The Potential Benefits of *Jamu Kunyit Asam* for COVID-19

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ABSTRACT
With the COVID-19 virus in the world that does not subside, scientists are competing to create various medicines that can be used to treat people who are infected with the virus. Even now, the vaccines distributed by the government have not shown significant results. However, until now, no medicine can cure humans of the virus. One alternative that people can do today is to consume herbal medicine. The purpose of this study is to find out 1) the various types of herbs that exist in Indonesia 2) the benefits of *jamu kunyit asam* 3) the benefits of the ingredients contained in the *jamu kunyit asam*, with the hope that the public realizes many easy ways can be done to maintain endurance, one of which is consuming herbal medicine. This type of research is a literature study using qualitative methods and descriptive approaches. Using this method is to describe and summarize the various phenomena that are the object of this research. The results show that there are no registered herbal remedies to treat and prevent COVID-19 in Indonesia. So far, herbal medicines, such as *jamu kunyit asam*, are only used to maintain the immune system to minimize the possibility of being exposed to the COVID-19 virus.

Keywords: *jamu kunyit asam, COVID-19, herbal medicine*

1. INTRODUCTION

Currently, the world is facing a crisis, such as a health crisis and even an unprecedented global social and economic crisis. The global social and economic problem is caused by a new type of virus, namely COVID-19. Initially, this virus originated from Wuhan, China, on December 31, 2019, and spread to various countries worldwide, including Indonesia. As of July 26, 2021, there were 3.17 million COVID-19 cases in Indonesia, of which 83,279 died and 2.51 million recovered. Symptoms experienced by coughing, sore throat, shortness of breath, lots of phlegm, fever, and fatigue.

In Indonesia, the lives of millions of children and families have changed. Various efforts to close multiple facilities such as Lockdown and PPKM (Enforcement of Restrictions on Community Activities) have been carried out. Lockdown and PPKM (Enforcement of Restrictions on Community Activities) affect education, mental health, and much more. However, economic considerations are always crucial for the government in taking various actions because the economy in Indonesia is the most important thing that determines the fate of its people.

Intense research efforts are currently underway to develop a vaccine against COVID-19. Although there is no specific cure for the virus, there are several things people can do to strengthen the immune

system, such as wear a face mask, cover mouth and nose when coughing, maintain a safe distance, don't touch your face, clean the surfaces, cover your mouth when you sneeze, wash your hand regularly, do some exercise, stay at home, and eat healthily. The World Health Organization (WHO) welcomes various innovations worldwide to search for potential treatments to deal with COVID-19, one of which is the reuse of traditional medicines.

One option to strengthen the body's immune system is *jamu*. *Jamu* is Indonesian traditional herbal drink that has been used for generation to generation in Indonesia. Although there are many more modern medicines, herbal medicine is still top-rated in rural and urban areas, especially when there is no cure for COVID-19. In addition, jamu can produce *jamu* at home because the price is relatively low, and the raw materials are easy to find.

There are many types of *jamu* in Indonesia, including *wedhang jahe, jamu temulawak, jamu beras kencur, and jamu kunyit asam*. And the researchers chose to examine *jamu kunyit asam* as the object of this research. According to Andrie et al. [2], *jamu kunyit asam* is a modifies of the classic sour and sour taste traditionally used as a general standard to maintain overall health. Making this *jamu* can also be easy because it only requires turmeric, galangal, and lime. Each material has a different function but has the same purpose as preserving the body's immune system.

2. METHOD

This study uses qualitative research methods and a descriptive approach. According to Bogdan and Taylor [3], qualitative research is a research process that produces descriptive data in written or oral data from the subject and object under study. According to Sugiyono [23], qualitative research methods examine natural things where the researcher is the key instrument, and the research results emphasize meaning rather than generalization. Meanwhile, according to Sevilla et al., [9], the descriptive approach is designed to collect information about the current actual situation.

The researcher chooses to use qualitative methods to describe and summarize the various phenomena that are the object of this research. So the results of this study produce an overview of the current state of public health in Indonesia and illustrate how herbal medicine has good benefits for the body, especially in conditions like this, where the COVID-19 virus is still widespread.

The data collection technique used is literature study, in the sense that the data obtained by researchers come from scientific journals, books, and so on. In addition, researchers also studied references from previous studies related to the title of this study. The data collection technique is online by using the internet. The internet is beneficial for researchers to obtain information about the types and benefits of *jamu* in Indonesia.

3. RESULTS AND DISCUSSION

Jamu is a health drink used to cure disease, improve public health (promotive), and prevent disease (prevention). One herbal medicine known to the public is *jamu kunyit asam* which is made from rhizome materials, galangal rhizome, and additional lime juice [10]. Every raw material used as *jamu kunyit asam* has a chemical content that plays a role in increases the efficacy and benefits. The main ingredients in the *jamu kunyit asam* and their benefits for COVID-19 :

1) Curcuma longa

Curcuma longa, also known as turmeric, has been used in traditional medicine systems such as Traditional Chinese Medicine and Ayurveda. In the *jamu kunyit asam*, turmeric is one of the main components and gives the yellow color to that's herbal drink. In Asian countries especially Indonesian, turmeric

Table 1. The basic ingredients of *Jamu Kunyit Asam* and its benefits for dealing COVID-19 symptons and maintaining immune system

Plant name	Plant part	Main bioactive compounds	Pharmalogical activity
Curcuma longa	Rhizome	Curcumin (77%) [7]	Immunomodulator, anti-hypertension, anti-inflammatory
Alpinia galanga	Rhizome	1'S'-1'-acetoxychavicol and polysaccharides [13,14,15].	Immunomodulator
Citrus aurantifolia	Fruit juice	Vitamin C [17]	Anti-inflammatory, antioxidant

widely used as important spice, a natural food coloring, a supplement or medicine [11]. Turmeric contains chemical compounds such as carbohydrates (69.4%), proteins (6.3%), fats (5.1%), and minerals (3.5%); in the turmeric rhizome the main content is the curcuminoid component, namely curcumin (77%), demethoxycurcumin (17%) and bisdemethoxycurcumin (3%) [15].

Curcumin is the main component of turmeric and has been the most studied for its properties and activities. In COVID-19 patients in Indonesia, the main comorbidity found in patients is hypertension (50.5%) [14]. Curcumin can lower blood pressure by inhibiting the formation of angiotensin-converting enzyme (ACE), reducing the expression of angiotensin II receptor type 1, and regulating the renin-angiotensin-aldosterone system (RAAS) [20,24]. Curcumin has the ability as an immunomodulator through its interaction with various immunomodulators such as dendritic cells, macrophages, and B and T lymphocytes, as well as molecular components involved in the inflammatory process, such as interleukin 6 (IL-6) and tumor necrosis factor-alpha (TNF-α) [21]. In addition, curcumin also has anti-inflammatory properties by decreasing the release of proinflammatory cytokines TNF-α, IL-1β, and IL-6 by inhibiting the toll-like receptor (TLR4) and nuclear factor kappa beta (NF-kB) inflammatory signaling pathways, which are regulated by curcumin [5,22].

2) Alpinia galanga

In addition to turmeric, *Alpinia galanga* or galangal is the other main component of *jamu kunyit asam*. Just like turmeric, galangal in Indonesia is often used as an additional spice to add flavor to dishes. Galangal contains 1,8-cineole, *β*-bisabolene, polysaccharides, flavonoids such as kaempferol, kaempferide, galangin, alpine and 1'S'-1'-acetoxychavicol acetate which is the main compound that stings. These chemical compounds allow *Alpinia galanga* to have several activities such as anticancer, antitumor, anti-inflammatory, antimicrobial, anti-allergic, etc. [1,7,8].

Alpinia galanga can act as an immunomodulator by inhibiting the generation of reactive oxygen species (ROS) during the phagocytic phase of metabolism. Inhibition of *Alpinia galanga* extract on ROS release and phagocyte chemotaxis migration indicates that galangal can be a source of immunomodulatory agents [12].

The polysaccharide fraction in the galangal rhizome plays an active role in increasing immunity in the phagocytic and lymphocyte systems by increasing the blood's ability to eliminate carbon particles and increasing the number of spleen cells [6,8].

3) Citrus aurantifolia

Citrus aurantifolia, commonly known as lime, has been widely used as a sour taste enhancer in foods, one of which is *jamu*

kunyit asam. Besides providing a sour taste, lime also has a number of pharmacological properties, including antimicrobial, anticancer, antitumor, anti-inflammatory, anti-asthmatic, anti-allergic, antioxidant, etc. [13,19]. The pharmacological activity is due to the chemical content of lime, namely flavonoids, polysaccharides, lipids, vitamins (vitamin C, vitamin A, folic acid, vitamin K), limonene, β-pinene, β-terpinene, and citral [13]. Vitamin C contained in lime is quantitatively known to be 47.16 mg/ 100 ml [16], other sources found vitamin C content of 22.6 – 27.7 mg/ 100 mg lime extract [17]. When the body is infected with SARS-CoV-2, there will be a decrease in the level of the antiviral cytokine interferon. Vitamin C was able to increase interferon levels in animal model testing. Severe COVID-19 elicits characteristics such as increased inflammatory markers and a 'cytokine storm'. Vitamin C has anti-inflammatory and antioxidant properties by reducing IL-6 levels to overcome this phenomenon [21]. The content of vitamin C can also cause an immunomodulating effect through increasing natural killer cell activity, lymphocyte proliferation, chemotaxis, and also activating the function of T and B cells [18].

The current situation of COVID-19 causes challenges to find effective treatment and prevention. Consumption of *jamu kunyit asam* in Indonesia has been carried out for a long time and from generation to generation by utilizing herbal plants as the main ingredients. The plants used as the basic ingredients of *jamu kunyit asam* have active ingredients that have been widely studied for their pharmacological efficacy and safety. However, until now there has been no registered herbal treatment to treat and prevent COVID-19 in Indonesia. So far, herbal medicines have only been used to maintain the immune system so as to minimize the possibility of being exposed to COVID-19. The use of *jamu kunyit asam* for COVID-19 requires special attention because there have been no publications related to in-vitro or in-vivo testing regarding its efficacy and safety. In addition, the molecular mechanism of *jamu kunyit asam* as a whole is still not proven. The use of *jamu kunyit asam* and other herbal medicines requires caution, so it is not recommended to treat acute diseases and dangerous conditions due to viral infections without the permission of the treating doctor because the possibility that it can worsen the symptoms of the disease which can lead to a fatal condition.

4. CONCLUSION

One of the health drinks that has been used in Indonesia is *jamu kunyit asam* which is made from *Curcuma longa* rhizome, *Alpinia galanga* rhizome, and *Citrus aurantifolia* fruit juice. These essential ingredients have the benefit of boosting the human immune system to reduce the risk of contracting the virus. The use of *jamu kunyit asam* as a medicine to treat COVID-19 in Indonesia still needs a long way to go to test its effectiveness, safety, and molecular mechanisms. The promotion of herbal medicine such as *jamu kunyit asam* needs to be well communicated to the public.

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