



Research article

Relationship Between Physical Activity and Personal Hygiene with Pathological Leukorrhea in Female Sports Students

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Abstract

Background: Women's reproductive health must receive serious attention, especially a problem that is often experienced by most women, namely leukorrhea. These problems are often ignored and taken lightly, even though if handled too late it can be very fatal. In Indonesia, more than 80% of vaginal discharge complaints are pathological. Analysing of the risk factors for pathological vaginal discharge can be the first step in preventing leukorrhea early, especially in the community of women who are active in sports. **Methods:** This study used observational analytic with a cross-sectional approach. The sample size is 70 sports students in Surabaya. The sampling technique used is simple random sampling. Data were analyzed using the chi-square test on SPSS. **Results:** The results showed that there was no relationship between the level of physical activity; frequency of changing underwear; the use of underwear material; use of vaginal cleansing soap; and the use of panty liners with the event of pathological leukorrhea (p -value > 0.05). But there is a relationship between the way of washing the vagina with the incidence of pathological leukorrhea (p -value 0.007). **Conclusion:** The risk factor that has a significant relationship with the incidence of pathological leukorrhea is how to wash the vagina. Meanwhile, other factors such as the level of physical activity, the frequency of changing underwear, the use of underwear material, the use of vaginal soap/antiseptic, and the use of panty liners have no relationship with the incidence of pathological leukorrhea in female sports study program students in Surabaya.

Keywords : risk factor, activity, vaginal hygiene, leukorrhea

Abstrak

Latar belakang : Kesehatan reproduksi wanita harus memperoleh perhatian yang serius terutama masalah yang sering dialami oleh sebagian besar wanita yaitu leukorea. Persoalan tersebut sering diabaikan dan dianggap ringan, padahal jika terlambat ditangani maka akan bisa menjadi sangat fatal. Di Indonesia, wanita yang mengeluhkan keputihan lebih dari 80% diantaranya adalah patologis. Analisis terhadap faktor risiko keputihan patologis dapat menjadi langkah awal pencegahan leukorea lebih dini terutama pada komunitas wanita yang aktif berolahraga. **Metode :** Penelitian ini menggunakan *analitik observasional* dengan pendekatan *cross-sectional*. Besar sampel adalah 70 mahasiswi Keolahragaan di Surabaya. Teknik pengambilan sampel menggunakan *simple random sampling*. Data dianalisis menggunakan uji chi-square pada SPSS. **Hasil :** Hasil penelitian menunjukkan bahwa tidak ada hubungan antara tingkat aktivitas fisik dengan kejadian leukorea patologis (p value 0,141); tidak ada hubungan antara frekuensi ganti celana dalam dengan kejadian leukorea patologis (p value 1,000); tidak ada hubungan antara penggunaan bahan celana dalam dengan kejadian leukorea patologis (p value 0,207); ada hubungan antara cara membasuh vagina dengan kejadian leukorea patologis (p value 0,007); tidak ada hubungan antara penggunaan sabun pembersih vagina dengan kejadian leukorea patologis (p value 0,376); tidak ada hubungan antara penggunaan *panty liner* dengan kejadian leukorea patologis (p value 1,000). **Kesimpulan :** Faktor risiko yang memiliki hubungan signifikan dengan kejadian leukorea patologis adalah cara membasuh vagina. Sedangkan faktor lain seperti tingkat aktivitas fisik, frekuensi ganti celana dalam, penggunaan bahan celana dalam, penggunaan sabun/antiseptik vagina, dan penggunaan *panty liner* tidak memiliki hubungan dengan kejadian leukorea patologis pada mahasiswi prodi keolahragaan di Surabaya.

Kata kunci : faktor risiko, aktivitas, higiene vagina, leukorea

INTRODUCTION

Reproductive health is complete physical, mental, and social well-being, not just the absence of disease or disability, but includes all matters relating to the reproductive system, reproductive function, and reproductive processes (WHO, 2018). Reproductive health among women must receive serious attention, especially a problem that is often experienced by most women, namely leukorrhea. The problem of vaginal discharge is often overlooked by most women. For a long time, this problem has often been considered light, even though if it is handled too late, it can be very fatal (Rachmadianti, 2019). In Indonesia, 70% of the population of adolescent girls experience leukorrhea problems (Husni and Sukeji, 2020). According to Khan *et al* (2009), more than one-third of patients who seek treatment at gynecological clinics in Indonesia complain of fluor albus and more than 80% of them are pathological. Pathological leukorrhea is mostly experienced by adolescents due to poor hygiene behavior towards the reproductive organs (Paryono and Nugraheni, 2016).

High humidity facilitates the growth and development of certain fungi and bacteria that have the potential to cause vaginal discharge (Maimunah *et al*, 2019). Surabaya as one of the cities in Indonesia with high temperature and humidity certainly increases the risk of leukorrhea in women. Physical activity such as exercising can increase sweat production, especially in the folds of the body, including the inguinal area. High sweat production increases humidity in the genital area and becomes a good environment for the growth of bacteria and fungi that cause leukorrhea. Sports students in Surabaya are individuals who are prone to this condition, but until now research that explains the risk factors related to leukemia in the sports student community in Surabaya has not been reported.

Leukorrhea is divided into two, namely physiological and pathological (Oriza and Yulianty, 2018). Whether physiological or pathological, leukorrhea equally affects women. Physiological leukorrhea causes discomfort so that it can affect a woman's self-confidence. Meanwhile, continues pathological leukorrhea will continuously disrupt the function of the female reproductive organs, especially in the part of the fallopian tube which can cause infertility. In pregnant women. it

can cause miscarriage, Fetal death in utero (FDIU), congenital abnormalities, premature birth (Marhaeni, 2016).

Analysing of the risk factors for pathological vaginal discharge can be the first step in preventing early leukorrhea in women, especially in communities who are active in sports, such as students of sports study programs in Surabaya. The purpose of this study was to analyze the risk factors associated with the incidence of pathological leukorrhea in female sports majors in Surabaya. The research hypothesis is that there is a relationship between risk factors (the level of physical activity, the frequency of changing underwear, the use of underwear material, how to wash the vagina, the use of vaginal soap/antiseptic, and the use of panty liners) and the incidence of pathological leukorrhea in female sports majors in Surabaya.

METHOD

This study uses observational analytics to analyze the risk factors associated with the incidence of pathological leukorrhea in female sports majors in Surabaya with a cross-sectional approach. The research population was all students of the Faculty of Sports Science, Surabaya State University, class of 2018 and 2019 with a total of 297 female students. The sample size was determined using the bimanual proportion formula so that 70 samples were obtained. The sampling technique in this study used a simple random sampling technique. The independent variables in this study were the level of physical activity, the frequency of changing underwear, the use of underwear material, how to wash the vagina, the use of vaginal soap/antiseptic, and the use of panty liners. The dependent variable is the incidence/type of leukorrhea. Data collection was carried out in September-October 2021 online through a questionnaire. After the data collection was completed, the data were processed and analyzed using the chi-square test with the help of the SPSS computer program.

RESULT

Respondents in this study were 70 female sports students. The following table describes the general description of the characteristics of female sports students at the Faculty of Sport Sciences, Surabaya State University who are research respondents.

Tabel 1. Characteristics of Student Sports

Characteristics		N	%
Age	19 years old	2	2,8
	20 years old	22	31,4
	21 years old	37	52,9
	22 years old	9	12,9
Types of Leukorrhea	Physiological	47	67,1
	Pathological	23	32,9

Table 1 shows that most (52.9%) female students are 21 years old. In addition, as many as 23 (32.9%) students of the Faculty of Sports Science Unesa experienced pathological leukorrhea. While most (67.1%) female students experienced physiological leukorrhea.

Tabel 2. The relationship between risk factors and the incidence of pathological leukorrhea in sports students in Surabaya

Risk Factor		Physiological		Pathological		p value
		N	%	N	%	
Physical Activity Level	Low	1	25,0	3	75,0	0,141
	Moderate	6	60,0	4	40,0	
	High	40	71,4	16	28,6	
Frequency of changing underwear	≥2 times a day	44	67,7	21	32,3	1,000
	<2 times a day	3	60,0	2	40,0	
Use of underwear	Good	44	69,8	19	30,2	0,207
	Bad	3	42,9	4	57,1	
Methods in washing the vagina	From front to back	28	57,1	21	42,9	0,007
	From back to front	19	90,5	2	9,5	
Use of vaginal soap/antiseptic	Do not use	32	64,0	18	36,0	0,376
	Use	15	75,0	5	25,0	
Use of panty liner	Do not use	38	67,9	18	32,1	1,000
	Use	9	64,3	5	35,7	

Analysis of the relationship between risk factors and the incidence of pathological leukorrhea in female sports students in Surabaya using the chi-square test on the SPSS program on the computer. The results of the analysis showed that of the six risk factors, only one had a relationship with the incidence of pathological leukorrhea, namely the way of washing the vagina with a p-value of 0.007 ($p < 0.05$).

DISCUSSION

Characteristics of respondents based on age in table 1 the results of the study show that most (52.9%) female students are 21 years old. The age of the respondents in this study is in the late teens (19-22 years). Adolescents are an age that is prone to experiencing pathological vaginal discharge because the majority of them still often neglect their reproductive health. This is caused by many factors such as knowledge or other factors which will be mentioned in the following discussion.

In this study, it was found that 32.9% of respondents experienced pathological vaginal discharge. This certainly shows that many respondents also have the risk of complications due to vaginal discharge they experience. Pathological vaginal discharge is excretion of fluid from the vagina except blood either marked by a greenish-yellow, gray or milk-like liquid, sometimes foamy, thick textured, has a pungent odor, there are complaints of pain or itching, and the amount is excessive. This type of vaginal discharge can become an infection and spread to the internal reproductive organs such as the uterus and fallopian tubes which can cause inflammation in these organs. Other complications can be a urinary tract infection, or a sign of abnormalities in the female reproductive organs such as infection, cervical polyps, malignancy (tumors and cancer), and the presence of foreign bodies in the reproductive organs (Sari, 2012).

Based on the results of the study, not all risk factors have a relationship with the incidence of pathological leukorrhea. Explanation about the relationship between risk factors and the incidence of pathological leukorea in sports students in Surabaya will be presented below.

The relationship between the level of physical activity with the incidence of pathological leukorrhea

Physical activity is defined as any bodily movement produced by skeletal muscles that requires energy expenditure. Physical activity includes exercise or other activities that involve body movement as part of play, work, homework and recreational activities (WHO 2017). The type of physical activity is divided into three levels, namely light, moderate, and heavy activity. According to Maulidha (2017) factors that affect physical activity include: lifestyle, disease processes,

culture, energy levels, and age. Measurement of the level of physical activity using the GPAQ (Global Physical Activity Questionnaire) questionnaire.

The results of chi-square statistical test showed $p = 0.141$ ($P > 0.05$) which showed no relationship between the level of physical activity and the incidence of pathological leukorrhea in female sports students in Surabaya. That way the research results do not match the hypothesis or there is no relationship between the two variables. In a theoretical study, it is stated that the higher a person's level of physical activity, the more likely a woman will experience abnormal vaginal discharge. The results of this study are not in line with the research conducted by Wijayanti (2017) entitled "The Correlation of Physical Activity Levels with the Incidence of Leucorrhea in Adolescent Girls at SMAN 2 Ngaglik Sleman" which shows there is a relationship between physical activity and the incidence of vaginal discharge (p -value = 0.005).

The relationship between the frequency of changing underwear with the incidence of pathological leukorrhea

The results of statistical analysis using the chi-square test, obtained a p -value of 1,000 ($p > 0.05$) which means that there is no relationship between the frequency of changing underwear with the incidence of pathological leukorrhea in sports students in Surabaya. The results of the study stated that there was no relationship because although female students often changed their underwear, the way of washing the vagina was still wrong (from back to front) so it would certainly increase the risk of pathological leukorrhea.

Although the results of the study did not show a relationship between the frequency of changing underwear with the incidence of pathological leukorrhea, but changing underwear at least 2 times a day is still highly recommended because it can help maintain the cleanliness of the vulva and vagina. The routine habit of changing underwear at least 2 times a day also plays a major role in keeping the vagina so that it is not moist (Wardani, 2017). The same opinion was also expressed by Mancuso (2015) to avoid damp underwear, you should change your underwear at least 2 times a day or when it feels damp and uncomfortable (Mancuso, 2015).

The relationship between the use of underwear material with the incidence of pathological leukorrhea

The results of statistical analysis using the chi-square test, obtained a p -

value of 0.207 ($p > 0.05$), which means that there is no relationship between the use of underwear material and the incidence of pathological leukorrhea in sports students in Surabaya. This research is in line with the research of Cahyaningtyas (2019) which states that there is no relationship between the type of underwear used by students and the incidence of vaginal discharge. In addition, Azizah's research (2015) also stated that there was no relationship between the type of underwear material and pathological vaginal discharge in students of SMK Muhammadiyah Kudus, $p\text{value} (0.067) > (\alpha=0.05)$. Marbun's research (2018) also shows that the results of statistical tests obtained $p\text{value} = 0.153$, which means that there is no significant relationship between the material of the underwear and the incidence of vaginal discharge. The selection of underwear should be made of 100% cotton and in a clean condition, because underwear made of nylon or polyester (which due to aesthetic considerations and exploration of sexiness is more widely used) will increase vaginal moisture so that bacteria are easy to breed (Abrori, 2017).

This study is contrary to the results of research tests conducted by Setyowati on young women in Islamic boarding schools regarding the relationship between underwear material and the incidence of vaginal discharge. The CDC (2017) also states that wearing cotton underwear can reduce the risk of vaginal yeast infections. Vaginal discharge is essentially a disease that arises due to high humidity in the vaginal area which will facilitate the emergence of fungi, therefore humidity in the vaginal area must be minimized, one of which is to wear underwear made of materials that absorb sweat, such as cotton (Setyowati, 2013). Vaginal conditions that are too moist can lead to infection, yeast, and vaginal discharge. In addition, what needs to be considered to maintain vaginal moisture is to use underwear made of materials that can absorb sweat, such as cotton (Ariyani, 2012).

The relationship between how to wash the vagina with the incidence of pathological leukorrhea

The results of statistical analysis using the chi-square test, obtained a p -value of 0.007 ($p < 0.05$), which means that there is a relationship between how to wash the vagina and the incidence of pathological leukorrhea in female sports students in Surabaya. This is following the research of Cahyaningtyas (2019) which states that there is a significant relationship between how to wash the

vagina after urinating and the incidence of pathological vaginal discharge. Previous research has also shown that the way of washing the vagina is related to the incidence of pathological vaginal discharge, meaning that the prevalence of pathological vaginal discharge in respondents who wash their vagina from back to front is twice as large as respondents who wash their vagina from front to back (Abrori, 2017).

The direction of hand movement when cleaning the female genitals is from front to back (from the vagina to the anus). The reverse direction will actually give an opportunity for germs or worms that come from the rest of the dirt (faeces) that comes out of the anus to enter the urinary tract or vagina (Ariyani, 2012). Fungi and other parasites that cause vaginal discharge are abundant in the anus, so if the direction of cleaning the vagina is reversed, it will certainly cause the transfer of fungi and other parasites from the anus to the vagina. With vaginal humidity and an inappropriate pH, it will cause the fungus to grow rapidly resulting in vaginal discharge (Setyowati, 2013).

The relationship between the use of vaginal soap/antiseptic with the incidence of pathological leukorrhea

The results of statistical analysis using the chi-square test, obtained a p-value of 0.376 ($p > 0.05$), which means that there is no relationship between the use of vaginal cleansing soap and the incidence of pathological leukorrhea in female sports students in Surabaya. This study is under Ernawati's (2013) research, where it mentioned there is no relationship between the use of vaginal cleansers with the incidence of vaginosis accompanied by vaginal discharge (Ernawati, 2013). Vaginal cleaning fluids generally contain many chemical compounds that can damage the skin and the environment. The use of antiseptics that are widely sold in the market will disrupt the ecosystem in the vagina, especially the pH and the life of good bacteria. If the pH is disturbed, bad bacteria will easily grow more and the vagina will be susceptible to disease, one of which is marked by vaginal discharge (Triyani et al, 2013).

Based on the results of the study, most of the respondents admitted to using their own bath soap as a vaginal soap/antiseptic. In addition, there are also factors that influence the use of feminine hygiene, including knowledge as an internal factor and the environment as an external factor. Most of the materials used are commercial materials containing acids, antimicrobial bacteriostatics and

weak surfactants in various combinations (Pribakti, 2012).

According to Pribakti (2012), the basic ingredients in vaginal cleansing fluid are 0.25% and 1% acetic acid solutions. This solution can be used to treat vaginal infections caused by *Candida* and *Trichomonas vaginalis*. However, this substance can cause irritation to the vagina and if the concentration is higher it can cause skin irritation. It is different with lactic acid, which is a compound that is more difficult to evaporate than acetic acid and other chemical compounds. Povidone iodine is also found in vaginal cleaning fluids. The researchers found the effect of these compounds on the reduction of aerobic and anaerobic bacteria in large numbers. Feminine cleansers generally contain many chemical compounds such as petroleum, synthetic chemicals, and petrochemical heminal (chemicals harmful) which can damage the skin and the environment.

Normal vaginal flora has a role in helping maintain the acidity of the pH in an optimal state (3.5 – 5.5). Changes in the level of acidity in the vagina can cause other germs to grow easily so that an infection occurs which in turn causes vaginal discharge that smells, itch and causes discomfort. Antiseptics that are used continuously will also erode the *Lactobacillus* bacteria and other bacteria will more easily enter the vagina. If this is allowed to happen, it can lead to hip inflammation and even cervical cancer. The use of antiseptics in the intimate area should be used with a pH of 3.5 (Arumdika, 2018).

The relationship between the use of panty liners with the incidence of pathological leukorrhea

The results of statistical analysis using the chi-square test, obtained a p-value of 1,000 ($p > 0.05$), which means that there is no relationship between the use of panty liners and the incidence of pathological leukorrhea in sports students in Surabaya. This study is similar to Marbun's research (2018) with female respondents at the Salsabila Banten Midwifery Academy which showed that the statistical test results obtained p-value = 0.223, meaning that there was no significant relationship between the use of pantyliners and the incidence of vaginal discharge.

However, contrary to research conducted by Persia (2015) which reported that the use of panty liners was one of the predisposing factors for the onset of leukorrhoea. Some of the bad effects of using panty liners include: Bacteria easily breed, are exposed to chemicals, cause vaginal discharge, and trigger allergies.

Panty liner or panty shield is a type of sanitary napkin that is thinner in size and is used outside the menstrual period. Panty liners have the same composition as sanitary napkins (Persia, 2015). The use of panty liners aims to absorb vaginal fluids, sweat, blood spots, residual menstrual blood and is sometimes also used as a urine absorber for incontinence women (Persia, 2015).

The basic materials used for making sanitary napkins and panty liners are almost the same, namely recycled waste paper, perfume fibers, dioxin (a bleaching agent), plastic and cotton. However, some panty liner manufacturers choose not to use cotton because they don't need to contain blood fluids like sanitary napkins. The bottom of the panty liner is made of plastic, so it makes the skin unable to breathe freely due to lack of air circulation, this causes the vagina to be moist and easy to irritate (Wati, 2014).

CONCLUSION

Based on the results of research and discussion in the previous chapter, the researchers draw the following conclusions:

- 1) Not all risk factors have a relationship with the incidence of pathological leukorrhea in female sports study program students in Surabaya.
- 2) The risk factor that has a significant relationship with the incidence of pathological leukorrhea is how to wash the vagina.
- 3) The risk factors that did not have a significant relationship with the incidence of pathological leukorrhea were the level of physical activity, the frequency of changing underwear, the use of underwear material, the use of vaginal soap/antiseptic, the use of panty liners.

Some research results state that there is no relationship, it could be because there are many other risk factors outside this study that affect the incidence of pathological leukorrhea which have not been studied by researchers. In addition, research results can also be influenced by bias due to online data collection due to the COVID-19 pandemic, so researchers and respondents must keep their distance by implementing social distancing. However, the application of personal hygiene is very important for all women to avoid pathological leukorrhea which can be dangerous and even fatal if not treated immediately.

CONFLICT OF INTEREST

The authors declare that they hold no competing interests.

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