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The Relationship Between Knowledge, Attitude, and Vaginal Care Behavior and the Incidence of Vaginal Discharge Among Pregnant Women

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Abstract

Background: One of the physiological changes that occurs in pregnant women is vaginal discharge. Vaginal discharge that occurs during pregnancy is a health problem that requires attention, because it can have an impact on reducing maternal morbidity and mortality. Knowledge, attitudes and behavior of vaginal care are factors that influence the occurrence of vaginal discharge in pregnant women.

Purpose: To determine the knowledge, attitudes and behavior of vaginal care towards the occurrence of vaginal discharge in pregnant women.

Method: This type of study is an observational analytic with a cross-sectional approach. The sample of this study was 72 people. The sampling technique was consecutive sampling with inclusion criteria, namely gestational age 4-36 weeks who experienced vaginal discharge, had no history of urogenital infection.

Results: There is a significant relationship between knowledge and the occurrence of vaginal discharge in pregnant women ($p = 0.000$), attitudes with the occurrence of vaginal discharge in pregnant women ($p = 0.000$; $OR = 3.328$), and vaginal care behavior with the occurrence of vaginal discharge in pregnant women ($p = 0.000$; $OR = 10.105$).

Conclusion: The level of knowledge, attitudes and behavior regarding vaginal care plays an important role in influencing the occurrence of vaginal discharge in pregnant women.

Suggestion: Pregnant women should be more proactive in seeking information and increasing their knowledge about the importance of maintaining reproductive hygiene. Hospitals should improve their health promotion programs, particularly education on personal hygiene for pregnant women.

Keywords: Attitudes; Behavior; Knowledge; Pregnant Women; Vaginal Discharge.

INTRODUCTION

During pregnancy, numerous physiological and psychological changes occur that are significant for maintaining fetal development. These changes begin immediately after conception and affect every reproductive organ system. The reproductive system of pregnant women is vulnerable to infection due to decreased immune resistance and increased metabolic demands (Utami, 2024).

One of the physiological changes that occur during pregnancy is vaginal discharge. Vaginal

discharge among pregnant women frequently occurs as a result of adaptation and endocrine system changes within the maternal body (Aminah & Yuliani, 2024). Vaginal discharge (leukorrhea or fluor albus) refers to a condition in which there is an excessive and abnormal release of secretions or fluids, other than blood, from the vaginal canal. Vaginal discharge is categorized into two types: physiological (normal) and pathological (abnormal) (Prasad, Parween, Kumari, Singh, & Kumari, 2021).

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Vaginal discharge during pregnancy is a health concern that requires particular attention because it may increase maternal morbidity and mortality. If abnormal vaginal discharge during pregnancy is not managed appropriately, it may lead to complications such as preterm delivery, low birth weight, pelvic inflammatory disease (PID), post-abortion sepsis, or postoperative endometritis following cesarean section (Mokwele, Ndzamba, & Schellack, 2019). It also stated that untreated abnormal vaginal discharge can result in severe complications such as ectopic pregnancy, congenital abnormalities, and even malignancies of the genital tract (Khadawardi, 2020).

Compliance among nurses in implementing nursing standards and standard operating procedures is one of the benchmarks for successful healthcare delivery, ensuring the prevention of infections in wounds that may prolong treatment duration and increase complications (Munandar, Suhartono, & Ardani, 2018).

Previous research reported that approximately 75% of women worldwide have experienced vaginal discharge (fluor albus) at least once in their lifetime (Hillier, Austin, Macio, Meyn, Badway, & Beigi, 2021). Furthermore, it stated that about 90% of women in Indonesia are at risk of experiencing vaginal discharge due to the country's tropical climate, which facilitates fungal growth. According to the World Health Organization (WHO), 75% of women in Indonesia have experienced vaginal discharge at least once in their lives (Ministry of Health of the Republic of Indonesia, 2022).

Insan Permata Hospital, South Tangerang, is one of the hospitals providing obstetric and gynecological services. Based on hospital data, the average number of pregnant women receiving antenatal care (ANC) each month ranges between 140 and 170 individuals. One of the common complaints encountered during ANC visits is vaginal discharge.

A preliminary study conducted by the researchers at Insan Permata Hospital, South Tangerang, revealed that out of ten pregnant women attending antenatal care, eight experienced normal (physiological) discharge, while two experienced abnormal (pathological) discharge characterized by yellowish color and foul odor. Moreover, eight of these pregnant women who experienced discharge reported not performing any vaginal care because

they were unaware of proper care techniques and believed the condition would heal on its own. These findings indicate that the practice of genital hygiene among pregnant women remains relatively low.

In many cases, women experiencing vaginal discharge tend to conceal their symptoms due to feelings of embarrassment, which delays medical examination and often results in the worsening of the condition. This situation is partly due to insufficient information and understanding regarding vaginal discharge among pregnant women (Madiyanti, 2020). Knowledge and attitude are essential domains that shape individual behavior. The better an individual's knowledge, the more likely they are to demonstrate positive health behavior. Knowledge shapes one's beliefs, which then influence behavioral patterns (Mardiah, 2022).

One of the key efforts to maintain reproductive health is by practicing proper genital care behavior. This action involves vulva hygiene (Waruwu, 2022). Defined vulva hygiene as the practice of cleaning and maintaining the external female reproductive organs to keep them clean and healthy, thereby preventing infection. Proper vulva hygiene is essential to prevent vaginal discharge by minimizing bacterial and fungal growth in the female reproductive tract (Humairoh, Musthofa, & Widagdo, 2018).

A previous study showed on factors associated with the incidence of fluor albus among pregnant women revealed a significant relationship between personal hygiene and the occurrence of vaginal discharge ($p = 0.009$; $OR = 2.365$) (Prianti, Trianingsih, & Khatimah, 2021). Similarly, another study found that pregnant women with poor personal hygiene had a 28.519 times higher likelihood of experiencing vaginal discharge compared to those with good personal hygiene (Dewi, Ernawati, & Septiani, 2025).

RESEARCH METHOD

This study employed observational analytic design with a cross-sectional approach. The population consisted of all pregnant women who attended antenatal care (ANC) and experienced vaginal discharge at Insan Permata Hospital, South Tangerang, during June 2025. The sample size was determined using the Slovin formula, resulting in 72 respondents.

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The sampling method used in this study was consecutive sampling. The inclusion criteria were as follows : 1) Pregnant women with a gestational age of 4–36 weeks who experienced vaginal discharge; 2) Pregnant women who were primiparous, multiparous, or grand multiparous; 3) Pregnant women with no history of urogenital infections.

The research instruments used in this study were structured questionnaires designed to measure the respondents' knowledge, attitudes, and vaginal care behavior. The knowledge questionnaire consisted of 20 questions using the Guttman scale, assessing the respondent's understanding of vaginal discharge. The attitude questionnaire contained 15 questions measured using a Likert scale, aimed at identifying the respondent's perceptions and predispositions regarding vaginal care. The vaginal care behavior questionnaire also included 15 questions assessed through a Likert scale, evaluating respondents'

practices related to genital hygiene.

Data analysis was conducted using both univariate and bivariate methods. Univariate analysis was used to describe the characteristics of the respondents, such as education level, age, parity, and occupation. Bivariate analysis was conducted using the Chi-Square test to examine the relationship between the independent variables (knowledge, attitude, and vaginal care behavior) and the dependent variable (incidence of vaginal discharge among pregnant women). A significance level of $p < 0.05$ was considered statistically significant. The Odds Ratio (OR) was also calculated to determine the strength of the association between variables.

This study received ethical approval from the Research Ethics Committee of Universitas Indonesia Maju, with recommendation number 2692/Sket/Ka-Dept/RE/UIMA/VII/2025.

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RESEARCH RESULT

Table Characteristics of Respondents (N = 72)

Variable	Result	p-value	OR
Maternal Education (n/%)			
SD	5/6.9		
SMP	8/11.1		
SMA/SMK	25/34.7		
PT	34/47.2		
Maternal Age (n/%)			
Non-risk (20-35 years)	60/70.8		
At Risk (<20 dan >35 years)	12/29.2		
Parity (n/%)			
Multiparous	41/56.9		
Primiparous	31/43.1		
Occupation (n/%)			
Housewife	43/59.7		
Private Employee	3/4.2		
Entrepreneur	23/31.9		
Civil Servant	3/4.2		
Incidence of Vaginal Discharge (n/%)			
Pathological	21/29.2		
Physiological	51/70.8		
Knowledge of Pregnant Women (n/%)			
Poor	24/33.3	0.000	
Fair	25/34.7		
Good	23/31.9		
Attitude of Pregnant Women (n/%)			
Negative	41/56.9	0.034	3.328
Positive	31/43.1		
Vaginal Care Behavior of Pregnant Women (n/%)			
Poor	37/51.4	0.000	10.105
Good	35/48.6		

Table presents the characteristics of respondents at Insan Permata Hospital. The findings indicate that the majority of respondents had a higher education level (47.2%). Regarding maternal age, most respondents were in the non-risk age group (20–35 years), accounting for 70.8%. Based on parity, 56.9%

of respondents were multiparous, and 43.1% were primiparous. In terms of occupation, the majority were housewives (59.7%), followed by entrepreneurs (31.9%), private employees (4.2%), and civil servants (4.2%). Concerning the incidence of vaginal discharge, 70.8% of respondents experienced

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physiological (normal) discharge, while 29.2% experienced pathological (abnormal) discharge.

Based on the results of the Chi-Square statistical test for the knowledge variable, the obtained p-value was 0.000, which is smaller than 0.05, indicating that H_0 is rejected. This means there is a significant relationship between knowledge and the incidence of vaginal discharge among pregnant women at Insan Permata Hospital, South Tangerang. For the attitude variable, the significance value obtained was $p = 0.034$, which is also smaller than 0.05, thereby rejecting H_0 . Thus, there is a significant relationship between attitude and the incidence of vaginal discharge among pregnant women at Insan Permata Hospital. The Odds Ratio (OR) value was 3.328, meaning that pregnant women with a negative attitude are approximately three times more likely to experience pathological (abnormal) vaginal discharge compared to those with a positive attitude toward prevention.

For the vaginal care behavior variable, the p-value obtained was 0.000, which is smaller than 0.05, indicating that H_0 is rejected. Therefore, there is a significant relationship between vaginal care behavior and the incidence of vaginal discharge among pregnant women at Insan Permata Hospital, South Tangerang. The Odds Ratio (OR) value was 10.105, signifying that pregnant women with poor vaginal care behavior are ten times more likely to experience pathological vaginal discharge compared to those with good vaginal care behavior.

DISCUSSION

The results of this study at Insan Permata Hospital indicated that the majority of respondents had a higher education level (47.2%). A higher level of education tends to influence knowledge, attitudes, and behavior in maintaining reproductive health, particularly regarding vaginal care. This finding is in line with previous research which revealed a significant relationship between education level and the incidence of vaginal discharge, where respondents with higher education levels had a lower incidence of discharge due to broader access to health information (Riansih & Utami, 2020). Similarly, other research found that better knowledge is positively correlated with healthier vaginal care behavior (Madiyanti, 2020).

Education level plays an important role in determining an individual's knowledge and attitudes toward health, including the maintenance of reproductive organs. The higher the education level, the easier it becomes for an individual to comprehend health information obtained from medical professionals, media, or other sources. This understanding then influences daily behavior in maintaining genital hygiene, such as washing the vaginal area correctly, maintaining dryness, and choosing appropriate underwear (Dewi et al., 2025).

In terms of age, most respondents (70.8%) were within the non-risk group (20-35 years), indicating that the majority of participants were in the optimal reproductive age range physiologically ready for pregnancy and relatively less susceptible to reproductive health issues. A previous study showed that age affects the composition of the vaginal microbiota due to hormonal changes, especially estrogen levels. Microbiome analysis showed that women over 40 years old were more likely to have *Lactobacillus iners* (93%) compared to those under 30 years old (85%) or aged 30–40 years old (72%), showing a significant difference ($p = 0.006$) (Noyes, Cho, Ravel, Forney, & Abdo, 2018). In contrast, other studies have reported that younger women, such as teenagers or those in the early reproductive stage, often have less than optimal genital hygiene practices, which can worsen vaginal discharge conditions (Juniar, Simamora, Manalu, Cathryne, & Ningsih, 2023).

Regarding parties, most respondents were multiparous (56.9%), compared to primiparous (43.1%). Although multiparous women have prior pregnancy experience, it does not necessarily guarantee adequate vaginal care behavior without sufficient health education. Previous research found that higher parity was often associated with increased pregnancy complications, including reproductive health problems, emphasizing the need for continuous health education among multiparous women. Previous childbirth experiences do not automatically result in better hygiene practices if not supported by appropriate education (Muthoharoh & Virgia 2016).

From the perspective of occupation, most respondents were housewives (59.7%), followed by entrepreneurs (31.9%), while only 4.2% were private

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employees or civil servants. Being a housewife suggests that most respondents spend more time at home, which might limit their access to reproductive health information compared to women working in formal sectors. Occupational status thus plays an important role in influencing vaginal care behavior and the incidence of vaginal discharge. Women employed in formal settings may have greater access to reproductive health information through workplace health programs or digital platforms.

This study revealed a significant relationship between knowledge and the incidence of vaginal discharge among pregnant women at Insan Permata Hospital. Theoretically, knowledge is a dominant factor in shaping health behavior (Notoatmodjo, 2007). Pregnant women with insufficient knowledge may not understand proper methods of maintaining reproductive hygiene such as wiping from front to back, changing damp underwear promptly, and avoiding excessive use of soaps or antiseptic solutions. Such behaviors disrupt the normal vaginal flora that maintain an acidic pH, which inhibits the growth of pathogenic microorganisms. Consequently, the risk of pathological discharge increases, commonly caused by *Candida albicans* infection or bacterial vaginosis.

These findings align with previous research, which identified a significant association between knowledge of personal hygiene and pathological vaginal discharge in pregnant women. Respondents with lower levels of knowledge were more likely to experience abnormal vaginal discharge compared to those with good knowledge (Novianti & Haeriyah, 2021). Similarly, knowledge is closely related to clothing hygiene behavior. Women who understand the importance of wearing loose cotton underwear have lower rates of pathological vaginal discharge (Riansih & Utami, 2020).

Supporting evidence also comes from Ethiopia, which found that pregnant women with poor reproductive health knowledge were 2.1 times more likely to experience abnormal vaginal discharge (Worku, 2022). Similarly, India showed that genital hygiene education significantly reduced the prevalence of pathological vaginal discharge in pregnant women. These studies emphasize that increased knowledge not only improves understanding but also encourages consistent

hygienic behavior (Kumari, Kumar, Poonia, Singh, Raja, Bhatnagar, & Agarwal, 2021).

Beyond knowledge, cultural and social factors also influence hygiene practices among pregnant women. In several Indonesian cultural contexts, vaginal discharge is often considered normal and not requiring medical attention. This misconception leads many pregnant women to ignore symptoms, neglect preventive measures, or delay medical consultations. When coupled with poor knowledge, these beliefs increase the risk of pregnancy complications such as preterm labor, premature rupture of membranes, and low birth weight.

From a maternal and fetal health perspective, untreated pathological discharge can have serious consequences. Vaginal infections caused by bacteria or fungi may spread to the upper reproductive tract, leading to inflammation of the amniotic membranes and an increased risk of neonatal infection during childbirth (Kenfack-Zanguim, Kenmoe, Bowo-Ngandji, Kenfack-Momo, Ebogo-Belobo, Kengne-Ndé, & Esemu, 2023). Thus, poor maternal knowledge affects not only maternal health but also fetal well-being. Continuous reproductive health education, particularly during antenatal care (ANC) visits, is a crucial preventive strategy.

In conclusion, the knowledge level of pregnant women plays a key role in preventing vaginal discharge. Those with good knowledge of reproductive health are more likely to recognize risk factors, causes, and distinguishing signs between physiological and pathological discharge. This understanding enables appropriate self-care behaviors, such as maintaining genital cleanliness, using clean and breathable underwear, and avoiding perfumed or chemical cleaning agents that can disrupt the vaginal microbiota.

This study also showed a significant relationship between attitudes and the incidence of vaginal discharge in pregnant women. Previous research supports this finding, finding that pregnant women with positive attitudes have a lower likelihood of experiencing pathological vaginal discharge compared to those with negative attitudes, because positive attitudes encourage proper reproductive hygiene practices (Dewi et al., 2025). A similar finding was also found in Ethiopia, which found that poor knowledge and negative attitudes were significantly

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associated with abnormal vaginal discharge, with women with negative attitudes more likely to engage in improper hygiene practices such as not changing damp underwear or vaginal douching, making them more susceptible to infection (Worku et al., 2022).

Attitude and perception are closely related to preventive efforts. Attitude reflects an individual's tendency to respond to a particular issue, influenced by knowledge, beliefs, and experience. Pregnant women with positive attitudes are more likely to have correct perceptions of the importance of maintaining reproductive hygiene and understanding the consequences of untreated pathological discharge. Such perceptions encourage hygienic practices, including regularly changing underwear, avoiding chemical-based cleansers, and keeping the genital area dry. Conversely, women with negative attitudes or misconceptions tend to neglect hygiene practices, increasing their risk of infection.

The study found that pregnant women with negative attitudes toward vaginal discharge prevention were 3.328 times more likely to experience pathological discharge than those with positive attitudes. This finding confirms that attitude, as an affective component shaped by knowledge, belief, and personal values, significantly influences preventive behavior. Negative attitudes often manifest in poor motivation to adopt hygienic habits such as failing to change wet underwear, using fragranced cleaning products, or avoiding medical consultation despite symptoms.

These results are supported by other studies that suggest that attitudes are a significant determinant that increases the risk of pathological vaginal discharge. Their study found a high prevalence of bacterial vaginosis among pregnant women, largely due to poor preventive practices and misconceptions about reproductive health (Regassa, Kumsa, Wondimu, Yilma, Moreda, Shuulee, & Debelo, 2024). Similarly, previous studies have also found that attitudes and behaviors are stronger predictors of vaginal infections than demographic factors, with negative reproductive health attitudes associated with higher cases of vulvovaginal candidiasis (VVC) (Edziah, Acheampong, Tawiah, Amengor, Kpene, Amponsah, & Deku, 2025).

Biologically, the relationship between negative attitudes and pathological discharge can be explained

through poor hygiene behaviors that disrupt the normal vaginal flora. Pregnant women with negative attitudes are more likely to ignore hygiene, delay treatment, or use inappropriate cleansing methods. This can reduce the dominance of *Lactobacillus* species that maintain vaginal acidity, allowing pathogenic organisms such as *Candida albicans* or anaerobic bacteria to thrive, leading to bacterial vaginosis. Improving maternal attitudes is a key strategy in reducing the incidence and consequences of pathological discharge (Sethi, Narayanan, Saaid, Ahmad Adlan, Ngoi, & Teh, 2025).

Therefore, it can be inferred that attitude and perception play a vital role in determining the likelihood of vaginal discharge, especially pathological cases. Pregnant women with positive attitudes and correct perceptions of reproductive hygiene are more consistent in preventive practices such as maintaining genital cleanliness, changing underwear frequently, and avoiding high-risk behaviors like the use of perfumed soaps or vaginal douching. In contrast, those with negative attitudes or misconceptions are more likely to neglect genital hygiene, increasing their risk of infection.

These findings also demonstrate a significant association between vaginal care behavior and the incidence of vaginal discharge in pregnant women at Insan Permata Hospital. Another supporting study revealed that women with poor personal hygiene practices had a 9.028-fold higher risk of experiencing vaginal discharge compared to those with good personal hygiene (Novianti & Haeriyah, 2021). Similarly, another study found that pregnant women who maintained good personal hygiene had a 15-fold lower risk of vaginal discharge than those who did not (Wahyunita & Saragih, 2023).

From a biological standpoint, inadequate care behavior disrupts the vaginal microbiota by reducing *Lactobacillus* dominance and increasing pH levels, facilitating the growth of anaerobic bacteria such as *Gardnerella vaginalis* or fungi like *Candida albicans*, which are primary causes of pathological discharge (Ryan, Hepworth, Lyndon, & Bihuniak, 2023). Vaginal care behavior is thus closely linked to preventing pathological discharge. Pregnancy-related hormonal changes can alter the normal vaginal flora balance, making women more susceptible to infections. Proper hygiene practices such as cleaning the genital area

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correctly, changing underwear regularly, using breathable fabrics, avoiding perfumed soaps or douching, and maintaining dryness—are essential for preserving vaginal ecosystem stability.

Research in Yogyakarta emphasized that incorrect vaginal care practices such as infrequent underwear changes, the use of chemical-based vaginal cleansers, or cleaning the vaginal area from back to front increase the risk of bacterial and fungal infections (Pratiwi, 2022). Similarly, previous research found that vaginal gel use during or before pregnancy was associated with spontaneous preterm birth (SPTB) (OR = 3.45). Although not directly linked to vaginal discharge, these findings suggest that certain vaginal hygiene practices, even well-intentioned ones, can alter the microbial balance and increase obstetric risks (Janssen, Verduin, de Groot, Oudijk, & de Boer, 2022).

Therefore, vaginal care behavior functions not only as a daily hygiene routine but also as a strategic preventive effort to minimize the risk of pathological discharge among pregnant women. Proper behavior helps maintain the vaginal microflora balance, reduce external risk factors, and strengthen the body's resistance to infection during pregnancy.

Based on the results and discussion, it can be inferred that vaginal care behavior plays an essential role in determining the risk of vaginal discharge during pregnancy. Pregnant women with poor hygiene practices—such as rarely changing underwear, neglecting genital cleanliness, or using inappropriate cleansing products—are more prone to pathological discharge due to disruption of the vaginal flora balance. Conversely, consistent hygienic behavior serves as a protective factor by maintaining an optimal vaginal pH and preventing the growth of pathogenic organisms. Poor hygiene behavior is likely influenced by inadequate knowledge, low awareness, and incorrect reproductive health habits.

CONCLUSION

There is a significant relationship between knowledge, attitude, and vaginal care behavior and the incidence of vaginal discharge among pregnant women.

SUGGESTION

Pregnant women are encouraged to take a more

proactive role in seeking information and improving their knowledge regarding the importance of maintaining reproductive hygiene. A positive attitude toward the prevention of vaginal discharge should be reflected in consistent hygienic behavior. Hospitals are advised to strengthen their health promotion programs, particularly in providing health education on personal hygiene of the reproductive organs among pregnant women. Educational interventions should be delivered in structured formats, such as antenatal classes, individual counseling, or through educational media like brochures, leaflets, and videos.

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