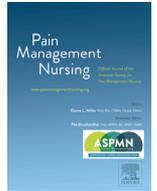




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Original Research

Ethnonursing Study of Pain Management in Neonates in Pangandaran, West Java, Indonesia

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ABSTRACT

Purpose: Even though Indonesia is comprised of at least 1,300 ethnic groups, no specific traditional method for reducing pain, especially in neonates, has been elaborated.

Aim: This study aimed to investigate the traditional methods used by the Sundanese people in Indonesia to manage pain in neonates.

Methods: This ethnonursing study was conducted in the Pangandaran District, West Java Province, Indonesia. Thirty informants including health cadres, midwives, and community leaders in the health sector, such as trained traditional birth attendants and female elders, participated in this study. Data were collected through interviews and focus group discussions, as well as from field notes. Data were analyzed using the four phases of qualitative analysis based on Leininger's theory.

Results: Six themes were identified in this study: (1) Preference for the use of traditional methods to treat pain in neonates and infants, (2) Desire to obtain information on the safe use of traditional medicine, (3) Desire to use practical pain management methods, (4) Easy to get modern medicine, (5) Use of medicinal plants, (6) Physical methods.

Conclusions: This study demonstrates the need for better harmonization between the use of traditional and modern medicines, in both research and practice, to determine the most appropriate mix that combines the strengths of each method based on accurate scientific evidence.

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Various non-pharmacological analgesia techniques and their variations have been studied in many different contexts for reducing pain in neonates. Commonly reported examples are administration of sucrose, the use of pacifiers, sensorial saturation, facilitated tucking, skin-to-skin techniques, breastmilk, breastfeeding (Altimier & Phillips, 2016; Pilai Riddell et al., 2015; Thrane et al., 2015), and the use of music (Emaliyawati et al., 2018). These non-pharmacological pain management approaches should be considered treatment options by medical providers (Ristia et al., 2018).

Traditional analgesia methods have been studied in several countries and are relatively effective in reducing pain in neonates (Fitri et al., 2020). Traditional knowledge and practices should be considered before developing intervention strategies for neonatal health (Upadhyay et al., 2012) because of the strong rela-

tionship between culture and beliefs in newborn care (Reshma & Sujatha, 2014). Traditional medicine (TM), inclusive of traditional analgesia, is the sum total of the knowledge, skills, and practices, based on theories, beliefs, and experiences indigenous to different cultures, used for health maintenance, as well as for the prevention, diagnosis, improvement, or treatment of physical and mental illness (World Health Organization, 2019). Indonesia is comprised of more than 1,300 ethnic groups (Statistics Indonesia, 2011) with various traditional ways of managing and treating health issues. However, specific traditional methods for reducing pain, especially in neonates, are not well understood. This understanding is very much needed, as traditional culture is one of the main elements of nursing services (Leininger, 1997). Nurses' understanding of culture and tradition is critical. Nevertheless, to ensure that a traditional-based health intervention is safe, formal studies are needed to collect data and assess the current traditional practices related to health and treatment in the community. Patients at the clinical level are currently in dire need of information about complementary and alternative medicine from health

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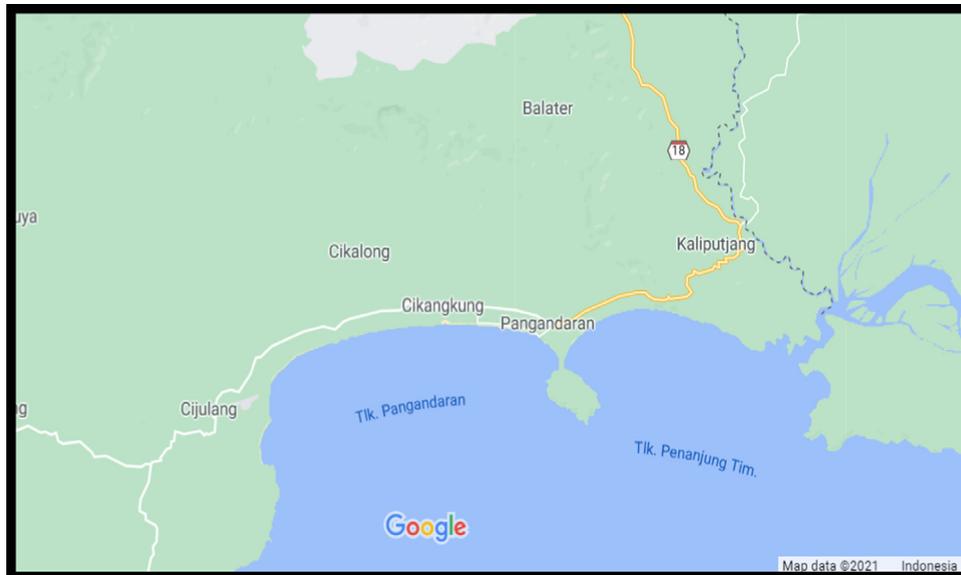


Figure 1. Map of Pangandaran.

professionals (Stub et al., 2021). The terms complementary or alternative medicine (CAM) are often used interchangeably with traditional medicine (Street et al., 2019).

Complementary and alternative medicine has often been defined in terms of contrast with western biomedicine (Gureje et al., 2015). Health care can be generally separated into modern medicine (conventional, orthodox, Western or allopathic) and traditional medicine (indigenous, complementary, alternative or integrative) (Heywood, 2007; Xue, 2008). In this study, we used the term modern medicine to refer to biomedical medicine or that received from health care facilities. This study aimed to investigate the traditional methods used by the people in Indonesia to reduce pain in neonates.

The Sundanese, one of the largest ethnic groups in Indonesia, were selected as the focus of this study. This ethnic group lives in West Java Province, which is the most populous province in Indonesia. The study area was the Pangandaran District, West Java Province. The Pangandaran District was selected because it is located on land with diverse morphological conditions including flat, hilly, and mountainous areas with varying altitudes (i.e., 0–2,000 m above sea level) (Statistics Indonesia, 2019). These differences in land contour led to various area characteristics, such as coastal, mountain, lowland, lake, river, and water areas (including sea, beach, and strait areas; Fig. 1), representing potentially different natural environments that influence the traditional methods used for health care, including pain management. Geographical considerations play a crucial role in influencing health (Rice & Smith, 2001). Health status, access to health care, and health outcomes vary by geographic location (Swift, 2002). Thus, it was expected that by conducting the study in this district, various methods of traditional medicine for reducing pain in neonates could be identified. Traditional knowledge is influenced by ancestry, intercultural diffusion, and interaction with the natural environment (Saslis-Lagoudakis et al., 2014).

Methods

Study Design

This study used a qualitative ethnonursing design for mini-level studies. Ethical approval for this study was issued by

the Research Ethics Committee of Universitas Padjadjaran (no. 880/UNG.KEP/EC/2020). The purpose of the ethnonursing method is to discover, describe, and systematically analyze the care expressions, patterns, and practices of people in their naturalistic environmental contexts (McFarland et al., 2012). The goal of this theory and method is to discover generic (folk) and professional care practices that promote health and well-being, and to explore ways to use both types of care to plan and implement culturally congruent care that is satisfying, meaningful, and beneficial for people to achieve optimum health and to face disabilities or death (Leininger, 1997).

This study explored how people traditionally handle pain in neonates and infants in the study area to identify the traditional types of analgesia used in the community. Results of this qualitative study were recorded by following the qualitative writing guidelines using the SRQR checklist (O'Brien et al., 2014).

Context/Setting

This study was conducted in the Pangandaran District, West Java Province, Indonesia. Data collection was carried out at the private home of the health cadre and by one group at the village hall.

Sampling Strategy

As this study explored traditional analgesia used for neonates based on the traditional culture of the local community, the participants selected for this study included community members who were involved in infant care, understood and/or were actively involved in neonatal care activities, and were considered community leaders for health issues, especially those related to infant care. Sampling and data collection were stopped when data had reached saturation.

Ethical Issues in Human Subject Research

To ensure ethical participation and safety of participants, participants were briefed before giving consent to participate in the study. Data collected from the participants were kept safe and confidential. The data was protected by being stored by the research

team in an electronic file encrypted with a code known only to the researcher.

Data Collection

Data collection was performed through focus group discussions, in-depth interviews, and observation. The instruments used were an interview guide, a focus group discussion guide, researcher field notes based on results of observation of the area, and an audio recorder for recording the discussion. Researchers also explored possible media, objects, or tools used in pain management for neonates (archival or cultural artifacts). Subjects were asked to tell and show how they manage pain to their baby, including showing the tools used.

Study Unit

The informants of this study consisted of 30 community members who had the role of health cadres or community leaders in the health sector, such as trained traditional birth attendants, midwives, female elders in the community, and mothers. Snowball sampling was used to recruit participants for this study, with the first participants selected using the purposive sampling method. The criterion applied for the first participants were local natives who were involved in direct care of their own children or were active in community health activities. The informants' demographic data are listed in Table 1.

Data Analysis

Data collected were analyzed using four stages of qualitative data analysis in ethnonursing (Leininger, 2005): (1) collecting, describing, and recording data; (2) identifying and categorizing descriptors; (3) data analysis to uncover repetitive patterns in the context; and (4) identifying major themes and reporting the findings.

Results

Based on the data analysis, three categories were identified, namely (1) community attitudes toward the use of traditional medicine, (2) community attitudes toward the use of modern medicine and (3) traditional pain management methods. Two themes were then generated in each category. The themes revealed in the category of community attitudes toward the use of traditional medicines were preference for the use of traditional methods in pain management and desire to obtain information on the

Table 1
Informant Demographic Data

Characteristics	n (person)
Sex	
Male	—
Female	30
Age (y)	
<20	—
20-30	4
31-50	11
≤50	15
Marital status	
Married	28
Not married	1
Divorced/Widow/Widower	1
Occupation	
Housewife	21
Unemployed	1
Traditional birth attendant	4
Midwife	2
Other civil servants	2
Number of children	
None	1
1	7
2-4	22
>4	—
Living area	
Coastal area	10
Hilly area	20

safe use of traditional medicines. Themes in the category of community attitudes toward the use of modern medicine were desire to use practical pain management methods and accessible modern medicine. Meanwhile, the two themes in the cultured-based traditional pain management methods were the use of medicinal plants and physical methods for reducing pain.

The following medicinal plants and non-pharmacologic approaches were reported by the participants. A brief description of these approaches is found in Table 2.

Galangal (kencur)

Galangal, or *kencur* (in Indonesian) or *cikur* (in Sundanese), is a medicinal plant that is referred to as *Kaempferia galanga* in Latin. *K. galanga* belongs to the Zingiberaceae family, and has 30 chemical isolates, both polar and non-polar. One of the components that can function as an anti-inflammatory and analgesic is the alcohol extract (Shetu et al., 2018). Ethyl-p-methoxycinnamate is the anti-inflammatory element that has been isolated from extracts of *K. galanga* (Komala et al., 2018; Umar et al., 2012). This alcohol

Table 2
Use of Medicinal Plants by Type of Pain

Medicinal plant	Use	How to use	Notes
Galangal (with or without rice)	Pain in closed wounds or bruises due to bumps or falls, stomachache.	Galangal is often combined with rice and then ground until smooth. The ground mix is applied on bruises or closed wounds or administered orally for stomachache.	
Shallot (with or without coconut oil or eucalyptus)	Pain at vaccination injection site and joint pain (due to sprain/ticengklak).	Shallots are sliced or coarsely ground and then applied to the injection site or joint. In joint pain, shallots are used with massage oil for massaging.	<i>Ticengklak</i> is a term in Sundanese to describe a sprain experienced by an infant because an adult has carried him/her inappropriately.
Garlic Coralbush leaf (<i>daun betadine</i>)	Open wound. Open wound or scratch.	Coarsely ground garlic. Leaves are ground until smooth and then applied on the open wound.	
Aibika leaf (<i>daun dedi</i>)	Fever.	Leaves are mashed and then used as a compress.	Fever is considered to cause discomfort in infants.

extract gives *K. galanga* the ability to inhibit inflammation by suppressing interleukin-1 and tumor necrosis factor- α , and angiogenesis by blocking endothelial functions (Umar et al., 2014). In addition, *K. galanga* has the same effectiveness as meloxicam in reducing pain and stiffness in patients with knee pain due to osteoarthritis (Syahrudin et al., 2017). *K. galanga* has also been reported to have anti-inflammatory and analgesic effects in animal experiments (Vittalrao et al., 2011).

Shallot

Shallot is a medicinal plant that has been widely studied (Griffiths et al., 2002). In Latin, shallots are referred to as *Allium cepa* and belong to the family Alliaceae (Kumar et al., 2010). The parts of the shallot used as traditional medicine are the leaves and bulbs of both red and green shallots. Shallots are rich in two chemical groups that are considered beneficial for human health. The main chemical constituents are flavonoids and alkenyl cysteine sulfoxides (Griffiths et al., 2002). Flavonoids consist of two subgroups, namely anthocyanins, which are found in the red/purple part of onions, and flavonols, which are found in the yellow part and brown skin of some shallot varieties.

The benefits of red shallot in treatments for health problems are well noted in several studies. Red shallot has been demonstrated to have an antidiabetic property and help in wound healing. It is also considered an anti-scar, anticancer, anti-0679 genotoxic, antimutagenic, antimicrobial, antiparasitic, and antihyperlipidemic agent. In addition, it can be used for anti-inflammatory, cardioprotective, antipyretic, analgesic, hepatoprotective, antioxidant, and insecticidal purposes (Upadhyay, 2016). Flavonoids from shallots have been found to have antioxidant, anticancer, hypolipidemic, antidiabetic, cardioprotective, and neuroprotective effects, as well as antimicrobial activity (Kothari et al., 2020).

Garlic

Since the 6th century BC, garlic has been used as a medicinal plant (Bayan et al., 2014). Garlic or *Allium sativum* has been studied intensively for its benefits and content. The chemical content in garlic includes water, fiber, fat, protein, carbohydrates (fructose), vitamins (especially vitamins C and A), minerals (potassium, phosphorus, magnesium, sodium, iron, and calcium), phytosterol, native substance phenol, and sulfur (Morales-González et al., 2019). From the perspective of its solubility, the chemical composition of garlic is divided into two major groups: (1) allyl sulfurs, which are soluble in fat, such as diallyl sulfur, diallyl disulfide, and diallyl trisulfide, and (2) water-soluble substances, such as γ -glutamyl S-allylcysteine and S-allylmercaptocysteine (Morales-González et al., 2019).

Garlic has been stated to have anticancer, cardioprotective, antihyperglycemic, antimicrobial, antihypertensive, antioxidant, anti-inflammatory, and lipid-lowering properties (Ansary et al., 2020). It has also been demonstrated to have wound healing activities due to its antibacterial, antiviral, antifungal, and antiprotozoal properties. Garlic can also be used as a pesticide or insecticide (Rahman, 2007; Singh et al., 2020). Garlic was used from the Middle Ages until World War II in wound healing, where it was used to treat wounded soldiers (Rahman, 2007).

Coralbush Leaf (daun betadine)

This plant belongs to the Euphorbiaceae family and goes by the species name of *Jatropha multifida* L. (Thomas, 2016). The *Jatropha* genus has 175 species, thrives in the tropics, and has been

widely used as traditional medicine (especially *J. multifida* and *J. podagrica*) in Asia, Africa, and Latin America (Anani et al., 2016; Byrappa et al., 2018).

The leaf contains the following chemical constituents: alkaloids, tannins, flavonoids, saponins, phenolic acids, glycoflavones, proanthocyanidins, and steroids. The chemical constituents differ in each part of the plant (Anggita et al., 2018; Thomas, 2016), and the parts that are often used are the leaf and sap. The effectiveness of the coralbush leaf or *daun betadine* lies in its inhibitory effect on the growth of the bacterium *Staphylococcus aureus*. When the concentration of this leaf extract is 100%, it has similar effectiveness to clindamycin (Anggita et al., 2018). In addition to its antimicrobial property, this leaf has anti-inflammatory and antioxidant properties (Anani et al., 2016).

Aibika Leaf (daun dedi)

The aibika leaf (*daun dedi*) is used by the Pangandaran people as a traditional medicine to reduce pain. The plant has the Latin name of *Abelmoschus manihot* (Ramadhani et al., 2020). The aibika leaf contains high levels of flavonoids and phenols (Tareh et al., 2015). Furthermore, a past study demonstrated that, in addition to flavonoids and phenols, this leaf contains steroids and alkaloids (Wulan & Indradi, 2018). With these phytopharmaceutical contents, *daun dedi* has been shown to have antioxidant, anti-obesity, analgesic, wound healing, anti-inflammatory, and antidiabetic properties (Wulan & Indradi, 2018).

Physical Methods

In addition to using medicinal plants as a traditional method, Pangandaran people use physical methods to treat pain in neonates. The physical methods used by the community are like the methods used by mothers or caregivers in various countries. Physical methods such as holding the infant, positioning, stroking, and breastfeeding have been widely studied throughout the world and, indeed, have been proven effective in reducing pain in neonates (Bucsea & Riddell, 2019; Harrison et al., 2016; Hsieh et al., 2018; Johnston et al., 2014; Mangat et al., 2018; P S Shah et al., 2012; Prakesh S. Shah et al., 2007).

One physical method unique to this area that has not been reported in studies from other countries and other regions in Indonesia is the mother rubbing the bruise or affected area with her hair when the infant has suffered a head impact. There has been no scientific or formal explanation for the effects of the method of rubbing hair on closed wounds. However, there is a review that analogizes rubbing hair on bruises as the transfer of negative ions from the hair to the vascular endothelial tissue (Heryani, 2015). The endothelium, a monolayer of endothelial cells, constitutes the inner cellular lining of the blood vessels (arteries, veins, and capillaries) (Feletou, 2011). When there is a hard impact, there is a change on the surface of the endothelium that can interfere with blood circulation. In normal endothelium, blood circulation is not disturbed because there is a negative electrical charge that prevents blood from approaching the endothelial wall. This is because the charge of carbonate, the buffer in blood and endothelium, is also negative, which prevents the two ions from approaching each other. When hair is rubbed on the bruised area, electrons from the hair pass to the bruised area and the endothelium, causing the endothelial wall to be negatively charged, as in normal circumstances, such that it will reject negatively charged blood (Heryani, 2015). Thus, the blood that was initially trapped adjacent to the endothelial wall due to the impact can circulate back to other parts of the body as usual, and the system will then return to normal.

Community Attitudes Toward the Use of Traditional Medicine (methods of pain treatment for neonates)

Preference for the use of traditional methods to treat pain in neonates and infants

Informants who prioritized the use of traditional medicine were mostly those aged 30 years or more (26 from 30 informants), while the younger informants preferred modern medicines. Their reasons also varied. Some informants stated that when their infants experienced pain, their first choice was traditional medicine. Only when the traditional methods failed to reduce complaints did they switch to modern medicines obtained from health workers. However, there were also informants who preferred modern medicines for reducing pain in neonates. These choices are reflected in the following excerpts:

"I always use traditional medicine first if my infant is ill, like shallot, garlic and galangal, including [when he/she experiences] pain, because natural medicine is safe".

"If my baby is sick or experiences pain, I will take him to the health center and get drugs".

Those who preferred traditional methods stated that they preferred this route because medicinal plants were readily available at home and were considered safe because they came from nature. In contrast, those who preferred modern medicine considered modern medicine more practical to use and faster to act in resolving pain complaints experienced by their children. In addition, informants who were under 30 years in age felt that they did not have sufficient information about traditional medicine and its use. Therefore, their preference for modern medicines was based on clear information regarding the medicines and their application by healthcare providers. Nevertheless, they generally accepted the use of both traditional and modern medicine. A combination of traditional and modern methods was also used to treat pain in neonates, and these informants agreed that they would use traditional medicine if there was enough information regarding its safety and if the form was more practical to be given to children. All informants considered traditional medicine to be safer than modern medicine. Apart from differences in preferences for the use of traditional and modern medicine, the variation in the characteristics of the respondents did not show any different implications in terms of the findings of this research.

Desire to obtain information on the safe use of traditional medicine

The second theme identified in this category was the desire to obtain information on the safe use of traditional medicine. The informants acknowledged that there were no standard rules on how to use traditional medicines, such as the dose, frequency, and method of administration. They only used their information and experience and estimates when using traditional medicines but were aware that this was not ideal and expressed their desire to obtain more information about the safe use of traditional medicine. Currently, information about traditional medicines is passed down from generation to generation from parents, as well as neighbors and elders, in the community, including traditional birth attendants.

"I know and use traditional medicine based on information from my parents and neighbors, but it will be clearer for me to use traditional medicine if there is official information from health workers".

All respondents from various backgrounds also mentioned types of plants that were mostly the same, such as shallots, garlic, galangal, and *betadin* leaves. They described what they know and what they usually do.

Community Attitudes Toward the Use of Modern Medicine

Desire to use practical pain management methods

Modern drugs referred to in this discussion were chemical agents that were sold in pharmacies or provided by health workers at community healthcare facilities. Several respondents, especially those under the age of 30, said they were more likely to use modern medicine in treating pain in neonates because of its practicality.

"I use chemical drugs that I get from drug stores or health centers to treat pain in my newborn baby because it is practical and the reaction is fast".

Easy-to-get modern medicine

The use of modern medicine is preferred for reasons of easy access. Many modern drugs to treat pain are sold freely in pharmacies and can be obtained 24 hours a day. To get modern medicine, people can immediately take their baby to a health facility for treatment where the medicine given by the health facility is modern medicine.

"If my baby experiences pain, for example from a fall, I take my child to the midwife or puskesmas because they will immediately receive medicine that can heal faster".

Traditional Pain Management Methods

Use of medicinal plants

The first theme identified in the category of traditional pain management methods was the use of medicinal plants. Most of the traditional analgesia methods adopted by the informants made use of medicinal plants according to the benefits delivered by the plant. Various methods were used for preparing these medicinal plants, including (1) boiling, (2) slicing, (3) grinding, and (4) direct use. The administration method also varied, including oral medicine or compress, or application on the skin.

The plants most frequently mentioned by informants to treat pain were galangal (*kencur* in local language), shallot, garlic, coral-bush leaf (*daun betadine* in local language), and aibika leaf (*daun dede* in local language). These medicinal plants were used for different types of pain (Table 2).

Physical methods

The second theme identified in this category was physical methods of analgesia. This method was used by mothers to reduce pain experienced by their infants and was mostly performed spontaneously and intuitively. This included holding the infant; stroking, rubbing, and massaging the painful area by hand; rubbing the painful area with the mother's hair; singing/humming songs to the infant; and breastfeeding or bottle-feeding the infant. The following are quotations obtained from the informants:

"If my baby is in pain, for example after vaccination, I automatically stroke, rock, and hum a song to the baby".

"The people here have the habit, including me, to spontaneously rub our hair [on the bruise] when an infant or child falls . . . especially when they hit their head, the mother will spontaneously rub the affected area with her hair".

Discussion

This study indicates that the Pangandaran community's main method for managing pain in neonates involves the use of medicinal plants. The benefits of medicinal plants are already acknowledged in scientific communities throughout publications on ethnobiological research. However, no publication to date explains

the specific functions of medicinal plants for pain reduction in neonates. Thus, the results of this study are a base for continued research aimed at identifying medicinal plants that can be used for reducing pain in neonates. Further research will help us discover and develop accurate dosing strategies, administration routes, and clear procedures on how to prepare the medicines. With this, evidence-based practice can be established, and health workers can provide accurate information and guarantee the safety of using medicinal plants as analgesia in neonates.

This study revealed that people feel that traditional medicine is safer than modern medicine. People in the Pangandaran District use medicinal plants as the first step in treating pain. When the medicinal plant fails to reduce pain, they turn to modern medicine (chemical drugs). In contrast, a prior study stated that people tend to turn to traditional medicine when they are not satisfied with modern medicine (Kenney et al., 2016). Issues related to the timing of the use of modern medicine and traditional medicine need to be studied in a more in-depth manner to obtain optimal benefits from the two groups of medicine. Regardless of the order, these findings may indicate that traditional medicine and modern medicine complement each other. The two systems should co-exist because they both have the same goal: the well-being of the patient. Therefore, harmonization is needed between the use of traditional medicine and modern medicine (World Health Organization, 2000).

Although the use of medicinal plants is considered safe, doubts remain about their use. Medicinal plants may be considered impractical because they may require processing, such as slicing, grinding, or boiling, before they are used. Their effects are also considered to be relatively slow compared with those of modern medicines. Furthermore, a study mentions that one of the obstacles to the use of traditional medicine is a lack of information about the duration and intensity of treatment (Telles et al., 2014). To optimize the utilization of medicinal plants, efforts are needed to find practical methods of administration.

Harmonization between traditional and modern medicine will establish mutual respect between practitioners or researchers in the fields of traditional and modern medicine (World Health Organization, 2000). Practitioners and researchers of modern medicine need to acquire adequate education and increased awareness about the practices, principles, and contexts of traditional medicine. Likewise, traditional medicine practitioners and researchers need to be more aware of the nature of practice and the power of modern medical approaches. With this harmonization, it is expected that a treatment method that combines the strengths of traditional and modern methods can be established.

The medicinal plants most widely used by the Pangandaran community to treat pain in neonates are galangal, shallot, garlic, coralbush leaf, and aibika leaf. Detailed discussion on these plants is provided below.

Conclusions

Pangandaran people use traditional and modern approaches to manage pain in neonates. Traditional methods are usually used when the complaints first appear, and modern methods are used if the traditional methods fail to yield satisfactory results after a few days. Traditional methods consist of the use of medicinal plants and physical methods, which are applied simultaneously. However, the dominant approach is the use of medicinal plants by using the tuber, root, or leaf. The types of plant that are often used for pain management in neonates are *Kaempferia galanga*, *Allium cepa*, *Allium sativum*, *Jatropha multifida* L., and *Abelmoschus manihot*.

The use of traditional and modern medicine needs to be harmonized to find the best mix of the two methods by combining the strengths of each method. This will require more in-depth re-

search to provide strong evidence for the use of traditional-modern medicine combinations.

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