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The Effect of Peer Educator Training on Knowledge of the Adolescent Reproductive Health Triad among Health Cadres

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ABSTRACT

Background: Adolescent reproductive health is a critical issue that significantly influences the quality of life and future development of young people. The high incidence of sexually transmitted infections (STIs) and unintended pregnancies among teenagers underscores the urgent need for effective educational interventions. Peer educator training is considered a promising approach to improve adolescents' understanding and management of their reproductive health. This study aims to assess the effectiveness of peer educator training in enhancing adolescents' knowledge and skills related to reproductive health. It also seeks to compare outcomes between the experimental and control groups. A quasi-experimental design was employed, involving two groups: an experimental group that received peer educator training and a control group that did not receive any intervention. Statistical analysis was conducted using independent and paired *t*-tests to examine significant differences within and between the groups. he analysis revealed a statistically significant improvement in knowledge within the experimental group, with a p-value of 0.000 ($p < 0.05$), indicating a substantial difference before and after the training. Furthermore, the post-intervention comparison between the experimental and control groups also showed a significant difference in knowledge levels ($p = 0.000$), supporting the effectiveness of the training intervention conducted at SMA 11 Samarinda.Peer educator training is effective in increasing adolescents' knowledge regarding reproductive health. This intervention can serve as a valuable model for youth health education programs. Sustained efforts are recommended to broaden its implementation and maximize its impact on adolescent health outcomes.

INTRODUCTION

Adolescence is a transitional phase in identity formation, characterized by changes across biological (physical), psychological, emotional, and social dimensions. This developmental period typically spans the ages of 10 to 24 years and includes individuals who are unmarried. Indonesia has a substantial adolescent population, with approximately 36 million individuals representing over one-fifth of the national population aged between 10 and 19 years. According to the 2019 national population census, around 49% of this adolescent group are female. This number is expected to continue increasing, based on national demographic projections (1).In parallel with advancements in technology and information, lifestyle shifts, and transformations in family structures, the prevalence of adolescent-related issues has also risen. These rapid changes have made adolescents particularly vulnerable to a wide range of negative consequences. Among the most pressing issues are those encompassed by the adolescent reproductive health triad: premarital sexual activity, early marriage, and substance abuse (2).

These issues encompass a range of serious consequences, including unwanted pregnancies, premarital sexual activity, abortion, infection with sexually transmitted diseases such as HIV and AIDS, and substance abuse. According to the 2020 Indonesian Demographic and Health Survey (IDHS), 9% of 19,000 adolescent respondents aged 15–24 years reported having engaged in premarital sex comprising 1% of females and 8% of males (3). Substance abuse is another critical concern. In 2018, approximately 27.32% of an estimated 4 million individuals were identified as drug abusers. Furthermore, the prevalence of HIV was highest among individuals aged 20–29 years, accounting for 70.4% of all reported HIV cases, while AIDS cases within this age group made up 33.6% of the total (4).

Results from the Sexual Behavior Survey conducted in five major cities—Greater Jakarta (Jabodetabek), Bandung, Surabaya, Bali, and Yogyakarta revealed that 39% of adolescents aged 15–19 years had engaged in premarital sexual activity. Such behavior increases the risk of unintended pregnancy, sexually transmitted infections, abortion, and early marriage (5).

These issues are partly attributable to adolescents' limited understanding and knowledge of reproductive health. Prevention efforts targeting the adolescent reproductive health triad (premarital sex, early marriage, and drug abuse) can be more effective when implemented using peer-based approaches, specifically through the involvement of peer educators (6).

Peer educators are trained individuals from the same age group who are competent in delivering health education to their peers, both within school settings and in their communities. The effectiveness of peer educators in reducing premarital sexual activity has been demonstrated in several studies (7). Therefore, strengthening programs that promote access to reproductive health information through peer education is essential for addressing the reproductive health needs of adolescents.

Peer educators play a vital role in delivering information related to life readiness and the development of maturity among adolescents, as well as conducting advocacy and Information, Education, and Communication (IEC) activities to support youth health (1). They are instrumental in disseminating reproductive health information, promoting sexual health and hygiene, and preventing drug abuse and infectious diseases such as HIV/AIDS (9).

In Samarinda City, the local Health Office regularly implements a peer educator training program, scheduled and conducted annually. This initiative aims to strengthen the capacity of adolescent health cadres through cognitive reinforcement strategies that address key reproductive health risks such as premarital sex, HIV/AIDS, and substance abuse (10).

The effectiveness of such training programs has been demonstrated in previous research. A study by Juwartini and Kusumaningtyas (2022) found that a four-day peer counselor training significantly improved the knowledge and skills of adolescents who received the intervention, particularly in delivering reproductive health education and counseling (11). SMAN 11 Samarinda is one of the senior high schools in the Samarinda area, where five peer educators have received formal training from the local health center. However, not all student cadres in the school have been trained as health educators. In light of these observations, this study aims to analyze the impact of peer educator training on the knowledge and skills of adolescents at SMAN 11 Samarinda.

METHODS

This study employed a quasi-experimental design with a non-randomized control group. The study population consisted of 50 health cadres from grade XI at Senior High School 11 (SMAN 11) Samarinda. A total sampling technique was applied, resulting in 25 participants assigned to the experimental group and 25 to the control group.The inclusion criteria were students registered as health cadres in grade XI who consented to participate in the study. The instrument used to assess knowledge was a structured questionnaire consisting of 29 items, covering three key indicators: sexuality, drug abuse, and HIV/AIDS. Skills were assessed using a structured observation checklist.The intervention consisted of a two-day peer educator training program. Baseline data on knowledge and skills were collected prior to the training. Post-intervention skill assessments were conducted three days after the training to evaluate immediate impact.Data analysis was carried out using the Wilcoxon signed-rank test to assess within-group differences and the independent *t*-test to compare outcomes between the experimental and control groups.This research adhered to ethical standards and obtained ethical clearance from the Ethics Committee of the Faculty of Medicine, Mulawarman University, under approval number: 350/KEPK/FK/XII/2024.

RESULT AND DISCUSSION

RESULT

Respondent Characteristics

Table 1 Frequency Distribution of Respondent Characteristics Based on Age and Gender of Peer Educators at SMA 11 Samarinda

Respondent Characteristics	Experimen Group		Control Group	
	Frequency	Persentage (%)	Frequency	Persentage (%)
Gender				
1) Male	6	24.0	6	24.0
2) Female	19	76.0	19	76.0
Total	25	100.0	25	100.0
Age				

1)	14 years	1	4.0	1	4.0
2)	15 years	13	52.0	12	48.0
3)	16 years	10	40.0	12	48.0
4)	17 yaers	1	4.0	0	0
Total		25	100	25	100
Ever Get Health Information					
1)	Yes	25	100	25	100
		25	100	25	100

Primary Data Source 2024

Table 1 presents the demographic characteristics of students in both the experimental and control groups. The majority of participants in each group were female, with 19 individuals (76%) in both the experimental and control groups identifying as female.In terms of age distribution, most students in the experimental group were 15 years old (6 students; 52%), while in the control group, nearly half were also 15 years old (12 students; 48%).Regarding class level and prior exposure to health information, all students (100%) in both the experimental and control groups reported having previously received health-related information.

Peer educator knowledge

The variable of peer educator knowledge in conducting reproductive health education is analyzed and then displayed in the form of central tendency which includes mean, median, standard deviation, 95% CI, minimum and maximum in students at SMA 11 Samarinda.

Table 2 Description of Peer Educator Knowledge in Conducting Reproductive Health Education at SMA 11 Samarinda

Knowledge about the triad of reproductive health	ledian	andar Deviation	95% Confident Interval	
			Min	Max
Knowledge Before Experiment	20	2.410	18.69	20.00
Knowledge After Experiment	28	1.904	26.25	27.83
Knowledge Before Control	24	1.314	23.78	24.86
Knowledge After Control	24	1.314	23.78	24.86

Primary Data Source 2024

Table 2 presents the results of the analysis of students' knowledge regarding reproductive health. In the experimental group, the mean knowledge score before receiving the peer educator training was 20.00 with a standard deviation (SD) of 2.41. The 95% confidence interval (CI) ranged from a minimum of 18.69 to a maximum of 20.00. Following the intervention, the mean knowledge score increased significantly to 28.00 (SD = 1.90), with a 95% CI ranging from 26.25 to 27.83.In contrast, the control group, which did not receive the training, showed no change in knowledge scores. The mean score before and after the intervention remained at 24.00 (SD = 1.31), with a 95% CI ranging from 23.78 to 24.86.

Normality Test

Table 3 Normality Test Results

Shapiro wilk	Asymp.sig	Criteria	Explanation
Knowledge before Experimental group	0.760	> 0.05	Normally distributed data
Knowledge after Experimental group	0.002	< 0.05	lon-normally distributed data
Knowledge before Control group	0.038	< 0.05	lon-normally distributed data
Knowledge after Control group	0.038	< 0.05	lon-normally distributed data

Primary Data Source 2024

Data from table 3 shows that from the normality test with Shapiro Wilk obtained a significance value > 0.05 on the knowledge variable before the experimental group, meaning that the data is normally distributed. While the other 7 variables all have values < 0.05 so that the data distribution is not normal. The conclusion is that the data is not normally distributed so that the parametric paired t-test requirements cannot be carried out and are replaced with an alternative test, namely the Wilcoxon test.

Homogeneity Test

Table 4 Homogeneity Tetst

Variable	Sig.	.riteria	Explanation
Knowledge	).131	‣ 0.05	Homogeneity data

Primary Data Source 2024

Based on table 4 shows the results of the homogeneity test of the significance value (sig) beased on mean 0.131> 0.05, the conclusion is that the data variant of knowledge about the Reproductive Health Triad after the experimental group and the control group data is the same or homogeneous. The significance value (sig) beased on mean 0.825> 0.05, meaning that the data variant after the experimental and control skills is the data is the same or homogeneous. So that the requirements for the independent t test are met.

Results Wilcoxon Test

Tabel 5. *Wilcoxon test*

Variable	Z	*p-value*
Knowledge Experimental group	-4.395	0.000
Knowledge Control group	0.000	0.000

Primary Data Source 2024

The results of the paired sample test showed a significance value of the experimental group's knowledge of 0.000 (p-value <0.05) which indicates that peer educator training has a difference before and after, for knowledge in the control group with a p-value of 0.000 (p-value> 0.05) which indicates that peer educator training has a difference before and after in the group that did not receive peer educator training. The p-value of skills in the experimental group was 1.000 (p-value> 0.05) there was no difference in skills before and after peer educator training in the experimental group, skills in the control group that was not given training obtained a p-value of 0.000 (p-value <0.05) which indicates that there was a difference before and after in the group that was not given training.

Results Independent T- Test

Table 6. *Independet T- test*

Variabel	Mean Difference	*t*	*p-value*
Peer educator knowledge	5.880	2.748	0.000

Primary Data Source 2024

The results of the p-value on the knowledge variable are 0.000 (p-value <0.05), so it can be concluded that there is a difference in the experimental and control groups after being given peer educator training related to reproductive health at SMA 11 Samarinda.

Bivariat Analiysis
Wilcoxon Test

Tabel 7. *Wilcoxon test*

Research variables	Z	*p-value*
Experimental Knowledge	-4.395	0.000
Control Knowledge	0.000	0.000

Primary Data Source 2024

The results of the paired sample test showed a significance value of the experimental group's knowledge of 0.000 (p-value <0.05) which indicates that peer educator training had a difference before and after, for knowledge in the control group with a p-value of 0.000 (p-value >0.05) which indicates that peer educator training had a difference before and after in the group that did not undergo peer educator training.

Independent T- Test

Tabel 8 *Independet T-test*

Variabel	Mean Difference	*t*	*p-value*
Peer educator Knowledge	5.880	2.748	0.000

Primary Data Source 2024

The results of the p-value on the knowledge variable were 0.000 (p-value <0.05), so it can be concluded that there is a difference between the experimental and control groups after being given peer educator training related to reproductive health at SMA 11 Samarinda.

DISCUSSION

Knowledge Before and After Peer Educator Training

The results of this study indicate that the average knowledge score regarding the adolescent reproductive health triad in the experimental group prior to receiving peer educator training was 20, while the average score in the control group was 24. These findings align with the study by Bhakti (2019), which reported that 19.2% of students had good knowledge, 50.3% had moderate knowledge, and 30.5% demonstrated poor knowledge (12). Based on this comparison, the knowledge levels in both the experimental and control groups in the present study fall within the "good" category. The relatively high baseline knowledge observed in both groups can be attributed to prior exposure to health information through extracurricular activities, particularly those conducted by the Youth Red Cross (Palang Merah Remaja/PMR). Many of the respondents were already familiar with core topics within the adolescent reproductive health triad namely sexuality, drug use, and HIV/AIDS through school-based PMR activities. These findings suggest that structured extracurricular programs can contribute positively to baseline health literacy among adolescents, which can then be further enhanced through targeted interventions such as peer educator training.

It is important to understand that knowledge is acquired through the processes of seeing and hearing an outcome of sensory perception and cognitive processing. Knowledge can be gained through formal education, personal experience, interpersonal communication, mass media, and the surrounding environment. As a component of the cognitive domain, knowledge significantly influences behavior. Actions that are grounded in solid knowledge tend to be more stable and enduring over time (13).The relevance of peer educator training lies in its function as an effective channel for knowledge dissemination among adolescents. Peer educators serve as accessible sources of information for their fellow students, facilitating the acquisition of accurate and relatable health knowledge. Their role is particularly impactful due to the developmental tendency of adolescents to rely heavily on peer groups for emotional support, social bonding, and identity formation. Peer educators often act as trusted companions, providing a sense of familial connection, empathy, shared experiences, and reliable information especially in sensitive areas such as sexual and reproductive health (14).

This study involved a two-day peer educator training conducted in a classroom setting at SMAN 11 Samarinda, facilitated by the research team in collaboration with a supervising faculty member. The training targeted adolescent students selected as peer educators, aiming to enhance their knowledge of the reproductive health triad and prepare them to conduct peer counseling sessions. The training content included modules on adolescent reproductive health concepts, the reproductive health triad (sexuality, drug abuse, and HIV/AIDS), and simulation-based exercises designed to improve communication and facilitation skills.

On the third day following the training, both knowledge and skills were reassessed using post-test instruments. The results showed that the average knowledge score in the experimental group increased from 20 to 28, whereas the control group remained constant at 24. This 8-point improvement in the experimental group confirms the effectiveness of the intervention. These findings are consistent with a previous study involving 151 respondents, where 85 participants demonstrated good knowledge after receiving mentoring from peer educators (12).

The notable improvement in knowledge among the experimental group may be attributed to the interactive and visual nature of the training. The use of PowerPoint presentations and audiovisual media has been shown to be particularly effective for adolescent audiences (15,16). Additionally, the training employed simplified content delivery and summarized materials, which facilitated better comprehension. The increase in knowledge was also supported by the active participation of the peer educators, who showed high enthusiasm, engaged in discussions, and demonstrated sustained curiosity throughout the sessions.

These findings align with prior evaluations of peer education programs, which have consistently shown that such interventions contribute to improved knowledge among adolescents regarding reproductive health. One study reported that knowledge categorized as “sufficient” decreased from 70% to 63.3% post-training, while “good” knowledge increased significantly from 23.3% to 63.3% (17). This highlights the positive shift in cognitive outcomes following structured peer education interventions.

In contrast, the control group, which did not receive any training, showed no improvement in knowledge scores. They were only provided with printed leaflets to read independently at home. This finding reinforces previous literature suggesting that passive educational tools such as leaflets, banners, and brochures are less effective as standalone methods for behavior change or knowledge improvement (18).

The researchers acknowledge that baseline knowledge differences between the experimental and control groups may be attributed to random group allocation and the varying prior exposure to health information. In particular, involvement in Youth Red Cross (PMR) activities appears to have influenced baseline knowledge levels. Nonetheless, the peer educator training significantly strengthened the knowledge base of health cadres and enhanced their role as facilitators of adolescent health education in school settings.

Effect of Peer Educator Training on Knowledge of the Reproductive Health Triad

The results of the Wilcoxon signed-rank test revealed a statistically significant difference in knowledge scores within both the experimental and control groups before and after the intervention, with a *p*-value of 0.000 ($p < 0.05$). These findings indicate that peer educator training had a significant impact on increasing knowledge about the reproductive health triad in the experimental group, while no substantial changes were observed in the control group. The independent *t*-test comparing post-intervention scores between the two groups also showed a significant difference ($p = 0.000$), confirming the effectiveness of the training intervention.These findings are in line with previous research demonstrating that structured training and mentoring of peer educators significantly improves their knowledge and capacity to educate others in school settings (19).

Similar results were found in studies evaluating the impact of health education interventions on adolescent knowledge related to nutritional monitoring, where significant improvements were observed only in the intervention group, not in the control group (20). Another study using the Wilcoxon test showed a significant improvement in adolescent knowledge post-intervention by peer educators, particularly in topics related to HIV/AIDS, with notable differences between the intervention and control groups (12,21).Hasan (2020) reported that peer educators who received structured training achieved higher post-test scores, with the intervention group scoring an average of 85.22 compared to 72.68 in the conventional group (22). Likewise, Wirdayatni (2023) found a 1.8-fold increase in knowledge among cadres trained using audiovisual media one week post-training (23).

These studies reinforce the conclusion that training using interactive, media-supported methods is effective in enhancing knowledge retention and comprehension.The effectiveness of peer education lies in its relatable delivery. As highlighted by Ahmad and Wati (2023), peer education facilitates easier acceptance of sensitive topics, as the content is delivered by individuals within the same age group, promoting openness and comfort among participants (24). Health education, as a deliberate and structured process, provides opportunities for adolescents to continuously build awareness and develop both knowledge and skills (25). Through such interventions, adolescents can overcome barriers such as embarrassment or reluctance when discussing reproductive health and move from low to moderate or high knowledge levels (26).In this study, the training was delivered through interactive lectures supported by audiovisual media such as PowerPoint presentations, complemented by printed handouts, Q&A sessions, and group discussions.

The delivery used language that was accessible and age-appropriate for adolescents. This method created a learning environment that was participatory, engaging, and conducive to
knowledge acquisition (19,27,28). Educational media play a vital role in enhancing message retention, especially when multiple senses are engaged in the learning process. In this context, audiovisual materials enabled students to better absorb, retain, and later apply the knowledge they acquired.The improvement in knowledge observed among participants in the experimental group may also be attributed to their prior exposure to adolescent reproductive health content, particularly through extracurricular programs such as the Youth Red Cross (PMR). These existing platforms had familiarized students with the core themes addressed in the peer educator training, which may have supported the intervention's effectiveness.In summary, peer educator training significantly enhanced knowledge among adolescent health cadres, demonstrating its value as a school-based strategy for improving reproductive health literacy. The use of interactive methods and contextualized media proved to be important pedagogical tools, and future programs should consider integrating these approaches for broader implementation.

CONCLUSION

Based on the findings of this study, there was a significant improvement in adolescents' knowledge of the reproductive health triad following the peer educator training intervention. This outcome provided respondents with new experiences in accessing and internalizing health-related information. The increase in knowledge among participants in the experimental group confirms the effectiveness of the peer educator training in enhancing the competencies of student health cadres.However, several external factors may have contributed to the participants' baseline knowledge. Observational data suggest that some students were already familiar with key reproductive health concepts prior to the intervention. This prior knowledge can be attributed to their participation in extracurricular activities, such as school-based counseling sessions and Youth Red Cross (PMR) programs, which had previously introduced similar educational content.These pre-existing exposures likely supported the knowledge acquisition process during the training and may have contributed to the relatively high pre-test scores in both groups. Nonetheless, the structured nature and interactive delivery of the peer educator training clearly facilitated more substantial gains in knowledge compared to passive educational methods, such as leaflets or brochures, used in the control group.

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