Nursing Frontiers Research and Practice
2026.Vol. 1, No.2, (56-65)
https://doi.org/10.35730/ksq6hm86

Factors Associated with Pathological Fluor Albus Among Undergraduate Nursing Students at Andalas University

Angellyta Verzir

Faculty of Nursing, Andalas University, Padang, West Sumatra, Indonesia

Type of article: Original Article

ARTICLE INFORMATION

Received: –
Revised: –
Accepted: –
Available online: –

KEYWORDS

Fluor albus, nursing students, nutritional status, physical activity, stress

CORRESPONDING AUTHOR

Name: Angellyta Verzir
E-mail: angellytaverzir2908@gmail.com

ABSTRACT

Background: Vaginal discharge (fluor albus) is a common reproductive health experience, but abnormal discharge may indicate a pathological condition. Several lifestyle and academic factors may be associated with this condition among nursing students.
Objective: This study aimed to identify factors associated with fluor albus among female students at the Faculty of Nursing, Andalas University.
Methods: An analytic observational study with a cross-sectional design was conducted among 110 female students from the 2021 cohort, selected through simple random sampling. Data were collected using questionnaires, anthropometric measurements, the Baecke physical activity questionnaire, a personal hygiene questionnaire, and the Perceived Academic Stress Scale. Data were analysed using the Chi-square test.
Results: Of the 110 respondents, 33 (30.0%) experienced pathological fluor albus, while 77 (70.0%) had physiological discharge. Nutritional status, personal hygiene, physical activity, and academic stress were significantly associated with fluor albus ($p<0.001$, $p<0.001$, $p=0.003$, and $p<0.001$, respectively). Pathological discharge was most prevalent among respondents with excess nutritional status (95.2%), poor personal hygiene (95.8%), heavy physical activity (37.3%), and high academic stress (39.5%).
Conclusion: Nutritional status, personal hygiene, physical activity, and academic stress were significantly associated with fluor albus. Reproductive health education and health promotion addressing these factors are recommended. However, the cross-sectional design indicates association rather than causation.

INTRODUCTION

Vaginal discharge, commonly referred to as fluor albus or leukorrhea, is a frequent reproductive health concern among women. Vaginal secretion may be physiological and associated with hormonal changes during the menstrual cycle, ovulation, pregnancy, or sexual stimulation. In contrast, pathological discharge may be accompanied by an abnormal color, unpleasant odor, itching, burning, or irritation and may reflect an alteration of the vaginal environment or infection. Distinguishing physiological from pathological discharge is important because symptoms can affect comfort, confidence, daily activities, and reproductive health. Previous literature cited in the source thesis describes vaginal discharge as a common experience and reports substantial variation in its prevalence across populations and settings [1–4].

Indonesia's tropical climate, with heat, perspiration, and humidity, may contribute to moisture around the genital area. Inadequate genital hygiene can also disturb the local environment and facilitate microbial growth. Earlier studies among adolescents and university students have examined associations between vaginal discharge and hygiene practices, nutritional patterns, physical activity, and psychosocial stress [5–10]. These factors are relevant to nursing students, who may experience

dense academic schedules, clinical placements, and other activities while developing independent health behavior's.

Personal hygiene is an important element of reproductive self-care. Practices such as appropriate cleansing, hand hygiene, changing underwear, and suitable menstrual product use may help maintain genital cleanliness. Studies cited in the thesis have reported associations between personal hygiene practices and pathological vaginal discharge, although the pattern and strength of the relationship vary between study populations [5,6,11–13]. This variation indicates the importance of examining hygiene practices within a specific student population rather than assuming that findings from other settings apply uniformly.

Physical activity is another potential correlate. The thesis discusses a possible pathway in which strenuous activity and perspiration increase moisture around the genital area, while excessive energy expenditure may influence hormonal balance and the vaginal environment. Research among young women has reported associations between activity levels and vaginal discharge, but the operational definitions and populations differ [8,14–16]. Nutritional status may also be relevant. Body mass index (BMI) reflects the relationship between body weight and height; excess weight may be associated with increased sweating and skin friction around the groin. Studies have reported links between nutritional status, dietary patterns, and reproductive or vaginal health outcomes [7,17–19].

Academic stress is a further concern in higher education. Students may experience pressure related to examinations, academic expectations, clinical work, and completion of final assignments. The thesis describes potential neuroendocrine and immune pathways through which prolonged stress may influence host defense and the vaginal microbial environment. Previous studies have reported relationships between stress and vaginal discharge among adolescents and students [2,9,20–23]. However, evidence across studies is not fully consistent, and stress measures, discharge definitions, and participant characteristics differ.

The present study used a study-specific conceptual framework in which nutritional status, personal hygiene, physical activity, and academic stress were treated as independent factors potentially associated with the occurrence and classification of fluor albus. The source thesis did not specify a named nursing grand theory; therefore, no external nursing theory is attributed to the original study. The framework is consistent with a health-promotion perspective: students' daily self-care behavior's and contextual demands may be relevant to reproductive health, and nursing education can support informed self-management and timely care-seeking.

This study is relevant to nursing practice because student nurses are both recipients and potential advocates of reproductive health promotion. Findings may inform campus-based health education, counselling about genital hygiene, balanced nutrition, recovery after strenuous activity, and stress management. Nurses and faculty health services may use the findings to identify topics for student

education, while avoiding the assumption that symptoms alone establish a specific infection. The study also highlights the need for clinical assessment when discharge is accompanied by abnormal symptoms.

Although previous studies have explored individual factors, the source thesis notes differences in findings and a need to examine several factors together in the local context of nursing students at Andalas University. The study therefore aimed to identify the distribution of fluor albus and examine the associations of nutritional status, personal hygiene, physical activity, and academic stress with fluor albus among female students of the Faculty of Nursing, Andalas University, cohort 2021.

METHOD

Research Design

This study employed analytic observational design with a cross-sectional approach. The independent variables (nutritional status, personal hygiene, physical activity, and academic stress) and the dependent variable (fluor albus classification) were assessed within the same study period. The design allows assessment of statistical associations but does not establish temporal sequence or causality.

Setting and Study Period

The study was conducted at the Faculty of Nursing, Andalas University, Limau Manis, Padang, West Sumatra, Indonesia. The overall research period was July 2024 to January 2025. Data collection took place from 16 to 23 January 2025.

Population and Sample

The target population comprised 152 female students from the 2021 cohort of the Faculty of Nursing, Andalas University. The sample size was calculated using the Slovin formula with a 5% error tolerance, resulting in 110 respondents. Participants were selected by simple random sampling through a lottery based on student attendance numbers. Proportional allocation across classes resulted in 38 participants from class A1, 36 from A2, and 36 from A3. Inclusion criteria were willingness to participate and being a final-semester student. The thesis also listed absence during data collection and not experiencing vaginal discharge as exclusion criteria; all included respondents were subsequently classified as having either physiological or pathological discharge.

Data Collection and Ethical Considerations

The researcher was assisted by two enumerators. Selected students were contacted to arrange a suitable time, informed about the study, and invited to provide written informed consent. Questionnaires were completed with the researcher present, collected, and checked for completeness. Respondent names were not recorded on the data forms; confidentiality was maintained, and the data were used for research purposes. The thesis reports that institutional permission and an ethical approval letter were obtained and includes an ethics approval document in its appendices. However,

the approval committee name and approval number are not stated in the thesis text available for this manuscript and should be inserted by the author before journal submission.

Measures and Instruments

Fluor albus was assessed using a two-question questionnaire. Physiological discharge was defined in the operational instrument as clear discharge without odor or itching; pathological discharge was classified by abnormal color (white, yellow, or grey), odor, itching, or burning. No laboratory confirmation of infection was reported. Nutritional status was assessed by measuring body weight and height and calculating BMI. The thesis operationalized undernutrition as BMI below 18.5 kg/m², normal status as 18.5–24.9 kg/m², and excess nutritional status as 25.0–29.9 kg/m².

Personal hygiene was measured using a 20-item Likert questionnaire adapted from Pratika (2021), comprising 16 positive and four negative statements. Scores were categorized as poor (<60%), fair (60–75%), and good (>75%). The source thesis states that the instrument had undergone validity and reliability testing but does not provide the coefficients. Physical activity was assessed using the 16-item Baecke questionnaire, covering occupational activity, sports, and leisure-time activity. The thesis reports validity r=0.80 and Cronbach's alpha=0.687; activity was categorized as moderate (5.6–7.9) or heavy (>7.9).

Academic stress was assessed using the 18-item Perceived Academic Stress Scale developed by Bedewy and Gabriel (2015), with 13 favourable and five unfavourable items and five-point Likert response options. The scale covers academic expectations, faculty work and examinations, and students' academic self-perception. Scores of 18–45 were categorized as low and 46–90 as high. The thesis reports a Cronbach's alpha coefficient of 0.70 for this instrument [24–26].

Data Analysis

Data were edited, coded, entered, cleaned, and tabulated using SPSS version 23.0. Univariate analysis described respondent characteristics and the distribution of each study variable using frequencies and percentages. Bivariate associations between each independent variable and fluor albus classification were tested using the Chi-square test. The significance threshold was $p<0.05$. The thesis describes Fisher's exact test as an alternative when Chi-square assumptions are not met; however, the reported bivariate results are presented as Chi-square tests. No multivariable analysis was reported.

Ethical Considerations

Participation was voluntary and based on informed consent. Anonymity, confidentiality, and the principle of beneficence were addressed in the study procedures. The ethics approval reference should be completed from the original approval letter before submission.

RESULTS AND DISCUSSION

Respondent Characteristics and Univariate Findings

A total of 110 female students participated. Most respondents were 21 years old (67; 60.9%), followed by 22 years (35; 31.8%), 23 years (5; 4.5%), and 20 years (3; 2.7%). Thirty-three respondents (30.0%) were classified as having pathological fluor albus, while 77 (70.0%) were classified as having physiological discharge. Normal nutritional status was reported in 76 respondents (69.1%); 13 (11.8%) were undernourished and 21 (19.1%) had excess nutritional status. Good personal hygiene was reported by 65 respondents (59.1%), fair hygiene by 21 (19.1%), and poor hygiene by 24 (21.8%). Heavy physical activity was reported by 83 respondents (75.5%), while 27 (24.5%) had moderate activity. High academic stress was found in 81 respondents (73.6%), and low stress in 29 (26.4%).

Table 1. Respondent Characteristics and Distribution of Study Variables (n=110)

Table 1. Respondent Characteristics and Distribution of Study Variables (n=110)

Variable	Category	n (%)
Age (years)	20	3 (2.7)
	21	67 (60.9)
	22	35 (31.8)
	23	5 (4.5)
Fluor albus	Physiological	77 (70.0)
	Pathological	33 (30.0)
Nutritional status	Underweight	13 (11.8)
	Normal	76 (69.1)
	Excess	21 (19.1)
Personal hygiene	Poor	24 (21.8)
	Fair	21 (19.1)
	Good	65 (59.1)
Physical activity	Moderate	27 (24.5)
	Heavy	83 (75.5)
Academic stress	Low	29 (26.4)
	High	81 (73.6)

Data are presented as frequency and percentage. Percentages may not total 100.0 due to rounding.

Bivariate Associations

All four independent variables showed statistically significant associations with fluor albus classification. The distribution of pathological discharge differed across nutritional status, personal hygiene, physical activity, and academic stress categories (Table 2).

Table 2. Associations Between Study Factors and Fluor Albus Classification (n=110)

Factor / Category	Physiological n (%)	Pathological n (%)	Total n	p-value
Nutritional status				<0.001
Underweight	11 (84.6)	2 (15.4)	13	
Normal	65 (85.5)	11 (14.5)	76	
Excess	1 (4.8)	20 (95.2)	21	
Personal hygiene				<0.001
Poor	1 (4.2)	23 (95.8)	24	
Fair	11 (52.4)	10 (47.6)	21	
Good	65 (100.0)	0 (0.0)	65	
Physical activity				0.003

Moderate	25 (92.6)	2 (7.4)	27	
Heavy	52 (62.7)	31 (37.3)	83	
Academic stress				<0.001
Low	28 (96.6)	1 (3.4)	29	
High	49 (60.5)	32 (39.5)	81	

Note: p-values are from the Chi-square tests as reported in the thesis. Values reported as 0.000 are presented as p<0.001. Percentages are within each category.

DISCUSSION

Occurrence of Fluor Albus

In this study, 30.0% of respondents were classified as having pathological fluor albus and 70.0% as having physiological discharge. This finding indicates that abnormal symptoms were present in a substantial minority of the surveyed students, while physiological discharge was more common. The distinction is clinically important: physiological discharge may accompany normal hormonal variation, whereas abnormal color, odor, itching, or burning warrants further assessment. The source thesis compares its result with studies reporting different proportions of pathological discharge among female students, illustrating how prevalence can vary with population, symptom definitions, and measurement procedures [1,5,27]. Because the present classification was questionnaire-based and not confirmed by laboratory testing, the 30.0% figure should be interpreted as the proportion meeting the study's symptom-based operational definition, not as a confirmed prevalence of a specific vaginal infection.

Nutritional Status and Fluor Albus

Nutritional status was significantly associated with fluor albus (p<0.001). Pathological discharge was reported by 20 of 21 respondents (95.2%) in the excess nutritional status group, compared with 11 of 76 (14.5%) in the normal group and two of 13 (15.4%) in the underweight group. The contrast was most pronounced between the excess and normal categories. The thesis proposes that excess body weight may contribute to sweating, friction, and moisture around the groin, creating conditions that may facilitate irritation or microbial growth. This interpretation is consistent with the study's discussion of body mass, skin folds, and local moisture, and with prior work cited in the thesis on nutritional status and health [17–19,28]. Nevertheless, the cross-sectional design cannot establish whether nutritional status precedes the symptoms, and residual confounding by hygiene, clothing, activity, or other factors cannot be excluded.

Personal Hygiene and Fluor Albus

Personal hygiene showed a statistically significant association with fluor albus (p<0.001). Nearly all respondents with poor hygiene (23/24; 95.8%) were classified as having pathological discharge. In the fair hygiene group, 10 of 21 (47.6%) had pathological discharge, whereas none of the 65 respondents with good hygiene were classified as pathological. This marked gradient supports the importance of appropriate genital hygiene education. Previous studies cited in the thesis have also described associations between hygiene habits and pathological discharge [5,6,11–13,29]. The finding should not

be interpreted as proof that hygiene alone determines vaginal health; excessive or inappropriate cleansing products may also disturb the local environment. Nursing education should therefore emphasize gentle external cleansing, hand hygiene, clean and dry underwear, appropriate menstrual hygiene, and avoidance of practices that may irritate the genital area.

Physical Activity and Fluor Albus

A significant association was found between physical activity and fluor albus (p=0.003). Pathological discharge was observed in 31 of 83 respondents (37.3%) with heavy physical activity and two of 27 (7.4%) with moderate activity. The thesis discusses perspiration and prolonged moisture around the genital area as possible explanations, and describes a proposed hormonal pathway related to strenuous energy expenditure [14–16,30]. The present study did not directly measure perspiration, hormonal concentrations, vaginal pH, or microbiota; these mechanisms should therefore be regarded as possible explanations from the cited literature rather than measured mediators in this dataset. Practical advice can focus on changing out of damp clothing after exercise, maintaining appropriate hygiene, and allowing adequate recovery, without discouraging beneficial physical activity.

Academic Stress and Fluor Albus

Academic stress was significantly associated with fluor albus (p<0.001). Pathological discharge occurred in 32 of 81 respondents (39.5%) with high stress and one of 29 (3.4%) with low stress. This result is consistent with studies cited in the thesis that report relationships between psychosocial or academic stress and vaginal discharge among adolescents and university students [2,9,20–23,31]. The thesis discusses activation of the hypothalamic–pituitary–adrenal axis and possible effects of stress hormones on immune function and mucosal defense. These pathways were not directly measured in this study, so they cannot be confirmed as explanations for the observed association. Student support services, academic advising, peer support, and accessible stress-management programs may nevertheless be appropriate components of campus health promotion.

Implications for Nursing Practice and Health Promotion

The findings suggest several practical priorities for nursing and campus health services. First, reproductive health education should help students distinguish physiological discharge from symptoms that require clinical evaluation. Second, education should address practical genital hygiene without promoting unnecessary intravaginal cleansing or self-medication. Third, student health programs may integrate nutrition counselling, healthy activity and recovery habits, and stress-management support. Nurses can use confidential, non-stigmatizing conversations to encourage students with persistent, recurrent, malodorous, discoloured, itchy, or painful discharge to seek assessment. These actions translate the observed associations into health-promotion opportunities while avoiding the claim that any single factor is a proven cause.

Limitations

Several limitations should be considered. Cross-sectional design prevents causal inference and does not establish the temporal relationship between exposures and symptoms. The study was conducted in one faculty and one cohort at a single university, limiting generalizability. Fluor albus classification relied on self-reported symptoms through a short questionnaire and was not confirmed by clinical examination, microscopy, culture, or other laboratory testing. Personal hygiene, activity, and stress were also questionnaire-based and may be affected by recall or social desirability bias. The study used bivariate analysis only; potential confounding and interactions among nutritional status, hygiene, activity, and stress were not adjusted for. Finally, the source thesis does not provide a reported validity coefficient for the personal hygiene questionnaire or the ethics approval number in its main text.

Recommendations

The Faculty of Nursing may consider regular reproductive health education, practical workshops on appropriate genital hygiene, and access to confidential consultation. Student support initiatives may also address academic workload and stress management. Future studies should include multiple faculties or universities, larger and more diverse samples, multivariable analyses, and clinical or laboratory assessment to distinguish symptoms from confirmed infections. Additional variables suggested in the thesis include previous vaginal infection and sleep patterns.

CONCLUSION

Among 110 female nursing students at Andalas University, 30.0% were classified as having pathological fluor albus. Nutritional status, personal hygiene, physical activity, and academic stress were each significantly associated with fluor albus classification. Pathological discharge was most frequent among respondents with excess nutritional status, poor personal hygiene, heavy physical activity, and high academic stress. These findings support comprehensive reproductive health promotion for nursing students, including appropriate genital hygiene, balanced nutrition, healthy activity and recovery practices, and academic stress management. Since the study was cross-sectional and relied on symptom-based self-report, the associations should not be interpreted as causal. Clinical assessment and laboratory confirmation are recommended when pathological discharge is suspected.

AUTHOR CONTRIBUTION

Angellyta Verzir: Conceptualization, methodology, investigation, data curation, formal analysis, visualization, writing – original draft, and writing – review and editing. The contribution statement is based on the single author identified in the source thesis and should be confirmed by the author before submission.

ACKNOWLEDGEMENT

The author acknowledges the Faculty of Nursing, Andalas University, and the students who participated in the study. No specific funding source was reported in the source thesis.

REFERENCES

1. Abrori, Ermulyadi. Factors associated with pathological vaginal discharge among female students of SMAN 1 Simpang Hilir, Kayong Utara Regency. Unnes J Public Health. 2017.
2. Afkarina D, Kurniawati D, Rahmawati I. The relationship between stress level during the COVID-19 pandemic and fluor albus incidence in adolescents. Nurs Health Sci J. 2022;2(3):228-31. doi:10.53713/nhs.v2i3.141.
3. Agolla JE, Ongori H. An assessment of academic stress among undergraduate students: the case of University of Botswana. Educ Res Rev. 2009;4(2):63-70.
4. Ainsworth BE, Haskell WL, Whitt MC, Irwin ML, Swartz AM, Strath SJ, et al. Compendium of physical activities: an update of activity codes and MET intensities. Med Sci Sports Exerc. 2000;32(9 Suppl):S498-504. doi:10.1097/00005768-200009001-00009.
5. Amelia W. Relationship between knowledge and use of genital cleansers and vaginal discharge among second-year students of STIKES Al-Ma'arif Baturaja. J Kesehat Pembangunan. 2018;8(16). doi:10.52047/jkp.v8i16.9.
6. Andolina N, Husnah R, Murniyati. Relationship between personal hygiene knowledge and dietary patterns with fluor albus infection among undergraduate nursing students at Universitas Awal Bros. J Penelit Kebidanan. 2022;3:25-34.
7. Astuti H, Wiyono J, Candrawati E. Relationship between vaginal hygiene behaviour and vaginal discharge among female students in the PSIK Unitri women's dormitory. Nurs News. 2018;3(1). doi:10.33366/nn.v3i1.831.
8. Astuti J, Ningsih N, Fitri YEY. Relationship between pantyliner use and pathological fluor albus among health students at Universitas Sriwijaya Indralaya. Undergraduate thesis. Universitas Sriwijaya; 2024.
9. Ayu Viralestari I, Adhiestiani NME, Karuniadi GAM. Relationship between pantyliner use and vaginal discharge among women of reproductive age. JPPP. 2024.
10. Baecke JAH, Burema J, Frijters JER. A short questionnaire for the measurement of habitual physical activity in epidemiological studies. Am J Clin Nutr. 1982;36(5):936-42.
11. Bedewy D, Gabriel A. Examining perceptions of academic stress and its sources among university students: the Perception of Academic Stress Scale. Health Psychol Open. 2015:1-9.
12. Brotman RM. Vaginal microbiome and bacterial vaginosis: implications for risk of STIs and HIV infection. Curr Infect Dis Rep. 2011;13(1):6-12. doi:10.1007/s11908-010-0145-6.
13. Chrousos GP. Stress and disorders of the stress system. Nat Rev Endocrinol. 2009;5(7):374-81.
14. Deastri P, Nopita S. Factors causing vaginal discharge among adolescent girls. J Ilmu Kesehat Karya Bunda Husada. 2020;6(2):2.
15. Dewi DK, Meylana EH, Widianti FP, Safitri RI. The profile of perceived academic stress in higher education. 2020. doi:10.2991/assehr.k.201201.028.
16. Etnis RB, Maay AGA. Effect of green betel leaf decoction on reducing pathological vaginal discharge among women of reproductive age. Window Health J Kesehatan. 2021;4:307-13. doi:10.33096/woh.v4i04.200.
17. Fradisa L. Relationship between stress level and nutritional intake among Upertis students preparing their thesis. J Kesehat Tambusai. 2024;5.
18. Gibney MJ, Lanham-New SA, Cassidy A, Vorster HH. Introduction to human nutrition. 3rd ed. Wiley-Blackwell; 2019.
19. Hako S, Kadir L, Ahmad ZF. Personal hygiene behaviour among adolescent girls during menstruation at SMKN 1 Bulango Selatan, Bone Bolango Regency, 2022. Madu J Kesehat. 2022;11(1):34. doi:10.31314/mjk.11.1.34-45.2022.
20. Hana C, Zuhdy N, Widyasih H. Psychosocial stress and pathological fluor albus among female Islamic boarding school students. J Forum Kesehat. 2018.
21. Hanifah H, Hedy HJ, Irma I. Relationship between personal hygiene, physical activity, and stress level with vaginal discharge among grade XII female students at SMA Darussalam, Garut Regency, 2023. SENTRI J Ris Ilm. 2023;2.
22. Hidayah A, Sari AW, Peu AY. Relationship between use of feminine cleansing soap and vaginal discharge among women of reproductive age in RW 06, Kletek Village, Taman District, Sidoarjo. Hosp Majapahit J. 2021;13.
23. Iswatun, Kusnanto, NAF. The effect of health education on knowledge, attitudes, and actions in prevention of leukorrhea in adolescent girls. J Int Dent Med Res. 2021;14.

24. Kaur R, Sharma S, Singh S. Impact of menstrual hygiene on vaginal health and the microbial balance: a review. Int J Womens Health. 2019;11:35-42. doi:10.2147/IJWH.S200405.

25. Ketut NW, Nabuasa E, Ndoen E. Attitudes and actions in managing pathological vaginal discharge among female students of the Faculty of Public Health, Universitas Nusa Cendana, Kupang. Media Kesehat Masy. 2021;3:108-18.

26. Khoriyah S, Khodijah I. Relationship between knowledge and behaviour regarding vulvar hygiene and vaginal discharge. Inov Kesehat Glob. 2024;3:265-72. doi:10.62383/ikg.v1i3.812.

27. Kusuma Dewi D, Ina Savira S, Wuri Satwik Y, Noviana Khoirunnisa R. Profile of perceived academic stress in students. J Psikol Teori Terap. 2022;3:395-402.

28. Marhaeni GA. Vaginal discharge in women. J Skala Husada J Health. 2017;13(1):30-8.

29. Mestecky J, Russell MW. Induction of mucosal immune responses: focusing on IgA-mediated protection against bacterial infections. Curr Opin Immunol. 2019;59:50-7.

30. Mitchell C, Marrazzo J. Bacterial vaginosis and the cervicovaginal immune response. Am J Reprod Immunol. 2014;71(6):555-63. doi:10.1111/aji.12264.

31. Nikmah US, Widyasih H. Personal hygiene habits and pathological fluor albus among female students at PP Al-Munawwir, Yogyakarta. Media Kesehat Masy Indones. 2018;14(1):36. doi:10.30597/mkmi.v14i1.3714.

32. Notoatmodjo S. Health research methodology. Jakarta: Rineka Cipta; 2018.

33. Nursalam. Nursing research methodology. 4th ed. Jakarta: Salemba Medika; 2016.

34. Prameswari VE, Yulianti I, Magfiroh N. The relation of stress level with fluor albus among adolescent girls at SMP Taman Siswa Mojokerto. Int J Nurs Midwifery Sci. 2018;2:155-8.

35. Pujiningsih E, Hadi S. Relationship between stress level and vaginal discharge among female students in grades X and XI at MA Hidayaturrahman NW Menggala. JIKF. 2019;7(2). doi:10.51673/jikf.v7i2.581.

36. Purbasari D, Suesti, Putri IM, Nengak G. The relationship between knowledge and the occurrence of vaginal discharge. Bul Ilmu Kebidanan Keperawatan. 2023;2(2):69-76. doi:10.56741/bikk.v2i02.260.

37. Ranamajaki NF, Argarini D, Widiastuti S. Analysis of factors associated with fluor albus among regular undergraduate nursing students at Universitas Nasional, South Jakarta. MAHESA Malahayati Health Student J. 2024;4(4):1274-89. doi:10.33024/mahesa.v4i4.14028.

38. Sulistiawaty S, Wathan FM, Silaban TDS. Factors associated with vaginal discharge among regular undergraduate midwifery students at Universitas Kader Bangsa Palembang in 2021. J Ilm Univ Batanghari Jambi. 2023;23(2):1975. doi:10.33087/jiubj.v23i2.3152.

39. Tomas MSJ, Nader-Macías MEF, Azpiroz MB. Lactobacillus and its role in the vaginal microbiota. Microb Cell Fact. 2021;20(1):1-14.

40. Wang H, Huang Z, Wu Z, Qi X, Lin D. An epidemiological study on vaginitis in 6,150 women of reproductive age in Shanghai. New Microbiol. 2017;40.

41. Yogev Y, Goren I, Neeman T. Effect of antiseptic soap on vaginal pH and microbial flora: a systematic review. Int J Gynaecol Obstet. 2021;152(2):123-9. doi:10.1002/ijgo.13546.

42. Yulfitria F, Karningsih K, Mardeyanti M, Wahyuni ED, EVK T. Health education influences adolescent girls' behaviour in preventing pathological vaginal discharge. Muhammadiyah J Midwifery. 2022;2(2):47-57. doi:10.24853/myjm.2.2.47-57.