

Short Communication: Plants used by Sundanese mothers for maternal care in a rural village in Bandung District, West Java, Indonesia

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Abstract. Oktavia D, Adnani QES, Gumilang L, Novianti E, Sunardi. 2023. *Short Communication: Plants used by Sundanese mothers for maternal care in a rural village in Bandung District, West Java, Indonesia. Biodiversitas 24: 3568-3573.* Traditional beliefs and plants are pivotal during pregnancy, childbirth, and postpartum. Little is known of Sundanese, a small ethnic group whose traditions and use of plants facilitate easier pregnancy, birth, and postpartum recovery. This study aimed to determine the traditional beliefs and types of plants used by Sundanese mothers of Bandung District, West Java, Indonesia during pregnancy, childbirth, and postpartum care. Individual interviews using structured questions were conducted to collect socio-demography data and gather information on traditional beliefs and the use of plants concerning pregnancy, childbirth, and postpartum care. Purposive and snowball sampling was employed to enroll women of reproductive age who were either pregnant at the time of the study or had recently given birth and were postpartum. Data were collected from 119 Sundanese women. These women frequently used 25 different medicinal plant species from 21 families to treat various conditions that arise during pregnancy and childbirth. The Zingiberaceae plant family was observed to be the most commonly used, with leaves being the most frequently utilized plant part. Decoction and cooking were reported as the most favored remedy preparation. The most effective plants during pregnancy, childbirth, and postpartum were *Cocos nucifera* L., *Cocos nucifera* L., and *Sauropus androgynus* (L.) Merr., respectively. Therefore, to promote sustainable women's health in rural areas, the current findings highlight the necessity for conservation efforts and further studies on the phytochemical and pharmacological aspects of frequently used food and medicinal plants.

Keywords: Childbirth, medicinal plants, postpartum, pregnancy, traditional knowledge

INTRODUCTION

Over centuries, people have learned how to use these natural remedies effectively and continue improving their knowledge. The use of complementary and alternative medicines (CAM) has increased extensively worldwide (Bodeker and Kronenberg 2002; Shaikh and Hatcher 2005; Gale 2014). Medicinal plants play a crucial role in pregnancy, childbirth, and postpartum care in urban and rural areas across the globe (Liamputtong et al. 2005; Attah et al. 2012; Ali-Shtayeh et al. 2015). Various ethnic groups have reported the use of plants for various women's health conditions, such as female infertility, birth control, pregnancy, childbirth (parturition), postpartum (puerperium), and breastfeeding, as well as infant care (Vo 2021; Ansong et al. 2022). The beneficial effects of herbal therapies during pregnancy, childbirth, and postpartum care are frequently relied upon in traditional societies, particularly in Asian countries (Withers et al. 2018).

Traditional cultures frequently depend on the advantageous impacts of herbal treatments for pregnancy, childbirth, and postpartum care (Vo 2021). The understanding and proper application of these natural remedies have been honed and enhanced over numerous generations. In the context of pregnancy and childbirth, traditional medicine places emphasis on specific herbs due to their beneficial properties in strengthening uterine muscles, stimulating labor, facilitating the removal of retained placenta, and managing postpartum bleeding (Attah et al. 2012). The documentation and scientific validation of herbal remedies traditionally employed provide excellent foundations for focused drug discovery endeavors aimed at specific biological targets, as well as their pharmacological characterization.

Plants used during pregnancy can serve various purposes, including addressing pregnancy-related conditions, such as nausea and vomiting, vaginal candidiasis, and fulfilling nutritional needs (Adane et al. 2020; Jan et al. 2021). They may also be utilized for non-related pregnancy

conditions such as respiratory or skin conditions (Razafindraibe et al. 2013). Traditional medicine relies on specific herbs throughout pregnancy, childbirth, and postpartum care due to their beneficial effects on contracting the uterus muscle, aiding labor, removing retained placentas, and managing postpartum hemorrhage (Karoshi and Keith 2009). In a study conducted by Razafindraibe et al. (2013), it was revealed that the residents of Mahabo-Mananivo, Madagascar, extensively relied on the utilization of 152 medicinal plants. Among these plants, eight native species are specifically used by women. A noteworthy finding by Oktavia et al. (2022) highlighted the documentation of 23 species of medicinal plants in Kelubi village, in Belitung Island. These plants have become widely recognized and commonly employed as herbal remedies specifically targeted for postpartum care and recovery after childbirth. The knowledge of these plants and their traditional usage serves as a valuable resource for understanding local healthcare practices and exploring potential therapeutic applications.

Communities residing in remote locations, particularly those near or within forests, often rely on local plant resources to meet their needs for food and traditional medicine. This reliance fosters the development of traditional ecological knowledge (TEK) on the diversity of plant species and their utilization and preservation. In this situation, obtaining a variety of food plants from fields and nearby forests becomes vital for obtaining daily sustenance and essential nutrients. The important role of local food plants, including those originating from forests, fields, and home gardens, in maintaining food security has been mentioned by Köhler et al. (2018), Cita (2020), Pawera et al. (2020), Sujarwo et al. (2016). Additionally, communities near the riversides require specific attention, particularly regarding maternal health care.

In this study, we investigate the cultural practices and plants utilized by Sundanese mothers in a rural village in Kertasari Sub-district, Bandung District, West Java, Indonesia, for prenatal, labor, and postpartum care. The Kertasari sub-district lacks specific surveys examining women's perspectives on using herbal remedies for labor, postpartum, and infant healthcare. In addition to enhancing the effectiveness of these plants, the documentation of ethnobotanical knowledge may also influence their conservation in nature.

MATERIALS AND METHODS

The study involved qualitative research conducted among women at various stages of pregnancy in three villages in the Kertasari sub-district, Bandung, West Java, Indonesia. Data were collected from a sample of 119 Sundanese women. Before the study, the research team provided a clear explanation to potential respondents about the nature of this study, which focuses on their traditional beliefs and the use of plants during different stages of pregnancy, giving birth, and postpartum treatment. The researcher ensured the respondent that their information would be kept confidential and solely used for research

purposes. Women who agreed to participate in the study were requested to sign an informed consent. The study was conducted between August 2022 and December 2022. This study has obtained permission from the local government and adhered to the ethical guidelines for data collection established by Research Ethics Committee at Universitas Padjadjaran with the issued number 1046/UN6.KEP/EC/2022.

The study employed purposive and snowball sampling techniques. Eligible participants included women who were either pregnant at the time of the study or had recently given birth and were postpartum. All women who were respondents were born in the Bandung district. Data collection utilized structured research questions administered through face-to-face interviews conducted by female interviewers. A pilot study on five randomly selected women who had not participated in the study to evaluate the structured research questions. The structured questions aimed to gather the following information: socio-demographic details of the women, identification of plants used by women during pregnancy, childbirth, and postpartum care, specific plant parts utilized, and traditional beliefs associated with these plants.

The age of the respondents ranged from 15 to 44 years (Table 1). Most respondents fell into the age group of 25-29 years old. However, there were also respondents aged 15-19 years old. Previous studies have indicated that younger age is associated with less effective breastfeeding practices. For instance, Jones et al. (2011) discovered that American mothers aged 30 years or older were more than twice as likely as mothers aged 20 years or younger to breastfeed for 6 months exclusively. Young mothers have special requirements, behaviors, and challenges. Therefore, it is crucial to understand young mothers' particular requirements to develop interventions and health promotion programs.

Table 1. Socio-demographic data of respondents

	Frequency	Percentage
Mother's age group		
15-19	9	7.6
20-24	29	24.4
25-29	31	26.0
30-34	29	24.4
35-39	15	12.6
40-44	4	3.3
Missing	2	1.7
Husband's age group		
20-24	17	14.3
25-29	30	25.2
30-34	26	21.9
35-39	24	20.1
40-44	15	12.6
45-49	5	4.2
Missing	2	1.7
Education level		
Elementary School	28	23.6
Junior High School	56	47.0
Senior High School	31	26.1
Bachelor's degree	1	0.8
Missing	3	2.5

RESULTS AND DISCUSSION

This study identified 25 plants commonly used during pregnancy, childbirth, and postpartum care. These plant species belong to 21 families (Table 2). The most widely used plant family is Zingiberaceae. It includes four species, including *Curcuma longa* L. *Curcuma xanthorrhiza* Roxb. *Kaempferia galanga* L. and *Zingiber officinale* Roscoe. Meanwhile, coconut (*Cocos nucifera* L.) is the most often used plant species with the most benefits. Pregnant women often consume young coconut water during pregnancy to increase red blood cells, alleviate difficulty in urination, cleanse the fetus, and relieve morning sickness. Morning sickness typically occurs during the first trimester of pregnancy (Yu et al. 2013). The increased production of stomach acid during pregnancy due to hormonal changes that affect the gastric muscles can irritate the gastric mucosa. However, drinking young coconut water could significantly reduce morning sickness symptoms during the first trimester of pregnancy (Ariestini et al. 2021). On the other hand, a study by Chakrabarti and Chakrabarti (2019) on food taboos in a rural West Bengal region reported that green coconut water is prohibited during pregnancy due to impaired vision. It is advised to avoid consuming fruits that are difficult to open, such as coconuts, during pregnancy to prevent complications during childbirth. The belief is that consuming coconut can cause the uterus to become firm like the fruit, potentially leading to obstructed labor and difficult delivery.

Parts of plants used as medicinal or food ingredients include leaves, fruits, tubers, and various plant parts. However, among these, the most commonly used part is the leaves. Leaves are utilized both as food and as medicine. For example, during pregnancy, leaves such as *katuk* (*Sauropus androgynus* (L.) Merr.), singkong (*Manihot esculenta* Crantz), and kelor (*Moringa oleifera* Lam.) are consumed during pregnancy to increase iron and prevent anemia (Table 3). *Katuk leaves* (*Sauropus androgynus* (L.) Merr.) one of the medicinal plants in Indonesian jamu (traditional herbal medicine) which is commonly used to increase milk production, as an antipyretic, and consumed as a vegetable (Silalahi et al. 2020). Research has shown that *katuk* leaves can increase hemoglobin levels, serum iron, and serum ferritin in cases of iron deficiency anemia (IDA) (Suparmi et al. 2021). Aregheore (2012) noted that pregnant women in certain African countries consume cassava leaves to increase breast milk production. Cassava leaves' high protein content and nutritional value can potentially reduce or eradicate nutritional deficiency in improvised populations and fight against micronutrient malnourishment.

The study also identified several plants species that support the availability of breast milk for infants, including *Amaranthus hybridus* L., *Brassica oleraceae* L., *Carica papaya* L., *Curcuma longa* L., *Daucus carota* L., *Ipomoea aquatica* Forssk., *Moringa oleifera* Lam., *Sauropus androgynus* L., *Sechium edule* (Jacq.) Sw. and *Phoenix dactylifera* L. During pregnancy and lactation, mothers require a greater need for nutrition. However, the situation becomes more complex when a pregnant or lactating

woman follows or is forced to undergo certain dietary restrictions for the benefit of her baby. Spinach or *bayam* (*Amaranthus hybridus* L.) is a popular vegetable consumed by pregnant and lactating women (Dawodu et al. 2020). Spinach is known to have benefits in reducing the risk of anemia in pregnant women (Orech et al. 2007). It is also a vegetable that can increase breast milk production due to its effective iron content (Dawodu et al. 2020).

Nursing mothers can greatly benefit from the consumption of *Moringa oleifera* L. leaves. These leaves contain flavonoids, and moringa leaves can aid lactating moms in producing more milk (Chukwuebuka 2015). Because moringa leaves contain 25 times more iron than spinach, they can also improve breast milk quality in addition to their high nutritional value (Rockwood et al. 2013). *Moringa oleifera* L., commonly known as moringa, is a plant with high nutritional value and has the potential to address nutritional deficiencies effectively (Mushtaq et al. 2021, Rode et al. 2022). The leaves of *Moringa oleifera* L., commonly known as moringa, are rich in nutrients and known to enhance the production of breastmilk. Studies have shown that higher doses of moringa (14-30 g/day) rather than lower doses (<10 g/day) can increase hemoglobin levels in children with iron deficiency and improve hemoglobin levels and vitamin A status among postmenopausal women, as well as increase body mass index (BMI) among underweight adults with HIV. Additionally, even smaller doses of moringa (0.5 g/day) have been associated with increased breast milk volumes (Brar et al. 2022). Malnutrition can be treated using leaf extracts, which are also used to help breastfeeding women produce more milk (Jendras et al. 2020). Additionally, moringa is being explored for its potential anti-inflammatory, anticancer, antioxidant, antibacterial, and anti-inflammatory agent (Gopalakrishnan et al. 2016; Liu et al. 2022).

Curcuma longa L. is a plant used in various maternal processes (pregnancy, childbirth, and postpartum). It contains curcumin, which is the primary polyphenolic compound found in the rhizomes of *Curcuma longa* L. Curcumin has been recognized for its potential as an anti-inflammatory substance and its applicability in managing various pregnancy complications, including Preeclampsia (PE), Gestational Diabetes Mellitus (GDM), Fetal Growth Restriction (FGR), Preterm Birth (PTB), as well as exposure to harmful agents and pathogens (Tossetta et al. 2021). Adding curcumin as a supplement has the potential as a preventive measure and an effective treatment strategy for mitigating negative pregnancy disorders. Furthermore, this method has shown promise in enhancing human fertility (Ghaneifar et al. 2020). As a booster to the body's immune system, *Curcuma longa* L. can heal wounds and alleviate joint pain (Razavi et al. 2021; Zahoor et al. 2021). Various species from the Zingiberaceae family, such as curcuma and zingiber, are ingredients in postpartum *jamu* drinks produced by major *jamu* medicine companies in Indonesia; these products relieve gastrointestinal pain after childbirth, reduce fecal and vaginal inflammations, increase blood circulation, enhance appetite and digestion, and strengthens overall health (Elfahmi et al. 2014).

Table 2. The local name and family of all plants used by Sundanese mothers during pregnancy, childbirth, and postpartum care in Kertasari sub-district, Bandung, Indonesia

Local name	Indonesia name	Latin name	Family
Bayeum	Bayam	<i>Amaranthus hybridus</i> L.	Amaranthaceae
Kacang su'uk	Kacang tanah	<i>Arachis hypogaea</i> L.	Fabaceae
Kol	Kubis	<i>Brassica oleracea</i> L.	Brassicaceae
Gedang	Pepaya	<i>Carica papaya</i> L.	Caricaceae
Kalapa	Kelapa	<i>Cocos nucifera</i> L.	Arecaceae
Bonteng	Timun	<i>Cucumis sativus</i> L.	Cucurbitaceae
Koneng	Kunyit	<i>Curcuma longa</i> L.	Zingiberaceae
Koneng gede	Temulawak	<i>Curcuma zanthorrhiza</i> Roxb.	Zingiberaceae
Daun camcauh	Daun cincau	<i>Cyclea barbata</i> Miers.	Menispermaceae
Wortel	Wortel	<i>Daucus carota</i> L.	Apiaceae
Handeuleum	Handeuleum	<i>Graptophyllum pictum</i> (L.) Griff.	Acanthaceae
Waru	Bunga sepatu	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae
Kangkung	Kangkung	<i>Ipomoea aquatica</i> Forssk.	Convolvulaceae
Cikur	Kencur	<i>Kaempferia galanga</i> L.	Zingiberaceae
Jukut fatimah	Rumput fatimah	<i>Labisia pumila</i> (Blume) Fern.-Vill	Primulaceae
Saladah	Selada	<i>Lactuca sativa</i> L.	Asteraceae
Sampeu	Singkong	<i>Manihot esculenta</i> Crantz	Euphorbiaceae
Daun kelor	Daun kelor	<i>Moringa oleifera</i> Lam.	Moringaceae
Korma	Kurma	<i>Phoenix dactylifera</i> L.	Arecaceae
Seureuh	Sirih	<i>Piper betle</i> L.	Piperaceae
Jambu klutuk	Jambu biji	<i>Psidium guajava</i> L.	Myrtaceae
Katuk	Katuk	<i>Sauropus androgynus</i> (L.) Merr.	Phyllanthaceae
Gamas	Labu siam	<i>Sechium edule</i> (Jacq.) Sw.	Cucurbitaceae
Kentang	Kentang	<i>Solanum tuberosum</i> L.	Solanaceae
Jahe	Jahe	<i>Zingiber officinale</i> Roscoe	Zingiberaceae

Kertasari sub-district is an agricultural area known for horticulture in the Bandung district. It is situated along the largest river in West Java province. Several villages in Kertasari are included in the upstream area of the Citarum River, with water conditions still relatively clean. The local community cultivates various crops, including carrots, cabbage, potatoes, and leeks. In 2021, the total production of potatoes, cabbage, and carrots was recorded as 775.33 kg, 938.07 kg, and 958.8 kg, respectively (District-BPS 2022). Besides vegetables, the Kertasari sub-district is known for cultivating medicinal plants such as ginger, *kencur*, turmeric, and galanga. The total production of ginger in 2020 reached 458 kg; *kencur* and turmeric production is 115 kg and 181 kg, respectively (Bandung District-BPS 2022).

Using medicinal plants during pregnancy often addresses gastrointestinal issues, such as nausea, bloating, flatulence, and vomiting, commonly experienced by pregnant women (John and Shantakumari 2015; Ahmed et al. 2018). In the context of Kertasari, Sundanese people utilize various plant species, including *Cyclea barbata* Miers., and *Hibiscus rosa-sinensis* L. to facilitate a smoother birthing process (Table 3). The successful combination of pectin extracted from *Cyclea barbata* Miers with chitosan has opened potential biomedical applications in wound dressings (Sari et al. 2021). Additionally, according to a study by Sarma et al. (2015), *Hibiscus rosa-*

sinensis L. is well-known in India's traditional medical system for its ability to increase appetite, prevent vomiting, and serve as a general tonic (Khan et al. 2014; De 2016; Kuber et al. 2019). In addition, *Hibiscus rosa-sinensis* L. demonstrates a wide range of pharmacological uses, including antimicrobial, antioxidant, antidiabetic, anti-inflammatory, antihypertensive, antifertility, antifungal, anticancer, hair growth-promoting, antihyperlipidemic, reproductive, neurobehavioral, antidepressant, and antipyretic properties (Amtaghri et al. 2023).

Plants and traditional beliefs play a crucial role throughout pregnancy, labor, and postpartum. However, it is important to emphasize the significance of warning when recommending herbal medicines or supplements to pregnant women due to the potential toxic effects. This precaution is necessary because there is limited knowledge regarding interactions, preclinical predictive studies, and teratogenicity of traditional medicinal herbs in clinical settings (Bruno et al. 2018). The Sundanese, one of the ethnic groups in Indonesia, have a belief system that emphasizes using customs and herbs to facilitate pregnancy, childbirth, and postpartum recovery. Therefore, to promote sustainable women's health in rural areas, the current findings highlight the significance of these efforts and additional studies into the phytochemical and pharmacological properties of commonly used food and medicinal plants.

Table 3. List of medicinal plants with the reported part used and therapeutic uses

Latin name	Stage of use	Part used	Preparation	Medical uses
<i>Graptophyllum pictum</i> (L.) Griff.	P, CB	Leaf	Brewed	Prevent hemorrhoids
<i>Amaranthus hybridus</i> L.	P, CB, PC	Whole plant	Cooked	Increase red blood cells/ prevent anemia; Boost the body's immune system, breastfeeding.
<i>Daucus carota</i> L.	P, CB, PC	Tuber	Cooked	Improve eye health; Prevent cramps, breastfeeding
<i>Cocos nucifera</i> L.	P, CB	Fruit	Drunk the water	Increase red blood cells/ prevent anemia; Cleanse the fetus's body; Overcoming difficulty urinating; Adding amniotic fluid; Relieves morning sickness.
<i>Phoenix dactylifera</i> L.	PC	Fruit	Eaten raw	Increase breast milk
<i>Lactuca sativa</i> L.	P, CB	Leaf	Eaten raw	Overcome constipation
<i>Brassica oleracea</i> L.	P, CB, PC	Leaf	Cooked	Boost the body's immune system by breastfeeding
<i>Carica papaya</i> L.	PC	Fruit	Eaten raw	Increase breast milk
<i>Ipomoea aquatica</i> Forssk.	P, CB, PC	Whole Plant	Cooked	Overcome constipation, breastfeeding
<i>Cucumis sativus</i> L.	PC	Fruit	Eaten raw	Gastroprotective, wound healing
<i>Sechium edule</i> (Jacq.) Sw.	PC	Fruit	Cooked	Breastfeeding
<i>Manihot esculenta</i> Crantz	P, CB, PC	Tuber	Cooked	Increase red blood cells/ prevent anemia
<i>Arachis hypogaea</i> L.	P	Legume	Cooked	provides the body with energy, reduces blood pressure
<i>Hibiscus rosa-sinensis</i> L.	P, CB	Leaf	Decoction	Streamlining the birth process
<i>Cyclea barbata</i> Miers.	P, CB	Leaf	Decoction	Streamlining the birth process
<i>Moringa oleifera</i> Lam.	PC	Leaf	Cooked	Breastfeeding
<i>Psidium guajava</i> L.	PC	Fruit	Eaten raw	Reduce fever, treat diarrhea
<i>Piper betle</i> L.	PC	Leaf	Decoction	Antiseptic, Stop bleeding
<i>Labisia pumila</i> (Blume) Fern.-Vill	CB	Whole plant	Decoction	Streamlining the birth process
<i>Sauropus androgynus</i> (L.) Merr.	PC	Leaf	Cooked	Breastfeeding, Thicken breast milk
<i>Solanum tuberosum</i> L.	P, PC	Tuber	Cooked	gastrointestinal disorders, nutrients supplementary
<i>Curcuma longa</i> L.	P, CB, PC	Tuber	Decoction	Boost the body's immune system by breastfeeding
<i>Curcuma zanthorrhiza</i> Roxb.	P, CB	Tuber	Decoction	Warm the body
<i>Kaempferia galanga</i> L.	P, PC	Tuber	Decoction	Increase appetite as <i>jamu</i> , Warm the body
<i>Zingiber officinale</i> Roscoe	P, CB	Tuber	Decoction	Warm the body

P: Pregnancy, CB: Childbirth, PC: Postpartum Care

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