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Jurnal Kesehatan

| ISSN (Print) 2085-7098 | ISSN (Online) 2657-1366 |

The Influence of Culturally Grounded Communication on Adolescent Decision-Making Related to STI and HIV/AIDS Risk in Semarang, Central Java, Indonesia

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ARTICLE INFORMATION

Received: October 2025
Revised: December 2025
Accepted: Januari 2026
Available online: 31 Maret 2026

KEYWORDS

Culturally grounded communication
STI
HIV/AIDS
Adolescents

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A B S T R A C T

Adolescence is a critical developmental stage characterized by physiological and psychological changes that increase vulnerability to risky sexual behavior and sexually transmitted infections (STIs), including HIV/AIDS. This study aimed to examine adolescent sexual behavior, communication ability, decision-making skills, and the impact of culturally grounded communication on adolescents' decision-making related to STI and HIV/AIDS risks in Central Java, Indonesia. A quantitative quasi-experimental pretest–posttest control group design was conducted among 80 high school students selected through simple random sampling from a population of 500 students. Participants were assigned to an intervention group (n = 40) and a control group (n = 40). The intervention consisted of culturally grounded communication training integrating local cultural values. Data were analyzed using the Wilcoxon Signed-Rank Test and the Mann–Whitney U Test. The results showed a significant improvement in decision-making scores in the intervention group after the intervention (Z = −2.919, p = 0.004), with a moderate-to-large effect size (r = 0.46). Post-intervention scores were significantly higher than pre-intervention scores, indicating enhanced cognitive and behavioral capacity in responding to sexual health risks. Culturally grounded communication was associated with improved adolescent decision-making regarding STI and HIV/AIDS. These findings highlight the importance of integrating cultural values into adolescent reproductive health education to strengthen preventive efforts

INTRODUCTION

Adolescence is a critical developmental stage characterized by rapid physical, emotional, and psychosocial changes that may increase vulnerability to risky sexual behavior and sexually transmitted infections (STIs), including HIV/AIDS [1]. In Indonesia, adolescents often experience limitations in reproductive health communication due to sociocultural norms that consider discussions about sexuality as sensitive or taboo topics [2]. Consequently, many adolescents rely

DOI : 10.35730/jk.v17i1.1404

Available *online* at : http://ejurnal.stikesprimanusantara.ac.id/

Jurnal Kesehatan

| ISSN (Print) 2085-7098 | ISSN (Online) 2657-1366 |

on peers or digital media as primary sources of sexual health information, which may increase exposure to misinformation and risky behavior [3],[4].

This study examines how culturally grounded communication embedded in local cultural values and social norms in Semarang, Central Java, influences adolescent decision-making related to STI and HIV/AIDS prevention. In Semarang society, adolescents are strongly influenced by Javanese cultural values such as unggah-ungguh (politeness norms), collectivism, respect toward parents and authority figures, and the tendency to avoid open discussions regarding sexuality-related issues. These sociocultural characteristics often limit adolescents' confidence and communication ability in discussing reproductive health matters openly, potentially affecting their sexual health decision-making.

According to UNAIDS, approximately 39.9 million people were living with HIV globally in 2023, with adolescents remaining a vulnerable population due to behavioral and structural risk factors [5]. In Indonesia, HIV incidence among adolescents and young adults remains concerning, particularly in urban settings with increasing exposure to digital media and changing social interactions [6]. Central Java remains among the provinces with a substantial HIV/AIDS burden, highlighting the need for context-specific preventive interventions [7].

Previous interventions in Indonesia have primarily focused on knowledge improvement through peer education or general reproductive health promotion. However, limited studies have integrated local cultural values into communication-based interventions aimed at improving adolescent decision-making regarding STI and HIV/AIDS risks. Therefore, this study offers novelty by integrating Javanese sociocultural values into communication strategies and examining their effect on adolescent decision-making related to sexual health risks.

METHODOLOGY

The study was conducted in five public senior high schools (SMA) in Semarang City, which represented urban adolescent populations with diverse sociocultural backgrounds. This quasi-experimental study used a pretest–posttest control group design and was conducted in five public high schools in Central Java, Indonesia. The study examined the effect of a culturally grounded

DOI : 10.35730/jk.v17i1.1404

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Jurnal Kesehatan

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communication intervention on adolescents' decision-making regarding sexually transmitted infections (STI) and HIV/AIDS. From a sampling frame of 500 students, simple random sampling identified 80 eligible participants, with 40 assigned to the intervention group and 40 to the control group. Eligible participants were 15–18 years old, active students, and willing to participate. Data were collected using structured questionnaires assessing knowledge, attitudes, risk perception, and decision-making.

Although the sample size (n = 80) may not fully represent all adolescents in Semarang, it was determined using statistical power analysis and is considered adequate for detecting intervention effects in quasi-experimental studies. The main dependent variable in this study was adolescent decision-making ability, while communication ability and sexual behavior were treated as supporting variables. The decision-making instrument consisted of 15 items covering cognitive evaluation, risk assessment, and behavioral intention domains, measured using a 5-point Likert scale. The communication ability instrument consisted of 12 items assessing clarity, assertiveness, and confidence in expressing opinions. The sexual behavior instrument categorized responses into risky and non-risky behavior based on predefined scoring criteria adapted from previous validated studies. The intervention was delivered in group sessions (8–10 students per group) over 10 sessions (70 minutes each**)**. Each session included: culturally adapted discussion, case-based learning using real-life adolescent scenarios, role-play activities based on scripts developed by the research team and validated by experts.

The decision-making instrument demonstrated strong validity and reliability (Cronbach's α = 0.943). The intervention consisted of ten 70-minute sessions integrating Javanese cultural values through discussions, case analyses, and role-play, while the control group received no comparable program. Pre–post changes within groups were analyzed using the Wilcoxon test, and between-group differences using the Mann–Whitney U test, with significance set at $p < 0.05$. The Wilcoxon Signed-Rank Test and Mann–Whitney U Test were used because the data were not normally distributed, as indicated by the Shapiro–Wilk normality test ($p < 0.05$).

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Jurnal Kesehatan

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Ethical approval for this study was obtained from the Health Research Ethics Committee of Dr. Adhyatma Regional Public Hospital, Semarang (No. 092/KEPK.EC/XI/2024). Written informed consent was obtained from all participants and accompanied by parental or guardian consent for minors, in accordance with national ethical guidelines for research involving adolescents.

The instruments used in this study were developed by the research team based on literature review and previously validated adolescent reproductive health questionnaires. Prior to data collection, the instruments underwent content validity assessment by three experts in adolescent health and communication.The communication ability questionnaire consisted of 12 items covering three domains: clarity of expression, assertiveness, and confidence in communication. The instrument included both favorable and unfavorable statements measured using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Total scores ranged from 12 to 60. Scores ≥75% of the total score were categorized as good communication ability, while scores <75% were categorized as poor communication ability.

The decision-making skills questionnaire consisted of 15 items assessing cognitive evaluation, risk consideration, and behavioral intention related to STI and HIV/AIDS prevention. Responses were measured using a 5-point Likert scale. Total scores ranged from 15 to 75. Scores ≥75% were categorized as adequate decision-making skills, whereas lower scores were categorized as inadequate.The sexual behavior instrument classified respondents into risky and non-risky sexual behavior categories based on predefined scoring criteria adapted from previous validated adolescent reproductive health studies. The communication ability instrument demonstrated good reliability (Cronbach's $\alpha = 0.882$), while the decision-making skills instrument showed excellent reliability (Cronbach's $\alpha = 0.943$).

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RESULTS

Characteristics of Respondents

Table 1. Distribution of Subjects According to Demographic Characteristics (N = 80)

Demographic Characteristics	Female n (%)	Male n (%)	Total n (%)
Religion			
Islam	32 (40.0)	22 (27.5)	54 (67.5)
Christian/Catholic	13 (16.3)	12 (15.0)	25 (31.3)
Hindu	1 (1.2)	0 (0.0)	1 (1.2)
Buddhist	1 (1.2)	0 (0.0)	1 (1.2)
Ethnicity			
Javanese	33 (41.3)	23 (28.7)	56 (70.0)
Chinese	13 (16.3)	11 (13.7)	24 (30.0)
Age Group (years)			
≥ 17	17 (21.2)	14 (17.5)	31 (38.7)
< 17	29 (36.3)	20 (25.0)	49 (61.3)

The table shows that most respondents were Muslim, of Javanese ethnicity, and aged under 17 years, reflecting the dominant sociocultural characteristics of adolescents in Central Java.

Adolescent Sexual Behavior

Table 2. Distribution of Subjects According to Adolescent Sexual Behavior (N = 80)

Sexual Behavior	Intervention Group (n = 40) n (%)	Control Group (n = 40) n (%)	Total n (%)
Risky	6 (15.0)	11 (27.5)	17 (21.3)
Non-risky	34 (85.0)	29 (72.5)	63 (78.7)
Total	**40 (100)**	**40 (100)**	**80 (100)**

Table 2 presents the distribution of adolescents' sexual behavior according to study group. Sexual behavior was categorized based on scoring thresholds derived from the instrument, where higher scores indicated risky behavior.The majority of adolescents in both groups were categorized as

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Jurnal Kesehatan

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having non-risky sexual behavior. However, the proportion of adolescents reporting risky sexual behavior was higher in the control group (27.5%) than in the intervention group (15.0%)

Table 3. Adolescents' Communication Ability

Communication Ability	Intervention Group (n = 40) n (%)	Control Group (n = 40) n (%)	Total n (%)
Good	32 (80.0)	24 (60.0)	56 (70.0)
Poor	8 (20.0)	16 (40.0)	24 (30.0)
Total	**40 (100)**	**40 (100)**	

These findings support the significant effect of the culturally grounded communication intervention on adolescents' communication ability, which aligns with the observed improvement in decision-making skills ($Z = -2.919$; $p = 0.004$).

Decision-making skills

Table 4. Distribution of Decision-Making Skills by Study Group (Posttest) (N = 80)

Decision-Making Skills	Intervention (n = 40) n (%)	Control (n = 40) n (%)	Total n (%)
Inadequate	4 (10.0)	12 (30.0)	16 (20.0)
Adequate	36 (90.0)	28 (70.0)	64 (80.0)
Total	**40 (100)**	**40 (100)**	**80 (100)**

Table 4 presents the distribution of adolescents' decision-making skills according to study group at posttest. The majority of adolescents in the intervention group demonstrated adequate decision-making skills (90.0%), compared with 70.0% in the control group. Conversely, a higher proportion of adolescents in the control group were categorized as having limited decision-making ability (30.0%) compared with the intervention group (10.0%)

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Table 5. The effect of culturally grounded communication on adolescents' decision-making skills regarding risky behaviors related to STI and HIV/AIDS

The Wilcoxon Signed-Rank Test was conducted to assess the effect of the culturally grounded communication intervention among 40 adolescents. Results indicated a significant increase in decision-making scores from pretest to posttest.

Description	Results	N	Mean Rank	Wilcoxon value	P Value
After training < before training	Negative Ranks		0.00	-2.919	0.004
After training > before training	Positive Ranks	40	16.50		
After training = before training					
Total		40			

Summarizes the results of the Wilcoxon Signed-Rank Test assessing the effect of the intervention. The analysis yielded a Z value of –2.919 with a p-value of 0.004, indicating a statistically significant difference between pretest and posttest scores among participants in the intervention group. The mean rank of posttest scores (16.50) was higher than that of pretest scores, suggesting an improvement in adolescents' decision-making ability following exposure to culturally grounded communication. Rather than confirming causality, the data indicate that the intervention may influence adolescents' cognitive and behavioral responses to STI and HIV/AIDS risks.These findings align with prior evidence that culturally relevant communication approaches may serve as mediating factors in enhancing health-related decision-making among adolescents. This improvement provides empirical support for the role of culturally grounded communication in strengthening adolescents' decision-making capacity, which is further explored in the discussion section.

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Jurnal Kesehatan

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Comparison Between Intervention and Control Groups

Table 6. To determine whether the observed improvements were attributable to the intervention, a Mann–Whitney U Test was performed comparing posttest scores between the intervention group (n = 40) and the control group (n = 40).

Group	n	Mean Rank	Mann-Whitney U	p-value
Intervention	40	52.30	-	**< 0.05**
Control	40	28.70		
Total	80			

The intervention group demonstrated significantly higher decision-making scores than the control group, suggesting that culturally grounded communication contributed meaningfully to the observed improvements.

DISCUSSION

The findings of this study are more comparable to interventions that integrate cultural communication approaches rather than general sexual education programs. Similar studies in culturally sensitive settings have shown that incorporating local values improves adolescents' decision-making and communication skills. The role-play component allowed adolescents to simulate real-life decision-making situations, enabling them to practice communication and negotiation skills in a culturally appropriate context. This experiential learning process is likely to explain the significant improvement in decision-making skills observed in the intervention group. The slight improvement observed in the control group may be attributed to testing effects or exposure to external information sources during the study period

Prevalence and Risk Interpretation. The results of this study indicate that although most adolescents reported non-risky sexual behavior, a considerable proportion still engaged in behaviors that increase vulnerability to sexually transmitted infections (STI), including HIV/AIDS. Risky sexual behavior was more prevalent in the control group than in the intervention

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group, suggesting that the absence of structured communication may be associated with higher behavioral risk. These findings suggest that adolescents in Central Java engage in relatively high-risk sexual behaviors, even within sociocultural contexts that traditionally discourage premarital sexual activity. Compared with studies conducted in South Africa and other high-prevalence regions [18,19], the proportion of risky behavior observed in this study was lower. This difference may be explained by contextual factors such as stronger school-based sexual health education, higher parental supervision, and sociocultural norms that regulate adolescent sexual conduct in Indonesia [20]. Nevertheless, the presence of risky behavior, even at moderate levels, remains a significant public health concern due to its potential cumulative impact.

Role of Culture and Communication. Culture plays a central role in shaping adolescents' perceptions, attitudes, and responses to sexual health information. In this study, adolescents who received the intervention demonstrated better communication abilities than those in the control group, particularly in expressing ideas clearly and assertively. Culturally sensitive communication ensures that sexual health messages align with prevailing values and norms, improving adolescents' understanding and behavioral adoption [21]. In collectivist societies such as Central Java, communication that reflects local beliefs, religious values, and social expectations fosters trust and reduces resistance to sensitive topics. Previous research highlights that adolescents' sexual decision-making is strongly influenced by culturally mediated interactions with parents, teachers, peers, and community figures, rather than by knowledge acquisition alone [22,23].

Empirical Evidence Supporting Culturally Grounded Communication Interventions. The effectiveness of culturally grounded communication was empirically supported by the significant improvement in decision-making skills observed in the intervention group. The Wilcoxon Signed-Rank Test revealed a statistically significant increase in posttest scores ($Z = -2.919$; $p = 0.004$), indicating meaningful cognitive and behavioral change. Furthermore, the Mann–Whitney U Test showed that posttest decision-making scores in the intervention group were significantly higher than those in the control group. These findings suggest that the observed improvements were associated with the intervention rather than natural maturation alone. As highlighted by previous

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Jurnal Kesehatan

| ISSN (Print) 2085-7098 | ISSN (Online) 2657-1366 |

intervention studies, integrating cultural context into health communication enhances message credibility [24], addresses culturally rooted misconceptions [25], and strengthens adolescents' ability to assess sexual health risks and consequences [26].

Implications for Sustainable Program Development. These findings have important implications for the development of sustainable adolescent health programs. Interventions grounded in cultural context are more likely to be accepted by adolescents, educators, families, and communities, thereby supporting long-term engagement and behavioral reinforcement [27,28]. Involving schools, parents, and community leaders can further enhance program legitimacy and continuity, as emphasized by prior studies on community-based health promotion [29]. Rather than relying solely on standardized health education models, culturally adapted communication strategies can strengthen adolescents' decision-making capacity and promote lasting behavioral change. Future research should examine the long-term effectiveness of such interventions and explore how cultural factors interact with communication processes to influence adolescent sexual health outcomes across diverse sociocultural settings [30]. These findings are consistent with previous findings reported by Sujianto et al. [31], who highlighted that behavioral, emotional, and social factors play a critical role in shaping responses to HIV-related health decisions.

Compared with studies conducted in countries with sociocultural norms discouraging premarital sexual activity, such as Malaysia and several collectivist Asian societies, the findings of this study demonstrated relatively similar behavioral patterns. In these settings, adolescents' sexual decision-making is strongly influenced by family supervision, religious values, and community expectations. Therefore, culturally grounded communication interventions may be more effective because the health messages are delivered in ways that align with prevailing sociocultural norms and expectations.

Unlike studies conducted in South Africa, where sociocultural dynamics and HIV epidemiology differ substantially, this study specifically integrated local Javanese cultural values

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Jurnal Kesehatan

| ISSN (Print) 2085-7098 | ISSN (Online) 2657-1366 |

into communication strategies. Consequently, the intervention approach used in this study may provide greater contextual relevance for Indonesian adolescents.

CONCLUSION

This study demonstrates that culturally grounded communication plays an important role in strengthening adolescents' decision-making related to STI and HIV/AIDS in Central Java. These findings highlight the need for reproductive and sexual health programs that are context-specific and aligned with local norms and values.

Moreover, future research should examine the mechanisms through which cultural factors shape the effectiveness of sexual health interventions. Understanding these pathways will help refine communication models that are more adaptive to evolving social and cultural dynamics. Additionally, long-term evaluations are needed to assess whether culturally grounded communication interventions can sustain behavioral change and ultimately reduce the incidence of STIs and HIV/AIDS among adolescents.

In this regard, the integration of digital technologies—such as social media, mobile applications, and e-learning platforms—offers promising avenues for delivering culturally relevant health information. These tools may enhance adolescents' engagement and access to accurate sexual health messages.

Finally, the findings of this study may inform public health policies aimed at incorporating cultural contexts into adolescent sexual health education. Strengthening collaboration among families, schools, and community stakeholders will be essential to ensure the successful implementation of culturally grounded intervention strategies.

AUTHOR CONTRIBUTIONS

Conceptualization, methodology, data collection, analysis, and manuscript preparation were conducted collaboratively by all authors.

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Jurnal Kesehatan

| ISSN (Print) 2085-7098 | ISSN (Online) 2657-1366 |

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to the participating schools, students, and teachers in Semarang for their cooperation and active involvement in this study. We also thank the Health Research Ethics Committee of Dr. Adhyatma Regional Public Hospital, Semarang, for granting ethical approval. Appreciation is extended to all research assistants who contributed to data collection and implementation of the intervention.

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DOI : 10.35730/jk.v17i1.1404

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DOI : 10.35730/jk.v17i1.1404

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