

COVID-19, PREVENTION AND TREATMENT BY ETNOBOTANY OF HERBAL MEDICINE USED BY COMMUNITIES IN BATU, EAST JAVA PROVINCE, INDONESIA

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ABSTRACT

COVID-19 was first discovered in Hubei, China at the end of 2019. The name COVID-19 comes from the acronym Coronavirus Disease. The COVID-19 pandemic is caused by the SARS-CoV-2 type of corona virus that attacks human respiration. Prevention of the spread of Covid-19 can be done by increasing the body's immunity. The community believes that drinking herbal medicine can prevent various diseases including Covid-19. The aim is to find out the potential of herbal medicine to help increase people's immunity and income during the Covid 19 pandemic. The data collection method uses cluster sampling with the help of the Guttman questionnaire instrument. Statement of answers: number 1 for the answer Yes and 0 is No. Each statement in each category that has been given a score will be added up and multiplied by the rating scale from the Guttman score. Guttman Formulation: Total score = P; $P (\%) = f/n \times 100 \%$ where f = frequency of yes or no answers; n = Number of respondents. All results obtained in each category will be added up to calculate the percentage. Policy determination in the development of herbal medicine uses SWOT analysis.

Keywords:

Etnobotany, herbal medicine, immunity, income, Covid-19

INTRODUCTION

Recently, the world has been shocked by the emergence of COVID-19. The first time COVID was discovered in Hubei, China at the end of 2019. The name COVID-19 comes from the abbreviation Coronavirus Disease. The COVID-19 pandemic is caused by the SARS-CoV-2 type corona virus which attacks human respiration (Rabi et al., 2020). Viruses are pathogenic microorganisms that infect living cells. Viruses develop by means of replication in cells. Viruses do not have the cellular equipment to reproduce on their own. Viruses can be transmitted from one person to another in various ways, such as patient droplets (Putra and Susanto, 2011). The initial symptoms of the patient will be high fever, shortness of breath, cough, to hypoxemia which appears on the 4th to 7th days.

The main problem is public panic due to rapid transmission and cannot be stopped. This situation shows that the number of people exposed and those who died is increasing. The incubation period for the virus is relatively long, indicating that there is an equally strong reaction between the virus and the patient's immune system. The body's immune system is the defense of the organism to protect the body from external influences in

recognizing and killing pathogens. The immune system will work to kill the virus. However, the virus also develops or mutates more strongly as an effect of resistance against the immune system (Fatmah, 2006). The human body naturally has the power to fight viruses and bacteria as the cause of disease. However, there are other factors that can weaken a person's immune system, such as age, nutrition, type of disease, and even medication. Therefore, it is necessary to keep the immune system strong in order to prevent various diseases, especially COVID-19.

Efforts to increase body immunity can be done by consuming fruits, vegetables, vitamins and traditional herbal medicine. Herbal medicine is a traditional medicine made from natural ingredients to maintain health. The definition of herbal medicine is an ingredient or ingredient in the form of plants, animal ingredients, mineral ingredients, and or a mixture of these ingredients for treatment based on experience and can be applied according to the norms that apply in society (Biofarmaka IPB, 2013).

Family Medicinal Plants (Tanaman Obat Keluarga or TOGA) are all types of plants that are cultivated and have medicinal properties. Medicinal plants are believed to have good properties to prevent exposure to pathogens. One way to process spice plants is to make herbal drinks. Plants such as turmeric (*Curcuma domestica* Val.), java ginger (*Curcuma zanthorrhiza*), Temu kunci (*Boesenbergia pandurata*) can be used as raw materials for herbal drinks. Turmeric is an herbal plant that contains curcumin compounds of 3-14%. curcumin is a yellow pigment that has biological activities such as antibacterial, antioxidant, and antihepatotoxic (Dewi et al., 2016). Javanese turmeric (*Curcuma xanthorrhiza*) also contains the active substances curcuminoids and ukanone types A, B, C and D which function to stimulate the immune system. The main function of curcuminoids and ukanon is to increase endurance. This plant is categorized as an immunostimulator or as an immune booster (Pamadyo et al, 2014). Temu kunci (*Boesenbergia pandurata*) is useful for stone medicine which can dissolve phlegm and increase appetite.

In the Batu City area, East Java Province, the majority of the people's livelihoods are farming rice, vegetables and dairy cattle. Many people grow spices such as ginger, galangal (*Alpinia galanga*), temu kunci, javanese turmeric, turmeric, java ginger. The availability of spices is relatively easy to find around residents' homes. The manufacture of herbal medicine is intended to increase the body's resistance and provide added value for spices so that people's income, especially at the microeconomic level, can be improved.

METHOD

This community service will be carried out in Batu City, January 2022. The data collection method uses the cluster sampling method with the help of the Guttman questionnaire instrument. Answer statements namely: 1 for Yes answers and 0 for No answers. Each statement in each category that has been given a score will be added up and multiplied by the rating scale from the Guttman score. Guttman Formulation: Total score = P; $P (\%) = f/n \times 100 \%$ where f = frequency of yes or no answers; n = Number of respondents. All results obtained for each category will be added up for each statement and used to calculate the percentage. Policy determination in the development of herbal medicine uses SWOT analysis. List of questions (Table 1):

Table 1: List of question for respondents

No	Question	Answer (Y/N)
1	Are you sure that herbal medicine (HM) can increase immunity?	
2	Can HM such as ginger, galangal, temu kunci, javanese turmeric, turmeric, java ginger help prevent disease?	
3	Can HM prevent getting the Corona virus?	
4	Does the Batu area support drinking HM?	
5	Does your family like HM?	
6	Do the people around you also have empon empon (traditional drink from the island of Java) culture?	
7	Do government officials support the herbalization movement?	
8	Is HM liked by everyone?	
9	Have you ever had symptoms of a Covid attack?	
10	Is there a relationship between drinking herbal medicine and increasing confidence in being healthy?	
11	Are you sure that the ginger, galangal, temu kunci, javanese turmeric, turmeric, java ginger plants have properties as traditional medicine?	
12	Is the community willing to cultivate that plants?	
13	Does HM need to be packaged properly and hygienically?	
14	Do young people know HM?	
15	Can drinking HM maintain stamina?	
16	Do you agree if MH's business is made a micro business in your area?	
17	Can HM's business help overcome family economic difficulties?	
18	Does the women's group support HM's efforts?	
19	Has the Covid pandemic reduced people's income?	
20	Do you agree that an internal lock down is applied in your area?	
21	Do you agree if everyone is advised to drink HM?	
22	Does the local government pay attention to public health?	
23	Is your area an area with a potential for a covid epidemic?	

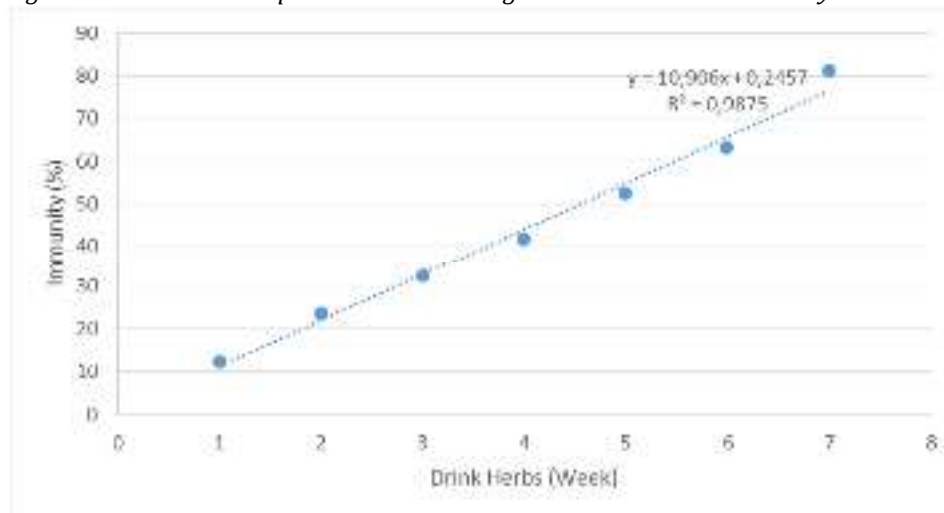
RESULT AND DISCUSSION

Based on data from the East Java Covid-19 task force, September 2021 the number of confirmed positive cases of Covid-19 was 387,017 people. The number of people who recovered was 350,266 people, active cases were 8,045 and 28,706 people died. Batu City, including the level of spread of Covid-19, is quite high, especially the delta variant, which spreads more easily. This is of course a serious problem because there is an increase in cases every day. Immunity is a defense in humans e to protect the body from contracting covid. The body's immunity will work against viruses that will enter the body. The speed of replication of the Covid virus becomes endemic which is supported by low resistance

conditions (Fatmah, 2006). Efforts to increase the body's immunity can be done by consuming fruits, vegetables, and drinking traditional herbal medicine.

Increasing the frequency of drinking traditional herbal medicine is proven to be able to increase one's body's immunity (Fig. 1). Increasing the body's immunity during the Covid-19 pandemic will be able to help a person not be susceptible to corona disease. The level of immunity is very important for self-defense from various pathogens that will penetrate a person's body. According to the Ministry of Health (2010), 35.7% of people use traditional herbal medicine and more than 85% admit that traditional herbal medicine is beneficial for health.

Figure 1: The relationship between consuming herbal medicine to the body's immunity

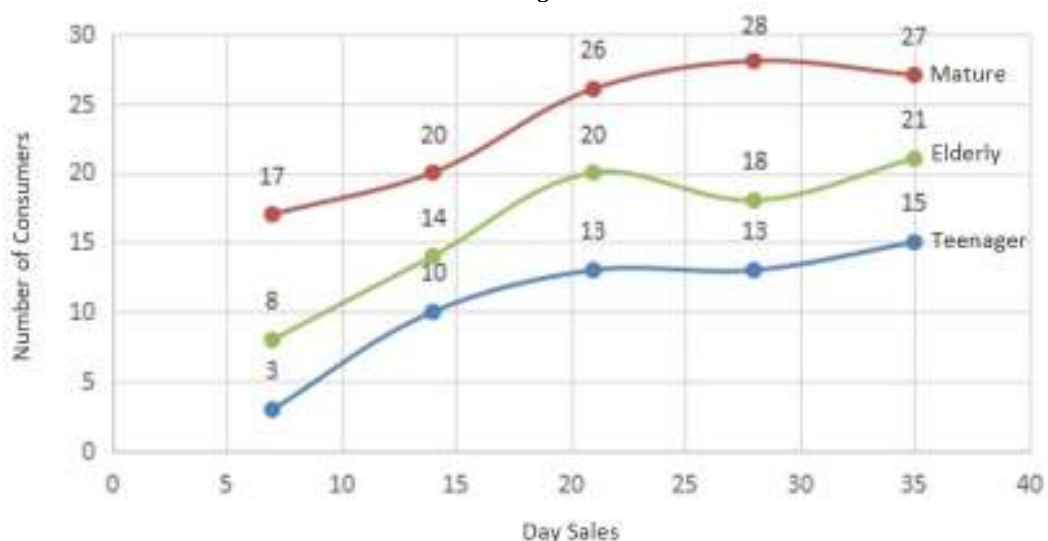


Traditional herbal medicine made from ginger, galangal, temu kunci, javanese turmeric, turmeric, java ginger. The chemical constituents of turmeric rhizome are curcumin, essential oils, resins, desmethoxycurcumin, oleoresin and bidesmethoxycurcumin, resin, gum, fat, protein, calcium, phosphorus and iron. The chemical composition of turmeric essential oil consists of artumeron, α and β -tumeron, tumerol, α -atlanton, β -karyophyllene, linalol and 1.8 cineol. The essential oil is produced by steam distillation from turmeric rhizome, containing a-phellandrene (1%), sabinene (0.6%), cineol (1%), borneol (0.5%), zingiberene (25%) and sesquiterpines (53%). Curcumin (diferuloylmethane) (3–4%) is an active component of turmeric which plays a role in producing a yellow color, and consists of curcumin I (94%), curcumin II (6%) and curcumin III as much as 0.3% (Hayakawa et al. 2011). Temulawak contains curcuminoid compounds, essential oils such as isofuranogermacrene, tricycline, allo-aromadendrene, germacrene, and xanthorrhizol (Wasito, 2011). The temu kunci is rhizome contains essential oils in the form of 1,8-cineol, borneol camphor, pinnen, sesquiterpenes, zingiberone, curcumin and zeodarin. Other ingredients include cardamonin, pinosembrin (5,7-dihydroxyflavone), pinostrobin (5-hydroxy-7-methoxyflavanone), panduratin A, and 4-hydroxypanduratin. The temu kunci (*Boesenbergia rotunda*) is similar to the temu kunci (*Kaempferia rotunda*), but contains more essential oils and exhibits a distinctive odor (Tan Eng Chong, 2012). Curcumin is an active compound that belongs to the curcuminoids group. Curcumin is found in rhizomes such as ginger, turmeric, temulawak, and plants belonging to the *Zingiberaceae* family. Curcuminoid compounds are polyphenolic compounds that have a yellow color like turmeric, temulawak, and other *Zingiberaceae* plants. Compounds that belong to the class of curcuminoids include desmethoxycurcumin and bisdesmethoxycurcumin. Curcumin is a phytopharmaca compound that has several

biological effects, namely antidyslipidemia, antioxidant, anti-inflammatory, antiviral, antifungal effects, inhibits the formation of atherosclerotic plaques, inhibits the growth of *Helicobacter pylori* bacteria, binds mercury and cadmium, prevents cancer, and can protect the liver (Akram et al. 2010).

As much as 60% of the public's perception believes that herbal medicine can increase the body's immunity against the Covid-19_delta pandemic and 80% believe that consuming traditional herbal medicine can reduce disease attacks and not experience harmful side effects. Herbal medicine products can be consumed by various ages including teenagers (12-25 years), adults (26-45 years), and the elderly (46-65 years) because they do not have harmful side effects. Most of the people are farmers and traders. This situation is closely related to the availability of raw materials for the manufacture of herbal medicine. The community obtains raw materials for herbal medicine from traditional markets and their own agricultural products. In general, people plant crops such as temulawak, turmeric and keys in areas of land such as yards, fields and plantations that have slopes. Planting in moor areas and plantations is carried out using an intercropping system with citrus, crystal guava as the main agricultural product, while spices are a secondary agricultural product.

Figure 2: The relationship between the number of consumers and herbal products sold is based on the age range

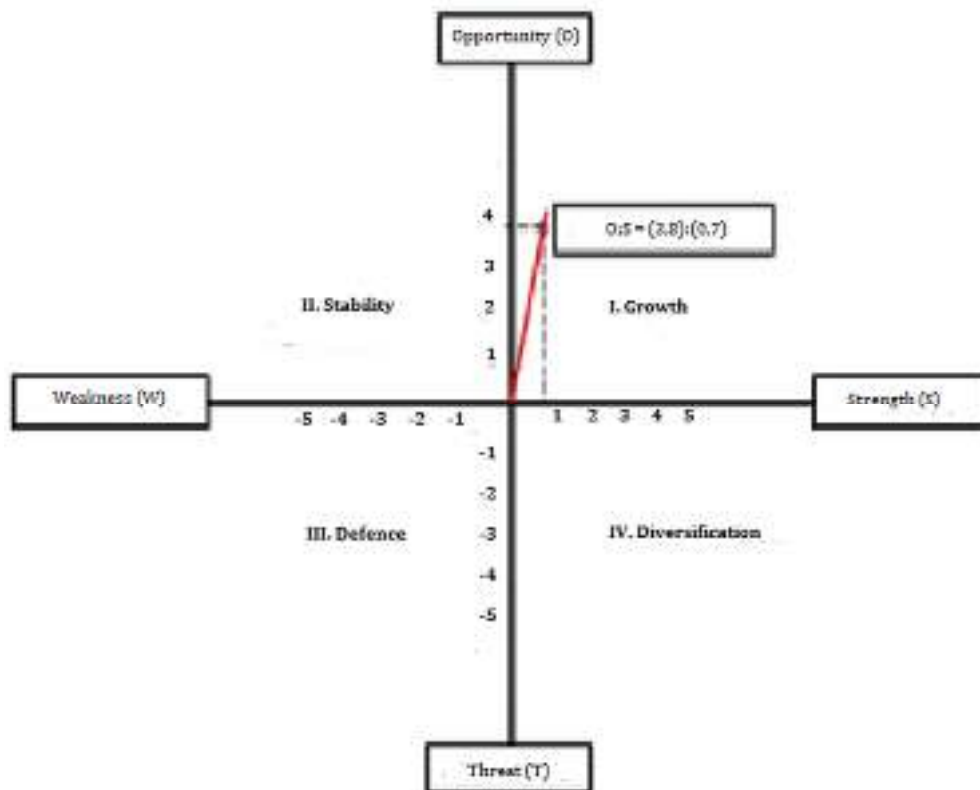


Agricultural products can be sold directly or processed in advance so that the selling price is higher. Batu City is a tourist area, this situation has the potential to sell processed agricultural products including herbal medicine, considering that many tourists visit. One of the business strategies for selling traditional herbal medicine is by implementing product sterilization when making herbal medicine, product packaging, maintaining product quality, quantity, and affordable prices. Based on consumer demand that herbal medicine has the opportunity to be developed (Fig. 2). This effort besides being able to increase endurance or body immunity and has a positive impact can increase people's income during the recession and the Covid-19 pandemic. The results of the analysis of the strategy for developing herbal medicine in the community show that there is a significant opportunity.

The results (Fig. 3) of the analysis of the herbal medicine production development strategy show that internal factors (IFAS) and external factors (EFAS) have a positive contribution to decision making. Internal factor analysis shows the total value of the strength score = 6.4; total value of weakness = 2.6. The external factor analysis strategy shows the total value of the opportunity score = 3.8; while the total value of threats = 3.1. The internal

coordinate value is obtained from the total score of strengths - total score of weaknesses while the external coordinate value is obtained from the total score of opportunities - total score of threats. The internal value is 3.8 and the external coordinate value is 0.7 coordinate value. The meeting line occupies quadrant I which indicates a business opportunity and can be developed with various external supporting factors available around the area. According to Suryana, 2011 business success is the success of a business in achieving its goals. According to Purnama et al., 2010, the success of small industrial businesses is influenced by various factors. These factors include: (1) commitment, (2) experience, (3) finance, (4) business location, (5) motivation, and (6) business ability. The company's business performance is one of the goals of every entrepreneur. The performance of small industrial businesses can be interpreted as the level of success in achieving or achieving the expected goals.

Figure 3: Analysis of SWOT



CONCLUSION

The results of the SWOT analysis show that the production of herbal medicine has the potential to be developed. Development efforts can be made by making packaging more attractive, promoting products by means of promotion on social media and increasing market partners in order to reach more consumers. Empowerment of traditional herbal medicine has been proven to be able to increase immunity and increase people's income during the Covid-19 pandemic. A good increase in community immunity will reduce the number of people exposed to Covid 19.

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