
Changes In The Level Of Knowledge And Attitudes Of Adolescent Girls After Providing Health Education About Fluor Albus At Gunungjati Twin Middle School

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Abstract

Vaginal discharge (fluor albus) is a reproductive health problem frequently experienced by adolescent girls and is often considered a normal condition, thus receiving little attention. Lack of appropriate knowledge and attitudes can influence reproductive hygiene behavior and increase the risk of pathological fluor albus. This study aims to determine changes in the level of knowledge and attitudes of adolescent girls after health education about fluor albus was provided at Gunungjati Kembaran Junior High School. The study used a quantitative approach with a pre-test design.-One Group Pretest-Posttest experimental study. The population was all female adolescents at Gunungjati Kembaran Junior High School with a total sample of 29 respondents. Data collection was conducted using a knowledge and attitude questionnaire, then analyzed descriptively using univariate analysis, paired sample t-test, and Wilcoxon Signed Rank Test. The results showed an increase in the average knowledge score from 56.62 before the intervention to 74.62 after the intervention ($p = 0.000$). All respondents had a positive attitude after the intervention with no remaining negative attitudes. In conclusion, health education about fluor albus had a significant effect in improving the knowledge and attitudes of female adolescents in maintaining reproductive organ hygiene, thus proving this intervention effective.

Keywords: Fluor albus, Reproductive Health, Health Education, Adolescent Girls, Knowledge Improvement.

INTRODUCTION

Adolescence is a transitional period marked by rapid physical, psychological, and hormonal changes, including in the reproductive system of young women. One reproductive health issue frequently experienced by young women aged 13–14 is vaginal discharge, or fluor albus, which can be both physiological and pathological (Fallis, 2021; G et al., 2020). Many adolescents experience mild vaginal discharge but do not understand the difference between normal and abnormal vaginal discharge, and therefore tend to dismiss it as a common condition that does not require special treatment (Nasution & Samosir, 2021; Hannifah et al., 2023).

This condition is exacerbated by a lack of knowledge and appropriate attitudes about maintaining reproductive organ hygiene, increasing the risk of pathological vaginal discharge, which can lead to infertility, reproductive tract infections, and psychological disorders (Husna et al., 2023; Putri, 2018). Research in various high schools shows that most adolescent girls have experienced vaginal discharge, but knowledge about its causes, risk factors, and prevention methods is still considered adequate to inadequate (Darmala, 2018; Khairani et al., 2025).

Adolescent girls' lack of knowledge about vaginal discharge leads to misperceptions and inappropriate attitudes, such as downplaying symptoms or using cleaning methods that do not comply with health recommendations (Hannifah et al., 2023; Putri, 2018). Cross-sectional studies in several junior high schools showed a significant relationship between knowledge, attitudes, and personal hygiene behaviors and the incidence of vaginal discharge, with genital hygiene being the primary determinant (Chairiyah, 2023; Nengsih et al., 2022). Without adequate understanding, adolescents tend not to seek medical attention when abnormal symptoms appear, thus potentially leading to long-term complications not being detected early (Husna et al., 2023; Dr. Bhavesh, 2023).

Furthermore, adolescent girls' sources of information about reproductive health vary widely, from social media to their peers, parents, and even teachers. However, not all sources have a clear scientific basis (Buenita et al., 2025; Hamdani et al., 2021). Research on the influence of social media on adolescents' knowledge and attitudes shows that reproductive health content on digital platforms is

often unverified, potentially leading to misconceptions and anxiety (Buenita et al., 2025; Meilani, 2021). Furthermore, the role of health workers and educational institutions has not been maximized in filling the gap in accurate information, even though schools are strategic settings for providing structured reproductive health education (Ministry of Health of the Republic of Indonesia, 2022; Murbiah, 2023).

This study aimed to determine changes in the level of knowledge and attitudes of adolescent girls after health education about fluor albus was provided at Gunungjati Kembaran Junior High School. Specifically, the study aimed to measure increases in knowledge regarding the definition, causes, signs, symptoms, impacts, and prevention of fluor albus, as well as changes in adolescent attitudes towards maintaining reproductive organ hygiene as a preventative measure (Amalia et al., 2022; Husna et al., 2023). Paired Sample t-test and Wilcoxon Signed Rank Test were used to assess significant differences in average knowledge and attitudes before and after the intervention (Murbiah, 2023; Andriani et al., 2020).

The urgency of this research lies in the importance of providing appropriate health education during early adolescence, when health knowledge, attitudes, and habits are being formed (Nasution & Samosir, 2021; Mayasari, 2025). Similar studies in secondary schools have shown that counseling-based health education effectively improves adolescent girls' knowledge and attitudes towards reproductive health issues, including oral hygiene and personal hygiene (Providing Health Education with Leaflets, Pujiati et al., 2024; Kristanti & Sebtalezy, 2021). This research also aligns with the KAP (Knowledge, Attitude, Practice) concept, which emphasizes that increased knowledge will strengthen positive attitudes and lead to better health behavior practices (Notoatmodjo, 2018; Husna et al., 2023).

The novelty of this research lies in its focus on a group of adolescents in grades 7–9 in one secondary school with a pre-school approach.-One Group Pretest–Posttest Design experiment, as well as the use of mixed educational media (animation and PowerPoint lectures) relevant to the characteristics of digital native adolescents (Murbiah, 2023; Kristanti & Sebtalezy, 2021). The results of this study are expected to serve as a reference for schools and health workers to design more systematic and sustainable reproductive health education programs in junior high school settings (Nasution & Samosir, 2021; The majority of previous studies were conducted at the high school or Islamic boarding school level, so the junior high school context is still relatively limited (Khairani et al., 2025; Murbiah, 2023).

RESEARCH METHODS

This study used a quantitative approach with a pre-experimental research type through a One Group Pretest–Posttest Design. This design was used to determine changes in the level of knowledge and attitudes of adolescent girls before and after being given an intervention in the form of health education about fluor albus. In this study, measurements were taken twice, before the intervention (pretest) and after the intervention (posttest), so that the effect of health education on changes in respondents' knowledge and attitudes could be determined.

The study was conducted at Gunungjati Kembaran Junior High School in 2025–2026. The population was all female adolescents enrolled at Gunungjati Kembaran Junior High School. The sampling technique used total sampling, resulting in 29 respondents who met the inclusion criteria.

The variables in this study consist of independent variables and dependent variables. The independent variable in this study is health education about fluor albus, while the dependent variable is the level of knowledge and attitudes of adolescent girls towards fluor albus prevention and reproductive organ hygiene.

The research instrument used was a questionnaire consisting of a knowledge level questionnaire and an attitude questionnaire regarding fluor albus. The knowledge questionnaire was used to measure respondents' understanding of the definition, causes, signs and symptoms, impacts, and prevention of fluor albus. Meanwhile, the attitude questionnaire was used to assess the responses,

perceptions, and behavioral tendencies of adolescent girls in maintaining reproductive organ hygiene as an effort to prevent fluor albus. Data collection was conducted before the health education program was provided and repeated after the intervention was delivered.

This study used primary data obtained directly from respondents through questionnaires. Data analysis was conducted using univariate analysis to describe the characteristics of respondents, their level of knowledge, and the attitudes of adolescent girls. Bivariate analysis using paired sample t-tests to determine differences in knowledge and attitudes before and after health education. The analysis was considered significant if the p-value was <0.05.

RESULTS AND DISCUSSION

Table 1 Operational Definition

No.	Variables	Operational Definition	Measuring instrument	Measurement Results	Measuring Scale
1.	Age Characteristics	The length of time the respondent lived was calculated from the year of birth until the time the research was conducted.	Questionnaire	Categorized: Score figures in years 13 years old 14 years	Nominal
2.	Resources	The origin or media where respondents first or most frequently obtained information about vaginal discharge (Fluor albus).	Questionnaire	Categorized: Teacher Doctor Counseling Parent Instagram TikTok TV Brochure	Nominal
3.	Knowledge	Everything that respondents know and understand about (Fluor albus), including the definition, causes, signs and symptoms, impacts and prevention.	Questionnaire	Categorized: Good (76%-100%) Sufficient (56%-75%) Less (<55%)	Ordinal
4.	Teenagers' Attitudes	Closed response or emotional response of respondents to prevention and treatment (Fluor albus)	Questionnaire	Categorized: Positive Attitude ≥60% Negative Attitude < 60%	Ordinal

Characteristics of Respondents of Gunungjati Kembaran Middle School Students Respondent Characteristics Based on Age:

Table 2. Frequency Distribution of Age

No.	Age	Frequency (f)	Percentage (%)
1.	13 years old	9	31.00
2.	14 years	20	69.00
	Total	29	100.0

Based on the frequency distribution table above, the results of the study indicate that the characteristics of the respondents are dominated by the 14-year-old age group. The majority of respondents, namely 20 students (69.0%), are aged 14 years, while the remaining 9 students (31.0%) are aged 13 years. This data indicates that all research subjects are in the early adolescence age range.

Respondent Characteristics Based on Information Sources:

Table 3. Frequency Distribution of Information Sources

No.	Resources	Frequency (f)	Percentage (%)
1.	Tik Tok	12	41.4
2.	Teacher	7	24.1
3.	Parent	4	13.8
4.	Counseling	4	13.8
5.	Instagram	2	6.9
Total		29	100.0

Based on the frequency distribution table above, the results show that the primary source of information about reproductive health for respondents came from the social media platform TikTok, with 12 students (41.4%). The second most common source of information was from teachers, with 7 students (24.1%). Furthermore, respondents obtained information from parents and counseling (4 students each, 13.8%), and Instagram (2 students, 6.9%).

Level of Knowledge of Young Women About Fluor Albus Before and After Health Education

Table 4. Frequency Distribution of Knowledge Level of Young Women About Fluor Albus Before and After Health Education

No.	Knowledge Category	Pre-test (Before)		Post-test (After)	
		f	%	f	%
1.	Good	0	0.0	12	41.4
2.	Enough	16	55.2	17	58.6
3.	Not enough	13	44.8	0	0.0
Total		29	100.0	29	100.0

Based on the frequency distribution table above, there is a shift in knowledge levels before and after the intervention. During the pre-test, the majority of respondents had sufficient knowledge (55.2%) and insufficient knowledge (44.8%), and none had good knowledge. However, after receiving health education (post-test), no respondents had insufficient knowledge (0%). Most respondents experienced an increase to the sufficient (58.6%) and good (41.4%) categories.

Attitudes of Adolescent Girls Towards Fluor Albus Prevention Before and After Health Education

Table 5. Frequency Distribution of Attitudes of Young Women Towards Fluor Albus Prevention Before and After Education

No.	Attitude Category	Pre-test (Before) f %	Post-test (After) f %
1.	Positive	17 (58.6%)	29 (100.0%)
2.	Negative	12 (41.4%)	0 (0.0%)
Total		29 (100.0%)	29 (100.0%)

Based on the frequency distribution table of attitudes above, a very striking difference is seen before and after the intervention. During the pre-test, respondents' attitudes were still polarized into two groups, with 17 students (58.6%) holding positive attitudes and 12 students (41.4%) holding negative attitudes. However, after receiving health education (post-test), a complete change occurred, with all 29 students (100%) having positive attitudes towards maintaining reproductive hygiene. No more respondents had negative attitudes after the intervention.

Differences in Average Level of Knowledge of Adolescent Girls Before and After Health Education

Table 6. Analysis of Differences in Average Level of Knowledge of Adolescent Girls Before and After Health Education

Variables	Mean	Mean Difference	Standard Deviation	t-count	Sig. (2-tailed)
Knowledge					
<i>Pre-test</i>	56.62	-18,000	15,360	-6,311	0,000
<i>Post-test</i>	74.62				

Based on the table above, it is known that the average (mean) knowledge score of adolescent girls before being given health education was 56.62. After being given health education, the average score increased to 74.62. Statistically, the average difference value was obtained at -18.000 with a standard deviation of 15.360. The results of the Paired Sample T-Test showed a t-count value of -6.311 and a significance value (Sig. 2-tailed) of 0.000. Because the p-value of 0.000 < 0.05, Ha is accepted and Ho is rejected. This means that there is a significant influence of health education about fluor albus on increasing the knowledge of adolescent girls at Gunungjati Kembaran Middle School.

Differences in Attitudes of Adolescent Girls Before and After Health Education

Table 7. Analysis of Differences in Attitudes of Adolescent Girls Before and After Health Education

Variables	Information	N	Mean Rank	Sum of Ranks	Z-count	Asymp. Sig. (2-tailed)
<i>Pre-test</i> Attitude	<i>Positive Ranks</i>	29	15.00	435.00	-4,708	0,000
<i>Post-test</i> Attitude	<i>Negative Ranks</i>	0	0.00	0.00		
	<i>Ties</i>	0				
	Total	29				

The results of the statistical test showed that the Mean Rank value increased by 15.00 with a Sum of Ranks of 435.00. The Z-count value obtained was -4.708 with a significance value (Asymp. Sig. 2-tailed) of 0.000. Because the p-value of 0.000 < 0.05, Ha was accepted and Ho was rejected. This means that there was a significant difference (real increase) in the attitudes of young women in maintaining reproductive organ hygiene before and after being given health education about fluor albus.

Discussion

The following will discuss the results of the research that has been conducted, including the characteristics of respondents, the level of knowledge and attitudes of young women, as well as the influence of health education on these two variables.

Respondent characteristics consist of (age, information source, knowledge, adolescent attitudes)

a. Age

Based on the research results, it was found that all respondents, based on age, were in the early adolescent category, namely 13-14 years old, with a total of 29 respondents (100%). The age of 13-14 years is early adolescence, marked by physical, psychological, and hormonal changes as part of puberty. During this phase, adolescent girls begin to experience reproductive organ maturity, which can be indicated by the onset of menstruation and other physiological changes, including the possibility of vaginal discharge (fluor albus).

This condition makes teenagers aged 13-14 years a group that is vulnerable to experiencing misunderstandings regarding reproductive health if they are not accompanied by correct information.(Hamdani et al., 2021)At this age, adolescents' thinking skills begin to develop, but they still need proper guidance and education to understand the bodily changes they experience and practice good reproductive personal hygiene.(Mayasari, 2025)Therefore, providing health education to the

early adolescent age group is considered effective because at this stage individuals are still in the process of forming health knowledge, attitudes, and habits.

b. Resources

Based on the research results, it was found that the sources of information regarding vaginal discharge (fluor albus) obtained by respondents came from various sources, namely teachers (7 respondents (24.1%), Instagram (2 respondents (6.9%), parents (4 respondents (13.8%), counseling (4 respondents (13.8%), and TikTok (12 respondents (41.4%). The data shows that the majority of respondents obtained information about vaginal discharge through social media, especially TikTok.

The high use of social media as an information source indicates that adolescents aged 13-14 tend to more easily access information through digital platforms deemed interesting, easy to understand, and appropriate for the developmental characteristics of adolescents who are close to technology. However, information obtained through social media may not always have clear sources and be scientifically justified, potentially leading to misunderstandings regarding reproductive health. This underscores the crucial role of health workers and educational institutions in providing accurate and targeted information to adolescents.

The role of teachers as information sources also contributes significantly to the dissemination of reproductive health information in schools. Teachers hold a strategic position because they interact directly with students during the learning process, making them a trusted source of information. Furthermore, the role of parents as information sources remains relatively low, possibly due to a perceived discomfort or perception that discussing reproductive health is still considered sensitive within the family environment. However, good support and communication between parents and children play a crucial role in fostering understanding and positive attitudes toward adolescent reproductive health.

The results of this study are in line with health promotion theory, which states that information sources influence a person's level of knowledge, where information obtained from credible sources will more easily increase understanding and shape good health behaviors (Ministry of Health of the Republic of Indonesia, 2022).

In addition, research (Buenita, 2025) A study in the Journal of Preventive Promotion showed that social media influences adolescents' knowledge and attitudes regarding reproductive health. While social media facilitates access to health information for adolescents, the quality of the information received depends heavily on the source of the content accessed, necessitating educational support from health workers and schools.

Knowledge Level of Adolescent Girls Before Intervention

Based on the research results, it was found that the level of knowledge of female adolescents about fluor albus before receiving health education was mostly in the sufficient category (16 respondents (55.2%), while respondents with insufficient knowledge were 13 respondents (44.8%). These results indicate that most respondents already have basic knowledge about vaginal discharge, but their understanding is still not optimal and not comprehensive.

This situation can be influenced by limited sources of accurate and targeted information about reproductive health in adolescents. In early adolescence, information often comes from peers or social media, which may not be scientifically sound, resulting in a lack of understanding and a lack of a good understanding. Inadequate knowledge about vaginal discharge can make it difficult for adolescents to distinguish between normal and abnormal vaginal discharge, as well as a lack of understanding of how to properly maintain reproductive hygiene.

According to health promotion theory, knowledge is the primary factor influencing the formation of health attitudes and behaviors. The better the knowledge, the more likely an individual is to adopt appropriate health behaviors. Therefore, health education is needed to improve adolescent girls' understanding of fluor albus and thus help them prevent reproductive health problems.

Attitudes of Adolescent Girls Before Intervention

The results of the study showed that the attitudes of adolescent girls towards maintaining

reproductive organ hygiene before receiving health education (pre-test) were mostly in the positive category, with 17 respondents (58.6%), while 12 respondents (41.4%) had negative attitudes. This indicates that some respondents already have a positive attitude towards maintaining reproductive organ hygiene, although there are still respondents who have inappropriate attitudes.

Respondents' positive attitudes are likely influenced by personal experiences, habits taught by parents, and information gained from school. However, positive attitudes don't necessarily translate into correct understanding if they aren't supported by adequate knowledge. The persistent negative attitudes suggest that some adolescents still view vaginal discharge as a normal condition that doesn't require special treatment, leading to less attention to reproductive hygiene.

This aligns with health behavior theory, which states that a person's attitudes are shaped by experience, knowledge, and the influence of their social environment. Therefore, providing health education is necessary to strengthen existing positive attitudes and transform negative ones into positive ones.

The Influence of Health Education on Knowledge Levels

Based on the research results, it was found that before receiving health education, the level of knowledge of respondents was mostly in the sufficient (55.2%) and insufficient (44.8%) categories. After receiving health education, there was an increase in knowledge levels, with 12 respondents (41.4%) in the good category and 17 respondents (58.6%) in the sufficient category, and no more respondents were found in the insufficient knowledge category.

This increase in knowledge demonstrates that health education delivered through outreach using animation and PowerPoint-assisted lectures was effective in improving young women's understanding of fluor albus. The animation helped respondents understand the material visually and engagingly, while the lecture method clarified the information presented, making it easier to understand.

The results of this study align with health education theory, which states that providing information through methods tailored to adolescent characteristics can increase retention and improve knowledge. With increased knowledge, it is hoped that adolescent girls will understand the importance of maintaining reproductive hygiene and be able to distinguish between normal and abnormal vaginal discharge.

The Influence of Health Education on Attitudes

The research results showed a significant change in attitudes after the intervention. Before the intervention, 41.4% of respondents still held negative attitudes. However, after receiving health education, a complete change occurred, with all respondents (100%), or 29 students, having positive attitudes.

Statistical evidence using the Wilcoxon Signed Rank Test further strengthens this finding, obtaining a Z-value of -4.708 with a significance value of p-value = 0.000 ($p < 0.05$). These results statistically prove that the hypothesis is accepted, meaning there is a significant and real difference in the attitudes of adolescent girls in maintaining reproductive organ hygiene before and after receiving health education.

This 100% positive attitude change occurred because respondents gained a comprehensive understanding of the impacts of pathological fluoride (such as the risk of infertility and infection), thus fostering a sense of responsibility and self-awareness in maintaining the cleanliness of their reproductive organs. This finding aligns with Notoatmodjo's (2018) theory of behavioral change, which states that behavior based on knowledge is more lasting than behavior not based on knowledge.

According to the KAP (Knowledge, Attitude, Practice) concept, increased knowledge (cognitive) will shape beliefs and awareness, which influence the formation of attitudes (affective). This positive attitude then becomes a strong foundation (predisposing factor) for someone to manifest it in the form of concrete actions or behavioral changes (psychomotor) towards healthier behavior, namely routinely and correctly maintaining reproductive organ hygiene.

CONCLUSION

This study shows that health education about fluoride significantly impacts the knowledge and attitude changes of female adolescents at Gunungjati Kembaran Junior High School. The average knowledge score increased from 56.62 in the pretest to 74.62 in the posttest, with a p-value of 0.000, demonstrating a significant increase in knowledge according to the Paired Sample t-test. Furthermore, the distribution of attitudes also experienced a greater change; before the intervention, 41.4% of adolescents still held negative attitudes, while after the health education, all respondents (100%) showed positive attitudes, as supported by the Wilcoxon Signed Rank Test with a p-value of 0.000. These findings are consistent with previous studies showing that counseling-based health education effectively increases adolescents' knowledge and shapes their attitudes towards fluoride and personal genital hygiene (Murbiah, 2023; Kristanti & Sebtaleys, 2021; Andriani et al., 2020).

However, this study has several limitations, including a sample size of 29 adolescent girls from one junior high school aged 13–14 years, making the results unable to be generalized to the broader population of adolescent girls. Furthermore, knowledge and attitude measurements were conducted immediately after the intervention, making it impossible to demonstrate the sustainability of attitude changes and their transfer to long-term behavior. Further research is recommended using a longitudinal design and incorporating behavioral measures (practice) within the KAP framework, as well as comparing the effectiveness of various educational media (leaflets, videos, or a mix). The practical implication of these findings is that schools need to integrate ongoing reproductive health education and utilize media that appeals to digital native adolescents, so that adolescent girls have adequate knowledge, positive attitudes, and consistent practices for maintaining reproductive organ hygiene, in line with efforts to prevent vaginal discharge and its complications (Husna et al., 2023; Chairiyah, 2023; Nengsih et al., 2022).

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