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Factors Affecting the Intensity of the Use of Medicinal Plants in Minasatene Resort, Bantimurung-Bulusaraung National Park, South Sulawesi: A Case Study in Indonesia

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Abstract—Medicinal plants are believed to have the ability to both cure disease and maintain health and have been used by humans for a long time. The intensity of the use of medicinal plants can be influenced by community characteristics and supporting factors such as economic, social, and others. Data were collected using structured interview questionnaire from 210 respondents. The data recorded is: 1. How frequently did they use medicinal plants); 2. Information about respondents' characteristics consist of gender, age, marital status, educational level, occupation, and monthly income; 3. Preference of the Community for Type of Treatment and Reason for Preference of medicine; 4. Factors that affect the intensity of the use of medicinal plants consist of the effectiveness of medicinal plants, the price of modern medicine, side effects of modern medicine, distance of health facilities, participation in health insurance, a history of disease, frequency of illness, and average duration of illness. At the intensity of the use of medicinal plants in the community of Minasatene Resort, as much as 31.9% used medicinal plants at least once a year. The variables that had a significant relationship with the intensity of the use of medicinal plants were the effectiveness of medicinal plants against disease ($p = 0.000$), the presence of side effects of modern medicine ($p = 0.035$), a history of disease ($p = 0.007$), and the average duration of each time period sick ($p = 0.028$).

Keywords — Medicinal plants, Intensity of Use.

I. INTRODUCTION

Medicinal plants are believed to have the ability to both cure disease and maintain health and have been used by humans for a long time [1]. Along with the development of human civilization, human interaction with plants is also increasing, that human knowledge and expertise in the use of medicinal plants also develops [2]. WHO estimates that 80% of the world's population, especially rural communities in developing countries, uses traditional medicine to both cure disease and maintain health [3,4,5]

Several medicinal plants have been known and used in Indonesia. Currently, the use of medicinal plants is increasing in society and has become an alternative treatment. According to Elya, based on data from the Directorate General of Pharmaceutical Development and Medical Devices of the Indonesian Ministry of Health, the herbal medicine market reached Rp 5 trillion in 2007 and then increased to 7.2 trillion in 2008, and even in 2012 it reached 13.2 trillion with an export value of Rp 1.1 trillion. The herbal medicine market is dominated by several superior products such as herbs, herbal medicines, herbal drinks, spas, and aromatherapy [6].

The intensity of the use of medicinal plants determines how often people use medicinal plants. This can be influenced by community characteristics and supporting factors such as economic, social, and others [6]. These



factors can be different in each country, where in developing countries they can be influenced by economic limitations and beliefs held, while in developed areas they can be influenced by the level of knowledge and ease of accessing information about the side effects of modern drugs [8].

Minasatene is one of the buffer sub-districts in the Bantimurung-Bulusaraung National Park. This sub-district has an area of about 76.48 km² with a population of 39,364 people, making it a buffer sub-district with the highest population density in the Babul National Park area [9]. The community at Minasatene utilizes forest products to fulfill their daily needs, including the need for medicinal plants, which is still limited. This study aims to determine the intensity of the use of medicinal plants and the factors that influence the use of medicinal plants by the community at Minasatene (Pangkep Regency), Bantimurung-Bulusaraung National Park.

II. RESEARCH METHODOLOGY

A. Study Area and Period

The study was conducted in Minasatene, Pangkep Regency, South Sulawesi, which is included in the buffer area in the Bantimurung-Bulusaraung National Park consist of Biraeng, Bontoa, Bonto Kio, Kabba, Kalabbirang, Minasatene, and Panaikang. The area is 55 km far away and can be reached in 1,5 hours by vehicle from Makassar, the capital of South Sulawesi Province. According to BPS [10], there are 2 public health center and 2 polyclinic. This study was conducted from November 2021 to January 2022.

B. Ethnobotanical data collection

Data were collected using structured interview questionnaire from 210 respondents. All respondents were indigenous inhabitants of Minasatene aged more than 21 years or married, with the assumption that they are responsible for their health. The data recorded is: 1. How frequently did they use medicinal plants (every day, at least once a week, at least once a month, at least once a year, and never); 2. Information about respondents' characteristics consist of gender, age, marital status, educational level, occupation, and monthly income; 3. Preference (preference between medicinal plants and modern drugs, reason for the preference of medicinal plants, and intended use of medicinal plants); 4. Factors that affect the intensity of the use of medicinal plants consist of the effectiveness of medicinal plants, the price of modern medicine, side effects of modern medicine, distance of health facilities, participation in health insurance, a history of disease, frequency of illness, and average duration of illness.

C. Data Analysis

The data were entered and cleaned by excel software and exported to SPSS 22 for further analysis. Descriptive statistics were used for organizing, describing, and summarizing the data. Chi-square (X^2) was used to see the relationship between factors that affect the use of medicinal plants with the intensity of use of medicinal plants. P value $<0,05$ was used to declare the significant correlation.

III. FINDING

A. Sociodemographic Characteristic

Based on table 1, the number of female respondents is slightly higher (57.1%) than male respondents (42.9%) and the majority of respondents are married (76.7%). Based on age, most of the respondents are in the age group of 30-44 years (34.3%). In terms of education level, most of the respondents have completed high school (39%). The percentage for each job is quite balanced, which is around 17.1% - 25.2%, and generally, respondents (72%) have an income of around Rp. 1,000,000-Rp. 2,999,999 (34.8%).



Table 1. Socio-demographic characteristics of Respondents, Minasatene

Characteristic	No. of Respondents	
	Frequency	%
Gender		
Male	90	42.9
Female	120	57.1
Marital Status		
Married	161	76.7
Single	49	23.3
Age group (years old)		
<30	45	21.4
30-44	72	34.3
45-59	63	30
≥60	30	14.3
Education level		
Uneducated	14	6.7
Elementary	35	16.7
Secondary school	30	14.3
High school	82	39
Universitaire	49	23.3
Occupation		
Unemployment/housewife	53	25.2
Laborer/farmer	43	20.6
Civil servants	41	19.5
Private employee	37	17.6
Seller/trader	36	17.1
Monthly income (Rp)		
<1,000,000	46	21.9
1,000,000 – 2,999,999	73	34.8
3,000,000 – 4,999,999	59	28.1
>5,000,000	32	15.2

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B. The Intensity of the Use of Medicinal Plants

The intensity of the use of medicinal plants was obtained from the result of a survey of 210 respondents regarding how often they used medicinal plants (Table 2). The result of calculation show that the intensity of the use of medicinal plants in Minasatene is still low, with most respondents using medicinal plants at least once a year (32%) and only 5% using every day. Although the intensity of the use of medicinal plants is still low, the number of people who use medicinal plants in Minasatene Resort is quite high (72%).

Table 2. the Intensity of the use of medicinal plants in Minasatene

The Intensity	No. of Respondents	%
Never	59	28
At least once a year	67	32
At least once a month	50	24
At least once a week	23	11
Every day	11	5



C. Preference of the Community for Type of Treatment and Reason for Preference

Based on the type of treatment, people in study area prefer to use modern medicine (34.8%) and only 27.6% choose to use medicinal plants. The reason that is most often mentioned for choosing medicinal plants is cheap (100%). For the purpose of using medicinal plants, 39.7% of respondents chose to use medicinal plants to cure diseases. People's preferences at Minasatene can be seen in Table 3.

Table 3. Preference of the community for type of treatment, reason for preference, and intended use of medicinal plants in Minasatene

Preference	No. of Respondents	%
Type of Treatment		
Medicinal plants	58	27.6
Modern medicine	79	37.6
Both	73	34.8
Reason for Preference (n=58)*		
Therapeutic effectiveness	52	89.7
Comfortness	49	84.4
Habitude	50	86.2
Few negative effect	55	94.8
Affordability	58	100
Availability	54	93.1
Intended use		
Maintain health	13	22.4
Cure disease	23	39.7
Both	22	37.9

*The respondents respond more than one response, so the percentage might be greater than 100%

D. Factors Affecting the Intensity of the Use of Medicinal Plants

Based on several factors that are considered to affect the intensity of the use of medicinal plants, it is known that the majority of respondents feel that medicinal plants are effective against diseases. Compared to modern medicine, the use of medicinal plants is cheaper. Most respondents also agree that modern medicine can cause side effect on the body. Most respondents have a place of residence that is quite close to health facilities and also have health insurance. For health factors, respondents generally do not have a history of illness, where the frequency of illness is several days.

Table 4. The Relationship between intensity of the use of medicinal plants with the variables in Minasatene

Variables	p values
Effectiveness of medicinal plants against disease	0.000
The price of modern medicine	0.994
The presence of side effects of modern medicine	0.035
The distance of health facilities	0.895
Participation in health insurance	0.078
A history of disease	0.007
The frequency of illness	0.066
Average duration of illness	0.028



A bivariate analysis was performed using chi-square test to see the relationship between the intensity of use of medicinal plants to the given variables. The calculation results can be seen in Table 4. The result showed that there was a significant relationship between the intensity of the use of medicinal plants with several variables, which were the effectiveness of medicinal plants against disease, the presence of side effects of modern medicine, a history of disease, and the average duration of illness ($p < 0,05$). In other words, the more effective medicinal plants are against disease, the more intense the use of medicinal plants. Likewise, the more respondents understand about side effects of modern medicine and the longer the duration of illness, the more often medicinal plants are used. The existence of a history of disease and the duration of illness also affects the increase in the intensity of the use of medicinal plants. While the price of modern medicine, the distance of health facilities, participation in health insurance, and the frequency of illness do not significantly affect the increase in the use of medicinal plants.

IV. DISCUSSION

The result show that intensity of the use of medicinal plants was still low. Most of respondents use medicinal plants at least once a year (31.9%), and 28% respondents do not use medicinal plants or prefer modern medicine. This is due to the availability of health facilities in the study area so that people can easily get modern medicines. In addition, the location of the study, which is only 8 km from district capital, allows people to get treatment in the city. Different results were reported by Heilemeskel, where 34% of respondents use traditional medicine every week and 15% of respondents use it every day [11].

Respondents who choose to use medicinal plants have several reasons. One of them is cheaper (100%), where all respondents agree that there are almost no costs incurred when using medicinal plants. The next reason, which is easy to find (93.1%), Based on interviews with respondents, most of the medicinal plants used are wild plants, so they are easy to find. The same thing was also found in the research of Nguyen, where 55.72% of the medicinal plants used were wild plants [12]. The lack of side effects (94.8%) is also the reason for the use of medicinal plants compared to modern drugs, which sometimes cause allergies. Other information obtained is that most respondents choose medicinal plants for the purpose of curing diseases because they are considered effective even in one use. Some respondents continue to use medicinal plants even though they have recovered to maintain their health.

There are several factors related to the intensive use of medicinal plants. Respondents who feel the effectiveness of medicinal plants against disease and the side effects of modern medicine use medicinal plants more often. Another factor is the respondent's health condition, namely the presence of a history of illness and the average duration of illness. Respondents with a history of disease more often use medicinal plants, and the more intense the use of medicinal plants, the shorter the duration of illness. How many respondents who regularly consume medicinal plants admit that they rarely get sick? Other factors, namely, the price of modern medicine, the distance of health facilities, ownership of health insurance, and the frequency of illness, do not affect the intensity of the use of medicinal plants. This can be attributed to the existence of health insurance for both the middle and upper class populations (BPJS) and the poor population (KIS), so that the price of the drug has no effect because it can be obtained free of charge. Different results were reported by Theresiana, where the distance of facilities, ownership of health insurance, and the health condition of the respondents have an influence on the use of medicinal plants [13].

Based on the number of respondents who use medicinal plants (72%), the use of medicinal plants in Minasaten Resort is quite high, but the intensity of their use is still low, at least once a year. One of the things that can be done is by promoting medicinal plants to the public to attract public interest in using and cultivating medicinal plants, especially the less popular species.



V. CONCLUSION

Based on the results of research and discussion, it can be concluded that the intensity of the use of medicinal plants in the community of Minasatene Resort, Bantimurung-Bulusaraung National Park, Pangkep, as much as 31.9% used medicinal plants at least once a year. The variables that had a significant relationship with the intensity of the use of medicinal plants were the effectiveness of medicinal plants against disease ($p = 0.000$), the presence of side effects of modern medicine ($p = 0.035$), a history of disease ($p = 0.007$), and the average duration of each time period sick ($p = 0.028$).

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