International Journal of Health, Economics, and Social Sciences (IJHESS)
Vol. 8, No. 1, January 2026, pp. 695~705
DOI: 10.56338/ijhess.v8i1.10247
Website: https://jurnal.unismuhpalu.ac.id/index.php/IJHESS

Relationship Between Vaginal Hygiene Behavior and Levels Stress with Leukorrhea Incidence on Young Women at School

Nur Suci Ainniyah Thayib[1]*, Zuhriana K. Yusuf[2], Siti Hajar Salawali[3]
[1]Mahasiswa Program Studi Ilmu Keperawatan UNG
[2]Dosen Program Studi Kedokteran UNG
[3]Dosen Program Studi Ilmu Keperawatan UNG

***Corresponding Author Email:** sucytayib@gmail.com

Article Info

Article history:

Received 05 Dec, 2025
Revised 19 Dec, 2025
Accepted 27 Jan, 2026

Keywords:

Leukorrhea, Adolescent Girls, Stress Levels, Vaginal Hygiene

ABSTRACT

Leukorrhea (vaginal discharge) is a reproductive health problem that is often experienced by adolescent girls. The incidence of leukorrhea can be influenced by vaginal hygiene behavior and stress levels. Improper vaginal hygiene behavior and stress can lead to imbalances in the normal flora of the vagina and hormonal changes that trigger the occurrence of leukorrhea. This study analyzes the relationship between vaginal hygiene behavior and stress levels with the incidence of leukorrhea in adolescent girls at Madrasah Aliyah Negeri 1 Gorontalo City. It was conducted with a cross-sectional observational analytical design of 275 respondents selected through proportionate stratified random sampling from a population of 884 adolescent girls. Primary data were collected via validated questionnaires (Cronbach's alpha >0.6 for vaginal hygiene and leukorrhea, DASS-42 for stress), analyzed univariate (frequency) and bivariate (Spearman rank test, α=0.05). The results showed that the majority of respondents were 16 years old (37.8%), class X (35.6%), adequate vaginal hygiene behavior (76.4%), moderate stress (62.5%), and normal leukorrhea (76%). There was a significant relationship: vaginal hygiene behavior with leukorrhea (r=-0.155, p=0.010, weak negative), and stress level with leukorrhea (r=0.517, p=0.000, moderate positive). Conclusion: Good hygiene behaviors lower the risk of leukorrhea, while high stress increases it; Reproductive Health Education Advice in Schools for Prevention

INTRODUCTION

Adolescence is a transition period with the maturity of the reproductive organs. Adolescents are divided from early adolescence 10-12 years, middle adolescence 13-16 years, late adolescence 17-21 years. As for the adolescent population based on statistical data, there are 11,238,221 people in Indonesia between the ages of 10 and 14; in Gorontalo Province, there are 99,028 adolescent girls and 100,980 adolescent boys in 2023. In 2023, Gorontalo Regency has the highest number of adolescents at 57,225, followed by Gorontalo City at 51,980, North Gorontalo Regency at 48,847, Pohuwato Regency at 40,081, Bone Bolango Regency at 27,954, and Boalemo Regency at 25,468. In adolescent girls, there are changes and increases in LH hormones (Luteinizing Hormone) and FSH (Follicle Stimulating Hormone) causes puberty, which results in maturation in the vaginal part (Hapsari, 2019). Many changes occur during adolescence, including mental, emotional, social and physical changes. These changes can lead to social, behavioral and reproductive health problems for adolescents (Putri, Arizki Amalia, Paramitha Amelia K, 2021).

One of the most frequently complained problems about adolescent reproductive health, especially adolescent girls, is vaginal discharge or Leukorrhea (Navalia, 2024). Leukorrhea Or commonly called vaginal discharge is a condition of discharge / fluid with different consistency, color, and odor from the vagina. There are two types of vaginal discharge: physiological (physiological) and pathological (abnormal). The characteristics of physiological (normal) vaginal discharge are as follows: not strong, fishy, fresh, or rotten, clear or egg white raw

with a sticky and slippery texture, can be thick or runny, appears in considerable quantities with a slippery and wet texture, usually discharges every month, usually before and after menstruation, in the days of the menstrual cycle, during ovulation, and does not cause itching or pain in the vagina, It will usually change color from clear to deep white or slightly brownish, no itching or pain in the vagina (Regilta & Sofianawati, 2021). Abnormal vaginal discharge is usually colored (yellow, green, grayish, brownish), smells bad, is numerous, and causes symptoms such as itching or itching in the intimate area causing discomfort (Pondaang & Januar Dwi Christy, 2023). Aspects that must be considered in leukorrhea are aspects that affect Leukorrhea namely the history of vaginal discharge, the pattern/frequency of vaginal discharge, the characteristics of vaginal discharge, and the symptoms that accompany vaginal discharge (Hastuty, 2023).

Factors that cause the occurrence Leukorrhea i.e. including bacteria, stress, hormones, and treatments Vaginal Hygiene inappropriate. Stress can disrupt the immune system to become weakened. As a result, women are also more susceptible to fungal and bacterial infections that cause abnormal vaginal discharge so that excessive progesterone hormone can cause vaginal discharge (Sukmawati et al., 2024). Stress is a common reaction of the body to disturbed body needs. Physical and mental stress (such as excessive academic demands, poor test results, and too much assignment (Masruroh et al., 2023).

In research Bansu & Lante (2022) 53.1% of the study subjects experienced vaginal discharge, which is significantly related to stressful events experienced in adolescents, so that the colony of lactobacillus sp. The vagina is reduced when under stress because this hormone is responsible for producing lactic acid from the glycogen metabolism of vaginal mucosal cells. Stress can reduce lactic acid production, resulting in an increase in vaginal pH. The vagina needs an acidic environment to stop the spread of pathogens. The growth potential of pathogens such as anaerobic bacteria increases when the vaginal pH increases. Anaerobic bacteria are a type of bacteria that often grow in the vagina of stressed teenagers. Anaerobic bacteria that grow produce odors in vaginal secretions.

Other factors that can cause the occurrence of the incident Leukorrhea i.e. behavior Vaginal Hygiene. Behavior Vaginal Hygiene It is an effort to maintain the hygiene of individuals every day to prevent disturbances in the reproductive organs and obtain a better level of health. If the reproductive organs are not taken care of with correct vaginal hygiene behavior, infections and sources of disease can arise (Zougira & Shintya, 2024). Maintaining and maintaining the hygiene of the genital organs is essential to prevent vaginal discharge, infections of the reproductive organs, and the risk of cancer. Vaginal infections, which are the outermost reproductive organs, can threaten other internal genital organs such as the uterus, cervix, and so on (Febriyanti, 2020). Aspects that affect behavior Vaginal Hygiene namely hand hygiene before/after cleaning the feminine area, water sources and washing techniques, drying the feminine area, menstrual management and Leukorrhea, underwear selection, toilet/toilet environment cleanliness (Yulfitria & Primasari, 2019).

According to World Health Organization (2019) reported that 35% of women experienced reproductive disorders due to poor vaginal hygiene. Unhealthy behavior and hygiene of the reproductive organs during menstruation are also dangerous for most Indonesian adolescents, who reach 63 million people. BKKBN data (2020) shows that adolescents are particularly vulnerable to reproductive health disorders because they do not know about the function and care of their reproductive organs. This is evident with 3.2 million adolescents in Indonesia who suffer from reproductive disorders, with a percentage of 26.3% (Hanipa & Nirmalasari, 2020).

The treatment carried out by adolescent girls in preventing reproductive organ problems, especially vaginal discharge, is by doing behavior vaginal hygiene. Behavior Vaginal Hygiene It is a habit of maintaining the cleanliness of the female organs by not using bath soap when cleaning the genitals, wearing tight pants or skirts, and not wearing pantyliners are some of these habits that are considered natural to clean the genitals even though they are at risk of causing physiological and pathological vaginal discharge(Hannibal, 2021).

To cope with the vaginal discharge caused by stress, adolescents must get enough rest. The vaginal discharge caused by this problem can be overcome safely and easily with good sleep and adequate rest. Having a good night's sleep can help teens avoid nervous disorders such as stress, depression, and anxiety. Sleep can also calm nerve cells, allowing them to produce more energy. Stress, anxiety, and vaginal discharge will be reduced with enough sleep (Masruroh et al., 2023), The aspects of this stress are self-control/emotional management, reaction to pressure/difficult situations, level of anxiety/anxiety/mental fatigue (Pramesta, D. K & Dewi, 2021).

Based on research (Zougira & Shintya (2024) year 2024 with the title "Behavioral Relationships Vaginal Hygiene and Genesis Leukorrhea In female students" from this study, it was concluded that there is a relationship between the knowledge of maintaining genitilia hygiene and the incidence of vaginal discharge in female students in the dormitory of Klabat University, there is a relationship between behavior Vaginal Hygiene with the incidence of leukorrhea in adolescents. Also research conducted Masruroh et al (2023) with the title "The Relationship between Stress Level and the Occurrence of Vaginal Discharge (Fluor Albus) in Adolescents Aged 14-18 Years in Keboireng Village, Besuki District, Tulungagung Regency" from this study it is concluded that there is a relationship between stress levels and the occurrence of vaginal discharge (Fluor Albus) in adolescents aged 14-18 years in Keboireng Village, Besuki District, Tulungagung Regency in 2022.

In August 2024, researchers conducted interviews with members of the PIK-R organization at Madrasah Aliyah Negeri 1 Gorontalo City, they said that there had been 3 who had done counseling about the vaginal

discharge problem that occurred. Researchers have also conducted initial observations at Madrasah Aliyah Negeri 1 Gorontalo City. Based on the results of initial observations conducted by researchers through interviews with 9 young women consisting of 3 people in class X, 3 people in class XI, and 3 people in class XII, data was obtained that adolescent girls had experienced vaginal discharge (leukorrhea). 6 adolescent women admitted to experiencing vaginal discharge before and after menstruation, and 3 other adolescent women experienced vaginal discharge at an uncertain time and sometimes accompanied by itching.

In terms of daily feminine care, 2 adolescent girls use bath soap to clean the genital area and dry it with tissues. 9 Remaj Aputri has the habit of washing the genitals from the back to the front every time they have a bowel movement, and 5 young women use tight, nylon underwear. They said they only changed their underwear after taking a shower. Almost all responses do poor vaginal hygiene behavior. In addition, 5 young women experienced mild stress characteristics such as abdominal pain, mules, muscle tension, sleep problems, and the body felt light due to stress about tasks.

Therefore, the researcher is interested in conducting a study on "The relationship between Vaginal Hygiene behavior and Stress Level with the incidence of Leukorrhea in adolescent girls at Madrasah Aliyah Negeri 1 Gorontalo City".

RESEARCH METHODS

This research was carried out at Madrasah Aliyah Negeri 1, Gorontalo City on June 5 – July 27, 2025. This research is a quantitative research. The research design used was observational analysis with a Cross Sectional approach. The samples used in this study amounted to 275 samples using probability sampling techniques. The instruments used in this study were demographic questionnaires, genital hygiene behavior questionnaires, Depression Anxiety Stress Scales (DASS) 42 questionnaire and leukorrhea incidence questionnaire (vaginal discharge).

RESEARCH RESULTS

Respondent Characteristics

Table 1 Frequency Distribution by Age

No.	Age	(f)	(%)
1.	15 Years	62	22,5
2.	16 Years	104	37,8
3.	17 Years	80	29,2
4.	18 Years	29	10,5
	Total	275	100

Source: Primary Data, 2025

Based on table 1 above, it can be concluded that the age of the respondents in this study as the largest is 16 years old which amounted to 104 respondents (37.8%), and the small part was 18 years old which amounted to 29 (10.5%), the rest were 17 years old amounting to 80 respondents (29.2%) and 15 years old 62 respondents (22.5%).

Table 2 Frequency Distribution by Class

No.	Classes	(f)	(%)
1.	Grade 10	98	35,6
2.	Grade 11	92	33,5
3.	Grade 12	85	30,9
	Total	275	100

Source: Primary Data, 2025

Based on table 2, the results of respondents in this study were mostly from grade 10 which amounted to 98 respondents (35.6%), and a small part from class 12 which amounted to 85 respondents (30.9%), the rest came from grade 11 with 92 respondents (33.5%).

Table 3 Frequency Distribution by Age at the Time of Getting Your Period

No.	First Age of Menstruation	(f)	(%)
1.	Early Adolescence	173	62,9
2.	Middle Teens	100	36,4
3.	Late Teens	2	0,7
	Total	275	100

Source: Primary Data, 2025

Based on table 3, the results were obtained that based on the age at menstruation, the respondents in this study were mostly early adolescents (10-12 years) which amounted to 173 respondents (62.9%), and a small number of late adolescents (17-21 years) which amounted to 2 respondents (7%), the rest were middle adolescents (13-16 years) amounting to 100 respondents (36.4%).

Univariate Analysis

Table 4 Frequency Distribution Based on Vaginal Hygiene Behavior in Adolescent Girls MAN 1 Gorontalo City

No.	*Vaginal Hygiene Behavior*	(f)	(%)
1.	Good	26	9,5
2.	Enough	210	76,4
3.	Less	39	14,2
	Total	275	100

Source: Primary Data, 2025

Based on table 4, it was found that most of the vaginal hygiene behaviors in adolescent female respondents at Madrasah Aliyah Negeri 1 Gorontalo City had sufficient vaginal hygiene behavior with a total of 210 respondents (76.4%), and a small part were in the range of good vaginal hygiene behavior with a total of 26 respondents (9.5%), the rest had poor vaginal hygiene behavior with a total of 39 respondents (14.2%).

Table 5 Frequency Distribution Based on Stress Level in Adolescent Girls MAN 1 Gorontalo City

No.	Stress Level	(f)	(%)
1.	Lightweight	59	21,5
2.	Medium	172	62,5
3.	Weight	44	16,0
	Total	275	100

Source: Primary Data, 2025

Based on table 5, the results were obtained that most of the stress levels in adolescent female respondents at Madrasah Aliyah Negeri 1 Gorontalo City had moderate stress levels with a total of 172 respondents (62.5%), and a small number were in the range of severe stress levels with a total of 44 respondents (16.0%), the rest had a light stress level with a total of 59 respondents (21.5%).

Table 6 Frequency Distribution Based on Leukorrhea Incidence in Adolescent Girls MAN 1 Gorontalo City

No.	Emesis Gravidarum	(f)	(%)
1.	Normal	209	76,0
2.	Abnormal	66	24,0
	Total	275	100

Source: Primary Data, 2025

Based on table 6, the results of most of the incidence of leukorrhea in adolescent female respondents at Madrasah Aliyah Negeri 1 Gorontalo City were obtained from the incidence of euchorrhea, which is normal with a total of 209 respondents (76.0%), and a small part is in the range of abnormal leukorrhea incidence with a total of 66 respondents (24.0%).

Bivariate analysis

Table 7 Relationship between Vaginal Hygiene Behavior and Leukorrhea Incidence

Correlations				
			QuestionnaireVaginal Hygiene Behavior	QuestionnaireIncidence of Leukorrhea
Spearman's rho	QuestionnaireVaginal Hygiene Behavior	Correlation Coefficient	1,000	-,155*
		Sig. (2-tailed)	.	,010
		N	275	275
	QuestionnaireIncidence of Leukorrhea	Correlation Coefficient	-,155*	1,000
		Sig. (2-tailed)	,010	.
		N	275	275

Source: Primary Data, 2025

Based on table 7 of the results of the statistical test using Spearman rank in the direction of the relationship, the negative relationship direction means that the better the vaginal hygiene behavior, the risk of leukorrhea decreases, the strength of the relationship is weak (<0.25) which means that the influence is still small even though there is a clear relationship direction and p-value (0.001) is smaller than α = 0.05 or p-value < α value so it is concluded that H1 is accepted, meaning that there is a relationship between Vaginal Hygiene Behavior and the Incidence of Leukorrhea in adolescent girls at Madrasah Aliyah Negeri 1 Gorontalo City.

Table 8 Relationship of Stress Level Behavior with Leukorrhea Incidence

Correlations				
			Stress Level Questionnaire	QuestionnaireIncidence of Leukorrhea
Spearman's rho	Stress Level Questionnaire	Correlation Coefficient	1,000	,517**
		Sig. (2-tailed)	.	,000
		N	275	275
	QuestionnaireIncidence of Leukorrhea	Correlation Coefficient	,517**	1,000
		Sig. (2-tailed)	,000	.
		N	275	275

Source: Primary Data, 2025

Based on table 8, the results of the statistical test using Spearman rank were obtained in the direction of a positive relationship, meaning that the higher the stress level, the more the incidence of leukorrhea, the strength of the relationship is moderate (0.50-0.75) meaning that the relationship is significant, the result does not occur by chance and the p-value (0.000) is less than α = 0.05 or p-value <α value so that it was concluded that H1 was accepted, meaning that there was a relationship between Stress Level and the incidence of Leukorrhea in Adolescent Women at Madrasah Aliyah Negeri 1 Gorontalo City.

DISCUSSION

Vaginal Hygiene Behavior in Adolescent Girls MAN 1 Gorontalo City

Based on the results of this study, it shows that of 275 respondents, the majority have good behavior about vaginal hygiene, namely as many as 26 adolescent girls (9.5%), while 210 adolescent girls (76.4%) respondents have sufficient behavior about vaginal hygiene behavior and 39 adolescent girls (14.2%) respondents have poor behavior about vaginal hygiene. From this data, most of the young women in MAN 1 Gorontalo City have sufficient vaginal hygiene behavior.

The results of the study showed that there were quite a lot more categories, namely 210 adolescent girls (76.4%) with vaginal hygiene indicators answered in the questionnaire were dominant in answering when touching the female area, respondents always washed their hands. Although they show a sufficient level of concern for the cleanliness of the feminine area, their understanding of how to maintain cleanliness is still not fully mature. According to Albert Bandura's Social Learning Theory (1969) This theory states that individual behavior is learned through observation of the surrounding environment, especially through the process of modeling or imitating the behavior of others. In the context of vaginal hygiene, adolescents who see examples of positive behavior from family, teachers, or peers tend to adopt a better attitude so as to increase their knowledge. Conversely, the lack of role models who provide education or correct examples can cause adolescents to have limited understanding. This is in line with research by Susanti & Afi (2020) which shows the relationship between knowledge and respondents' personal hygiene behavior. This is because the observation until it became the respondent's knowledge was applied to his daily life so that it had an impact on his own hygiene behavior.

In the results of the study, it was found that adolescent girls with the category of poor vaginal hygiene behavior amounted to 39 respondents (14.2%). This can be seen from the questionnaire answers of the average young woman with a bad category who answered that she washed her feminine area not from front (vagina) to back (anus), still wearing tight underwear. This wrong behavior occurs due to a lack of encouragement and knowledge from the closest people, for example, parents, and it is also known that as many as 98 respondents (35.6%) came from grade 10, 92 (33.5%) from grade 11, and 85 respondents (30.9%) from grade 12. This data shows that poor behavior towards vaginal hygiene is not only found in 10th graders who are still in the early stages of secondary to upper secondary education, but also among 11th and 12th graders who should have a better understanding. This indicates that the level of education alone is not enough to ensure good behavior towards vaginal hygiene, so a more effective and structured educational approach is needed at all grade levels to increase the awareness and concern of young women in maintaining their feminine hygiene.

This is in line with Erik Erikson's Theory (1950) in his theory of psychosocial development which states that adolescents are in the stage of Identity vs Role Confusion at the age of 12-18 years. This stage is important for adolescents in forming their self-identity, including awareness of maintaining personal hygiene. Students in

class X (ages 14-15 years) are still in the early stages of identity search, so they are more easily influenced by the environment and have not fully understood the importance of vaginal hygiene. Class XI (ages 16-17) begins to develop a deeper understanding of personal responsibility, including maintaining personal hygiene, although it still requires guidance. Meanwhile, class XII (ages 17-18 years) is expected to have a stronger self-identity and a better understanding of reproductive health. The lack of positive attitudes towards vaginal hygiene at all grade levels shows that there are obstacles in the development of adolescents' health-related self-identity. Therefore, effective education and according to the stage of development is very important to form personal awareness and responsibility in maintaining vaginal hygiene. This is in line with the research of Amalia et al., (2022) which shows that there is a relationship between motivation and the incidence of vaginal discharge where the motivation or support encourages respondents to behave well towards their own personal hygiene in order to avoid pathological vaginal discharge.

In the category of good vaginal hygiene behavior, the results of the study were obtained from 26 adolescent girls (9.5%). This shows that a minority of respondents fill in the vaginal hygiene indicators well such as paying attention to vaginal hygiene and moisture and also paying attention to the cleanliness of water and toilet facilities. This is supported by the HBM Health Belief Model Theory (1950) which states that young women with good hygiene understand perceived benefits such as the prevention of vaginal discharge through proper washing and the selection of clean water, thereby increasing their self-efficacy. This theory is in line with Kurniasih's (2022) research, good hygienic behavior is very helpful for students in dealing with vaginal hygiene behavioral problems. If not applied correctly, this can have a negative impact on women's reproductive health. Therefore, the proper application of these behaviors will automatically support adolescents in carrying out good habits related to vulvar hygiene during menstruation. Individual behavior is influenced by three predisposing factors, namely knowledge, education, attitudes, and public trust in health.

Stress Level in Adolescent Girls of MAN 1 Gorontalo City

The results showed that students with moderate stress levels were more dominant, namely 172 respondents (62.5%), then for the light category as many as 59 respondents (21.5%), and the least in the heavy category amounted to 44 respondents (16%). From this data, most of the young women of MAN 1 Gorontalo City have moderate levels of stress.

The results showed that there were more adolescent girls with a level of stress in the moderate category, namely 172 respondents (62.5%). This is because the respondents fill in the most stress level indicators, respondents often feel that they become irritable because of trivial things, often overreact to a situation and even often find it difficult to relax. During adolescence, there will be psychological changes in the form of unstable emotions that are difficult to control. Teenagers will find it difficult to understand themselves and find it difficult to solve the problems they are facing so that teenagers will easily experience stress. This is reinforced by Lazarus' Theory (1984) complemented by emphasizing primary appraisal (threat of unstable emotions) and secondary appraisal (coping deficiency), in which adolescents feel overwhelmed due to a lack of self-control and problem-solving skills. This theory is in line with PKM UMS research (2017) analyzing identity confusion factors in adolescents, causing labile emotions and difficulty in self-understanding. This theory is in line with the research of Kheirandish, A., Hosseinian (2019) that factors that affect stress consist of internal and external factors. Internal factors include gender, social status, economy, personal characteristics, coping strategies and intelligence. While external factors consist of academic tasks and relationships with the social environment.

The results of the study in the light stress category there were 59 respondents (21.5%), this is marked by the respondents' answers to the questionnaire, sometimes the respondents feel anxious, sometimes they spend energy to be anxious. This is reinforced by Hastuti (2019) Stress is a part of life that has positive and negative effects caused by environmental changes. In simple terms, stress is a condition where there is a body's response to changes to achieve a normal state. This is in line with research (Agustiyani Dwi, 2019) that respondents who experience mild stress can further develop their potential if they respond positively to the stress they experience. The mild stress experienced by respondents can be used as motivation to study harder, build better communication with their families and environment. For respondents who have a positive view, light stress is a new power or spirit to perform even better.

The results of the study in the severe stress category were 44 respondents (16%). This shows that this minority always feels very irritable, irritable, and always finds it difficult to be patient in dealing with the disturbances that are being done. Other causes are also academic pressures such as demands for grades and achievements from parents, teachers, and yourself, the burden of school assignments that accumulate. This is strengthened by the theory of Potter and Perry (2005) quoted in (Agustiyani Dwi, 2019) explaining that the more frequent and prolonged the stressful situation, the higher the health risk caused. This is in line with the research of Kupriyanov and Zhdanov (2014) cited in (Lumban Gaol, 2016) which states that stress that exists today is an attribute of modern life. This is because stress has become an inevitable part of life. Whether in the school, work, family, or anywhere else, stress can be experienced by a person. Stress can also affect anyone, including children, adolescents, adults, or the elderly. In other words, stress must happen to anyone and anywhere. The problem is

that the amount of stress is so much for a person. The impact is that the stress is harmful to his physical and mental condition.

Incidence of Leukorrhea in Adolescent Girls MAN 1 Gorontalo City

Based on the results of the study, it was shown that out of 275 respondents, the majority had a normal incidence of leukorrhea as many as 209 respondents (76.4%), while 66 respondents (24%) had an incidence of abnormal leukorrhea. From this data, most of the adolescent girls in MAN 1 Gorontalo City have a normal incidence of leukorrhea.

The results showed that the incidence of normal leukorrhea in 209 adolescent girls (76%) was because most of the respondents filled in the indicators of leukorrhea that only occurred before and after menstruation and did not experience symptoms of vaginal discharge that led to pathology. This is supported by Hollingworth (1939) stating that vaginal discharge varies according to the menstrual cycle, most abundant and clear during ovulation (close to menstruation), with high elasticity (spinnbarkeit) and minimal leukocytes, indicating a physiological condition. This is also in line with the research stated by Ping, Natalia & Antika (2020), the vaginal wall produces odorless and clear mucus during fertile periods, before/after menstruation, and at certain times. This physiologically normal vaginal discharge does not show symptoms such as pain or itching and is small in volume, in contrast to pathological vaginal discharge which is colored and smells bad due to infection. This study is in line with research conducted by Marfu'ah et al., (2024) regarding the description of vulva hygiene and self-medication behavior carried out by UNIDA Gontor students in overcoming vaginal discharge, showing that as many as 1348 female students (82%) experienced vaginal discharge before and after menstruation.

In the abnormal leukorrhea category, the results of the study were found as many as 66 adolescent girls (24%). This is because 66 adolescent girls (24%) filled in the assessment indicators of one or more signs and symptoms of pathological vaginal discharge such as yellowish discharge and vaginal discharge experienced by heat around the vagina and itching. In addition, many respondents ignore moisture from the vagina because the underwear they use is wet due to sweating or after urinating/defecating but not dried and left alone. This statement is in line with the GA Marhaeni Theory (2016) that pathological vaginal discharge is characterized by a lot of fluid, yellow/green/gray like stale milk, accompanied by itching, heat, pain, and fishy/foul odor due to bacterial, fungal, or parasitic infections. This indicates a reproductive abnormality, with persistently high leukocytes, rather than a normal cycle. This is in line with the research of Suminar, (2022) who said that when the vaginal pH is disturbed, the risk of infection that can cause vaginal discharge is higher. This study is in line with the research of Dhea & Ginting, (2023) found that as many as 82 adolescent girls (50%) experienced pathological leukorrhea because the respondents experienced vaginal discharge accompanied by itching and heat around the vagina. The incidence of abnormal leukorrhea is dominated by adolescent girls in grades X, XI, and XI. This is because even though they are adults, they still often ignore good and correct vaginal hygiene behaviors so that they still experience abnormal leukorrhea.

The Relationship between Vaginal Hygiene Behavior and the Incidence of Leukorrhea in Adolescent Girls MAN 1 Gorontalo City

The results of the statistical test using Spearman rank were obtained with a p-value (0.000) lower than $\alpha = 0.05$ or p-value < α value so that it was concluded that H1 was accepted, meaning that there was a relationship between the level of stress and the incidence of Leukorrhea in adolescent girls at Madrasah Aliyah Negeri 1 Gorontalo City. This is supported by Behavior Theory In health behavioral science, a person's perception of risk and habits affect the extent to which they take preventive measures (e.g. personal hygiene). Models such as the Health Belief Model explain that people who understand that hygiene can prevent infection are more likely to adopt good hygiene habits , which in turn have a positive impact on their reproductive health. This is also in line with research conducted by Mukarrah Research (2020) showing that better personal hygiene will reduce the risk of pathological vaginal discharge. Poor personal hygiene behavior during menstruation is shown by not washing hands before touching the vagina, changing panties, shaving hair to avoid excessive vaginal moisture in the vaginal area. Adolescents do not clean their reproductive organs properly such as when washing the vagina after urinating (usually done from the direction of the anus to the vagina), not wiping until dry after washing it, and even many teenagers rarely change sanitary napkins unless they feel uncomfortable. Lack of knowledge about how to wash the vagina and the time of changing pads leads to an increase in the incidence of vaginal discharge in adolescents (Hanifah et al., 2023).

The age and age of menarche play an important role in influencing the relationship between stress levels, vaginal hygiene behaviors, and the incidence of leukorrhea in adolescents because they are directly related to hormonal, emotional, and reproductive health behaviors. Adolescents who experience menarche at a younger age tend to experience hormonal changes (estrogen and progesterone) earlier, which can increase cervical mucus production and vaginal secretion as part of physiological processes. According to Kim et al. (2021), increased estrogen levels after early menarche lead to higher activity of the vaginal glands so that adolescents with early menarche are more likely to experience physiological leukorrhea.

However, in adolescence, the ability to maintain personal hygiene is often not optimal and is still influenced by psychological factors such as stress, shyness, and lack of knowledge. Setyawati & Wulandari (2023) explained that emotional stress in adolescents can affect hygiene behavior through decreased motivation in maintaining the cleanliness of the genital area, thereby increasing the risk of pathological leukorrhea. Stress also plays a biological role by increasing cortisol levels, which suppresses the vaginal local immune system and disrupts the balance of the protective microbiota (Lactobacillus), as described by Turpin et al. (2021).

In addition, the chronological age of adolescents is related to levels of cognitive and social maturity. Older adolescents typically have a better understanding of reproductive hygiene and are better able to manage stress than younger ones. Rahmawati et al. (2022) found that hygiene behavior increases with age, which has an impact on decreasing the incidence of pathological leukorrhea. Thus, adolescents with more mature menarche ages and ages tend to have stable hormonal regulation, better hygiene behaviors, and more effective stress coping skills, making them more likely to develop normal leukorrhea.

Vaginal hygiene behavior is an effort or effort made to maintain health in the genitals to prevent infections and microorganisms from entering and can improve health quality (Aryani, 2021). Good vaginal hygiene behavior is an action carried out in female genital care by cleaning the vagina properly and correctly, not using scented soaps, drying with a clean towel and not wearing tight underwear (Hanifah et al., 2023).

Personal hygiene behavior according to Abselian et al, (2023) is one of the basic human abilities in meeting the needs to maintain their life, health and well-being in accordance with their health conditions which are declared to be disturbed by their nursing if they cannot take care of themselves, these results are supported by the results of a questionnaire in this study of adolescent girls of MAN Palangka Raya city with good personal hygiene behavior tend to maintain hair cleanliness using shampoo 2 times a week due to activities at school MAN wearing hijab and personal hygiene behaviors that are less likely to not maintain skin hygiene and genital hygiene due to excessive activity that will cause moist skin around the vaginal area (Hanifah et al., 2023).

In carrying out good personal hygiene practices, it can reduce the risk of pathological vaginal discharge. Maintaining the cleanliness of the genitalia, for example, washing the vagina with clean water, keeping the vagina dry, after the vagina is dried first, not having the habit of using tight pants, using cotton pants, will reduce fungi and bacteria that cause pathological vaginal discharge (Putri, Arizki Amalia, Paramitha Amelia K, 2021).

According to Azzam (2012), poor personal hygiene behavior such as wearing tight underwear, nylon underwear, and not keeping the vagina dry will result in the condition of the vagina and the vaginal area becoming moist, this condition is very favored by bacteria and fungi to multiply so that it causes pathological vaginal discharge. Therefore, often change cotton underwear at least 2 times during the shower, especially in women who are active and sweat easily.

This research is in line with research conducted by Citra, in 2023 which states that health education and understanding of proper personal hygiene can help women with disabilities to manage the hygiene of their reproductive organs better. This includes managing during menstruation, using appropriate sanitary pads, and maintaining the cleanliness of the genital area to prevent infection. In addition, support from families, health workers, and the community also plays an important role in creating a supportive environment so that women with disabilities can more easily take care of themselves and avoid the risk of reproductive health problems. With proper attention, personal hygiene behavior can be well maintained, improving the quality of life and overall health.

Good personal hygiene behavior , especially related to the care of reproductive organs, has a significant influence on the prevention of vaginal discharge in women. The habit of keeping the feminine area clean in the right way such as regularly cleaning the genital area with clean water, avoiding the use of cleaning products containing harmful chemicals, and changing underwear regularly can help reduce the risk of infections and disorders that can cause vaginal discharge. On the other hand, poor hygiene such as the use of scented products or damp underwear, can interfere with the health of the feminine area and increase the likelihood of abnormal vaginal discharge that is often accompanied by symptoms such as itching, odor, or discoloration (Jumarnis & Anjarwati, 2025).

This is also supported by the theory of Wijayanti, (2009), personal hygiene that is not good in adolescent girls today, most of them do poor reproductive organ care. For example, their daily behaviors such as wearing underwear that are not made of cotton, wearing tight pants, and immediately wearing underwear after menstruation without drying first, these habits can make the feminine area moist so that the growth of fungi and bacteria can trigger pathological vaginal discharge (Pariati, 2024).

The Relationship between Stress Levels and the Incidence of Leukorrhea

Based on the results of the sperm rank test, it was found that the p-value (0.000) was less than $\alpha = 0.05$ or p-value < α value so it was concluded that H1 was accepted, meaning that there was a relationship between Stress Level and the incidence of Leukorrhea in Adolescent Girls at Madrasah Aliyah Negeri 1 Gorontalo City. This is reinforced by the theory of Hans Selye (1956) explaining that stress is a non-specific response of the body to any demands or pressures, which will activate the Hypothalamic–Pituitary–Adrenal (HPA Axis). The activation of this system leads to an increase in stress hormones such as cortisol. The results of this study are in

agreement with research by Atusnah & Agus (2021) with a sample of 57 respondents obtained the results that stress and the incidence of vaginal discharge have a meaningful relationship in 2nd semester nursing students with p value = 0.04 (p<0.05) (Atusnah & Agus, 2021). The condition of teenagers who experience stress causes an imbalance of hormones in the body so that it becomes the cause of vaginal discharge.

According to Puji Ningsih et al (2019), stress conditions in adolescent girls can affect the menstrual cycle, such as the length and short period of menstruation and the pain caused. This irregular menstrual cycle results in a person experiencing leukorrhea or vaginal discharge. In addition, the stress conditions experienced by a person result in low body immunity, so that bacteria in the vagina will develop more rapidly and cause vaginal discharge.

This study agrees with Judha & Tjatjo (2019) who conducted the research and obtained the results of the Fisher Exact Test of 0.006 (p<0.05). From these results, it was said that the level of stress on social conditions was related to the incidence of physiological vaginal discharge. Although the study only focused on physiological vaginal discharge. The condition of a person who experiences stress results in changes in the hormonal balance in the body which is the cause of vaginal discharge. This is because in performing its performance and function the organs of the body are controlled by the brain (Febryary et al., 2016).

These findings are in line with recent research that explains that psychological stress has a complex relationship to women's reproductive health, especially the balance of the vaginal microbiota. According to Turpin et al. (2021), moderate stress can trigger the activation of the hypothalamic–pituitary–adrenal axis (HPA) and increase cortisol levels, but at moderate levels the body is still able to maintain immune balance and homeostasis of the vaginal microbiota so that it does not always cause pathological leukorrhea. This is reinforced by (Amabebe & Anumba, 2018) who explain that mild to moderate stress can cause temporary changes in the microbiota without disrupting the dominance of Lactobacillus as the main protective bacteria of the vagina.

In addition, Kwon et al. (2022) found that the local immune system of the vagina has an adaptive mechanism to increase stress hormones in the short term, so in moderately stressed individuals, the likelihood of infection or dysbiosis that causes pathological vaginal discharge is still low. Behavioral factors also play a role, because women with moderate stress tend to still be able to maintain good reproductive health and personal hygiene behaviors, in contrast to severe stress which often decreases attention to personal hygiene. Thus, it shows that the body's physiological response is still functioning optimally, and that moderate stress is not enough to significantly disrupt the balance of the vaginal microbiota ecosystem.

This study is in line with the research of Fitri & Safitri (2021) in their research entitled "The Relationship between Stress Levels and Vulva Hygiene and Vaginal Discharge in Adolescent Girls", where the results showed that for stress and vaginal discharge showed that there was a relationship between stress and vaginal discharge (p value = 0.022, the results of the study for vulva hygiene and vaginal discharge showed that there was a relationship between vulva and vaginal discharge (p-value = 0.026, OR=2,230) (Fitrie & Safitri, 2021).

Stress is a problem that occurs that every individual experiences in their daily lives. In eastern philosophy, stress is said to be the absence of calm in the mind, while in western culture, stress is a loss of emotional control. According to the author, the results of the study on the relationship between stress and vaginal discharge show that there is a relationship between stress and vaginal discharge. Vaginal discharge that occurs can be caused by psychological problems, including stress, tired body conditions, and stress can trigger an increase in the hormone estrogen which causes vaginal discharge. Stress will lower immunity decreases. This decreased immunity makes bacteria in the vagina grow rapidly and suppresses the growth of normal vaginal flora, causing abnormal vaginal discharge (Fitrie & Safitri, 2021).

This is in line with the research of Amabebe and Anumba (2018), that some of them report leukorrhea that is categorized as normal can be explained by two mechanisms reported in the recent literature. First, the immunoneuroendocrine impact of severe stress: chronic stress causes activation of the hypothalamic–pituitary–adrenal axis and increased cortisol and local immune changes that have the potential to alter the balance of the vaginal microbiota, thereby increasing susceptibility to dysbiosis, but these changes do not always show clear clinical signs so that some women persist with physiological vaginal discharge despite experiencing severe stress (Amabebe & Anumba, 2018).

The role of symptom perception and psychosocial context: epidemiological studies show that mental disorders (stress, anxiety, depression) affect the way women perceive and report genital-complaints; Some discharge complaints can be subjective perceptions without evidence of microbiological pathology during examination. The combination of these two pathways explains why in the group with severe stress there is a proportion whose vaginal discharge is recorded as a "normal" biological condition (immune/microbiota changes) and perceptual/psychosocial factors can run simultaneously or opposite each other (Turpin et al., 2021).

This is also in line with the research conducted by Hanifah et al., 2023 found that the results of the study showed a ρ-value of 0.000 which means a ρ-value < 0.05 so that it can be concluded that there is a meaningful relationship between stress levels and the incidence of vaginal discharge in adolescent girls. The OR (Odd Ratio) value of 3.938 means that adolescent girls with severe stress levels are 3.938 times more likely to experience vaginal discharge compared to adolescent girls who have mild stress levels.

According to Hastuti (2019), stress is a part of life that has positive and negative effects caused by environmental changes. In simple terms, stress is a condition where there is a body's response to changes to achieve a normal state. Meanwhile, a stressor is something that can cause a person to experience stress. Stressors can come from internal (e.g., hormonal changes, pain) or external (e.g., temperature and pollution). All organs of the body are affected and controlled by the brain, so when brain receptors experience a stressful condition, this can cause changes in the balance of hormones in the body and this can cause vaginal discharge (Hanifah et al., 2023).

When stress occurs, the hormone estrogen is produced which is then released in the vaginal lumen, resulting in an increased risk of high blood pressure, STD disorders, and the appearance of cancer of the reproductive organs. Stress bias lengthens the menstrual cycle in women, and even high levels of stress also make vaginosis bacteria more severe. The increase in vaginosis bacteria causes adolescent girls to be at risk of experiencing stress so that they are prone to vaginal discharge (Syukrila Ranti, 2009 in Pujiningsih 2019). The level of stress in adolescents can also affect the incidence of vaginal discharge, The condition of the adolescent's body at times of stress will change, including changes in reproductive hormones. The hormone estrogen will also be affected by stressful conditions, which is the cause of vaginal discharge (Hanifah et al., 2023).

CONCLUSION

Of the 275 respondents of MAN 1 Gorontalo City students, there were 26 respondents (9.5%), then 210 respondents (76.4%) were young women with poor vaginal hygiene behavior, and 39 respondents were female students with poor vaginal hygiene behavior.

Of the 275 respondents of MAN 1 Gorontalo City students, 59 respondents were young women with mild stress levels (21.5%), then 172 respondents were young women with moderate stress levels (62.5%), and 44 respondents were young women with severe stress levels.

Of the 275 respondents of MAN 1 Gorontalo City students, 209 respondents (76%) were adolescent girls who experienced normal leukorrhea and 66 respondents (24%) were adolescent girls who experienced abnormal leukorrhea.

The results of the statistical test using Spearman rank were obtained in the direction of a negative relationship, meaning that the better the vaginal hygiene behavior, the risk of leukorrhea decreases, the strength of the relationship is weak (<0.25) meaning that the influence is still small even though there is a clear direction of relationship and the p-value (0.001) is smaller than $\alpha = 0.05$ or p-value < α value so that it is concluded that H1 is accepted, meaning that there is a relationship between Vaginal Hygiene Behavior and the Incidence of Leukorrhea in Adolescent Women at Madrasah Aliyah Negeri 1 Gorontalo City.

5. The results of the statistical test using Spearman rank were obtained in a positive relationship direction, meaning that the higher the stress level, the more the incidence of leukorrhea, the strength of the relationship is moderate (0.50-0.75) meaning that the relationship is significant, the result does not occur by chance and the p-value (0.000) is smaller than $\alpha = 0.05$ or p-value < the value of α so that it is concluded that H1 is accepted, meaning that there is a relationship between Stress Level and Leukorrhea Incidence Ramaja Putri at Madrasah Aliyah Negeri 1 Gorontalo City.

ADVICE

For Educational Institutions

This research is expected to be a benchmark for seminars for schools on vaginal hygiene behavior and stress levels with the incidence of leukorrhea in adolescent girls.

For Students

This study is expected to be an evaluation material related to vaginal hygiene behavior and stress levels in adolescent girls

For the Next Researcher

Researchers are further advised to expand the study by examining more diverse populations or adding other variables that may influence the relationship between vaginal hygiene behaviors and stress levels and the incidence of leukorrhea. For example, fatigue, anemia, low nutrition, unhealthy lifestyle and obesity that cause pathological leukorrhea.

REFERENCES

Nur, L., & Mugi, H. (2021). A Review of the Literature Regarding Stress in Organizations. Journal of Management Science, 18(1), 20–30. https://journal.uny.ac.id/index.php/jim/article/view/39339/15281

Pondaang, M. F., & Januar Dwi Christy. (2023). Overview of the Level of Knowledge of Adolescent Women About Personal Hygiene and the Incidence of Vaginal Discharge. WOMB Midwifery Journal, 2(1), 11–15. https://doi.org/10.54832/wombmidj.v2i1.120

Pramesta, D. K & Dewi, D. K. (2021). The Relationship Between Self-Efficacy and Academic Stress in Students at SMA X Dhea Karina Pramesta Damajanti Kusuma Dewi Abstract. Character: Journal of Psychological Research, 8(7), 23–33.

Putri, Arizki Amalia, Paramitha Amelia K, S. C. (2021). The Relationship between Personal Hygiene Behavior and the Incidence of Vaginal Discharge in Adolescent Women. Journal of Midwifery-ISSN, 7(1), 1–8.https://doi.org/10.21070/midwiferia.v

Yulfitria, F., & Primasari, N. (2019). Prevention of Pathological Vaginal Discharge in Jakarta Midwifery Students.

Zougira, N., & Shintya, L. A. (2024). The Relationship between Vaginal Hygiene Behavior and the Incidence of Leukorrhea in Adolescents. Nutrix Journal, 8(1), 125. https://doi.org/10.37771/nj.v8i1.1108