

# Disclosure of Herbal Medicines Use on Mother and Children Health Care in Ternate Island Indonesia

Musiana<sup>1</sup>, Hamidah Rahman<sup>1,\*</sup>, Rosmila Tuharea<sup>1</sup>, Zubair Saing<sup>2</sup>

<sup>1</sup>Department of Public Health, Faculty of Health Sciences, Universitas Muhammadiyah Maluku Utara, Ternate, Indonesia

<sup>2</sup>Faculty of Engineering, Universitas Muhammadiyah Maluku Utara, Ternate, Indonesia

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**Abstract** Traditional medicine (TM) is still used by some tribes in Indonesia to treat and cure a variety of diseases, including maternal and child health care. A *Biang*, or Woman Traditional Healer (WTH), is a woman who uses herbal plants to practice TM for the health of mothers and children. Indeed, the herbs and ingredients used are frequently undocumented, putting the sustainability of TM in jeopardy. TM practices are also practiced on Ternate Island, and no research has been conducted to date on the identification and documentation of local knowledge of WTH in the use of herbal plants. The purpose of this study was to identify the characteristics of the WTH who practice on Ternate Island, as well as to identify local knowledge of WTH and to document herbal plants used in caring for the health of mothers and children. The descriptive explanatory research method was used, and data were collected using a semi-structured questionnaire guide. Snowball sampling was used to obtain respondents, and the data were analyzed using descriptive statistics. The average age of the thirty-eight WTH respondents was fifty-three years old. They have a primary school education (92.1%), and some have attended traditional medicine training (60.5%). All WTH use herbs in traditional medicine practice (100%), and their healing skills were entirely inherited from their parents. WTH used 32 herbal plants, with postnatal care receiving the most attention. Given the significance of TM using herbal plants, more research is needed to determine the safety of these plants.

**Keywords** Maternal and Child Health, Herbal

Medicine, Traditional Medicine, Traditional Knowledge

## 1. Introduction

Traditional medicine (TM) systems are still valued, particularly in developing countries [1-3]. Indonesia recognizes the TM system as well, employing a wide range of medicinal plants to treat a variety of diseases [4]. Even in the age of modern computational pharmacology, TM plants play an important role in the treatment of a variety of ailments [5]. Similarly, many modern drugs are based on information about the use of herbs in traditional knowledge systems of TM that has been subjected to extensive clinical testing [6-8]. *Artemisia annua* is used as an antimalarial, *Silibum marianum* is used as a *hepatoprotective*, *Taxus brevifolia* is used in the treatment of lung, ovarian, and breast cancers, and many other herbs are currently used as raw materials in the production of modern medicine [7], [9].

The use of herbal plants (HP) in the TM system has several advantages, including a treatment method derived from indigenous and local culture [8], [10-11], the ease of obtaining herbs [12], and fewer side effects [5], [12-14]. TM using HP, on the other hand, is in short supply and may become extinct. According to some reports, there is a risk of HP resource extinction, as well as the possibility of finished over or data loss on traditional herbal recipes. Continuous harvesting without replanting or conservation

can lead to the extinction of HP. Climate change also contributes to plant extinction in some areas, resulting in dead plants [15]. Another issue is that land and HP habitat are being over-exploited as a result of rapid development [5], [15]. Furthermore, the threat of losing information about prescription herbal ingredients as a result of the treatment methods was only passed on to the closest family members without proper notes or documentation [16]. Even if a few notes or documentation are discovered, they are only done in a specific language that, of course, only a certain group of people understand [17]. In order to avoid the loss of information on the use of herbs, it is critical to keep meticulous records and documentation in the practice of TM using herbs [5], [10].

Many studies have been published on the use of HP in the medical system in various parts of the world, including Thailand [6], [16], Ethiopia [10-11], Saudi Arabia [12], Italy [15], India [8], and many others. Among those who use HP to care for themselves and their families are women [7]. Women's health care with HP, including treatment of *gynecological* problems with *Amaranthus* sp [18] and care during pregnancy with *Zingiber officinale* [13], [19]. Similarly, mothers use HP for the care and treatment of their children if they become ill [4], [20-21]. The World Health Organization (WHO) also supports the practice of TM by recommending a 2014-2023 strategy for TM that each tribe can safely practice [6], [22]. The use of TM for maternal and child health care has been reported by several

tribes from various countries, and such TM practices are also found in Indonesia. There have been studies on the use of HP for maternal and child health care in Indonesia [23-25], but the practice of TM for the Ternate Island tribe has not been reported. Similarly, data on the extent of local knowledge of WTH on Ternate Island about the benefits of HP are still limited.

The purpose of this study was to characterize the WTH on Ternate Island while also identifying their local knowledge in carrying out TM practices using HP. Furthermore, HP type identification was carried out to supplement the documentation of HP that grows on Ternate Island. This study contributed to efforts to preserve the practice of TM. Moreover, the results were used as the initial data to identify the source of the raw material for a new drug for maternal and child health care.

## 2. Methods

Ternate Island was the site of the study. Ternate Island is in eastern Indonesia, in the Maluku Islands group, specifically in the northern part of Maluku. Ternate is located between 0°25'41.82" and 1°21'21.78" North latitude and 126°7'32" and 127°26'23.12" East longitude. Ternate Island has a total area of 5,709.72 km<sup>2</sup>, divided into 162.17 km<sup>2</sup> of land and 5,547.55 km<sup>2</sup> of sea. The climate on Ternate Island is tropical [26], as present in Fig. 1.



Figure 1. The map of study location

Respondents were WTH who practice maternal and child health care in Ternate Island which were by snowball sampling. Snowball sampling was carried out in a way, namely in the early stages of the study, six of WTH were found. Of the six of them, a search was carried out for the candidate respondents who have the same characteristics, and so on, so that at the end of the study thirty-eight were obtained. This study was completed with informed consent for each respondent. Informed consent contains the provision of information regarding the involvement of every respondent as the subject of the study. In addition, there was also a statement of consent from each respondent to participate in this study voluntarily.

Data were collected through a face-to-face survey which was completed with a semi-structured questionnaire. The questionnaire's questions were used to collect all the data covering the characteristics of WTH. The data was processed by descriptive statistics such as frequency and percentage which is also called *univariate* analysis. The

ethno-botanical data were collected by grouping all types of HP mentioned by WTH based on the type of service practice in maternal and child health care. The data and the results were presented in tables and narratives.

### 3. Results

Thirty-eight WTH from Ternate Island participated in the study. The WTH's average age was around fifty-three years old, and they were all married. The majority of WTH have completed primary school, and up to 60.5% have received TM training. Other characteristics of WTH include the fact that they learned how to practice TM from their parents, and that all use HP in the care of mothers and children. WTH treated more than ten patients per month on average. Table 1 displays the characteristics of WTH.

Table 2-5 contains the HP used by WTH for maternal and children health care, respectively.

**Table 1.** Socio-demographic characteristics of the WTH in Ternate Island (n=38)

Characteristic	Frequency	Percentage (%)	Mean $\pm$ SD (year)
Age	-	-	53.3 $\pm$ 4.5
<b>Marital status</b>			
Unmarried	0	0	
Married	38	100	
<b>Level of education</b>			
None	0	0	
Primary school	35	92.1	
High school	3	7.9	
<b>Have attended health care training</b>			
Yes	23	60.5	
No	15	39.5	
<b>Average patients/month</b>			
1-3	5	13.2	
4-6	12	31.6	
7-9	10	26.2	
$\geq$ 10	11	29.0	
<b>Healing skills of</b>			
Parents	38	100	
Another family	0	0	
Friend	0	0	
Other	0	0	
<b>Using herbs in mother-child health care practice</b>			
Yes	38	100	
No	0	0	

**Table 2.** Herbal plants used by WTH on postnatal care in Ternate Island

Indications	Herbal plants
Milk production and secretion	Drumstick tree ( <i>Moringa oleifera</i> ); Katuk ( <i>Sauropus androgynus</i> ); banana flower ( <i>Musa paradisiaca</i> )
Shrink and warm the stomach after giving birth	Turmeric ( <i>Curcuma domestica</i> L.); Kencur ( <i>Kaempferia galanga</i> L.); Ginger ( <i>Zingiber officinale</i> ); Cinnamon ( <i>Cinnamomum verum</i> ); Areca nut ( <i>Areca catechu</i> )
Increase stamina	Miyana leaf ( <i>Coleus scutellarioides</i> ); Nutmeg leaf ( <i>Myristica fragrans</i> ); Clove leaf ( <i>Syzygium aromaticum</i> )
Improve blood circulation	Nutmeg leaf ( <i>Myristica fragrans</i> ); Clove leaf ( <i>Syzygium aromaticum</i> ); banana flower ( <i>Musa paradisiaca</i> )

**Table 3.** Herbal plants used by WTH for caring during pregnancy in Ternate Island

Indications	Herbal plants
Increase appetite	Areca nut ( <i>Areca catechu</i> )
Blood booster	Lemongrass ( <i>Cymbopogon nardus</i> L.); Red Jatropha ( <i>Jatropha gossypifolia</i> )
Morning sickness, vomiting, nausea	Ginger ( <i>Zingiber officinale</i> )
Hypertension	Garlic ( <i>Allium sativum</i> ); Celery leaf ( <i>Apium graveolens</i> L.)

**Table 4.** Herbal plants used by WTH on childbirth assistance in Ternate Island

Indications	Herbal plants
Childbirth facilitates	Caricature plant ( <i>Graptophyllum pictum</i> L.), Katang leaf ( <i>Ipomoea pes-caprae</i> ); Gedi leaf ( <i>Abelmoschus manihot</i> ) <i>Orthosiphon aristatus</i> leaf; Castor leaf ( <i>Ricinus communis</i> ); Jackfruit root ( <i>Artocarpus heterophyllus</i> )
Removing the remnants of dirty blood	Lemongrass ( <i>Cymbopogon nardus</i> L.); Ginger ( <i>Zingiber officinale</i> ); Turmeric ( <i>Curcuma demostica</i> L.); Tamarind ( <i>Tamarindus indica</i> ); Galangal ( <i>Alpinia galanga</i> ); Java ginger ( <i>Curcuma zanthorrhiza</i> )

**Table 5.** Herbal plants used by WTH on baby and child health care in Ternate Island

Indications	Herbal plants
Fever reducer	Jathropa leaf ( <i>Jathropa curcas</i> L.); Lime fruit ( <i>Citrus aurantiifolia</i> ); <i>Alloe vera</i> L.
Treat child seizures	Soursop leaf ( <i>Annona muricata</i> L.)
Baby skin cleanser	Ylang flower ( <i>Cananga odorata</i> ); Bitter melon ( <i>Momordica charantia</i> L.)
Mucus cough	Jathropa leaf ( <i>Jathropa curcas</i> L.)
Diarrhea	Guava leaf ( <i>Psidium guajava</i> L.); Soursop leaf ( <i>Annona muricata</i> L.)
Fungus in mouth	Patchouli ( <i>Pogostemon cablin</i> )

### 4. Discussion

The WTH, like tribes in other countries, particularly in developing countries, continues to rely on traditional medicines as a means of maintaining and treating health. This also applies to maternal and child health care and treatment. Malaysia [14], [27], Indonesia [20, 23, 28], Bangladesh [29], Nepal [30], Pakistan [18], Ethiopia [13, 32], Italy [31], Africa [2, 33, 34], and Palestine [35] have all used TM for maternal and child health care. Women are the primary consumers of herbal medicines, according to the number of reports from these studies.

This is the first study to reveal WTH in Ternate Island's knowledge of the use of HP in treating and improving maternal and child health. The practice of TM, which is run by the WTH on Ternate Island, is still active and is regarded as significant in the alternative medicine community. According to the findings of these studies, the average number of patients treated by the WTH in a month was four (data in Table 1). *Biang* or WTH use HP and medicinal herbs that they have prepared themselves in their medical practice. *Biang* is the term used by Ternate residents to describe a woman who uses TM to treat and cure maternal and child diseases. The data from this study shows that the knowledge and skills of all WTH (100%) in running TM were obtained directly from their parents, which is consistent with the statement that TM practice is typically passed down through the immediate family [5]. The majority of WTH (60.5%) have received TM training to improve their skills.

Local knowledge of the WTH about the different types of HP, their benefits, and their skills in preparing herbal medicines for maternal and child health care are well

documented in this study. WTH's maternal and child health services include postnatal maternal care, care for women during pregnancy, maternal assistance during childbirth, and health care for infants and children. The mother's postpartum care includes assistance in facilitating the production of breast milk, tightening the abdomen after giving birth, and increasing stamina and blood circulation after birth (as shown in Table 2). *Moringa* leaves have the ability to improve both the quality and quantity of breast milk. *Moringa* contains *phytosterols*, which act as a *galactagogue*, stimulating breast milk secretion [36-38]. Similarly, katuk leaves can boost breast milk production [28, 39]. Breast milk secretion has also been reported to be stimulated by banana flowers [40]. Postnatal care is also important for restoring the mother's stamina after giving birth. Nutmeg, clove, turmeric, galangal, ginger, and cinnamon are also used in TM to boost women's stamina after giving birth [41-43], as WTH did on Ternate Island.

The WTH on Ternate Island provided TM practices during pregnancy to increase pregnant women's appetites, prevent blood deficiency or *anemia*, reduce nausea and vomiting during pregnancy, and treat hypertension during pregnancy (as shown in Table 3). Symptoms of nausea, vomiting, heartburn, and constipation are common in pregnant women. Typically, these symptoms are self-treated with traditional medicine [19]. Ginger (*Zingiber officinale*) was widely reported to be used by pregnant women with an indication for nausea and vomiting [13, 19, 44]. Similarly, ginger is used by WTH in Ternate Island to reduce nausea and vomiting during pregnancy. WTH in Ternate Island used garlic and celery-containing ingredients to treat hypertension during pregnancy. Hajj and Handayani [19, 45] also reported the

use of garlic (*Allium sativum*) and celery (*Apium graveolens L.*) as antihypertensive herbs. There was a WTH using areca nut to stimulate the mother's appetite during pregnancy. Local communities in Asia chew areca nut to stimulate saliva secretion [46]. Nonetheless, the use of areca nut for pregnant and lactating women needs to be researched further, given that several studies have found areca nut consumption to be harmful to pregnant women [47, 48].

WTH's delivery assistance activities include facilitating birth and cleaning up the remnants of dirty blood after birth (as shown in Table 4). *Graptophyllum pictum L.*, *Ipomoea pes-caprae*, *Abelmoschus manihot*, *Orthosiphon aristatus*, *Ricinus communis*, and *Artocarpus heterophyllus* were some of the HP used by WTH on Ternate Island to help facilitate childbirth. Some of these HP have been shown to have oxytocic and labour-inducing properties [49, 50].

The WTH on Ternate Island not only cares for mothers, but also for the health of babies and children. WTH mentions health treatments for babies and children such as reducing fever, treating seizures, cleaning new-born skin, slimy treating coughs, *diarrhea*, and treating fungi that are commonly found in the baby's mouth (as shown in Table 5). Guava leaves have been reported to be antidiarrheal [51], while *jathropa* leaves are used to treat fever, colds, and cough [52].

The prevalence of HP use in women varies depending on factors such as geographic location, ethnicity, cultural traditions, and socioeconomic status, among others. Aside from the use of HP in traditional treatment methods, experience, skills passed down from generation to generation, education, and training [14, 19, 35] are all important considerations. To support the use of HP, it is necessary to locate the appropriate scientific evidence for the use, which may aid in the formation of a correct understanding of HP. As a result, it is necessary to develop TM from a pharmacology standpoint, so that mothers and children can be treated based on local wisdom as well as user safety, particularly for pregnant women, *fetuses*, infants, and children [23, 53, 54]. To reduce the risk of endangering the lives of *fetuses* and infants, pregnant and lactating women, as well as WTH, should be educated on the proper use of HP during pregnancy and lactation [19]. In this regard, some studies suggest studying the safety of herbal use in pregnant and lactating mothers [2, 13, 14, 19, 33]. As one example, areca nut has been linked to adverse effects on pregnant women and fetuses [48]. As a result, extensive research on the safety of plants used in traditional medicine practice is required. Another critical point is to increase WTH's understanding of the safety of administering HP to their patients, specifically women, pregnant women, breastfeeding mothers, infants, and children.

## 5. Conclusions

Ternate Island has maintained a tradition of traditional medicine based on herbal plants to this day. All the thirty-eight women traditional healers who responded used herbal plants, and their healing abilities were entirely inherited from their parents. There were 32 herbal plants used by women traditional healers for postnatal care, pregnancy care, childbirth assistance, and child health care. The majority of the herbal plants used have already been reported in accordance with the purpose of treatment, but some of the plants have not been reported in accordance with the purpose of therapy. To ensure the safe use of herbal plants for maternal and child health, scientific evidence-based research must be conducted to reveal the therapeutic purposes and adverse toxicity to mother and child health.

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