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ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS AMONG COASTAL AND HIGHLAND COMMUNITIES IN PEKALONGAN REGENCY

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ABSTRACT

In Indonesian society, including in Pekalongan Regency, the use of medicinal plants has been passed down from generation to generation as part of the cultural heritage preserved by coastal and highland communities. Understanding of ethnobotany can help nurses design holistic approaches that integrate traditional medicine with modern health services. With the increasing public interest in herbal medicine, it is important for nurses to have insight into the use of medicinal plants to ensure their safe and effective use in community nursing practice. This study used a qualitative approach to explore the use of medicinal plants in coastal and highland communities in Pekalongan Regency. The population in this study was people living in coastal and highland communities in Pekalongan Regency who had experience in using medicinal plants. The sample in this study was selected using purposive sampling techniques. This study shows that there are differences in the use of medicinal plants between highland and coastal communities in Pekalongan Regency. People living in highland areas mostly use rhizomes and warming herbs such as ginger, turmeric, temulawak, and lemongrass. Meanwhile, coastal communities mostly use leafy plants and multifunctional plants such as bidara, pandan, betel, and moringa. The community's view of herbal medicine is that it has the same benefits as medical treatment and supports the healing process. This reflects the community's open attitude towards various forms of treatment, both traditional and modern.

Keywords: Ethnobatany, Coastal Community, Highland

INTRODUCTION

Indonesia possesses a high level of biological and cultural diversity, including traditional knowledge regarding the use of plants for medicinal purposes. This knowledge has evolved through community experience and has been passed down across generations, encompassing the types of plants used, the specific plant parts utilized, preparation methods, and the intended applications. The use of medicinal plants is an integral part of the relationship between the environment, culture, and community healthcare practices. A systematic review by Febriyanti et al. (2026) identified 791 species of medicinal plants from 91 ethnobotanical studies in Indonesia, highlighting the extensive diversity of knowledge concerning medicinal plants across various regions.(Febriyanti et al., 2026).

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In Indonesian society, including in Pekalongan Regency, the use of medicinal plants has been passed down from generation to generation as part of the cultural heritage preserved by coastal and highland communities (Pharmaceuticals & Research, 2021).

Although many studies have examined the use of medicinal plants in various regions, there is a research gap regarding the comparison of medicinal plant use between coastal and highland communities. Environmental, social, and cultural factors can influence patterns of medicinal plant use in these two regions, but there have not been many studies that specifically compare patterns of use and their impact on the health of local communities.(Adriadi et al., 2022)

Nurses contribute significantly to health promotion by providing education and creating interventions that incorporate local cultural knowledge to improve the quality of public health services. Understanding of ethnobotany can help nurses design holistic approaches that integrate traditional medicine with modern healthcare services. With the growing public interest in herbal medicine, it is important for nurses to have insight into the use of medicinal plants to ensure their safe and effective use in community nursing practice. (Surabaya, n.d.)

Evidence-based utilization of medicinal plants supported by public education, hygienic preparation methods, and collaboration with traditional medicine practitioners will strengthen the use of such plants through community education, hygienic herbal preparation, and collaboration with traditional healers. Ethnobotanical mapping also helps identify medicinal plant use and potential herb–drug interactions, particularly among patients with chronic diseases. Nurses can promote safer herbal practices by educating patients on appropriate preparation, monitoring adverse effects, and providing evidence-based guidance on contraindications and referral to healthcare facilities.

METHOD

This study uses a qualitative approach with a case study method. Case studies were chosen because they allow researchers to understand phenomena in depth in the context of real life. (Yin, 2023). In this study, a case is defined as the ethnobotanical practices of a community in utilizing medicinal plants within two distinct geographical contexts: the coastal region and the highlands of Pekalongan Regency.

The population in this study was people living in coastal and highland communities in Pekalongan Regency who had experience in using medicinal plants. The sample in this study was selected using purposive sampling, where informants were selected based on certain criteria relevant to the research objectives. (Ethnobotany, n.d.)

In qualitative research, the sample size is determined based on the principle of data saturation, which is when the information obtained from interviews is repetitive and there are no new findings (Guest et al., 2006). In this study, there were informants consisting of: 1. herbalist or traditional healer, 2. community leaders who have knowledge of medicinal plants, 3. users of medicinal plants from the general public. Data collection was conducted through in-depth interviews, which allowed for a broader exploration of the informants' experiences, practices, and perspectives on the use of medicinal plants. (Qualitative Interviewing_ The Art of Hearing Data - Herbert J, n.d.). The data were analyzed using descriptive-qualitative methods with a thematic approach (Braun & Clarke, 2006). The stages of analysis included: 1) Data transcription, 2) Data reduction, 3) Data coding, 4)

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Data interpretation, 5) Drawing conclusions. Before data collection, participants were informed about the objectives of the study, the interview procedures, and the intended use of the research findings. Informed consent was obtained from participants before interviews were conducted.

RESULTS AND DISCUSSION

The researcher processed the interview results or raw data by writing down the words according to the notes and recordings. The data was examined several times to find keywords. The keywords that were obtained and collected were categorized and summarized into research themes. The categories are as follows:

A. Types and Uses of Medicinal Plants

Table 1. Types and Uses of Medicinal Plants

Informant	Region	Plants Used	Method of Preparation	Method of Consumption
R1	Highlands	Celery, Cucumber, Lemon	Boiled, sliced	Drunk
R2	Highlands	Ginger, Kamijara, Celery, Avocado	Boiled, crushed	Drink,
R3	Highlands	Ginger, turmeric, temulawak	Grated, boiled	Drink
R4	Highlands	Ginger, turmeric, lemongrass	Pounded, burned	Drink
R5	Coastal	Bidara, temulawak, kencur, etc	Mixed, boiled, capsules	Drink
R6	Coastal	Pandan, betel leaf, moringa, turmeric	Boil, blend	Drink, mask, applied topically
R7	Coastal	Bidara, white turmeric, avocado	Boil, chew	Drink, apply

This study shows that there are differences in the use of medicinal plants between highland and coastal communities in Pekalongan Regency. People living in the highlands mostly use rhizomes and warming herbs such as ginger, turmeric, temulawak, and lemongrass. Meanwhile, coastal communities mostly use leafy plants and multifunctional plants such as bidara, pandan, betel, and moringa. (Trisianna et al., 2025).

The findings of this study indicate that medicinal plant selection in the highland and coastal communities of Pekalongan Regency reflects differences in the local availability of plant resources and the interaction between environmental conditions and traditional knowledge.(Retinopathy, 2026).

Highland communities predominantly reported rhizomatous plants and aromatic herbs, including ginger (Zingiber officinale), turmeric (Curcuma longa), Java turmeric (Curcuma zanthorrhiza), and lemongrass (Cymbopogon citratus). In contrast, coastal communities more frequently reported leafy and multipurpose plants, such as bidara (Ziziphus spp.), pandan (Pandanus amaryllifolius), betel (Piper betle), and moringa (Moringa oleifera). These differences may reflect local ecological conditions, household cultivation practices, and community preferences in selecting plants for traditional healthcare. Previous research in Indonesia has similarly documented that medicinal plant use varies between locations in

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association with environmental, geographical, socioeconomic, and cultural factors.(Ratiwi et al., 2017)

Ethnomedicine studies show that plants from the Zingiberaceae family, such as ginger, turmeric, temulawak, and kencur, are widely used as traditional medicines in various regions of Indonesia, especially in Java and Sumatra, to maintain stamina and treat health problems. The dominance of rhizome plant use in highland areas also indicates a correlation between geographical conditions and the choice of medicinal plants. Colder environments encourage communities to use plants that warm the body, such as ginger and turmeric. (Wirasti et al., 2021)

Rhizomatous plants in the highland communities is the suitability of some commonly cultivated medicinal plants to the cooler conditions and growing environments found in upland areas. Ginger, turmeric, and Java turmeric are members of the Zingiberaceae family and are widely cultivated for culinary and medicinal purposes. Their rhizomes can be stored and processed into household remedies, making them practical resources for traditional healthcare. Nevertheless, these species are not exclusive to highland environments and may also grow in lowland areas. Therefore, their greater representation in the present study should be interpreted as a difference in reported use or local availability rather than proof that these plants can only thrive in the highlands. Research on medicinal plants across different elevations in the Menoreh Mountains also identified ginger and turmeric as highly preferred species across locations, suggesting that some medicinal plants are shared across ecological zones despite differences in local cultivation patterns.(Nurul et al., 2025).

The preference for leafy medicinal plants in coastal communities may be related to their accessibility, ease of preparation, and integration into everyday household practices. Leaves can generally be harvested when needed without removing the entire plant, which may support the continued availability of medicinal resources when harvesting is managed sustainably. Evidence from an ethnobotanical study among the Tengger community in Ngadisari, Indonesia, showed that leaves were the most frequently used plant parts, accounting for 61.5% of reported plant-part uses, while decoction was the predominant preparation method. The researchers also highlighted the practicality and sustainability of leaves as medicinal materials.(Id et al., 2020).

The processing of medicinal plants by boiling, grating, crushing, or burning is carried out by highland communities, while coastal communities use more varied methods, such as boiling, blending, mixing, and even making capsules. Boiling is the most dominant technique used in both regions. This method is considered practical and capable of extracting active compounds from plants. This is in line with research on the formulation of instant drinks made from ginger, katuk leaves, and moringa leaves, which uses boiling and drying methods to preserve the efficacy of the active ingredients (Wirasti et al., 2021).

The dominance of consumption in the form of beverages in the highlands is related to the function of rhizome plants as warmers and immunity boosters. Research on instant ginger processing shows that ginger-based herbal drinks are effective as body warmers and for maintaining fitness. Coastal communities use plants such as moringa, betel, and bidara not only for drinking, but also for skin care and external health. Research on polyherbal syrups proves that the combination of moringa, turmeric, and ginger has high antioxidant activity that has the potential to be used for overall health. (Sains & Kes, n.d.) Variations in processing methods in coastal areas indicate that communities are adapting to

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technological developments and health needs, such as the use of blenders and capsules. Innovations in the use of traditional medicinal plants, from this study, show that highland communities consume more medicinal plants in the form of beverages, while coastal communities use medicinal plants both orally and topically, such as applied topically and used as masks. (Aisa et al., 2022)

Sources of Information and Differences with Medical Treatment

Table 2. Sources of Information and Differences with Medical Treatment

Area/Region	Source of Information	Example Conversation	Meaning of Findings
Wonokerto (Coastal)	Family (Husband)	"...I asked my husband, and he said that there is research on hadith..."	Information obtained from a spouse with specialized knowledge
Wonokerto (Coastal)	Training/ education	"Your husband studied in Malaysia..."	Herbal knowledge comes from the husband's education and experience.
Wonokerto (Coastal)	Internet	"Scroll through Google?" – "Google."	Information obtained from digital media.
Wonokerto (Coastal)	In-laws/Extended Family	"My in-laws asked me to do it."	Knowledge passed down through the extended family
Petung (Highlands)	Personal Experien	Experience "...I gave birth many times and consuming it reduced the pain by almost 50%..."	Personal experience is the basis for use
Petung (Highlands)	Friends/Neighbors	"...seeking information from friends and neighbors..."	Information obtained when plants are difficult to find family.
Petung (Highlands)	Ancestors	"Our ancestors used to..."	Information passed down across generations
Petung (Highlands)	Ancestors	"...the traditions of our ancestors..."	HKnowledge sourced from cultural traditions

Information about the use of medicinal plants is obtained from ancestors, parents, friends or neighbors, the internet (Google), and personal experience. This shows that knowledge about traditional medicine is obtained through a process of cultural inheritance as well as through the development of information technology. Knowledge originating from parents and ancestors is a form of local wisdom that

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is passed down from generation to generation. This pattern of inheritance is generally carried out through direct practice within the family, such as how to mix herbal medicines and determine the types of plants to use.
(Awoke et al., 2024)

Social interactions within communities enable the exchange of experiences regarding the use of medicinal plants, both in terms of their benefits and how they are processed. Research by Ningrum et al. shows that information on the use of Zingiberaceae plants is mostly obtained through communication between residents at markets and in the surrounding environment (Kusna et al., 2020).
The development of information technology has also influenced the way people search for information. The internet, especially Google, has become a means of obtaining references on the efficacy of medicinal plants and how to use them. This shows a shift from traditional information systems to digital systems. Personal experience is also an important factor in the use of medicinal plants, as people tend to repeat the use of herbs that have had positive results for their health. This experience strengthens their belief in traditional medicine. Yanuarty et al. explain that after people experience the benefits of ginger, they become more regular in using it as a health drink (Yanuarty et al., 2024).

This study shows that the use of medicinal plants by the community is influenced by various factors, both internal and external. These factors include personal experience, family knowledge, plant availability, religious beliefs, health needs, economic factors, social roles, ease of processing, safety perceptions, and social support. Personal experience is a major factor in shaping public confidence in the effectiveness of medicinal plants. (Yanuarty et al., 2024) In addition to personal experience, other factors such as religious beliefs also influence the community's acceptance of medicinal plants, as religious legitimacy strengthens the community's belief in the use of herbs. Religious beliefs provide a moral and spiritual basis for traditional medicine practices. Health needs are the main driver for the use of medicinal plants.
The community's view is that treatment with plants has the same benefits as medical treatment. And support the healing process. This reflects the public's open attitude towards various forms of treatment, both traditional and modern. Medical drugs are considered to be faster in providing healing effects. This perception is related to the nature of medical drugs, which have standardized doses and have undergone clinical trials. Therefore, medical treatment is more often used for acute or severe conditions. (Covid- et al., 2022)

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. The types of plants used are almost the same between highlands and coastal areas.
2. Highland communities use more rhizome plants to warm the body, while coastal communities use more leaves and combine them with other plants.
3. There is no difference in the simple consumption methods of plants between coastal and highland communities.
4. Experience, culture, ease of obtaining plants, and religiosity are factors that influence the use of medicinal plants.

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Recommendations

1. There is a need for innovation in the consumption of medicinal plants.
2. There is a need to introduce and formulate medicinal plants that are attractive to the younger generation (Gen Z).

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