Pandanaceae</i>						
<i>Pandanus amaryllifolius</i> Roxb. ex Lindl.	RM 59/C	Pandan	Leaf	5	Hypertension, muscle sore, diabetes, lack of appetite	dc/oi
<i>Phyllanthaceae</i>						
<i>Antidesma bunius</i> (L.) Spreng.	RM 72/S	Huni	Leaf	1	Wound healing	dc/oi
<i>Breynia androgyna</i> (L.) Chakrab. & N.P.Balakr.	RM 26/M	Katuk	Leaf	22	Post-partum healing, fever, stimulate breast milk production	dc/oi or co/cs
<i>Phyllanthus acidus</i> (L.) Skeels	RM 44/C	Cereme	Leaf	1	Mouth ulcer	nn/cw
<i>Phyllanthus emblica</i> L.	RH 103/S	Malaka	Fruit	1	Diabetes	sq/oi
<i>Petiveriaceae</i>						
<i>Rivina humilis</i> L.	RH 101/S	Kalingsir	Leaf	1	Edema	sq/ta
<i>Piperaceae</i>						
<i>Piper betle</i> L.	RM 02/M	Seureuh	Leaf	30	Vaginal discharge, post-partum healing Bad breath	dc/ws dc/oi
<i>Piper crocatum</i> Ruiz & Pav.	RM 50/C	Seureuh beureum	Leaf	1	Nose bleed	nn**
<i>Piper nigrum</i> L.	RH 92/S	Pedes	Fruit	5	Blood circulation problem, cough	dc/oi
<i>Piper retrofractum</i> Vahl	RH 91/S	Cabe jawa	Fruit	6	Blood circulation problem, cough, asthma	dc/oi
<i>Piper sarmentosum</i> Roxb.	RM 58/C	Karuk	Leaf	5	Cough Eye-care Vaginal discharge	dc/oi dc/ws dc/ws
<i>Plantaginaceae</i>						
<i>Plantago major</i> L.	RM 24/M	Ki urat	Leaf	4	Muscle sore, arthritis, gout	pd/ta
<i>Poaceae</i>						
<i>Cymbopogon citratus</i> (DC.) Stapf	RM 01/M	Sereh	Roots	36	Toothache Itchy skin, bad body odor	pd/gg nn/hb
<i>Imperata cylindrica</i> (L.) P.Beauv.	RM 61/C	Alang-alang	Whole part	2	Hypertension, indigestion	dc/oi
<i>Saccharum officinarum</i> L.	RM 27/M	Tiwu	Sap	2	Genito-urinary (bladder, cystitis), gastritis, blood circulation problem	sq/oi
<i>Rubiaceae</i>						
<i>Gardenia jasminoides</i> J.Ellis	RM 52/N	Kaca piring	Leaf	1	Stomachache, back pain, fever	dc/oi
<i>Morinda citrifolia</i> L.	RM 47/C	Cangkudu	Fruit	6	Hypertension	sq/oi

(continued on next page)

(continued)

Family and species names	Collection no.	Local name	Part used	Total number of citations	Purpose	Preparation/ application method
<i>Rutaceae</i>						
<i>Citrus × aurantiifolia</i> (Christm.) Swingle	RM 07/C	Jeruk mipis	Fruit	28	Cold, cough, sore throat, stamina Post-partum healing	sq/oi sq/ta
<i>Citrus hystrix</i> DC.	RM 51/N	Jeruk purut	Leaf	2	Swelling gum	dc/oi
<i>Sapotaceae</i>						
<i>Manilkara zapota</i> (L.) P.Royen	RH 94/S	Sawo	Young fruit	1	Diarrhea, fever	sq/oi
<i>Solanaceae</i>						
<i>Physalis angulata</i> L.	RM 56/N	Cecenet	Whole part	2	Back pain	dc/oi
<i>Solanum americanum</i> Mill.	RM 68/S	Leunca	Leaf	1	Fever	dc/oi
<i>Solanum lycopersicum</i> L.	RM 64/S	Tomat	Fruit	1	Prostate problems	nn/cs
<i>Solanum melongena</i> L.	RM 54/N	Terong	Seed, Leaf	1	Toothache	dc/gg
<i>Thymelaeaceae</i>						
<i>Phaleria macrocarpa</i> (Scheff.) Boerl.	RM 46/C	Mahkota dewa	Fruit	1	Diabetes	dc/oi
<i>Verbenaceae</i>						
<i>Lantana camara</i> L.	RM 60/ N	Saliara	Root, leaf	4	Hypertension, gastritis	dc/oi
<i>Zingiberaceae</i>						
<i>Alpinia galanga</i> (L.) Willd.	RM 39/M	Langkoas/ laja	Rhizome	5	Joint pain	pd/ta
<i>Wurfbainia compacta</i> (Sol. ex Maton) Skomick. & A D Pnilsen	RH/82/S	Kapulaga	Rhizome	3	Low back pain, arthritis	dc/oi
<i>Curcuma longa</i> L.	RM 06/M	Koneng	Rhizome	181	Post-partum healing, gastritis, stomachache, irregular menstrual cycle	dc or sq/oi
<i>Curcuma zanthorrhiza</i> Roxb.	RM 41/C	Temulawak	Rhizome	2	Liver disease, lack of appetite, high cholesterol	dc/oi
<i>Curcuma zedoaria</i> (Christm.) Roscoe	RM 55/N	Koneng bodas	Rhizome	4	Gastritis, lack of appetite	dc or sq/oi
<i>Etlingera elatior</i> (Jack) R.M.Sm.	RH 86/S	Honje	Rhizome	1	Vertigo	dc/oi
<i>Kaempferia galanga</i> L.	RM 53/N	Cikur	Rhizome	7	Cough, stomachache	sq/oi
<i>Zingiber officinale</i> Roscoe	RM 08/M	Jahe	Rhizome	92	Cough, cold, muscle sore, nauseous, stomachache, post-partum	dc or sq/oi
<i>Zingiber zerumbet</i> (L.) Roscoe ex Sm.	RM 69/S	Lampuyang	Rhizome	4	Hypertension, gastritis	dc or sq/oi

Notes : preparation method—dc: decocting (in water, with or without heat); ht: heating (not in water); mc: macerating; nn: none; pd: pounding; rs: roasting; sq: squeezing (not heated, with or without water), and for application method—co: consume; cw: chew; gg: gargle; hb: hot bath oi: oral ingestion; ta: topical application; ws: washing with water in which the plant is admixed; *directly used as fracture's support, **fold then directly stuffed into nose.

REFERENCES

- Abuduli, M., & Aljunid, S. (2011). Role of Traditional And Complementary Medicine In Universal Health Coverage. *Malaysian Journal of Public Health Medicine*, 11(2), 1–5.
- Aday, L. A., & Andersen, R. M. (2005). Models of Health Care Utilization and Behavior. *Encyclopedia of Biostatistics*, 2–5. <https://doi.org/10.1002/0470011815.b2a4a010>
- Adi Nugroho, I., Ridho Nurrochmat, D., Kosim Kadarusman, L., & Poerwadianto, A. (2016). Stakeholders's Economic Behavior on Utilization of Medicinal Plant in Meru Betiri National Park, East Java. *Penelitian Sosial Dan Ekonomi Kehutanan*, 13(2), 107–120.
- Agyemang-Duah, W., Peprah, C., & Arthur-Holmes, F. (2020). Predictors of healthcare utilisation among poor older people under the livelihood empowerment against poverty programme in the Atwima Nwabiagya District of Ghana. *BMC Geriatrics*, 20(1), 1–12. <https://doi.org/10.1186/s12877-020-1473-8>
- Alawiya, N., Utami, N. A. T., & Afwa, U. (2017). Implementasi Legalisasi Pelayanan Kesehatan Tradisional Di Kabupaten Banyumas Sebagai Bentuk Perlindungan Hukum Bagi Masyarakat. *Prosiding Seminar Nasional*, 6, 1479–1485.
- Albedah, A. M., El-olemy, A. T., & Khalil, M. K. M. (2012). Knowledge and attitude of health professionals in the Riyadh region , Saudi Arabia , toward complementary and alternative medicine. *Journal of Family and Community Medicine*, 19(2), 93–99. <https://doi.org/10.4103/2230-8229.98290>
- Albuquerque, U. P. De. (2006). *Re-examining hypotheses concerning the use and knowledge of medicinal plants : a study in the Caatinga vegetation of NE Brazil*. 10. <https://doi.org/10.1186/1746-4269-2-30>
- Allabi, A. C., Busia, K., Ekanmian, V., & Bakiono, F. (2011). The use of medicinal plants in self-care in the Agonlin region of Benin. *Journal of Ethnopharmacology*, 133(1), 234–243. <https://doi.org/10.1016/j.jep.2010.09.028>
- Alnaim, L., Almazrou, S., Alsunbul, M., Alhaji, A., Alenazi, A., & Alboami, S. (2018). Pharmacist's knowledge and attitudes towards complementary and alternative medicine in Saudi Arabia: A cross-sectional study. *Advances in Integrative Medicine*, 5(3), 96–102. <https://doi.org/10.1016/j.aimed.2018.01.003>
- Amar, S. C. D. (2010). *Gunem Catur in the Sunda Region of West Java: Indigenous Communication on MAC Plant Knowledge and Practice within the Arisan in Lembang, Indonesia*. (Publication No. 6) [Doctoral dissertation, Leiden University]. Leiden University Library.
- Appiah, B., Amponsah, I. K., Poudyal, A., & Mensah, M. L. K. (2018). Identifying strengths and weaknesses of the integration of biomedical and herbal medicine units in Ghana using the WHO Health Systems Framework: A qualitative study. *BMC Complementary and Alternative Medicine*, 18(1), 1–8.

- Assan, J. K., Assan, S. K., Assan, N., & Smith, L. (2009). Health inequality in resource poor environments and the pursuit of the MDGs: Traditional versus modern healthcare in rural Indonesia. *Journal of Health Management*, 11(1), 93–108. <https://doi.org/10.1177/097206340901100107>
- Astin, J. A. (1998). Why patients use alternative medicine: Results of a national study. *Journal of the American Medical Association*, 279(19), 1548–1553. <https://doi.org/10.1001/jama.279.19.1548>
- Astin, J. A., Soeken, K., Sierpina, V. S., & Clarridge, B. R. (2006). Barriers to the integration of psychosocial factors in medicine: Results of a national survey of physicians. *Journal of the American Board of Family Medicine*, 19(6), 557–565. <https://doi.org/10.3122/jabfm.19.6.557>
- Avina, R. L., & Schneiderman, L. J. (1978). Why patients choose homeopathy. *Western Journal of Medicine*, 128(4), 366–369.
- Awodele, O., Agbaje, E. O., Abiola, O. O., Awodele, D. F., & Dolapo, D. C. (2012). Doctors' attitudes towards the use of herbal medicine in Lagos, Nigeria. *Journal of Herbal Medicine*, 2(1), 16–22. <https://doi.org/10.1016/j.hermed.2012.02.002>
- Aziz, Z., & Tey, N. P. (2009). Herbal medicines: Prevalence and predictors of use among Malaysian adults. *Complementary Therapies in Medicine*, 17(1), 44–50. <https://doi.org/10.1016/j.ctim.2008.04.008>
- Babitsch, B., Gohl, D., & Lengerke, T. von. (2012). Re-revisiting Andersen's Behavioral Model of Health Services Use: a systematic review of studies from 1998–2011. *GMS Psycho-Social-Medicine*, 9, 1–15.
- Backer, C. A., & Bakhuizen van den Brink Jr., R. C. (1963). *Flora of Java*.
- Bagiastra, I. N., & Sudantra, I. K. (2019). Bali Dalam Pengembangan Pengobatan Tradisional Komplementer (Kajian Yuridis Peraturan Menteri Kesehatan Republik Indonesia Nomor 15 Tahun 2018 Tentang Penyelenggaraan Pelayanan Kesehatan Tradisional Komplementer). *Jurnal Penelitian Dan Pengembangan Sains Dan Humaniora*, 2(2), 88. <https://doi.org/10.23887/jppsh.v2i2.17487>
- Bahar, Y. H. (2016). Kebijakan Pengembangan Tanaman Obat. *Prosiding Seminar Nasional Tumbuhan Obat Indonesia (TOI) Ke-50, Penggalan, Pelestarian, Pemanfaatan Dan Pengembangan Berkelanjutan*, 33(66), 1–20.
- Balitbang TOOT. (2015). *Riset khusus Eksplorasi Pengetahuan Lokal Etnomedicin dan Tumbuhan Obat Berbasis Komunitas Di Indonesia (Etnis Osing Jawa Timur)*.
- Ben-Arye, E., Frenkel, M., Klein, A., & Scharf, M. (2008). Attitudes toward integration of complementary and alternative medicine in primary care: Perspectives of patients, physicians and complementary practitioners. *Patient Education and Counseling*, 70(3), 395–402. <https://doi.org/10.1016/j.pec.2007.11.019>
- Benítez, G. (2010). *Pharmaceutical ethnobotany in the western part of Granada province (southern Spain): Ethnopharmacological synthesis*. 129, 87–105.

<https://doi.org/10.1016/j.jep.2010.02.016>

- Benz, B. F., Cevallos E., J., Santana M., F., Rosales A., J., & Graf M., S. (2000). Losing knowledge about plant use in the sierra de manantlan biosphere reserve, Mexico. *Economic Botany*, 54(2), 183–191. <https://doi.org/10.1007/BF02907821>
- BHL. (2020). *Biodiversity Heritage Library*. <http://www.biodiversitylibrary.org/>.
- Birhan, W., Giday, M., & Teklehaymanot, T. (2011). The contribution of traditional healers' clinics to public health care system in Addis Ababa, Ethiopia: A cross-sectional study. *Journal of Ethnobiology and Ethnomedicine*, 7, 1–7. <https://doi.org/10.1186/1746-4269-7-39>
- Bishop, F. L., & Lewith, G. T. (2010). Who uses CAM a narrative review of demographic characteristics and health factors associated with CAM use. *Evidence-Based Complementary and Alternative Medicine*, 7(1), 11–28. <https://doi.org/10.1093/ecam/nen023>
- Bitran, R. (2014). Universal health coverage and the challenge of informal employment : lessons from developing countries. In *Health, Nutrition, and Population (HNP) Discussion Paper This (Issue January)*. <http://documents.banquemondiale.org/curated/fr/2014/01/19491214/universal-health-coverage-challenge-informal-employment-lessons-developing-countries>
- Boateng, M. A., Danso-Appiah, A., Turkson, B. K., & Tersbøl, B. P. (2016). Integrating biomedical and herbal medicine in Ghana - experiences from the Kumasi South Hospital: A qualitative study. *BMC Complementary and Alternative Medicine*, 16(1), 1–8. <https://doi.org/10.1186/s12906-016-1163-4>
- Bodeker, G. (2001). Lessons on integration from the developing world's experience. *BMJ*, 322, 164–167.
- Bodeker, G., Ong, C.-K., Grundy, C., Burford, G., & Shein, K. (2005). *WHO global atlas of traditional, complementary and alternative medicine*. WHO. <https://apps.who.int/iris/handle/10665/43108>
- Bourdy, G., Willcox, M. L., Ginsburg, H., Rasoanaivo, P., Graz, B., & Deharo, E. (2008). *Ethnopharmacology and malaria: New hypothetical leads or old efficient antimalarials ?* 38, 33–41. <https://doi.org/10.1016/j.ijpara.2007.07.004>
- BPJS Health. (2019). *Info BPJS Kesehatan: Pemanfaatan Data JKN Untuk Perbaikan Sistem Kesehatan di Indonesia*. <https://bpjs-kesehatan.go.id/bpjs/>
- BPJS Health. (2020). *Peserta Jaminan Kesehatan*. BPJS Kesehatan. <https://bpjs-kesehatan.go.id/bpjs/pages/detail/2014/11>
- BPOM RI. (2004). *Keputusan Kepala BPOM RI No. HK. 00.05.4.2411 Tentang Ketentuan Pokok Pengelompokan dan Penandaan Obat Bahan Alam Indonesia*.
- BPOM RI. (2005). *Peraturan Kepala Badan Pengawas Obat dan Makanan RI No. HK.00.05.4.1380*.
- BPOM RI. (2020). *Informatorium Obat Modern Asli Indonesia (OMAI) di Masa Pandemi*

- Busmann, R. W., Glenn, A., Sharon, D., Chait, G., Díaz, D., Pourmand, K., Jonat, B., Somogy, S., Guardado, G., Aguirre, C., Chan, R., Meyer, K., Rothrock, A., & Townesmith, A. (2011). Proving that Traditional Knowledge Works: The antibacterial activity of Northern Peruvian medicinal plants. *Ethnobotany Journal*, 9, 67–96.
- Caniago, I., & Siebert, S. F. (1998). Medicinal plant ecology, knowledge and conservation in Kalimantan, Indonesia. *Economic Botany*, 52(3), 229–250. <https://doi.org/10.1007/BF02862141>
- Case, R. J., Pauli, G. F., & Soejarto, D. D. (2005). Factors in Maintaining Indigenous Knowledge Among Ethnic Communities of Manus island. *Economic Botany*, 59(4), 356–365. [https://doi.org/10.1663/0013-0001\(2005\)059\[0356:FIMIKA\]2.0.CO;2](https://doi.org/10.1663/0013-0001(2005)059[0356:FIMIKA]2.0.CO;2)
- Ceuterick, M., Vandebroek, I., Torry, B., & Pieroni, A. (2008). *Cross-cultural adaptation in urban ethnobotany: The Colombian folk pharmacopoeia in London*. 120, 342–359. <https://doi.org/10.1016/j.jep.2008.09.004>
- Chaudhury, R. ., & Rafei, U. . (2001). Traditional medicine in Asia. In *WHO Regional Office for South-East Asia*. http://searo.who.int/entity/medicines/documents/traditional_medicines_in_asia.pdf
- Christina, J., Abigail, W., Cuthbertson, L. A., & Whitehead, D. (2019). Nurses' Knowledge and Attitudes Toward Complementary and Alternative Medicine for Adult Patients With Cancer in Bandung, West Java, Indonesia: A Qualitative Study. *Journal of Holistic Nursing*, 37(2), 130–139. <https://doi.org/10.1177/0898010118811047>
- Clement, Y. N., Morton-Gittens, J., Basdeo, L., Blades, A., Francis, M. J., Gomes, N., Janjua, M., & Singh, A. (2007). Perceived efficacy of herbal remedies by users accessing primary healthcare in Trinidad. *BMC Complementary and Alternative Medicine*, 7, 1–9. <https://doi.org/10.1186/1472-6882-7-4>
- Dahlberg, A. C., & Trygger, S. B. (2009). Indigenous medicine and primary health care: The importance of lay knowledge and use of medicinal plants in Rural South Africa. *Human Ecology*, 37(1), 79–94. <https://doi.org/10.1007/s10745-009-9217-6>
- DAR. (2020). *Digital Academic Repository of Naturalis Biodiversity Center*. <https://www.repository.naturalis.nl/>.
- Dartanto, T., Rezki, F. J., Pramono, W., Siregar, C. H., Usman, & Bintara, H. (2016a). Participation of Informal Sector Workers in Indonesia's National Health Insurance System. *Southeast Asian Economies*, 33(3), 317–342. <https://doi.org/10.1355/ae33-3c>
- Dartanto, T., Rezki, J. F., Pramono, W., Siregar, C. H., & Bintara, H. (2016b). Why Are Workers in the Informal Sector Reluctant to Join the National Health Insurance System in Indonesia? *Journal of Southeast Asian Economies*, 33(3), 320–348. <https://doi.org/10.1355/ae33-3c>
- Dartanto, T., Rezki, J. F., Siregar, C. H., Bintara, H., & Pramono, W. (2015). *Expanding Universal Health Coverage in The Presence of Informality in Indonesia: Challenges and Policy* (No. 004). www.lpem.org

- De Mello Amorozo, M. C. (2004). Pluralistic medical settings and medicinal plant use in rural communities, Mato Grosso, Brazil. *Journal of Ethnobiology*, 24(1), 139–161.
- Delgoda, R., Ellington, C., Barrett, S., Gordon, N., Clarke, N., & Younger, N. (2004). The practice of polypharmacy involving herbal and prescription medicines in the treatment of diabetes mellitus, hypertension and gastrointestinal disorders in Jamaica. *West Indian Medical Journal*, 53(6), 400–405.
- Delima, Widowati, L., Astuti, Y., Siswoyo, H., Gitawati, R., & Purwadianto, A. (2012). Gambaran Praktik Penggunaan Jamu Oleh Dokter Di Enam Provinsi Di Indonesia. *Buletin Peneliti Kesehatan*, 40(3), 109–122.
- Dewi, T. F., & Nisa, U. (2019). Faktor-Faktor yang Berhubungan dengan Pemanfaatan Obat Tradisional pada Pasien Hiperkolesterolemia di Rumah Riset Jamu “Hortus Medicus.” *Indonesian Journal of Clinical Pharmacy*, 8(1). <https://doi.org/10.15416/ijcp.2019.8.1.49>
- Diana Sari, I., Yuniar, Y., Siahaan, S., & Syaripuddin, M. (2015). Tradisi Masyarakat dalam Penanaman dan Pemanfaatan Tumbuhan Obat Lekat di Pekarangan Community Tradition in Planting and Using Medicinal Plant in Surround Home Yard. *Jurnal Kefarmasian Indonesia*, 5(2), 123–132.
- Dikti. (2021). *PDDikti - Pangkalan Data Pendidikan Tinggi*. <https://pddikti.kemdikbud.go.id/> accessed 2021-05-12
- Dinarta, H., & Purhadi. (2013). Faktor-faktor yang Mempengaruhi Morbiditas Penduduk Jawa Timur dengan Multivariate Geographically Weighted Regression (MGWR). *Jurnal Sains Dan Seni Pomits*, 2(2), 189–194.
- Djamaluddin, A., Putra, R. K., & Ratnasari, D. (2021). Persepsi Masyarakat Terhadap Pengobatan Tradisional Berdasarkan Perbedaan Jenis Kelamin. *Journal of Holistic and Health Sciences*, 4(2), 67–77. <https://doi.org/https://doi.org/10.51873/jhhs.v4i2.82>
- Duaja, M. D., Kartika, E., & Mukhlis, F. (2011). Improvement of Community Health Through Empowerment of Women in Utilizing Homestead with Medicinal Plants (TOGA) in Geragai District (in bahasa Indonesia). *Jurnal Pengabdian Pada Masyarakat*, 52, 74–79.
- eFlora. (2020). <http://www.efloras>.
- Ekawati, F. M., Claramita, M., Hort, K., Furler, J., Licqurish, S., & Gunn, J. (2017). Patients' experience of using primary care services in the context of Indonesian universal health coverage reforms. *Asia Pacific Family Medicine*, 3(1), 4. <https://doi.org/10.1186/s12930-017-0034-6>
- Elfahmi, .N.V. (2006). *Phytochemical and Biosynthetic Studies of Lignans, with a Focus on Indonesian Medicinal Plants s.n.*
- Elfahmi, Woerdenbag, H. J., & Kayser, O. (2014). Jamu: Indonesian traditional herbal medicine towards rational phytopharmacological use. *Journal of Herbal Medicine*, 4(2), 51–73. <https://doi.org/10.1016/j.hermed.2014.01.002>

- Elliott, S., & Brimacombe, J. (1987). The medicinal plants of Gunung Leuser National Park, Indonesia. *Journal of Ethnopharmacology*, 19(3), 285–317. [https://doi.org/10.1016/0378-8741\(87\)90006-7](https://doi.org/10.1016/0378-8741(87)90006-7)
- Erlangga, D., Ali, S., & Bloor, K. (2019). The impact of public health insurance on healthcare utilisation in Indonesia: evidence from panel data. *International Journal of Public Health*, 64(4), 603–613. <https://doi.org/10.1007/s00038-019-01215-2>
- Ernst, E. (2000). Prevalence of use of complementary/alternative medicine: A systematic review. *Bulletin of the World Health Organization*, 78(2), 252–257. <https://doi.org/10.1590/S0042-96862000000200015>
- Estomba, D., Ladio, A., & Lozada, M. (2006). *Medicinal Wild Plant Knowledge and Gathering Patterns in a Mapuche Community from Northwestern Patagonia*. *Medicinal wild plant knowledge and gathering patterns in a Mapuche community from North-western Patagonia*. July 2018. <https://doi.org/10.1016/j.jep.2005.07.015>
- Fathurrahman, F., Nursanto, J., Madjid, A., & Ramadanil, R. (2016). Ethnobotanical study of “Kaili Inde” tribe in Central Sulawesi Indonesia. *Emirates Journal of Food and Agriculture*, 28(5), 337–347. <https://doi.org/10.9755/ejfa.2015-06-463>
- Fischer, F. H., Lewith, G., Witt, C. M., Linde, K., von Ammon, K., Cardini, F., Falkenberg, T., Fønnebø, V., Johannessen, H., Reiter, B., Uehleke, B., Weidenhammer, W., & Brinkhaus, B. (2014). High prevalence but limited evidence in complementary and alternative medicine: Guidelines for future research. *BMC Complementary and Alternative Medicine*, 14(February). <https://doi.org/10.1186/1472-6882-14-46>
- Frass, M., Strassl, R. P., Friehs, H., Müllner, M., Kundi, M., & Kaye, A. D. (2012). Use and acceptance of complementary and alternative medicine among the general population and medical personnel: A systematic review. *Ochsner Journal*, 12(1), 45–56.
- Furnham, A., & Kirkcaldy, B. (1996). The health beliefs and behaviours of orthodox and complementary medicine clients. *British Journal of Clinical Psychology*, 35(1), 49–61. <https://doi.org/10.1111/j.2044-8260.1996.tb01161.x>
- Gailea, R., Ariffien Bratawinata, A., Pitopang, R., & Kusuma, I. (2016). The Use of Various Plant Types As Medicines By Local Community in the Enclave of the Lore-Lindu. *Global Journal of Research on Medicinal Plants & Indigenous Medicine*, 5(1), 29–40.
- Gedif, T., & Hahn, H. J. (2003). The use of medicinal plants in self-care in rural central Ethiopia. *Journal of Ethnopharmacology*, 87(2–3), 155–161. [https://doi.org/10.1016/S0378-8741\(03\)00109-0](https://doi.org/10.1016/S0378-8741(03)00109-0)
- Giovannini, P., Reyes-García, V., Waldstein, A., & Heinrich, M. (2011). Do pharmaceuticals displace local knowledge and use of medicinal plants? Estimates from a cross-sectional study in a rural indigenous community, Mexico. *Social Science and Medicine*, 72(6), 928–936. <https://doi.org/10.1016/j.socscimed.2011.01.007>
- Greenway, C. (1998). Hungry earth and vengeful stars: soul loss and identity in the Peruvian Andes. *Social Science & Medicine*, 47(8), 993–1004.
- Grosvenor, P. W., Gothard, P. K., McWilliam, N. C., Supriono, A., & Gray, D. O. (1995a).

- Medicinal plants from Riau Province, Sumatra, Indonesia. Part 1: Uses. *Journal of Ethnopharmacology*, 45(2), 75–95. [https://doi.org/10.1016/0378-8741\(94\)01209-I](https://doi.org/10.1016/0378-8741(94)01209-I)
- Grosvenor, P. W., Supriono, A., & Gray, D. O. (1995b). Medicinal plants from Riau Province, Sumatra, Indonesia. Part 2: antibacterial and antifungal activity. *Journal of Ethnopharmacology*, 45(2), 97–111. [https://doi.org/10.1016/0378-8741\(94\)01210-Q](https://doi.org/10.1016/0378-8741(94)01210-Q)
- Grundy, J., & Annear, P. (2010). Health-seeking behaviour studies: a literature review of study design and methods with a focus on Cambodia. *Health Policy and Health Finance Knowledge Hub*, 7(7), 1–14. <https://doi.org/10.1371/journal.pone.0073049>
- Gyasi, R., Buor, D., Adu-Gyamfi, S., Adjei, P. O. W., & Amoah, P. A. (2018). Sociocultural hegemony, gendered identity, and use of traditional and complementary medicine in Ghana. *Women and Health*, 58(5), 598–615. <https://doi.org/10.1080/03630242.2017.1321608>
- Gyasi, R. M., Abass, K., Adu-Gyamfi, S., & Accam, B. T. (2017a). Nurses' knowledge, clinical practice and attitude towards unconventional medicine: Implications for intercultural healthcare. *Complementary Therapies in Clinical Practice*, 29, 1–8. <https://doi.org/10.1016/j.ctcp.2017.07.001>
- Gyasi, R. M., Asante, F., Abass, K., Yeboah, J. Y., Adu-Gyamfi, S., & Amoah, P. A. (2016). Do health beliefs explain traditional medical therapies utilisation? Evidence from Ghana. *Cogent Social Sciences*, 2(1). <https://doi.org/10.1080/23311886.2016.1209995>
- Gyasi, R. M., Mensah, C. M., Adjei, P. O.-W., & Agyemang, S. (2011). Public Perceptions of the Role of Traditional Medicine in the Health Care Delivery System in Ghana. *Global Journal of Health Science*, 3(2), 40–49. <https://doi.org/10.5539/gjhs.v3n2p40>
- Gyasi, R. M., Mensah, C. M., & Siaw, L. P. (2015). Predictors of Traditional Medicines Utilisation in the Ghanaian Health Care Practice: Interrogating the Ashanti Situation. *Journal of Community Health*, 40(2), 314–325. <https://doi.org/10.1007/s10900-014-9937-4>
- Gyasi, R. M., Poku, A. A., Boateng, S., Amoah, P. A., Mumin, A. A., Obodai, J., & Agyemang-Duah, W. (2017b). Integration for coexistence? Implementation of intercultural health care policy in Ghana from the perspective of service users and providers. *Journal of Integrative Medicine*, 15(1), 44–55. [https://doi.org/10.1016/S2095-4964\(17\)60312-1](https://doi.org/10.1016/S2095-4964(17)60312-1)
- Handayani, P. W., Saladdin, I. R., Pinem, A. A., Azzahro, F., Hidayanto, A. N., & Ayuningtyas, D. (2018). Health referral system user acceptance model in Indonesia. *Heliyon*, 4, e01048. <https://doi.org/10.1016/j.heliyon.2018.e01048>
- Harmanto, N., & Subroto, M. A. (2007). *Pilih Jamu Dan Herbal Tanpa Efek Samping*. Elex Media Komputindo.
- Harris, P., & Rees, R. (2000). The prevalence of complementary and alternative medicine use among the general population: A systematic review of the literature. *Complementary Therapies in Medicine*, 8, 88–96. <https://doi.org/10.4324/9780203698372-10>

- Hartanti, D., Dhiani, B. A., Charisma, S. L., & Wahyuningrum, R. (2020). The Potential Roles of Jamu for COVID-19: A Learn from the Traditional Chinese Medicine. *Pharmaceutical Sciences and Research*, 7(4), 12–22. <https://doi.org/10.7454/psr.v7i4.1083>
- Hasan, S. S., Ahmed, S. I., Bukhari, N. I., & Loon, W. C. W. (2009). Use of complementary and alternative medicine among patients with chronic diseases at outpatient clinics. *Complementary Therapies in Clinical Practice*, 15(3), 152–157. <https://doi.org/10.1016/j.ctcp.2009.02.003>
- Helmi, A. (2017). Persepsi dan Perilaku Masyarakat Terhadap Obat Herbal. *Jurnal Ekonomi Dan Bisnis Terapan*, 13(2).
- Herman, M. J., Supardi, S., & Handayani, R. S. (2013). Policy on Herbal Traditional Medicines Therapy in Three Provinces in Indonesia. *Buletin Penelitian Kesehatan*, 41(2), 111–119.
- Hidayat, D., & Hardiansyah, G. (2012). Studi Keanekaragaman Jenis Tumbuhan Obat di Kawasan IUPHHK PT . Sari Bumi Kusuma Camp Tontang Kabupaten Sintang. *Vokasi*, 8(2), 61–68.
- Hikmat, A., Zuhud, E. A. M., Siswoyo, Sandra, E., & Sari, R. K. (2011). Revitalizing Conservation of Family Medicine Plant (TOGA) For Health and Economis Improvement In Model Village Surrounding IPB, Bogor. *Jurnal Ilmu Pertanian Indonesia*, 16(2), 71–80.
- Himmi, S. K., Humaedi, M. A., & Astutik, S. (2014). Ethnobiological Study of the Plants Used in the Healing Practices of an Indigenous People Tau Taa Wana in Central Sulawesi, Indonesia. *Procedia Environmental Sciences*, 20, 841–846. <https://doi.org/10.1016/j.proenv.2014.03.102>
- Hirschhorn, H. H. (1983). Botanical remedies of the former Dutch East Indies (Indonesia). Part I: Eumycetes, pteridophyta, gymnospermae, angiospermae (monocotyledones only). *Journal of Ethnopharmacology*, 7(2), 123–156. [https://doi.org/10.1016/0378-8741\(83\)90016-8](https://doi.org/10.1016/0378-8741(83)90016-8)
- Hollenberg, D., Lytle, M., Walji, R., & Cooley, K. (2013). Addressing provider shortage in underserved areas: The role of traditional, complementary and alternative medicine (TCAM) providers in canadian rural healthcare. *European Journal of Integrative Medicine*, 5(1), 15–26. <https://doi.org/10.1016/j.eujim.2012.08.008>
- Holttum, R. E. (1950). *The Zingiberaceae of the Malay Peninsula*. Govt. Printer.
- Hughes, G. D., Aboyade, O. M., Clark, B. L., & Puoane, T. R. (2013). The prevalence of traditional herbal medicine use among hypertensives living in South African communities. *BMC Complementary and Alternative Medicine*, 13. <https://doi.org/10.1186/1472-6882-13-38>
- Jabbar, A., Musdalipah, & Nurwati, A. (2017). Studi Pengetahuan, Sikap dan Tindakan Terhadap Penggunaan Obat Tradisional Bagi Masyarakat di Desa Sabi-Sabila Kecamatan Mowewe Kabupaten Kolaka Timur. *Majalah Farmasi, Sains, Dan Kesehatan*, 3(1), 19–22.

- Jain, A., Katewa, S. S., Galav, P. K., & Sharma, P. (2005). *Medicinal plant diversity of Sitamata wildlife*. 102, 143–157. <https://doi.org/10.1016/j.jep.2005.05.047>
- James, P. B., Wardle, J., Steel, A., & Adams, J. (2019). Pattern of health care utilization and traditional and complementary medicine use among Ebola survivors in Sierra Leone. *PLoS ONE*, 14(9), 1–19. <https://doi.org/10.1371/journal.pone.0223068>
- Jamu Digital. (2021). *Jelang PIT PDHMI 2021: Regulasi Penggunaan Obat Herbal di Yankes*.
https://www.jamudigital.com/berita?id=Jelang_PIT_PDHMI_2021:_Regulasi_Penggunaan_Obat_Herbal_di_Yankes accessed 2021-05-12
- Janes, C. R. (1999). The health transition, global modernity and the crisis of traditional medicine: The Tibetan case. *Social Science and Medicine*, 48(12), 1803–1820. [https://doi.org/10.1016/S0277-9536\(99\)00082-9](https://doi.org/10.1016/S0277-9536(99)00082-9)
- Jennifer, H., & Saptutyningsih, E. (2015). Preferensi individu terhadap pengobatan tradisional di Indonesia. *Jurnal Ekonomi Dan Studi Pembangunan*, 16(1), 26–41. <https://doi.org/https://doi.org/10.18196/jesp.2015.0039.26-41>
- Kartika, D. M. (2015). *Does Indonesian National Health Insurance serve a potential for improving health equity in favour of workers in informal economy?(Doctoral dissertation)* (Vol. 72112) [University Library of Munich, Germany]. <https://doi.org/10.1227/01.NEU.0000349921.14519.2A>
- Kasumaningrum, Y. (2019). *16 Persen Penduduk Jabar Belum Jadi Peserta BPJS Kesehatan*. Pikiran Rakyat Online. <https://www.pikiran-rakyat.com/bandung-raya/pr-01310134/16-persen-penduduk-jabar-belum-jadi-peserta-bpjs-kesehatan> accessed 2019-11-02
- Katoch, D., Sharma, J. S., Banerjee, S., Biswas, R., Das, B., Goswami, D., Harwansh, R. K., Katiyar, C. K., & Mukherjee, P. K. (2017). Government policies and initiatives for development of Ayurveda. *Journal of Ethnopharmacology*, 197, 25–31. <https://doi.org/10.1016/j.jep.2016.08.018>
- Kayombo, E. J., Uiso, F. C., & Mahunnah, R. L. A. (2012). Experience on healthcare utilization in seven administrative regions of Tanzania. *Journal of Ethnobiology and Ethnomedicine*, 8(5), 1–8.
- Kelley, K., Clark, B., Brown, V., & Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care*, 15(3), 261–266. <https://doi.org/10.1093/intqhc/mzg031>
- Kelner, M., & Wellman, B. (1997). Health care and consumer choice: Medical and alternative therapies. *Social Science and Medicine*, 45(2), 203–212. [https://doi.org/10.1016/S0277-9536\(96\)00334-6](https://doi.org/10.1016/S0277-9536(96)00334-6)
- Kitula, R. A. (2007). Use of medicinal plants for human health in Udzungwa Mountains Forests: A case study of New Dabaga Ulongambi Forest Reserve, Tanzania. *Journal of Ethnobiology and Ethnomedicine*, 3, e7 (2007). <https://doi.org/10.1186/1746-4269-3-7>
- Kretchy, I. A., Okere, H. A., Osafo, J., Afrane, B., Sarkodie, J., & Debrah, P. (2016).

- Perceptions of traditional, complementary and alternative medicine among conventional healthcare practitioners in Accra, Ghana: Implications for integrative healthcare. *Journal of Integrative Medicine*, 14(5), 380–388. [https://doi.org/10.1016/S2095-4964\(16\)60273-X](https://doi.org/10.1016/S2095-4964(16)60273-X)
- Kristiana, L., Maryani, H., & Lestari, W. (2017). Gambaran Pelaksanaan Pelayanan Kesehatan Tradisional Ramuan Menggunakan Jamu Tersaintifikasi (Studi Kasus di BKTM Makassar dan Puskesmas A Karanganyar). *Media Penelitian Dan Pengembangan Kesehatan*, 27(3), 185–196. <https://doi.org/10.22435/mpk.v27i3.6233.185-196>
- Kristina, S. A., Yayi, P. S., & Riskawa, S. (2007). Perilaku pengobatan sendiri yang rasional pada masyarakat. *Berita Kedokteran Masyarakat*, 23(4), 176–183.
- Kuo, G. M., Hawley, S. T., Weiss, L. T., Balkrishnan, R., & Volk, R. J. (2004). Factors associated with herbal use among urban multiethnic primary care patients: A cross-sectional survey. *BMC Complementary and Alternative Medicine*, 4(18). <https://doi.org/10.1186/1472-6882-4-18>
- Kurniawan, R. A., & Aprilianto, S. (2020). The Integration Traditional Medicine Practice at National Health Insurance in Indonesia. *Proceedings of the International Law Conference (iN-LAC 2018)*, 13–17. <https://doi.org/10.5220/0010049900130017>
- Kwan, D., Hirschhorn, K., & Boon, H. (2006). U.S. and Canadian pharmacists' attitudes, knowledge, and professional practice behaviors toward dietary supplements: A systematic review. *BMC Complementary and Alternative Medicine*, 6(June 2014). <https://doi.org/10.1186/1472-6882-6-31>
- Leach, M. J. (2004). Public, nurse and medical practitioner attitude and practice of natural medicine. *Complementary Therapies in Nursing and Midwifery*, 10(1), 13–21. [https://doi.org/10.1016/S1353-6117\(03\)00082-9](https://doi.org/10.1016/S1353-6117(03)00082-9)
- Leaman, D. J., Arnason, J. T., Yusuf, R., Sangat-Roemantyo, H., Soedjito, H., Angerhofer, C. K., & Pezzuto, J. M. (1995). Malaria remedies of the Kenyah of the Apo Kayan, East Kalimantan, Indonesian Borneo: A quantitative assessment of local consensus as an indicator of biological efficacy. *Journal of Ethnopharmacology*, 49(1), 1–16. [https://doi.org/10.1016/0378-8741\(95\)01289-3](https://doi.org/10.1016/0378-8741(95)01289-3)
- Lee, G. B. W., Charn, T. C., Chew, Z. H., & Ng, T. P. (2004). Complementary and alternative medicine use in patients with chronic diseases in primary care is associated with perceived quality of care and cultural beliefs. *Family Practice*, 21(6), 654–660. <https://doi.org/10.1093/fampra/cmh613>
- Lestaris, T., & Keman, S. (2018). How does the Dayak Ngaju Community Treat Malaria? A Qualitative Study on the Use of Traditional Medicine in Central Kalimantan Province, Indonesia. *Indian Journal of Public Health Research and Development*, 9(11), 43–47. <https://doi.org/10.5958/0976-5506.2018.01707.2>
- Liebert, M. A. (1998). Characteristics of users and nonusers of alternative medicine in dermatologic patients attending a university hospital clinic: a short report. *J Altern Complement Med*, 4(3), 277–279. <https://doi.org/10.1089/acm.1998.4.3-277>

- Liem, A. (2019). Beliefs, attitudes towards, and experiences of using complementary and alternative medicine: A qualitative study of clinical psychologists in Indonesia. *European Journal of Integrative Medicine*, 26(January), 1–10. <https://doi.org/10.1016/j.eujim.2019.01.003>
- Liem, A., & Newcombe, P. A. (2020). Development of complementary and alternative medicine (CAM) education for clinical psychologists: An example from Indonesia. *International Journal of Mental Health*, 49(1), 17–34. <https://doi.org/10.1080/00207411.2019.1680079>
- Lim, M. A., & Pranata, R. (2020). The insidious threat of jamu and unregulated traditional medicines in the COVID-19 era. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, 14(5), 895–896. <https://doi.org/10.1016/j.dsx.2020.06.022>
- Limyati, D. A., & Juniar, B. L. L. (2012). Jamu Gendong , a kind of traditional medicine in Indonesia : the microbial contamination of its raw materials and endproduct . Stimulation of ultraviolet-induced apoptosis of human fibroblast UVR- 1 cells by tyrosine kinase inhibitors . *Journal of Ethnopharmacology*, 63(3), 201–208.
- Lozada, M., Ladio, A., & Weigandt, M. (2006). Cultural Transmission of Ethnobotanical Knowledge in a Rural Community of Northwestern Patagonia, Argentina. *Economic Botany*, 60(4), 374–385. [https://doi.org/10.1663/0013-0001\(2006\)60\[374:CTOEKI\]2.0.CO;2](https://doi.org/10.1663/0013-0001(2006)60[374:CTOEKI]2.0.CO;2)
- Mahadi, T. (2020). *Obat modern asli Indonesia berpotensi masuk JKN , ini sebabnya*. Kontan Online. <https://industri.kontan.co.id/news/obat-modern-asli-indonesia-berpotensi-masuk-jkn-ini-sebabnya> accessed 2021-02-01
- Maharani, D. (2016). *Mungkinkah Obat Herbal Ditanggung BPJS ?* Kompas Online. [https://sains.kompas.com/read/2016/11/17/080000923/mungkinkah.obat.herbal.ditanggung.bpjs.accessed 2019-06-05](https://sains.kompas.com/read/2016/11/17/080000923/mungkinkah.obat.herbal.ditanggung.bpjs.accessed%202019-06-05)
- Mahendradhata, Y., Trisnantoro, L., Listyadewi, S., Soewondo, P., Marthias, T., Harimurti, P., & Prawira, J. (2017). *The Republic of Indonesia Health System Review* (Vol. 7, Issue 1).
- Mahyar, U. W., Burley, J. S., Soejarto, D. D., Arboretum, A., Avenue, D., St, W., & August, A. (1991). Medicinal Plants of Seberida. *Journal of Ethnopharmacology*, 31, 217–237.
- Mangestuti, S., Widyawaruyanti, A., Zaidi, S. F. H., Awale, S., & Kadota, S. (2007). Traditional Medicine of Madura island in Indonesia. *Journal of Traditional Medicines*, 24(3), 90–103.
- Maryani, H., Kristiana, L., & Lestari, W. (2016). Faktor dalam Pengambilan Keputusan Pembelian Jamu Saintifik (Factor in Decision Making for Buying Jamu Scientific). *Buletin Penelitian Sistem Kesehatan*, 19(3), 200–210.
- Mathez-Stiefel, S.-L., Vandebroek, I., & Rist, S. (2012). Can Andean medicine coexist with biomedical healthcare ? A comparison of two rural communities in Peru and Bolivia Can Andean medicine coexist with biomedical healthcare ? A comparison of two rural communities in Peru and Bolivia. *Journal of Ethnobiology and Ethnomedicine*, 8(26), 1–14. <https://doi.org/doi:10.1186/1746-4269-8-26>

- Mboi, N. (2015). Indonesia: On the Way to Universal Health Care. *Health Systems & Reform*, 1(2), 91–97. <https://doi.org/10.1080/23288604.2015.1020642>
- McGinnis, J. M., Williams-Russo, P., & Knickman, J. R. (2002). The case for more active policy attention to health promotion. *Health Affairs*, 21(2), 78–93. <https://doi.org/10.1377/hlthaff.21.2.78>
- Mcgregor, K. J., & Peay, E. R. (1996). The choice of alternative therapy for health care: Testing some propositions. *Social Science and Medicine*, 43(9), 1317–1327. [https://doi.org/10.1016/0277-9536\(95\)00405-X](https://doi.org/10.1016/0277-9536(95)00405-X)
- Meretika, A. H. C., Peroni, N., & Hanazaki, N. (2010). Local knowledge of medicinal plants in three artisanal fishing communities (Itapoá , Southern Brazil), according to gender , age , and urbanization. *Acta Botanica Brasileira*, 24(2), 386–394. <https://doi.org/10.1590/S0102-33062010000200009>
- Mirza, Amanah, S., & Sadono, D. (2017). The Dynamic Level of Women Farmer Group in Supporting the Sustainability of Family Business in Medicinal Plants in Bogor Regency, West Java (In Indonesian language). *Jurnal Penyuluhan*, 13(2), 181–193.
- MoH. (2007). *Keputusan Menteri Kesehatan RI No. 381/MENKES/SK/III/2007 Tentang Kebijakan Obat Tradisional*.
- MoH RI. (1990). *Peraturan Menteri Kesehatan RI No. 246/1990 Tentang Izin Usaha Industri Obat Tradisional dan Pendaftaran Obat Tradisional* (Vol. 5). <http://bpmppt.jabarprov.go.id/web/application/modules/arsip/files/08363ba01e2b006427e725f7a28fd8fc.pdf>
- MoH RI. (1995). *Keputusan Menteri Kesehatan RI No.0584/VI/1995 Tentang SP3T* (Issue 0584).
- MoH RI. (2003). *Kepmenkes 1076/2003 Tentang Pengobatan Tradisional*. MoH.
- MoH RI. (2007). *Keputusan Menteri Kesehatan RI No. 381/MENKES/SK/III/2007 Tentang Kebijakan Obat Tradisional*.
- MoH RI. (2008). *Kepmenkes 121/2008 Standar Pelayanan Medik Herbal*.
- MoH RI. (2010a). *Peraturan Menteri Kesehatan RI No. 003/MENKES/PER/I/2010 Tentang Saintifikasi Jamu Dalam Penelitian Berbasis Pelayanan Kesehatan*.
- MoH RI. (2010b). *RISKESDAS 2010*.
- MoH RI. (2013). *RISKESDAS 2013*.
- MoH RI. (2014). *Peraturan Pemerintah RI No. 103/2014 Tentang Pelayanan Kesehatan Tradisional*.
- MoH RI. (2015a). *Peraturan Menteri Kesehatan RI No.64/2015 Tentang Organisasi dan Tata Kerja Kementerian Kesehatan*.
- MoH RI. (2015b). *Renstra Kemenkes 2015–2019*.

- MoH RI. (2016a). *Peraturan Menteri Kesehatan RI No. 6/2016 Tentang Formularium Obat Herbal Asli Indonesia* (No. 6).
- MoH RI. (2016b). *Peraturan Menteri Kesehatan RI No.61/2016 Tentang Pelayanan Kesehatan Tradisional Empiris*.
- MoH RI. (2017a). *Keputusan Menteri Kesehatan RI No. HK.01.07/MENKES/187/2017 Tentang Formularium Ramuan Obat Traditional Indonesia*.
- MoH RI. (2017b). *Peraturan Menteri Kesehatan No. 37/2017 Tentang Pelayanan Kesehatan Integrasi*.
- MoH RI. (2018a). *Hasil Utama Riskesdas 2018 (Basic Health Survey 2018)*.
- MoH RI. (2018b). *Peraturan Menteri Kesehatan RI. 15/2018 Tentang Penyelenggaraan Pelayanan Kesehatan Tradisional Komplementer*.
- MoH RI. (2018c). *Peraturan Menteri Kesehatan No.54/2018 Tentang Penyusunan dan Penerapan Formularium Nasional Dalam Penyelenggaraan Program Jaminan Kesehatan*.
- MoH RI. (2020). *Profil Kesehatan Indonesia Tahun 2019*.
- Monteiro, J. M., Albuquerque, U. P. De, Lins-Neto, E. M. D. F., Araújo, E. L. De, & Amorim, E. L. C. De. (2006). Use patterns and knowledge of medicinal species among two rural communities in Brazil's semi-arid northeastern region. *Journal of Ethnopharmacology*, 105(1–2), 173–186. <https://doi.org/10.1016/j.jep.2005.10.016>
- Moschik, E. C., Mercado, C., Yoshino, T., Matsuura, K., & Watanabe, K. (2012). Usage and Attitudes of Physicians in Japan Concerning Traditional Japanese Medicine (Kampo Medicine): A Descriptive Evaluation of a Representative Questionnaire-Based Survey. *Evidence-Based Complementary and Alternative Medicine*, 2012. <https://doi.org/10.1155/2012/139818>
- MPNS. (2020). Medicinal plant names services portal, version 9. <https://mpns.science.kew.org>. In *Orphanet Journal of Rare Diseases*.
- Muktiningsih, S. ., Muhammad, H. ., Harsana, I. ., Budhi, M., & Panjaita, P. (2001). Review Tanaman Obat Yang Digunakan Oleh Pengobat Tradisional Di Sumatera Utara, Sumatera Selatan, Bali, Dan Sulawesi Selatan. *Media Litbangkes*, 11(4), 25–36.
- Murni, A. S., Prawito, P., & Widiono, S. (2012). Eksistensi Pemanfaatan Tanaman Obat Tradisional (TOT) Suku Serawai Diera Medikalisasi Kehidupan. *Naturalis: Jurnal Penelitian Pengelolaan Sumberdaya Alam Dan Lingkungan*, 1(3), 225–234.
- Nisfiyanti, Y. (2012). Traditional Medicine System: A Case Study in Juntinyuat Village, Indramayu Regency, West Java. *Patanjala*, 4(1), 129–140.
- Nulfitriani, Pitopang, R., Yuniati, E., Alumni,), Biologi, J., Matematika, F., Pengetahuan, I., Universitas, A., Kampus, T., Tadulako, B., Palu, T., Tengah, S., Tadulako, T. B., Nulfitriani, Pitopang, R., & Yuniati, E. (2013). Pemanfaatan Tumbuhan Sebagai Obat Tradisional Pada Suku Tolitoli. *Biocelebes*, 7(2), 1–8.

- Nurdin, A. I., Amin, M. Z., Putri, Z. A., Lestari, A. W. S., & Fauzi, A. (2018). Eksistensi jamu sebagai minuman tradisional di dunia penelitian modern dan potensinya dalam kajian in silico. *Prosiding Seminar Nasional IV 2018*, 187–196. <http://research-report.umm.ac.id/index.php/psnpb/article/download/2542/2375>
- Nurhayati, N., & Widowati, L. (2017). The use of traditional health care among Indonesian Family. *Health Science Journal of Indonesia*, 8(1), 30–35. <https://doi.org/10.22435/hsji.v8i1.5600>.
- Oktarina, O., & Rukmini, R. (2021). Gambaran Implementasi Kebijakan Program Pelayanan Kesehatan Tradisional di Dinas Kesehatan Kota Surabaya. *Buletin Penelitian Kesehatan*, 48(4), 291–300. <https://doi.org/10.22435/bpk.v48i4.3584>
- Oktober, Z. (2018). Studi Etnofarmasi Tanaman Obat Untuk Perawatan Dan Penumbuh Rambut Pada Beberapa Daerah Di Indonesia. *Jurnal Jamu Indonesia*, 3(3), 81–88. <https://doi.org/10.29244/jji.v3i3.65>
- Park, Y. L., & Canaway, R. (2019). Integrating traditional and complementary medicine with national healthcare systems for universal health coverage in asia and the Western Pacific. *Health Systems and Reform*, 5(1), 24–31. <https://doi.org/10.1080/23288604.2018.1539058>
- Patwardhan, B., Warude, D., Pushpangadan, P., & Bhatt, N. (2005). Ayurveda and traditional Chinese medicine: A comparative overview. *Evidence-Based Complementary and Alternative Medicine*, 2(4), 465–473. <https://doi.org/10.1093/ecam/neh140>
- Payyappallimana, U. (2009). Role of Traditional Medicine in Primary Health Care : *Yokohama Journal of Social Sciences*, 14(6), 724–743.
- PDHMI. (2021). *Harmonic Orchestration of Herbal Medicine Practice in Indonesia*. https://www.youtube.com/watch?v=I4RGLzcbRWc&ab_channel=PerkumpulanDisiplinHerbalMe+dikIndonesia
- Peltzer, K. (2009). Utilization and Practice of Traditional/Complementary/Alternative Medicine (TM/CAM) in South Africa. *Afr. J. Trad.CAM*, 6(2), 175–185.
- Peltzer, K., & Pengpid, S. (2015). Utilization and practice of traditional/complementary/alternative medicine (T/CAM) in southeast asian nations(ASEAN) member states. *Studies on Ethno-Medicine*, 9(2), 209–218. <https://doi.org/10.1080/09735070.2015.11905437>
- Peltzer, K., Pengpid, S., Puckpinyo, A., Yi, S., & Anh, L. V. (2016). The utilization of traditional, complementary and alternative medicine for non-communicable diseases and mental disorders in health care patients in Cambodia, Thailand and Vietnam. *BMC Complementary and Alternative Medicine*, 16(1), 1–12. <https://doi.org/10.1186/s12906-016-1078-0>
- Penchansky, R., & Thomas, J. W. (1981). The concept of access: Definition and relationship to consumer satisfaction. *Medical Care*, 19(2), 127–140. <https://doi.org/10.1097/00005650-198102000-00001>
- Pengpid, S., & Peltzer, K. (2018). Utilization of traditional and complementary medicine

- in Indonesia: Results of a national survey in 2014–15. *Complementary Therapies in Clinical Practice*, 33, 156–163. <https://doi.org/10.1016/j.ctcp.2018.10.006>
- Permana, R. C. E. (2009). Baduy Community and The Traditional Herbal Medicine. *Wacana*, 11(1), 81–94. <https://doi.org/10.17510/wjhi.v11i1.145>
- Picking, D., Younger, N., Mitchell, S., & Delgoda, R. (2011). The prevalence of herbal medicine home use and concomitant use with pharmaceutical medicines in Jamaica. *Journal of Ethnopharmacology*, 137(1), 305–311. <https://doi.org/10.1016/j.jep.2011.05.025>
- Pinto, R., Masaki, E., & Harimurti, P. (2016). Policy Brief Indonesia Indonesia Health Financing System Assessment (Spend more, right & better). In *Health Financing System Assessment (HFSA) The World Bank Report*.
- Presiden RI. (2013). Perpres Nomor 111 Tahun 2013 Tentang Jaminan Kesehatan. *Journal of Chemical Information and Modeling*, 53, 1689–1699. <https://doi.org/10.1017/CBO9781107415324.004>
- President of RI. (1992). *Undang-Undang No.23/1992 Tentang Kesehatan*.
- President of RI. (2009). *Undang-Undang Republik Indonesia Nomor 36 Tahun 2009 Tentang Kesehatan*.
- Pribadi, E. R. (2009). Pasokan dan Permintaan Tanaman Obat Indonesia serta Arah Penelitian dan Pengembangannya. *Perspektif*, 8(1), 52–64. <https://doi.org/10.21082/p.v8n1.2009.%25p>
- PROSEA. (2020). *Plant Resources of South-East Asia*. [https:// www.prota4u.org/](https://www.prota4u.org/).
- Purnama, Y. (2016). Kearifan lokal masyarakat jatigede dalam pengobatan tradisional. *Patanjala*, 8(1), 69–84.
- Purwadianto, A., Soetedjo, S., & Sjamsuhidajat, R. (2019). Sikap Etik Dokter Terhadap Pelayanan Kesehatan Tradisional. *Jurnal Etika Kedokteran Indonesia*, 3(1), 17. <https://doi.org/10.26880/jeki.v3i1.29>
- Purwaningsih, E. H. (2013). Jamu, Obat Tradisional Asli Indonesia: Pasang Surut Pemanfaatannya di Indonesia. *EJournal Kedokteran Indonesia*, 1(2). <https://doi.org/10.23886/ejki.1.2065.85-89>
- Putro, W. R., Utomo, R. D. W., & Achmad, S. (2020). Analisis Elemen Visual Pada Desain Kemasan Produk Jamu Houseblend Suwe Ora Jamu. *Jurnal Seni & Reka Rancang*, 2(2), 253–263. <https://trijurnal.lemlit.trisakti.ac.id/jsrr/article/view/8238>
- Quinlan, M. B. (2010). Ethnomedicine and ethnobotany of fright , a Caribbean culture-bound psychiatric syndrome. *Journal of Ethnobiology and Ethnomedicine*, 6(9).
- Quinlan, M. B., & Quinlan, R. J. (2007). Modernization and Medicinal Plant Knowledge in a Caribbean Horticultural Village. *International Journal of Qualitative Studies on Health and Well-Being*, 21(2), 169–192. <https://doi.org/10.1525/MAQ.2007.21.2.169.169>

- Rahayu, M., & Kazuhiro, H. (2004). The Role of Plants on the Traditional Life of Local Society in Gunung Halimun National Park , West Java. *Berita Biologi*, 7(April), 17–23.
- Rahayu, M., Sunarti, S., Sulistiarini, D., & Prawiroatmodjo, S. (2006). Pemanfaatan Tumbuhan Obat secara Tradisional oleh Masyarakat Lokal di Pulau Wawonii , Sulawesi Tenggara Traditional use of medicinal herbs by local community of Wawonii island , Southeast Sulawesi. *Biodiversitas*, 7(3), 245–250. <https://doi.org/10.13057/biodiv/d070310>
- Rahayu, Y. Y. S., Araki, T., & Rosleine, D. (2020). Factors affecting the use of herbal medicines in the universal health coverage system in Indonesia. *Journal of Ethnopharmacology*, 260. <https://doi.org/10.1016/j.jep.2020.112974>
- Rahayu, Y. Y. S., Araki, T., & Rosleine, D. (2021). Predictors of the Use of Traditional Medicines in the Universal Health Coverage System in Indonesia. *Global Journal of Health Science*, 13(6), 24–35. <https://doi.org/10.5539/gjhs.v13n6p24>
- Ramadianto, A. S., Andrian, C. R., Lenardi, M., Surya, R., Cheng, W., & Rahmawati, F. N. (2015). Knowledge, Perception, and Attitude of Universitas Indonesia Medical Students toward Complementary and Alternative Medicine. *Journal Asian Med Stud Assoc*, 4(1), 4–16.
- Ramzan, S., Soelberg, J., Jäger, A. K., & Cantarero-Arévalo, L. (2017). Traditional medicine among people of Pakistani descent in the capital region of Copenhagen. *Journal of Ethnopharmacology*, 196, 267–280. <https://doi.org/10.1016/j.jep.2016.11.048>
- Rasna, I. W. (2010). Obat tradisional di Kabupaten Buleleng dalam rangka pelestarian lingkungan : sebuah kajian ekolinguistik. *Jurnal Bumi Lestari*, 10(2), 321–332.
- Raymond, T. (2020). *Konsep Obat Modern Asli Indonesia (OMAI) dalam penggunaannya di fasilitas kesehatan formal*. May. <https://doi.org/10.6084/m9.figshare.12367331.v5>
- Rolindrawan, D. (2015). The Impact of BPJS Health Implementation for the Poor and Near Poor on the Use of Health Facility. *Procedia - Social and Behavioral Sciences*, 211, 550–559. <https://doi.org/10.1016/j.sbspro.2015.11.073>
- Roosita, K., Kusharto, C. M., Sekiyama, M., Fachrurrozi, Y., & Ohtsuka, R. (2008). Medicinal plants used by the villagers of a Sundanese community in West Java, Indonesia. *Journal of Ethnopharmacology*, 115(1), 72–81. <https://doi.org/10.1016/j.jep.2007.09.010>
- Rosmanita, I., & Saharuddin. (2017). Relationship Between Community Knowledge and Management of TOGA. *Jurnal Sains Komunikasi Dan Pengembangan Masyarakat*, 1(3), 359–378. <https://doi.org/10.29244/jskpm.1.3.359-378>
- Sangat, H. M., & Larashati, I. (2002). Some Ethnophytomedicinal Aspects and Conservation Strategy of Several Medicinal Plants in Java, Indonesia. *Biodiversitas, Journal of Biological Diversity*, 3(2), 231–235. <https://doi.org/10.13057/biodiv/d030204>
- Saraswati, D. E. (2018). Women Empowerment in Utilising Homestead with Medicinal Plants (TOGA) in The Effort to Improve Public Health In Sembung Village,

- Bojonegoro (in bahasa Indonesia). *Jurnal Pengabdian Masyarakat*, 1(2), 37–40.
- Sato, A. (2012). Do Inequalities in Health Care Utilization in Developing Countries Change When We Take into Account Traditional Medicines ? *World Development*, 40(11), 2275–2289. <https://doi.org/10.1016/j.worlddev.2012.03.019>
- Sato, A., & Costa-i-Font, J. (2012). *Does culture matter at all in explaining why people still use traditional medicines?* (No. 27). LSE Health. <http://eprints.lse.ac.uk/43653/1/LSEHWP27.pdf>
- Schäfer, T., Riehle, A., Wichmann, H. E., & Ring, J. (2002). Alternative medicine in allergies-Prevalence, patterns of use, and costs. *Allergy: European Journal of Allergy and Clinical Immunology*, 57(8), 694–700. <https://doi.org/10.1034/j.1398-9995.2002.23469.x>
- Setyoningsih, A., & Artaria, M. D. (2016). Pemilihan penyembuhan penyakit melalui pengobatan tradisional non medis atau medis. *Masyarakat, Kebudayaan Dan Politik*, 29(1), 46. <https://doi.org/10.20473/mkp.v29i12016.46-59>
- Shaikh, B. T., & Hatcher, J. (2005). Health seeking behaviour and health service utilization in Pakistan: Challenging the policy makers. *Journal of Public Health*, 27(1), 49–54. <https://doi.org/10.1093/pubmed/fdh207>
- Siahaan, S., & Aryastami, N. K. (2018). Studi Kebijakan Pengembangan Tanaman Obat di Indonesia. *Media Litbangkes*, 28(3), 157–166. <https://doi.org/10.22435/mpk.v28i3.119>
- Sibarani, R. (2014). The Contributory Scheme is Not for Indonesian Informal Workers: A Literature Review on the Implementation Plan of the Contributory Scheme in BPJS for the Informal Workers. *SSRN*, 1–9. <https://doi.org/http://dx.doi.org/10.2139/ssrn.2424984>
- Silalahi, M., Nisyawati, Walujo, E. B., Supriatna, J., & Mangunwardoyo, W. (2015). The Local Knowledge of Medicinal Plants Trader and Diversity of Medicinal Plants in The Kabanjahe Traditional Market, North Sumatra, Indonesia. *Journal of Ethnopharmacology*, 15(3), 432–443. <https://doi.org/10.1016/j.jep.2015.09.009>
- Silva, F. dos S., Ramos, M. A., Hanazaki, N., & de Albuquerque, U. P. (2011). Dynamics of traditional knowledge of medicinal plants in a rural community in the Brazilian semi-arid region. *Brazilian Journal of Pharmacognosy*, 21(3), 382–391. <https://doi.org/10.1590/S0102-695X2011005000054>
- Siregar, B. P. (2021). *BPOM Dorong Obat Tradisional Indonesia Tembus Pasar Dunia*. Warta Ekonomi Online. <https://www.wartaekonomi.co.id/read243474/bpom-dorong-obat-tradisional-indonesia-tembus-pasar-dunia> accessed 2020-03-20
- Siswanto. (2018). Pengembangan Kesehatan Tradisional Indonesia: Konsep, Strategi dan Tantangan. *Jurnal Penelitian Dan Pengembangan Pelayanan Kesehatan*, 1(1), 17–31. <https://doi.org/10.22435/jpppk.v1i1.429>
- Soedarsono, R., & Harini, S. R. (2002). Jamu as Traditional Medicine in Java, Indonesia. *South Pasific Study*, 23(1), 1–9. <http://hdl.handle.net/10232/17321>

- Srithi, K., Balslev, H., Wangpakapattanawong, P., Srisanga, P., & Trisonthi, C. (2009). Medicinal plant knowledge and its erosion among the Mien (Yao) in northern Thailand. *Journal of Ethnopharmacology*, 123(2), 335–342. <https://doi.org/10.1016/j.jep.2009.02.035>
- Clasification of Urban and Rural in Indonesia, Pub. L. No. 37, Regulation of the Head Statistics Indonesia No.37 (2010). https://sirusa.bps.go.id/webadmin/doc/MFD_2010_Buku_1.pdf
- Sudibyo, S., & Andi, S. L. (2010). Penggunaan Obat Tradisional Dalam Upaya Pengobatan Sendiri Di Indonesia (Analisis Data Susenas Tahun 2007). *Bul. Penel. Kesehatan*, 38(2), 80–89.
- Suharmiati, Handayani, L., & Zainul, K. (2020). Utilization of Integrated Traditional Health Services at Public Hospitals (A Study in 5 Provinces , Indonesia). *Buletin Penelitian Sistem Kesehatan*, 23, 126–134.
- Suharmiati, S., Handayani, L., Kusumawati, L., & Angkasawati, T. J. (2018). Studi Kesesuaian Sumber Daya dengan Pelayanan Kesehatan Tradisional Rumah Sakit Pemerintah di Provinsi DI Yogyakarta, Jawa Tengah dan Jawa Timur. *Jurnal Kefarmasian Indonesia*, 8(1), 64–75. <https://doi.org/10.22435/jki.v8i1.7672.64-75>
- Sujarwo, W., Keim, A. P., Savo, V., Guarrera, P. M., & Caneva, G. (2015). Ethnobotanical study of Loloh: Traditional herbal drinks from Bali (Indonesia). *Journal of Ethnopharmacology*, 169, 34–48. <https://doi.org/10.1016/j.jep.2015.03.079>
- Sumarni, W., Sudarmin, S., & Sumarti, S. S. (2019). The scientification of jamu: A study of Indonesian's traditional medicine. *Journal of Physics: Conference Series*, 1321(3). <https://doi.org/10.1088/1742-6596/1321/3/032057>
- Supardi, S., Herman, M. J., & Yuniar, Y. (2011). Penggunaan Jamu Buatan Sendiri Di Indonesia (Analisis Data RISKESDAS Tahun 2010). *Buletin Penelitian Sistem Kesehatan*, 14(4), 375–381. <https://media.neliti.com/media/publications/20978-ID-penggunaan-jamu-buatan-sendiri-di-indonesia-analisis-data-riset-kesehatan-dasar.pdf>
- Supardi, S., Jamal, S., & Loupatty, A. M. (2003). Beberapa Faktor Yang Berhubungan Dengan Penggunaan Obat Tradisional Dalam Pengobatan Sendiri di Indonesia (Factors Related To the Use of Traditional Medicine on Self-Medication In Indonesia). *Bul. Penel. Kesehatan*, 31(1), 25–32.
- Supardi, S., Sampurno, O. D., & Notosiswoyo, M. (2002). Pengobatan Sendiri Yang Sesuai Dengan Aturan Pada Ibu-Ibu Di jawa Barat. *Bul. Penel. Kesehatan*, 30(1), 11–21.
- Supardi, S., & Susyanty, A. L. (2010). Penggunaan Obat Tradisional Dalam Upaya Pengobatan Sendiri Di Indonesia (Analisis Data Susenas Tahun 2007). *Buletin Peneliti Kesehatan*, 38(2), 80–89. <http://bpk.litbang.depkes.go.id/index.php/BPK/article/view/100/174>
- Suryahadi, A., Febriany, V., & Yumna, A. (2014). *Expanding social security in Indonesia: the processes and challenges*. November, 1–22. https://doi.org/10.1057/978-1-137-53377-7_14

- Suryana, Y., & Iskandar, J. (2014). Studi Pengetahuan Lokal Tanaman Obat pada Agroekosistem Pekarangan dan Dinamika Perubahannya di Des Cibunar Kecamatan Rancakalong Kabupaten Sumedang-Jawa Barat. *Bionatura-Jurnal Ilmu-Ilmu Hayati Dan Fisik*, 15(3), 203–209.
- Suswardany, D. L., Sibbritt, D. W., Supardi, S., Pardosi, J. F., Chang, S., & Adams, J. (2017). A cross-sectional analysis of traditional medicine use for malaria alongside free antimalarial drugs treatment amongst adults in high-risk malaria endemic provinces of Indonesia. *PLoS ONE*, 12(3), 1–15. <https://doi.org/10.1371/journal.pone.0173522>
- Szuter, C. D. (2015). “Aduh, Biyung!” (“Ouch Mother!”): the impacts of gender roles on motivations and management strategies of jamu entrepreneurs in Yogyakarta, Indonesia. <https://unbscholar.lib.unb.ca/islandora/object/unbscholar:7155>
- Teklehaymanot, T. (2009). Ethnobotanical study of knowledge and medicinal plants use by the people in Dek Island in Ethiopia. *Journal of Ethnopharmacology*, 124(1), 69–78. <https://doi.org/10.1016/j.jep.2009.04.005>
- Terasawa, K. (2004). Evidence-based Reconstruction of Kampo Medicine: Part I—Is Kampo CAM? *Evidence-Based Complementary and Alternative Medicine*, 1(1), 11–16. <https://doi.org/10.1093/ecam/neh003>
- Thomas, R. K. (2016). Non-demographic Factors Associated with Morbidity. In *In Sickness and In Health. Applied Demography Series*. Springer.
- Thonner, F. (1981). *Thonner’s Analytical Key to the Families of Flowering Plants*.
- THSD-MoH Indonesia. (2018). *LAKIP Direktorat Pelayanan Kesehatan Tradisional Tahun 2017*.
- Toda, M., Masuda, M., & Rengifo, E. L. (2017). Medicinal Plant Use Influenced by Health Care Service in Mestizo and Indigenous Villages in the Peruvian Amazon. *Journal of Sustainable Development*, 10(3), 19–34. <https://doi.org/10.5539/jsd.v10n3p19>
- Toda, M., Salgado, E. L. R., & Masuda, M. (2016). Assessing medicinal plants as the linkage between healthcare, livelihood and biodiversity: a case study from native villages surrounding a second-tier city in the central Peruvian Amazon. *Tropics*, 25(2), 53–65.
- Torri, M. C. (2012a). Programmes for the promotion of home herbal gardens: what challenges ahead? *Development in Practice*, 22(2), 143–153. <https://doi.org/10.1080/09614524.2012.640988>
- Torri, M. C. (2012b). The emergence of traditional Indonesian herbal medicine (jamu) for cosmetic use: new avenues for the revitalisation of Javanese health and cosmetic traditions through gender entrepreneurship? *International Journal of Entrepreneurship and Small Business*, 16(1), 48. <https://doi.org/10.1504/IJESB.2012.046916>
- Torri, M. C. (2013a). Knowledge and Risk Perceptions of Traditional Jamu Medicine among Urban Consumers. *European Journal of Medicinal Plants*, 3(1), 25–39.

- Torri, M. C. (2013b). Traditional jamu versus industrial jamu: perceptions and beliefs of consumers in the city of Yogyakarta: what future for traditional herbal medicine in urban Indonesia? *International Journal of Entrepreneurship and Small Business*, 19(1), 1. <https://doi.org/10.1504/IJESB.2013.054308>
- Torri, M. C. (2016). Linking Small-Scale Commercial Activities and Women's Health: The Jamu System in Urban Areas of Java, Indonesia. *Journal of Small Business Management*, 54(1), 341–355. <https://doi.org/10.1111/jsbm.12148>
- Triratnawati, A. (2010). Pengobatan Tradisional, Upaya Meminimalkan Biaya Kesehatan Masyarakat Desa Di Jawa. *Jurnal Manajemen Pelayanan Kesehatan*, 13(2), 69–73. <https://journal.ugm.ac.id/jmpk/article/viewFile/2598/2329>
- Trotter, R. . (1981). Remedios caseros: Mexican American home remedies and community health problems. *Soc Sci Med*, 15B, 107–114.
- Tshikalange, T. ., Meyer, J. . . ., Munoz, E., Sancho, R., Van de Venter, M., & Oosthuizen, V. (2008). In vitro anti-HIV-1 properties of ethnobotanically selected South African plants used in the treatment of sexually transmitted diseases. *Journal of Ethnopharmacology* *Journal*, 119, 478–481. <https://doi.org/10.1016/j.jep.2008.08.027>
- Umamah, M., Suparwati, A., & Wigati, P. A. (2015). Gambaran Potensi Masyarakat Pengguna Pelayanan Kesehatan Tradisional di Wilayah Kelurahan Rowosari Kecamatan Tembalang Kota Semarang. *Jurnal Kesehatan Masyarakat (e-Journal)*, 3(3).
- Uniyal, S. K., Singh, K. N., Jamwal, P., & Lal, B. (2006). *Traditional use of medicinal plants among the tribal communities of Chhota Bhargal , Western Himalaya*. 8, 1–8. <https://doi.org/10.1186/1746-4269-2-14>
- Valadeau, C., Castillo, J. A., Sauvain, M., Lores, A. F., & Bourdy, G. (2010). The rainbow hurts my skin: Medicinal concepts and plants uses among the Yaneshas (Amueshas), an Amazonian Peruvian ethnic group. *Journal of Ethnopharmacology*, 127(1), 175–192. <https://doi.org/10.1016/j.jep.2009.09.024>
- Vandebroek, I. (2013). Intercultural health and ethnobotany: How to improve healthcare for underserved and minority communities? *Journal of Ethnopharmacology*, 148(3), 746–754. <https://doi.org/10.1016/j.jep.2013.05.039>
- Vandebroek, I., & Balick, M. J. (2012). Globalization and loss of plant knowledge: Challenging the paradigm. *PLoS ONE*, 7(5), e37643. <https://doi.org/https://doi.org/10.1371/journal.pone.0037643>
- Vandebroek, I., Thomas, E., Sanca, S., Van Damme, P., Van, L. Van, & De Kimpe, N. (2008). Comparison of health conditions treated with traditional and biomedical health care in a Quechua community in rural Bolivia. *Journal of Ethnobiology and Ethnomedicine*, 4, 1–12. <https://doi.org/10.1186/1746-4269-4-1>
- Vandebroek, I., Van Damme, P., Van Puyvelde, L., Arrazola, S., & De Kimpe, N. (2004). A comparison of traditional healers' medicinal plant knowledge in the Bolivian Andes and Amazon. *Social Science and Medicine*, 59(4), 837–849.

<https://doi.org/10.1016/j.socscimed.2003.11.030>

Vincent, C., & Furnham, A. (1996). Why do patients turn to complementary medicine? An empirical study. *British Journal of Clinical Psychology*, 35(1), 37–48. <https://doi.org/10.1111/j.2044-8260.1996.tb01160.x>

Voeks, R. A. (2007). Are women reservoirs of traditional plant knowledge? Gender, ethnobotany and globalization in northeast Brazil. *Singapore Journal of Tropical Geography*, 28(1), 7–20. <https://doi.org/10.1111/j.1467-9493.2006.00273.x>

Voeks, R. A., & Leony, A. (2004). Forgetting The Forest: Assessing Medicinal Plant Erosion in Eastern Brazil. *Economic Botany*, 58, S294–S306. [https://doi.org/10.1663/0013-0001\(2004\)58\[s294:ftfamp\]2.0.co;2](https://doi.org/10.1663/0013-0001(2004)58[s294:ftfamp]2.0.co;2)

Walujo, E. B. (2008). Review: Research Ethnobotany in Indonesia and the Future Perspectives. *Biodiversitas Journal of Biological Diversity*, 9(1), 59–63. <https://doi.org/10.13057/biodiv/d090114>

Wayland, C. (2004). The failure of pharmaceuticals and the power of plants: Medicinal discourse as a critique of modernity in the Amazon. *Social Science and Medicine*, 58(12), 2409–2419. <https://doi.org/10.1016/j.socscimed.2003.09.023>

WCSP. (2020). *World Checklist of Selected Plant Families*. <http://wcsp.science.kew.org/>.

Weckmüller, H., Barriocanal, C., Maneja, R., & Boada, M. (2019). Factors Affecting Traditional Medicinal Plant Knowledge of the Waorani, Ecuador. *Sustainability*, 11(16), e4460. <https://doi.org/10.3390/su11164460>

Welsch, R. L., & Afdhal, A. F. (1988). The rise of the modern addict. In S. VanderGeestand & S. R. Whyte (Eds.), *The Context of Medicines in Developing Countries* (pp. 149–172). https://doi.org/10.2105/ajph.85.8_pt_1.1157

WHO. (1978). *Declaration of Alma-Ata. International conference on primary health care*.

WHO. (2000). *General Guidelines for Methodologies on Research and Evaluation of Traditional Medicine* (WHO/EDM/TRM/2000.1).

WHO. (2001). *Legal status of traditional medicine and complementary/alternative medicine : a worldwide review*.

WHO. (2002). *Traditional Medicine Strategy 2002-2005*.

WHO. (2005). *National Policy on Traditional Medicine and Regulation of Herbal Medicines - Report of a WHO Global Survey*.

WHO. (2008). *Beijing declaration: adopted by the WHO congress on traditional medicine, Beijing, China, 8 november 2008*. <https://doi.org/10.1177/0022034511399085>

WHO. (2013a). *The world health report 2013: Research for Universal Health Coverage*.

WHO. (2013b). *WHO Traditional Medicine Strategy 2014-2023*.

WHO. (2015). *In-House Consultation on the 2016-2017 Agenda for Traditional Medicine*

Integration in the Western Pacific Region, Manila, Philippines, 9 November 2015 : meeting report. <https://doi.org/10.1007/BF01996444>

- WHO. (2017). Meeting Contribution On The Contribution Traditional Medicine in Strengthening Primary Health Care. In *WHO for Western Pacific*.
- Wijaya, I. (2012). Socio-cultural knowledge and perceptions of jamu consumption risk: Local wisdom of urban Javanese community and its relation to the integration of traditional jamu medicine into formal health system in Indonesia. *JKM*, 11(2), 129–139.
- Wiles, J., & Rosenberg, M. W. (2001). ‘Gentle caring experience.’ *Health & Place*, 7(3), 209–224. [https://doi.org/10.1016/s1353-8292\(01\)00011-9](https://doi.org/10.1016/s1353-8292(01)00011-9)
- Wilson, S. L., Kratzke, C., & Hoxmeier, J. (2012). Predictors of access to healthcare: what matters to rural Appalachians? *Global Journal of Health Science*, 4(6), 23–35. <https://doi.org/10.5539/gjhs.v4n6p23>
- Wulandari, R. A., & Azrianingsih, R. (2014). Etnobotani Jamu Gendong Berdasarkan Persepsi Produsen Jamu Gendong di Desa. *Biotropika*, 4(2), 198–202. <https://biotropika.ub.ac.id/index.php/biotropika/article/view/286>
- Xu, J., & Yang, Y. (2009). Traditional Chinese medicine in the Chinese health care system. *Health Policy*, 90(2–3), 133–139. <https://doi.org/10.1016/j.healthpol.2008.09.003>
- Yulianingsih. (2016). *Banyak Obat Tradisional dan Jamu Gendong*. Republika Online. <https://nasional.republika.co.id/berita/o44nsl359/banyak-obat-tradisional-dan-jamu-gendong-tak-penuhi-standar-mutu> accessed 2019-03-04
- Yuniartha, L. (2020). *Ada pandemi , BPJS Kesehatan terus tingkatkan cakupan kepesertaan*. Kontan Online. <https://nasional.kontan.co.id/> accesed 2020-11-02
- Yuningsih, R. (2012). Pengobatan tradisional di unit pelayanan kesehatan. *Info Singkat Kesejahteraan Sosial*, 4(05), 36–39.
- Zumsteg, I. S., & Weckerle, C. S. (2007). Bakera, a herbal steam bath for postnatal care in Minahasa (Indonesia): Documentation of the plants used and assessment of the method. *Journal of Ethnopharmacology*, 111(3), 641–650. <https://doi.org/10.1016/j.jep.2007.01.016>