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Knowledge and Attitudes toward Reproductive Health among Female Teacher Training Students: A Cross-Sectional Study in Nusa Cendana University

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ABSTRACT:
Background: Reproductive health among adolescents and young adults remains a public health priority in Indonesia, including East Nusa Tenggara. Limited literacy and unfavorable attitudes increase risks of unintended pregnancy, risky sexual behaviors, and sexually transmitted infections (STIs). This topic is particularly salient for female students in the Faculty of Teacher Training and Education as future educators, while sociocultural norms and taboos can impede discourse.
Objective: To assess knowledge, attitudes, and their association regarding reproductive health among female students in the Faculty of Teacher Training and Education at Nusa Cendana University. Methods: An analytical cross-sectional study was conducted among 135 participants selected via cluster and stratified random sampling across nine programs. Data were collected using structured questionnaires on knowledge and attitudes. Univariate summaries and Chi-square tests (SPSS v30) were applied with a 0.05 significance level. Some cells in the contingency table had expected counts <5, violating the Chi-square assumption. Therefore, variable categories were collapsed, or an alternative test, such as Fisher's exact test, was used for inferential analysis, and the effect size (Cramér's V) = 0,564.
Results: Good knowledge was observed in 66.7% of respondents, moderate in 14.1%, and low in 19.3%. Positive attitudes were reported by 85.2% and negative by 14.8%. Knowledge level was significantly associated with attitudes (chi-square = 43.001; $p < 0.001$, Cramér's V = 0.564, large). Sensitivity analysis by collapsing knowledge categories (moderate + low) confirmed robustness (Fisher's exact $p < 0.001$; phi ≈ 0.55).
Conclusions: Higher knowledge is associated with more favorable attitudes toward reproductive health. Integrating comprehensive, culturally sensitive, and evidence-based reproductive health education within teacher-training curricula is recommended, with emphasis on digital literacy and curated information sources.

KEYWORDS: Attitude, Education, Knowledge, Female students, Reproductive health, Nusa Cendana University

I. INTRODUCTION

Reproductive health encompasses physical, mental, and social well-being beyond mere absence of disease. Knowledge domains include reproductive anatomy and physiology, prevention of sexually transmitted infections (STIs), contraception, and family planning to inform healthy decision-making [1]. Attitudes are shaped by beliefs, cultural values, and social norms, influencing responses to sexuality, disease prevention, and self-care [2].

In Indonesia, the burden of adolescent pregnancy and disparities in information access underscore the need to strengthen reproductive health literacy and attitudes, including in East Nusa Tenggara. [3]. Prior evidence regarding the relationships between knowledge and attitude is mixed, with significant associations in some studies and null findings in others. [4–6]. Within this socio-cultural context, taboos around sexuality may inhibit open discourse, while students in the Faculty of Teacher Training and Education—as future educators—have a strategic role in disseminating evidence-based information. This study aimed to analyze the association between knowledge level and attitudes toward reproductive health among female students in the Faculty of Teacher

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Training and Education at Nusa Cendana University. Scientifically, this study contributes to the empirical basis of the relationship between knowledge and attitude link; practically, the findings inform the design of educational interventions in universities in eastern Indonesia.

II. RESEARCH METHOD

A. Study Design and Setting

An analytical cross-sectional study was conducted at the Faculty of Teacher Training and Education, Nusa Cendana University (Kupang, East Nusa Tenggara) from August to September 2025.

B. Population and Sampling

The study population consisted of female undergraduate students enrolled in the faculty. The minimum sample size was calculated using Cochran's formula with a 95% confidence level, resulting in a required sample size of 96 female students. To account for potential non-response and to ensure adequate representation across study programs, the final sample size was increased to 135 respondents.

A total of 135 female students from nine programs were selected using cluster and stratified random sampling to ensure proportional representation. The sampling frame was derived from faculty program lists. From a total of 18 programs, nine programs were selected through cluster random sampling, and within each selected program, 15 female students were randomly recruited. Inclusion criteria were active enrollment in semester 3 or 5, provision of informed consent, and complete questionnaire data. Restricting to semesters 3 and 5 may limit representativeness for all female students in the faculty.

C. Instruments and Measures

Structured questionnaires assessed: (1) Knowledge levels, categorized as low (<55%/1-12), moderate (56–75%/13-16), and good (76–100%/17-22) [7]. The questions totaled 22, with correct answers given a value of 1 and incorrect answers given a value of 0. This questionnaire was adapted from a questionnaire made by Handari Mursit [8] And then modified to reduce the number of questions, after which it was tested on 30 female students in the Faculty of Teacher Training and Education. The instrument obtained a Cronbach's alpha value of 0.866 (>0.6) and a calculated r value > r table (0.361); and (2) Attitudes, categorized as negative (< mean (47.13)) and positive (≥ mean (47.13)) based on Likert-scale scoring. The mean attitude score was 47.13 (SD = 4.45). The statements totaled 14 numbers, rated as strongly disagree (1), disagree (2), agree (3), and strongly agree (4). This questionnaire was adapted from a questionnaire created by Eko Deddy Novianto [9], and then modified to reduce the number of questions, after which it was tested on 30 female students in the Faculty of Teacher Training and Education. The instrument obtained a Cronbach's alpha value of 0.814 (>0.6) and a calculated r value > r table (0.361). However, this questionnaire did not include the Content Validity Index (CVI) test and exploratory and confirmatory factor analysis (EFA/CFA). These limitations are recognized as part of the methodological limitations of the study.

D. Data Analysis

Univariate analysis summarized the data distributions. The association between knowledge (independent variable; three categories) and attitude (dependent variable; two categories) was initially analyzed using Pearson's chi-square test. However, the expected frequency assumption was not fully met, as several cells in the 3×2 table had expected counts <5. Therefore, the knowledge categories were collapsed by combining the moderate and low levels into a single "Not Good" category. The association was then re-tested using Fisher's exact test as the sensitive analysis, which yielded a statistically significant result ($p < 0.001$). The strength of the association was assessed using Cramér's V, indicating a strong relationship ($V = 0.564$). All analyses were performed using SPSS version 30 with a significance level of 0.05.

E. Ethics

Ethical approval was obtained from the Health Research Ethics Committee of Health Polytechnic Kupang (LB.02.03/1/0268/2025; July 23rd 2025). All procedures adhered to principles for research involving human participants. Before filling out the questionnaire, informed consent was given, and the confidentiality of the respondent's data was maintained.

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III. RESULTS

F. Respondent Characteristic

Table I. Respondet Demographics (N = 135)

Variable	N	(%)
Study Program	15%	11,1
Indonesian Language	15%	11,1
Counseling Guidance	15%	11,1
Economy	15%	11,1
Geography	15%	11,1
Mathematics	15%	11,1
Early Childhood Teacher Education	15%	11,1
Primary School Teacher Education	15%	11,1
Civic Education	15%	11,1
History		
Ages		
14-17	2	1,5
18-21	131	97,1
22	2	1,5
Semester		
3	83	61,5
5	52	38,5
Religions		
Muslim	7	5,2
Protestant	69	51,1
Catholic	59	43,7
Regional Origin		
Alor	5	3,7
Bajawa	2	1,5
Bugis	1	0,7
Ende	4	3,0
Kefamenanu	1	0,7
Kota Kupang	1	0,7
Lembata	19	14,1
Malaka	1	0,7
Manggarai	28	20,7
Nagekeo	1	0,7
Papua	1	0,7
Rote	16	11,9
Sabu	13	9,6
Sikka	1	0,7
Sumba	9	6,7
Timor	32	23,7
Source Of Information		
Lecturers	19	14,1
Internet	38	28,1
Print Media	1	0,7
Parents	29	21,5

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Health Workers	23	17,0
Peers	23	17,0
Televison	2	1,5
Total	**135**	**100**

Participants (N=135) were evenly distributed across nine programs (each 11.1%). Age ranged from 17–22 years, with 97.1% aged 18–21. Semesters: 61.5% in semester 3 and 38.5% in semester 5. Religions: Protestant 51.1%, Catholic 43.7%, Muslim 5.2%. Major regions of origin included Timor (23.7%), Manggarai (20.7%), and Lembata (14.1%). Predominant information sources were the internet (28.1%), parents (21.5%), health workers (17.0%), peers (17.0%), lecturers (14.1%), TV (1.5%), and print media (0.7%).

G. Knowledge Levels and Attitudes

Table II. Distribution of Reproductive Health Knowledge Levels

Knowledge	N	(%)
Low	26	19,3
Moderate	19	14,1
Good	90	66,7
Total	**135**	**100,0**

Table III. Distribution of Reproductive Health Attitudes

Attitudes	N	(%)
Negative	20	14,8
Positive	115	85,2
Total	**135**	**100,0**

Knowledge was low 19.3% (26/135); Moderate 14.1% (19/135); and Good 66.7% (90/135). Negative attitude 14.8% (20/135); Positive 85.2% (115/135)

H. Relationship between Knowledge and Attitude

Table IV. Correlations of Reproductive Health Knowledge and Attitude about Reproductive Health

Variable	Attitude						*p-value*
	Positive		Negative		Total		
Knowledge	n	%	n	%	n	%	
Good	89	98,9	1	1,1	90	66,7	
Moderate	9	47,4	10	52,6	19	14,1	<0,001
Low	17	65,4	9	34,6	26	19,3	
Total	115	85,2	20	14,8	135	100	

Chi-square test indicated a significant association ("chi-square = 43.001; df = 2; $p < 0.001$; minimum expected cell count = 2.82; Cramér's V = 0.564 [large]"). Sensitivity analysis (Good vs. Not Good [Moderate + Low]); Fisher's exact $p < 0.001$; phi ≈ 0.55, confirming robustness of the association under category collapse.

Good knowledge-positive attitude 98.9% (89/90), negative 1.1% (1/90); fair knowledge-positive 47.4% (9/19), negative 52.6% (10/19); poor knowledge-positive 65.4% (17/26), negative 34.6% (9/26).

IV. DISCUSSION

This study demonstrated a strong and statistically significant association between higher knowledge and more positive attitudes toward reproductive health among female teacher-training students. The findings align with health behavior perspectives

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that position knowledge as a cognitive basis shaping attitudes [1] and with attitude theory emphasizing learning processes and value internalization [2]. The high proportion of positive attitudes (85.2%) among respondents is consistent with late adolescent–young adult developmental trajectories that support increasingly reflective health decision-making. These findings are consistent with previous research. For instance, [4] found a significant relationship between knowledge and attitudes and reproductive health behaviors among high school students in Manado, indicating that adequate knowledge correlates with more positive attitudes. Similarly, [5] demonstrated a strong positive association between adolescents' knowledge and attitudes toward reproductive health. Moreover, findings cited from [6] reported that adolescents with better knowledge and attitudes tended to engage in safer premarital sexual behaviors. Although differences exist in study populations and contexts (young adult university students vs. high school adolescents), the overall pattern suggests that higher knowledge is associated with more positive attitudes, supporting the concept that knowledge serves as a key cognitive foundation for shaping attitudes toward reproductive health. At the same time, the heterogeneity of attitudes among those with low-to-moderate knowledge indicates that knowledge, while important, is not sufficient; peer influence, family authority, religiosity, sociocultural norms, and the quality of digital information likely contribute to attitude formation. The descriptive data indicate the internet as a predominant information source, suggesting a strategic window for curated, credible digital literacy interventions on campus.

Methodologically, the primary 3×2 chi-square test met overall assumptions but included cells with expected counts below five; this was addressed through a planned sensitivity analysis collapsing knowledge categories into Good versus Not Good (Moderate + Low). The association remained highly significant (Fisher's exact $p < 0.001$) with a large effect size (phi ≈ 0.55), supporting robustness. The instrument reliabilities were good (knowledge alpha = 0.866; attitude alpha = 0.814, both > 0.6), correcting the earlier reporting artifact. Nonetheless, several limitations must be highlighted. First, the cut-off for classifying attitudes was set based on the mean score (≥47.13 for positive) but was not empirically calibrated using methods such as ROC or distributional analysis; this mean-based cut-off is arbitrary and may introduce misclassification. Second, content and construct validity for the modified instruments (post-adaptation) were not reported. Third, the sampling included only semesters 3 and 5 and nine of eighteen programs, which may limit representativeness and introduce selection bias. Fourth, self-reported measures may be influenced by social desirability bias. Finally, the cross-sectional design precludes causal inference.

Programmatically, the results support: (1) integration of reproductive health content within teacher-training curricula emphasizing evidence-based, culturally sensitive materials; (2) student-friendly counseling services attentive to sociocultural sensitivities; (3) peer education initiatives; and (4) partnerships with health professionals to provide curated, credible content, particularly across digital channels, given the high reliance on the internet as an information source. Future research should apply longitudinal or interventional designs to test causal pathways and examine mediators and moderators (e.g., subjective norms, self-efficacy, religiosity, source credibility).

V. CONCLUSION

Most respondents demonstrated good knowledge and positive attitudes. Knowledge level was strongly associated with attitudes toward reproductive health. Strengthening knowledge through integrated, culturally sensitive, evidence-based educational strategies—particularly with digital literacy and content curation—may help sustain and improve favorable attitudes among female teacher-training students.

VI. RECOMMENDATION

1) For Students: Proactively access trusted sources and internalize safe reproductive health practices.

2) For Institutions: Integrate reproductive health into curricula; expand counseling, seminars, and peer education; and curate digital channels for reliable content.

3) For Communities: Support open communication and participation in counseling activities to prevent misinformation.

4) For Researchers: Conduct longitudinal and intervention studies; explore moderators/mediators (e.g., subjective norms, self-efficacy); and broaden contexts across faculties/universities.

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