

Profile on the Herb Use for the Prevention of COVID-19 Infection in the Gayo Lues Community - Indonesia

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ABSTRACT

Introduction: Corona Virus Disease 2019 (COVID-19) is an infectious respiratory disease with a global impact in all fields and increases mortality rates worldwide. Currently, there is no specific pharmacological therapy to fight this disease hence, preventive measures and supportive therapy are needed by increasing the community immune system using health supplements and herbal ingredients/traditional medicines.

Objective: This study aims to profile the use of herbal medicines for the prevention of COVID-19 infection in the Gayo Lues Regency community.

Methods: A cross-sectional study was conducted in September 2020 in Gayo Lues regency of Aceh. The population of this study were heads of families registered at the Gayo Lues Population and Civil Registration Service. By using purposive sampling methods, 379 respondents were obtained who were then contacted by telephone to fill out a questionnaire that had been prepared regarding the use of herbs. The data were analyzed using the univariate analysis.

Results: The results showed that up to 214 (56.5%) respondents used herbs for the prevention of COVID-19 infection with the majority being male (55.6%), aged 26-35 years (34.6%), and self-employed 92.6%). Moreover, the most widely used herb was ginger (*Zingiber officinale*) 28.89%, while information on the usage was majorly from the family 45.8%. The most predominant method of use was by boiling and drinking 55.1%, and the source was majorly from plants 52.7%.

Conclusion: The majority of the Gayo Lues - Indonesia community uses herbs for COVID-19 prevention. The most used herbs include Ginger, Turmeric, and Curcuma obtained from the immediate environment and used generally after boiling

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INTRODUCTION

According to the World Health Organization (WHO), COVID-19 is an infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2. The common signs and symptoms of infection include acute respiratory distress such as fever, cough, and shortness of breath. This disease was discovered in Wuhan City, Hubei Province, China in December 2019 [1]. It affects the community, including medically, due to its lethal nature (*Chhikara, B. S. 2020*).

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There is currently no specific treatment or vaccine against COVID-19. Consequently, symptomatic treatment is still used as a potential therapy, while oxygen is used as a primary care intervention for patients with severe infections [3]. This situation requires prevention and control of COVID-19. One of the prevention efforts is by increasing the body's immune system and maintaining individual health. This is carried out through healthy living habits, including good nutrition intake, maintaining cleanliness, as well as using health supplements and herbal ingredients/traditional medicines (Bodeker, 2020).

Indonesia is the fifth largest country in the world with a wealth of plants and biodiversity. Meanwhile, plants are raw materials used as herbal medicines. The use of plants is divided into traditional and non-traditional. Traditional herbal medicines have been used for generations and are the cultural heritage of the Indonesian nation (Sulis E, 2018). The diversity of these plants is due to the interaction of the growing environment with genetic potential. Furthermore, different growing environments produce various plant diversity (Putri DD, S, 2018).

The Basic Health Research shows that more than 50% of Indonesians use herb (*jamu*) or traditional medicine. It is a legacy of the nation's ancestors used for treatment and health maintenance from generation to generation. In addition, 95.6% of the population that consumes herbs attest to its benefits (Andriati A, 2016).

The area with the highest herbal use is East Java (65.2%), while the lowest is Bengkulu (23.5%), and the average is Aceh (44.3%). Concoctions or ingredients used in the past are still an alternative for the Aceh community, especially in rural areas due to the abundant plant wealth. Meanwhile, Gayo Lues is one of the regencies that still uses herbal medicine and also has the second-lowest Public Health Development Index (Indeks Pembangunan Kesehatan Masyarakat-IPKM) in Aceh. This shows high use by the majority of the population despite the availability of health care facilities (Rosita S, 2018).

The positive cases of COVID-19 in Gayo Lues was 215 as of December 15, 2020, due to the use of preventive measures, by exercising and maintaining a healthy lifestyle and consuming herbal medicines (Dinas Kesehatan Aceh, 2020).

The high availability of herbal medicine in this area is due to the abundance of biological nature. Therefore, this study aims to profile the herbal medicines used by the Gayo Lues community to prevent COVID-19 infection.

METHODS & MATERIALS

This is a descriptive observational study with a cross-sectional design conducted in Gayo Lues Regency, Aceh Province, Indonesia from September 1 to 29, 2020, while the population was the number of Family Cards (Head of Families) in the Gayo Lues Regency area consisting of 28,784 families. Furthermore, sampling was carried out with non-probability using purposive sampling methods. Heads of families who: (1) were registered at the Gayo Lues Population and Civil Registration Service; (2) were using or not using herbal medicine; and (3) were have a telephone number from the existing records.

The research instrument was a set of validated online questionnaires (google form) to determine people that use and do not use herbal medicines to prevent COVID-19 infection. The questionnaire included 14 items divided into three parts assessing: (1) respondents' demographic characteristics; (2) choice of question for target respondents; (3) the profile of herbal use among respondents in terms of plant species, parts of the plants used, methods of preparation and administration and source of information about herbs. The data was analyzed

using the univariate analysis. Next, the results are presented as distributions, frequencies, and percentages of the variables in tabular forms

RESULT

The results showed that 214 people (56.5%) in the Gayo Lues community used herbal medicines to prevent COVID-19 infection while 165 (43.5%) did not. Data on herbal use in Gayo Lues Regency are shown in Figure 1. The production of herbal medicines is increasing yearly due to the large variety of natural ingredients and traditional medicines that have been well received by almost all countries in the world (Dewi RS, 2019). People are looking for alternatives such as using traditional herbal medicine due to the unavailability of a COVID-19 vaccine (Sudarsana IK, 2020).

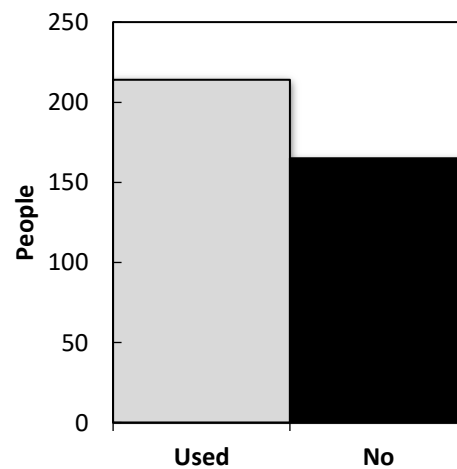


Figure 1. Herbal used in Gayo Lues - Indonesia.

Table 1. Characteristics of Respondents Using Herbs for Prevention of COVID-19 Infection

Characteristics	The Use of Herbs		Do not use Herb		Total
	(n)	(%)	(n)	(%)	
Gender					
Male	119	55.6	79	47.8	198 (52.2%)
Female	95	44.4	86	52.1	181 (47.8%)
Age					
17 – 25 years old	73	34.1	82	49.7	155 (40.8%)
26 – 35 years old	74	34.6	46	27.9	120 (31.6%)
36 – 45 years old	45	21.0	23	13.9	68 (17.9%)
46 – 55 years old	22	10.3	14	8.5	36 (9.4%)
Occupation					
Entrepreneur	57	26.6	21	12.7	78 (20.5%)
Student	47	22.0	59	35.8	106 (27.9%)
Employee	29	13.6	32	19.4	61 (16.1%)
Teacher	19	8.9	11	6.7	30 (7.9%)
Unemployment	17	7.9	15	9.1	32 (8.4%)
Civil servant	16	7.5	7	4.2	23 (6.1%)
Farmer	15	7.0	9	5.5	24 (6.3%)
Labor force	8	3.8	9	5.5	17 (4.4%)
Health workers	6	2.8	2	1.2	8 (2.1%)

The results obtained show that the male gender uses herbal medicines more than females. This is probably because there were more males than females in this study, and the number of telephone numbers available to be contacted as respondents was majorly male. Based on the results, the age groups that participated were late adolescence, early and late adulthood, as well as early elderly. It was found that the major category using herbs were respondents aged between 26-35 years old or early adults, by 34.6%. The adult age as the productive population as well as physically and biologically mature with good communication. At this age, sufficient information has been obtained, especially in relation to adequate health [10]. Similarly, the high number of adult herbal users in this study is because the average respondent is more active in communication. The use of herbal plants and the different parts used are shown in Table 2.

Table 2. Profile on herbal use by types of medicinal plants and the parts used

Plant Parts used	Types of Herbs used	(n)	(%)	Plant Parts used	(n)	(%)
Rhizome	Ginger	141	28.89	Rhizome	143	39.0
	Turmeric	91	18.64			
	Curcuma	53	10.86			
Fruit/seed	Guava	54	11.06	Fruit/seed	113	33.6
	Black Cumin	20	4.09			
	Garlic	14	2.86			
	Lemon	11	2.25			
	Red onion	6	1.22			
	Lime	9	1.84			
	Orange	1	0.2			
	Candlenut	3	0.61			
	Coconut water	3	0.61			
	Bits	1	0.2			
Leaf	<i>Meniran</i> / Shatterstone	10	2.04	Leaf	42	12.5
	<i>Ruku-ruku</i> / holy basil	10	2.04			
	Bay leaf	11	2.25			
	Betel leaf	5	1.02			
	<i>Sambiloto</i> / Bitterweed	3	0.61			
	Soursop leaf	2	0.4			
	Papaya leaf	1	0.2			
	Cassava Leaves	1	0.2			
Oil Extract	Lemongrass	23	4.71	Oil Extract	2	0.6
Flower	Clove	5	1.02	Flower	5	1.5
Stem	Parasite Coffee	1	0.2	Stem	30	8.9
Peel	Cinnamon	7	1.43	Peel	1	0.3
	<i>Bajakah</i> wood	1	0.2			
	Mangosteen skin	1	0.2			

The different types of plants in this study were consumed singly and in combination. Majority of the respondents consumed most of the herbs singly and also in combination, consisting of two types. The ingredients used by the respondents are mostly one type of plant or its part (Oktarlina RZ, 2018). This is probably due to the assumption that herbal medicines combinations are not always safe to use and leads to ineffective treatment.

Table 3. Profile of herbal use by source of information

Sources	Frequency (n)	Percentage (%)
Family	141	45.8

Social media	53	17.2
Friend	45	14.6
Health workers	31	10.1
Electronic Media	23	7.5
Print media	15	4.9

Table 4 shows that the major method of herbal medicine use is by boiling and drinking, 55.1% and followed by brewing with warm water 18.0%. The numerous people use herbs with liquid preparations (92.86%) because this form is the oldest in Indonesia, and is more practical, preferred, and in demand by all circles of the society (Dewi RS, 2019).

Table 4. Profile of herbal medicine method of use

How to Use Herbs	Frequency (n)	Percentage (%)
Boiling and drinking	150	55.1
Brewing with warm water	49	18.0
Eating raw	45	16.5
Smoothing	27	9.9
Steaming and eating	1	0.4

Table 5. Profile of herbal use based on the sources

Herbal Source	Frequency (n)	Percentage (%)
Surrounding Plants	138	52.7
Purchase	113	43.1
Health Practitioner	8	3.1
Pharmacy	3	1.1

The profile of herbal use based on the sources shows in Table 5. The most widely used source was surrounding plants 52.7%, followed by purchase 43.1%. The respondents in the study used herbs derived from medicinal plants in the home gardens, up to 55.3%. This is influenced by the ease of finding medicinal plants around the house (Oktarlina RZ, 2018). Similarly, the number of herbal plants around the environment is high because Gayo Lues is located in a tropical climate.

DISCUSSION

Gayo Lues has numerous villages, therefore, majority of the respondents still use herbs as alternative medicine. This is in line with the Indonesia Minister of Health Regulation in 2016, which stated that 70% of the Indonesian population that uses traditional medicine are in rural areas (Utami ER, 2018). Furthermore, the rural communities in Indonesia use traditional medicinal plants as the main choice of treatment due to the limited health facilities, hence it is an alternative and first step in treating disease (Jennifer H, 2015).

The socio-demography of the respondents is a description of the community characteristics in using herbal medicines for the prevention of COVID-19 infection which includes gender, age, and occupation. The respondents' characteristic data were filled according to the circumstances at the time the study was conducted as shown in Table 1. Table 1 shows that more male respondents 119 (55.6%) use herbs for the prevention of COVID-19 infection, compared to females 95 (44.4%), while majority of the age ranged between 26-35 years 74 (34.6%). Based on occupation, most of the respondents were self-employed 57 (26.6%).

Among the 27 different types of herbal plants, ginger (28.89%) was the most predominant, followed by turmeric (18.64%) Curcuma (10.86%), and guava (11.06%). Meanwhile, the most

widely used plant parts were tubers 34.8% and seeds/fruits 33.6%. The three major medicinal plants widely used include turmeric (*Curcuma longa*), followed by ginger (*Zingiber officinale*), and guava (*Psidium guajava*). These plants are widely known by different people from various tribes. *Curcuma longa* and *Zingiber officinale* aside from being used in medicinal ingredients are also used in spices and beverages to maintain fitness and health (Oktarlina RZ, 2018). According to Daryono Hadi Tjahjono as Professor of Pharmacy at the Bandung Institute of Technology, the herbal plants commonly used for the prevention of the coronavirus include turmeric, Curcuma, as well as white and red ginger (Sudarsana IK, 2020).

Some of these herbal medicines have been scientifically tested for efficacy, for example, ginger (*Zingiber officinale*) contains *zingiberin* which is clinically capable of treating coughs (Wahyono, 2015). Furthermore, according to the Head of the Research Group of the Center for Drug Discovery and Development, the Indonesian Institute of Sciences Research Center for Biotechnology (LIPI), stated that red ginger potentially relieves symptoms caused by COVID-19 due to its anti-inflammatory activity, but do not kill the virus or cure the disease. It also contains *gingerol* and *shogoal* which play a role in the immunomodulatory effect to increase endurance and immunity of the human body. This effect is useful in preventing and recovering from COVID-19 infection (Dewi RS, 2019).

Turmeric (*Curcuma longa*) has various pharmacological activities, namely for allergy, anti-inflammatory, as well as respiratory and digestive disorders (Febriani Y, 2017). Furthermore, turmeric contains curcumin compounds that have antiviral activity against viruses related to the respiratory system such as H6N1 and H1N1 influenza. The curcumin contained in turmeric also functions as an antioxidant in maintaining the human immune system (Dewi RS, 2019). Curcuma (*Curcuma xanthorrhiza Roxb*) is a plant that has been used for a long time. It contains curcumin, which has anti-inflammatory, antiviral, antibacterial, antifungal, and antioxidant properties. Moreover, curcumin controls inflammatory cytokines, thereby preventing its storm. Therefore, the curcumin content in ginger has an immune effect, namely as an immunomodulator (Dewi RS, 2019).

The part of the herbal plants mostly used is the rhizome 39.0%. The part of Curcuma mostly used in the manufacture of traditional medicine is the rhizome (Sudarsana IK, 2020). The rhizome is still widely used for concoctions. Based on the results, the profile of herbal use based on the information sources as shown in Table 3. The highest proportion of information sources in using herbs is from the family 45.8%, followed by social media 17.2%, and friends (14.6%). The respondents get more information from families. This is because the family plays an important role in providing advice on the use of herbs (Wahyono, 2015). In this study, the family is an important factor in the use of herbs, because most of the respondents pass the knowledge only to the family members.

CONCLUSION

Based on the results, majority of the population in the interior of Gayo Lues, Central Aceh - Indonesia uses herbs to prevent COVID-19 infection. The most used herbs include Ginger, Turmeric, and Curcuma obtained from the immediate environment and used generally after boiling. Furthermore, information on the use of these herbs is generally obtained from the family. Therefore, researchers and the government are expected to develop this information as basic data for the prevention and treatment of COVID-19 using available natural ingredients.

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