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Booklet development based on identification of medicinal plants in cempaka lake and hill, kebumen regency

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ABSTRACT

This research aims to develop information media in the form of a booklet of medicinal plants found in Cempaka Lake and Hill, how to use medicinal plants for traditional medicine, assessing the feasibility of the developed booklet, and the community's response to the developed booklet. The research method used is Exploration and R&D (Research and Development) with the ADDIE development model, which consists of 5 stages: Analysis, Design, Development, Implementation, and Evaluation. Based on the results of exploration by walking along the hiking trail via Purwonegoro Banjarnegara, and the hiking trails via Sempor, and Kebumen, 21 species of medicinal plants were identified which were grouped into 7 classes including Magnoliopsida, Liliopsida, Lycopodiinae, Dycotyledoneae, Angiospermae, Monocotyledonae, and Asteridae. Methods for processing medicinal plants include boiling, pounding, brewing, grating, crushing, and also without processing (used directly). The developed booklet is included in the very valid category with an average percentage of 83.3% on the material aspect validity assessment and 97.72% (very valid) on the media aspect validity assessment. The community's response results showed that the booklet was convenient to use with an average total percentage of 95.93% (very feasible category) used as a source of information for around Cempaka Lake and Hill.

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INTRODUCTION

The choice to use traditional medicine is also caused by environmental factors where the individual lives. People who use traditional medicine are mostly from rural communities, due to the ease of access to it, and usually, in rural areas, there are not many health facilities available (Dewi, 2019). The community utilizes medicinal plants by processing them as potions or herbs

(Oktariani, 2018). The Ministry of Health (2007) in the Decree of the Minister of Health of the Republic of Indonesia 381/Menkes/SK/III/2007 explained that herbal medicine is a traditional medicine that is approached from "hereditary heritage" and an empirical approach. People still strongly believe in the efficacy of herbal medicine, because herbal medicine can cure diseases suffered with relatively small side effects. Ningsih (2016) wrote that natural medicine or traditional medicine is recognized to have relatively small side effects when compared to modern medicine, but it is necessary to pay attention to the right way to use it, to ensure its benefits and safety, especially for routine use.

One of the areas with a high diversity of medicinal plants is the hiking trail and Cempaka Hill, but on the other hand, not many people have documented and inventoried it, so we need to develop it into a source of information in the form of booklet media which aims to help the community in utilizing medicinal plants in Cempaka Lake and Hill for traditional medicine. Many medicinal plants are widely found around the Cempaka Lake and Hill hiking trails, including *babadotan, dadap*, suji leaves, guava, and the most dominant is the horsewhip plant. The dominant medicinal plant on the hiking trail and in the Cempaka Lake and Hill areas is the horsewhip plant, the horsewhip leaf plant has a lot of content such as alkaloids, tannins, and saponins which can be used to treat throat diseases (Safitri, 2015). Therefore, it is necessary to carry out documentation and inventory of medicinal plants for further development in information media. The developed media can be used as a reference source regarding the types and uses of medicinal plants for the community, especially around Cempaka Lake and Hill. Some information media that can be used by the community include television, radio, magazines, newspapers, books, posters, booklets, and so on. The information media provided needs to pay attention to the characteristics of the community to be appropriate as needed.

The solution that can be done to overcome the problems described above is a booklet media. A booklet is a book with a small size, a few pages, and the sentences used are concise and simple so that it is flexible to use anywhere and makes it easier to understand the content of the material. The booklet is designed by taking into account the characteristics of the community so that the material can be understood properly and effectively to provide education related to the potential and utilization of medicinal plants in Cempaka Lake and Hill as traditional medicine. The booklet on medicinal plant identification in Cempaka Lake and Hill is expected to attract the attention of the surrounding community to study plants that have an important role as medicinal plants in Indonesia, especially in Cempaka Lake and Hill. The content in this media affects the cognitive (not knowing becomes knowing), affective (dislike becomes like), and conative (changing attitudes and behavior) in the community (Khatimah, 2018). Tafanao (2018) added that the information source of the medicinal plant diversity booklet can increase the knowledge of the surrounding community to utilize Indonesia's wealth in the form of plants which have many benefits and are often used as medicine to cure various diseases.

RESEARCH METHODS

Research Design

The research "Booklet Development Based on Identification of Medicinal Plants in Cempaka Lake and Hill, Kebumen Regency" will go through 2 types of research including Exploration carried out with analysis of exploration results carried out descriptively, namely by analyzing data from an inventory of medicinal plants found in Cempaka Lake and Hill which is done by walking along the hiking trail via Purwonegoro, Banjarnegara Regency and the hiking trail via Sempor, Kebumen Regency and Research and Development R&D (Research and Development). *This research uses the ADDIE development model which consists of 5 stages, namely Analysis, Design, Development, Implementation, and Evaluation.*

Population and Samples

Primary data was obtained through exploration by exploring along the hiking trail from the Kalitengah trail, Purwonegoro, and ending at the Sempor trail, Kebumen Regency. The community around Cempaka Lake and Hill was the population and 7 people were selected as samples with homogeneous educational backgrounds. Purposive sampling is a technique that involves special considerations determined by the researcher (Sugiyono, 2017).

Instruments

The research instruments used to identify the medicinal plants found were (1) an inventory sheet, and (2) a species expert validation sheet aimed at knowing the truth and validating the species diversity of medicinal plants found. (3) material validation sheet, material expert instrument regarding the material contained in the booklet media. (4) media validation sheet, an instrument for media experts to evaluate the booklet that has been made. (5) community response sheet, the last instrument, namely the community response sheet, is used to see the results of the community's response to the booklet media being developed, to see the practicality of the booklet as a media source of information. At the same time, the material and media validation questionnaire instrument resulted from the adoption of research (BSNP, 2014).

Procedures

The stages in exploratory research are (1) Observing Cempaka Lake and Hill where there is a large area of Cempaka Lake and Hill in Sempor Subdistrict that allows for the discovery of a diversity of medicinal plants. (2) Finding a problem, namely the absence of research and sources of information regarding medicinal plants in the area of Cempaka Lake and Hill, information about the identification of medicinal plants is still limited, and there has been no research on the diversity of medicinal plants in the Cempaka Lake and Hill areas. The R&D (Research and Development) development research is (1) Based on the problems above, information about medicinal plants is needed for the community. (2) Therefore, exploratory research is needed to identify medicinal plants in the Cempaka Lake and Hill areas. (3) Furthermore, the research results were developed into information media for the community through booklets, and responses were tested on several communities. (4) So that the resulting booklet media becomes a source of information for the community around Cempaka Lake and Hill. The research process is described in Figure 1.

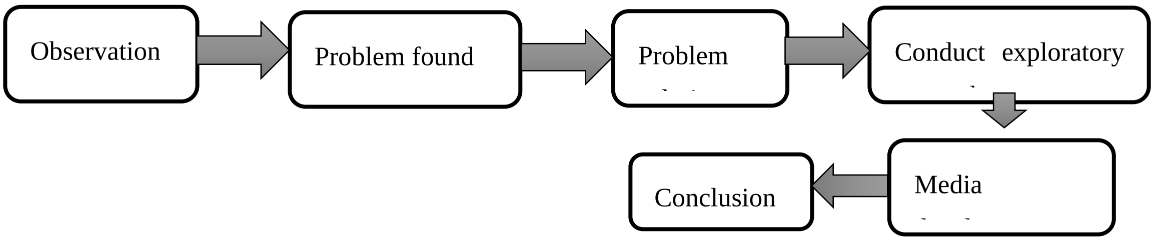

Figure 1. The Research Process

Data Analysis

Exploratory research was conducted using data analysis techniques in this research using descriptive techniques, namely by analyzing data from the inventory of medicinal plants found. The medicinal plants found were then identified by referring to relevant, valid, and actual or recent and reliable sources. Google Lens and PictureThis software was used as an initial step to help find out the names of medicinal plants based on image capture. Identification books and previous research results contained in journals are used to help further identification based on descriptions of the characteristics of medicinal plants. As for the R&D (Research and Development) development research, the test instruments used will be tested for suitability in the form of material and media validation tests as well as product practicalization tests. The validation test was conducted by one expert lecturer as a validator. The validator data of material experts as well as media experts will be analyzed in several stages as follows.

A. Summing up the scores given by each validator on each indicator.

B. Provide validation values proposed by Sudjana (2009).

$$\text{Validation Value} = \frac{\text{Total Score}}{\text{Highest Score}} \times 100\%$$

C. Determining the validity category of booklet media from Apriliani (2022), with the provisions in Table 1.

Table 1. Criteria for Product Validity

Range	Category
(NV) < 21%	Very Invalid
21% ≤ (NV) < 41%	Invalid
41% ≤ (NV) < 61%	Quite Valid
61% ≤ (NV) < 81%	Valid
81% ≤ (NV) < 100%	Very Valid

Source: Apriliani, 2022

The next research design is a product practicalization test. Product practicalization through community response questionnaire assessment. The percentage of community response to the product is determined using the following formula.

$$P = \frac{\text{Total Score}}{\text{Maximum Score}} \times 100\%$$

Description:

P = response from respondents

The value of each respondent will be found in the average value used to represent the entire response using the following formula.

$$P = \frac{\sum Xi}{n}$$

Description:

P = Average community response

$\sum$ Xi = Number of values given by respondents

n = Number of respondents

The product practicalization assessment criteria adapt from Apriliani (2022) with the provisions in Table 2.

Table 2 Product Practicality Criteria

Range	Category
(KP) < 21%	Very Impractical
21% ≤ (KP) < 41%	Not Practical
41% ≤ (KP) < 61%	Quite Practical
61% ≤ (KP) < 81%	Practical
81% ≤ (KP) ≥ 100%	Very Practical

Source: Apriliani, 2022

RESULTS

Based on the result of exploration carried out in Cempaka Lake and Hill via the hiking trail via Kalitengah and the hiking trail via Sempor, 21 species of medicinal plants were identified. The identified medicinal plants are divided into 7 classes, including *Magnoliopsida, Liliopsida, Lycopodiinae, Dicotyledoneae, Angiospermae, Monocotyledonae,* and *Asteridae*. Table 3 below is a list of medicinal plant species and the benefits of the 7 classes that have been identified based on exploration results.

Table 3 Benefits of Medicinal Plants in Cempaka Lake and Hill, Kebumen Regency

No	Class	Local Name	Species Name	Benefit
1.	Magnoliopsida	Babandotan	*Ageratum conyzoides*	Boils
		Sirih tumpang air	*Peperomia pellucida*	Uric acid
		Daun suji	*Pleomele angustifoli.*	Stomach ache
		Kelor	*Moringa oleifera L.*	Jaundice
		Daun dadap	*Erythrina sp.*	Catching a cold
		Pecut kuda	*Stachytarphea jamaicensis*	Sore throat
		Cocor bebek	*Kalanchoe pinnata L.*	Fever
		Bidara	*Ziziphus mauritiana*	Rheumatism
		Sambang rambut	*Mikania Sp.*	Joint pain
2.	Liliopsida	Serai	*Cymbopogon citratus*	Flu and cough
		Kunyit	*Curcuma domestica*	Diarrhea
3.	Lycopodiinae	Cakar ayam	*Selaginella Sp.*	Tonsils
4.	Dicotyledoneae	Jambu biji	*Psidium guajava*	Diarrhea
		Sirih	*Piper betle L*	Nosebleed
		Kumis kucing	*Ortosiphon stamineus Beth*	Back pain
		Tempuyung	*Sonchus arvensis*	Burns
		Kitolod	*Istoma longifera*	Toothache
		Jeruk nipis	*Citrus aurantifolia*	Cough
5.	Angiospermae	Putri malu	*Mimosa pudica L.*	Seizures
6.	Monocotyledonae	Talas	*Xanthosoma sagittifolium L.*	Diabetes
7.	Asteridae	Sambang getih	*Hemigraphis alternata*	Gallstones

In Table 3, there are 7 classes consisting of *Magnoliopsida, Liliopsida, Lycopodiinae, Dicotyledoneae, Angiospermae, Monocotyledonae,* and *Asteridae*. In the *Magnoliopsida* class there are 9 species, *Liliopsida* there are 2 species, *Lycopodiinae* there is 1 species, *Dicotyledoneae* there are 6 species, *Angiospermae* there is 1 species, *Monocotyledonae* there is 1 species, and *Asteridae* there is 1 species. The species most commonly found in the Cempaka Lake and Hill areas is the horsewhip plant. Based on Table 3, the horsewhip plant has benefits for treating sore throats.

As for the R&D (Research and Development) development research, the measurement of the feasibility of material expert validation is assessed in the form of a questionnaire. The material expert validation test questionnaire consists of 12 questions consisting of the components of content feasibility, presentation feasibility, and linguistic feasibility. The data obtained based on the assessment of the material expert validator can be seen in Table 3.

Based on Table 4, data analysis from the validation results of material experts obtained a total percentage of 83.3%. The average value obtained is included in the very valid category (Anikan, 2014). Based on the booklet assessment from the material expert validator, it can be concluded that the Identification Booklet of Medicinal Plants in Cempaka Lake and Hill, Kebumen Regency is considered feasible to be used with revisions.

Table 4. Analysis of Material Expert Validation Results

Assessment Aspects	Material Expert Assessment			
	Total score	Maximum Score	Percentage	Category
Content Feasibility Aspect	15	16	93.75%	Very valid
Presentation Feasibility Aspect	16	20	80%	Valid
Linguistic Feasibility Aspect	9	12	75%	Valid
Total Score	40			
Maximum Total Score	48			
Total Percentage	83.3%			
Category	Very valid			

Measurement of the feasibility results of media expert validation is assessed in the form of a questionnaire. The questionnaire for the media expert validation test consists of 11 questions consisting of aspects of the feasibility of graphics with several indicators, namely booklet size, cover design, and booklet content design. The data obtained based on the assessment of the media expert validator can be seen in Table 4.

Table 5. Analysis of Media Expert Validation

Assessment Aspect	Media Expert Assessment			
	Total score	Maximum Score	Percentage	Category
Graphic Feasibility Aspect				
Booklet Size	4	4	100%	Very Valid
Booklet Cover Design	16	16	100%	Very Valid
Booklet Content Design	23	24	95%	Very Valid
Total Score	43			
Total Maximum Score	44			
Total Percentage	97,72%			
Category	Very Valid			

Based on Table 5, data analysis from the validation results of media experts obtained a total percentage of 97%. The total percentage value obtained is included in the very valid category (Anikan, 2014). The media booklet assessment from media expert validators showed that the Identification Booklet of Medicinal Plants in Cempaka Lake and Hill, Kebumen Regency is considered feasible to be used with revisions.

Table 6. Results of Community Response to Products

Assessment Indicator	Total Score of All Community Answers per Indicator	Maximum Score Per Indicator	Percentage	Category
Interest	133	140	95%	Very Practical
Material	104	112	92,8%	Very Practical
Language	28	28	100%	Very Practical
Average Total Percentage			95,93%	Very Practical

Measurement of the results of the community's response to the products through questionnaires. The data obtained based on assessments of the community can be seen in Table 6.

The average results of 7 people's responses to the product can be seen in Table 6. Based on the results of the assessment by a group of 7 people, the average total percentage is 95.93% in the very practical category. The results of these measurements show that the developed booklet is feasible to be used by the community around Cempaka Lake and Hill widely.

DISCUSSION

Based on the results of exploration carried out in Cempaka Lake and Hill via the hiking trail via Kalitengah and the hiking trail via Sempor, 21 species of medicinal plants were identified. The identified medicinal plants are divided into 7 classes, including *Magnoliopsida, Liliopsida, Lycopodiinae, Dicotyledoneae, Angiospermae, Monocotyledonae,* and *Asteridae*. The data obtained from this research includes local names of plants which were then identified with the help of the *Picture This* application, the key determinations according to Elis Tambaro (2019), a book on traditional medicinal plants of local ethnic groups in West Sulawesi by Syamsiyah, as well as a book on the benefits and processing of family medicinal plants by the Center Plantation Research and Development, to identify the scientific name and classification and description of each plant species. Complete exploration results can be seen in Appendix 5. Table 4.1 below is a list of medicinal plant species from 7 classes that have been identified based on exploration results.

The surrounding community has received knowledge about the use of medicinal plants from their families for generations in the Table 3. In line with research by Ningsih (2016) which states that the family has a very important role in providing knowledge about traditional medicine. Even though they live close to Cempaka Lake and Hill, in fact, the people of Somagede Village, Sempor Subdistrict, Kebumen Regency are not aware of the potential for medicinal plants in this location. Therefore, this research conducted an inventory and identification of medicinal plants in Cempaka Lake and Hill. As a result of the inventory and identification carried out, the medicinal plant species that is often used and found around Cempaka Lake and Hill is the horsewhip plant.

Medicinal plant species that are often used by the community are horsewhip plants. This is because the horsewhip plant is easily available and easy to process. Processing the horsewhip plant as medicine is by boiling the leaves, and then filtering them to get the extract. This extract is usually used as medicine to cure sore throats. In line with research by Safitri (2015) which states that the horsewhip plant has been widely used as a traditional medicine, including as an antibacterial, blood purifier, vaginal discharge, and reducing sore throats. Santoso (2018) added that the horsewhip plant (*Stchyarphe Jamaicensis*) contains secondary metabolites found in the leaf extract, such as alkaloids, flavonoids, tannins, foliferols, and saponins. Based on the results of interviews with several people, the part of the plant most widely used for traditional medicine by the Somagede Village community is the leaves, which are 17 types of plants.

Taking leaves on a plant does not affect the survival of the plant and damages it because the leaves easily grow back. According to Kasrina & Veriana (2014), the method of processing the leaves as medicine is easier compared to other parts and the leaves also have better properties. People believe that leaves have medicinal properties because they contain chlorophyll, antioxidant compounds, anti-inflammatory substances, and substances that can cure disease (Maulidiah, 2019). In line with research by Dianto, Anam, & Khumaidi (2015), it is said that leaves contain elements of organic substances that can cure disease because leaves are a place for the accumulation of photosynthesis results. The processing of medicinal plants is not only boiled but several processing methods are adapted to the type and part of the plant being used and the disease to be treated.

In this research, the ways of processing medicinal plants include boiling, pounding, brewing, grating, crushing, extracting, and without processing (used directly). The medicinal plants found in Cempaka Lake and Hill vary greatly so the way of processing medicinal plants that are often used by the community around Cempaka Lake and Hill is boiling, besides the way of processing boiled easier because the drug by boiling is more effective and efficacy compared to other ways. This is by research by Ani (2018) which states that processing medicinal plants by boiling can attract the active substances contained in plants using water as a medium because water is a polar solvent. Bioactive substances usually found in plants include flavonoids, tannins, saponins, and alkaloids (Aslamiyah & Haryadi, 2014). The boiling process should not be done for long because it can damage the active compounds contained in the plant (Puspita, 2019). After knowing how to use medicinal plants in the Cempaka Lake and Hill areas by the surrounding community, then the study will be developed into information media in the form of a booklet.

The developed product is information media in the form of a booklet. The developed booklet is entitled "MEDICINAL PLANTS IN CEMPAKA LAKE AND HILL, KEBUMEN REGENCY" (Figure 2). This booklet is composed of several parts, namely: (1) Cover, (2) Foreword, (3) Table of Contents, (4) Introduction, (5) Book Contents, (6) Bibliography, (7) Author Profile. The contents of the booklet present material supported by real pictures or illustrations of medicinal plants in Cempaka Lake and Hill. Booklets that include real pictures of the surrounding environment make it easier for people to understand the concept of the material or information presented (Tari, 2019). Products that have been developed are validity tested including material expert validation, media expert validation, and community response to the product being developed.

Figure 2. Booklet Cover as Development Product

The validity results, carried out by material expert validator Mrs. Ferisa Prasetyaning Utami, M.Pd., showed that the total average percentage of material feasibility in the booklet as a whole was 83.3% with a very valid category according to the level of eligibility criteria put forward (BSNP 2014). Material validation includes aspects of content feasibility with a percentage score of (93.75%), aspects of presentation feasibility get a percentage of (80%), and aspects of linguistic feasibility get a percentage of (75%). As for the media expert validator, Mrs. Weni Anggraini, M.Pd., it is known that the *booklet of* medicinal plants in Cempaka Lake and Hill which was developed received a total percentage value of 97% with a very valid category from the media expert validator. Based on this assessment, from a media perspective, the developed booklet is suitable for use as information media on medicinal plants in Cempaka Lake and Hill by the surrounding community. The feasibility of booklet media was assessed based on graphic aspects consisting of indicators of booklet size, cover design, and content design, as well as results from the community response sheet which showed that the total percentage average was 95.93% in the very practical category. In line with Anika's (2014) research, it is stated that if the average value obtained is in the score range 80 < X < 89 then it is included in the good category and suitable for use. Increasing knowledge about medicinal plants by the community using booklet media can support the achievement of the community's goal of making maximum use of medicinal plants.

The community's response to the developed booklet can be seen from the results of calculating the questionnaire value. Based on the questionnaire value, the average total percentage is 95.93% in the very practical category. This can be seen from several community responses which state that the existence of booklet media is very helpful for the community regarding the use of medicinal plants in Cempaka Lake and Hill. In line with Anika's (2014) research, it is stated that if the average value obtained is in the score range 80 < X < 89 then it is included in the good category and feasible to use. Increasing knowledge about medicinal plants by the community using booklet media can support the achievement of the community's goal of making maximum use of medicinal plants. People's interest in reading medicinal plant booklets is influenced by several aspects displayed such as size, color, shape design, spacing, letters, illustrations or pictures, material, and the language used. In line with research by Jannah (2020) and Kurniawati (2015), it is stated that supporting images displayed in booklets can clarify concepts and convey material to readers effectively and meaningfully. Effective and meaningful delivery of material is also influenced by the writing language used in preparing the booklet. Apart from that, the language used in writing the booklet is adjusted to the level of thinking ability of the community. The language in each sentence pays attention to aspects of accuracy, effectiveness, and standardization which refer to refined spelling and are guided by the Big Indonesian Dictionary (KBBI). The language that is compiled by paying attention to applicable rules or regulations makes the information conveyed precise or does not give rise to multiple interpretations so that it is easily understood by readers (Wahyuni, 2021).

CONCLUSION

Based on the research results previously explained, the identification results in Cempaka Lake and Hill found 21 species of medicinal plants grouped into 7 classes, namely *Magnoliopsida, Liliopsida, Lycopodiinae, Dicotyledoneae, Angiospermae, Monocotyledonae*, and *Asteridae*. From several classes of plants, the use of medicinal plants as traditional medicines are processed in various ways, namely boiling, pounding, brewing, grating, crushing, extracting, or even processing (used directly). Meanwhile, the medicinal plant booklets in Cempaka Lake and Hill that were developed were declared suitable for use as information media with a material expert validation percentage of 83.3% in the very valid category and media expert validation of 97.72% in the very valid category, as well as the medicinal plant booklet in Cempaka Lake and Hill received a community response assessment percentage of 95.93% in the very practical category so they were used as a source of information for the people of Somagede Village.

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