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Comparison of the Effectiveness of Administration of Nusantara Medicinal Plants on the Incident of Flour Albus for Teenage Women in 2024

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Abstract: A common reproductive health issue among Indonesian teenagers is vaginal discharge (Flour albus), with 75% of the 37.4 million adolescent population affected in 2023. Vaginal discharge, or leukorrhea, is the production of pus-like mucus. While normal discharge helps keep the vagina clean, abnormal discharge can signal health issues. This quantitative study used a quasi-experimental two-group pre-test post-test design, involving 80 young women with vaginal discharge over seven days, divided into eight groups. Treatments included pineapple juice, boiled betel leaves, turmeric, red rose tea, bay leaves, soursop leaves, binahong leaves, and aloe vera. Statistical analysis with Anova-One Way (Sig. < 0.05) showed significant effects of the interventions. Tukey's test revealed boiled betel leaf had the highest average reduction (mean 2.30), while aloe vera had the lowest (mean 5.70), suggesting medicinal plants are effective in treating vaginal discharge among adolescent girls in Lampung and Karawang Regencies.

Keywords: Flour albus; Nusantara medicinal plants; Young women

Introduction

Reproductive health is a state of complete physical, mental and social well-being, not only free from disease or disability but in all matters relating to the reproductive system, as well as its functions and processes (Esthar et al., 2023; Haberland & Rogow, 2015). Maintaining the health of reproductive organs is important because it is related to how we ensure the continuity of human life from generation to generation so that the next generation can be of higher quality than the current generation. This also applies to the health of sexual organs, including the vagina. One of the reproductive health problems that women often experience is vaginal discharge. In fact, vaginal discharge can often be annoying to the point of causing discomfort in carrying out daily activities (Benjachairat et al., 2024).

According to *World Health Organization* (WHO) reproductive health problems are problems that often occur in women, where poor reproductive health problems experienced by women have reached 33% of the total burden of disease experienced by women in the world, one of which is vaginal discharge. A reproductive health problem that is often experienced by teenagers in Indonesia is vaginal discharge (Liang et al., 2023; Mukherjee & Karati, 2023; Zuo et al., 2023). Cases of vaginal discharge in adolescent girls in 2023 will be 75% of the 37.4 million population and are mostly experienced by teenagers. Based on research conducted there are two types of vaginal discharge, namely normal vaginal discharge and abnormal vaginal discharge, normal vaginal discharge is influenced by the hormones estrogen and progesterone before menstruation, normal vaginal discharge is clear, thick white, has no smell (Rao & Mahmood, 2020). Abnormal vaginal discharge that is

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yellow, green, grey, smelly and accompanied by itching, is caused by fungal infections, germs, parasites and viruses which can cause discomfort in teenagers and result in impaired self-confidence (Somade et al., 2023; Zuo et al., 2023).

The cause of the incident *fluorine albus* or vaginal discharge can occur from various factors ranging from the woman's knowledge and attitude, namely not maintaining vaginal cleanliness, rarely changing sanitary napkins during menstruation or menstruation, rarely changing underwear or wearing damp underwear, wearing trousers that are too tight, unhealthy lifestyle, very tiring physical activity, experiencing severe stress, excessive use of feminine cleansing soap, and can be caused by hormonal imbalance.

Pineapples contain the enzyme bromelain which can be used as an antiseptic. The way the bromelain enzyme works is to reduce the surface tension of bacteria by hydrolyzing bacteria which are mediators of bacteria attached to the vaginal organ which causes vaginal discharge (dos Anjos et al., 2016). According to research conducted, pineapple juice has been proven to be able to reduce vaginal discharge in women of childbearing age because pineapple contains flavonoid compounds which are disinfectants and very effective in inhibiting the growth of gram-positive bacteria because flavonoids are polar so they more easily penetrate the peptidoglycan layer. and is also polar in gram-positive bacteria rather than the non-polar lipid layer.

The results of research conducted (Chandra-Mouli et al., 2015; Swan et al., 2023), the use of boiled water from green betel leaves (*Pipper bettle L.*) can help reduce fluoride albus because of the substances contained in green betel leaves which are believed to be able to cure or reduce the fungus that causes *fluorine albus* These include tannins, saponins and alkaloids. Green betel leaves contain phytochemical compounds, namely flavonoids, essential oils, tannins, alkaloids, saponins, where these chemical contents are thought to have potential antimicrobial properties. The integrity of bacterial cell membranes can be disturbed by the activity of flavonoids which work by forming complex compounds with extracellular proteins. Likewise with alkaloids which have anti-bacterial capabilities, the mechanism is by interfering with the peptidoglycan components in bacterial cells, as a result the cell wall layer does not form completely, resulting in the death of the cell.

Turmeric or *Curcuma Longa* is a spice plant and is one of the traditional medicines native to Southeast Asia. Turmeric contains curcumin and essential oils, one of which acts as an antimicrobial and antioxidant (Iweala et al., 2023; Kumar et al., 2023; Mukherjee & Karati, 2023). Apart from curcumin, the contents found in turmeric include sesmetoxycumin, bisdesmetiksikurkumin, resim, starch, flavonoids. Saponins are very effective in preventing the emergence of bacteria and fungi which cause vaginal discharge.

These results are in line with research conducted by Jitasari Tarigan Sibero, Dewi Sartika, Udur Mauli Br Simanjuntak, with the title "The Effect of Giving Boiled Turmeric Water on the Incidence of Vaginal Discharge in Adolescent Girls in Kampung Jawa Pasar Hamlet, Pangkatan District, Labuhan Batu Regency in 2021" with Univariate Results Of the 10 respondents, 10 respondents experienced abnormal vaginal discharge before being given turmeric boiled water and 0 (0%) experienced normal vaginal discharge. According to researchers' assumptions, turmeric decoction is very effective in reducing the incidence of vaginal discharge in teenagers (Haberland & Rogow, 2015; Villa-Torres & Svanemyr, 2015). Another theory with the title "Effectiveness of Giving Red Rose Tea (*Rosa Damascene*) Against Pathological Vaginal Discharge in Mothers Using Iud Contraceptives at the Klari Community Health Center, Karawang Regency 2023" with the results obtained with a significance value of 0.001, meaning that there was a significant influence of vaginal discharge between before and after giving the treatment in the form of drinking red rose tea, where the average vaginal discharge after the treatment was given was lower than before treatment. There is an effect of giving red rose tea on pathological vaginal discharge in mothers with IUD contraception.

Treat vaginal discharge by using bay leaf boiled water and soursop leaf boiled water. According to research conducted by Astutiningrum (2019), bay leaves contain the active chemical compounds polyphenols, alkaloids, steroids, saponins and tannins. Bay leaves function as an antiseptic as an anti-Vaginal Bacteria (BV), having an inhibitory effect on bacterial growth. Leaves used by cutting can cure vaginal discharge because bay leaves contain polyphenol compounds which can kill bacteria that cause vaginal discharge, while tannin compounds can reduce excessive fluid in the vaginal canal (Denno et al., 2015; Lundgren & Amin, 2015; Svanemyr et al., 2015). Processing bay leaves by drinking them can help reduce the risk of cancer, therefore crushed bay leaves help reduce vaginal discharge. Based on research conducted. Soursop leaves contain polyphenolic compounds, steroids, alkaloids, flavonoids, tannins, antibacterial properties which can inhibit the growth of vaginal bacteria (BV). The results of research proven, that soursop leaves used by cutting them can help reduce vaginal discharge.

Based on research conducted, bay leaves contain essential oils produced by sesquiterpene oils, starch, diastase, sugar and tannins which can kill germs, are anti-oxidants and fungicides and are anti-fungal (Abdi-

Moghadam et al., 2023). The results of the research that has been carried out show that the use of bay leaf boiled water is effective in reducing the incidence of vaginal discharge. Research conducted, soursop leaves contain the compounds acetogenesis, asimisin, rondeasin, and squamosin which contain antiseptic substances that can kill germs, the phenol and ethanol extract content in soursop leaves can inhibit the growth of candida albicand, and it has been proven that soursop leaves are effective in reducing vaginal discharge. From the results of research conducted, it is known that bay leaf boiled water and soursop leaf boiled water have been proven to reduce vaginal discharge in teenagers (Cavalcante et al., 2023). Until now, no one has researched the difference between the effectiveness of boiled water from bay leaves and soursop leaves in reducing the number of vaginal discharges in adolescent girls.

Some research *in vitro* and *alive* This has been done to determine the content of aloe vera and pomegranate skin. Where this content can treat vaginal discharge (L. Zhang et al., 2022). Research on 60 teenage girls showed that the pretest results in the intervention group were 25.32% and after giving aloe vera jelly there was a decrease in vaginal discharge symptoms by 11.69%. Test results *T* shows that there is an effect of giving aloe vera jelly on vaginal discharge with *p-value* 0.001 (<0.05). Experimental research in the laboratory conducted on the Effect of Aloe Vera Extract on Fungal Growth *Candida Albicans* shows the same results (Sempere-Ferre et al., 2022). Aloe vera powder has anti-fungal activity against *Candida albicans* and Trichophyton mentagrophytes with barrier diameters of 15 ± 3 mm and 14 ± 0.5 mm. Indonesia is a tropical country that is always hot all the time. As a result, living in Indonesia automatically causes the body to sweat frequently (García-Pérez, 2023). This condition increases the body's moisture levels, especially in the closed and folded sexual and reproductive organs. This condition causes vaginal problems, either in the form of an unpleasant odor or infection.

Based on the results of the research above, according to the researchers one of the factors influenced the incident *fluorine albus* or vaginal discharge is a lack of good and correct genital health behavior, so that the less good the behavior of preventing vaginal discharge, the higher the risk of respondents experiencing abnormal vaginal discharge. However, in the research results there were respondents who had good behavior but there were still those who experienced problems *fluorine albus* or abnormal vaginal discharge, this is influenced by several factors, one of which is stress, lack of knowledge, negative attitudes and poor food patterns, while there are some respondents' behavior that is not good, but it occurs *fluorine albus* or normal vaginal discharge, this is due to a well-maintained diet and the respondent being able to manage stress levels as well as the participation of parents who always provide health education to the respondent (Ansari et al., 2024; Routti et al., 2019; Soedarsono et al., 2024).

The aim of this study was to determine the comparative effectiveness of Indonesian medicinal plants (pineapple juice, betel leaf decoction, turmeric decoction, red rose tea, bay leaf decoction, soursop leaf, binahong leaf decoction, and aloe vera pudding) in reducing the average level of vaginal discharge. among young women in the cities of Lampung and Karawang in 2024.

Method

The type of research taken is quantitative and the research method used is *quasy experiment* with design *Two group pre-test post-test desain.* Sampling techniques using techniques *Accindental Sampling* and *Purposive sampling*. The results of the statistical tests used are *Anova-One Way* and carried out further tests using the Honest Significant Difference test (*Tukey*) to compare the average level of vaginal discharge from highest to lowest after being given different interventions or treatments (Whitacre et al., 2022; X. Zhang et al., 2022). Respondents in this study were 80 young women who experienced vaginal discharge for 7 days, who were divided into 10 groups who were given pineapple juice, 10 people who were given boiled betel leaves, 10 people who were given boiled turmeric, 10 people who were given boiled red rose tea, 10 people who were given boiled red rose tea, people were given boiled bay leaves, 10 people were given soursop leaves, 10 people were given boiled binahong leaves and 10 people were given aloe vera. The instruments used in this research were observation sheets and questionnaires. The questionnaire is in the form of closed ended questions. This questionnaire contains 5 questions that must be answered about the level of vaginal discharge.

Result and Discussion

Based on table 1, of all intervention groups, the highest number of respondents aged between 16-19 years was 20 respondents (100%) in group 1 and 20 respondents (100%) in group 2; the highest age of menarche was between 11-13 years, namely 16 respondents (80%) in group 4; and the highest number of education levels was at the high school level, namely 20 respondents (100%) in group 1 and 20 respondents (100%) in group 2.

Table 1. Distribution of Respondent Characteristics

Respondent Characteristics	Number (n)	Percentage (%)
Pineapple Juice and Betel Leaf Decoction Group (Group 1)		
Age		
10-12 years		
13-15 years old		
16-19 years old	20	100
Menarche Age		
<11 years	8	40
11-13 years old	12	60
Education		
JUNIOR HIGH SCHOOL		
SMA	20	100
College		
Other		
Betel Leaf Decoction and Red Rose Tea Group (Group 2)		
Age		
10-12 years		
13-15 years old		
16-19 years old	20	100
Menarche Age		
<11 years	6	30
11-13 years old	14	70
Education		
Junior High School		
SMA	20	100
College		
Group of decoction of bay leaves and decoction of soursop leaves (Group 3)		
Age		
12 – 15 years	9	45
16 – 20 years	7	35
> 20 years	4	20
Menarche Age		
<11 years	6	30
11-13 years old	14	70
Education		
Junior High School	9	45
SMA	7	35
College	4	20
Other		
Binahong Leaf Decoction and Aloe Vera Pudding Group (Group 4)		
Age		
12 – 15 years	4	20
16 – 20 years	10	50
> 20 years	6	30
Menarche Age		
<11 years	4	20
11-13 years old	16	80
Education		
Junior High School	4	20
SMA	12	60
College	4	20
Other		

Source: Primary Data 2024

Based on table 2, it can be seen that the highest average level of vaginal discharge in all groups before being given the intervention was 7.90 in the group given rose tea and aloe vera pudding; and the lowest average vaginal discharge before the intervention was given was 4.30 in the pineapple juice group. The highest average level of vaginal discharge in all groups after the intervention was given was 5.70 in the group given aloe vera pudding; and the lowest average vaginal discharge after being given the intervention was 2.30 in the group given the betel leaf decoction.

Table 2. Average Level of Vaginal Discharge Before and After Intervention

Level of Vaginal Discharge		n	Mean	Min	Max
Group 1					
Pineapple juice	Before	10	4.30	2	6
	After		2.40	0	4
Decoction of Betel Leaves	Before	10	4.70	3	6
	After		2.30	0	4
Group 2					
Turmeric Decoction	Before	10	7.80	3	10
	After		2.80	0	5
Red Rose Tea	Before	10	7.90	3	11
	After		3.50	0	5
Group 3					
Bay Leaf Decoction	Before	10	7.80	6	10
	After		5.60	4	7
Decoction of Soursop Leaves	Before	10	7.70	5	10
	After		5.20	3	8
Group 4					
Decoction of Binahong Leaves	Before	10	7.40	6	9
	After		5.00	4	7
Aloe Vera Pudding	Before	10	7.90	6	9
	After		5.70	3	8

Source: SPSS 2024

The highest minimum score for assessing vaginal discharge before intervention was given was 2 in the group given pineapple juice and the highest was 6 in the group given bay leaf decoction, binahong leaf decoction and aloe vera pudding (Surya et al., 2023). And the highest maximum score after being given the intervention was 8 in the group given bay leaf decoction and aloe vera pudding; The lowest maximum score was 4 in the group given pineapple juice and betel leaf decoction.

Table 3. Multivariate Analysis Results (*Anova-One Way*)

ANOVA Results					
	Sum of Squares	df	Mean Square	F	Say.
Between Groups	149.988	7	21.42	10.51	.000
Within Groups	146.700	72	2.03		
Total	296.688	79			

Source: SPSS 2024 data

Based on table 3 in the test *Anova-One Way* known that value *Say*. < 0,05 (p <0.05) was 0.00 < 0.05 so that H_O is rejected, then the conclusion is that giving different

interventions to young women who experience vaginal discharge has a significant influence or significantly different treatment in reducing the average level of vaginal discharge. Because the treatment was significant, further tests were carried out, in this case using the Real Difference test (*Tukey*).

Table 4. Difference Test (*Tukey*)

Tukey HSD[a]	Group	N	Subset for alpha = 0.05		
			1	2	3
	Decoction of betel leaves	10	2.30		
	Pineapple juice	10	2.40		
	Turmeric decoction	10	2.80		
	Red rose tea	10	3.50	3.50	
	Decoction of binahong leaves	10		5.00	5.00
	Decoction of soursop leaves	10		5.20	5.20
	Bay leaf decoction	10			5.60
	Aloe vera pudding	10			5.70
	Say.		.569	.151	.956

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 10.000.
Source: 2024 SPPS data

Table 4 is the result of the honest real difference test (*Tukey*) treatment group for adolescent girls' vaginal discharge. If the treatments are in the same subset, it means that the treatments are not significantly different. If the treatments are located in different subsets, it means that the treatments are significantly different. And it can be concluded that, the results of the decrease in the average level of vaginal discharge were highest in adolescent girls, namely the group given betel leaf decoction with a mean value of 2.30, while the decrease in the average level of vaginal discharge was lowest in adolescent girls, namely the group given aloe vera pudding with a mean value 5.70.

Conclusion

This research shows that the age characteristics of respondents were highest between the ages of 16-19 years, namely 20 respondents (100%) in the group given pineapple juice and betel leaf decoction, and 20 respondents (100%) in the group given turmeric decoction and red rose tea. The most common age for menarche occurred between 11-13 years, with 16 respondents (80%) in the binahong leaf decoction and aloe vera pudding group. The highest level of education was at high school level, with 20 respondents (100%) in the group given pineapple juice and betel leaf decoction, and 20 respondents (100%) in the group given turmeric decoction and red rose tea. The highest average level of vaginal discharge in all groups before being given the intervention was 7.90 in the group given rose tea and aloe vera pudding, while the lowest average level of vaginal discharge before being given the intervention was 4.30 in the group given pineapple juice. After being given the intervention, the average level of vaginal discharge was the highest in all groups, namely 5.70 in the group given aloe vera pudding, while the lowest average level of vaginal discharge after being given the intervention was 2.30 in the group given betel leaf decoction. Based on the Anova-One Way test, it is known that the Sig. < 0.05 ($p < 0.05$), namely 0.00 < 0.05 so HO is rejected. This shows that providing different interventions to adolescent girls who experience vaginal discharge has a significant influence or significantly different treatment on reducing the average level of vaginal discharge. The results of the Honestly Significant Difference (Tukey) test show that if the treatments are in the same subset, then the treatments are not significantly different. On the other hand, if the treatments are located in different subsets, it means that the treatments are significantly different. From the research results, it can be concluded that the highest decrease in the average level of vaginal discharge in young women occurred in the group given betel leaf decoction with a mean value of 2.30. Meanwhile, the lowest decrease in the average level of vaginal discharge occurred in the group given aloe vera pudding with a mean value of 5.70.

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NY, ENS, NA, SN, SMU assists in the data collection process, data processing and analysis, as well as writing the article.

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