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Investigating the Usage of Medicinal Plants and Herbal Products in Aceh to Address COVID-19 Symptoms: A Cross-Sectional Survey

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Abstract

Medicinal plants have been used worldwide as supportive therapy in reducing symptoms of various diseases, including COVID-19 symptoms. The objective of this study was to investigate the use of medicinal plants and herbal products in respondents who experienced symptoms of COVID-19 in Aceh, Indonesia. A cross-sectional study was conducted, involving 384 respondents from the age group over 18 years old residing in Aceh Province, Indonesia. Data was collected via an online questionnaire consisting of 4 structured questions to assess the types and names of medicinal plants, the time of use, and the purpose of using medicinal plants. The results showed that nearly half of the study population (181 respondents) consumed medicinal plants and commercial products, mainly for the reason to enhance their immunity (49.7%), followed by to overcome the COVID-19 symptoms (26.7%). Amongst all medicinal remedies mentioned in this study, Ginger (*Zingiber officinale*) and turmeric (*Curcuma longa*) are the most widely used, which were consumed by 65.5% of medicinal plant and herbal products users. The other medicinal plant chosen by the study population were lemon (*Citrus lemon*), Java Ginger/temulawak (*Curcuma zanthorrhiza*), and Habbatus sauda (*Nigella sativa*). Although the majority of the respondents had used the herbal remedies prior contracting COVID-19 symptoms (45.5%), a third of the respondents consumed traditional medicine during the symptomatic period only (less than two weeks). This study has demonstrated the characteristics of the consumption of medicinal plants and their commercial products in Aceh, during the occurrence of COVID-19 symptoms in the study population.



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1. Introduction

The COVID-19 pandemic (Coronavirus Disease 2019) is caused by the SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus-2) virus. It gained concern due to its fatality and its economic effect worldwide [1]. COVID-19's mild clinical symptoms include fever, coughing,

myalgia, and anosmia. The severe symptoms, that result in death when therapy fails, include respiratory distress, septic shock, organ failure, myocardial infarction, stroke, blood coagulation abnormalities, and multi-organ dysfunction or failure [2].

The severity of COVID 19 is paramount compared to Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) [3]. Therefore, the life-threatening symptoms urge effective therapy, both for preventive and curative managements.

Currently, there has been no definitive cure for COVID-19. Antiviral therapy, adequate oxygen supports, including provision of immunosuppressant have been use for managing the symptoms. in addition, Self-isolation, rest, and hydration are currently known as advised strategies for managing mild COVID-19 symptoms. Patients who experience mild symptoms without chronic illness or organ dysfunction are encouraged to add symptomatic or adjuvant therapies, including herbal medications [4].

Herbal are raw materials derived from plants that show therapeutic effects [5, 6]. Due to its availability, herbal has been used for many purposes, including reducing COVID-19 symptom Herbal is used as supportive therapy in reducing the symptoms of COVID-19 including fever and dry cough. Research in China showed that patients who received traditional Chinese medicine (TCM) had a lower mortality rate than patients who did not receive TCM treatment [7]. Herbal can reduce the patient's clinical symptoms without significant side effects and then the patient could recover gradually [8].

The use of herbal to treat various diseases and increase endurance has also been practiced by the Indonesian communities [9]. Ethnobotanical research in Aceh showed that medicinal plants are widely used [10, 11]. In Aceh, the community has inherited sufficient knowledge about traditional medicine which is categorized as sufficient [12, 13]. According to our previous research in rural areas in Aceh [14] involving elderly respondents, the most frequent herbal used for various types of chronic illness was Soursop (*Annona muricate* L.). Consumption of traditional remedy practiced by the Acehnese community highlights the importance of the identification of medicinal herbs and traditional remedies particularly during COVID-19 pandemic in Aceh. In this study we explored the utilization of traditional plants and herbal products in Acehnese population, to identify the choice of the medicinal herbs used when contracting covid 19 symptoms.

2. Methodology

2.1. Sample selection

A total of 384 respondents who experienced COVID-19 symptoms, aged 18 years old and over, were recruited by purposive sampling technique sampling, to provide answers to the online questionnaires. The total sample size was calculated according to the Equation 1.

$$n = \frac{(Z\alpha)^2 \cdot P \cdot Q}{d^2} \quad (1)$$

where n is desired sample size, an α is the level of significance (5%), and $Z_{\alpha} = 1.96$. Furthermore, P is the assumption of the proportion of the population using herbs, and d is the desired level of absolute accuracy or precision in a study. Using $Z_{\alpha} = 1.96$ and $P = 0.5$ with $d = 5\%$, 384 respondents were included in this study.

2.2. Research Instruments

The questionnaire consisted of two parts; the first part was the identity of the respondent, and the second part is the questions regarding the profile of herbal use by the respondent. Respondent's identity includes name, age, gender, occupation, last education, and address. The second part of the questionnaire includes questions about the occurrence of symptoms of COVID-19 experienced by respondent, types of herbal plants and herbal products used, duration of herbal use, and purpose of herbal use according to the respondent's perception. The questionnaire was validated by with the aid of pharmacologists from Universitas Syiah Kuala. Following the recruitment of the respondents, the questionnaire was distributed via online form to all the respondents.

The questionnaire explained the research procedure to the respondents to ensure their willingness and understanding of the study protocol, then after agreeing to be included in the study they will be directed to the questions about medicinal plants and herbal products used when they experiencing COVID-19 symptoms.

3. Results and Discussion

From the total 384 participants, nearly half of the respondents (48.7%) used herbal either in the form of medicinal plants or commercial herbal products. No further studies were conducted on the factors that influence this behavior. However, factors that may be related are knowledge, family support and the role of health practitioners.

Characteristic of respondents and their status in using herbal therapy is shown in Table 1. Women used herbs more frequent (51.5%) compared to men. The preference for therapy can be influenced by gender because women are usually more concerned about the health of themselves and their families [15]. The 18-30-year age group was the most frequent herbal user (51.9%) compared to other age groups. Most herbal users graduated from senior high school (56.1%). Students were the most dominant herbal users (39.6%).

Table 1. Characteristic of respondents using medicinal plants and or its products.

Variable		Users		Non-Users		Total
		(n)	(%)	(n)	(%)	
Gender	Male	89	47.6	103	52.3	192
	Female	98	52.4	94	47.7	192
Age	18-30	97	51.9	53	26.9	140
	31-40	27	14.4	32	16.2	59
	41-50	25	13.4	45	22.8	70
	51-60	23	12.3	36	18.3	59
	>60	15	8	31	15.7	46
Education	Elementary school	11	5.8	7	3.6	18
	Junior High school	9	4.8	18	9.1	27
	Senior high school	105	56.1	85	43.1	190
	Diploma	7	3.7	8	4.1	15
	Bachelor	50	26.7	75	38.1	125
	Master Degree	5	2.7	4	2	9
Occupation	Students	78	41.7	38	19.3	116
	Retired	5	2.7	12	6.1	17
	Housewives	20	10.7	27	13.7	47
	Professionals	84	44.9	120	60.9	204

Table 2. The medicinal plants used by respondents.

Medicinal Plants	Users of medicinal plants only	Users of both medicinal plants and herbal products
	n (%)	n (%)
Ginger (<i>Zingiber officinale</i>)	85 (70.2)	38 (65.5)
Turmeric (<i>Curcuma longa</i>)	63 (52)	38 (65.5)
Lemon (<i>Citrus lemon</i>)	53 (43.8)	23 (39.7)
Java Ginger/temulawak (<i>Curcuma zanthorrhiza</i>)	34 (28)	10 (17.2)
Habbatus sauda (<i>Nigella sativa</i>)	22 (18.2)	12 (20.7)
Garlic (<i>Allium sativa</i>)	22 (18.2)	8 (13.8)
Guava (<i>Psidium Guava</i>)	22 (18.2)	7 (12)
Lemongrass (<i>Cymbopogon citranus</i>)	9 (7.4)	3 (5.1)
Chamber bitter (<i>Phyllanthus urinaria</i>)	7 (5.8)	4 (6.9)
Papaya Leaves (<i>Carica papaya</i>)	2 (1.7)	-
Red Ginger (<i>Zingiber officinale</i> var <i>rubrum</i> rhizoma)	2 (1.7)	1 (1.7)
Moringa leaves (<i>Moringa oleifera</i>)	2 (1.7)	-
Coconut (<i>Cocos nucifera</i>)	1 (0.8)	1
Lime (<i>Citrus aurantifolia</i>)	1 (0.8)	3 (5.1)
Mangosteen peel (<i>Garcinia mangostana</i>)	1 (0.8)	-
Galangal (<i>Alpinia galangal</i>)	1 (0.8)	-
Peacock leaves (<i>Caesalpinia pulcherrima</i>)	1 (0.8)	-
Siam weed (<i>Chromolaena odorata</i>)	1 (0.8)	-
cat's whiskers (<i>Orthosiphon aristatus</i>)	1 (0.8)	-
Keji Beling (<i>Strobilanthes crispus</i>)	1 (0.8)	-
Great hot plum (<i>Spondias dulcis</i>)	-	1 (1.7)
Clove (<i>Syzygium aromaticum</i>)	-	1 (1.7)
Jamblang peel <i>Syzygium cumini</i>		1 (1.7)
Pandan leaves <i>Pandanus amaryllifolius</i>		1 (1.7)
Cinnamon (<i>Cinnamomum verum</i>)		1 (1.7)
Iboh bark <i>Corypha utan</i>		1 (1.7)
Paitin flowers <i>Tithonia diversifolia</i>		1 (1.7)

Table 3. The commercially available herbal products used by respondents.

Herbal products	Users of both medicinal plants and herbal product n (%)	Users of herbal products only n (%)
Habbatussauda	9 (16.4)	6 (75)
Tolak angin	6 (10.9)	-
HPAI products	5 (9.1)	-
Antangin	5 (9.1)	-
De nature products	4 (7.3)	-
Kuku bima	2 (3.6)	-
China products	2 (3.6)	-
Qusthul hindi	1 (1.8)	1 (12.5)
Propoelix	1 (1.8)	1 (12.5)
Herbalife tea	1 (1.8)	1 (12.5)
Unspecified herbal	18	-

Table 4. The length and purposes of herbal used by respondents.

	Responses of users	n (%)
Length of use of herbs	Before getting infected	85 (45.5)
	During infection (less than 2 weeks)	63 (33.7)
	Since infection until now (more than 2 weeks)	39 (20.9)
Purpose of Herbal Use	Boost immunity	93 (49.7)
	Overcoming the symptoms of COVID-19	50 (26.7)
	Kill viruses	36 (19.3)
	Increase appetite	1 (0.5)
	Increase blood Hb	1 (0.5)
	Reduce sore throat	1 (0.5)
	Heal wounds	1 (0.5)
	Lowering blood sugar	1 (0.5)
	Cure stomach pain	1 (0.5)
	Treating hypothyroidism	1 (0.5)
Total		187

It is well understood that respondents with a proper educational background are more knowledgeable therefore show positive attitudes toward maintaining health [16]. The high frequency of students was also influenced by the data collection environment which was carried out around universities.

The medicinal plants used by respondent in this study is shown in Table 2. The most widely used medicinal plants, respectively, were ginger (70.2%), turmeric (52%), lemon (43.8%), java ginger (28%), black seed (22%), garlic (22%), and guava (22 %). Among those herbs, five are spices usually used for cooking and easily available at markets. This reason is even more important because during a pandemic people are physically restricted. In addition, the selection of these herbs may be due to the belief in their efficacy and safety that has been passed down from their ancestor [17].

The commercially available herbal products used by respondents is shown in Table 3. The most widely used commercial herbal product is habbatussauda (16.4%).

Habbatussauda known as black seed is widely used to treat respiratory problems such as rhinitis and asthma [18]. The use of black seed can relieve one of the most disturbing symptoms of COVID-19, shortness of breath. *HPAI (Herba Penawar Aiwahida Indonesia)*, De Nature and China products consists of herbs that work to boost immunity and reduce respiratory symptoms. For these three products, there was no product brand mentioned by the respondents. *Tolak angin* is a mixture of many herbs such as fennel fruit, ules wood, clover leaf, ginger, mint leaf, honey. *Antangin* consists of red ginger, royal jelly and peppermint. *Kuku Bima* consists of saffron-colored rice, ginger and ginseng. All the herbs in *Tolak Angin*, *Antangin* and *Kuku Bima* are believed to show efficacy in reducing inflammation, boosting immunity and eliminating respiratory problems. *Qusthul hindi* is costul bark from India which claimed to metabolic, hepatic and respiratory diseases [19]. Tea contains polyphenol which act as immunostimulant, antimicrobial, antiinflammation and antioxidant [20]. Unspecified herbal consists of many kinds of essential oils from medicinal plants which are reported by respondents who

were not sure about the brand name of products. Essential oils have been investigated for their activity in inhibiting bacterial biofilm [21]. This therapeutic activity is important to prevent secondary infection, potentially worsening the patients' clinical symptoms during COVID-19.

The length and purposes of herbal used by respondents is shown in Table 4. Most respondents used medicinal plants or herbal products before getting infected (45.5%). Their action may be aimed at increasing the immune system, which was most frequent reason in using herbal in this study (49.7% of the respondents). However, even though one has used herbal to boost their immunity against infection, the risk of contracting infectious agents is higher when the viral load is excessive. In this case, immune system alone may fail to prevent viral infection such as COVID-19 [22]. Finally, this study shows that the use of medicinal plants and herbal products for overcoming COVID-19 symptoms is a common practice within the study population in Aceh. The medicinal plants and herbal products are mainly used before experiencing the symptoms for increasing the immune system.

Although using herbal is recommended for mild symptoms, interaction with several medicines should be cautioned. The use of herbal should be informed to health professionals to monitor the unwanted effects.

4. Conclusions

In summary, the finding from this study demonstrated the commonly used herbal remedies for treating COVID-19 symptoms in selected population in Aceh. The result is useful in providing information for educating the community about the use of traditional remedies, which was chosen based on their purposes for overcoming the viral symptoms. Nevertheless, the limitation of this study arose from the requirements of internet technology for data collection may have restricted the recruitment of respondents to a particular population, which means some other group, such as non-internet-users, are excluded from the study. In addition, the respondent's ability to remember the herbal products used was very limited, so this some information might have been missed.

Therefore, further study is crucial for ensuring wider population coverage. Moreover, further research is needed to identify prospective areas of modern medicine's integration with herbal treatments to expand treatment options for society, as well as to assure the efficacy and safety of the traditional medicine.

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formal analysis, A.R.; investigation, T.H.; resources, A.R.; data curation, A.R.; writing—original draft preparation, S.S.; writing—review and editing, N.A.P.; visualization, A.R.; supervision, T.H.; project administration, A.R.; funding acquisition, S.S. All authors have read and agreed to the published version of the manuscript.

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