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Junior High School Students' Perception Of The Utilization Of Medicinal Plants: A Qualitative Study At Smpn 1 Talang Kelapa

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Abstract

This qualitative case study explores the perception of junior high school students on the use of medicinal plants in the framework of biological literacy in the peri-urban area of Banyuasin, South Sumatra. The study involved 46 students of SMPN 1 Talang Kelapa, 9 science teachers, and 8 student guardians through open questionnaires, in-depth interviews, and observations. The data were analyzed using Braun and Clarke Reflective Thematic Analysis. The results of the study revealed three main findings: (1) students constructed the use of medicinal plants dichotomously as first aid for mild diseases, while severe diseases relied on modern pharmacological drugs; (2) the transmission of ethnobotanical knowledge takes place in a hybrid manner, namely through embodied learning in the family environment and mediated by digital media as an external validation agent; and (3) teachers and guardians of students agree to integrate ethnobotanical wisdom into the science curriculum on the topics of Biodiversity, Plant Reproduction, and Natural Material Processing. Empirical evidence at home has been proven to soften initial skepticism and the phenomenon of plant blindness of students. The integration of project-based Ethno-STEM approaches and School TOGA Gardens has the potential to increase contextual science literacy and foster students' environmental concern character.

Keywords: Ethnobotany, Medicinal Plants, Biological Literacy, Local Knowledge.

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INTRODUCTION

Knowledge about the use of medicinal plants is a cultural heritage that has been preserved for centuries through intergenerational transmission. However, in recent decades, there has been a significant decline in the transmission of ethnobotanical knowledge to the younger generation, especially in areas that are undergoing rapid modernization (Wahab et al., 2025). This phenomenon is closely related to the tendency of modern humans to be unaware of the existence and diversity of plants around them, which in a study of contemporary literature refers to as the crisis of human-plant relations (Quiao et al., 2026). Junior High School (SMP) students are at a critical point in this phenomenon. The age of 12–14 years is a transition period when knowledge previously acquired from the family begins to compete with formal knowledge in schools and the penetration of digital media (Quiao et al., 2026). When the transmission of local knowledge is interrupted, students not only lose cultural heritage, but also lose the opportunity to develop biological literacy rooted in the context of their lives (Lestari et al., 2026). This condition demands serious attention from the world of education, especially in designing biology learning that is able to bridge local knowledge and scientific knowledge from the secondary school level (Nurjannah et al., 2026).

SMPN 1 Talang Kelapa is an A-accredited public school located on Jalan Kerani Amad KM. 18, Talang Kelapa District, Banyuasin Regency, South Sumatra Province. This school has 1,113 students, 62 teachers, and implements the Independent Curriculum in the implementation of full-day learning. Geographically, Talang Kelapa District is located in a peri-urban area that is directly adjacent to two sub-districts of Palembang City, namely Sako in the north and Gandus in the south. This position puts students of SMPN 1 Talang Kelapa in a space of attraction between urban modernity and rural local wisdom (Lestari et al., 2026). The phenomenon of being in an area that still retains the tradition of using medicinal plants, most students show alienation from the plants around them (Quiao et al., 2026). Students are more familiar with modern medicine and digital media than the ethnobotanical knowledge inherited by the family (Wahab et al., 2025). This condition makes SMPN 1 Talang Kelapa a relevant case to explore how students' perceptions of medicinal plants are formed in the midst of peri-urban dynamics (Trisnawati et al., 2025).

Previous research on medicinal plants in Indonesia and Southeast Asia has mostly focused on species inventories and censuses of people's medical knowledge (Bibi et al., 2026). These studies are indeed important for documenting biodiversity, but have not touched on the question

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of how knowledge is constructed and interpreted by junior high school students (Aftab et al., 2023). This gap becomes significant when it is associated with biological literacy, which is the ability to use biological knowledge to understand and make decisions in daily life (Bibon, 2022). Perception, in the framework of Robbins and Judge (2017), is the process of individuals organizing and interpreting sensory impressions to give meaning to their environment. Perception is not formed neutrally, but is influenced by acting factors, target factors, and situational factors. Thus, students' perception of medicinal plants is a complex cognitive and social construct, which has not been widely studied in the context of biology education in Indonesia (Quiao et al., 2026). The novelty of this research lies in its efforts to fill this gap through qualitative case studies that explore cognitive processes, social construction, and the articulation of ethnoscience meanings in junior high school students in the peri-urban area of South Sumatra (Guarnizo-Losada et al., 2026).

Based on this description, the general purpose of this study is to explore the perception of junior high school students towards the use of medicinal plants in the framework of biological literacy. Specifically, this study seeks to answer three research questions. First, how students perceive and articulate the use value of local medicinal plants in their daily lives. Second, how the dynamics of ethnobotanical knowledge transmission between family conformity and digital media penetration shape these perceptions. Third, how the construction of student perception can be integrated as a foothold for learning Biology in the context of ethnoscience. This study uses a case study approach with SMPN 1 Talang Kelapa as a single case and students as an analysis unit (Yin, 2018). Data were collected through semi-structured interviews, observations of school environments, and document analysis (López-Estrada & Elizondo-Mejias, 2024). This approach was chosen because the case study allows researchers to investigate contemporary phenomena in depth in real-life contexts.

This research is expected to contribute on three levels. Theoretically, this research enriches the study of perceptions in biology education, especially in the realm of ethnoscience and biological literacy (Quiao et al., 2026). Practically, the findings of this research can be an input for junior high school science teachers in designing contextual learning that integrates the local wisdom of South Sumatra (Bibon, 2022). In terms of policy, this research supports the implementation of the Independent Curriculum which emphasizes learning based on local potential and the context of students' lives (Lestari et al., 2026). The novelty of this research lies in its position as a qualitative case study that explores the perception of junior high school

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students towards medicinal plants in the peri-urban context of South Sumatra (Guarnizo-Losada et al., 2026). Thus, the research is the initial foothold for biological transformation in favor of local wisdom (Nurjannah et al., 2026).

RESEARCH METHODS

This study uses a qualitative approach with a case study design. The case study was chosen because this study focuses on one unit of bound cases, namely students' perception of the use of medicinal plants at SMPN 1 Talang Kelapa. This approach allows researchers to investigate contemporary phenomena in depth in real-life contexts, when the boundaries between phenomena and contexts cannot be clearly separated.

This research was carried out at SMPN 1 Talang Kelapa, Banyuasin Regency, South Sumatra Province. This location was chosen because it is an A-accredited public school with 1,113 students and 62 teachers, and is located in a peri-urban area that is directly adjacent to the city of Palembang. The research participants consisted of three groups. First, 46 students from 32 classes (grades VII–IX) were selected through total sampling to fill out an open questionnaire as initial data. Second, 8–12 students were selected through purposive sampling to be interviewed in depth. The selection criteria for students included: (a) having used or known medicinal plants from the family, (b) coming from a varied residential background (peri-urban and rural), and (c) demonstrating family involvement in traditional medicine practice. Third, nine science teachers as key informants to provide the learning context, as well as eight student guardians as key informants for triangulation of sources. The number of student guardians was selected based on the guardians of the students who were the core participants, not purely random. Data collection was stopped when data saturation was achieved, which is a condition when additional interviews no longer produce new themes or information.

Data collection was conducted through three techniques. First, semi-structured in-depth interviews with students, science teachers, and guardians. Interviews were conducted face-to-face to capture the gestures, context, and depth of participants' cognitive responses. Second, an open questionnaire was given to 46 students to explore their initial experience with medicinal plants. Third, observation of artifacts and documentation, such as photographs of medicinal plants known or used by students at home, field notes, and science learning documents at school. All interviews were recorded using audio recorders and transcribed verbatim to maintain data accuracy. The researcher acts as the main instrument in the entire data collection process. Before

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data collection, the researcher obtains permission from the school and informed consent from students and guardians as a form of compliance with research ethics.

The data was analyzed using Reflexive Thematic Analysis developed by Braun and Clarke (2021). The analysis procedure consists of six stages. First, familiarization, which is the researcher re-reads transcripts and field notes repeatedly to understand the depth of the data. Second, coding, which is the provision of initial codes on data segments that are relevant to the research question. Third, generating themes, which is the grouping of codes into initial themes. Fourth, reviewing themes, which is reviewing and refining the theme to be consistent with the data. Fifth, defining themes, which is the formulation of definitions and limits of each theme. Sixth, writing up, which is writing the results of the analysis in the form of a narrative supported by direct quotes from the participants. The analysis process is carried out iteratively and reflexively, with the researcher consciously reflecting on his position and assumptions on the data.

The validity of the data uses four criteria from Lincoln and Guba (1985). First, credibility, through triangulation of sources (students, teachers, guardians) and member checking, which is confirmation of findings to participants. Second, transferability, through thick descriptions that describe the context of schools and peri-urban environments in depth. Third, dependability, through trail audits that document the entire research process, including field records, transcripts, and analytical decisions. Fourth, confirmability, through researcher reflexivity and storage of verifiable raw data. The application of these four criteria refers to contemporary qualitative research practices that emphasize process transparency and accountability (Stahl & King, 2020).

RESULTS AND DISCUSSION

3.1 Subject Profile, Research Informant, and Researcher Reflexivity

This qualitative research with a tied case study design explores the perception of SMPN 1 Talang Kelapa students towards the use of medicinal plants and their potential integration in Biology/Science learning. Data were collected through an open qualitative questionnaire and semistructured interviews based on source triangulation. The main subjects of the study consisted of students of SMPN 1 Talang Kelapa (), where 12 students were selected by $N = 46$*purposive sampling* based on the criteria of involvement of family domestic experiences (families of active users of traditional medicine versus non-users) as a focal of in-depth descriptive-reflective analysis.

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In order to enrich pedagogical and sociocultural perspectives, this study involved two groups of key informants, namely science teachers of SMPN 1 Talang Kelapa (, symbolized by G1–G9) and student guardians (symbolized WL 1–WL 8). Anonymous coding is applied consistently to maintain research ethics while ensuring the traceability of the track record of qualitative analysis.$N = 9N = 8$

Within the framework of Braun and Clarke's (2006, 2021) Reflexive Thematic Analysis, the existence and position of the researcher are explicitly recognized as an inseparable part of data collection and interpretation. The researcher is an educator who interacts in the school ecosystem of SMPN 1 Talang Kelapa. This subjective position provides methodological advantages in the form *of insider access*, close *rapport* with participants, and a deep understanding of the local cultural context of Talang Kelapa.

To minimize the potential for subjective bias, the researcher applied the credibility strategy of Lincoln and Guba (1985), which include: selecting focal students from classes that were not directly supervised by the researcher to prevent *desirability* bias, triangulating sources and data collection techniques, and applying *the member checking process* to student representatives, teachers, and guardians to validate the accuracy of transcripts and interpretation of the theme.

3.2 Thematic Analysis and Discussion Results

3.2.1 Theme 1: Construction of Meaning and the Dichotomy of Medicine (Digital Generation Skepticism vs Empirical Proof)

The first research question unpacks how students perceive and articulate the use value of local medicinal plants in daily life. Reflexive thematic analysis reveals that students restructure the meaning of the use of medicinal plants into a firm dichotomous pattern. Medicinal plants are predominantly interpreted as "first aid" instruments or complementary therapies for mild-scale physical complaints, such as cough, flu, fever, abdominal pain, or burns). In contrast, modern pharmacological medical interventions (doctor/pharmacy medicines) are perceived as the primary means of healing for diseases that are severe in nature or require a rapid healing reaction.

The roots of this perception formation are colored by the clash between cultural alienation and skepticism typical of *the digital native generation*. Some students expressed doubts about the practicality of traditional medicine because they thought it tasted "bitter", the

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processing process "complicated", or the healing effects tended to be slower than instant chemical drugs. Meanwhile, some students saw the positive use of medicinal plants as a safe and body-friendly natural trend. This dynamic state of affairs was emphasized by the observation of science teachers in class. Informants G4 and G3 revealed that despite initial doubts, students' interest could be sparked through a scientific approach:

"The tendency of today's students is generally skeptical and considers it old-fashioned, but they can turn very curious if scientifically proven in the classroom." **(G4)**
"Nowadays, some students are more familiar with modern medicine and less understand the benefits of medicinal plants that grow around the house." **(G3)**

The skepticism or doubt experienced by some students is reported to soften when faced with empirical evidence in the domestic environment. Empirical evidence in this study is an organic theme that emerges purely from field data. The experience of experiencing firsthand the therapeutic impact of traditional herbs serves as a cognitive bridge that reconstructs students' views. The student's guardians (WL 3 and WL 4) reported how the dynamics of these perception changes occur when the child is sick:

"When my son's feet were soaked in hot oil, I spread aloe vera leaf meat. As soon as he felt the heat subside, he didn't refuse anymore." **(WL 4)**
"When my son had a fever, I made red ginger tea and applied pure coconut oil mixed with onion squeeze... He immediately understood because he felt a difference after getting the potion." **(WL 3)**

This set of findings indicates that the phenomenon *of Plant Blindness* (Wandersee & Schussler, 2001) in which individuals fail to recognize or appreciate the existence and vital value of plants in their environment is not absolute. These findings suggest that in the context of this study, *plant blindness* could potentially be mitigated through the direct sensory-empirical experiences students had when traditional herbs were shown to relieve their pain, as reported by the student's guardian.

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3.2.2 Theme 2: Dynamics of Knowledge Transmission

The second research question analyzes the dynamics of ethnobotanical knowledge transmission between family conformity and digital media penetration. The results of the analysis show that the flow of knowledge transmission no longer takes place in a single linear-vertical from the older generation to the younger generation, but occurs in a *hybrid manner*.

In the domestic realm, transmission takes place through *embodied learning* (Merleau-Ponty, 1945; Kolb, 1984), which is an embodied learning process in which knowledge is acquired through the body, actions, and direct physical experiences. Parents (WL 1–WL 8) do not simply transfer verbal knowledge, but involve the child's physical in real practice: squeezing betel leaves, picking ginger rhizomes, applying herbs, or planting in the yard.

However, the penetration of social media (TikTok, YouTube, Google) is revolutionizing the way students respond to those family learning. Students do not swallow family information raw. Instead, digital media serves as a secondary source of knowledge as well as an external validation agent that students use to self-confirm the narratives received from parents. WL 5 informant underscores these interactions:

***"I gave my son a stew of turmeric, ginger, laos, and lemongrass for my son to try, and finally he found out for himself through the internet the benefits of the stew."* (WL 5)**

Judging from Vygotsky's Sociocultural Learning Theory (1978), the process of forming local knowledge has undergone an expansion of social learning spaces. If in traditional societies senior family members are positioned as the only *More Knowledgeable Other* (MKO) who transfers knowledge orally and in action, then in the information age, digital platforms act as a *secondary source of knowledge*. The penetration of digital media does not automatically dilute local wisdom. When synergized with family briefings, information from the internet actually functions as a cognitive enhancer that validates and strengthens students' belief in the benefits of medicinal plants.

3.2.3 Theme 3: Ethnoscience Policy and Pedagogical Integration in Science Biology Learning

The third research question explores the potential of integrating ethnobotanical wisdom into science biology learning. The data shows the alignment of aspirations between the school and the home. The majority of science teachers who provided substantive explanations (G1–G5,

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G7–G9) confirmed the importance of integrating local wisdom materials. In parallel, all student guardians (WL 1–WL 8) agreed that schools need to teach knowledge of medicinal plants to form health independence and cost efficiency.

The geocultural position of SMPN 1 Talang Kelapa in the *peri-urban area* , namely the border transition area between the urban dynamics of Palembang and the countryside of Banyuasin, has strategic implications. The peri-urban characteristics cause students to have easy access to modern health and medicine facilities, but on the other hand, their surrounding environmental ecosystem still provides land rich in medicinal plants. This implication was voiced by informant WL 3:

"The environment around SMPN 1 Talang Kelapa has a lot of land planted with medicinal plants, vegetables, and fruit trees. This basic knowledge can be used by children in continuing their studies and doing business." **(WL 3)**

From the perspective of the junior high school science curriculum, science teachers identify some of the most relevant Learning Outcomes (CP) to be inserted in ethnoscience:

1. Biodiversity and plant classification are to know the taxonomy, morphology, and diversity of the local flora of Banyuasin.
2. Plant reproduction (natural vegetative) is observing and practicing the propagation of rhizomes/rhizomes (ginger, turmeric, kencur).
3. Food processing and household chemistry is processing local natural ingredients into hygienic health products. (Processing of herbal ingredients is categorized as the science of food processing/chemistry of natural ingredients, not conventional biotechnology which is synonymous with the fermentation process of microorganisms).

The greatest challenge facing educators is bridging the indigenous science of local communities (Ogawa, 1995; Snively & Corsiglia, 2001) with *western scientific knowledge* . G8 informants underscore this epistemological challenge:

"The challenge is how to turn this traditional knowledge into valid scientific material according to the concept of science, so that students do not only know its properties but understand its biological mechanisms." **(G8)**

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As a holistic solution, the application of the Ethno-STEM (*Ethnoscience-Science, Technology, Engineering, and Mathematics*) approach (Sudarmin et al., 2019) combined with the creation of TOGA (Family Medicinal Plants) School Gardens and *the Project-Based Learning* (PjBL) model is formulated as a concrete step. This integration has the potential to increase contextual science literacy, erode *plant blindness*, and foster the character of caring for the environment in students in peri-urban areas.

CONCLUSIONS, IMPLICATIONS AND SUGGESTIONS

4.1 Conclusion

Based on the results of reflective thematic analysis and discussion of data triangulation (, ,), three main conclusions were obtained according to the research questions:$N_{\text{siswa}} = 46 N_{\text{guru}} = 9 N_{\text{wali}} = 8$

1. The construction of meaning and dichotomy of treatment is that SMPN 1 Talang Kelapa students construct the use of medicinal plants in a dichotomous framework. Medicinal plants are interpreted as a first-aid instrument or complementary therapy for minor physical complaints, while modern pharmacological drugs are perceived as the main means of healing for severe conditions. The initial alienation and skepticism of students towards the practicality of traditional medicine is not absolute; the perception has the potential to be softened after students directly experience the therapeutic effects of traditional concoctions in the home environment.
2. The dynamics of knowledge transmission, namely the transmission of ethnobotanical knowledge, take place in a *hybrid* manner. In the family environment, knowledge is passed down through *embodied learning* (physical involvement and direct practical experience). Meanwhile, the penetration of digital media (such as Google, TikTok, and YouTube) serves as a secondary source of knowledge as well as an external validation agent that students use to verify and strengthen the information received from parents.
3. The potential for pedagogical integration in science learning is that there is an alignment of aspirations between the school and the student's guardians regarding the importance of integrating ethnobotanical wisdom into Biology/Science learning. This material is most relevant to the Learning Outcomes of Biodiversity, Plant Reproduction (Natural Vegetative/Rhizome), and Food Processing and Natural Material Chemistry. The application of a project-based Ethno-STEM approach and the creation of a School TOGA Park has the

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potential to increase contextual science literacy, erode *plant blindness*, and foster environmental concern in students in *peri-urban areas*.

4.2 Research Implications

The findings of this study provide the following theoretical and practical implications:

- The theoretical implication is that this study enriches the pedagogical ethnobotanical literature in *peri-urban areas* by showing that the phenomenon of *plant blindness* in *the digital native generation* can be mitigated through a combination of domestic empirical experience and digital media validation.
- The practical implication for science teachers is to provide contextual guidance for teachers to design *Ethno-STEM-based* science learning modules that connect community-based science with scientific science concepts.
- The implication for schools is that it is a consideration for school policy developers to provide productive green open spaces, such as the TOGA School Garden, as an outdoor learning medium.

4.3 Research Limitations

This research has several methodological limitations that need to be examined:

1. The specific context is bound that the research was carried out qualitatively in one school location () in the $N_{\text{sekolah}} = 1$*peri-urban* area of Talang Kelapa, so these findings are not intended to be generalized quantitatively to the wider population.
2. The limitation of direct observation is that the data on changes in student perception is sourced from the description of an open qualitative questionnaire and the retrospective report of the student's guardian, not through longitudinal studies or direct observational experimental actions.

4.4 Suggestions

Based on the above conclusions and limitations, the following suggestions were formulated:

1. For teachers and curriculum developers, it is recommended to prepare an Ethno-STEM-based Science Learning Tool/Teaching Module that utilizes examples of local medicinal plants in Banyuasin on the topic of Biodiversity and Plant Reproduction.
2. For further research:

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- It is recommended to conduct research and development (*Research & Development* / R&D) to design and test the effectiveness of science modules based on the ethnoscience of medicinal plants on improving students' science literacy and environmental care attitudes.
- It is recommended to conduct a comparative study that compares ethnobotanical perceptions between students in urban (*urban*), peri-urban, and rural (*rural*) areas.

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