



## Empon-Empon Increases Body Immunity During the Climacterium Period

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### ABSTRACT

The climacterium period including the elderly is a vulnerable group to the Covid-19 Virus. As a person ages, the body will experience various decreases in body functions due to the aging process which causes the immune system to be weak and more difficult to fight infections. As a result, the body will be more susceptible to diseases, including the Covid-19 virus. There is one way to prevent the transmission of COVID-19, by increasing endurance through the consumption of supplements and herbs such as empon-empon. This type of research is a quasi-experiment using a pre-post test one group design determined using Purposive sampling of 100 respondents with inclusion criteria: Mothers who experience climacterium age range over 40 years, healthy (not suffering from respiratory tract infections and allergies), and they are willing to consume empon-empon 2 times a day (1 sachet) for 30 days. This data is generated through observation sheets and analyzed using paired sample t-test. The paired sample t test results showed that the body immunity before the intervention had an average symptom (mean) of 1.40, the body immunity after the intervention of 15 days of average symptoms (mean) 0.24, after the intervention of 30 days the average (mean) 0.08. There was a decrease in symptoms before the intervention and after the 15-day intervention and after the 30-day intervention and there was a significant difference between the body immunity before and after the intervention, meaning that there was an effect on increasing endurance. From the results of this study, it is expected that people will often consume empon-empon to increase the body immunity.

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### INTRODUCTION

Covid-19 (coronavirus disease) is known through a mysterious disease that paralyzes Wuhan City, China. The tragedy at the end of 2019 continued until the Covid-19 virus spread throughout the world. WHO (World Health Organization) has designated it as a Public Health Emergency of International Concern (PHEIC) on January 30, 2020. The increase of Covid-19 cases took place quite quickly. On August 9, 2020, it was reported by worldwide that 19.824.060 people in the world were infected with Covid-19, 12.732.548 million people had recovered, and 729.910 people died. In Indonesia as of August 9, 2020 there were an additional 125.396 new cases, the total cases that occurred in Indonesia were 39.294 Covid-19 positive people, 1.646 people were declared cured, the total recovered patients

were recorded at 80.952 people, so the total became 5.723 death cases. In North Sulawesi Province on August 9, 2020, there were a total of 2.904 positive Covid-19 cases, there were around 1.618 patients declared cured and 140 people died. Details of cities/regencies in North Sulawesi and the highest number of cases are in Manado City. The climacterium period, including the elderly, is a vulnerable group to the Covid-19 Virus. As a person ages, the body will experience various decreases in body functions due to the aging process causing a weak immune system and more difficult to fight infections. As a result, the body will be more susceptible to diseases, including the Covid-19 virus. One way to prevent the transmission of COVID-19 is to increase endurance through the consumption of supplements and herbs such as empon-empon.

## METHODS

This type of research is a quasi-experiment using a pre-post test one group design determined using Purposive sampling of 100 respondents with inclusion criteria: Mothers who experience climacterium age range over 40 years, healthy (not suffering from respiratory tract infections and allergies), and they are willing to consume empon-empon 2 times a day (1 sachet) for 30 days. This data is generated through observation sheets and analyzed using paired sample t-test.

## RESULTS

**Table 1.**  
Distribution of Respondents by Age

Age	n	%
41	8	8
42	4	4
44	8	8
45	16	16
46	4	4
47	12	12
48	20	20
49	12	12
50	4	4
51	8	8
52	4	4
Total	100	100

Based on table 1, most respondents are 48 years old, which is 20%.

**Table 2. Variable distribution of immune system before intervention**

No	Symptom	Before intervention	
		N	%
1	Fever	12	12
2	Tired	68	68
3	Flu	16	16
4	Heartburn	4	4
5	No symptoms	0	0
	Total	100	100

**Table 5.**  
Differences in body resistance before the intervention and after the intervention.

No	Body immunity	Mean	St Deviation	95% Confidence Interval of the Difference		P value
				Upper	Lower	
1	Before the intervention	1.40	.569	1.29	1.51	0.000*
2	After the intervention 15 days	.24	.429	.15	.33	
3	After the intervention 30 days	.08	.273	.03	.13	

## DISCUSSION

Based on the results of the study of frequency distribution of the frequency distribution of body immunity before the intervention 100% of respondents were symptomatic, then the most symptoms were fatigue 68%. After the 15-day intervention there was an increase in body

immunity marked by respondents there were no symptoms 80 respondents (80%) while no one had symptoms of fatigue, flu symptoms there were 8 respondents (8%), stomach heartburn there were 12 respondents (12%). After the 30-day intervention, there was an increase in body immunity, marked by respondents there were no symptoms 92 respondents (92%), heartburn stomach symptoms 8

**Table 2.** The frequency distribution of the body's immune variables before the intervention mostly with fatigue symptoms, 68 respondents (68%). Body immune after 15-day intervention

No	Symptom	After intervention	
		n	%
1	Fever	0	0
2	Tired	0	0
3	Flu	8	8
4	Heartburn	12	12
5	No symptoms	80	80
	Total	100	100

Table 3. The distribution of immune frequency after the 15-day intervention was mostly asymptomatic, 80 respondents (80%), while those who experienced heartburn were 12 respondents (12%).

**Table 3. Frequency distribution of immunity after the 15-day intervention**

No	Symptom	After intervention	
		n	%
1	Fever	0	0
2	Tired	0	0
3	Flu	0	0
4	Heartburn	8	8
5	No symptoms	92	92
	Total	100	100

Table 4. Distribution of the frequency of body immunity after the 30-day intervention there was a significant increase in no symptoms, 92 respondents (92%).

Table 5. Illustrating that there was a decrease in respondents' symptoms on average (mean) before the intervention 1.40 and after the intervention 15 days average (mean) 0.24, after the intervention 30 days average (mean) 0.08, the value  $p = < \alpha$ , which is  $0.000 p < 0.05$  and these results showed a significant difference between symptoms before and after the intervention.

respondents (8%). The increase in body immunity was characterized by a reduction in symptoms felt by respondents, the average (mean) before the intervention 1.40 and after the 15-day intervention average (mean) 0.24, after the intervention 30 days average (mean) 0.08, then obtained  $p$  value =  $< \alpha$ , which is  $0.000 p < 0.05$  and these results showed a significant difference between the body immunity before and after the intervention.

This research is in line with research conducted by Handriatni, A. In 2020 that empon-empon plants contain lots of curcumin compounds, essential oils that are antioxidants that are useful for the body to protect cells from free radical damage, can increase stamina when consumed as herbal drinks. Body resistance or immunity by consuming herbal drinks derived from empon-empon plants or plant findings.

To get these ingredients, you can do farming at home with your family. The government has launched work from home since the Covid 19 pandemic, before the new normal was enforced. To overcome boredom at home for months, Farm From Home is the right choice to make farming with family very fun.

This study is in line with research conducted by Thevarajan, et al in 2020 showing that there was an increase in immunoglobulin G (IgG), immunoglobulin M (IgM), helper T cells, killer T cells and B cells in COVID-19 patients. Various ways can be done to increase body immunity including adequate rest, frequent exercise, reducing stress, sunbathing and maintaining a healthy diet. It can also be by consuming supplements and herbs such as empon-empon.

This study is also in line with research conducted by Tedjo, A. et al in 2021, namely SARS-CoV-2 is thought to occur through memory cellular responses by specific T lymphocyte activity. However, most Coronavirus disease-19 (Covid-19) patients have a decreased number of T lymphocytes or lymphopenia. Agents that help maintain T cell counts such as Curcumin appear to have played an important role during the Covid-19 pandemic. Curcumin is known to provide a balance between T cell effectiveness and T cell autoaggressiveness, as well as restoring memory T cell function as observed in tumor-induced mice. A mixture of 4 herbal extracts commonly used as herbal medicines, namely ginger, lemongrass, and turmeric is thought to have the same effect as curcumin. This is known from searching the database of plant protein compounds which shows that not many compounds other than curcumin can modulate T cells. It is necessary to study the role of curcumin and a mixture of 4 herbs in modulating T cells in cases of SARS-Cov-2 antigen infection.

According to a global study published in the Journal of Traditional and Complementary Medicine in 2018, titled "Herbal beverages: Bioactive compounds and their role in disease risk reduction – A review" or "Herbal drinks: Bioactive compounds and their role in reducing disease risk – Review" conducted by Anoma Chandrasekaraa and Fereidoon Shahidib, herbal drinks are made from natural ingredients derived from plants, leaves, roots, stems, fruits, and flowers. The efficacy of rhizome plants to relieve various symptoms of various diseases or increase body resistance has been believed for generations in Indonesia. Reporting from Kompas.com, Prof. Dr. Ir. Murdijati Gardjito, Professor of Food Science and Technology Universitas Gadjah Mada, explained that empon-empon has the basic name of empu. Empon-empon is a term used to name plant parts that are rich in compounds. This means, empon-empon is not the name of one type of plant, but is a group of plants that can form deposits of compounds. According to Murdijati Gardjito, plants that can form masters are plants that have

rhizoma, namely ginger, comedy, turmeric, kencur, sunti, and white temulawak. In a book by Y.T Prasetyo entitled 'Instan: Jahe, Turmeric, Kencur, Temulawak' published by Publisher Kanisius in 2003, it is explained, that the four types of empon-empon that are popular in Indonesian society are ginger, turmeric, kencur and temulawak. Each of these plants has characteristics and benefits; Ginger is a rhizome plant that is very popular as a spice and medicinal ingredient. The rhizome is finger-shaped bulging in the middle segments. The dominant spicy taste in ginger is caused by a ketone compound called zingeron. There are several types of ginger that are popular in the market, namely red ginger, yellow ginger, and rhino/elephant ginger. The most often used as a basic ingredient of pharmaceuticals and herbs, is red ginger. Because this kind of ginger has a high essential oil content and the most spicy taste, so it is suitable for pharmaceutical and herbal medicine. The size of the rhizome is the smallest with red skin with larger fibers than ordinary ginger. Turmeric is a spice commonly used in cuisine in Asian countries. For example, it is used as a seasoning in dishes of a type of goulash or curry, and is also used to give yellow color to dishes or as a preservative. The main ingredient of turmeric is curcumin and essential oil which serves for the treatment of hepatitis, antioxidants, digestive disorders, anti-microbial, anti-cholesterol, anti-HIV, anti-tumor. Indonesian turmeric contains compounds with medicinal properties, called curcuminoids. These curcuminoid compounds, consisting of curcumin, desmetoxicumin as much as 10%, bisdesmetoxicurcumin as much as 1-5% and other beneficial substances such as essential oils. Turmeric also contains fat as much as 1-3%, carbohydrates as much as 3%, protein 30%, starch 8%, vitamin C 45-55%, and mineral salts, namely iron, phosphorus, and calcium. Kencur (*Kaempferia galanga* L.) is one type of empon-empon belonging to the tribe of findings (*Zingiberaceae*). Originally from Indonesia, especially Java, then spread to several places in the biogeographic region of Malaysia. Currently, most of the cultivation of temulawak is in Indonesia, Malaysia, Thailand, and the Philippines. In Indonesia, temulawak is used as an ingredient in making godog jamu. This rhizome contains 48-59.64% of powdery matter; 1.6-2.2% curcumin; and 1.48-1.63% essential oils. Temulawak is believed to improve kidney work and anti-inflammatory. Other benefits are as an acne medicine, increase appetite, anticholesterol, anti-inflammatory, anemia, antioxidant, cancer prevention, and antimicrobial. *Cymbopogon citratus*, commonly known as lemongrass or grass oil, is actually a tropical plant native to tropical Asia mostly from southern India and Sri Lanka. Lemongrass that can increase the body immunity. According to Memorial Sloan Kettering Cancer Center, the two main compounds in lemongrass, citral and geranial, have anti-inflammatory benefits. Brown sugar or gula jawa is a natural sweetener that is quite popular in Indonesia. This natural sweetener made from coconut sap is often used in various snacks or drinks. Some of the ingredients contained in brown sugar include: iron, potassium, vitamin C, magnesium, and phosphorus. The benefits of brown sugar that the body can get because brown sugar provides small amounts of phytonutrients, such as polyphenols, flavonoids and anthocyanidins, and antioxidants. These phytonutrients can make the body more energetic, fight cancer cells and increase immunity. In addition, brown sugar has a relatively low glycemic index, which is about 54. While the glycemic index is fairly high when it is at 70. Brown coconut sugar also contains nutrients that are not found in white sugar. Brown sugar contains vitamins and amino acids, so brown sugar is more useful and safe when compared to granulated sugar.

The benefits of brown sugar or the benefits of java sugar that are useful for the body, including: launching menstruation is believed to facilitate blood circulation in the body so as to make the menstrual cycle normal. In fact, brown sugar is also believed to be able to relieve cramps when menstruation comes. Prevents anemia, brown sugar has a rich content of iron and folate. Both of these ingredients are effective in preventing anemia. Overcoming flu and cough, brown sugar is also very rich in antioxidants that can make the body more immune to free radicals. In the end, the benefits of brown sugar that can be felt are as a healing therapy for flu, cough, and fever. Losing weight with high potassium levels, the benefits of Java sugar that can be obtained are improving metabolic processes, helping to remove toxins and maintaining electrolyte balance in the body. Another benefit of brown sugar is its ability to fight the effects of free radicals. It has a high antioxidant content, especially selenium which helps prevent various effects of free radicals. Overcoming fatigue contains folate and iron in high amounts, the benefits of Java sugar that can be felt are to prevent fatigue and also weakness which is a common symptom of anemia. Increase hemoglobin, another important benefit of Java sugar is to strengthen the immune system and increase hemoglobin count. If both things are maintained in good condition, diseases caused by blood disorders can be avoided. Preventing nervous system disorders by consuming brown sugar can help the nervous system function. In addition, brown sugar also helps prevent major problems related to the nervous system. Improve digestive function, consuming brown sugar will improve the digestive system in the body and help its function to remain optimal. Regular consumption of brown sugar can help prevent respiratory problems such as bronchitis and asthma. In addition, brown sugar also contains certain properties that help in regulating temperature. The source of energy of Java sugar is a complex carbohydrate food that will provide energy to the body for a longer time, but it will not make blood sugar levels rise. Phytochemical Screening Test Results of empon-empon 15 gr qualitatively contain: Tannins 2.6331, Flavonoids 12.9162, Phenolics 6.2297

## CONCLUSION

The body immunity before the intervention symptoms averaged (mean) 1.40. Body immunity after the 15-day intervention had mean 0.24, after the 30-day intervention the mean was 0.08. There was a decrease in symptoms before the intervention and after the 15-day intervention and after the 30-day intervention. There is a significant difference between the body immunity before and after the intervention, meaning that there is an effect on increasing the body immunity.

## Suggestion

It is expected that people will consume empon-empon more often to increase body immunity.

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