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Program for Infection and Cancer Prevention Activities (PROACTIVE) towards knowledge and attitudes of self-hygiene and breast self-examination for adolescents

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ABSTRACT

Introduction: *Pesantren* are Islamic educational institutions that implement a boarding system. Insufficient sanitation increases the risk of contagious disease transmission. Besides infectious diseases. Moreover, there is a rising trend of cancer incidence in adolescents. The aim of this study is to evaluate the effectiveness of the Program for Infection and Cancer Prevention Activities (PROACTIVE) on knowledge and attitudes regarding personal hygiene, infectious diseases, and cancer among students in the Pesantren.

Methods: This study used a quasi-experimental design with a single-group pre-test and post-test approach. It was conducted at MA Nur Iman Sleman, located within a *Pesantren* environment, 47 students completed both the pre- and post-test questionnaire. Data were analyzed using descriptive and inferential statistics.

Results: The study at MA Nur Iman revealed a significant increase in knowledge about Acute Respiratory Infections (ARIs) post-intervention, especially in Class 1 (from 2.91 to 3.07, P=0.0001). Scores related to personal hygiene, handwashing, residential cleanliness, and women's reproductive health showed good scores. However, the overall practice of Breast Self-Examination (BSE) did not show significant changes, However, two statements related to laziness and embarrassment during BSE showed significant improvements (P=0.000).

Conclusions: The intervention was effective in enhancing awareness and attitudes regarding Acute Respiratory Infections (ARIs). However, an engaging and continuous educational approach is needed to form a lasting awareness and attitude among adolescents, particularly concerning cancer.

Keywords: Adolescents; attitude; cancer; health behavior; knowledge.
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INTRODUCTION

Pesantren are Islamic educational institutions that implement a boarding system, also referred to as Islamic Boarding School, playing a pivotal role in shaping the character of their students, termed *Santri*. According to the 2022 data from the Ministry of Religious Affairs of Indonesia, there are approximately 27,722 *Pesantren* spread across 34 provinces, serving over 4 million students ranging from adolescents to young adults.[1]

A primary issue in these *Pesantren* is the high number of students leading to humid dormitory conditions, subsequently increasing the risk of infectious disease transmission.[2] Inadequate sanitation facilities are identified as a key factor contributing to the spread of infectious diseases among the *Santri*.[3] These diseases include hepatitis A and E, skin diseases, diarrhea, cholera, and typhoid, among others.[4] In addition to infectious diseases, there has been an increase in non-communicable diseases such as cancer in Indonesia. The Ministry of Health (2019) reports that Indonesia ranks eighth in Southeast Asia for cancer incidence, with breast cancer being the most common among women. Notably, there is a rising trend in cancer incidence among adolescents, underscoring the need for early prevention and education.[4,5]

The significance of cancer prevention during adolescence is paramount. Since cancer is often associated with lifestyle choices, it requires early education and the development of healthy behaviors. Initiatives like self-breast examination education are crucial for breast cancer prevention and should be introduced in *Pesantren*. A study conducted in three Midwest high schools with 235 students explored adolescents' perceptions and knowledge of cancer and its risk factors. The results indicate a need for engaging education to enhance adolescents' understanding of cancer prevention.[6]

The social and cultural environment of *Pesantren* significantly influences the effectiveness of health promotion programs. The motivation among *Santri* and the communal lifestyle prevalent

in *Pesantren* can be leveraged to foster knowledge acquisition and positive behavioral changes.[7] In response to these challenges, we propose a community service initiative called Program Optimization of Activities against Infection and Cancer as a Preventive (PROACTIVE), specifically designed for adolescents in *Pesantren*. This program aims to utilize the unique environment of *Pesantren* and employ a participatory approach to teach preventive health behaviors to the *Santri*. PROACTIVE is designed considering key factors such as health-related knowledge, attitudes, and behaviors of adolescents, as well as their social and physical environment. Therefore, this study evaluates the effectiveness of the Program for Infection and Cancer Prevention Activities (PROACTIVE) on knowledge and attitudes regarding personal hygiene, infectious diseases, and cancer among students in the Pesantren.

METHOD

This study employed a quasi-experimental design, specifically a one-group pre-test and post-test design. The study was conducted at *Madrasah Aliyah* (MA) Nur Iman on November 27, 2023, in Mlangi, Sleman Regency. *Madrasah Aliyah* (MA) is a secondary-level formal education in Indonesia (equivalent to senior high school) managed by the Ministry of Religion. The participants were students of *Madrasah Aliyah* (MA) Nur Iman, both male and female, aged 10-19 years, in line with WHO criteria. The exclusion criteria included absence from the intervention and incomplete questionnaire responses. Implementation Stages. 1) Preparation: Selected Madrasah-based schools in *Pesantren* and designed training materials (appendix). 2) Execution Session: Distributed pre-intervention questionnaires before the PROACTIVE health promotion education session, focusing on increasing knowledge about attitudes and prevention of communicable diseases through personal hygiene education, handwashing habits, living space cleanliness, and acute respiratory infection prevention. For female respondents, additional information on reproductive hygiene and breast cancer prevention was provided through video presentations and lectures on breast self-examination (BSE) techniques. 3) Evaluation: Collected and analyzed the post-test questionnaire.

The study utilized the following instruments: Knowledge Instrument for Healthy Living Behaviors based on a modified questionnaire by Syukri, S. (2017).[8] Attitude Questionnaire for the Prevention of Acute Respiratory Infections (ARIs), developed by Karimah et al. (2014).[9] Knowledge Instrument for Breast Self-Examination (BSE) for early detection of breast cancer in female students, developed by Nugraheni (2010).[10] Data analysis included both descriptive and inferential statistics. Between-group comparisons used independent t-tests and Mann–Whitney U tests, while ANOVA or Kruskal–Wallis tests were employed for group differences. Paired t-tests or Wilcoxon signed-rank tests were applied to evaluate changes in knowledge and attitudes before and after the program. Ethical approval for this study was granted by the Medical and Health Research Ethics Committee (MHREC), with the approval number: KE/FK/1499/EC/2023.

RESULT

Comparison in Knowledge and Attitude Regarding Personal Hygiene, Hand Washing, Residential Cleanliness, and Acute Respiratory Infections Based on Respondent Characteristics

Out of the 135 students registered at MA Nur Iman, 103 were present, and 47 completed the entire questionnaire. The number of completed questionnaires was reduced due to several factors including 25 participants leaving the session early due to other activities at the *Pesantren*, while others did not complete the complete questionnaire during the post-test. The demographics of the study's participants reveal most females (66%) predominantly in the age group of 15-17 years (80.9%) (Table 1). In terms of high school class representation, Class 1 is the most represented (46.8%). Geographically, most participants come from Central Java (40.4%). Ethnically, the majority of the participants are Javanese (87.2%).

Table 1 presents comparisons in knowledge and attitudes related to personal hygiene, handwashing habits, residential cleanliness, and Acute Respiratory Infections (ARIs) based on respondent characteristics such as gender, age, class, region of origin, and ethnicity (Table 1). In terms of gender, both females and males showed no significant differences in aspects of personal hygiene, handwashing habits, residential cleanliness, and ARIs, with all p-values exceeding 0.05.

Regarding age, early adolescents (11-14 years) exhibited no significant changes across all variables in this age group. In terms of class-based differences, Class 1 (46.8%) showed a trend towards improvement in residential cleanliness ($p = 0.081$) and a significant difference in ARIs ($p = 0.04$). This indicates that the intervention was more effective in increasing knowledge about ARIs in Class 1 compared to Classes 2 and 3. Meanwhile, there were no significant differences based on the region of origin ($p > 0.05$). Lastly, from an ethnic perspective, the Javanese group exhibited a significant difference in personal hygiene ($p = 0.041$) following the intervention.

Pre- and Post-Intervention Comparison of Knowledge and Attitudes on Hygiene, Hand Washing, Residential Cleanliness, and ARIs

In this study, the scale used to measure knowledge and attitudes towards Cleanliness, Handwashing, Housing Cleanliness, and ISPA used a Likert scale ranging from 1 ("Never") to 5 ("Always") (Table 2). In this study, the majority of the average scores were around 4, which means they were often done and there was an increase in scores. Still, statistically only knowledge about ISPA showed significant changes. The average score before the intervention was 2.91 (SD = 0.28), indicating a moderate level of knowledge. This score increased to 3.07 (SD = 0.38) after the intervention, with a statistically significant difference ($P = 0.0001$).

Although scores for personal hygiene, handwashing, and residential cleanliness increased, they were not statistically significant.

Table 1. Difference in Attitude Regarding Personal Hygiene, Hand Washing Habits, Residential Cleanliness, and Knowledge of Acute Respiratory Infections Based on Respondent Characteristics (N=47)

Characteristic	Number (Percentage)	Variables			
		Personal Hygiene (P-value)	Hand Washing (P-value)	Residential cleanliness (P-value)	Acute Respiratory Infection (P-value)
Gender					
Female	31 (66%)	0.593[a]	0.838[d]	0.744[d]	0.574[d]
Male	16 (34%)				
Age					
Early Adolescents (11-14 years)	3 (6.4%)	0.379[b]	0.528[e]	0.942[d]	0.593[e]
Middle Adolescents (15-17 years)	38 (80.9%)				
Late Adolescents (18-20 years)	6 (12.8%)				
Class					
1	22 (46.8%)	0.468[b]	0.215[e]	0.081[d]	0.04 [e*]
2	14 (29.8%)				2 > 1 (0.027); 1 < 3 (0.032)
3	11 (23.4%)				
Region of Origin					
Special Region of Yogyakarta	16 (34%)	0.36[c]	0.822[e]	0.097[d]	0.476[e]
Central Java	19 (40.4%)				
Other (Jakarta, West Java, etc.)	12 (25.6%)				
Ethnicity					
Javanese	41 (87.2%)	0.041[a*]	0.897[d]	0.666[d]	0.502 [d]
Other (Sumatran, Betawi, etc.)	6 (12.8%)				

Noted: a: t-test, b: ANOVA, c: Tukey HSD, d: Mann-Whitney U test, e: Kruskal-Wallis test

Table 2. Comparative Pre- and Post-Intervention Attitudes Towards Personal Hygiene, Hand Washing, Residential Cleanliness, and Knowledge of Acute Respiratory Infections (N=47)

Variables	Pre-Test Mean (SD)	Post-Test Mean (SD)	P-Value[a]
Personal Hygiene	4.23 (0.47)	4.29 (0.51)	0.239
Hand Washing	4.48 (0.58)	4.59 (0.44)	0.198
Living Space Cleanliness	4.18 (0.51)	4.28 (0.50)	0.287
Knowledge and Attitudes on ARIS	2.91 (0.28)	3.07 (0.38)	0.0001*

Noted: a: Wilcoxon test

Table 3. Pre- and post-intervention comparison attitudes of female reproductive health

Key Statement	Pre-Test Mean (SD)	Post-Test Mean (SD)	P-Value[a]
Washing genital area	4.84 (0.45)	4.79 (0.48)	0.655
Use of underwear	4.29 (0.90)	4.30 (1.07)	0.542
Use of sanitary pads during menstruation	4.90 (0.30)	4.67 (0.92)	0.257
Frequency of changing sanitary pads	4.74 (0.77)	4.70 (0.81)	0.627
Changing underwear when stained with blood	4.87 (0.34)	4.73 (0.80)	0.317
Hand washing after cleaning sanitary pads	4.97 (0.18)	4.79 (0.78)	0.197
Bathing twice a day during menstruation	4.71 (0.53)	4.67 (0.85)	0.890
Overall Score	4.76 (0.30)	4.66 (0.68)	0.82

Noted: a: Wilcoxon test

Pre- and post-intervention Comparison Attitudes of Female Reproductive Health and Self-breast Examination

In this study, the intervention focused on female reproductive health hygiene practices and BSE, utilizing a Likert scale ranging from 1 ("Never") to 5 ("Always"). The attitudes towards female reproductive health before and after the intervention showed no significant statistical changes (P=0.82) (Table 3). A slight decrease in the attitude toward handwashing after cleaning sanitary pads (4.97 to 4.79, P=0.197) was not statistically significant. Overall, pre-and post-test scores averaged around 4, reflecting frequent good reproductive health practices among female participants.

In Table 4, attitudes toward BSE were assessed before and after the intervention. Laziness and embarrassment were significantly reduced (P=0.000). However, the overall BSE practice score (1.67 to

Table 4. Pre- and post-intervention comparison attitudes of self-breast examination

Key Statement	Pre-Test Mean (SD)	Post-Test Mean (SD)	P-Value[a]
Self-breast examination	1.81 (0.74)	1.81 (0.73)	1
Feeling lazy to self-examine	1.98 (0.87)	1.98 (0.88)	0.000*
Embarrassment during self-examination	1.85 (1.04)	1.83 (1.03)	0.000*
BSE for early detection of breast cancer	1.72 (0.99)	1.71 (0.98)	1
Frequency of performing BSE	1.47 (0.69)	1.46 (0.68)	1
Best time for BSE	1.64 (0.82)	1.60 (0.81)	0.317
Performing BSE in front of a mirror	1.34 (0.67)	1.33 (0.66)	1
Raising arms during BSE	1.66 (0.84)	1.65 (0.83)	1
Observing breast shape during BSE	1.87 (0.90)	1.85 (0.89)	1
Assessing breast size during BSE	1.74 (0.92)	1.73 (0.91)	1
Noticing changes in skin color of the breast during BSE	1.66 (0.89)	1.65 (0.88)	1
Massaging the breast up to the nipple during BSE	1.47 (0.80)	1.46 (0.79)	0.317
Feeling all parts of the breast with varying pressure during BSE	1.68 (0.84)	1.67 (0.83)	1
Feeling up to the armpit during BSE	1.53 (0.86)	1.50 (0.85)	1
Overall score	1.67 (0.46)	1.66 (0.46)	0.317

Noted: a: Wilcoxon test, BSE: Breast Self-Examination

1.66) remained statistically insignificant (P = 0.317), indicating that participants rarely performed BSE despite reduced psychological barriers.

DISCUSSION

This study revealed several significant findings regarding the knowledge and attitudes of MA Nur Iman students concerning personal hygiene, hand washing, residential cleanliness, and ARIS through health education interventions. Health education was proven to provide students with validation of positive health-promoting beliefs, intentions, and behaviors. It also allowed students to assess their vulnerability to health issues, the actual risk of dangerous health behaviors, and exposure to unhealthy diseases,[11] which is crucial as forgetting knowledge can also lead to ignorance and errors in preventive behavior.[12]

The findings indicated no significant pre-post-intervention differences in personal hygiene, hand washing, and residential cleanliness among the participants. One factor influencing the good hand-washing attitudes and practices among MA Nur Iman students before and after the intervention could be the high level of knowledge already present before the intervention was provided.[13] The overall average score of around 4 signifies that knowledge and attitudes often practiced by participants concerning personal hygiene and residential cleanliness had practical implications. Moreover, the post-COVID-19 outbreak has had a significant impact, highlighting the importance of maintaining good personal hygiene and hand washing among school-going children. Even with the development of antibodies and the availability of suitable vaccines, proper hand hygiene will continue to be a key element in preventing similar diseases and pandemics in the future.[14]

There was a significant improvement in knowledge scores regarding ARIS prevention, which showed a statistically significant difference between pre- and post-intervention. The health education intervention applied was found to be more effective in increasing the knowledge of students in Class 1 compared to students in Classes 2 and 3. This could be attributed to Class 1 students being at an early stage of formal education where their interest and enthusiasm for learning are generally higher. This is supported by studies suggesting that younger children have a greater capacity to learn and remember health information when delivered appropriately.[13] Moreover, structured and engaging health education has been shown to significantly enhance knowledge and preventive behaviors regarding respiratory infectious diseases among students.[15]

The intervention focusing on women's reproductive health showed overall good hygiene attitudes before and after the intervention. Students gain sexual information or knowledge from friends, teachers, parents, and media. The high level of education and access to health services are also believed to be factors in the absence of differences in students' attitudes both before and after being given the intervention.[13] Effective sexual health education has been found to produce positive changes in sexual health knowledge and attitudes towards sexuality among high school students. Other studies have also indicated that reproductive health education interventions are effective in changing teenagers' attitudes and behaviors about reproductive health if accompanied by support and engagement.[16]

The findings demonstrated that the intervention significantly impacted psychological barriers like laziness and embarrassment experienced by participants when performing BSE. Previous studies support these findings, suggesting that educational interventions can effectively boost self-confidence and mitigate psychological barriers associated with BSE.[17] However, overall, there was no significance in other statements related to BSE. This result contrasts with the study conducted in Nepal, which demonstrated that educational intervention programs significantly enhanced knowledge and practice of BSE among high school students.[18] Previous studies have identified psychosocial factors as the main obstacles to early detection, such as low perceived benefits and self-efficacy, high perceived barriers, and lack of awareness about

breast cancer.[19] The strong beliefs and culture in *Pesantren* among students pose significant barriers to conducting early BSE detection. Further study suggests that significant improvements in BSE behavior can be achieved when interventions include comprehensive educational elements and ongoing support, such as regular reminders or involvement of close persons in the educational process.[20]

Limitations of the study

Sample Size and Participation Rate Of 135 registered students, only 47 completed the entire questionnaire. The design of this study, being a single-group pre-test and post-test without a control group, limits the ability to determine outcomes definitively. Moreover, the intervention was delivered by various instructors, which could affect consistency. Although this study was conducted within the unique context of *Pesantren*, further study is required to understand how social and cultural factors within and beyond *Pesantren* might influence the effectiveness and receptivity of health education interventions.

CONCLUSION

This study showed the effectiveness of the PROACTIVE program in enhancing the knowledge and attitudes of MA Nur Iman students concerning personal hygiene, hand washing, ARIs prevention, women's reproductive health, and BSE. The findings indicate that the intervention significantly improved the knowledge of first-grade students about ARI, distinctly compared to grades 2 and 3. This underscores the importance of educational approaches tailored to educational levels and ages for optimal effectiveness. Additionally, the study highlights significant changes in overcoming laziness and embarrassment felt by participants during post-intervention BSE. These results are hoped to reduce psychological barriers to self-breast examination, a crucial step in early breast cancer detection. Within the context of *Pesantren*, a participatory adapted health education approach is necessary. Thus, there remains a need for continuous and engaging educational methodologies to foster sustained awareness and proactive attitudes among adolescents, particularly regarding cancer prevention, which is still relatively unfamiliar to them.

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CONFLICT OF INTERESTS

No conflict of interest to declare.

AUTHOR CONTRIBUTIONS

All authors contributed to the study's conceptualization, design, literature search, data collection, and manuscript preparation. YNF additionally led the intellectual content definition, quasi-experimental studies, data acquisition and analysis, statistical analysis, manuscript drafting, editing, and reviewing. MBR and FFF participated in data acquisition, statistical analysis, and manuscript review, while NHAN contributed to data acquisition and analysis.

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REFERENCES

1. Kementerian Agama RI. Direktorat Jenderal Pendidikan Islam Kemenag RI | PENDIS [Internet]. 2022 [cited 2024 Jan 28]. Available from: https://pendis.kemenag.go.id/read/mengembangkan-kestrategisan-pondok-pesantren.
2. Ratnasari AF, Sungkar S. Prevalensi Skabies dan Faktor-faktor yang Berhubungan di Pesantren X, Jakarta Timur. eJournal Kedokteran Indonesia [Internet]. 2014 [cited 2024 Jan 28];2. doi: 10.23886/EJKI.2.3177.
3. Fahham AM. Sanitasi dan Dampaknya bagi Kesehatan: Studi dari Pesantren. Aspirasi: Jurnal Masalah-masalah Sosial [Internet]. 2019 [cited 2024 Jan 28];10:33–47. doi: 10.46807/ASPIRASI.V10I1.1230.
4. Suarilah I, Nihayati HE, Wahyudi AS, Asmoro CP, Felipe-Dimog EB. Treatment decision-making experience among Indonesian women with obstetrics and gynecology-related cancer. Médecine Palliative. 2023;22:68–76. doi: 10.1016/J.MEDPAL.2022.08.004.
5. Shoemaker ML, White MC, Wu M, Weir HK, Romieu I. Differences in breast cancer incidence among young women aged 20–49 years by stage and tumor characteristics, age, race, and ethnicity, 2004–2013. Breast Cancer Res Treat [Internet]. 2018 [cited 2024 Jan 28];169:595. doi: 10.1007/S10549-018-4699-9. Cited: in: : PMID: 29445940.
6. Abraham O, Rosenberger CA, LeMay SM, Bittner SJ. Adolescents' Perceptions About Cancer and Preferences for Cancer Education. Cancer Control [Internet]. 2021 [cited 2024 Jan 28];28:1–12. doi: 10.1177/10732748211036057. Cited: in: : PMID: 34403277.
7. Sudjak S, Udji A, Prasetyo RA. The Role of Islamic Boarding School as Socialization Agent of Ecological Values (A Case Study in Salaf-Modern Islamic Boarding School) | Wacana Journal of Social and Humanity Studies [Internet]. 2017 [cited 2024 Jan 28]. Available from: https://wacana.ub.ac.id/index.php/wacana/article/view/535.
8. Syukri S. Gambaran Pengetahuan dan Perilaku Santri Mengenai Kebersihan Pribadi dan Tempat Tinggal pada Pesantren X Di Kabupaten Bogor. 2017.
9. Karimah DN. endidikan Kesehatan dengan Metode Syndicate Group terhadap. Pencegahan ISPA pada Remaja Putri di Pondok Pesantren. Universitas Airlangga; 2014. https://doi.org/10.20473/cmsnj.v3i1.12208
10. Nugraheni A. Hubungan Tingkat Pengetahuan tentang Sadari dengan Perilaku Sadari sebagai Deteksi Dini Kanker Payudara pada Mahasiswi DIV Kebidanan FK UNS. 2010.
11. Widyasari V, Prabandari YS, Utarini A. Training intervention to improve hygiene practices in Islamic boarding school in Yogyakarta, Indonesia: A mixed-method study. PLoS One [Internet]. 2020 [cited 2024 Aug 25];15:e0233267. doi: 10.1371/JOURNAL.PONE.0233267. Cited: in: : PMID: 32469906.
12. Putri RN. Indonesia dalam Menghadapi Pandemi Covid-19. Jurnal Ilmiah Universitas Batanghari Jambi [Internet]. 2020 [cited 2024 Aug 25];20:705–709. doi: 10.33087/JIUBJ.V20I2.1010.
13. Linhares FMP, de Abreu WJC, Melo P de OC, Mendes RCMG, da Silva TA, de Gusmão TLA, Guedes TG. Effectiveness of educational interventions in knowledge, attitude, and practice for preventing respiratory infections: a systematic review and meta-analysis. Rev Bras Enferm [Internet]. 2022 [cited 2024 Aug 25];75 4. doi: 10.1590/0034-7167-2021-0522. Cited: in: : PMID: 35352787.
14. Wang X, Liu J, Wu Y, Su B, Chen M, Ma Q, Ma T, Chen L, Zhang Y, Dong Y, et al. Enhancing the effectiveness of infectious disease health education for children and adolescents in China: a national multicenter school-based trial. BMC Public Health [Internet]. 2023 [cited 2024 Aug 25];23:1–11. doi: 10.1186/S12889-023-16000-3/TABLES/2.

15. Wang M, Fang H. The effect of health education on knowledge and behavior toward respiratory infectious diseases among students in Gansu, China: a quasi-natural experiment. BMC Public Health. 2020;20. doi: 10.1186/S12889-020-08813-3. Cited: in: : PMID: 32404088.
16. Boku GG, Abeya SG, Ayers N, Wordofa MA. The Effect of School-Linked Module-Based Friendly-Health Education on Adolescents' Sexual and Reproductive Health Knowledge, Guji Zone, Ethiopia - Cluster Randomized Controlled Trial. Adolesc Health Med Ther [Internet]. 2024 [cited 2024 Aug 25];15:5. doi: 10.2147/AHMT.S441957. Cited: in: : PMID: 38282688.
17. Mirsafi R, Akbari TN, Noroozi E, Moslemi A. The Effect of Group Counseling Based on Reality Therapy on Women's Self Efficacy in Breast Self-examination: An Educational Intervention. Iranian Quarterly Journal of Breast Diseases. 2021;14:64–75. doi: 10.30699/IJBD.14.2.64.
18. Sapkota D, Parajuli P, Kafle TK. Effectiveness of Educational Intervention Programme on Knowledge Regarding Breast Self Examination Among Higher Secondary School Girls of Biratnagar. Birat Journal of Health Sciences. 2017;1:13–19. doi: 10.3126/BJHS.V1I1.17091.
19. Haryanti E, Kamesyworo. Knowledge Levels and Adolescent Attitudes towards the Implementation of BSE (Breast Self-Examination) in Level I Students. Journal of Applied Nursing and Health [Internet]. 2022 [cited 2024 Aug 25];4:33–39. doi: 10.55018/JANH.V4I1.33.
20. Rahman Z, Ikhtiar M, Patimah S. Educational Interventions to Change Behavior of Adolescents About Reproductive Health Adolescents SMAN 11 South Sinjai. Window of Health : Jurnal Kesehatan [Internet]. 2018 [cited 2024 Aug 25];235–240. doi: 10.33368/WOH.V1I3.56.