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The Effect of Instagram Social Media on Improving Reproductive Health Behavior Among Students of SMK Negeri 1 Labuan

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***Abstrack*:** *Adolescent reproductive health remains a critical public health issue, particularly in Indonesia, where limited knowledge and unstructured health education continue to expose adolescents to reproductive health risks. This study aimed to determine the effect of Instagram social media on improving reproductive health behavior, encompassing knowledge, attitude, action, and motivation among students of SMK Negeri 1 Labuan, Donggala Regency, Central Sulawesi. A preliminary survey of 80 students revealed that only 41.3% had good reproductive health knowledge, 47.5% showed permissive attitudes toward risky behavior, and 87.5% had active Instagram accounts, yet no structured reproductive health education via social media had been implemented. A quasi-experimental study using the Nonequivalent Control Group Design was conducted from March to May 2026, involving 132 students divided equally into an intervention group (n=66) and a control group (n=66) through purposive sampling. The intervention consisted of structured Instagram-based reproductive health education delivered over six weeks. Data were collected using validated pre-post-test questionnaires and analyzed using the Wilcoxon Signed Ranks Test, Paired t-test, Mann–Whitney U Test, and multiple linear regression. The intervention group demonstrated highly significant improvements across all variables: knowledge ($Z=-7.074$, $p=0.000$), attitude ($Z=-7.077$, $p=0.000$), action ($Z=-7.091$, $p=0.000$), and motivation ($Z=-7.078$, $p=0.000$), while the control group showed no significant changes. Multiple linear regression confirmed that group assignment was the sole significant predictor of reproductive health action ($B=25.322$, $R^2=0.949$, $p=0.000$). Instagram-based health education is an effective, scalable strategy for improving adolescent reproductive health behavior.*

***Keywords* :** *Instagram; reproductive health; adolescent; health education; quasi-experiment.*

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INTRODUCTION

Adolescents form a crucial transitional population between childhood and adulthood, experiencing intense biological, psychological, and social transformations that have lasting effects on health and behavior. As the reproductive system matures during this period, young people require clear, accurate

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information and practical skills to make safe choices; without such knowledge and supportive environments, they become more susceptible to adverse outcomes such as unintended pregnancy, sexually transmitted infections, and related psychosocial problems. These vulnerabilities reflect the interplay of developmental impulses, peer influences, and gaps in accessible, youth-friendly health education and services (WHO, 2025).

Globally, the World Health Organization notes that adolescents continue to face significant reproductive health risks, driven by limited knowledge, engagement in high-risk sexual behaviors, and inadequate access to youth-friendly health services (WHO, 2024). These global patterns are reflected in Indonesia, where the 2023 Indonesian Demographic and Health Survey (SDKI Remaja) found that a substantial share of young people still lack sufficient reproductive health knowledge, especially about preventing unintended pregnancies and sexually transmitted infections. The information gap is particularly pronounced among students in Vocational High Schools (SMK), who are often more vulnerable because they enter the workforce earlier, encounter different social and economic pressures, and operate within social environments that may expose them to adult behaviors sooner than their peers (Rahmawati et al., 2022; Sari & Nugroho, 2023). Together, these findings underline the need for targeted, accessible education and services that respond to the specific circumstances of Indonesian adolescents, especially those in vocational settings.

The rapid advancement of information and communication technologies has fundamentally changed the ways adolescents seek and receive health information, shifting much of their attention from traditional sources to digital platforms. Among these, social media, especially Instagram, has become a primary information channel for many young people because it combines visual storytelling with interactive tools that encourage engagement. Instagram's strengths for reproductive health education include strong visual appeal, which helps simplify complex topics; interactive features such as polls, question boxes, and comment threads that facilitate two-way communication and immediate clarification; and structured content formats like infographics, reels, and carousel posts that suit short attention spans while allowing layered explanation. These characteristics make Instagram particularly well aligned with adolescent communication preferences and learning habits, enabling educators to present accurate, accessible reproductive health information in formats young people are already using (Umaroh et al., 2023; Chen et al., 2024).

Instagram was chosen as the intervention platform for this study because it presents several practical advantages over other social media channels. A preliminary survey at SMK Negeri 1 Labuan showed that 87.5% of students had active Instagram accounts, indicating strong reach and the potential for wide exposure within the target population. Compared with alternatives such as TikTok, which often prioritizes short-form entertainment and can constrain the depth of educational content, and Facebook, which has seen falling engagement among adolescents (only 32% of 13–17-year-olds remain active users; Pew Research Center, 2023), Instagram provides a useful middle ground: it combines visual attractiveness with greater flexibility for substantive messaging. In addition, Instagram's features support sustained learning and easy content retrieval, posts can be organized in the main feed and saved permanently in Highlights, allowing learners to revisit material, reinforce messages, and access information on their own schedule. These characteristics, together with evidence on platform effectiveness for health communication, informed the decision to deploy an Instagram-based intervention in this setting (Chen et al., 2024; Putri et al., 2025).

In Central Sulawesi Province, including Donggala Regency where Labuan is situated, early marriage and teenage pregnancy continue to pose serious public health and social challenges, affecting education continuity, economic prospects, and long-term wellbeing. A preliminary survey at SMK Negeri 1 Labuan during the 2024/2025 academic year revealed concerning gaps: only 41.3% of students demonstrated good

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reproductive health knowledge, 47.5% expressed permissive attitudes toward risky behaviors, and merely 34.1% had ever actively sought reproductive health education on Instagram, even though 63.8% reported using the platform more than three times per day. This pattern indicates a mismatch between high platform use and low proactive engagement with accurate health content, creating both a clear vulnerability and a strategic entry point for intervention. Given these local needs and the widespread use of Instagram among students, this study was designed to evaluate whether an Instagram-based social media intervention can improve reproductive health behavior, measured across knowledge, attitudes, actions, and motivation, among students of SMK Negeri 1 Labuan.

METHODOLOGY

This study employed a quasi-experimental design using the Nonequivalent Control Group Design (Campbell & Stanley, 1996). The study was conducted at SMK Negeri 1 Labuan, Donggala Regency, Central Sulawesi Province, from March to May 2026. The research design is presented in Figure 1.

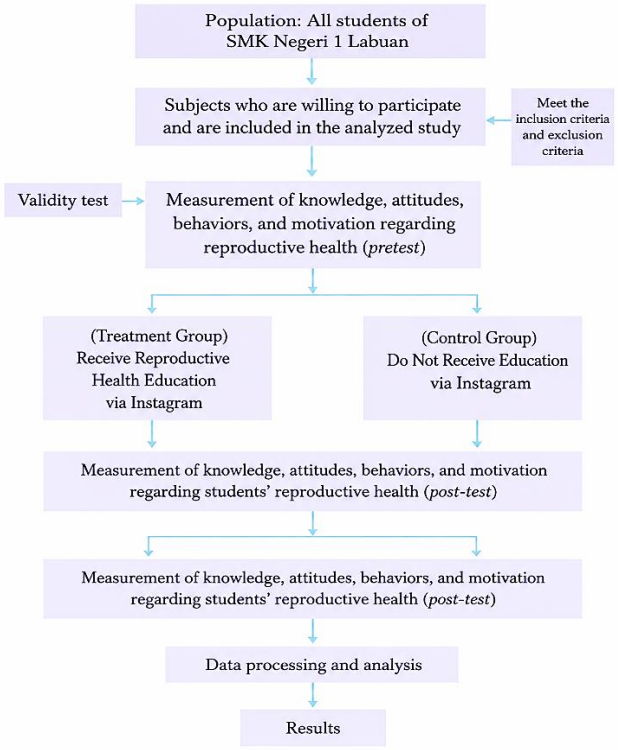

Figure 1. Research Design – Nonequivalent Control Group Design (O1 X O2 = Intervention Group; O3 O4 = Control Group)

The population comprised all active students of SMK Negeri 1 Labuan for the 2024/2025 academic year. A total of 132 students were recruited using purposive sampling and divided proportionally into two groups based on class level and gender to minimize baseline differences:

Table 1. Respondent Groups

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Group	n	Description
Intervention Group	66	Received structured Instagram-based reproductive health education for 6 weeks
Control Group	66	Did not receive the Instagram intervention; followed routine school health programs only

Inclusion criteria were: active student aged 15–18 years, active Instagram account holder, willingness to participate (informed consent), and commitment to complete all study stages including pre-test and post-test. Students who did not complete the questionnaire, were absent during study stages, or withdrew were excluded.

The Instagram-based reproductive health education was implemented over six weeks (April–May 2026) with a structured posting schedule of three items per week, totaling 18 educational entries. Posts combined varied formats to match adolescent learning preferences: informational infographics, short Reels (30–60 seconds), multi-slide carousel posts, and interactive Instagram Stories featuring polls, quizzes, and Q&A sessions. Program content followed six weekly themes (1) reproductive hygiene, (2) HIV/AIDS awareness, (3) the human reproductive system, (4) eating disorders and adolescent health, (5) reproductive health statistics and contraception, and (6) comprehensive adolescent reproductive health, each validated by subject matter experts and pretested on non-sample students to ensure clarity and cultural appropriateness before rollout.

Outcome data were collected with a validated pre-post questionnaire adapted from Ahmad Yani (2016) that measured four dependent variables: knowledge (10 items), attitude (10 items), action (10 items), and motivation (10 items), each using a Likert scale. Content validity was established through expert review, while construct validity was demonstrated via Pearson correlations (all item r-values exceeded critical r-table thresholds, $p < 0.05$). Internal consistency was acceptable for all scales (Cronbach's alpha: knowledge 0.782, attitude 0.840, action 0.815, motivation 0.708).

Statistical procedures matched data distributions: normality was tested using the Kolmogorov–Smirnov test; because the intervention group's post-test scores were non-normally distributed, within-group pre-post comparisons used the Wilcoxon Signed-Ranks Test, whereas the control group, showing normal distribution, was analyzed with the paired t-test. Between-group comparisons at post-test employed the Mann–Whitney U Test. Finally, multivariate multiple linear regression was performed to estimate the intervention's simultaneous and independent effects while controlling for demographic covariates (age, sex, grade level, major, and Instagram usage duration). All analyses were executed in SPSS.

RESULTS AND DISCUSSION

Before presenting detailed outcome measures, we first describe the sample to contextualize the findings and confirm baseline comparability between groups. The following section summarizes the respondents' demographic and Instagram-use profiles, which establish the population characteristics used to interpret subsequent changes in knowledge, attitudes, actions, and motivation.

1. Respondent Characteristics

Of the 132 respondents included in the study, 75 (56.82%) were male and 57 (43.18%) were female, indicating a modest male predominance in the sample. Age distribution was concentrated in mid-adolescence: 31.06% were 16 years old, and another 31.06% were 17, while 18.94% were 15 and 18.94% were 18, reflecting a balanced representation across the 15–18 age range. By

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academic level, students were spread across three grades: 44 (33.33%) in Grade X, 49 (37.12%) in Grade XI, and 39 (29.55%) in Grade XII. The sample also represented three vocational majors fairly evenly: Computer Networking (TKJ, n = 43; 32.58%), Electrical Installation (TITL, n = 45; 34.90%), and Construction and Property (TKP, n = 44; 33.33%), which supports generalizability within the school's programs. Patterns of Instagram use varied: 40 respondents (30.30%) reported using the platform for more than three hours per day, 39 (29.55%) for 1–2 hours, 31 (23.48%) for 2–3 hours, and 22 (16.67%) for less than one hour, indicating substantial daily exposure to social media for many participants.

The study's results show that the Instagram-based reproductive health education produced significant improvements in the intervention group across multiple domains, knowledge, attitudes, reported actions, and motivation, when compared to the control group. Importantly, baseline demographic and usage characteristics were distributed similarly between groups, which supports the internal validity of the findings by reducing the likelihood that pre-existing differences drove the observed changes. These outcomes align with Notoatmodjo's health behavior framework (2022), which emphasizes that knowledge functions as a key predisposing factor in the development of health behaviors; when baseline comparability is established, increases in knowledge following an educational intervention can reasonably be interpreted as causal drivers of subsequent shifts in attitudes, intentions, and actions rather than artifacts of initial group differences.

Table 2. Distribution of Respondent Characteristics (n=132)

Characteristic	Sex		Age				Grade			Major			Instagram Use/Day			
Category	Male	Female	15 years	16 years	17 years	18 years	X	XI	XII	TKJ	TITL	TKP	<1 hour	1–2 hours	2–3 hours	>3 hours
n	75	57	25	41	41	25	44	49	39	43	45	44	22	39	31	40
%	56.82	43.18	18.94	31.06	31.06	18.94	33.33	37.12	29.55	32.58	34.90	33.33	16.67	29.55	23.48	30.30

2. *Normality Testing*

Kolmogorov–Smirnov tests of normality showed that all pre-test measures in both the intervention and control groups met the assumption of normal distribution ($p = 0.200$ for every variable), indicating comparable baseline score distributions. However, examination of post-test data revealed a different pattern: in the intervention group the distributions for knowledge ($p = 0.008$), attitude ($p = 0.031$), action ($p = 0.049$), and motivation ($p = 0.034$) significantly deviated from normality, which required use of non-parametric methods (Wilcoxon Signed-Ranks Test) for within-group pre-post comparisons. By contrast, all post-test variables in the control group remained normally distributed ($p = 0.200$ for all), permitting the use of parametric paired t-tests for their within-group comparisons. This mix of distributional results informed the choice of appropriate statistical tests and strengthened the validity of subsequent inferences by aligning analysis methods with the actual data characteristics.

Before conducting between-group comparisons, we first tested data distribution to select appropriate statistical methods and avoid invalid inferences. Normality checks showed that the

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post-intervention scores for knowledge, attitude, action, and motivation did not satisfy the normality assumption, so non-parametric tests were used for the relevant analyses. Choosing analysis techniques that match the observed data distribution preserves the study's internal validity by ensuring that reported effects reflect the actual structure of the results rather than relying on parametric assumptions the data do not support.

3. Pre-Post Comparison within Each Group

Within the intervention group, pre- to post-intervention comparisons demonstrated statistically significant gains on all four outcome measures, knowledge, attitude, action, and motivation—indicating that the Instagram-based program produced measurable improvements across cognitive, affective, and behavioral domains. These findings are consistent with Notoatmodjo's health behavior framework (2022), which argues that enhanced knowledge serves as a primary predisposing factor that shapes attitudes and thereby enables behavioral action; in this study, increases in knowledge were followed by more positive attitudes and greater reported readiness to act. The observed effectiveness of Instagram likely reflects the platform's visual-centred and interactive features, which align with adolescent communication preferences and facilitate engagement and comprehension. Moreover, the intervention's structured, repeated delivery over six weeks probably supported retention and consolidation of information, helping translate new knowledge into sustained motivation and concrete actions. By contrast, the control group exhibited no significant pre-post changes across any variable, which underscores that change in reproductive health behavior typically requires deliberate, structured educational stimuli rather than occurring spontaneously, an observation that echoes prior reports of limited improvement among adolescents who do not receive organized reproductive health education (as noted by Sari et al., 2022; Putri & Handayani, 2023).

4. Between-Group Comparison (Mann–Whitney U Test)

Between-group analyses using the Mann–Whitney U Test revealed statistically significant differences in post-intervention scores for knowledge, attitude, action, and motivation, with the intervention group outperforming the control group on all measured outcomes. Because the control group showed no meaningful change over the same period, the between-group contrasts reduce the likelihood that improvements in the intervention arm were due to maturation, seasonal influences, or incidental exposure rather than the Instagram program itself. The size of the observed differences, most pronounced for knowledge and motivation, aligns with evidence that interactive digital media can strengthen reception and retention of health messages among adolescents (Kuss & Griffiths, 2023). In this study, the intervention's visual formats and two-way engagement features appear to have leveraged students' habitual communication patterns, making educational content more salient and motivating and thereby producing measurable gains relative to the non-intervention group.

Post-test comparisons between groups revealed highly significant differences across all variables, confirming the effectiveness of the Instagram intervention.

Table 3. Mann–Whitney U Test Results at Post-test

Variable	Group	n	Mean Rank	Sum of Ranks	Z	p-value
Knowledge	Intervention	66	99.45	6563.50	-9.911	0.000*

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Variable	Group	n	Mean Rank	Sum of Ranks	Z	p-value
Attitude	Control	66	33.55	2214.50	-9.717	0.000*
	Intervention	66	98.80	6521.00		
Action	Control	66	34.20	2257.00	-9.778	0.000*
	Intervention	66	99.02	6535.50		
Motivation	Control	66	33.98	2242.50	-9.809	0.000*
	Intervention	66	99.13	6542.50		
	Control	66	33.87	2235.50		

*$p < 0.05$

5. Multivariate Analysis

The multivariate regression analysis showed that group assignment (intervention vs. control) remained a significant independent predictor of action even after adjusting for all measured demographic covariates, which reinforces the internal validity of the intervention effect. In other words, differences in reported action are best explained by exposure to the Instagram program itself rather than by participant characteristics such as age, grade, major, or baseline Instagram use. This finding increases confidence in a causal interpretation of the program's impact on behavior, but several important limitations temper that conclusion. First, outcomes were measured with self-reported questionnaires and therefore may be influenced by social desirability or recall bias. Second, the six-week duration of the intervention limits assessment to short-term effects and may not reflect longer-term maintenance of behavioral change. Third, actual depth of engagement with the Instagram content could not be fully controlled or verified; some students may have only skimmed posts rather than interacted meaningfully, which would affect dose–response interpretation. These caveats do not invalidate the observed effects but clarify the scope and generalizability of the results and suggest directions for future studies—such as objective engagement metrics, longer follow-up, and triangulation with behavioral or service-use data—to strengthen causal inferences.

CONCLUSIONS

Instagram-based reproductive health education significantly improved knowledge, attitude, action, and motivation among students of SMK Negeri 1 Labuan. The Wilcoxon Signed Ranks Test confirmed significant within-group pre-post improvements for the intervention group on all four variables ($Z = -7.074$ to -7.091, $p = 0.000$), while the control group showed no significant changes. Mann–Whitney U Tests revealed significant between-group differences at post-test for all variables ($Z = -9.717$ to -9.911, $p = 0.000$). Multiple linear regression confirmed that the intervention ($B = 25.322$, $p = 0.000$) was the sole significant predictor of reproductive health action, with the model explaining 94.9% of the variance ($R^2 = 0.949$).

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These findings support the integration of Instagram-based health education into school health programs. Healthcare providers and schools are encouraged to collaborate in developing evidence-based, visually engaging digital content tailored to adolescent users. Future research should explore longer intervention durations, larger and more diverse samples, and comparative analyses across multiple social media platforms (e.g., TikTok, YouTube, WhatsApp).

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