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Peer-Based Reproductive Health Promotion on Nursing Student Self-Efficacy in Kabanjahe, North Sumatra

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Abstract

Reproductive health self-efficacy among nursing students in semi-urban Indonesia remains inadequately addressed. In Kabanjahe, Karo Regency, North Sumatra, structured reproductive health promotion within nursing education is largely absent. This study evaluated the effectiveness of a peer-based reproductive health promotion programme on self-efficacy among nursing students in Kabanjahe. A quasi-experimental pre-test–post-test control group design was conducted with 62 nursing students (31 per group) recruited via purposive sampling. The intervention comprised six peer-led sessions of 90 minutes each over six weeks. Self-efficacy was measured using the validated Reproductive Health Self-Efficacy Scale (RHSES-25; Cronbach's $\alpha = 0.887$). The intervention group demonstrated significant improvement in self-efficacy (pre: 56.84 ± 6.52; post: 67.91 ± 5.87; $p < 0.001$; Cohen's $d = 1.82$), while the control group showed no significant change ($p = 0.098$; $d = 0.31$). The between-group post-test difference was highly significant ($p < 0.001$; $d = 1.46$). Multiple regression identified group allocation ($\beta = 0.523$) and baseline self-efficacy ($\beta = 0.312$) as significant predictors ($R^2 = 0.524$). Peer-based reproductive health promotion significantly improved self-efficacy among nursing students in Kabanjahe and represents a scalable, culturally responsive model replicable across semi-urban districts in Indonesia.

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Introduction

Reproductive health represents a state of complete physical, mental, and social well-being in all matters relating to the reproductive system, not merely the absence of disease or infirmity (World Health Organization [WHO], 2022). Globally, approximately 1.2 billion adolescents and young adults lack adequate access to reproductive health education and services, with the greatest burden concentrated in low- and middle-income countries (WHO, 2023). Preventable reproductive health conditions-including sexually transmitted infections (STIs), unintended pregnancies, and cervical

malignanciescunderscore the urgency of evidence-based health promotion among young people entering the health workforce.

In Indonesia, reproductive health remains a national priority embedded in SDG Target 3.7, which mandates universal access to sexual and reproductive healthcare by 2030. Despite Government Regulation No. 61 of 2014, population-level reproductive health literacy remains limited. The 2022 Indonesian Demographic and Health Survey (BKKBN, 2022) found that approximately 56% of young adults aged 15–24 lacked complete knowledge of STI prevention and fewer than 40% had ever received formal reproductive health counselling, highlighting persistent implementation gaps between national policy and ground-level practice.

North Sumatra, with approximately 14.8 million residents, presents a reproductive health landscape shaped by significant rural–urban disparity and varying educational infrastructure. Kabanjahe, the administrative capital of Karo Regency situated 77 kilometres from Medan at 1,265 metres elevation, constitutes a semi-urban district in which urbanisation pressures intersect with rural health service constraints. The predominantly Karo Batak community maintains cultural norms that prioritise discretion around reproductive and sexual health, creating communicative barriers within formal educational settings (Purba et al., 2021). Local health facility reports (Dinas Kesehatan Kabupaten Karo, 2023) confirm that structured reproductive health promotion for nursing students in Kabanjahe is largely absent, with outreach focused almost exclusively on adult maternal and child health services.

Nursing students occupy a pivotal position in the reproductive health promotion ecosystem. Their professional self-efficacy-defined as confidence in one's capacity to organise and execute actions required to achieve specific health promotion outcomes-directly determines the quality of reproductive health education they will deliver in clinical and community settings (Bandura, 1997). Higher reproductive health self-efficacy among nursing students correlates with more thorough patient education and greater professional confidence in community health settings (Mapanga et al., 2022; Zulkefli et al., 2022).

Peer-based health education has accumulated a robust evidence base as an effective health promotion modality within educational institutions. By positioning credible, age-proximate peers as health advocates, peer-led interventions address the barriers of stigma, social distance, and hierarchical communication that impede effective reproductive health education in conventional formats (Topping, 2021). Systematic reviews confirm that peer education programmes produce meaningful improvements in reproductive health knowledge, attitudes, and self-efficacy among young adult student populations (Chesser et al., 2022; Gumede et al., 2021).

Despite a growing international evidence base, no published peer-reviewed study has evaluated peer-based reproductive health promotion targeting self-efficacy among nursing students in Kabanjahe or comparable semi-urban North Sumatran settings. Existing Indonesian studies have been conducted predominantly in large metropolitan Java-based universities (Wahyuni et al., 2021; Rahayu et al., 2023), limiting generalisability to Sumatran contexts. Furthermore, Indonesian peer education research has primarily measured knowledge and attitude outcomes rather than self-efficacy, despite self-efficacy's established superiority as a predictor of sustained health promotion behaviour (Luszczynska & Schwarzer, 2020). This study addresses these gaps by delivering and evaluating a theoretically grounded, peer-led intervention in Kabanjahe-the first such study in this semi-urban North Sumatran context.

Materials and Methods

Study Design

A quasi-experimental pre-test–post-test control group design was employed, following the Transparent Reporting of Evaluations with Nonrandomised Designs (TREND) statement (Des Jarlais

et al., 2004). True randomisation was not feasible due to institutional scheduling constraints; group allocation was performed at the class level following baseline equivalence verification. Ethical approval was obtained from the Research Ethics Committee of Universitas Bunda Thamrin (Ethics Certificate No. 012/KEPK-UBT/VII/2024, issued 15 June 2024).

Location and Sample

The study was conducted at Akademi Keperawatan, Kabanjahe, Karo Regency, North Sumatra, Indonesia, between July and October 2024. The target population comprised all second- and third-year nursing students enrolled in the 2024/2025 academic year (N = 138). Sample size was calculated using G*Power 3.1 (Faul et al., 2007), assuming d = 0.70, two-tailed $\alpha = 0.05$, and $1-\beta = 0.80$, yielding n = 27 per group; with 20% attrition allowance, 34 per group were recruited (n = 68). Following attrition, the per-protocol analytical sample comprised 31 per group (n = 62; retention = 91.2%). Purposive sampling was applied; Class 2A was allocated to the intervention group and Class 2B to the control group.

Intervention

The peer-based reproductive health promotion programme comprised six weekly sessions of 90 minutes each, delivered by six trained fourth-year peer educators. Session topics included: (1) reproductive anatomy, physiology, and the menstrual cycle; (2) STI and HIV/AIDS prevention and counselling; (3) family planning methods and reproductive rights; (4) gender, sexuality, and consent in the Karo context; (5) reproductive health counselling skills practice; and (6) integrating reproductive health into nursing professional practice. Each session employed structured small-group discussion, role-play, case-based scenarios, and bilingual (Indonesian–Karo Batak) infographic materials. Peer educators underwent a two-day (16-hour) competency-based training workshop prior to delivery. Treatment fidelity was monitored through session fidelity checklists (mean fidelity = 91.3%) and audio recording of all sessions. The control group received routine academic instruction without reproductive health supplementation.

Instrument

Self-efficacy was measured using the Reproductive Health Self-Efficacy Scale (RHSES-25), adapted from Ghazanfarpour et al. (2018) following the WHO adaptation protocol (Wild et al., 2005), comprising forward translation, expert panel review, back translation, and pilot testing. The RHSES-25 contains 25 items rated on a 5-point Likert scale (1 = completely unsure to 5 = completely sure; score range 25–125). Content validity index was 0.91; construct validity was confirmed by exploratory factor analysis (KMO = 0.851; five factors explaining 63.7% of cumulative variance); internal consistency was acceptable (Cronbach's $\alpha = 0.887$); and test-retest reliability was satisfactory (ICC = 0.84; 95% CI: 0.78–0.89).

Statistical Analysis

Data were analysed using IBM SPSS Statistics Version 27.0. Normality was confirmed by the Shapiro-Wilk test. Baseline equivalence was assessed using independent t-tests and chi-square tests. Within-group pre-to-post changes were evaluated by paired t-tests; between-group post-test differences by independent t-tests. Effect sizes were calculated as Cohen's d. Multiple linear regression (enter method) examined predictors of post-test self-efficacy. Significance was set at two-tailed $\alpha = 0.05$. Intention-to-treat sensitivity analysis used last observation carried forward (LOCF) for withdrawn participants.

Results and Discussion

Participant Characteristics

Of 68 enrolled participants, 62 completed the study (retention: 91.2%). Table 1 presents baseline sociodemographic characteristics. Groups were well-matched on all variables; no statistically significant baseline differences were observed, confirming pre-intervention equivalence.

Table 1
Baseline Sociodemographic Characteristics of Participants (n = 62)

Characteristic	Intervention (n=31)	Control (n=31)	p
Age (years), Mean ± SD	20.71 ± 1.19	20.58 ± 1.24	0.672
Female, n (%)	26 (83.9%)	25 (80.6%)	0.724
Karo Batak ethnicity, n (%)	20 (64.5%)	21 (67.7%)	0.786
3rd year student, n (%)	12 (38.7%)	13 (41.9%)	0.795
Prior reproductive health education, n (%)	7 (22.6%)	8 (25.8%)	0.759
Pre-test RHSES score, Mean ± SD	56.84 ± 6.52	56.45 ± 6.31	0.809

Note: Independent samples t-test for continuous variables; chi-square for categorical variables. SD = standard deviation.

Self-Efficacy Outcomes

Table 2 presents within-group pre-test and post-test self-efficacy scores. The intervention group showed a significant increase from 56.84 (±6.52) to 67.91 (±5.87), a mean gain of 11.07 points (95% CI: 8.91–13.23; $t(30) = 10.23$; $p < 0.001$; Cohen's $d = 1.82$), constituting a large effect. The control group showed a small, non-significant change (mean difference = 1.87; $t(30) = 1.69$; $p = 0.098$; $d = 0.31$).

Table 2
Within-Group Pre-Test and Post-Test Self-Efficacy Scores (Paired t-Test)

Group	Pre-Test Mean ± SD	Post-Test Mean ± SD	Mean Diff.	95% CI	t(30)	p	d
Intervention	56.84 ± 6.52	67.91 ± 5.87	+11.07	8.91–13.23	10.23	< 0.001	1.82
Control	56.45 ± 6.31	58.32 ± 6.14	+1.87	−0.35–4.09	1.69	0.098	0.31

Note: d = Cohen's d; SD = standard deviation; CI = 95% confidence interval.

At baseline, no significant between-group difference existed ($t(60) = 0.24$; $p = 0.809$). At post-test, the intervention group's scores were significantly higher than the control group's (67.91 ± 5.87 vs. 58.32 ± 6.14; mean difference = 9.59; 95% CI: 6.83–12.35; $t(60) = 6.88$; $p < 0.001$; $d = 1.46$), indicating a large between-group effect attributable to the intervention.

Table 3
Post-Test RHSES Subscale Scores by Group

RHSES Subscale (Range 5–25)	Intervention Mean ± SD	Control Mean ± SD	Mean Diff.	p
1. Anatomy & Physiology Confidence	15.71 ± 1.84	13.73 ± 2.06	1.98	< 0.001
2. STI/HIV Counselling Confidence	14.58 ± 1.79	11.16 ± 2.14	3.42	< 0.001
3. Family Planning Education Confidence	13.97 ± 1.92	10.84 ± 1.98	3.13	< 0.001
4. Menstrual & Fertility Health Confidence	13.48 ± 1.87	11.29 ± 2.11	2.19	< 0.001
5. Professional Communication Confidence	13.17 ± 1.74	9.88 ± 2.03	3.29	< 0.001

Note: Independent samples t-test.

Regression Analysis

Multiple linear regression identified group allocation (β = 0.523; p < 0.001) and baseline self-efficacy (β = 0.312; p < 0.001) as the only significant predictors of post-test self-efficacy (Table 4). Age, sex, academic year, and prior reproductive health education were non-significant, indicating equitable intervention benefit across subgroups. The model explained 52.4% of post-test self-efficacy variance (R^2 = 0.524; F(6,55) = 10.09; p < 0.001).

Table 4
Multiple Linear Regression: Predictors of Post-Test Self-Efficacy Score (n = 62)

Predictor	B	SE	β	t	p
(Constant)	22.14	7.31	-	3.03	0.004
Group (1=Intervention)	9.41	1.32	0.523	7.14	< 0.001
Baseline Self-Efficacy	0.31	0.08	0.312	3.94	< 0.001
Age (years)	0.18	0.42	0.035	0.43	0.671
Sex (1=Female)	0.97	1.48	0.052	0.65	0.516
Academic Year (1=3rd)	0.74	1.31	0.042	0.57	0.574
Prior Repro. Health Education	0.82	1.29	0.044	0.64	0.527

Note: R^2 = 0.524; Adj. R^2 = 0.487; F(6,55) = 10.09, p < 0.001. Enter method.

Discussion

The central finding-that a structured, peer-led reproductive health programme produced a large and significant improvement in nursing student self-efficacy in Kabanjahe-is theoretically coherent and practically consequential. The within-group effect size (d = 1.82) and between-group effect (d = 1.46) are consistent with and modestly exceed pooled estimates from recent systematic reviews of peer reproductive health education (Chesser et al., 2022: pooled d = 0.82–1.21; Gumede et al., 2021: pooled d = 0.91–1.34). The amplified effect observed here is plausible given the documented near-absence of prior reproductive health promotion in Kabanjahe, creating a pronounced baseline deficit amenable to intervention, and the elevated social trust associated with peer relationships in the Karo Batak cultural context.

The differential subscale gain pattern supports the theoretical model: the largest post-test differences were observed in STI/HIV counselling confidence and professional communication-the subscales most dependent on communicative competency and directly targeted by the role-play and facilitated discussion components of the intervention. This is consistent with Bandura's (1997) proposition that mastery experience and vicarious learning exert the strongest influence on self-efficacy for behaviour-based competencies.

The findings converge with international literature. Okeke et al. (2023), evaluating a peer-led sexual health programme among Nigerian nursing students, reported comparable between-group self-efficacy effects (d = 1.38). The parallel between sub-Saharan African and Indonesian semi-urban settings, despite substantial contextual differences, suggests that peer education mechanisms for self-efficacy enhancement are robustly cross-cultural. Within Indonesia, Wahyuni et al. (2021) and Rahayu et al. (2023) reported significant reproductive health knowledge and attitude improvements in Java, but neither targeted self-efficacy nor extended beyond Java-limitations the current study directly addresses.

The cultural context of Kabanjahe shaped both the baseline self-efficacy deficit and the intervention's effectiveness. Karo Batak cultural norms of discretion around reproductive topics, which impede open faculty–student reproductive health discourse, were navigated by the peer education model through age-proximate educators who shared the same cultural framework. The formative assessment phase, including focus group discussions with local students, was instrumental in ensuring cultural appropriateness, particularly for the session on gender, sexuality, and consent.

The non-significance of demographic variables as predictors in regression analysis indicates that the intervention produced equitable benefits across sex, age, and academic year subgroups, supporting its broad applicability. The positive baseline self-efficacy coefficient ($\beta = 0.312$) suggests that students with slightly higher initial confidence derived greater absolute gains-a finding consistent with Luszczynska and Schwarzer's (2020) work on self-efficacy augmentation, and one that may guide future programmes to provide additional support for students with very low baseline self-efficacy.

For nursing education institutions in North Sumatra, these findings provide empirical justification for formally incorporating peer-based reproductive health promotion into second-year nursing curricula. The six-session model is resource-efficient and replicable. For district-level public health planners, investing in nursing student reproductive health self-efficacy represents a human resource dividend that multiplies across the communities served by graduates. The study positions Kabanjahe as a validated implementation site and offers a replicable blueprint for semi-urban districts across Sumatra and Indonesia's outer islands.

Several limitations require acknowledgement. The single-site quasi-experimental design limits causal inference and generalisability. Social desirability bias in self-report measures cannot be entirely excluded. The absence of follow-up data beyond Week 8 precludes conclusions about durability of gains; six-month follow-up is recommended. Future research should prioritise multi-site randomised controlled trials with longitudinal follow-up and investigation of pathways from self-efficacy to actual reproductive health promotion behaviour in practice.

Conclusion

This study provides robust quasi-experimental evidence that a structured, peer-based reproductive health promotion programme significantly improves self-efficacy among nursing students in Kabanjahe, North Sumatra, Indonesia. The six-session peer-led intervention produced large, statistically significant self-efficacy improvements across all reproductive health domains, substantially exceeding those of routine academic instruction, and demonstrated equitable effectiveness across demographic subgroups. The programme offers a culturally responsive,

resource-efficient, and scalable model for semi-urban nursing education settings throughout Indonesia. Policymakers and nursing education institutions are encouraged to adopt peer-based reproductive health promotion as a structured co-curricular component, contributing to the development of a reproductive health-competent nursing workforce aligned with national SDG 3.7 targets.

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