



The Effect of Hair Personal Hygiene Education Using Comic Media on the Incidence of *Pediculosis Capitis* Among Female Students in Islamic Boarding Schools

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Abstract

Pediculosis capitis is a common health problem among students in Islamic boarding schools due to close interpersonal contact and communal living conditions. Health education using engaging media may support preventive behavior and reduce the occurrence of head lice infestation. This study aimed to determine the effect of hair personal hygiene education using comic media on the occurrence of *Pediculosis capitis* among female students at Nurul Jadid Islamic Boarding School. This study used a pre-experimental design with a one-group pretest–posttest approach. The population consisted of 451 female students, with 212 respondents selected using simple random sampling. Hair personal hygiene education was delivered using comic media, while the occurrence of *Pediculosis capitis* was assessed through direct examination using a fine-toothed lice comb before and after the intervention. Data were analyzed using the McNemar test with a significance level of 0.05. Before the intervention, 195 respondents (92.0%) were positive for *Pediculosis capitis* and 17 (8.0%) were negative. After the intervention, the number of positive respondents decreased to 132 (62.3%), while 80 (37.7%) were negative. The McNemar test showed a statistically significant difference between the pretest and posttest results ($p < 0.001$). The findings indicate that hair personal hygiene education using comic media had a significant effect on reducing the occurrence of *Pediculosis capitis*. Comic-based health education can be used as a promotive and preventive approach to support the reduction of head lice infestation among female students in Islamic boarding school settings.

Keywords: *Pediculosis capitis*, Hair Hygiene, Health Education, Comic Media, Female Students

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Resive : 28 September 2026

Revised : 03 Oktober 2026

Accept : 03 Oktober 2026

Publish : 03 Oktober 2026





1. Introduction

Pediculosis capitis remains a public health problem caused by infestation of the scalp and hair by *Pediculus humanus capitis*, particularly among children, adolescents, and populations living in close-contact and crowded environments (Shoniya and Adnani, 2023). Globally, its prevalence is estimated at approximately 19% among school-aged children and 2% among adults, with substantial variation across countries due to behavioral, environmental, social, and hygiene-related factors (Fu et al., 2022; Nasirian, 2024; Anwar, Riswanda and Ghiffari, 2022; Trasia, 2023). In Indonesia, boarding schools represent a setting with increased transmission risk because of communal living, close interaction, shared facilities, and personal belongings (Susiawan, Faisal and Krisnansari, 2023; Souza et al., 2022). Previous studies reported high prevalence among students, including 93.9% at Fadlun Minallah Islamic Boarding School in Bantul and 96% at Darul Mujahadah Islamic Boarding School in Semarang (Pringgayuda, Putri and Yulianto, 2021). Infestation can cause pruritus, sleep disturbance, reduced concentration, excoriations, secondary infection, and psychosocial problems such as embarrassment, stigma, and reduced self-confidence (Khasanah et al., 2022; Lanita et al., 2023; Suweta, Swastika and Sudarmaja, 2021). Transmission primarily occurs through direct head-to-head contact and may be facilitated by sharing combs, hair accessories, towels, bedding, and other personal belongings, while research has demonstrated an association between personal hygiene and pediculosis among students (Setiyani, Mulyowati and Binugraheni, 2021).

Health education is an important strategy to improve knowledge and preventive behavior related to *Pediculosis capitis*. Education on regular hair washing, appropriate hair care, avoiding shared personal belongings, and proper cleaning of clothing, bedding, and towels can strengthen prevention practices (Notoatmodjo, 2026; Cahyani et al., 2024). Previous studies have shown that health education can improve personal hygiene behavior and that several hygiene practices and knowledge are associated with pediculosis occurrence (Emira, Sofia and Wheny Utariningsih, 2022; Febrinatilova and Lilia, 2024; Abhari et al., 2026; Susiawan, Faisal and Krisnansari, 2023). However, findings are not entirely consistent, as improved personal hygiene behavior has not always been accompanied by a significant reduction or association with pediculosis (Emira, Sofia and Wheny Utariningsih, 2022). Comic-based education has demonstrated effectiveness in improving health knowledge through the integration of visual illustrations, dialogue, and sequential storytelling (Nadila, Tampubolon and Utami, 2025; Triana et al., 2023; Yuningsih and Kurniasari, 2021; Kaluku, Sari and Mahmud, 2023). Nevertheless, evidence regarding the effectiveness of comic-based education specifically in reducing *Pediculosis capitis* among female Islamic boarding school students remains limited (Adhyatma, Purba and Panggabean, 2023).

Preliminary observations conducted on November 10, 2025, at the Az-Zainiyah area of Nurul Jadid Islamic Boarding School identified 451 female students living in a communal residential environment. Interviews with caregivers and students indicated that





Pediculosis capitis occurs in the boarding school, with several areas reporting female students experiencing infestation. These findings establish the relevance of Pediculosis capitis in the study setting and support the need for an intervention addressing both personal hygiene knowledge and behaviors. The novelty of this study lies in the use of comic media specifically to provide hair personal hygiene education to female students in an Islamic boarding school, with Pediculosis capitis occurrence as the outcome. Therefore, this study aimed to determine the effect of hair personal hygiene education using comic media on the incidence of Pediculosis capitis among female students at Nurul Jadid Islamic Boarding School.

2. Research Methods

This study employed a pre-experimental one-group pretest–posttest design to determine the effect of hair personal hygiene education using comic media on the occurrence of *Pediculosis capitis* among female students at Nurul Jadid Islamic Boarding School, Probolinggo, East Java, Indonesia, from December 2025 to September 2026. The population consisted of 451 female students residing in the Az-Zainiyah area, with 212 respondents selected using simple random sampling based on the Slovin formula with a 5% margin of error. The inclusion criteria included active residency in the boarding school for at least three months, willingness to participate, completion of all study stages, and ability to understand the educational materials and research instruments, while students who were absent, withdrew, or failed to complete the study were excluded. The independent variable was hair personal hygiene education using comic media, while the dependent variable was the occurrence of *Pediculosis capitis*.

Data were collected using a hair personal hygiene questionnaire and an observation sheet, with *Pediculosis capitis* assessed through direct examination using a fine-toothed lice comb based on the presence of live lice, nits, itching, and scratch marks. The intervention consisted of education using comics covering the definition, transmission, prevention, and proper hair hygiene practices. Data collection included permission and informed consent, pretest assessment, educational intervention, and posttest examination. Instrument validity was assessed using the Pearson Product Moment correlation, with all items demonstrating *r*-values above the critical value of 0.361, while reliability testing using Cronbach's alpha yielded coefficients of 0.744 for the hair personal hygiene instrument and 0.736 for the *Pediculosis capitis* instrument. Data were analyzed using univariate and bivariate analyses; the McNemar test was used to assess differences in *Pediculosis capitis* occurrence before and after the intervention, with statistical significance set at $\alpha = 0.05$ and $p \leq 0.05$.





3. Results and Discussion

a. Results

Table 1. Occurrence of *Pediculosis Capitis* Before the Intervention

<i>Pediculosis Capitis</i> Status	Frequency (n)	Percentage (%)
Positive	195	91,5
Negative	17	8,5
Total	212	100

Table 1 shows that the majority of respondents were positive for *Pediculosis capitis* before the intervention, with 194 respondents (91.5%). Only 18 respondents (8.5%) were not found to have *Pediculosis capitis*. The high proportion of positive cases indicates that pediculosis was a considerable health problem among female students in the study setting before the implementation of hair personal hygiene education. The occurrence of *Pediculosis capitis* was reassessed after the respondents received hair personal hygiene education using comic media.

Table 2. Occurrence of *Pediculosis Capitis* After the Intervention

<i>Pediculosis Capitis</i> Status	Frequency (n)	Percentage (%)
Positive	132	59,4
Negative	80	40,6
Total	212	100

Table 2 shows that the number of respondents who were positive for *Pediculosis capitis* decreased to 126 (59.4%) after the intervention, while 86 respondents (40.6%) were negative. Compared with the pre-intervention findings, the proportion of respondents with *Pediculosis capitis* decreased from 91.5% to 59.4%, whereas the proportion of respondents without *Pediculosis capitis* increased from 8.5% to 40.6%. These findings indicate a reduction in the occurrence of *Pediculosis capitis* following hair personal hygiene education using comic media.

Table 3. Cross-Tabulation of *Pediculosis Capitis* Before and After the Intervention

Occurrence of <i>Pediculosis Capitis</i>	After Intervention			Asymp. Sig. (2-sided)
Before Intervention	Positive	Negatif	Total	
Negative	11	6	17	< 0,001 ^a
Positive	69	126	195	
Total	80	132	212	

Table 3 shows changes in the occurrence of *Pediculosis capitis* among respondents before and after the intervention. Among the 17 respondents who were negative for *Pediculosis capitis* before the intervention, 6 became positive and 11 remained negative after the intervention. Among the 195 respondents who were positive before the intervention, 126 became negative after the intervention, while 69 remained positive.





The McNemar test showed a significant difference in the occurrence of *Pediculosis capitis* before and after hair personal hygiene education using comic media ($p < 0.001 < \alpha = 0.05$). The proportion of respondents who were positive for *Pediculosis capitis* decreased from 195 (92.0%) before the intervention to 132 (62.3%) after the intervention. Conversely, the proportion of respondents who were negative increased from 17 (8.0%) before the intervention to 80 (37.7%) after the intervention. The largest change was observed among respondents who were initially positive, with 126 respondents becoming negative after the intervention. These findings indicate that hair personal hygiene education using comic media was associated with a significant reduction in the occurrence of *Pediculosis capitis* among female students.

These findings indicate that hair personal hygiene education using comic media was associated with a significant change in the occurrence of *Pediculosis capitis* among female students. The reduction in positive cases after the intervention suggests that education focusing on hair personal hygiene and the prevention of *Pediculosis capitis* may contribute to reducing its occurrence among female students living in an Islamic boarding school environment.

b. Discussion

Occurrence of *Pediculosis Capitis* Before and After the Intervention

The findings showed a high occurrence of *Pediculosis capitis* among female students at Nurul Jadid Islamic Boarding School, with 195 respondents (92.0%) testing positive before the intervention. This high occurrence may be related to communal living, residential crowding, close interaction, and sharing of personal belongings, which facilitate the transmission of *Pediculus humanus capitis* (Maryanti et al., 2026; Pringgayuda, Putri and Yulianto, 2021; Nasirian and Ahmadi, 2024). Hair hygiene practices, sharing hair-care equipment, alternating use of sleeping facilities, and high dormitory occupancy may further increase infestation risk, indicating that prevention requires both individual behavioral changes and collective efforts within the boarding school environment (Khasanah et al., 2022; Trasia, 2023; Sari, Sunarsih and Septiyani, 2025). Limited knowledge regarding transmission, signs of infestation, and preventive measures may also delay identification and contribute to continued transmission (Kotus et al., 2025).

Following hair personal hygiene education using comic media, the number of positive respondents decreased from 195 (92.0%) to 132 (62.3%), while negative respondents increased from 17 (8.0%) to 80 (37.7%). This descriptive change indicates an improvement in *Pediculosis capitis* status following the intervention and may be related to increased awareness of hair hygiene, avoidance of sharing personal items, recognition of early infestation signs, and appropriate management (Rohmaniah and Prajayanti, 2022; Azizah and Kesetyaningsih, 2022). Comic media may have supported these changes by presenting information through illustrations, dialogue, and sequential





stories, making messages about transmission and prevention more concrete, engaging, and relevant to students' daily experiences (Awisarita et al., 2024).

However, the findings should be interpreted cautiously because 132 respondents (62.3%) remained positive after the intervention. Persistent infestation may be influenced by continued close contact, untreated or unidentified cases, shared facilities, inconsistent preventive practices, and the life cycle of head lice, including the hatching of remaining nits. Therefore, a single educational session is unlikely to eliminate *Pediculosis capitis* and should be accompanied by regular screening, early treatment, environmental support, and monitoring by boarding school administrators or caregivers (Pertiwi and Nasiatin, 2022).

These findings are consistent with previous studies showing that health education, knowledge, personal hygiene, and visual educational media can support preventive behaviors against *Pediculosis capitis* (Astuti and Asyfiradayati, 2025; Sari and Sunarsih, 2023; Magati et al., 2023). Nevertheless, individual knowledge must be supported by a healthy communal environment because prevention may be less effective when only some members of the community apply recommended practices. The difference between pre- and post-intervention proportions provides a descriptive indication of change but does not independently establish causality because the study used a one-group pretest–posttest design without a control group; other factors, such as behavioral changes, treatment received outside the intervention, spontaneous changes in infestation status, or differences in exposure, may also have contributed to the observed change (Adhyatma, Purba and Panggabean, 2023).

Overall, *Pediculosis capitis* decreased following hair personal hygiene education using comic media, although infestation remained relatively high. Comic-based education may therefore serve as a promotive and preventive approach to improving awareness and supporting preventive behavior, but it should be combined with early detection, appropriate treatment, personal hygiene practices, routine monitoring, and environmental support. Sustainable prevention requires cooperation among students, caregivers, and boarding school administrators to ensure that educational messages are consistently applied in daily life (Farhany et al., 2024).

Effect of Hair Personal Hygiene Education Using Comic Media on *Pediculosis Capitis*

The McNemar test showed a significant difference in the occurrence of *Pediculosis capitis* before and after hair personal hygiene education using comic media ($p < 0.001$). Positive cases decreased from 195 respondents (92.0%) before the intervention to 132 (62.3%) after the intervention, while negative cases increased from 17 (8.0%) to 80 (37.7%). This finding indicates that the intervention was associated with a reduction in *Pediculosis capitis* and may have supported improvements in preventive awareness and hair hygiene practices among female students. Health education focused on hair cleanliness, avoiding shared combs, head coverings, towels, and pillows, and recognizing





infestation signs can encourage students to modify behaviors that facilitate transmission. Previous studies have reported significant relationships between personal hygiene knowledge and *Pediculosis capitis*, as well as improvements in hygiene behavior following health education (Astuti and Asyfiradayati, 2025; Awisarita et al., 2024; Lanita et al., 2023; Sari and Sunarsih, 2023).

Comic media may have strengthened the intervention by combining illustrations, dialogue, colors, and sequential stories to present information in a concrete, engaging, and contextually relevant manner. Situations such as sharing personal belongings, living in shared rooms, and experiencing scalp itching can help students relate educational messages to their daily experiences and remember preventive behaviors (Triana et al., 2023). Attractive educational media can improve attention, acceptance, and retention of health information, while comic-based education has also been reported to positively influence knowledge, attitudes, and learning outcomes (Sozangar and Shahhosseini, 2023; Sabri et al., 2024; Topkaya et al., 2023). This approach is particularly relevant for adolescents because visual and narrative materials may increase engagement and facilitate the application of preventive practices such as cleaning combs, avoiding shared hair-care equipment, and maintaining personal belongings (Maryanti et al., 2026).

Despite the significant reduction, 132 respondents (62.3%) remained positive after the intervention, indicating that education alone may not immediately eliminate existing infestation. Persistent cases may result from remaining lice or nits, untreated individuals, incomplete implementation of preventive behaviors, and continued close contact in the boarding school environment. Therefore, a single educational session should not be considered sufficient to eliminate *Pediculosis capitis*. Routine examination, appropriate and simultaneous treatment, examination of close contacts, and continued preventive education are necessary to interrupt transmission and reduce reinfestation (Petri et al., 2024; Awisarita et al., 2024). Boarding school administrators and caregivers can support these measures by promoting individual use of personal items, maintaining clean sleeping facilities, reinforcing hair hygiene, and conducting regular monitoring.

Several personal hygiene practices, including regular nail cutting, use of personal bathing equipment, and weekly cleaning of personal combs, were relatively prominent among respondents. Although nail cutting and personal bathing equipment are not primary determinants of head lice transmission, they reflect general hygiene practices, while maintaining clean combs and avoiding shared hair-care equipment are more directly relevant to prevention (Azizah and Kesetyaningsih, 2022). Nevertheless, *Pediculosis capitis* is influenced not only by individual hygiene but also by direct head-to-head contact, shared belongings, residential density, environmental conditions, and untreated individuals. Consequently, individual behavior change should be supported by collective preventive measures within the boarding school (Triana et al., 2023; Alwadi et al., 2026).

Overall, hair personal hygiene education using comic media was associated with a significant reduction in *Pediculosis capitis* among female students at Nurul Jadid Islamic





Boarding School ($p < 0.001$). Comic media may facilitate health education through visual, contextual, and engaging messages; however, the persistence of positive cases highlights the need to integrate education with early detection, appropriate treatment, consistent personal hygiene practices, environmental support, and routine monitoring to achieve sustainable prevention.

4. Conclusion

Based on the findings of the study on the effect of hair personal hygiene education using comic media on the occurrence of *Pediculosis capitis* among female students at Nurul Jadid Islamic Boarding School, it can be concluded that the occurrence of *Pediculosis capitis* decreased following the intervention, with the proportion of respondents testing positive decreasing from 195 (92.0%) before the intervention to 132 (62.3%) after the intervention, while respondents testing negative increased from 17 (8.0%) to 80 (37.7%). Hair personal hygiene education using comic media had a statistically significant effect on the occurrence of *Pediculosis capitis*, as demonstrated by the McNemar test ($p < 0.001$; $p < 0.05$), indicating that comic-based hair personal hygiene education can be used as a promotive and preventive approach to reduce the occurrence of *Pediculosis capitis* among female students in Islamic boarding school settings.

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