

The Relationship Between Personal Hygiene Behavior and Incidence of Vaginal Discharge Among Seventh and Eight-Grade Students

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ABSTRAK Adolescence is a critical developmental period marked by rapid physical changes, particularly in the reproductive system. Poor understanding and behavior related to personal hygiene during this stage can increase the risk of reproductive health issues, including pathological vaginal discharge. Despite the prevalence of vaginal discharge among adolescent girls, limited research has examined its association with personal hygiene practices in school-aged populations. This study aimed to investigate the relationship between personal hygiene behavior and the incidence of vaginal discharge among seventh and eighth-grade female students. An observational analytic study was conducted using a cross-sectional approach at SMPN 1 Ngariboyo. The study population consisted of 179 students, with 124 participants selected through simple random sampling. Data were collected using a validated and reliable questionnaire assessing personal hygiene behavior (20 items) and the incidence of vaginal discharge (5 items). The variables analyzed were personal hygiene behavior (independent) and vaginal discharge (dependent), with statistical analysis performed using the Gamma correlation test. The findings revealed that 66.1% of students exhibited poor personal hygiene behavior, and 75.8% experienced pathological vaginal discharge. The Gamma test indicated a significant correlation between personal hygiene behavior and vaginal discharge ($p = 0.030$), suggesting that inadequate hygiene practices are associated with a higher risk of pathological discharge. In conclusion, this study demonstrates a significant association between poor personal hygiene behavior and the incidence of pathological vaginal discharge among adolescent girls. The findings highlight the importance of improving hygiene education and awareness, particularly in school settings, to promote reproductive health. It is recommended that schools implement regular health counseling sessions focusing on female hygiene to reduce the prevalence of vaginal discharge and improve overall adolescent well-being.

INDEX TERMS Adolescence, personal hygiene behavior, vaginal discharge, reproductive health.

I. INTRODUCTION

Adolescence, defined by the World Health Organization as individuals aged 10–19 years, represents a critical period of transition marked by profound biological, psychological, and social changes [1]. One of the most significant changes occurs in the reproductive system, which necessitates a strong understanding of personal hygiene to prevent health complications, particularly in young females [2]–[4]. Poor genital hygiene during this developmental stage is associated with a higher risk of vaginal infections, including pathological vaginal discharge (fluor albus), which is common but often overlooked [5]–[7].

Vaginal discharge, particularly the pathological type, can lead to severe health consequences if left untreated. These include chronic infections, pelvic inflammatory disease, infertility, and ectopic pregnancy [8], [9]. The National Population and Family Planning Board (BKKBN) reports that approximately 75% of Indonesian women have experienced vaginal discharge, a rate significantly higher than in Western countries due to Indonesia's humid tropical climate [10]. Many adolescent girls are unaware of the proper techniques

for maintaining personal hygiene, such as cleaning from front to back after urination or washing hands before touching genital areas, increasing their vulnerability to infections [11], [12].

Recent studies emphasize the importance of educational interventions to improve adolescent girls' knowledge and behavior regarding reproductive health [13]–[16]. Various cross-sectional and interventional methods have been employed, such as health promotion via school-based counseling, digital media, and peer education programs, to reduce the incidence of reproductive tract infections [17]–[19]. However, the integration of these methods in school settings in rural Indonesia remains limited, and there is insufficient data evaluating their effectiveness among junior high school students [20], [21].

Although prior research has explored the relationship between personal hygiene and reproductive health outcomes, few have specifically focused on early adolescents and the influence of hygiene behavior on the occurrence of pathological vaginal discharge in rural school environments [22], [23]. Moreover, some studies lack a clear

implementation plan for health education based on their findings [24], [25]. This creates a gap between academic evidence and practical application in school health programs. This study aims to examine the relationship between personal hygiene behavior and the incidence of vaginal discharge among seventh and eighth-grade female students at SMPN 1 Ngariboyo. By identifying the link between hygiene practices and vaginal health, the study seeks to inform effective preventive strategies in school settings. The main contributions of this study are as follows: It provides empirical evidence linking personal hygiene behavior with the prevalence of pathological vaginal discharge in early adolescents. It identifies behavior patterns and hygiene practices most associated with reproductive health risks.

II. METHODS

This study employed an observational analytic design with a cross-sectional approach to examine the relationship between personal hygiene behavior and the incidence of vaginal discharge among female junior high school students. The cross-sectional method was chosen due to its suitability in identifying associations between variables at a single point in time, providing efficient insight into behavioral and health conditions within a defined population [26], [27].

A. STUDY SETTING AND DURATION

The research was conducted at SMPN 1 Ngariboyo, a public junior high school located in Magetan Regency, East Java, Indonesia. The study took place over the course of two months, from April to May 2024, including instrument validation, data collection, and analysis.

B. STUDY POPULATION AND SAMPLING

The population of this study consisted of all seventh and eighth-grade female students enrolled in SMPN 1 Ngariboyo during the 2023/2024 academic year, totaling 179 students. Inclusion criteria were: (1) students who had reached menarche, (2) were willing to participate, and (3) had received parental or guardian consent. Exclusion criteria included students who were absent during the data collection or refused to participate after initial consent. A simple random sampling technique was used to ensure equal opportunity of selection among participants. The final sample consisted of 124 students, which met the minimum sample size requirement for correlation analysis at a 95% confidence level and 5% margin of error. This method of sampling enhances the generalizability of the findings within the school population [28].

C. STUDY VARIABLES

There were two main variables in this study. The independent variable was personal hygiene behavior, and the dependent variable was the incidence of vaginal discharge, further categorized into physiological, pathological, or absence of discharge. Both variables were measured using a self-administered questionnaire.

D. Research Instruments

Data were collected using a structured questionnaire developed by the research team based on relevant literature and previous instruments used in similar studies [29]. The

questionnaire consisted of two parts: Personal Hygiene Behavior Questionnaire: This section contained 20 items assessing hygiene practices, including genital washing techniques, frequency of underwear changes, handwashing before genital contact, and menstrual hygiene habits. Responses were rated using a three-point Likert scale: "Always," "Sometimes," and "Never."

Vaginal Discharge Questionnaire: This consisted of 5 items designed to identify the presence and type of vaginal discharge based on characteristics such as color, odor, consistency, and associated symptoms. Before data collection, a pilot test was conducted involving 30 students from a neighboring school who were not included in the main study sample. Instrument validation was conducted using item-total correlation for validity and Cronbach's alpha for reliability. All items showed acceptable validity ($r > 0.3$) and the internal consistency coefficients were satisfactory ($\alpha = 0.81$ for personal hygiene behavior and $\alpha = 0.78$ for vaginal discharge), indicating that the instrument was reliable [30], [31].

E. DATA COLLECTION PROCEDURE

Prior to data collection, permission was obtained from the school administration and the local health research ethics committee. Participants and their parents or guardians were informed of the study's purpose, procedures, and confidentiality provisions. Written informed consent was obtained. The questionnaire was administered during school hours in a classroom setting under researcher supervision to minimize misunderstanding and ensure completeness. Participants were instructed to answer honestly and were allowed to seek clarification as needed. Data collection was completed in one session per class to avoid repeated measures or contamination of responses.

F. DATA MANAGEMENT AND ANALYSIS

After collection, all questionnaire responses were checked for completeness and consistency. Data were coded, entered, and analyzed using SPSS version 26.0. Descriptive statistics were used to summarize participant characteristics, hygiene behavior levels, and the prevalence of vaginal discharge. For bivariate analysis, the Gamma correlation test was used to examine the relationship between personal hygiene behavior and the incidence of vaginal discharge, given the ordinal nature of the data and the non-parametric distribution. Statistical significance was determined at a p-value < 0.05 .

G. ETHICAL CONSIDERATIONS

Ethical clearance was obtained from the Health Research Ethics Committee of Poltekkes Kemenkes Surabaya. Participants' anonymity and confidentiality were strictly maintained throughout the research process. All data were stored securely and used solely for academic purposes.

H. LIMITATIONS

While the study design allows for the identification of associations, it does not establish causality. Additionally, self-reported data may be subject to bias due to social desirability or recall errors. However, these limitations were minimized through questionnaire validation and supervised data collection procedures.

III. RESULT**A. AGE DISTRIBUTION**

The results in [TABLE 1](#) show that the age of the students is mostly 13 years old, namely 61 people (49.2%).

TABLE 1
Age Distribution

Age (year)	Frequency (n)	Percentage
12	4	3.2
13	61	49.2
14	55	44.4
15	4	3.3
Total	124	100

B. FREQUENCY DISTRIBUTION OF PERSONAL HYGIENE BEHAVIOR

The results in [TABLE 2](#) show that 82 students (66.1%) experienced less personal hygiene behavior.

TABLE 2
Frequency Distribution of Personal Hygiene Behavior

Personal Hygiene Behavior	Frequency (n)	Percentage
Not enough	82	66.1
Enough	36	29.0
Good	6	4.8
Total	124	100

C. FREQUENCY DISTRIBUTION OF VAGINAL DISCHARGE

The results in [TABLE 3](#) show that the most female students experienced vaginal discharge in the pathological vaginal discharge category, namely 94 female students (75.8%).

TABLE 3
Frequency Distribution of Vaginal Discharge

Vaginal Discharge	Frequency (n)	Percentage
Pathologic Vaginal Discharge	94	75.8
Physiologic Vaginal Discharge	25	20.2
Not Vaginal Discharge	5	4.0
Total	124	100

D. ANALYSIS OF THE RELATIONSHIP BETWEEN PERSONAL HYGIENE BEHAVIOR AND THE INCIDENCE OF VAGINAL DISCHARGE

The results of data analysis from [TABLE 4](#) using the Gamma test show p value of 0.030 (<0.05) that there is a relationship between personal hygiene behavior and the incidence of vaginal discharge.

TABLE 4
Analysis of the Relationship Between Personal Hygiene Behavior and the Incidence of Vaginal Discharge

Personal hygiene behavior	Vaginal discharge			Total	P value
	Pathologic Vaginal Discharge	Physiologic Vaginal Discharge	No Vaginal Discharge		
	N (%)	N (%)	N (%)		
Not enough	68 (82.9)	12 (14.7)	2 (2.4)	82 (100)	0,030
Enough	20 (55.6)	13 (36.1)	3 (8.3)	36 (100)	
Good	6 (100)	0 (0)	0 (0)	6 (100)	
Total	94 (75.8)	25 (20.2)	5 (4.0)	124 (100)	

IV. DISCUSSION**A. INTERPRETATION OF RESULTS**

This study found a significant relationship between personal hygiene behavior and the incidence of vaginal discharge among seventh and eighth-grade female students at SMPN 1

Ngariboyo, as indicated by a p-value of 0.030. The results showed that 66.1% of respondents exhibited poor hygiene practices, while 75.8% experienced pathological vaginal discharge. This finding aligns with the understanding that adolescence, particularly around age 13, is a critical period for behavioral development. Physical and hormonal changes during early adolescence, coupled with emotional volatility, contribute to inadequate self-care if not properly addressed through education and support [26], [27].

The prevalence of poor hygiene behavior in this study reflects insufficient knowledge and awareness regarding genital care. Practices such as infrequent changing of undergarments, lack of proper handwashing before genital contact, and incorrect cleaning methods can contribute to bacterial or fungal growth, ultimately leading to infections [28], [29]. Furthermore, the lack of understanding surrounding the differentiation between physiological and pathological vaginal discharge makes adolescents more vulnerable to health risks.

Adolescent girls often perceive vaginal hygiene as a trivial matter. Without adequate education and routine reinforcement of hygienic practices, this neglect may evolve into persistent health problems. Our findings suggest that health education programs focusing on genital hygiene and preventive behaviors should be implemented at school level as a critical intervention strategy.

B. COMPARISON WITH PREVIOUS STUDIES

The findings of this study are consistent with research conducted by Indriyani et al., which reported that 95% of students at MA Al-Hikmah had inadequate personal hygiene, driven by limited awareness of proper genital care [30]. Similarly, Novita and Rismawati found that 68.97% of students at STIKes Estu Utomo practiced poor genital hygiene, largely due to lack of accurate information and preventive knowledge [31].

Additional support comes from Anggraini, who showed that 55.6% of adolescent girls in Summersari exhibited low levels of personal hygiene, which was significantly associated with increased vaginal discharge [32]. Astuti et al. also emphasized that proper hygiene behaviors such as wiping from front to back and using clean water reduced the risk of vaginal discharge among female dormitory students [33].

On the other hand, contrasting results were presented by Yarıcı et al., who conducted a study among adult women in North Cyprus and found higher hygiene awareness and practices, possibly due to stronger health literacy and access to health education in their setting [34]. This contrast highlights the need for localized interventions tailored to specific cultural and socioeconomic contexts.

Research by Maysaroh and Mariza distinguishes between physiological and pathological discharge, explaining that normal discharge is hormone-induced and not accompanied by unpleasant symptoms, while pathological discharge involves changes in odor, color, consistency, and causes discomfort [35]. In this study, students with poor hygiene behavior predominantly reported symptoms matching the pathological category, suggesting that their condition stemmed from behavioral rather than physiological causes.

Furthermore, studies by Krisdayanti and Hasyim [36], as well as Rosidah et al. [37], have consistently reinforced that

improved personal hygiene is significantly associated with a decrease in vaginal discharge cases. These comparative insights underscore the urgency of early education as a preventive approach to adolescent reproductive health issues.

C. LIMITATIONS AND IMPLICATIONS

Despite its strengths, this study is not without limitations. Firstly, the use of a cross-sectional design restricts the ability to infer causality between variables. Although a significant association was found, it cannot be definitively concluded that poor hygiene causes vaginal discharge without longitudinal follow-up [38].

Secondly, the reliance on self-reported data may introduce bias, particularly social desirability bias, where students may provide responses they perceive as favorable rather than truthful. While questionnaires were administered in a supervised setting, some level of response inaccuracy is inevitable. Future studies may consider incorporating clinical examinations or interviews to validate reported symptoms and behaviors.

Another limitation concerns the sample size and geographical focus. While simple random sampling enhances generalizability within the school, the study only represents one educational institution in East Java. Broader research encompassing urban and rural schools across multiple provinces would offer a more comprehensive perspective.

Despite these limitations, the findings have important implications for public health policy and school-based health education. First, the high prevalence of poor hygiene and pathological vaginal discharge underscores the urgent need for reproductive health education as part of the school curriculum. Programs must be age-appropriate, culturally sensitive, and practically focused to influence adolescent behavior effectively.

Second, collaboration between schools, healthcare professionals, and parents is essential. Regular counseling sessions, health talks, and awareness campaigns on personal hygiene should be encouraged. School health units can take an active role in monitoring students' hygienic behaviors and provide support services when needed.

Third, technological tools such as mobile applications or online platforms can be explored as means of disseminating information and offering guidance on personal hygiene to adolescents, particularly in the post-pandemic context where digital outreach is expanding.

In conclusion, this study contributes to the growing body of literature emphasizing the need for early, consistent, and context-specific education on personal hygiene among adolescent girls. Intervention strategies must go beyond knowledge transfer and include skills training, attitude change, and sustained behavioral reinforcement to ensure lasting improvements in reproductive health.

V. CONCLUSIONS

This study aimed to examine the relationship between personal hygiene behavior and the incidence of vaginal discharge among seventh and eighth-grade female students at SMPN 1 Ngariboyo. The research was conducted in response to concerns regarding the high prevalence of reproductive health issues among adolescents, particularly those related to inadequate genital hygiene practices. A total of 124 students

were selected using simple random sampling, and data were collected using validated questionnaires assessing hygiene behavior and symptoms of vaginal discharge. The results revealed that 66.1% of the students exhibited poor personal hygiene behavior, and 75.8% experienced pathological vaginal discharge. Statistical analysis using the Gamma correlation test indicated a significant relationship between the two variables, with a p-value of 0.030 (<0.05). These findings underscore the impact of behavioral factors on adolescent reproductive health and highlight the critical need for targeted interventions. Adolescents, particularly girls undergoing early puberty, are vulnerable to neglecting proper hygiene due to limited knowledge and behavioral inexperience. This can result in discomfort, infection, and long-term health consequences if not addressed appropriately. As a preventive measure, schools should integrate structured and continuous health education programs that focus on personal hygiene, reproductive anatomy, and symptom recognition. Such initiatives can be further supported through collaboration with healthcare professionals and the use of digital health promotion platforms. Future research should explore a wider range of variables, including parental education, access to sanitation facilities, and psychosocial factors, while employing longitudinal or quasi-experimental designs to assess causal relationships. Additionally, expanding the study scope to include students from different schools and regions would enhance generalizability and provide a broader understanding of adolescent reproductive health behavior. Ultimately, the findings of this study emphasize the necessity of early, comprehensive, and sustained hygiene education as a cornerstone for promoting adolescent well-being and preventing reproductive tract infections.

ACKNOWLEDGEMENTS

We extend our deepest gratitude to the students, parents, and staff of SMPN 1 Ngariboyo for their participation and support in this study. We also thank Poltekkes Kemenkes Surabaya for ethical guidance and the school administration for facilitating data collection. Our appreciation goes to the midwifery department colleagues for their valuable insights. Finally, we acknowledge the local health authorities for their encouragement in advancing adolescent reproductive health research.

FUNDING

This research received no external funding. All costs were borne by the authors and their affiliated institution.

DATA AVAILABILITY

The datasets generated and analyzed during this study are not publicly available due to privacy restrictions but may be made available from the corresponding author upon reasonable request and with permission from the ethics committee.

AUTHOR CONTRIBUTIONS

Fenti Suwarno Putri: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing - original draft, Project administration. Nurlailis Saadah: Methodology, Validation, Resources, Supervision, Writing - review & editing. Rahayu Sumaningsih: Investigation, Formal

analysis, Visualization, Writing - review & editing. Heru SWN: Resources, Project administration, Supervision. All authors read and approved the final manuscript.

DECLARATIONS

ETHICAL APPROVAL

This study was approved by the Health Research Ethics Committee of Poltekkes Kemenkes Surabaya. Written informed consent was obtained from all participants' parents/guardians, and assent was secured from the students. The study adhered to ethical guidelines for health research in Indonesia and the Declaration of Helsinki.

CONSENT FOR PUBLICATION PARTICIPANTS.

Written informed consent for publication was obtained from all participants' parents/legal guardians, including permission to publish anonymized data in scientific journals and derivative publications. Participants were assured that their identities would remain confidential, and no personally identifiable information would be disclosed.

COMPETING INTERESTS

The authors declare no competing interests, financial or otherwise, related to this work.

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