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Bachelors thesis

Take a pill or use a herb? A dilemma of students from the DEL University in North Sumatra, Indonesia

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Declaration

"I hereby declare that this thesis entitled "Traditional medicine, perception and prevalence of use in compare with conventional medicine among students from DEL Institute in North Sumatra, Indonesia" is my own work and all the sources have been quoted and acknowledged by means of complete references".

April 15, 2016

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Tereza Vejvodová

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Abstract

This survey sought to document the traditional medicine products which are common used for treatment among students enrolled at DEL university and villagers of Balige town in North Sumatra province, Indonesia. Specific objectives were to determine prevalence, preferences and factors associated with traditional medicine and the availability of medicine in target area. Data used in this study were collected during the three-week summer school organized by CULS and DEL Institute of Teknologi in August 2015. Data were collected via semi-structured questionnaires complemented by open interviews with selected respondents. Survey included 35 respondents from DEL and 30 respondents from Balige town. Furtermore we conducted survey on the local street market in Balige and interviews with traditional healer, general practioner and pharmacist. In total, we documented 81 medicine products among students. Thereof 54.32% was conventional origin and 45.68% was biological. From biological products we determined 22 species of plants which are somehow used for health. Rest of the biological products are animal-based, minerals or final traditional medicine products containing unknown composition (Karo oil or Jamu). Most common health issues treated by traditional medicine are cold, cough, fever, minor injuries, tooth pain, body pain or as a dietary supplements for immunity support. About frequency of use traditional medicine among students, 88.57% use TM only seasonally or if some specific problem occurred and only 11.43% stated that they use TM regularly throughout the year. More than half use TM concurrently with conventional medicine with that they rather prefer herbal medicine than chemical drugs. Results from Balige showed similiar attitudes. Only 16.67% of respondents use TM very often. The majority use TM only sometimes together with modern medicine and relatively large part (36.67%) never use TM or herbal products. In conclusion use of herbs and TM is not already widespread thanks to rising of pharmaceutical industries and loss of sources of medicinal plants in target area. According to our survey people more prefer easily accessible and more efficient conventional medicine from pharmacy.

Key words: traditional medicine, herbal plants, Indonesia, health, conventional and modern medicine, alternative and complementary medicine

Abstrakt

V této bakalářské práci jsme se snažili zdokumentovat využití tradiční medicíny mezi studenty university Del Institute a obyvateli vesnice Balige na Severní Sumatře v Indonésii. Cílem práce bylo zdokumentovat převládání, preference a další faktory spojené s užíváním tradiční medicíny a také její dostupnost v dané lokalitě. Data použitá v této práci byla nashromážděná v průběhu letní školy organizované ČZU a DEL Institutem v srpnu 2015 prostřednictvím strukturovaných dotazníků a rozhovorů s 35 studenty z Del Institutu a s 30 místními obyvateli města Balige. Mimoto jsme také provedli průzkum místního tradičního trhu a rozhovory s tradičním léčitelem, praktickým lékařem a lékárnicí. Celkem bylo zdokumentováno mezi studenty 81 produktů, které jsou používány pro podporu jejich zdraví. Z těchto produtků bylo 54,32% konvenčního původu a 45,68% biologického. Z 37 produktů bilogického původy jsme identifikovali 22 rostlinných druhů. Ostatní produkty byli živočišného původu nebo se jednalo o minerály či již konečné tradiční léčivé produkty. Nejčastějšími zdravotními problémy mezi studenty, které jsou léčeny tradičním způsobem jsou nachlazení, kašel, horečka, drobná zranění, bolest zubů nebo podpora imunitního systému. Co se týče toho, jak často studenti využívají TM, tak 88,57% uvedlo, že ji využívají pouze sezóně či pokud pouze nastane nějaký specifický zdravotní problém. Pouze 11,43% uvedlo, že užívají TM pravidělně po celý rok. Více než polovina studentů uvedla, že užívají spíše moderní medicínu, ale souběžně i s tradiční. Když jsme se studentů ptali na prefernce tak, preferují raději přírodní produkty. V Balige výsledky byly obdobné. Pouze 16,67% užívá bylinné a tradiční produkty velmi často. Většina (46,66%) užívá TM pouze příležitostně a současně s konvenční medicínou. Poměrně velká část respondentů (36,67%) uvedla, že TM vůbec nevyužívají. V závěru můžeme konstatovat, že četnost využívání TM a léčivých bylin v této oblasti není již tak rozšířená. A to především díky nárůstu farmaceutického průmyslu a úbytku zdrojů léčivých rostlin kvůli zemědělským účelům. V naší studii bylo potvrzeno, že se lidé spíše uchylují k snadnější, dostupnější a efektivnější konvenční medicíně z lékáren.

klíčová slova: tradiční medicína, léčivé rostliny, indonésie, zdraví, konvenční a moderní medicína, alternativní a komplementární medicína

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List of Abbreviations

ASEAN	Association of South East Asian Nations
BPS	Badan Pusan Statistik, Statistics Indonesia
CULS	Czech University of Life Sciences
DEL	Institute Teknologi Del
GDP	Gross Domestic Product
HDI	Human Development Index
IDR	Indonesian Rupiah
NADFC	The National Agency for Drugs and Food Control
NCCIH	National Center for Complementary and Integrative Health
OECD	Organisation for Economic Co-operation and Development
SUDA	Sumatera Utara Dalam Angka
TM	Traditional Medicine
UNDP	United Nations Development Programme
USD	United States Dollar
WB	World Bank
WHO	World Health Organization

1 Introduction

Since 1946 according to World Health Organization health means good social, mental a physical well-being with the absence of disease and infirmity. Health is primary human right, recognized in the Universal Declaration of Human Rights and it is necessary for economic, social and cultural development and stability of whole society. Better health outcomes have the main role in reducing poverty but poor health is a waste of human potential and strength. Sick people have a lower efficiency compared to the healthy population. Especially chronically ill individuals cannot actively participate in fulfilling their social roles, for example, in work or family. Health people are the driving force of economic growth and increase the productivity of society (WHO, 2016).

In terms of illnesses original traditional methods with using the resources of nature are the oldest way how to treat the disease. But with human development the twentieth century became the time of modern synthetic drugs and pharmaceutical industry has become dominant. Of course the rise of this industry had an enormous effect on disease treatment and saved many lives. But the advantages of modern drugs were felt primarily in developed countries where thanks to global commercialization, intercultural knowledge and information exchange, patients have the choice between different medicinal systems also as a fashionable life-style treatment (Marco Leonti and Laura Casu, 2013). Despite the development of modern medicine two billion world populations still do not have access to the medicines which they need and traditional ways of treatment are only option how to care of their health (WHO, 2016).

In Indonesian culture traditional medicine plays the important role over many centuries (WHO, 2005). Indonesia still belongs to less developed countries but on the other side Indonesia has experienced significant economic growth in the last decade, and its middle-class country, which continues to expand (UNDP, 2016). Thanks to the growth of the country, availability of modern medicine is better than before. People have more opportunities in health care and can use also other methods of treatment.

2 Literature Review

2.1 „Different approaches to the treatment“: Conventional medicine × alternative and complementary medicine

Upon the occurrence of the disease we may encounter different approaches to treatment. We have the ability to use conventional, i.e. modern, or alternative medicine, or we can to combine both options together. If we use conventional and alternative method of treatment also we call this process as a complementary medicine. However, if we only use other methods than conventional treatments, we talk about alternative medicine (NCCIH, 2008). The aim of conventional medicine is that if the human body is hit by a disease, an originator of the disease must be identified and treated with order to return the patient to a good health condition. On the other hand, alternative medicine takes a holistic approach towards the sick individual and treat concurrently disturbances on the physical, emotional or mental and spiritual levels, as well as in the environment (ASEAN, 2001). Alternative medicine is a very broad term that refers to a variety of diagnostic, therapeutic and preventive methods, practices, and products that are not part of conventional medicine and usually it does not doctor, but the healer. Example of alternative medicine can be phytotherapy or herbal medicine. The term unconventional medicine indicates that those treatments are not recognized as lege artis medical procedures, namely that have not been verified by clinical rules research (Kotyková, 2010). In many cases particularly when serious illnesses it is unusual use only alternative therapies. Most people report that they combine both methods, which complement each other (NCCIH, 2008).

2.2 What is traditional medicine and what is its role in self-treatment?

The terms like a complementary medicine, alternative medicine or non-conventional medicine can be often interchangeable with traditional medicine. The term traditional medicine refers to a broad set of health care practices that is a part of the country's own tradition but are not integrated into the official health care system (ASEAN, 2001). Traditional medicine was defined by the World Health Organization as a set of knowledge, skills and practices based on the theories, beliefs and experiences indigenous of various societal cultures. These knowledges and skills are passed down from generation to generation and are used for the prevention, improvement, healing and maintaining health during physical or mental diseases, mainly chronic origin, where it requires a long-term treatment (WHO, 2000).

The main role in traditional medicine plays herbal plants with healing effects. A medicinal plant is any plant which, in one or more of its organs, contain substances that can be used for therapeutic purposes or which are precursors for the synthesis of useful drugs (Umar Faruk Adamu, 2006). Use of medicinal plants for self-therapy is a common practice all over the world. Worldwide consumption of herbal medicines has nowadays rapidly increased. Global sales of herbal supplements and remedies were estimated to be 93.15 billion USD in 2015 (WHO, 2003) and according to research from Global Industry Analysts the global herbal supplement and remedy industry is forecast to exceed 105 billion USD by 2017 (Herbals summit, 2016).

Self-treatment with herbal plants and with traditional methods is beneficial especially in developing countries where medical services are limited. Herbal remedies are cheaper and often more available in rural areas than modern medications. Herbs can have many benefits but also can have negative and dangerous effects and risks. WHO has reported that about 50-80 % of the population of developed and developing countries, use traditional and conventional medicine respectively (WHO, 2001). Many people believe that, herbal medications are “natural”, or have been used in some parts of the world of generations, hence must be safe. However, like modern pharmaceuticals, herbal

medications can cause adverse effects (Farah et al., 2000). For example survey from Israel demonstrated that 56% of the users of “natural drugs” believed that “they caused no side-effects”, and in most cases people do not consult use of herbal medicine with their physician and it might be a problem because use of herbs and conventional drugs can be potential risks (Giveon et al., 2004). A large proportion of the adverse events are attributable to the poor quality as contamination of the finished products. This problem might cause serious harms to patients (WHO, 2003). Herbal self-therapy can have too serious health consequences when we determine wrong diagnosis or we use inappropriate herbal product together with conventional medicaments (Sawalha et al., 2008). Cuzzolin confirmed in a survey that serious adverse effects do happen and are more frequent when herbals are combined with conventional drugs. Unfortunately the majority of patients are far less likely to report adverse effects of herbal medicine to their physicians than those of conventional drugs (Barnes J et al., 1998). Indeed, herb-drug interactions are a serious issue and sadly one which we are only beginning to understand (Ernst E, 2003).

Countries and regions which are more economically developed, used herbal medicine mostly as a therapeutic alternative to holistic medicine for the treatment of chronic and not too serious health problems or also used to treat side effects of conventional drugs (Marco Leonti and Laura Casu, 2013). But in most parts of developing countries is no choice and nature remedies are still their primary source of medicine (Raskin et al., 2002).

Despite that the traditional healing systems in developing countries are deeply embedded in culture and beliefs and still are an integral part of the lives of most people, the western medicine partly replaced indigenous health systems and traditional medical system continuous to exist side by side with the modern system. The majority of the population regularly consult both types of healers (WHO, 1995).

During the past decade the gulf of misunderstanding between modern and traditional practioners has begun to narrow. A growing realization has developed that it is possible for traditional and modern medicine to work hand in hand in improving the health and

well-being of rural people and that both traditional and modern practitioners can learn from each other (Wilbur Hoff, 1995). However patients who want to use herbs as a supplement to conventional medicine or conversely, should be informed about the correct use and talk with your doctor about possible side effects.

Currently, many countries have gradually accept and acknowledge that traditional medicine can greatly contribute to improving the health of individuals and the complexity of the healthcare system. Due to this is in processing many plans and strategies about an integration of traditional and herbal medicines into officially primary health care because market with traditional medicine is still increasing (WHO, 2013). In 2012, global sales of chinese herbal medicine reached 83 billion, up more than 20 per cent from 2011 (WHO, 2013). The global market for all herbal supplements and remedies could reach 115 billion USD by 2020. At the present WHO participates in the development of strategies for traditional medicine for the year 2014-2023.

2.3 Indonesian healthcare

The rate of Indonesians living below the national poverty line between 2000 and 2015 fell from 19% to less than 11%. Indonesia is now the 16th biggest economy in the world and looking to the long term, Indonesia might become a high income country in 2025. But this progress is not enough. Country has still more than 28 million people who live below the national poverty line and 68% do not have access to basic social services (UNDP, 2016).

The Indonesian healthcare market is worth 24 billion USD, and this could reach 31 billion USD in 2016. At the same time, Indonesians are forecast to spend almost 150 USD per person on healthcare in 2015, up from 35 USD in 2005 (Pacific Bridge Medical, 2014). In the chart provided below we can see total and government spendings on health per capita in USD from 2000 to 2013.

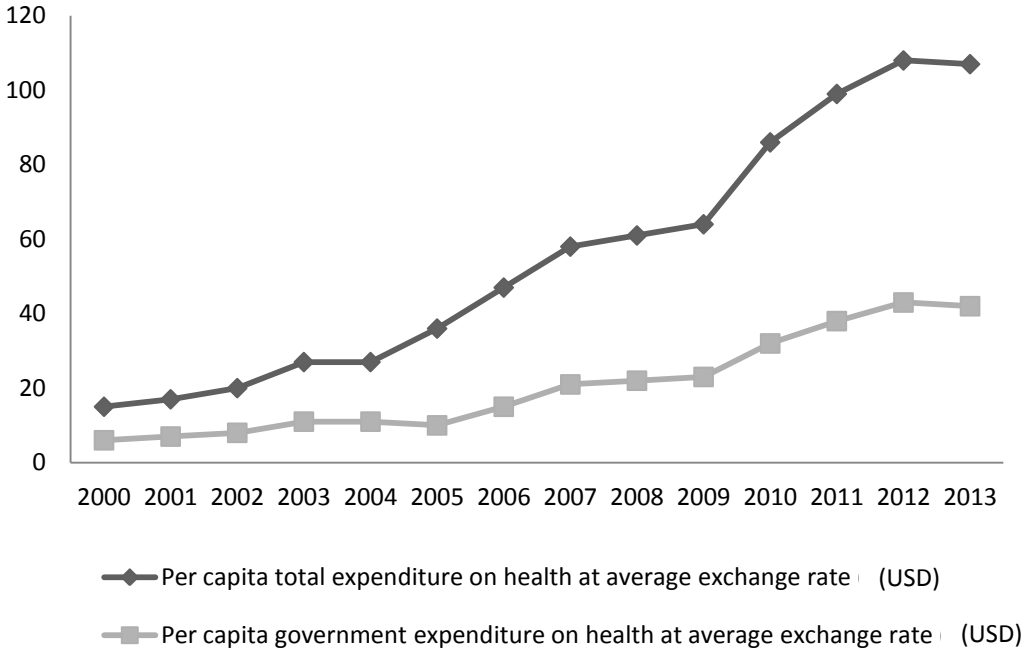

Figure 1

Indonesia's spending on health per capita, 2000-2013

Source: World Bank (2016)

Although government health expenditure has increased in recent years, total health expenditure has remained about 3% of GDP and Indonesia has still one of the lowest level of spending on health care in ASEAN, but it should increase soon. According to the latest information Indonesia spends around 42 USD per capita per year on health (WHO, 2016). The folowing chart shows health care expenditure as percentage of GDP in compare with ASEAN and developed countries from 2008 to 2013.

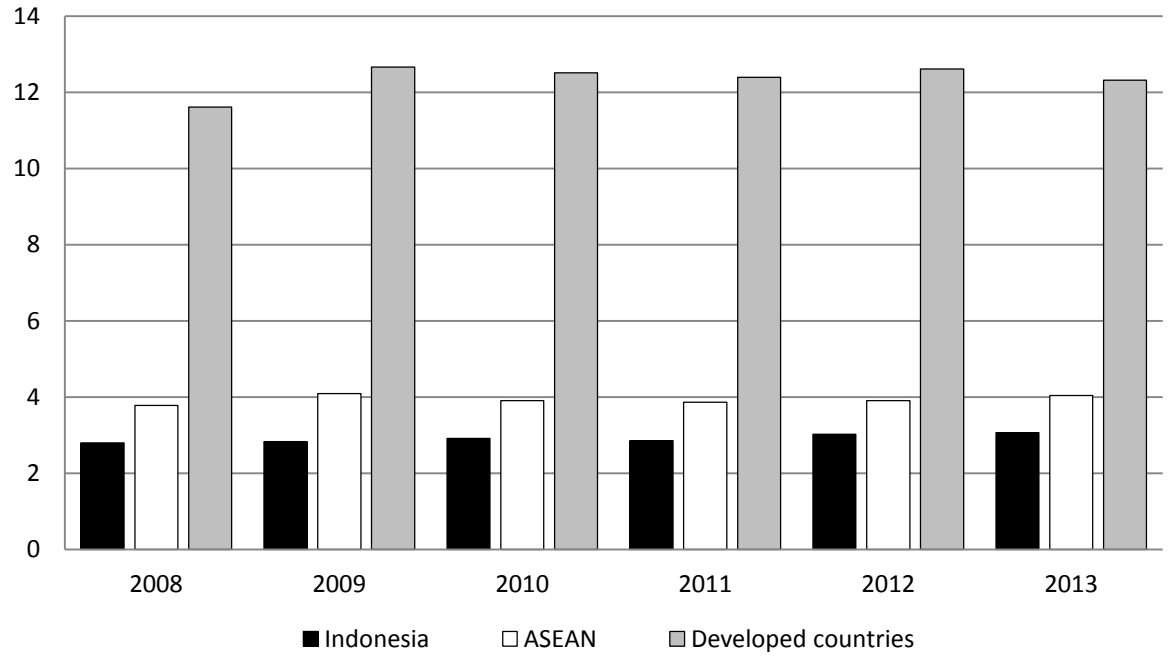

Figure 2

Health care expenditure as % of GDP, 2008–2013

Source: World Bank (2016)

Indonesia has almost 10,000 primary care centers and over 2,200 hospitals for 250 million people. Due to the lack of medical appliances and supplies is very low confidence in health care services. About 70% of the indonesian population rather prefer themselves treating. According to the Indonesian Medical Association of North Sumatra people in North Sumatra spend more than trillion rupiahs (223 mil. USD) each year on health care in Malaysia (OECD, 2013). Significantly many high income people in Indonesia trust doctors in Malaysia and Singapore more than in Indonesia and they are willing to pay higher fees for doctors overseas (Short, 2012).

Since 1990 Indonesia has gradually opened up its pharmaceutical market to international trade and availability of a list of essential drugs at minimal or no charge is quite good in developed regions of Indonesia (WHO, 2009). Nowadays indonesian pharmaceutical market is expanding quickly, it is valued at 6.5 billion USD with an annual growth rate of 12.5%. This growth is expected to continue through 2018. The Indonesian drug market

mainly grew 85% over the 2007-2013 period (Pacific Bridge Medical, 2014). But still in poorer and rural districts they have problems with availability due to low budgets or high transport costs (WHO, 2009). Concretely Sumatra has a strategic location in line of the national economy into the european, african, south asian, east asian and australian markets. Thanks to this good location Sumatra thrives in the field of economic and social development and the availability of health services continues to improve (ASEAN Master plan 2011-2025). Moreover The Ministry of Health has been looking to reduce the price of generic drugs since may 2006, when it issued a decree on the topic.

2.4 Traditional medicine in Indonesia

The use of traditional medicine in Indonesia has always been a part of the culture over many centuries and knowledge or skills has been passed down from generation to generation (Batugal et al., 2004). About 40 million people living in Indonesia have historically used the herbal medicines for support and treatment of disease (Elfahmi et al., 2014). Nowdays the majority of indonesians prefer to use traditional medicines for ordinary ailments (Christoph Antons, 2009).

Indonesian forest area covers more than 143 million hectares and is located here 80% of medicinal plants from around the world. In the forests of Indonesia can be found up to 30,000 species of plants and 6,000 of which are used by various ethnic indonesian communities in their preparation of traditional medicine. But only about 250 species of medicinal plants are officially registered as traditional medicinal plants (Batugal et al., 2004). The table below shows the most commonly used species of medicinal plants in Indonesia.

Table 1 Medicinal plants commonly used as a traditional medicine in Indonesia (Continued)

Indigenous name	Local name	Uses
Abrus precatorius	Saga manis	
Andrographis paniculata	Sembung	Analgesic, antipyretic, expecorant
Carica Papaya		Anti-inflammation
Centella asiatica	Pegagan	Vulnerary
Curcuma domestica		Anti-diarrhoea, antiseptic, anti-cancer
Curcuma xanthorrhiza	Temulawak	Antihepatitis, anti-cancer
Graphtophilum pictum	Daun wungu	Anti-hemorrhoid
Guazuma ulmifolia	Jati Belanda	Anti-cholesterol
Kaempferia galanga	Kencur	Coughs
Morinda citrifolia	Mengkudu	Leucorrhea, sapraemia, anti-diabetes
Mysristica fragrans	Pala	Relaxant, flatulent, anti-diarrhoea
Orthosiphon aristatus	Kumis kucing	Diuretic

Piper betle	Sirih	Antiseptic
Piper retrofractum	Cabe jawa	Aphrodisiac
Psidium guajava	Jambu biji	Anti-diarrhoea
Sauropus androgynus	Katuk	Breast milk production stimulant
Sonchus arvensis	Sembung	Diuretic
Strobilanthes crispus	Keji beling	Diuretic
Syzigium aromaticum	Cengkeh	Antiseptic
Syzigium polyanthum	Salam	Rheumatism, anti-hyperurecimia
Talinum paniculatum	Som jawa	Tonic
Tinospora rumphii	Brotowali	Jaundice, stomach ache, antipyretic, skin infection
Vitex trifolia	Legundi	Tuberculosis, after-birth treatment, relaxant
Zingiber officinale	Jahe	Anti-cancer, antiseptic, cough

Source: Batugal (2004)

Medicinal plants in Indonesia have high economic and health values in both indigenous and modern communities. A lot of industries are dependent on it. The market value of traditional medicine has increased from 12.4 million USD in 1996 to 130 million USD in 2002 (Batugal et al., 2004). Currently part of chemicals, pharmaceuticals and traditional medicine manufacturers in Indonesia has increased from 3.89% in 2014 to 7.36% in 2015 (Indonesia investments, 2016).

The Indonesian Agency of Drug and Food Control (BPOM) classified in 2004 Indonesian herbal medicines into Jamu, standardized herbal medicines and phytopharmacy. The difference is in the level of evidence and standardization. All these kinds of herbal medicine are subjects of safety and quality controll. In Indonesia, integration the use of traditional medicine into formal health care system has been started by the scientification of jamu in 2009 (Dra. Kustantinah, 2010).

Jamu is the most famous and used traditional medicine in Indonesia which comes from indigenous javanese ethnics (Adhitya S Ramadianto et al., 2015). Jamu is traditional

medicine from plants, minerals and animals (Soadersono Riswan et al., 2002). In indonesian culture Jamu is practiced for many centuries and although modern medicine is becoming increasingly important in Indonesia, jamu is still very popular in rural as well as in urban areas (Elfahmi et al., 2014). Jamu contains many species of medicinal plants thanks to rich biodiversity of Indonesian forests. Each family that produces traditional medicine Jamu has a different original recipe, which they transmit to each other for generations (Soadersono Riswan et al., 2002). Jamu is commonly sold on the streets and is accessible to everyone.

In the chart provided below we can see data from the website of statistics Indonesia (BPS) which show us percentage of people in North Sumatra use traditional medicine compared with conventional medicine for self-treatment since 2002-2014. The difference is noticeable. Major the part (90 %) use conventional medicine. Between years 2006 and 2008 trend of conventional medicine has increased and on the other side trend of traditional medicine dropped significantly. The reason for deflection might be decision of Ministry of health has been looking to reduce the price of generic drugs since may 2006. Between the years 2007 and 2013 the Indonesian drug market grew up on about 85%. Also was conducted many plans and strategies to increase access to healthcare throughout Indonesia (WHO, 2009). These aspects could help for better availability of modern medicine and this is the reason why people use conventional medicine more than before the year 2006.

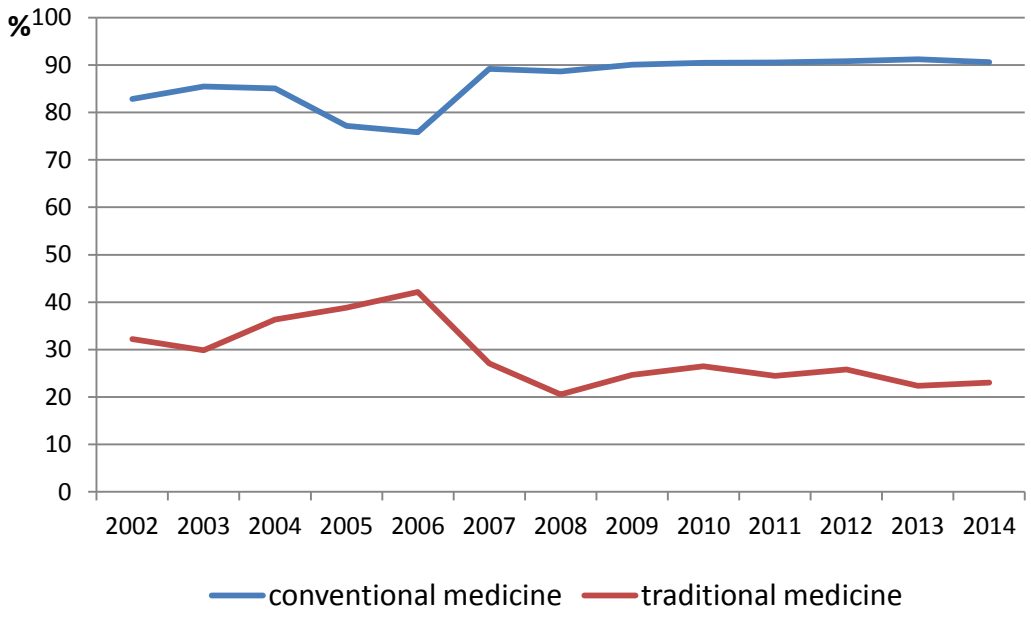

Figure 3

Percentage of population who had self-treatment during the last month by North Sumatra province and type of medicine, 2002-2014

Source: BPS (2016)

3 Objectives

The aim of this study is to determine the prevalence and factors associated with traditional medicine use by students enrolled at DEL university, North Sumatra, Indonesia. Specific objectives were (i) to document medicinal products common used among the students to treat their health issues, (ii) to document the prevalence and preferences in use of tradition medicine among DEL students and villagers of Balige, (iii) to document what is the availability of traditional medicine on the local street market in target area.

4 Methodology

4.1 Study area characteristics

The research was performed in Republic of Indonesia. Country with 250 million people is located on 17,508 islands in Southeast Asia. Indonesia is the fourth most populous country in the world with 34 provinces and 412 districts and has a many diverse ethnic groups and languages (UNDP, 2016). The main language is Indonesian and religion Islam. The country has experienced significant economic growth in the last decade and has become one of the world's major emerging economies (BBC, 2016).

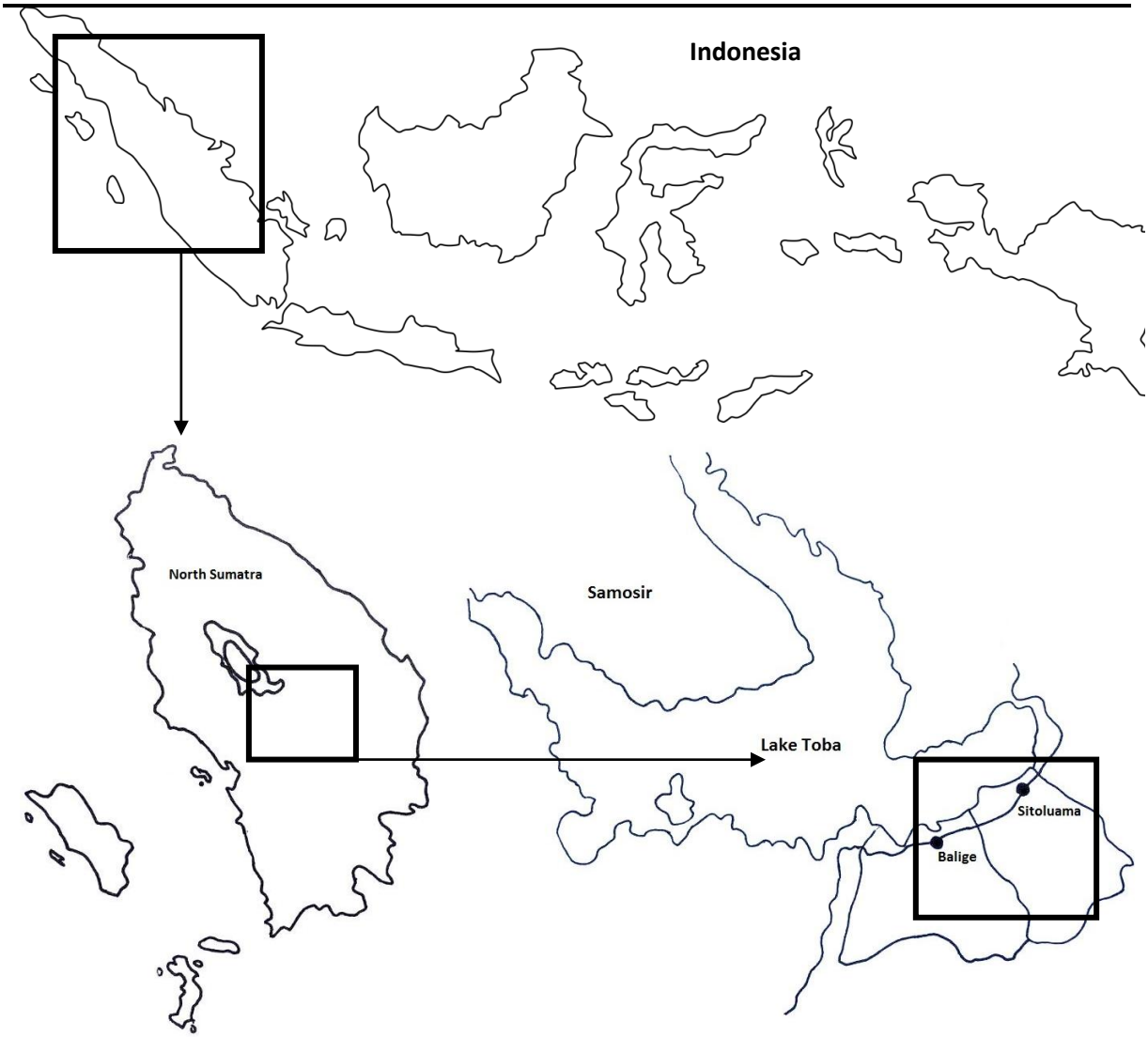

Figure 4

Map of our study sites

The research was focused on North Sumatra province more specifically in Toba Samosir regency, which is divided to 16 districts with 216 villages (SUDA, 2011). North Sumatra is mostly rural area with 11.31% of population under the poverty line. Toba Samosir regency is located 905-1500 meters above the sea level in Barisan Mountains. The population is 173 129 with 73 per km^2 population density and with 42,510 households (86,101 men and 87,028 women). Average household size is 4.1 (SUDA, 2011). In Toba Samosir prevail rural population with 130 152 people. Urban population is only 42 977. Regency has boundaries on north with Simalungun regency, on the south side is bordered with North

Tapanuli, on east with Asahan and Labuhan Batu and on the west with Samosir regency (Tobasamosirkab, 2014).

Research itself was carried out in Lagu Boti and Balige districts. Lagu Boti district is located over the 23 villages, where the population census from 2010 was 18 359 people. The total area of district is 73 km^2. About 1983 ha of land cover rice fields and the rest is dry land and built up area. The district neighbours on north with Lake Toba, on south with Borbor and Sipahutar districts, on the west with Balige district, which is the seat of Toba Samosir regency with the largest population and on the east with Sigumpar district. Balige is 12 km away from Del Institute and it is capital city of Toba Samosir regency with population 36 653.

Toba has a tropical climate. The rainfall in Toba is significant, with precipitation even during the driest month. The average annual temperature in Toba is 24.6 °C. In a year, the average rainfall is 2897 mm. The driest month is July, with 175 mm of rainfall (climate-data, 2016).

4.2 Identification of respondents, data collection and analysis

Due to limited time, language barrier and low number of respondents the dissertation applied rapid appraisal techniques for data collection. Regarding students, we individually approached them in the campus and asked for willingness to participate in our study. Other stakeholders, such as traditional healers, pharmacies, physicians, were identified upon discussion with the students and DEL university representatives. To get deeper insight into availability of herbs in the target area, we decided to survey local agricultural markets as well.

4.2.1 Interviews with students at DEL University

First, semi-structured questionnaires were used to collect quantitative data from students enrolled at Del Institute of Technology, which was situated in Sitoluama village, Lagu Boti district of Toba Samosir regency. We followed studies dealing with similar issues in order to develop the questionnaire, which was consequently discussed with the local key informant, teacher from Del Institute of Technology, and translated into local language. 35 students were randomly chosen for testing of our questionnaire about the role of herbal medicine in treatment of their illnesses and after some correction, finally, we used via face-to-face interview with our respondents. Respondents were chosen from the students of Del Institute, who helped with the insight and translation of questionnaires. After filling out questionnaires we lacked some important information about students health. Therefore, questionnaires were completed by open interview with randomly selected students.

4.2.2 Interviews with local people in Balige town

As students would represent much closed community and they may not have access to herbal plants, we decided for a different approach. Hence, we questioned local people in the near Balige town. We wanted to document the prevalence of traditional medicine in the study area. Thus, the second part of field research was focused on obtaining a better insight of local people in connection to traditional medicine. We used structured questionnaires consisting of three questions about the use of herbs, which were administered to local people through face-to-face interviews in the streets of Balige village. Questionnaires were translated to Indonesian language by student of Del Institute of Technology, who also moderated the interview. People were approached in the street and asked for participation in our survey. We tried to keep the composition of our respondent to be equal in gender perspective and as a result, we approached 15 women and 15 men, whose average age was 47 years.

4.2.3 Interview with local traditional healer

In the next step, we needed to visit local medicine providers. First, we turned our attention to traditional healers. Students from DEL recommended us one traditional healer who comes from Balige. We interviewed him in order to find out his traditional methods and herbal species which he used for treatments. As an old medicine man passed away recently, the interview was conducted with his son, who was supposed to continue in his father's practice, and the widow after medicine man, who was always involved in the preparation of traditional medicine as medicineman's assistant. Interview was carried out under the assistance of one student from Del Institute of Technology who translated open questions.

Figure 5

Data collection from traditional healer and his family in Balige

Photo: Author

4.2.4 Street market in Balige

To complete our study, we conducted a survey at traditional street market. The nearest market around university was in Balige village. The students have the opportunity to visit the shops and to buy everything necessary. We tried find some traditional herbal plants, that have medical effects. Survey was conducted with the help of one university student, that asked vendors which plants have health benefits.

4.2.5 Interview with local university physician and pharmacists

Finally, we decided to do open interview with a university doctor and pharmacists directly at the campus of university to complement our ideas about student's health. The interview was conducted again in cooperation with one of the local student, who translated into Bahasa. The university physician is situated at the campus of university in Sitoluama village. The questions were open and non-structured. We asked on two questions. With such health problems, most students come to him and what drugs most commonly prescribed. It should be noted that the health care from a doctor is free of charge for the students. Questions to the pharmacists were about the five most sold medicines and their prices. The next question was where are the goods purchased and how often. The last question was how many people buy medicine in the pharmacy per day.

5 Results

5.1 Medicine at DEL university: availability, prevalence and use

5.1.1 Socio-demographic characteristics of DEL students

The typical student who participated in our survey is 19 years old and his/her family spent on medicine in average 84 (±52) USD every year. The average size of the student's family is 5.29 (±1.16). Majority of them lived in a close distance to DEL university, only 7 students were from Medan, which is approximately 240 km far from the study area (see Table 2).

Table 2 Demographic characteristics of respondents

Variables	Percentage of respondents (n= 35)
Gender	
Male	43.1
Female	56.9
Age	
18-19	51.4
20-22	48.6
Distance from home	
50 ≥ km	37.1
51 - 100 km	28.6
>100 km	34.3

5.1.2 Medicine products documented among DEL students used for self-treatment

Our study documented 81 products, used by our respondents as a medicine for treatment of different health problems. Out of this number, 54.32% was more of conventional origin and 45.68% biological origin. Medicine of biological origin is not always based on herbal plants. In some cases, it is a traditional home medicine from various domestic raw materials or minerals. Furthermore, biological medicine could be further classified into animal-based and plant-based. 13.51% products of biological origin were animal-based and 86.49% were plant-based and other. From all biological products we identified 22 species of plants and 7 of them correspond to the most common used plants in indonesian traditional medicine. 56.76% of biological origin products are used internally and 43.24% used externally. In the case of internal use, the primarly intake is by drinking water from boiled products or eat and chew parts of the plants. Products used externally are largely in the form of ointments which are placed on affected parts of the body. Accurately, botanical plants determination has not been done.

Table 3 Traditional medicine for self-treatment used by DEL students (contined)

Medicine	n	Preparation and application	Health issue	Notes
Aloe Vera	2	drink extract, leaves attached to the wound	Fever, burns, dietary supplements	diabetes, asthma, epilepsy, **burns, sunburns** (NCCIH, 2016)
Andaliman	1	Boiled mix with oil and attached on the body	Body pain	Digestion problems, asthma, **body pain**, heart disease, mouth diseases, tooth pain, diarrhea, antimicrobial and antioxidant activity (Ruth Elenora Kristanty and Junie Suriawati, 2015)
Betel	5	Chew the leaves,extract dropped into the eyes, boiled and drink	Tooth pain, body pain, eyes problems	**juice of the leaves is dropped into the eye, strengthens the teeth, analgesic properties**, cough, diarrhea (Sujay Rai et al., 2005)
Coconut oil	1	massage	Minor injuries	Diabetes, problems with skin (webMD, 2016), **wounds are healed much faster** (Nevin K.G. and Rajamohan T., 2010)

Cucumber	3	Drink juice, put on the head	Blood pressure, head ache	Skin problems, antioxidant activity, **lower high blood pressure**, helpful in reducing the effects of **migraines** (Pulok K. Mukherjee et al., 2013)
Castorbean	1	Heated leaves and put on the head	Fever	
Dog soup	2	Dog meat broth	Dengue fever	
Egg	7	Eat boiled egg everyday	Immunity and memory support	**healthy immune system**, lower risk of heart disease (James McIntosh, 2015)
Eucalyptus oil	1	massage	Body pain	**Head ache**, arthritis, wounds, burns (webMD, 2016)
Fish oil	2	Eat one spoon every day	Improve memory and concentration	Heart disease, high blood pressure (webMD, 2016), **boost memory** (Charlene Laino, 2009)
Garlic	3	Eat boiled clove of garlic	Heart issues, cholesterol, blood pressure	**high cholesterol, heart disease, and high blood pressure** (NCCIH, 2016)
Ginger	2	Eat/chew or drink boiled	Cold, cough, fever	stomach aches, nausea, diarrhea, joint and muscle pain, **cold** (webMD, 2016)
Mung bean	5	Eat boiled beans	Immunity support	Antioxidant and antimicrobial activities (Dongyan Tang et al., 2014)
Guava	4	Boiled young leaves	Dengue fever, digestion problems	**Anti-dengue effects** (Siti Latifah Abd Kadir, 2013), **diarrhea** (webMD, 2016)
Honey	4	Eat one spoon every day	Immunity support, cold, fever, cough	**Support immunity system, cough**, asthma, hay fever, diarrhea, stomach ulcers, wound healing, burns, sunburns, diabetic (NLM, 2015)
Lemon	2	Chew, juice with hot water	Cold, fever, cough, immunity support, tooth pain, obesity	**Cold, flu, immunity support,** decreases the risk of obesity, diabetes, heart disease (Megan Ware, 2015)
Jamu traditional indonesian medicine	2	drink	Immunity support	Anticancer, antiviral, antiparasitic, antidiabetic (Elfahmi et al., 2014)
Jicama	4	Squeezed water put on the face	Skin problems	boosting the immune system, supporting eye and **skin health** (Christina Sarich, 2013)

Karo oil	4	Massage	Body pain, minor injuries	**Muscle and joints pain, breaks, burns, cuts** (Mynyakalunkaro, 2010)
Mangosteen	1	Eat fresh fruit	Diabetes	diarrhea, urinary infections, gonorrhea, thrush, tuberculosis, menstrual disorders, cancer, osteoarthritis, stimulating the immune system, improving mental health (NLM, 2015)
Milk	1	Drink one glass every day	Improve memory and concentration	**Improve memory** (NHS, 2012)
Onion+ginger+garlic	2	Crush and mix with oil and put on body	Body pain	
Cat's whiskers	5	Boiled leaves and drink the water	Urological problems	High blood pressure, **kidney disorders, urinary infections,** diabetes (vitaminestore, 2013)
Papaya	1	Put on wound, drink papay juice	Burns, digestion problems	Cancer, diabetes, **digestion problems**, reduce HPV infection, parasite infections (NLM, 2015)
Plectranthus amboinicus	1	Crushed with salt and put on tooth	Tooth pain	cough, stomachache, headache, skin infection, **pain** (Erny Sabrina M.N et al., 2014)
Potatoes+milk+float	1	Mixed and use like a face mask	Skin problems	
Red onion	1	Mixed with sugar and put on wound	Minor injuries	Antioxidant and antibacterial activity, prevent and treat cancer, and reduce high blood pressure (healwithfood, 2016)
Rice	1	Heated rice put on wound	Minor injuries	
Snake soup	2	Snake meat broth, drink two glasses every day	Allergy	
Sulfur	1	Mixed with oil and use as a face mask	Skin problems	**Support skin health**, aid the metabolism, regulating blood sugar (mariobadescu, 2016)
Sunflower	2	Heated leaves put on wound	Minor injuries	**wounds, bruises** and ulcers, cough, asthma, headache (JC Kurian, 2010)
Turmeric (*Curcuma longa*)	1	Boiled and eat	Digestion problems	**aid digestion**, liver function, heartburn, stomach ulcers, gallstones, inflammation, and cancer (NCCIH, 2012)
Water+lime+salt	4	Mixed and drink, use like mouthwash	Cold, fever, cough, tooth pain	

Water+sugar	1	Drink one glass every day	Immunity support	
Water+sugar+salt	1	Mixed and drink	Digestion problems	
Worms	1	Boiled and mixed with meal	Typhus	High protein content, good nutrition and vitamins value (Medicinelist, 2011)

Based on our questionnaires we were documented among respondents 15 common different ailment categories which are treated by traditional medicine (See table 4).

Table 4 Most common health issues treated by traditional medicine

Health issue	Percentage of respondents
Cold, cough, fever, dengue fever	45.71
immunity support	34.29
Minor Injuries	31.43
Tooth pain	20.00
Digestion problems	20.00
Body pain	14.29
heart issues, cholesterol, blood pressure	11.43
Memory improving and concentration	11.43
Problems with skin and allergy	8.57
Diabetes	8.57
Urological problems	5.71
Problems with sleeping	5.71
Head ache	2.86
Typhus	2.86
Eyes problems	2.86

5.1.3 Attitudes, prevalence and use of medicine by DEL students

We asked in our questionnaires the students on six structured questions about their use and preferences in medicine and where they purchase the medicine. Based on our data, 45.71% of students used herbal medicine only seasonally, particularly if they were aware that there is a risk of some illness or health risk. 42.86% used herbal medicine only if some specific problem occurred and only 11.43% of students stated using herbs regularly throughout the year as a prevention. Furthermore, our data identified that co-medication is very common among the students as 51.43% admitted the use of both herbal medicine and conventional drugs with the result that they preferred more herbs and herbal medicine over chemical conventional medicine. 20% of students stated that they always prefer herbs and herbal product than chemical drugs in proportion. 17.14% rather prefer chemical medicine than herbs and 11.43% use herbal medicine very rarely in proportion conventional drugs and herbs.

45.71 % said that never consult using herbs with doctor, 28.57% consult and 25.71% consult only sometimes. Additionally, we examined where students get information about medicine. The majority (60%) gets information about medicine from relatives and friends and 57.14% from a doctor. 34.29% from internet, 31.43% from a shop or a store. 28.57% a literature, 25.71% a traditional healer, 20% newspapers and magazines, 14.29% a pharmacy, 11.43% a vendor on a street market. Moreover, we gathered data showing that 71.43% of the students purchased medicine from the shop or the store and only 22.86% purchased medicine from the pharmacy and the doctor despite the fact that the university has a medical center. More students purchase medicine on a street marke rather than in the pharmacy. 5.71% and 2.86% respondents purchase medicine on the internet or have other sources.

Finally, we documented decision-making process in family on using medicine. Mother was identified in majority of the answers (71.14%) and the most important decision-maker on using medicine at the household level. 40% students said that in their families decides about medicine father. 14.29% has anyone else in family who decides like a siblings or

other family members. 11.43% said that grandmother decides about medicinal products and only 5.71% is grandfather.

The most frequent answers why students do not use herbs for self-treatment more often. Students furthermore commented their answers. They highlighted for example poor availability of traditional medicinal plants, mentioned the difficulty of preparation and stressed out that for them it is much easier to go to the pharmacy store and to buy conventional medicine there. Additionally, personal attitudes of the students showed that they perceived herbs as medicine only for poor and not for educated people, or, that traditional medicine is only used as prevention or for long-term treatment of chronic diseases and not for serious illnesses.

5.1.4 Interview with university physician

The office of university physician is situated in Sitoluama village. To complement our ideas about students health and treatment we conducted open and non-structured interview with general practitioner, who is directly determined for the needs of Del institute university students. We asked on two questions. With such health problems, most students come to him and what drugs most commonly prescribed. It should be noted that health care from a doctor, students have free. In most cases students come to the doctor with health problems like is head ache, fever or problems with eyes.

5.1.5 Interview with university pharmacy staff

Pharmacy in Sitoluama village is situated next to the university and physician's office. Firstly, table 5 shows documented kinds of medicine, which people were mostly buying and what the prices of those drugs.

Table 5 The most commonly sold drugs in the pharmacy

Medicine	Health issue	Price in IDR	Price in USD
Paracetamol 500 mg	fever	8,000	0.61
Vitacimin 500 mg	immunity support	2,500	0.19
OBH Combi Syrup	cough	17,000	1.29
Dulcolax 5 mg	digestion problems	2,000	0.15
Entrostop	diarrhoea	7,000	0.53

Another question concerned the number of customers per day. Pharmacist said that in average is it about 30 people per day. In the last question we asked where pharmacy purchase their goods and how often they have to supplement products. This pharmacy purchase medicine products from Medan and in average they complement the goods once a month.

5.2 Medicine in Balige town: availability, prevalence and use

5.2.1 Medicine available at street market in Balige

Following plant species used for treatment health were identified at local market: andaliman, betel leaves, mangosteen and turmeric and also products for support health such as ginger, garlic, lemon and lime. Not special herbal plants used for traditional medicine.

Figure 6

Examples of traditional products used for health on the street market in Balige

Photo: author

5.2.2 Interviews with local people at market in Balige

There were selected randomly 15 women and 15 men for the questionary. The average age of women respondents was 34 years and average age of men was 45 years. In the first question 46.67% of respondents said that they use herbal plants only sometimes together with conventional medicine, 36.67% use herbs never in case of illness or as prevention and only 16.67% use herbal medicine very often. In the second question 45.45% people do not use herbal plants for treatment because in this area is poor accessibility and it is too much difficult for preparation. 18.18% said that they do not believe in power of herbal plants and it is not too much effective like a conventional medicaments. 36.36% ticked other reasons. Nobody chosen answer that herbal medicine is expensive. Last question concerned that where they purchase the medicine. The most people 43.33% purchase medicine from pharmacy and doctor. Than 30% purchase

medicine by yourself. 13.33% respondents use medicine from traditional healer and 13.33% purchase medicine another way.

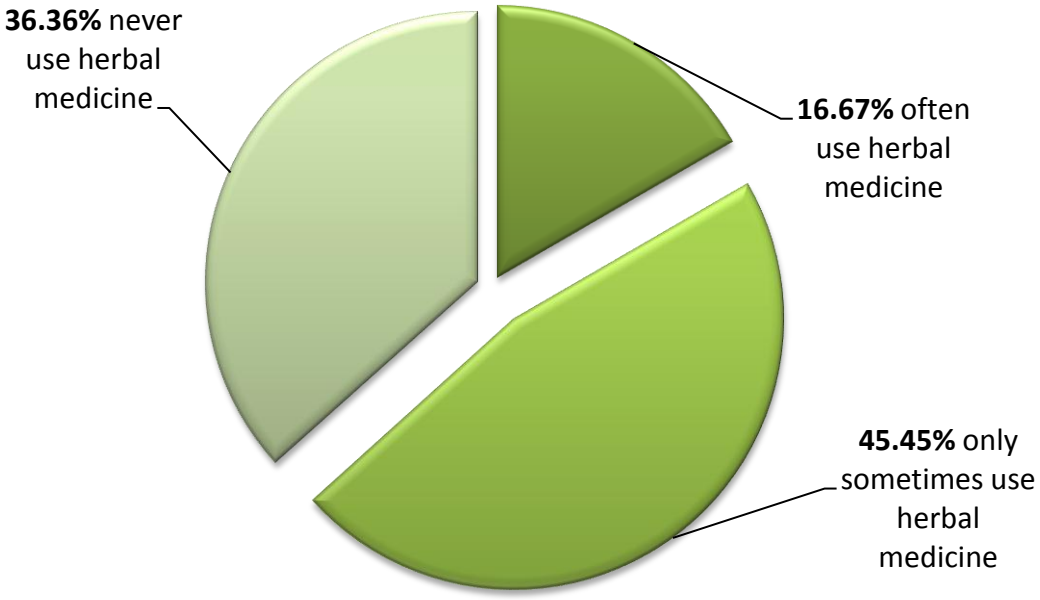

Figure 7

Prevalence of use herbal medicine in Balige town

5.2.3 Discussion with traditional healer in Balige

Our visit to a traditional healer showed us two examples of homemade traditional Indonesian medicine. Traditional healer produces two types of medicine. The first one is in a liquid state which contains these species of medicinal plants (see table 6).

Table 6 Medicinal plants used by traditional healer

Local name	Latin name	Reported uses
Sambiloto	*Andrographis paniculata*	liver disease, blood pressure, diabetes
Brotowali	*Tinospora crispa* L.	liver disease and diabetes
Lempuyang	*Zingiber zerumbet*	digestion problems
Turemeric	*Curcuma* Spp.	diare

At first the healer crushed and mixed these four medicine raw plants and after that placed in water and let it boil together. Two litres of medicine he sells for 50,000 IDR, which is the equivalent of 3.7 USD. Dosage is drink one cup three times per day. This mixture is mostly good like a prevention for diabetes and blood pressure and like a treatment for problems with stomach, diare or lever disease.

Figure 8

Herbal plants used in healers traditional medicine and their preparation

Photo: Author

The second traditional medicine product from healer is in the solid state and contains only two materials. Dry leaves and seeds of wild mimosa (*Leucaena leucocephala*) and dry chicken stomachs. *Leucaena leucocephala* has good antioxidant activity and is used to control stomachache. Dry chicken stomachs are most used in traditional Chinese medicine for the treatment and improving digestion problems, gallstones, kidney stones or bladder stones. These two dry ingredients are blended and crushed in blender. Thereby it gives dry black mix, which is added to hot water and drink it. Recommended dosage is one spoon three times per day. The price of half kilogram is 30,000 IDR. (2,2 USD).

Figure 9

Traditional medicine product made from chicken guts and wild mimosa

Photo: Author

These all medicines were purchased by older people from Balige and surrounding villages. Consumption depends on the season. Most people buy from July to august and from December to January. This is because in these months there are holidays and people often celebrate and then have digestion and kidneys problems or diarrhoea. The healer said that in average he sells his medicine to 3-5 people every day.

6 Discussion

Based on our results, we documented answers of 35 students from DEL Institute and 30 villagers of Balige town about prevalence and use of traditional medicine compare with conventional medicine. Due to economical growth of whole Asia region and rising of pharmaceutical industries, availability of health care is still improving and people in most regions have a choice between two different approaches to treatment. People can stay with traditional methods based on natural resources or they can utilize the benefits of modern medicine. In our survey we examined attitudes and preferences about these approaches.

Our results obtained from structured questionnaires and open interviews with students and villagers showed that use of herbs and traditional medicine is used less compare to conventional medicine. Respondents who use traditional medicine at least seasonally or regularly throughout the year, use mostly TM concurrently with conventional drugs. Respondents most often cited that the main reason why they do not use herbal plants more is poor availability of medicinal plants in nature or at the market of this area. Another reason was mainly difficult and lengthy preparation. Problem is not that people do not trust in herbal medicine but they think that in more serious health problems is safer to use modern medicne and traditional herbal medicine they prefer rather only as a support of chemical drugs. No one stated that traditional medicine is too much expensive, while based on interview with healer who provides traditional medicine in Balige we found that traditional medicine is twice as expensive than conventional medicine from pharmacy.

These all findings mean that purchasing of conventional medicine from pharmacy in target area is easier, more available, cheaper and has a rapid efficiency in serious health problems than herbs. Situation of good availability can correspond with the changes in healthcare in Indonesia since 2006 (WHO, 2009). However, WHO and other sources still state that, traditional medicine in developing countries is widely available and more affordable than conventional medicine and is primary source of health. But nowdays

pharmaceutical industries penetrated into the markets in third world countries and North Sumatra belongs to this rise. Demographic and epidemiologic factors such as urbanization, aging population and the growing prevalence of chronic diseases combined with strong GDP growth and increasing budgetary spend on healthcare means that Asia region is now firmly in focus for pharmaceutical firms (Anthony Morton-Small et al., 2016) Pharmacies are on every corner and people swallow pills already widely. The results from Turkey show that traditional medicine is there still widespread among the people but due to the increasing health service facilities in the country, herbal medicine, seemed to be more related to health care and disease prevention than cure (Ridvan Polat and Fatih Satil, 2012). In Kenya, as well as apparent from our results, over the years, the practice of herbal medicine has been downgraded as a result of the introduction of conventional medicine that are available in more patient compliant formulations such as syrups, capsules and tablets as opposed to traditional roots, barks and leaves which are often bitter to taste (Thairu, 1975). The main reasons why people stop using traditional medicine is that conventional drugs have a faster and more reliable onset healing effects and are therefore easier to use. The popularity of conventional medicine is also growing with big loss of biodiversity of local forest, which prevents the collection and cultivation of origin medicinal plants. Medicinal plants are very profitable especially for export into developed markets, where people are willing to pay for herbal medicine high amounts. Due to commercial use of medicinal plants, there is increasing pressure on the wild plant populations from which most medicinal plants are harvested. Overharvesting has placed many medicinal species at risk of extinction. Commercial exploitation has also sometimes led to traditional medicines becoming unavailable to the indigenous peoples that have relied on them for centuries or millennia. The accelerating loss of species and habitat worldwide adds to this urgency. Already, about 15,000 medicinal plant species may be threatened with extinction worldwide (Emily Roberson, 2008).

Despite the loss of biodiversity of Sumatran forest, we detected among the students 22 plant species which are used for promoting health. Based on reported 24 most common used plants for medicinal purposes by Batugal et al., we confirmed from our 22 species 7

of them as the same. These include betel leaves, turmeric, ginger, papaya etc. which can be found at the local street market.

Another noteable aspect is that local people often try to do things the way as the west society and in health they think that west modern medicine is better, while paradoxically people in developed countries are returning to the nature. Based on interviews, people stated that traditional medicine is for poor and uneducated people. Families with better incomes and with higher education mostly use conventional medicine. Similiar results were confirmed in study from Kenya, where the practice of herbal medicine has largely been considered primitive by the elite. On the other side in Europe and other developed countries is nature and alternative medicine more expensive and exclusive as a kind of life style.

Considerable part of our research was focused on students and their use of traditional medicine. For example study from Indonesian medical universities shows, that students generally have positive attitude towards alternative and traditional medicine as jamu. Almost half of the respondents are also users of traditional medicine (Adhitya S Ramadianto et al., 2015). In our case, percentage of students who use traditional medicine regularly througout the year or seasonally it is also more than 57.14% and 42.86% of students use traditional medicine very rarely. But if we asked on preferences, more than half of students prefer herbal medicine but concurrently with conventional drugs. In comparison with USA as different culture, habits and beliefs, from the number of three hundred and five students, said only 77 respondents that they used herbal medicine in the last 12 months (Cindy E. McCrea and Mary E. Pritchard, 2011). It is evident that use of traditional herbal medicine is still more frequent in third world countries.

In our study, we also observed many limits and deficiencies, which significantly influenced research results. It was mainly loss of meaning in translation because of the language barrier. Also small number of respondents due to ongoing student holidays. The original intention of the study was to do interviews with students families and find out species of

herbal plants and kinds of traditional medicine which they use at home. But due to lack of time, unwillingness and inability of some respondents to join us with their families was unfortunately impossible to do more detailed ethnobotanical research in target area. Our study is therefore about rapid appraisal of current situation. After evaluation of the questionnaires and personal interviews was found that research topic has greater potential then the scope of this thesis and for further study would be interesting to investigate how conventional medicine is developing and is easily accesible at the expense of traditional healing methods which are gradually being neglected and are fading from indigenous cultures.

During the searching of similiar studies was not found many sources. It means that the topic about students such as young people and their attitudes to traditional herbal medicine in developing countries should be more further explored.

7 Conclusion

In our survey we conducted interviews with 35 students of DEL university, 30 respondents from Balige town and with health care providers of conventional and traditional medicine. The views of our respondents is quite evident that in research area is more popular and used modern medicine. Based on our questionnaires we documented 81 medicine products from which 45.68% was biological origin and 54.32% was conventional. In case of bilogical origin it was not only about herbal plants but also animal-based or traditional homemade methods of treatment. Medicine products based on biological origin which students most often cited were egg and mung bean for immunity support, betel leaves for tooth pain or cat's whiskers for urological problems. The most common issues supported by traditional medicine were, head ache, immunity, fever, body pain, tooth pain or digestion problems.

The majority opinion on traditional medicine was positive. More than half of students, use herbs as a supplement to modern medicine and they confirmed that in more serious health problems rather use conventional medicine from pharmacy. They are not against of traditional medicine but also do not seek it out. The main reasons why people do not use traditional and herbal medicine as much anymore as before are poor accesibility of herbal plants in this area, difficult preparation and at least that herbal medicine is for poor and uneducated people. Wealthy and educated people rather buy medicine in pharmacy. Traditional indigenous methods of healing are gradually loosing in a flurry of modern medicine from the west and local people become accustomed to a simpler and more convenient methods of therapy.

The majority stated that do not consult using of herbal medicaments with their physician and they get informations about medicine mostly from relatives and friends. More than 70% of respondents purchase the medicine from the shop or pharmacy and the most important decision-maker about medicine in family is mother.

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Annex

Annex 1. Structured questionnaire translated into bahasa for respondents in Balige

Mohon mengisi ottau memilih salah satu pilihan yang terbaik dari pertanyaan dibawah ini :

1. Apakah kamu menggunakan obat - obatan herbal ?

   a) Sering, saya hanya menggunakan obatan herbal

   (b) Kadang - kadang, saya menggunakan obat herbal dan kadang - kadang obat kimia (pil)

   c) Tidak pernah, saya hanya menggunakan obatan kimia (pil)

2. Jika kamu memilih jawaban c pada pertanyaan nomor 1, apa alasan anda tidak menggunakan obat herbal (alami) ?

   a) Menemukan obatan herbal dan menyajikan obatan herbal tidak mudah.

   b) Saya tidak yakin obatan herbal bekerja mujarab.

   c) Harganya terlalu mahal

   d) Alasan yang lain

3. Dimana anda menemukan obat yang anda butuhkan ?

   a) Mr. Bakara

   b) Dengan membuatnya oleh dirimu sendiri dengan menemukannya di :
      - ⊙ Sekitar rumah
      - ⊙ Hutan / kebun
      - ⊙ Pasar
      - ⊙ Lainnya

   c) Farmasi, Rumah sakit, Dokter

   (d) Orang yang mengetahui obatan herbal lainnya.

Annex 2. Semi-structured questionnaire for students of Del

1. Write down all the people who live together with your family for the more than 6 months a year (e.g. father, mother, grandpa, grandma, brothers, sisters, friends …).

People in the household	When they were born (year)?	Gender

Where your family lives? In which city or village?

2. Ask them if any of them used some kind of herb or herbal product to heal some illness or just to support the health? Choose how many possibilities you need and briefly discribe which herbal product exactly do you use and how do you prepare it?

Body pain (arms, knees …) □ ……

Cold, cough, fever □ .....

Diabetes □

Digestion problems □

Eyes problems □

Head ache □

Heart issues, blood pressure, cholesterol □

Immunity support □

Improve of memory and concentration □

Minor injuries (e.g. bruise, abrasion, burn) □

Obesity □

Problems with skin □

Problems with sleeping □

Urological (Kidney) □

Tooth pain □

3. **Ask your parents how often herbs are used in your household for healing the illness or to support the health? Please, chose one answer only.**

□ not very regularly, rather if some (specific) problem occur
□ seasonally, if we know that there is a risk of some illness or health risk
□ regularly throughout the year (e.g. as a prevention, chronic illnesses)

4. **Ask your parents how important herbs and herbal products are for your family in comparison with chemical medicine from pharmacies? Please, chose one answer only.**
□ we always prefer herbs and herbal products than chemical medicine (20:80)
□ we prefer herbs, but we also use some chemical medicine (60:40)
□ we prefer chemical medicine, but we also use some herbs (40:60)
□ we use herbs very rarely (80:20)

5. **Do you consult using herbs and herbal medicine with your physician? Please, chose one answer only.**
□ yes
□ sometimes …in the case of less serious illnesses such as fever, cold …
□ never, because i don't think that's important information

6. **Where your family get information about the medicine. Choose how many possibilities you need.**
□ from the internet
□ from the TV and radio
□ from relatives and friends
□ from newspapers and magazines
□ from literature
□ from doctor (physician)
□ from pharmacy
□ from specialized shop or store
□ from vendor on the street market
□ from traditional healer
□ other, please write down from whom or where?

7. **Where your family purchase the medicine? Choose how many possibilities you need.**
□ pharmacy
□ internet
□ street market
□ store or shop
□ others, please specify …

8. **Who in your family decide to buy a medicine? Choose how many possibilities you need.**
□ father
□ mother
□ grandpa
□ grandma
□ other family member

9. **How much you family spent on medicine per month/year?**