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INFLUENCE OF CONSUMING GEDI LEAF DECOCTION (*Abelmoschus Manihot*) TO THE LEUCOSIT INCREASING IN INFECTION CONTROLLING

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ABSTRACT

Infection was body invasion by microorganism which did poliferasi in the body tissue. In the nursing dictionary it stated that infection was invasion and multiplication of microorganism inside the body tissue, especially that caused local cellular injury caused by competitive metabolism, toxin, intracellular replication, or antigen-antibody reaction.

This used *"Quasy experiment design with pre-post testcontrol group"* aimed to know whether there was any influence of consuming gedi leaf (*Abelmoschus manihot*) to the leucosit increasing in infection controlling. Sample of this research were 12 persons who got infection in Gosoma Village Tbelo Sub district North Halmahera Regency. From 12 respondents, it divided into two groups, 6 respondents for intervention group and 6 respondents for control group.

Data was analyzed by using T-test with means degree $p=0,05$. The research result showed that consuming gedi leaf decoction at the intervention group was give influence with significant value $p=0,001$. Whereas the control group which wasn't influenced had significant value $p=0,332$.

From the result, it could be concluded that gedi leaf wasn't only functioned as delicious food, but also as treatment means for some diseases such as problem of kidney, stomach disorder, and reduced cholesterol, diabetes, etc because the compounds inside gedi leaf had pharmacologic effect.

INTRODUCTION

According to WHO (*World Health Organization),* infection was disease that often against the body caused by pathogen microbes and was very dynamic. For example, infection of respiratory and sistitis and also other infections. There were 8,3 billion cases reported per year. Infection was often met in female than male. Indonesia was the big fourth in the world after China, India, and United Stated America. The sufferers of infection in Indonesia were estimated around 222 billion persons. (Safitri, 2013)

Infection and it's prevalence in Indonesia was still high enough. According to estimation from Health Department of Republic Indonesia, number of infection sufferers in Indonesia were 90-100 cases per 100.000 population per year, or around 180.000 new cases per year (Depkes RI, 2014).

Number of sufferers in Tobelo Clinic were registered 80% from number of population, with any infections such as ISPA,ISK, ulkus DM, and also aother infections. (Tobelo Clinic, 2015).

Infection was the entry and growth of infection agent into someone's body or animal. At the infection that "manifest", the people who got infection seemed at their physical sick. At the infection that "non manifest", there was no physical indication or sign. So, don't make it confused between infection and disease. (Health dictionary).

Occurring of infection was influenced by some factors that related in infection chain. Microorganism which was able to cause infection called *pathogen* (infection agent), whereas microorganism which wasn't able to caused disease/damage called *asimtomatik.* Disease occurred if pathogen was proliferating and caused the change in normal tissue.

Infection was invasion and multiplication of microorganism in the body tissue, especially that cause local cellular injury that caused by competitive metabolism, toxin, intracellular replication or antigen-antibody reaction, the infection caused the increasing of leucosit in the body. (Potter & Perry,2005).

Normal number of leucosit was 5.000-10.000 sel/mm3, if the number was more that 10.000, this condition called leukositosis, if it less than 5000 called leukopenia. There were two kinds of leukosit agranula: small cell limfosit, few of sitoplasma. Big cell monosit contained more sitoplasma. There were three kinds of leukosit granula, Neutrofil, Basofil, and eusinofil (Efendi, 2003 and Wilson, 2006).

Group of traditional ethnic in Indonesia had clear characteristics and self identities, so it assumed that the society's perception and conception toward the biological source in the environment was different, included in utilizing plants as traditional medicine. (Rifai, 1998)

Gedi plant was known by the society of North Sulawesi as vegetable plant which mixed in special food of Manado called manado porridge (Tinutuan). Gedi leaf consisted of two kinds, red Gedi (*Abelmoschus manihot)* that used for caring some diseases such as kidney, stomach disorder, and reducing cholesterol, and green Gedi *(Abelmoschus esculentus)* that used as vegetable (Mamahit and Soekamto, 2010).

Red Gedi leaf (*Abelmoschus manihot*) contained secudary metabolite of flavonoid (722,5 mg/Kg). This was appropriate with identification of Gedi leaf compounds, that flavonoid degree found in gedi leaf extract got by using maserasi method was high. Flavonoid in vegetable was secondary metabolite that used for health and played as antioxidant.

South, et.all (2013) examined the activities of anti-inflammatory from *Proteleum ether* extract and metanol extract of *Abelmoschus manihot* stem by using "*paw edema model*". The result showed that Gedi leaf (*Abelmochus manihot*) had compounds of anti-inflammatory and anti–microbial (Todarwal,et al.2010).

Gedi leaf (*Abelmoschus manihot*), widely, used for controlling fertility, depression, and anxiousness in China traditional treatment and had therapy potential, that gave benefit for *cardiovaskular* disease coupled with *Diabetes melitus*. (Jain and Bari, 2010).

METHODS

Research design was reference for researcher to examine the relationship among variables in a research and was an umbrella to answer the research or examine the validity of hypothesis. This research was quantitative research by using design of *Quasy experiment design with pre-post test control group* (Notoatmodjo,2007).

This research was aimed to analyze the influence of Gedi leaf (*Abelmoschus manihot*) to the leucosit increasing in infection controlling in Gosoma Village Tobelo Sub district North Halmahera regency. Intervention group in this research was sufferers of infection who would get intervention of gicing consumption of Gedi leaf decoction. At the intervention group, laboratory checkup (*pre - post test*) was done by giving Gedi leaf decoction, whereas at the control group, laboratory checkup (*pre - post test*) was done without

given the gedi leaf decoction and only got health education about infection

Research design viewed as follow:

Pretest	Treatment	Posttest	
O_1	x	O_3	**Intervention Group**
O_2		O_4	**Control Group**

Explanation :

O_1 = Measurement result of leucosit degree before being given Gedi leaf decoction at intervention group (experiment).

O_2 = Measurement result of leucosit degree before being given health education at control group (experiment).

X = Intervension (treatment) of giving gedi leaf decoction.

O_3 = Measurement result of leucosit degree after being given Gedi leaf decoction at intervention group (experiment).

O_4 = Measurement result of leucosit degree after being given health education at control group (experiment).

SAMPLE

Sample was part or all of population numbers used in a research. Sample of this research were 12 sufferers of infection in Gosoma Village Tobelo Sub district. Method of sampling was done by getting all population members became the sample. This method was done if the number of population was small, as if the sample were less than 30 so that all population members were taken as research sample. Other term of saturated sample was census, where all of the population members were taken as sample. (Hidayat, 2007).

A. **Inclusion Criteria**

Inclusion criteria was criteria or standard determined before the research conducted. Inclusion criteria was used to determine whether someone coul be participated in the research or whether individual research could be included systematically (Health Dictionary, 2013). Inclusion criteria in this research are:

1. Patients who got infection
2. Patients who were not consuming any medicine
3. Patients who were willing to be examined.

B. **Exclusion criteria**

Exclusion criteria or exception criteria was criteria that decided before the research conducted. Exclusion criteria were used to determine whether someone must participate in the research or whether individual research must be in systematic review (Health Dictionary, 2013). Exclusion criteria in this research are:

1. Patients with awareness lowering
2. Respondents who weren't willing to consume gedi leaf
3. Respondents who weren't willing to sign agreement sheet to be respondent.

RESEARCH PROCEDURE

Infection sufferers that were willing to be respondents were measured their leucosit degree (*pre test* of leucosit degree measurement) then given the treatment at experiment group during one week by giving gedi leaf decoction to be consumed every morning and evening.

Infection sufferers, who disobeyed to consume gedi leaf because one and other factors, couldn't be included in this research for the next stage. Giving of gedi leaf decoction for experiment group was done during one week. One day after one week, the second checkup of leucosit was done for both groups (*post test* of leucosit degree measurement).

a. **Experiment Group**

1. Researcher assured the respondents who would be given intervention procedure and introduced self to the respondents.
2. Researcher gave explanation to the respondents about the signification, objective, benefit of giving gedi leaf decoction for the respondent and time of implementation, and procedure of giving gedi leaf.
3. Giving opportunity to the respondents to ask questions and gave *informed consent,* asked signatures as agreement proof for the respondents who wer willing to include in research activities.
4. Researcher did research of laboratory checkup, *pre-post* of leucosit checkup and gave the gedi leaf decoction.

b. **Control Group**

Respondents of control group only got laboratory checkup, *pre-post test* of leucosit checkup and health education about infection, without giving gedi leaf decoction.

RESULTS

The research was conducted in Gosoma Village on June until July 2016. The sufferers with leucosit increasing were 15 persons. At the research time, the sufferers were at the ages of 30 to 60 years old. Whereas, they who fulfilled the inclusion criteria were 12 persons.

After the data collected, data investigation and processing were done, then the researcher would display univariat data analysis (respondents demography data) and bivariat analysis (analyzing the influence between independent and dependent variables by using T-test).

At the univariat analysis, respondents' distribution based on gender, the most respondents were female, 7 persons with percentage of (58,3%), whereas the lowest respondents were male, 5 persons with percentage of (41,6%). Based on the ages, the most respondents were respondents with the age <35 years old, 7 persons with percentage of (58,3%), whereas the lowest were respondents with the age of 35-65 years old, 5 persons with percentage of (41,6 %). Respondents' characteristic based on the education level were: SMA level were 6 persons with percentage of (50%), wher4eas the lowest respondent were S1/College level, 1 person with percentage of (8,3%).

At the bivariat analysis, got the *pretest-posttest* result of laboratory checked up of experiment and control groups, as viewed in the following tables:

Table 1. Result of Laboratory Check Up at Control Group

No. Resp	Result of Laboratory Check Up	
	Pre-Test	Post-Test
1	11000(/µl)	7000 (/µl)
2	10000(/µl)	8000(/µl)
3	12000(/µl)	12000(/µl)
4	11000(/µl)	14000(/µl)
5	10000(/µl)	11000(/µl)
6	13000(/µl)	15000(/µl)

Table 2. Result of Laboratory Check Up at Experiment Group

No. Resp	Result of Laboratory Check Up	
	Pre-Test	Post-Test
1	11000(/ul)	7000 (m)
2	10000(/ul)	8000(/ul)
3	12000(/ul)	12000(/ul)
4	11000(/ul)	14000(/ul)
5	10000(/ul)	11000(/ul)
6	13000(/ul)	15000(/ul)

Table 3. Bivariat Analysis of Experiment Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pre_test - pos_test	3.1673	983.192	401.386	2134.870	4198.463	7.889	5	.001

Table 4. Justification of T-Test Result of Experiment Group

Nilai normal			Hasil uji T-test			P value
α (Tingkat kemaknaan) < 0,05	T Hitung > t tabel	T Tabel < t hitung	α 0,00 1	T Hitung 7,889	T - tabel 2,160	Hasil uji T-test nilai α < 0,05 (0,001) dan berdasarkan perbandingan t hitung dengan t tabel : (angka t hitung) > statistik Tabel (T-tabel), maka Ho ditolak dan Ha di terima artinya terdapat pengaruh yang signifikan konsumsi air rebusan daun gedi terhadap peningkatan leukosit pada pengendalian infeksi

Ho diterima dan Ha ditolak artinya tidak terdapat pengaruh yang signifikan pada kelompok kontrol.

Table 5. Justification of T-Test result of Control Group

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pre_test - pos_test	-1.0003	2280.351	930.949	-3393.081	1393.081	-1.074	5	.332

Based on the statistical test by using T-test and T-table, at the experiment/intervention group, known that value of T-counting = 7,889 whereas the T-table hadn't known. Therefore in order to determine value of T-table was as follow: df (degree of freedom) or numb degree was found with formula of (df =n-k) ; two sides/0,025 means (n= number of respondent and k = 1) so by observing T-table (df = n-k (6-1=5); two sides/0,025) =2.160.

At the control group, t-counting = -1,074 with significant value = 0,332, meant could be concluded that there was no influence of leucosit degree reduction at the control group. This was showed from significant value (0,332>0,05) and T-counting (-1,074)< T-table (2,160), that meant zero hypothesis (Ho) was accepted.

DISCUSSION

Compound inside gedi leaf *(Abelmoschus manihot)* contained secondary metabolite that was flavonoid (722,5 mg/Kg). This was appropriate with research result that flavonoid degree of red gedi leaf extract that found by doing maserasi was high. Flavonoid at vegetable was secondary metabolite that used for health and played role as antioxidant. The research result of South et.al. (2013).

Gedi plant *(Abelmoschus manihot)* was annual plant that had standing stem with 1,2-1,8 height. Mucilage content of that plant consisted of polisakarida dan protein. This plant contained quercetin-3-robinobiosid, hyperin, isoquercetin gossipetin-8-0-glukuronid, and myricetin. According to (Liu at al, 2006), gedi plant was also able to increase filtering function of glomerular, reduce proteinuria, hyperplasia, that could reduce kidney's damage. Flavonoid compound was one of the biggest of biological phenol cluster that contained in all plants with vessel. Based on it's structure, flavonoid was derivative of flavon main compound which had numbers of similar characteristics. (Shao-Yu et al., 2006).

Some compounds contained in gedi leaf *(Abelmoschus manihot)* was Alkaloin, that was compound with alkali characteristic, that was able to neutralize acid inside the body. Tannin was polifenol compound that could care infection, terpenoid, and used as antioxidant. Saponin was used to add deliciously and natural thickening material. Flavonoid was anti infection substance that also enforced blood capillary. Polofenol was used as hearth health and protected the body from free radical.

Serotonin was as anti depressed. Vitamin A, beta-carotene was very needed for eyes health and growth and for mucous health of intestine. Vitamin C was very useful in preventing infection, bones forming, activated respiration cell and blood vessel.

Gedi leaf also contained some kinds of secondary metabolite such as [1] Hibifolin, [2] Stigmasterol, [3] Sitosterol, [4] Mirisetin, [5] Kanabistrin, [6] Mirisetin 3-O-beta-D- gukopironisida, [7] Asam 2,4-Dihidrokxi benzoat, [8] asam maleik, [9] Quersetin, [10] guanosin, dan [11] adenosin 37. (Source : Todawal, *et al.,* 2011).

Table 6. Content and compound of gedi leaf (*Abelmoschus manihot*)

Compound	Content (%)
2,6,10-Trimethyl, 14-Ethilene-14-Pentadene	1,97
Hexadecanoic Acid	12,26
8-Hexadecanoic acid	2,97
(21)-3,7,11,15-Tetramethyl—2-Hexadocen-1-01	4,96
9,12—octa decadienoic acid, ethyl ester	1,13
1-Cyelododecyne	1,23
(9E,12E)-9-12-octadecadienoic Acid	31,64
2-Hidroxy-(Hidroxy methyl)ethyl Plamitate	4,57
Oleile Acid	3,95
z-z-10-12-1 exadecadien-1-01 Acetat	4,58
(6E,10E,14E,18E)-2,6,10,15,19,23-haxamethyl-2,6,10,14,18,22-tetracosahexaene	4,95
(24,zeta)-24-methil-24-Homoeholestanol	1,35
28,33-dinorgorgosta-5,7-dien-3-ol,(3beta,22R)	3,66

Based on that case, it could concluded that there was influence of consuming gedi leaf decoction toward the increasing of leucosit in controlling infection in Gasoma village Tobelo Sub district of experiment/intervention groups. That also could be seen at the statistical result of SPSS 23 by using T test where significant value of α= 0,001 that meant less that significant limit (α = 0,05) or T-counting value (7,889)>T-table (2,160) so Ho rejected and Ha accepted.

CONCLUSION

Gedi leaf *(Abelmoschus manihot)* was not only used as special vegetable, but this leaf also saved any special quality for health. Beside keeping health, gedi leaf *(Abelmoschus manihot)* also could help to overcome any diseases because it had anti inflammatory, antibacterial, antiviral, antioxidant, and could eliminate free radical (Business News, 2010). Gedi leaf also had more protein than spinach.

Gedi leaf (*Abelmoschus manihot*) was also functioned as hearth attack prevention because Gedi leaf contained flavonoid component that could reduce the risk of hearth attack. By consuming gedi leaf, it would reduce the high blood pressure became normal and reduce cholesterol degree. Besides that, gedi leaf also could enforce capillary's wall. ITIS Report. (2010)

It could be concluded that there was any influence of consuming gedi leaf decoction toward the increasing of leucosit in controlling the infection. So that, gedi leaf decoction could normalize leucosit at the sufferer of infection.

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