International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

https://gssrr.org/index.php/JournalOfBasicAndApplied/index

Correlations of Characteristics, Knowledge, and Attitude with the Use of Registered Herbal Medicine by People in East Lombok

Hurip Pratomo[a*], Sudibyo Supardi[b], Inggit Winarni[c], Sri Utami[d], Faqih Dwi Kurniawan[e]

[a,c,d] *Study Program of Biology, Faculty of Science and Technology. Universitas Terbuka*

[b] *Professor, Research Center for Raw Materials for Traditional Medicine and Traditional Medicine, Research Organization for Health, Indonesian National Research and Innovation Agency*

[e] *Student of Study Program of Biology, Faculty of Science and Technology. Universitas Terbuka*

[a] *Email: hurip@ecampus.ut.ac.id,* [b] *Email: sudibyosupardi@gmail.com,* [c] *Email: inggit@ecampus.ut.ac.id*

[d] *Email: sri-utami@ecampus.ut.ac.id,* [e] *Email: faqihdwikurniawan@gmail.com*

Universitas Terbuka, Jl. Cabe Raya, Pondok Cabe, Tangerang 15418. Indonesia

Telp. +6221-7490941 ext 1809, Fax: +6221-7434691.

Abstract

It has been conducted a number of studies on the use of herbal medicine (traditional medicine) in some areas based on the Basic Research for Health in Indonesia, however, there are a number of areas without any studies on the use of registered herbal medicine, among other is East Lombok. This research aims to: 1). Describe the characteristics of people using the herbal medicine; 2). Describe the knowledge of the people on the herbal medicine; 3). Describe the attitude of the people on the herbal medicine; 4). Describe the use of registered herbal medicine in the society; 5). Describe the correlations of characteristic and the use of registered herbal medicine; 6). Describe the correlations of knowledge, attitude, and the use of registered herbal medicine. The research conclusions are: 1).

Received: 9/2/2023
Accepted: 10/7/2023
Published: 11/4/2023

---

* Corresponding author.

There is more than of 95% of the respondents having knowledge on herbal medicine but there is still people having lack information on the registered herbal medicine which must include the expiry date, 2) The biggest percentage of the respondents' attitude agree to the statement that there is little side effect of the herbal medicine than the medicine and the use of herbal medicine is safer than medicine, 3) the respondents using registered herbal medicine is 31.2% than the use of herbal medicine in general. The biggest percentage of the respondents using registered herbal medicine is in the form of powder (43.3%) by boiling the traditional medicine in advance (56.3%), 4) The biggest percentage of the registered herbal medicine users is in the range of pre-elderly age, men, married, having advanced education (more than senior high school level), having occupation and living in the district areas, 6) There is no correlation of the age, gender, marital status, education, occupation, location of residence ial and the use of registered herbal medicine, 6) There is no meaningfull correlation of knowledge and the use of registered herbal medicine, also there is no meaningfull correlation of attitude and the use of registered herbal medicine.

Keywords: Registered herbal medicine; East Lombok.

1.Introduction

Traditional medicine is materials or ingredients derived from plants, animals, minerals, extracts, or mixtures of these materials that have been used for generations for treatment, and can be applied in accordance with accepted norms in the community [1]. One of the objectives of Indonesia's national traditional medicine policy is to encourage the availability of traditional medicines that are assured of quality, efficacy and safety, scientifically tested and widely used both for self-medication and in formal health services [2].

The production of traditional medicines can only be performed by the traditional medicine industry (TMI) and small traditional medicine businesses (STMB) that are licensed by the Ministry of Health of Indonesia [3]. One example of the use of medicinal plants for the manufacture of registered herbal is *Eurycoma longifolia* or known as pasak bumi.

The decoction of its root powder is used as a male stamina freshener, which is included in a number of registered herbal medicine, because after consuming it for several days based on pre-clinical trials, the findings include: 1). Increase libido [4], 2). Improve semen and spermatozoa quality [5], 3). Increase the activity of LH hormone producing cells [6], 4). Stabilize the activity of FSH hormone producing cells [7], 5). Increase androgen levels [8], 6). Does not cause effects on blood sugar, cholesterol, and uric acid levels within 6 consecutive days of use [9], 7). Increase the formation of mature spermatids in seminiferous tubules [10].

The increasing trend of traditional medicine trade and use leads to the interest of the modern medicine industry to produce the herbal medicine or traditional medicine [11]. There is an increasing use of traditional medicine (registered or industrial made of and non-industrial made of traditional medicine) in the effort of self-medicine namely from 15.2% to 38.3% in the period of recent years in Indonesia [12].

Studies on the use of herbal medicine have been conducted in some areas based on the Basic Research for Health [13], but there are some areas with no studies on the use of registered herbal medicine, among other East

Lombok. Meanwhile, it is known that most of East Lombok people is from indigenous population from the descent of Sasak tribe and also migrants who commonly consume herbal medicine. Based on the some mentioned issues, then it is described the extent of use of registered herbal medicine and characteristics of the society using it in East Lombok, particularly in Selong subdistrict, including 1. Description of residents who used herbal medicine at the time of the study, 2. Description of residents' knowledge of herbal medicine, 3. Description of residents' attitudes towards herbal medicine, 4. Description of the use of registered herbal medicine in the community, 5. Correlation of characteristics and the use of registered herbal medicine, 6. Correlation of knowledge, attitude and the use of registered herbal medicine.

The objectives of the study are: 1. to describe the characteristics of the people who use herbal medicine; 2. to describe the knowledge of the people about herbal medicine; 3. to describe the attitude of the people towards herbal medicine; 4. to describe the use of registered herbal medicine in the community; 5. to describe the relationship between characteristics and the use of registered herbal medicine; 6. to describe the relationship between knowledge, attitude and the use of registered herbal medicine. The benefit of the study is as important information that encourages the increasing use of registered herbal medicine in circulation. So it can increase the production of natural ingredients for making herbal medicine, cultivation of medicinal plants, testing, processing, and marketing.

2. Method

2.1 Research Location and Time periode

The research was conducted in East Lombok Indonesia, especially in Selong sub-district, in 2023, from March to September 2023, the samples were based on Random Purposive Sampling. Selong sub-district was chosen because this sub-district is relatively large and populated, there are a number of villages and sub-districts, as well as housing, and there are offices of the government of East Lombok Regency.

2.2 Basic Concept of health behavior theory

The correlation of knowledge, attitude and the use of registered herbal medicine is the basis of health behavior theory. According to Green, and his colleagues health behavior can be seen as a function of the collective effects of 3 factors, namely (a) predisposing factors including knowledge, attitudes, and perceptions, (b) enabling factors including the state of health and affordability related to the cost / distance to obtain herbal medicine, and (c) reinforcing factors including social environmental support. Factors associated with the use of herbal medicine are age, gender, marital status, education, occupation and location of residence [14].

2.3 Hypotheses

Based on this concept, the following hypotheses were formulated: 1. There is a significant correlation of between age, gender, marital status, education, occupation, residence location and the use of registered herbal medicine. 2. There is a significant correlation of knowledge, attitude, and the use of registered herbal medicine.

2.4 Population and Samples

The study population was the adult population in Selong Subdistrict, East Lombok. The samples were the residents in the research location who consumed registered herbal medicine / traditional medicine within the last month. The sample inclusion criteria were adults in 17 years old and over. The sample exclusion criteria in this study were illiterate residents, hearing impaired or having difficulty communicating in writing.

2.5 Research Ethics

The research was conducted by considering ethical principles, so that the research could be carried out properly. Each respondent was given an informed consent form to maintain the ethical principles of the research.

2.6 Data Collection and Processing

Data collection activities were carried out through guided interviews by questionnaires to measure variables of respondents' characteristics, knowledge, attitudes and use of registered herbal medicine. Data processing was carried out using the SPSS 19 computer program, in the following orders namely editing, coding, data entry and cleaning. If the data is considered correct, it can be analyzed using SPSS 19 statistical software.

2.7 Data Analysis

Data analysis in the study was carried out in the following stages: Univariate analysis was used to present data in the form of frequency distribution, measure of the spread and mean values. The purpose of univariate analysis was to describe the characteristics, knowledge and use of registered herbal medicine. Furthermore, Bivariate Analysis was conducted to examine the correlation of people characteristics and knowledge of registered herbal medicine, as well as the correlation of knowledge and use of registered herbal medicine using the Chi Square non-parametric statistical test. To determine the results of statistical calculations, the accuracy limit with probability (0.05) was used. If the p value is <0.05 then Ho is rejected, meaning that there is a significant influence between the independent variable and the dependent variable [15].

3. Results and Discussion

3.1 Frequency Distribution of Respondents' Characteristic

Table 1: Frequency Distribution of Respondents' Characteristic in Selong Subdistric, East Lombok, 2023.

Variables	Total	Percentage (%)
Age		
Non-elderly (before 60 years old)	50	50
Elderly (60 years old and over)	42	42
Gender		
Female	57	59,4
Men	39	40,6
Marital Status		
Yet married	12	12,5
Married	70	72,0
Divorce	14	14,6
Education		
Elementary school graduates	19	19,8
Junior high graduates	11	11,5
Senior high graduates	46	47,9
University graduates	20	20,8
Occupation		
Civil servants	2	2,1
Private employees	13	13,5
Labors / farmers / traders	36	37,5
Entrepreneurs	23	24
Housewives / no occupation	22	22,9
Location of residence		
Urban	55	57,3
Village	41	42,7
Total	96	100,0

Table.1 shows that the largest percentage of respondents using herbal medicine are non-elderly (0), female (59.4%), married (72.0%), graduated from high school (47.9%), laborer/farmer/trader (37.5%), urban residence (57.3%).

3.2 Respondents' Knowledge on Herbal Medicine

Table 2 shows that more than 95% of the respondents have knowledge on the herbal medicine, but there is is still lack information that the registered herbal medicine must present the expiry date.

Table 2: Frequency Distribution of Respondents Knowledge on Registered Herbal medicine in Selong Subdistrict East Lombok, 2023.

Statements on herbal medicine	Knowledge on herbal medicine	
	% Correct	% Incorrect
Herbal medicine is from plants, animals and mineral		
Herbal medicine includes registered herbal medicine, concoctions and self-making	99,0	99,0
Herbal medicine includes oral medicine and external medicine	97,9	97,9
Herbal medicine used for medication for illness and maintaining health	99,0	99,0
Registered herbal medicine must have registration number from National Agency of Drug and Food Control	99,0	99,0
Registered herbal medicine must present the expiry date	95,8	95,8
Registered herbal medicine should not be added by chemical substance with medicinal properties	93,8	93,8
Registered herbal medicine must have distinguished special signs with general medicine	95,8	95,8
The correct use of Herbal medicine is presented in the packaging	95,8	95,8
Herbal medicine is safer than the medicine made of plants	99,0	99,0
Herbal medicine is from plants, animals and mineral	99,0	99,0

A study by Wisely stated that the community knowledge on registered herbal medicine is categorized high for the name of products (98,71%), indication (93,68%), information on the expiry date (92,89%), procedure of consumption (92,82%), side effects (81,90%), but there is still low in terms of logo (8,19%), number of *batch* (29,31%) and number of distribution license (48,28%). There is 72,41% of the respondents choosing to consume fresh potion of herbal medicine because it has no preservative ingredients (18,82%), safe and have quality insurance (16,78%), affordable price (14,74%), has been consumed from generations (13,61%), and has been known its production ways (13,15%) [16].

3.2 Respondents' Attitude Towards Herbal Medicine

Table 3: Frequency Distribution of Respondents' Attitude Towards Herbal medicine in Selong Subdistrict East Lombok, 2023.

	Respondents' Attitude		
	% Agree	% Doubful -2	% Disagree
The use of herbal medicine is more frequent for medication	75,0	18,8	6,2
The use of herbal medicine is more practical than medicine in general	77,1	16,7	6,2
The use of herbal medicine is longer than medicine in general	76,0	19,8	4,2
Herbal medicine packaging is better than medicine in general	52,1	30,2	**17,7**
Information about herbal medicine is more than medicine in general	75,0	13,5	**11,5**
The taste of herbal medicine is better than medicine in general	77,1	14,6	8,3
The sellers of herbal medicine is easier to be found than medicine in general	72,9	8,3	**18,8**
The price of single-use herbal medicine is cheaper than medicine in general	78,1	13,5	8,3
Side effects of herbal medicine is less than medicine in general	87,5	12,5	0
The use of herbal medicine is safer than medicine in general	88,5	10,4	1,0

Table 3 shows the biggest percentage of the respondents' attitude namely agree to the statement of herbal medicine which is better than the medicine in general. The most percentage is related to the statement stating that there is little side effects of the herbal medicine than the medicine in general (87,5%) and the use of herbal medicine is safer than the medicine in general (88,5%). Though there is small percentage of the respondents who disagree to the statements namely stating that seller of herbal medicine is easier to be found than medicine in general (18,8%), the herbal medicine packaging is better than medicine in general (17,7%), and information about the herbal medicine is more than medicine in general (11,5%).

Table 4: Frequency Distribution of Herbal Medicine Use in Selong Subdistrict East Lombok, 2023.

Behavior of using types of herbal medicine	Total	%
Registered Herbal medicine / registered herbal medicine	30	31,2
Concoction Herbal medicine / carried herbal medicine	14	14,6
Self-production Herbal medicine / herb plants	52	54,2
Total	96	100,0

Table 4 shows the respondents consuming registered herbal medicine / registered herbal medicine by 31,2% out of the herbal medicine users.

3.3 Respondents' Attitude Using Registered Herbal Medicine

Table 5: Frequency Distribution of Respondents' Attitude in Consuming Registered Herbal Medicine in Selong Subdistrict East Lombok, 2023.

Attitude of Herbal medicine Use	Total	%
• Dosage form of herbal medicine		
• Powder	13	43,3
• Sliced	6	20,0
• Solid / syrup	9	30,0
• Capsule	2	6,7
• The way of using herbal medicine		
• Directly consumed	12	40,0
• Boiled first	17	56,7
• External medicine	1	3,3
• Purposes of using herbal medicine		
• Medication / curative	5	16,7
• Maintaining health / promotive	25	83,3
• Sources of information on the use of herbal medicine		
• Electronic Media	3	10,0
• Social environment (relatives / neighbor)	20	66,7
• Sellers of concoction of herbal medicine / carried herbal medicine	4	13,3
	1	3,3
• Self-information / searching	2	6,7
• Brochure / packaging of herbal medicine		
• Frequency of using herbal medicine		
• Almost every day	4	13,3
• If there is any complain	26	86,7
• Source of herbal medicine to be used		
• Small shop / stand of herbal medicine	14	46,7
• Sellers of concoction of herbal medicine / carried herbal medicine	8	26,6
	3	10,0
• Yard / Garden / market	5	16,7
• Others		
• Cost of using single-use herbal medicine		
• Reaching Rp 5.000	16	53,3
• More than Rp 5.000	13	43,3
• For free	1	3,4
• Benefits of using herbal medicine		
• Helpful	30	100,0
• Less helpful	0	0,0
• Any perceived side effects after consuming herbal medicine		
• Yes	1	3,3
• No	29	96,7

Table 5 shows the biggest percentage of the respondents using registered herbal medicine in the form of powder (43,3%), by boiling it firstly (56,3%), the purpose of using to maintain the health or promotive (83,3%), source of information on herbal medicine taken from social environment (relatives / neighbor) (66,7%), using herbal medicine if there is any complain (86,7%), source of herbal medicine bought from small shop or stand selling herbal medicine (46,7%), cost of buying single-use herbal medicine reaching Rp 5.000 (53,3%), perceiving the benefit of consuming herbal medicine (100,0%) and having no side effects of consuming herbal medicine (96,7%). A study by Maharianingsih [17] concluded that herbal medicine used by community is categorized as registered herbal medicine (57,75%), majority source of information on herbal medicine taken from families (50,25%), having helpful effects of the herbal medicine (98,5%), having no side effects (87,25%). Though,

ingredients of herbal medicine may have unidentified toxic constituents so it is necessary to examine in longer period of time [18].

3.4 Correlation of characteristics and attitude of registered Herbal medicine users

Table 6: Correlation of characteristics and attitude of registered herbal medicine users in Selong subdistrict, East Lombok, 2023.

Characteristics	Registered herbal medicine use				%	p
	Yes		No			
	Total	%	Total	%	Total	
Age						00,259
• Non elderly (< 45 years old)	23	34,82	43	65,2	100,0	
• Elderly (> 45 years old)	7	3,3	23	76,7	100,0	
Gender						
• Female	15	26,3	42	73,7	100,0	0,207
• Male	15	38,5	24	61,5	100,0	
Marital Status						
• Not married	1	8,3	11	91,7	100,0	0,096
• Married	26	37,1	44	62,9	100,0	
• Divorced	3	21,4	11	78,6		
Education						
• Primary education	10	33,3	20	66,7	100,0	0,767
• Advanced education	20	30,3	46	69,7	100,0	
Occupation						
• Having occupation	23	31,9	49	68,1	100,0	0,799
• Having no occupation / housewives	7	29,2	17	70,8	100,0	
Location of residence						
• District	17	30,9	38	69,1	100,0	0,933
• Village	13	31,7	28	68,3	100,0	

Table 6 shows that the biggest percentage of the respondents consuming registered herbal medicine is non elderly age, male, married, having advanced education (more than senior high school graduates), having occupation and living in district areas. There is no correlation ($p \geq 0.05$) of age, gender, marital status, education, occupation, location of residence and use of registered herbal medicine. Katili, and his colleagues and Rahayu and his colleagues showed that factors related to the use of traditional medicine for medication are age, education, economic status, environmental factors, sources of information, and the use of traditional medicine for medication. The utilization of herbal medicine in Indonesia is mostly based on the fact that herbal medicine is easy to obtain, easy to process, and used for generations. Plant species that are commonly used as medicine include Jahe (*Zingiber officinale*), Kencur (*Kaempferia galanga*), Temulawak (*Curcuma zanthorrhiza*), Meniran (*Phyllanthus Niruri*), Pace (*Morinda citrifolia*) [19, 20]. A study by Oktarlina and his colleagues and Supardi, and his colleagues showed a significant correlation between age, education, income and the use of herbal medicine in self-medication efforts, while gender and occupation had no significant correlation with the attitude of using herbal medicine [12, 21]. A study by Riastuti Pandi stated that most herbal medicine consumers were male at 55% and in the age group of 26-45 years at 63%. The most sources of information about registered herbal medicine at the primary education level came from experience, at the secondary education level (high school graduates) came from advertisements/mass media, and at the higher education level (D 1 to university graduates) came from conversations. The main priority in the selection and use of registered

herbal medicine at the primary to university education level was efficacy at 73%. The higher the education level, the more optimistic that registered herbal medicine can compete with modern medicine. Individuals who use registered herbal medicine the most are married couples at 78%. The harder the work done, the more often they consume herbal medicine. The greater the income, the efficacy is preferred in the use of registered herbal medicine compared to drugs. The amount of income gives no effects to the frequency of taking registered herbal medicine. [22]. A study by Muwahid and Ahmad stated that the main priority in consuming registered herbal medicine was efficacy at 74%. Individuals who use registered herbal medicine the most are unmarried. The amount of income gives no effect to the main priorities in selection and use of registered herbal medicine because most consumers of registered herbal medicine prioritize efficacy [23]. Individuals who mostly consume registered herbal medicine are married couples 62%. The amount of income gives no effects to the use of registered herbal medicine because most consumers of registered herbal medicine prioritize efficacy [24].

3.5 Correlation of knowledge, attitude and the use of registered Herbal medicine

Table 7: Correlation of knowledge, attitude and the use of registered Herbal medicine In Selong subdistrict,

Influence variables	**Use of registered herbal medicine**					
	Yes		**No**		%	p
	Total	%	Total	%	TOTAL	
Knowledge						
• High	27	33,7	53	66,7	100,0	0,237
• Low	3	18,8	13	81,2	100,0	
Attitude						
• Good	12	36,4	21	63,6	100,0	0,434
• Less good	18	28,6	45	71,4	100,0	

East Lombok 2023.

Table 7 shows no meaningful correlation of knowledge, attitude and use of registered herbal medicine ($p \geq 0.05$). This is in line with the research of Oktarlina and his colleagues [20] stated that there was no significant correlation between knowledge, attitude and behavior of using herbal medicine in self-medication efforts. Also a study by Zainar Kasim [25] revealed no significant correlation between knowledge and the use of herbal medicine. However, a study by Maharianingsih [17] found a significant correlation between knowledge ($p=0.03$), culture (0.000) and the use of herbal medicine in postpartum women. Also research by Yulianto and his colleagues [26] who found a significant correlation between community knowledge and the use of traditional medicine. Based on knowledge about registered herbal medicine, herbal medicine is used as an alternative medicine because visiting a doctor or clinic is considered rather expensive [27]. Based on the increasing knowledge of the use of registered herbal medicine, its use also increased sharply in Indonesia during the covid19 pandemic [28, 29, 30]. A number of medicinal plants which are registered as herbal medicine consumed by the people of East Lombok, have many benefits, namely: Jahe (*Zingiber officinale*), Kencur (*Kaempferia galanga*), Temulawak (*Curcuma zanthorrhiza*), Meniran (*Phyllanthus Niruri*), Pace (*Morinda citrifolia*). Two species of plants, namely *Kaempferia galanga* and *Curcuma zanthorrhiza*, are widely planted in the yards and gardens of Indonesian people, especially on the islands of Java, Sumatra, Kalimantan, and Lombok. *Kaempferia galanga (K. Galanga)* is efficacious for relieving asthma, hypertension, headaches, rheumatism, toothache,

indigestion, and inflammation caused by bacteria [31, 32]. Anti-inflammatory properties are due to Cyclohexane, ethyl acetate, chloroform, and diarylheptanoids. *K. galanga* extract caused a decrease in lipopolysaccharide-induced nitric oxide in 264.7 RAW macrophages compared to indomethacin [33]. Compounds from *K. galanga* have significant anti-inflammatory activity based on nitric oxide synthase mRNA gene expression [34, 35, 36]. A clinical study on *Curcuma zanthorrhiza* (*C. Zanthorrhiza*) related to immunity obtaining *C. zanthorrhiza* combined with *Curcuma mango* and adding *Phyllanthus niruri* was able to maintain the stability of CD4+ levels in the bodies of HIV/AIDS patients. *C. zanthorrhiza* in combination with *Vitex trifolia* did not cause liver and kidney damage after therapy 14 days. A study in Systemic Lupus Erythematosus (SLE) patients found that the release of TNF-α decreased after therapy with *C. zanthorrhiza* extract for 4 weeks [37, 38, 39].

4. Conclusion

Based on the results and discussion of 96 respondents who used registered herbal medicine within the last month, the following conclusions were drawn.

1. More than 95% of respondents recognized herbal medicine, but there were still some who did not understand that registered herbal medicine must include an expiry date.

2. The largest percentage of respondents agreed that the side effects of herbal medicine are less than medicine in general and the use of herbal medicine is safer than medicine in general.

3. Respondents who consumed registered herbal medicine were by 31.2% of herbal medicine users in general. The largest percentage of respondents consumed registered herbal medicine was in the form of powder (43.3%), by boiling first (56.3%), the purpose of use is to maintain health/promotive (83.3%), the source of information about herbal medicine from the social environment (relatives/neighbors) (66.7%), using herbal medicine if there are complaints (86.7%), the source of herbal medicine from herbal medicine small shop /stand (46.7%), the cost for single-use herbal medicine is reaching Rp 5. 000 (53.3%), perceived any benefits of herbal medicine (100.0%) and having no side effects of herbal medicine (96.7%).

4. The largest percentage of users of registered herbal medicine were non elderly age, male, married, advanced education (high school and more), having occupation and living in village areas.

5. There was no correlation between age, gender, marital status, education, occupation, location of residence and the use of registered herbal medicine.

6. There is no significant correlation between knowledge and the use of registered herbal medicine, also there is no meaningful correlation between attitude and use of registered herbal medicine.

Acknowledgments

We express our high appreciation to the Institute for Research and Community Service, Universitas Terbuka (UT) for the support of research funds in 2023 and other facilities, also many thanks to Muhammad Hibban, a student of FHISIP UT Mataram branch with his team who assisted a lot of technical research in Selong sub-district, East Lombok.

References

[1] Undang-undang Republik Indonesia Nomor 36 Tahun 2009 tentang Kesehatan.

[2] Kepmenkes Republik Indonesia (RI) No.381/Menkes/Sk/III/2007 Tentang Kebijakan Obat Tradisional Nasional.

[3] Peraturan Menteri Kesehatan RI Nomor 06 Tahun 2012 Tentang Industri dan Usaha Obat Tradisional.

[4] Pratomo, H., Winarto, A., Rusdiyanto, E. "Kerja Pasak Bumi (*Eurycoma longifolia*. Jack) Terhadap Tingkah Laku Dan Libido Tikus Putih Jantan". Jurnal Matematika Sains dan Teknologi. vol.11, no.1, p.30-41, 2010, doi: https://jurnal.ut.ac.id/index.php/jmst/article/view/551

[5] Pratomo, H., and Yudi. "Pemberian Pasak Bumi Memengaruhi Kadar Testosteron dan Spermatozoon Kambing Peranakan Etawa", Jurnal Kedokteran Hewan, vol.10, no.2, p. 148-152, 2016, doi: https://jurnal.usk.ac.id/JKH/article/view/5046

[6] Pratomo, H. "*Eurycoma longifolia* extract increases intracellular production activity of luteinizing hormone (LH) in pituitary". AIP Conference Proceedings, 1862. Issue 1. 10.1063/1.4991216. 2017, doi: https://doi.org/10.1063/1.4991216

[7] Pratomo, H., Supriatna, I., Winarto, A., Manalu, W. "Tingkat Aktivitas Sel Endokrin Penghasil Folikel Stimulating Hormon (FSH) Terkait Pemberian Pasak Bumi (*Eurycoma longifolia* Jack)". Jurnal Kefarmasian Indonesia, vol 2 no.1, p. 1-10. 2012, doi: https://jkefarind.com/index.php/jki/article/view/3715

[8] Pratomo, H. "Evaluation of The Effect of Pasak Bumi (*Eurycoma longifolia* Jack) to Increase Androgen Levels". International Series on Interdisciplinary Research (INSIST), vol. 1 no. 1, 2016. ISSN Online: 2502-8588, doi: http://dx.doi.org/10.23960/ins.v1i1.6

[9] Pratomo, H. "Effects of *Eurycoma longifolia* provision on Blood sugar level, cholesterols, and uric acid of Etawa Crossbreed Goat". Journal of Physics: Conf. Series 1025 (2018) 012069. Vol. 1025 no.1, p. 1-9. 2018, doi: 10.1088/1742-6596/1025/1/012069

[10] Pratomo, H., Winarto, A., Sulistana, S.. "Increasing Mature Spermatids Formation Using Pasak Bumi". International Journal of Sciences: Basic and Applied Research (IJSBAR) vol. 67 no.1, p. 204-216,

2023, doi: https://www.gssrr.org/index.php/JournalOfBasicAndApplied/article/view/15333/6492

[11] Zaidi SF, Khan MA, Saeed SA, Zahrani KA, Ahmadi AA, Yamy TA, Khan A, Ahmed K. "Knowledge, Attitude and Practice Regarding Herbal medicineAmong Medical Students in Saudi Arabia". RADS J Pharm Pharm Sci., vol. 9 no. 1, p.25-39, 2021, doi: https://doi.org/10.37962/jpps.v9i1.476

[12] Supardi, S., Herman, MJ. Yuniar, Y. "Penggunaan Herbal medicine Buatan Sendiri di Indonesia, Analisis Data Riset Kesehatan Dasar Tahun 2010". Buletin Penelitian Sistem Kesehatan, vol.14 no. 4, p. 375–381, 2011, doi: http://perpustakaan.bkpk.kemkes.go.id /index.php?p=show_detail&id=33700

[13] Joko Priyambodo, W., Yuniarto, B., Ramaida, N. "Laporan eksplorasi Pengetahuan local etnomedisin dan tumbuhan obat berbasis komunitas di Indonesia Provinsi Maluku". Jakarta: Lembaga Penerbitan Badan Litbangkes. Kementerian Kesehatan RI. 132 pp., 2017, doi: https://repository.badankebijakan.kemkes.go.id/id/eprint/3076

[14] Green, Lawrence W, Marshall W. Keuter, Sigrid G. Deeds, and Kay B. Partridge. "Health Education Planning, a Diagnostic Approach". California: Mayfield Publishing Company, pp 14-15, 1980, doi: https://www.amazon.com/Health-Education-Planning-Diagnostic-Approach/dp/0874844711

[15] Sugiyono. "Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif dan R&D", 2016, Alfabeta publ, Bandung, doi: https://pustaka.unm.ac.id/opac/detail-opac?id=35458

[16] Wisely. Studi Tentang Pemahaman Obat Tradisional Berdasarkan Informasi Pada Kemasan dan Alasan Pemilihan Herbal medicine Ramuan Segar Atau Herbal medicine Instan Pada Masyarakat Desa Maguwoharjo. (Skripsi Fakultas Farmasi Universitas Sanata Dharma Yogyakarta), 2008, doi: https://repository.usd.ac.id/17062/

[17] Maharianingsih, N.M. "Hubungan Pengetahuan dan Sikap terhadap Pola Penggunaan Obat Tradisional untuk Swamedikasi di Masyarakat Kota Denpasar. Indonesian", Journal of Pharmaceutical (e-Journal), vol. 3 no 1, pp. 51-62, 2023. doi: 10.37311/ijpe.v3i1.18886

[18] Kumar, N and Ashaq, M. "Adverse Effects Of Herbal Therapy: Some Observations. International Journal of Recent Scientific Research", vol. 13, Issue, 03 (B), pp. 611-618, 2022,

doi: https://recentscientific.com/sites/default/files/19107-A-2022.pdf

[19] Katili, S., Fatimawali, F., Manampiring, A. E. ., & Surya, W. S. "Penggunaan Dan Pemanfaatan Obat Tradisional Di Masa Pandemi Covid 19 Pada Masyarakat Di Desa Tanamon Kabupaten Minahasa Selatan", Prepotif : Jurnal Kesehatan Masyarakat, vol. 6 no.3, pp 2425–2438, 2023. Doi: https://doi.org/10.31004/prepotif.v6i3.6946

[20] Rahayu, YYS, Araki Tetsuya, Rosleine Dian. "Factors Affecting The Use Of Herbal Medicines In The Universal Health Coverage System In Indonesia", Journal of Ethnopharmacology, vol. 260 no.1, pp 1129-1174, 2020, doi: https://doi.org/10.1016/j.jep.2020.112974

[21] Oktarlina, R Z, Asnah Tarigan, Carolia, Novita, Utami, Ebti, Rizki "Hubungan Pengetahuan Keluarga Dengan Penggunaan Obat Tradisional Di Desa Nunggalrejo Kecamatan Punggur Kabupaten Lampung Tengah". Jurnal Kedokteran Universitas Lampung, vol.2 no.1, pp 42-45, 2018, doi: https://juke.kedokteran.unila.ac.id/index.php/JK/article/view/1906

[22] Pandi R, Pandi. "Pola Pemilihan Dan Penggunaan Herbal medicine Kemasan Pada Penduduk Di Kelurahan Bringin Kecamatan Lakarsantri Surabaya Barat". (Skripsi Fakutas Farmasi Universitas Surabaya) 2001, Surabaya. doi: http://digilib.ubaya.ac.id/pustaka.php/150872

[23] Ahmad M. "Pola Pemilihan dan Penggunaan Herbal medicine Kemasan di Kalangan Pekerja Seks Komersil di Lokalisasi Doly Surabaya". (Skripsi Fakutas Farmasi Universitas Surabaya), . 2006, Surabaya, doi: https://digilib.ubaya.ac.id/index.php?page=view/daftarpustaka_detail&key=149940

[24] Yudhistira, Rangga Bayu. "Pola Pemilihan dan Penggunaan Herbal medicine Kemasan di Kalangan Penarik Becak di Terminal Bratang, Surabaya". (Skripsi Fakutas Farmasi Universitas Surabaya), 2006, Surabaya, doi: http://digilib.ubaya.ac.id/pustaka.php/149986

[25] Kasim, Z. "Faktor-Faktor Yang Berhubungan Dengan Penggunaan Obat Tradisional Herbal medicine bersalin Pada Ibu Masa Nifas Di Desa Kima Bajo Kecamatan Wori Kabupaten Minahasa Utara". Jurnal Kesehatan : Amanah, Prodi Ilmu Keperawatan STIKES Muhammadiyah Manado, vol. 2 no 12, pp 105-108, 2018, doi: https://ejournal.unimman.ac.id/index.php/jka/article/view/35/59

[26] Yulianto, D. J., Puspitasary, K. ., & Salamah, U. "Pengaruh Sosiodemografi terhadap Tingkat Pengetahuan Penggunaan Obat Tradisional pada Masyarakat". Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal, vol. 13 no 2, pp 437–442, 2023, doi: https://doi.org/10.32583/pskm.v13i2.911

[27] Andriati A dan R.M. Teguh Wahjudi. "Tingkat penerimaan penggunaan herbal medicine sebagai alternatif penggunaan obat modern pada masyarakat ekonomi rendah-menengah". Masyarakat, Kebudayaan dan Politik, vol 29 no 3, pp 133-145, 2016, doi: https://doi.org/10.20473/mkp.V29I32016.133-145

[28] Eriyanto dan Salman. "Analisis Faktor yang Mempengaruhi Penggunaan Obat Tradisional Sebagai Upaya Swamedikasi di Masa Pandemi Covid-19". Jurnal Ilmu Kesehatan, vol. 5 no 2, pp 305-311, 2021, doi: http://dx.doi.org/10.33757/jik.v5i2.443

[29] Darwis, A. M., Nirwana, A., Burhamzah, R., Patimang, Y. C.. "Pengetahuan Masyarakat Tentang Penggunaan Tanaman Obat Keluarga Sebagai Peningkatan Imun Selama Pandemi". Public Health Nutrition Journal, vol. 1 no 2, pp 83-86, 2021, doi: https://doi.org/10.24252/algizzai.v1i2.21939

[30] Wa Ode Endang Nursanti, Irman Idrus, Muh. Ramadhan Salam. "Profil Pengetahuan dan Penggunaan Obat Tradisional Sebagai Upaya Swamedikasi Masyarakat Wangi-Wangi Selatan". Jurnal Pelita Sains Kesehatan, vol. 3 no. 2, pp 28-31, 2023, doi: https://ojs.pelitaibu.ac.id/index.php/jpasaik/article/view/35/28

[31]. Mustafa MR, Mustafa AM, Hashim S. Vasorelaxant effects of the chloroform extract of *Kaempferia galanga* on smooth muscles of the rat aorta. Asia Pac J Pharmacol. 11(3- 4):97-101, 1996.

[32] Kanjanapothi D, Panthong A, Lertprasertsuke N, Taesotikul T, Rujjanawate C, Kaewpinit D, et al. Toxicity of crude rhizome extract of *Kaempferia galanga* L. (Proh Hom). J Ethnopharmacol. 90(2-3):359-65, 2004, doi: 10.1016/j. jep.2003.10.020.

[33]. Jena S, Ray A, Sahoo A, Sahoo S, Dash B, Kar B, et al. Rapid plant regeneration in industrially important *Curcuma zedoaria* revealing genetic and biochemical fidelity of the regenerants. 3 Biotech. 10(1):17, . 2020, doi: 10.1007/s13205- 019-2009-9

[34]. Chan EWC, Lim YY, Wong SK, Lim KK, Tan SP, Lianto FS, et al. Effects of different drying methods on the antioxidant properties of leaves and tea of ginger species. Food Chem. 113(1):166-72, 2009, doi: 10.1016/j.foodchem.2008.07.090.

[35]. Kaewkroek K, Wattanapiromsakul C, Kongsaeree P, Tewtrakul S. Nitric oxide and tumor necrosis factor-alpha inhibitory substances from the rhizomes of *Kaempferia marginata*. Nat Prod Commun. 8(9):1205-8, 2013, doi: 10.1177/1934578x1300800904

[36]. Rafif Khairullah Aswin, Tridiganita Intan Solikhah, Arif Nur Muhammad Ansori, Ristag Hamida Hanisia ,Gavrila Amadea Puspitarani, Amaq Fadholly, Sancaka Cashyer Ramandinianto. Medicinal importance of *Kaempferia galanga* L. (Zingiberaceae): A comprehensive review. J Herbmed Pharmacol. 10(3): 281-288, 2021, doi: 10.34172/jhp.2021.32

[37]. Astana, P. R. W., Ardiyanto, D., and Mana, T. A. Change in quality of life and CD4+ value on HIV/AIDS patients with immuostimulant Jamu Formula in Sragen regency. Indonesian J. Clin. Pharm. 7, 227-235, 2018, doi:10.15416/ijcp.2018.7.4.227.

[38]. Wahono, C. S., Wahyuni, Z. D., and Kalim, H. Effect of *Curcuma xanthorrhiza* Suplementation in Vitamin D3 Administration towards Proteinuria, Serum Anti-dsDNA and IL-17 Levels on Systemic Lupus Erythematosus (SLE) Patients with Hypovitamin. D Int. J. Clin. Rheumatol. 12, 121–129, . 2017.

[39]. Yuandani, Ibrahim Jantan, Ade Sri Rohani, and Imam Bagus Sumantri. Immunomodulatory Effects and Mechanisms of Curcuma Species and Their Bioactive Compounds: A Review Front Pharmacol. 12: 643119, 1-12, 2021, doi: 10.3389/fphar.2021.643119.