e-ISSN : 2597-6052

MPPKI MEDIA PUBLIKASI PROMOSI KESEHATAN INDONESIA

Research Articles Open Access

Parenting Communication Education and Adolescents' Preventive Intentions Toward Early Marriage: A Quasi-Experimental Family-Centered Intervention Study

Elfina Elfina[1*], Fadly Umar[2], Dewi Lestari[3], Dhea Karolina[4], Magfirah Magfirah[5]
[1]Faculty of Health Science, Institut Teknologi Kesehetan dan Bisnis Graha Ananda, Sulawesi Tengah, Indonesia
[2]Faculty of Public Health, Universitas Muhammadiyah Palu, Sulawesi Tengah, Indonesia
[3]Faculty of Public Science, Universitas Widya Nusantara, Sulawesi Tengah, Indonesia
[4,5]Student, Faculty of Health Science, Institut Teknologi Kesehetan dan Bisnis Graha Ananda, Sulawesi Tengah, Indonesia
***Corresponding Author**: E-mail: sstelfina800@gmail.com

ARTICLE INFO

Manuscript Received: 29 Sep, 2025
Revised: 29 May, 2026
Accepted: 07 Jun, 2026
Date of Publication: 12 Jun, 2026
Volume: 9
Issue: 6
DOI: 10.56338/mppki.v9i6.8689

KEYWORDS

Early Marriage Prevention;
Parenting Communication;
Adolescent Reproductive Health;
Family-Based Intervention;
Behavioral Intention

ABSTRACT

Introduction: Early marriage remains a significant public health concern because it is closely associated with adolescent pregnancy, limited educational attainment, and increased risk of maternal and child health problems, including stunting. Family dynamics and parent–adolescent communication play an important role in shaping adolescents' knowledge, attitudes, and preventive intentions regarding marriage timing and reproductive health. This study aimed to examine the short-term effect of parenting communication education as a family-based intervention to improve knowledge, attitudes, and behavioral intentions related to early marriage prevention in a community setting.

Methods: This study employed a quasi-experimental design with a pre-test–post-test control group structure. A total of 60 respondents were divided into an intervention group and a control group, each consisting of 30 participants. Participants were adolescents aged 15–18 years and parents from the working area of Biromaru Community Health Center and SMK 1 Sigi, selected according to predefined eligibility criteria. The intervention group received parenting communication education focusing on parent–adolescent dialogue, reproductive health awareness, and the risks associated with early marriage, while the control group did not receive the intervention during the study period. Data were collected using structured questionnaires that had undergone validity and reliability testing to measure knowledge, attitudes, and behavioral intentions related to early marriage prevention. Statistical analysis was conducted using paired t-tests to assess within-group changes and independent t-tests to compare outcomes between groups, with findings interpreted as short-term psychosocial changes rather than verified behavioral outcomes.

Result: The results demonstrated significant improvements in the intervention group across all measured domains. Knowledge scores increased from 55.6 ± 8.2 to 82.4 ± 5.7 ($p < 0.001$), indicating enhanced understanding of reproductive health risks and the consequences of early marriage. Attitude scores also improved from 60.3 ± 9.1 to 84.1 ± 7.4 ($p < 0.001$), reflecting stronger rejection of early marriage and greater awareness of the importance of mental and social preparedness for parenthood. Behavioral intention scores showed the largest improvement, increasing from 50.2 ± 8.1 to 88.1 ± 6.9 ($p < 0.001$), suggesting stronger intention to delay marriage and prioritize education and reproductive health preparation. In contrast, the control group showed only limited changes across the measured domains. These findings suggest that family-based educational interventions may strengthen parent–adolescent communication and reinforce normative support for delaying marriage, although longer-term follow-up is required to determine whether these intentions translate into actual behavioral outcomes.

Conclusion: In conclusion, parenting communication education represents a promising strategy for preventing early marriage by strengthening family communication, improving reproductive health knowledge, and promoting preventive attitudes and behavioral intentions. Integrating family-based education into adolescent health programs may support upstream prevention pathways associated with early marriage and stunting risk, but its effects on actual marriage timing, reproductive health behavior, and child nutritional outcomes require longitudinal verification.

Publisher: Fakultas Kesehatan Masyarakat Universitas Muhammadiyah Palu

INTRODUCTION

Stunting remains one of the most persistent global public health challenges, reflecting chronic undernutrition and adverse environmental conditions experienced during early childhood. It is widely recognized as a multifactorial condition associated with long-term consequences for physical growth, cognitive development, and the quality of human resources. Globally, the burden of stunting remains disproportionately concentrated in low- and middle-income countries, particularly in regions such as South Asia and Sub-Saharan Africa where poverty, food insecurity, infectious diseases, and inadequate health services interact to sustain high prevalence rates (1–3). These structural determinants are relevant to the present study because they show that child health outcomes are shaped not only by nutrition and healthcare access, but also by upstream social conditions affecting maternal readiness, reproductive timing, and family decision-making.

Because the present study did not directly measure nutritional, anthropometric, or child-development outcomes, stunting is used in this manuscript as a broader public health context rather than as an empirical endpoint. The long-term implications of stunting extend beyond childhood growth deficits and affect broader developmental trajectories across the life course. Evidence consistently demonstrates that children who experience stunting during early life are more likely to experience reduced cognitive capacity, poorer educational attainment, and lower productivity in adulthood. These developmental disadvantages ultimately translate into reduced earning potential and diminished contributions to national economic growth (4–6). From a population perspective, these outcomes represent a significant barrier to human capital formation and sustainable development. Consequently, preventing stunting has become a global public health priority, particularly in countries where childhood malnutrition threatens both individual well-being and long-term socioeconomic progress. Within this prevention agenda, attention to early marriage and adolescent pregnancy is important because reproductive timing can influence maternal and child health risks.

Early marriage is an important upstream social determinant linked to adolescent pregnancy and subsequent maternal and child health vulnerability. Early marriage remains prevalent in many low-resource settings and is frequently driven by social norms, poverty, limited educational opportunities, and gender inequality. Marriages occurring at a young age often lead to early childbearing, when girls are not yet physically, psychologically, or socially prepared for pregnancy and child-rearing (1,7,8). This pathway provides the rationale for examining early marriage prevention as part of broader reproductive health and stunting-risk mitigation efforts.

Empirical studies across multiple low- and middle-income countries consistently show that adolescent pregnancy is associated with a range of adverse maternal health outcomes, including anemia, obstetric complications, and postpartum risks. These maternal conditions are closely linked to poor fetal development and adverse perinatal outcomes such as low birth weight, prematurity, and increased perinatal mortality (7–11). Although the present study does not test these biological outcomes, this evidence explains why delaying early marriage and adolescent pregnancy is relevant to public health prevention (3,12,13).

Several mechanisms explain how early marriage contributes to childhood malnutrition and growth failure. Biologically, adolescent mothers are often still undergoing their own physical growth and may experience competition for nutrients between maternal development and fetal growth. This biological constraint increases the risk of intrauterine growth restriction and low birth weight, both of which are well-established predictors of later stunting (14–16). However, because this study focuses on educational and psychosocial outcomes, these biological pathways are presented only as background justification for early marriage prevention.

Beyond biological mechanisms, social and economic determinants strongly influence the relationship between early marriage and child health outcomes. Early marriage frequently interrupts girls' education, limiting their opportunities for knowledge acquisition, economic participation, and decision-making autonomy. Lower educational attainment is associated with reduced health literacy and limited access to reproductive health information and nutrition practices, which may negatively influence child feeding and caregiving behaviors (11,12,14). These social pathways are directly relevant to the present study because education, family communication, and delayed marriage intention are modifiable psychosocial factors (14,17,18).

Social context also shapes the caregiving environment experienced by children of adolescent mothers. Young mothers may lack the emotional readiness, social support, and parenting knowledge necessary to provide optimal childcare. Evidence suggests that adolescent mothers may experience higher levels of stress and postpartum

depression, which can influence caregiving practices and mother–child interactions (2,19). For this reason, interventions that strengthen reproductive health awareness and family communication before marriage may help adolescents and parents develop stronger preventive orientation toward early marriage (14,17).

Family dynamics and parenting practices also play a crucial role in shaping adolescents' decisions regarding marriage and reproductive health. Parenting styles influence adolescents' beliefs, aspirations, and access to information about relationships and reproductive health. In this manuscript, the intervention is conceptualized primarily as parenting communication education rather than a formal assessment of parenting typologies. Supportive and communicative parenting environments that encourage open dialogue about health and life planning can empower adolescents to delay marriage, pursue education, and make informed reproductive decisions (2,20). Conversely, restrictive or authoritarian family structures may limit adolescents' ability to discuss reproductive health concerns, increasing the likelihood of early marriage and pregnancy.

Family communication patterns are particularly important in contexts where adolescents rely heavily on parental guidance for decision-making related to education, marriage, and health behaviors. Studies indicate that adolescents who experience open and supportive communication with parents are more likely to access reproductive health information and delay marriage compared with those who grow up in environments characterized by limited discussion of sexual and reproductive health issues (2,19). These findings suggest that family-centered educational strategies may represent an important pathway for influencing proximal psychosocial outcomes, including knowledge, attitudes, perceived support, and behavioral intentions related to early marriage prevention.

Despite growing recognition of the role of early marriage in shaping maternal and child health outcomes, many public health interventions have historically focused primarily on nutrition and healthcare access while paying less attention to family dynamics and parenting practices. Existing strategies aimed at reducing stunting commonly emphasize nutrition supplementation, maternal health services, and improvements in sanitation and hygiene. While these interventions are essential, they may not fully address the social determinants that influence adolescent marriage decisions and reproductive behaviors (12,14,21). Consequently, there is a need for complementary approaches that integrate parent–adolescent communication, family-based education, and adolescent reproductive health awareness into broader prevention strategies.

Family-based educational interventions have emerged as a promising approach to address these interconnected determinants. By strengthening parenting communication, improving family dialogue, and increasing awareness of the risks associated with early marriage, such interventions may influence adolescents' knowledge, attitudes, and behavioral intentions related to reproductive health and life planning. Programs that engage both parents and adolescents have the potential to create supportive family environments that encourage intentions toward delayed marriage, continued education, and improved reproductive health preparedness.

Table 1. Summary of Previous Evidence on Family-Related Factors, Maternal Knowledge, and Stunting Risk

No	Author(s)	Year	Study Focus	Key Findings	Moderating Factors	Geographic Context
1	Aprianti R.	2023	Parenting practices and feeding patterns related to stunting among children under five	Parenting style and feeding practices were significantly associated with stunting incidence in toddlers	Maternal education and knowledge	Indonesia
2	Nuraiman; Elfina	2025	Relationship between maternal knowledge and complementary feeding practices with stunting	Maternal knowledge influences feeding practices and the risk of stunting	Maternal knowledge level and family support	Sigi, Indonesia
3	Bertalina B.; Wahyuni E.S.	2023	Nutrition education and clean and healthy lifestyle behavior (PHBS) for stunting prevention	Nutrition education and PHBS effectively increased family awareness in preventing stunting	Health education and family behavior	Lampung, Indonesia
4	World Health Organization	2022	Determinants of stunting among children in developing countries	Approximately one-third of children in developing countries experience stunting, particularly those born to young mothers	Social, economic, and maternal health factors	Global

Table 1 demonstrates that family-related factors, including parenting practices, maternal knowledge, family support, and health education, consistently influence child nutritional outcomes and stunting risk. Previous studies have primarily focused on feeding behavior, maternal nutrition knowledge, and family health practices as determinants of child growth outcomes. While these findings highlight the importance of family involvement in child health promotion, relatively little attention has been given to parenting communication interventions that address upstream determinants of stunting risk through the prevention of early marriage and the promotion of adolescent reproductive health awareness. Furthermore, evidence from rural Indonesian settings remains limited. This gap suggests the need for culturally contextualized family-based educational interventions that strengthen communication between parents and adolescents as a preventive strategy for improving reproductive health preparedness and delaying early marriage.

Nevertheless, important research gaps remain regarding how family-based educational interventions influence adolescents' short-term psychosocial readiness to delay marriage, particularly in rural and community-health-center-linked settings in Indonesia. Existing studies highlight the need for more rigorous evaluations of parenting-focused programs, standardized educational curricula, and longitudinal data that track outcomes from adolescence through reproductive age and child development (22–24). However, less attention has been given to culturally contextualized parenting communication education delivered through local health and school settings as an upstream strategy for strengthening early marriage prevention intentions.

Based on these considerations, this study aims to evaluate the short-term effect of parenting communication education on adolescents' and parents' knowledge, attitudes, and behavioral intentions related to early marriage prevention and reproductive health. By examining how family-based educational interventions influence proximal psychosocial outcomes rather than verified marriage behavior, this research seeks to contribute evidence for culturally contextualized adolescent reproductive health promotion in Sigi Regency, Central Sulawesi. Its implications for stunting prevention are framed as indirect and pathway-based, requiring future longitudinal verification.

METHODS

Research Design

This study employed a a quasi-experimental pre-test–post-test control-group design with a supportive qualitative component. This design was selected because it enabled the researchers to evaluate the short-term effect of parenting communication education under natural field conditions in which random assignment was not feasible. In public health research, quasi-experimental designs are widely used to assess educational interventions when ethical, administrative, or contextual considerations limit the use of randomized controlled trials. In the present study, the design was intended to determine whether parenting communication education could improve respondents' knowledge, attitudes, and behavioral intentions related to early marriage prevention. The study did not measure actual marriage behavior, reproductive outcomes, or child nutritional status; therefore, the findings were interpreted as short-term educational and psychosocial outcomes.

The pre-test–post-test control group format allowed the study to compare changes over time within each group and differences between groups following the intervention. This approach was considered suitable because the primary outcomes were educational and psychosocial in nature, requiring measurement before and after exposure to the intervention. The use of a comparison group strengthened internal validity by providing a reference point for interpreting whether observed improvements were associated with the educational program rather than external influences alone. However, because allocation was non-random, baseline comparability between groups was examined and considered in interpreting the findings (11,22,24).

Research Setting and Period

The study was conducted in Sigi Regency, Central Sulawesi, Indonesia, with data collection centered in the working area of the Biromaru Community Health Center and SMK 1 Sigi. This setting was selected because the area reflects an important public health context in which early marriage and stunting remain relevant concerns. The involvement of both the community health center and the school environment enabled the study to engage adolescents and their families within the institutional settings related to reproductive health education, preventive counseling, and

family development. Conducting the study in this setting also supported the implementation of a contextually grounded parenting communication intervention accessible to the target population.

The study was carried out from May to October 2025. This period covered participant recruitment, baseline assessment, delivery of the parenting communication education intervention, post-intervention measurement, and collection of supporting qualitative information through interviews and observation. The selected timeframe allowed the researchers to evaluate immediate post-intervention changes in participants' responses. Because no long-term follow-up was conducted, the study could not assess the sustainability of behavioral intentions or confirm actual delayed marriage behavior.

Population and Sample

The study population consisted of adolescents and parents residing in the working area of the Biromaru Community Health Center. This population was considered relevant because early marriage prevention requires family-level engagement involving both adolescents and their parents. Adolescents represent the group directly exposed to early marriage risk, whereas parents play an important role in shaping family communication, educational support, reproductive health awareness, and marriage-related expectations. The unit of analysis was the individual respondent, and the outcomes were measured separately as respondent-level knowledge, attitudes, and behavioral intentions.

The sample comprised 60 respondents divided into two groups: an intervention group and a control group, each consisting of 30 participants. Participants were recruited using a purposive sampling approach based on their eligibility and availability within the selected community health center and school setting. Eligible participants were adolescents aged 15–18 years who were attending school or residing in the health center service area, together with parents or family representatives who were willing to participate in the educational activities. The inclusion criteria were: being within the target adolescent age range or being a parent/family representative of an eligible adolescent, residing or studying in the study area, being able to complete the questionnaire, and providing informed consent or assent where applicable. Respondents who were absent during either the pre-test or post-test, declined participation, or submitted incomplete questionnaires were excluded. Allocation into intervention and control groups was conducted according to setting-based feasibility rather than randomization, which was acknowledged as a potential source of selection bias.

Intervention Description

The intervention in this study was parenting communication education, designed to improve understanding of the risks associated with early marriage and its implications for adolescent reproductive health. The educational content emphasized parental involvement, open parent–adolescent communication, emotional support, accurate reproductive health information, educational continuation, and preparation for responsible family life. The intervention focused on communication practices and family dialogue rather than formal parenting-style typologies. Parenting communication education was selected because family dynamics and communication patterns are recognized as important determinants of adolescents' knowledge, attitudes, and intentions related to marriage timing, education, and reproductive health.

From a methodological perspective, educational interventions in public health should be described in sufficient detail to support reproducibility. The intervention was delivered through structured educational sessions consisting of interactive lectures, guided discussion, question-and-answer activities, and family communication exercises. The main topics included early marriage risks, adolescent reproductive health, mental and social readiness for marriage, parent–adolescent dialogue, educational aspirations, and family support for delayed marriage. The sessions were facilitated by trained health education personnel and research team members familiar with adolescent reproductive health issues. Implementation was monitored using observation sheets to document participant attendance, engagement, delivery of core materials, and consistency of intervention activities (11,22,25).

Research Instruments

The study used several instruments to collect data on the effects of the intervention. The primary quantitative instrument was a structured pre-test and post-test questionnaire developed to assess respondents' knowledge,

attitudes, and behavioral intentions related to parenting communication, early marriage prevention, and reproductive health. The questionnaire was reviewed for content validity by relevant experts and tested for reliability before use. This was necessary because outcome measures in educational intervention research must demonstrate conceptual relevance and adequate internal consistency. Where applicable, validity coefficients and Cronbach's alpha values should be reported in the final manuscript to demonstrate psychometric quality transparently.

The knowledge component of the questionnaire assessed respondents' understanding of the risks of early marriage, reproductive health consequences, and the relationship between early marriage and broader maternal-child health risks. The attitude component used a Likert-scale format to capture respondents' evaluative positions on delaying marriage, mental preparedness for parenthood, and parental responsibility. The behavioral intention component measured respondents' stated intention to support delayed marriage, continue education, communicate about reproductive health, and recognize the importance of preparation before marriage. Thus, this domain was interpreted as behavioral intention or preventive orientation, not as observed behavior.

In addition to the questionnaire, observation sheets and semi-structured interview guides were used. Observation sheets documented participant engagement, delivery of intervention materials, and implementation consistency during educational sessions. Semi-structured interviews were conducted with selected adolescents and parents to obtain qualitative insights into participants' experiences, perceptions, and responses to the intervention. The qualitative component was used to support interpretation of the quantitative findings rather than to function as a fully independent qualitative study. The use of combined instruments enabled triangulation between numerical changes in questionnaire scores and contextual understanding derived from interviews and observation (16,22,23).

Data Collection Procedures

Data collection was conducted through coordinated activities involving the Biromaru Community Health Center, relevant administrative offices, and SMK 1 Sigi. The research process began with coordination to obtain contextual information related to stunting and early marriage in the study area. This preliminary step helped situate the study within a local public health context and justified the relevance of the intervention in the selected setting. These contextual data were not analyzed as intervention outcomes but were used to support the rationale for selecting the study location.

Following the preparatory phase, eligible respondents were recruited and administered a baseline pre-test questionnaire before the intervention. The parenting communication education program was then delivered to the intervention group. After the educational sessions, respondents completed the post-test questionnaire to assess changes in knowledge, attitudes, and behavioral intentions. The control group underwent the same pre-test and post-test measurement process without receiving the intervention during the evaluation period. This sequence ensured consistency in outcome measurement across groups and enabled comparison between pre-intervention and post-intervention conditions. Any incomplete questionnaires or missing responses were checked before analysis, and cases with incomplete outcome data were excluded from the relevant statistical test.

After the quantitative phase, in-depth interviews were conducted with a subset of participants and parents to explore how they perceived the intervention and its relevance to family communication and early marriage prevention. Participatory observation was also carried out during educational sessions to document interaction patterns, participant responsiveness, and contextual implementation. Interview participants were selected purposively to represent the intervention participants' experiences. The number of interviewees, interview duration, and example quotations should be reported in the Results section to strengthen transparency. These procedures indicate that the study incorporated a supportive qualitative component to complement the primary quantitative evaluation.

Data Analysis

Quantitative data were analyzed using statistical procedures appropriate for a quasi-experimental pre-test–post-test design. Descriptive statistics were used to summarize respondent characteristics and outcome scores. Baseline comparability between the intervention and control groups was assessed before interpreting post-intervention differences. The paired t-test was used to examine within-group changes in knowledge, attitudes, and behavioral intention scores from pre-test to post-test. The independent t-test was used to compare mean scores

between groups. Because the study used non-random allocation, results were interpreted cautiously, particularly where baseline imbalance was present.

These analytical choices are consistent with common practice in public health educational research when the outcome variables are continuous or treated as interval-scale measures and when the design involves two groups observed at two time points. Normality and other test assumptions should be examined before applying parametric tests. A significance level of $p < 0.05$ was used. To improve analytical transparency, mean differences, 95% confidence intervals, and effect sizes should be reported alongside p-values. If baseline imbalance is substantial, baseline-adjusted analysis such as ANCOVA should be considered or acknowledged as a limitation (11,22).

For qualitative data, analysis followed the Miles and Huberman framework, consisting of data reduction, data display, and conclusion verification. Interview and observation data were organized, coded, and grouped into themes related to participants' experiences, perceived relevance of the material, parent–adolescent communication, and intention to delay marriage. To enhance qualitative credibility, coding decisions were reviewed by the research team, and themes were compared with observation notes and quantitative findings. The qualitative analysis was used to explain how participants interpreted the intervention and how these interpretations supported the observed changes in questionnaire scores.

Trustworthiness and Measurement Considerations

The questionnaire instrument was tested for validity and reliability before use, which is essential for ensuring the credibility of educational intervention outcomes. In studies addressing reproductive health, early marriage, and parenting-related constructs, validated measures are important because knowledge, attitudes, and behavioral intentions are multidimensional and culturally influenced. Public health research commonly emphasizes the need for contextually adapted instruments with demonstrated psychometric quality, especially when questionnaires are used among adolescent populations and community respondents (22,23,26). The final manuscript should report the validity-testing procedure, reliability coefficients, number of items per domain, score range, and interpretation of higher scores.

The inclusion of interviews and observation also improved the trustworthiness of the study by allowing cross-verification of quantitative trends with qualitative accounts. For example, improvements in questionnaire scores could be interpreted alongside participants' statements regarding the relevance, comprehensibility, and perceived usefulness of the educational content. However, because the qualitative component was supportive, its findings were used to contextualize rather than independently verify intervention effectiveness.

Ethical Considerations

Ethical principles were observed throughout the study. All participants received a clear explanation of the study objectives, procedures, potential risks, and their right to withdraw. Adult participants provided written informed consent, while adolescent participants provided assent accompanied by parental or guardian consent. Confidentiality was maintained throughout the research process by anonymizing questionnaire and interview data. These safeguards were particularly important because the study involved adolescents and addressed sensitive topics such as early marriage, reproductive health, and family decision-making. The final manuscript should include the name of the approving ethics committee, approval number, and approval date where available.

RESULTS

Overview of Findings

This study evaluated the short-term effect of parenting communication education on adolescents' and parents' knowledge, attitudes, and behavioral intentions related to early marriage prevention. The quantitative findings indicate that the intervention group experienced statistically significant improvements across all measured domains after the educational program, whereas the control group showed minimal change. These findings suggest that parenting communication education may function as a family-based intervention for increasing awareness of reproductive health risks, strengthening attitudes against early marriage, and encouraging preventive behavioral intentions.

The observed changes should be interpreted as short-term psychosocial outcomes rather than evidence of actual delayed marriage or long-term behavioral change. The study measured knowledge, attitudes, and self-reported behavioral intentions immediately after the intervention; therefore, conclusions about real-world marriage decisions, reproductive behavior, or stunting outcomes require longitudinal verification. (5,23,27,28,29).

Knowledge Outcomes

Table 2. Changes in Respondents' Knowledge Scores Before and After the Intervention

Group	n	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	p-value (Paired t-test)
Intervention	30	55.6 ± 8.2	82.4 ± 5.7	<0.001
Control	30	56.1 ± 7.9	58.3 ± 8.1	0.247

The paired t-test indicated a notable rise in knowledge scores for the intervention group when comparing pre-test and post-test results ($p < 0.001$). On the other hand, the control group exhibited no noteworthy change in knowledge scores ($p = 0.247$). Additionally, the independent t-test demonstrated a considerable difference in post-test knowledge scores between the intervention and control groups ($p < 0.001$).

The mean knowledge score in the intervention group increased from 55.6 ± 8.2 before the intervention to 82.4 ± 5.7 after the intervention. In contrast, the control group showed only a slight increase from 56.1 ± 7.9 to 58.3 ± 8.1. This pattern indicates that the educational intervention was associated with improved understanding of parenting communication, reproductive health, and the risks associated with early marriage. The findings should be interpreted together with baseline comparability and the non-randomized design.

Attitude Outcomes

Table 3. Changes in Respondents' Attitude Scores Before and After the Intervention

Group	n	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	p-value (Paired t-test)
Intervention	30	60.3 ± 9.1	84.1 ± 7.4	<0.001
Control	30	61.7 ± 8.5	62.9 ± 8.9	0.312

Respondents' attitudes were measured using a Likert-scale questionnaire. The intervention group demonstrated an increase in positive attitudes after the intervention, particularly regarding awareness of the health risks of early marriage, the importance of mental preparedness, and parental responsibility in child-rearing. Higher scores indicated stronger preventive attitudes toward early marriage.

The intervention group's mean attitude score increased from 60.3 ± 9.1 at baseline to 84.1 ± 7.4 after the intervention, while the control group showed only a marginal change from 61.7 ± 8.5 to 62.9 ± 8.9. The paired t-test confirmed that the change in the intervention group was statistically significant ($p < 0.001$), whereas the change in the control group was not significant ($p = 0.312$). These data indicate that parenting communication education was associated with more favorable attitudes toward delaying early marriage, parental responsibility, and reproductive readiness.

Behavioral Intention Outcomes

Table 4. Changes in Respondents' Behavioral Intention Scores Before and After the Intervention

Group	n	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	p-value (Paired t-test)
Intervention	30	50.2 ± 8.1	88.1 ± 6.9	<0.001
Control	30	62.8 ± 8.3	63.9 ± 8.6	0.318

The results indicate that after the intervention, there was an improvement in respondents' behavioral intention scores, as shown by the paired t-test in the intervention group ($p < 0.001$). Most respondents in the intervention group reported stronger intention to postpone marriage until a more mature age and acknowledged the importance of

education and reproductive health preparation. This change was further supported by in-depth interviews, which indicated that the educational material was easier to understand when connected to everyday life and local context.

The behavioral intention results showed the largest numerical increase among the three measured domains. In the intervention group, the mean score increased from 50.2 ± 8.1 before the intervention to 88.1 ± 6.9 afterward, whereas the control group changed only slightly from 62.8 ± 8.3 to 63.9 ± 8.6. The paired t-test showed a statistically significant improvement in the intervention group ($p < 0.001$), but not in the control group ($p = 0.318$). Because the intervention group had a lower baseline behavioral intention score than the control group, this result should be interpreted cautiously and should ideally be supported by baseline-adjusted analysis.

In the context of this study, the outcome reflects increased self-reported intention or preventive orientation, such as rejecting marriage at a young age, prioritizing education, and recognizing the importance of reproductive health preparation. The findings do not confirm actual behavioral enactment, such as delayed marriage, sustained school attendance, or reproductive health service use. The qualitative statements obtained in this study suggest that participants perceived the intervention as guidance applicable to daily life and family decision-making (8,11,24).

Although the results indicate strong short-term improvement in behavioral intention, this study measured intention primarily through questionnaire responses and immediate post-intervention reporting. Therefore, the findings should be interpreted as evidence of strengthened behavioral orientation rather than confirmed long-term behavior change. This distinction is important because actual marriage decisions may still be influenced by structural, economic, familial, and cultural constraints beyond the scope of the intervention.

Supporting Qualitative Findings

The quantitative outcomes were supported by qualitative data derived from in-depth interviews and participatory observation. Respondents in the intervention group reported that the parenting communication education was easier to understand because it was delivered in a way that was relevant to everyday life and local context. The qualitative findings were used to contextualize the quantitative results, particularly participants' perceived usefulness of the intervention and its relevance to family communication.

Qualitative responses also suggested that the intervention encouraged reflection on the consequences of early marriage, including the risks associated with immature parenthood, interrupted education, and poor preparation for child-rearing. Participants reported greater awareness of the importance of postponing marriage until they were mentally, physically, and socially prepared. Representative participant quotations should be included in the final manuscript to substantiate these themes and improve qualitative transparency. (8,23,28).

The observation component indicated active participant engagement during the educational process, including participation in discussion, attention to intervention materials, and responsiveness during question-and-answer activities. These observations suggest that the intervention was acceptable to participants; however, they should be interpreted as implementation-supporting evidence rather than independent proof of intervention effectiveness.

Integration of Results Across Domains

Taken together, the results demonstrate a coherent pattern of change across knowledge, attitudes, and behavioral intentions. The intervention group showed improvement in all three domains, while the control group remained relatively stable. This pattern is consistent with a proximal prevention pathway in which increased knowledge may support attitude change and stronger intention to delay early marriage. However, because the causal relationship among these domains was not formally modeled, this interpretation should be treated as explanatory rather than confirmatory.

DISCUSSION

The findings of this study indicate that parenting communication education was associated with short-term improvements in respondents' knowledge, attitudes, and behavioral intentions related to early marriage prevention. The intervention group demonstrated significant improvements across all measured domains, whereas the control group showed minimal change. This pattern suggests that parenting-focused education functioned not merely as an informational intervention, but as a family-based strategy capable of shaping the cognitive and normative dimensions

of early marriage prevention. Because this study measured immediate post-intervention intentions rather than actual marriage behavior, the findings should be interpreted as evidence of strengthened preventive orientation, not verified behavioral change.

These findings align with previous studies demonstrating that school- and family-based reproductive health education can increase adolescents' knowledge regarding contraception, pregnancy risks, and the consequences of early marriage. Evidence from several low- and middle-income settings indicates that knowledge gains are more pronounced when interventions are interactive, culturally tailored, and integrated with family reinforcement rather than delivered through one-way didactic instruction alone (4,6,10,17,23). The present study appears to support this pattern, particularly because respondents also reported that the locally grounded educational content was easier to understand and more closely connected to their daily experiences.

The knowledge gains observed in this study are also important from a public health perspective because knowledge is a foundational determinant of preventive behavior. Adolescents and parents who understand the consequences of early marriage, including reproductive health complications and the increased risk of poor child growth outcomes, are more likely to recognize the value of delaying marriage and preparing for healthy parenthood. Although knowledge alone does not guarantee behavioral change, it creates the cognitive basis for attitudinal shift, family communication, and future decision-making. Thus, the observed increase in knowledge represents an important first step in a broader preventive pathway.

A central implication of the results is that family-based interventions may be useful for strengthening attitudes and intentions surrounding early marriage prevention. However, this study was not designed to compare family-based interventions with school-based interventions; therefore, claims of superiority should be avoided. School-based interventions may improve factual knowledge and awareness, while family-based interventions may reinforce messages within the relational context where norms about marriage, education, and reproductive health are negotiated. The current study suggests that parenting communication education may be especially relevant in settings where parents remain central actors in adolescents' life planning (30,32,34).

This result is consistent with evidence that educational interventions can shape adolescents' attitudes toward early marriage when the intervention addresses local norms, personal aspirations, and the psychosocial consequences of early childbearing. Studies have shown that family-inclusive and school-based reproductive health education can strengthen adolescents' willingness to reject early marriage, particularly when parents are involved in reinforcing messages related to education continuation, future planning, and health risks (9,18,24,25,28). The present findings support the argument that parent-focused educational programs can modify the evaluative dimension of adolescent decision-making by establishing stronger normative resistance to early marriage.

Attitudes toward delaying marriage are shaped not only by knowledge but also by self-efficacy, future orientation, perceived social norms, and the quality of parent–child communication. Previous literature indicates that adolescents are more likely to develop favorable attitudes toward delaying marriage when they perceive education and personal development as achievable goals and when parents provide emotional and informational support for those aspirations (3,13,26). The improvement in attitudes observed in the intervention group may therefore reflect both the informational effects of the educational sessions and the strengthening of family dialogue regarding long-term life planning.

From an intervention perspective, this finding is especially significant because attitudes often operate as a bridge between knowledge and behavior. A respondent may understand that early marriage is risky, but preventive action is more likely when that respondent also holds a strong evaluative position against early marriage and in favor of continued education and reproductive preparedness. The present results suggest that parenting style education successfully shaped this evaluative dimension.

The present findings should instead be understood as supporting the importance of family engagement within adolescent reproductive health programming. Integrated approaches that combine school-based information, adolescent-friendly health services, and family communication may provide more comprehensive support than isolated educational strategies. In practical terms, a family-based intervention can complement formal education by translating reproductive health information into everyday conversation, emotional support, and household-level norm-setting. This interpretation remains provisional because the present study did not evaluate combined intervention models or long-term outcomes (18,21,23,26).

This result corresponds with evidence suggesting that educational interventions can influence adolescents' behavioral intentions related to early marriage when they are combined with family engagement, communication support, and future-oriented messaging. Previous studies report that theory-driven programs integrating reproductive health content with family and community components can increase intentions to continue education, delay marriage, and seek supportive health services, although actual behavioral outcomes often require longer-term follow-up to confirm sustainability (26,30–34).

The findings can also be interpreted through established behavioral theories. From the perspective of the Theory of Planned Behavior, parenting communication may influence attitudes toward early marriage, perceived subjective norms within the family, and perceived behavioral control over life choices such as continuing education and postponing marriage (5,23,28,29). In the present study, improvements in attitude and behavioral intention scores suggest that the intervention may have strengthened perceptions that delaying marriage is desirable and socially supported. Similarly, Social Cognitive Theory helps explain how parental modeling, communication, and emotional support may contribute to self-efficacy and future-oriented decision-making. However, these mechanisms were not directly measured and should be interpreted as theoretical explanations rather than confirmed mediating pathways.

Family systems and ecological approaches provide an equally important interpretive lens. These perspectives emphasize that adolescent intentions and health-related choices are shaped not only by personal knowledge but also by family relationships, household norms, school contexts, and community expectations (11,15,18,29). In this study, the intervention may have supported these relational processes by encouraging family discussion and making health-related information more meaningful within respondents' daily lives. This interpretation is supported by qualitative findings indicating that the educational material was perceived as understandable and relevant to local context. Nevertheless, because the qualitative component was supportive and limited in scope, it should be used to contextualize rather than independently verify the intervention effect.

These results are also consistent with the broader body of evidence showing that educational interventions are most effective when they combine accurate information with supportive interpersonal processes. Knowledge gains alone are often insufficient to change practice, but when education is reinforced through family communication, emotionally supportive parenting, and messages connected to future aspirations, the likelihood of attitudinal and behavioral improvement becomes stronger (2,23,28). The present study appears to reflect this integrated mechanism, in which parenting education strengthened both cognitive understanding and family-supported prevention orientation.

The study's findings have broader public health relevance because early marriage is linked in the literature to adolescent pregnancy, reduced educational attainment, limited health literacy, and constrained household resources, which may contribute to poor maternal and child health outcomes (14,17,21,29). By improving parental communication, reproductive health understanding, and intention to delay marriage, parenting communication education may serve as an upstream psychosocial intervention. However, the present study did not directly measure marriage timing, pregnancy outcomes, child nutrition, or stunting. Therefore, any implication for stunting prevention should be framed as an indirect and theoretical pathway requiring longitudinal verification.

This interpretation aligns with policy-oriented arguments that family education can complement broader adolescent health and stunting-risk mitigation strategies. Effective integration may require multisectoral coordination across health, education, nutrition, and social protection sectors, as well as alignment with legal and policy frameworks related to minimum marriage age, adolescent health services, and school retention (1,12,21). Community-based strategies that combine parenting education with maternal and child health counseling, Community-based strategies that combine parenting communication education with maternal and child health counseling, nutrition education, and school outreach may be promising. However, the present findings provide empirical support only for short-term improvements in knowledge, attitudes, and behavioral intentions, not for direct reductions in early marriage or stunting.

Another important point arising from the results is that improvements were observed not only in knowledge but also in attitudes and behavioral intentions. This suggests that the intervention did more than deliver information; it was associated with changes in how respondents evaluated early marriage and how they expressed future-oriented preventive intentions. This distinction is important because knowledge gain alone is often insufficient to produce sustained behavioral change. Adolescents may understand the risks of early marriage but still face social pressure, economic constraints, or restrictive family norms. Thus, the present study contributes to the literature by showing

that parenting communication education can influence several proximal psychosocial dimensions of adolescent preparedness within a short intervention window. (26,33).

Despite these positive findings, the study must be interpreted in light of several limitations. First, the research was conducted in a single health center working area and school setting in Sigi Regency, which limits generalizability to other geographic, cultural, or socioeconomic contexts. Second, the quasi-experimental design, although appropriate for the field context, did not use random allocation and therefore cannot provide the same level of causal certainty as a randomized controlled trial. Third, baseline imbalance between groups, particularly in behavioral intention scores, may have influenced the magnitude of observed change and should be considered when interpreting intervention effects. Fourth, the study captured short-term post-intervention change rather than long-term behavioral outcomes, meaning that it cannot confirm whether improved attitudes and intentions translate into actual delayed marriage, continued schooling, or reproductive health practices over time.

In addition, the outcome measures relied heavily on questionnaire responses and self-reported perceptions, which may be affected by social desirability bias, particularly after exposure to a health education program. The behavioral domain should be interpreted as behavioral intention or preventive orientation, not verified behavior. The study also did not incorporate broader contextual variables such as peer influence, household economic stress, service accessibility, local policy enforcement, or implementation fidelity in sufficient depth. The qualitative component was useful for contextual interpretation but remained limited because participant numbers, coding procedures, and direct quotations require clearer reporting. These limitations indicate the need for stronger longitudinal and multisite evaluations of family-based educational interventions (13,20,23).

Even with these limitations, the study makes an important contribution by showing that parenting communication education is feasible and associated with short-term improvements in knowledge, attitudes, and behavioral intentions among adolescents and families in a community setting. It adds to the growing evidence that family engagement is a relevant component of adolescent reproductive health education. The findings suggest that programs addressing early marriage prevention should move beyond individual-level education and invest in family communication, parental capacity-building, and integrated community support systems. However, claims regarding downstream nutritional consequences should remain cautious until supported by longitudinal health outcome data.

Future research should examine the long-term effects of parenting communication education using longitudinal, multisite, or stronger quasi-experimental designs with baseline-adjusted analysis. It would also be valuable to measure mediating variables such as parent–adolescent communication quality, subjective norms, perceived behavioral control, parental support for education, adolescent self-efficacy, and access to reproductive health services. In addition, future studies should examine whether integrating parenting communication education with nutrition counseling, school-retention support, and adolescent-friendly health services produces sustained effects on actual marriage timing, reproductive health behavior, and child nutritional outcomes. Such work would help determine whether short-term educational gains can translate into sustainable improvements in adolescent reproductive health and indirect stunting-risk reduction.

CONCLUSION

This study found that parenting communication education was associated with short-term improvements in knowledge, attitudes, and behavioral intentions related to early marriage prevention. Respondents in the intervention group demonstrated significantly higher post-intervention scores across these domains compared with the control group, suggesting that family-based educational approaches may strengthen reproductive health awareness, support preventive attitudes toward early marriage, and encourage intentions to delay marriage and continue education. The findings support the potential value of family engagement within adolescent reproductive health promotion programs, particularly in settings where parents play an important role in shaping adolescents' aspirations, communication patterns, and life planning. However, the study measured only immediate post-intervention psychosocial outcomes and did not assess actual marriage decisions, reproductive health behaviors, pregnancy outcomes, or child nutritional status. Therefore, the results should be interpreted as evidence of strengthened preventive orientation rather than confirmed behavioral change. Although early marriage prevention is theoretically relevant to broader maternal and child health and stunting-risk reduction efforts, the present study does not provide direct evidence of effects on stunting or other health outcomes. Any implications for stunting prevention should therefore be considered indirect

and require future longitudinal verification. Given the study's non-randomized design, limited geographic scope, baseline imbalance in some outcome domains, and short follow-up period, further research using longitudinal, multisite, and baseline-adjusted designs is recommended to determine whether improvements in knowledge, attitudes, and behavioral intentions translate into sustained changes in marriage timing, reproductive health behavior, and child health outcomes.

AUTHOR'S CONTRIBUTION STATEMENT

Authors explicitly outline and describe their individual contributions to the research and the development of the manuscript. This statement is intended to provide transparency and clarity regarding each author's role in the project. It helps readers and reviewers understand the specific contributions of each author to the research process.

CONFLICTS OF INTEREST

Confirms that the authors have declared any potential conflicts that could influence the impartiality of the research. The authors explicitly state that they have no financial or personal relationships with entities that might unduly affect their objectivity. This declaration ensures the integrity of the study by transparently addressing any possible influences on the research outcomes, contributing to the credibility and trustworthiness of the article.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

Authors are required to transparently disclose any use of generative artificial intelligence (AI) tools or AI-assisted technologies—such as ChatGPT, Grammarly, or DeepL—during the manuscript preparation process. This policy aims to uphold academic integrity, promote responsible authorship practices, and ensure compliance with ethical publication standards. If AI tools have been employed to support language refinement, enhance clarity, or improve the overall readability and structure of the manuscript.

SOURCE OF FUNDING STATEMENTS

The implementation of the 2025 research activity entitled "The Effectiveness of Parenting Style Education on the Prevention of Early Childhood Marriage in Efforts to Reduce Stunting" (Contract No.: 1480/LL16/AL/2024; Decree No. 0667/E5/AL.04/2024) with the Chief Researcher Elfina, S.ST, M.Kes is fully funded through the DRTMP budget scheme therefore, the research team expresses its highest gratitude and appreciation to the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) for the funding support that has been provided, so that the entire series of parenting style education intervention programs based on local wisdom can run smoothly, systematically, and provide a real contribution to strengthening preventive strategies for preventing early child marriage and accelerating the reduction of national stunting rates.

ACKNOWLEDGMENTS

Brief expression of gratitude to individuals, organizations, or institutions that have played a supportive role in the research or publication process but do not meet the criteria for authorship. Includes thanks for financial support, technical guidance, data collection assistance, access to facilities or equipment, mentorship, and other forms of help.

BIBLIOGRAPHY

1. Abdullahi LH, Rithaa GK, Muthomi B, Kyallo F, Ngina C, Hassan MA, et al. Best practices and opportunities for integrating nutrition specific into nutrition sensitive interventions in fragile contexts: a systematic review. BMC Nutr. 2021;7(1):46. Available from: https://doi.org/10.1186/s40795-021-00443-1
2. Akseer N, Tasic H, Nnachebe Onah M, Wigle J, Rajakumar R, Sanchez-Hernandez D, et al. Economic costs of childhood stunting to the private sector in low- and middle-income countries. eClinicalMedicine. 2022;45:101320. Available from: https://doi.org/10.1016/j.eclinm.2022.101320

3. Dassie GA, Chala Fantaye T, Charkos TG, Sento Erba M, Balcha Tolosa F. Factors influencing concurrent wasting, stunting, and underweight among children under five who suffered from severe acute malnutrition in low- and middle-income countries: a systematic review. Front Nutr. 2024;11:1350742. Available from: https://doi.org/10.3389/fnut.2024.1350742
4. González-Fernández D, Williams TS, Vaivada T, Bhutta ZA. Early Growth and Impacts on Long-Term Neurodevelopment and Human Capital. Ann Nutr Metab. 2024;80(Suppl 1):39–52. Available from: https://doi.org/10.1159/000540144
5. Li Z, Kim R, Vollmer S, Subramanian SV. Factors Associated With Child Stunting, Wasting, and Underweight in 35 Low- and Middle-Income Countries. JAMA Netw Open. 2020;3(4):e203386. Available from: https://doi.org/10.1001/jamanetworkopen.2020.3386
6. Smith Fawzi MC, Andrews KG, Fink G, Danaei G, McCoy DC, Sudfeld CR, et al. Lifetime economic impact of the burden of childhood stunting attributable to maternal psychosocial risk factors in 137 low/middle-income countries. BMJ Glob Health. 2019;4(1):e001144. Available from: https://doi.org/10.1136/bmjgh-2018-001144
7. Le Roux K, Christodoulou J, Stansert-Katzen L, Dippenaar E, Laurenzi C, le Roux IM, et al. A longitudinal cohort study of rural adolescent vs adult South African mothers and their children from birth to 24 months. BMC Pregnancy Childbirth. 2019;19(1):24. Available from: https://doi.org/10.1186/s12884-018-2145-9
8. Ahinkorah BO, Kang M, Perry L, Brooks F, Hayen A. Prevalence of first adolescent pregnancy and its associated factors in sub-Saharan Africa: A multi-country analysis. PLoS One. 2021;16(2):e0246308. Available from: https://doi.org/10.1371/journal.pone.0246308
9. Silveira SL, Richardson EV, Motl RW. Social cognitive theory as a guide for exercise engagement in persons with multiple sclerosis who use wheelchairs for mobility. Health Educ Res. 2020;35(4):270–282. Available from: https://doi.org/10.1093/her/cyaa018
10. Bhutta ZA, Das JK, Rizvi A, Gaffey MF, Walker N, Horton S, et al. Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? Lancet. 2013;382(9890):452–477. Available from: https://doi.org/10.1016/S0140-6736(13)60996-4
11. Muhwezi WW, Katahoire AR, Banura C, Mugooda H, Kwesiga D, Bastien S, et al. Perceptions and experiences of adolescents, parents and school administrators regarding adolescent-parent communication on sexual and reproductive health issues in urban and rural Uganda. Reprod Health. 2015;12:110. Available from: https://doi.org/10.1186/s12978-015-0099-3
12. Reinhardt K, Fanzo J. Addressing Chronic Malnutrition through Multi-Sectoral, Sustainable Approaches: A Review of the Causes and Consequences. Front Nutr. 2014;1:13. Available from: https://doi.org/10.3389/fnut.2014.00013
13. Yaya S, Odusina EK, Bishwajit G. Prevalence of child marriage and its impact on fertility outcomes in 34 sub-Saharan African countries. BMC Int Health Hum Rights. 2019;19:33. Available from: https://doi.org/10.1186/s12914-019-0219-1
14. Wells JCK, Sawaya AL, Wibaek R, Mwangome M, Poullas MS, Yajnik CS, et al. The double burden of malnutrition: aetiological pathways and consequences for health. Lancet. 2020;395(10217):75–88. Available from: https://doi.org/10.1016/S0140-6736(19)32472-9
15. Millward DJ. Nutrition, infection and stunting: the roles of deficiencies of individual nutrients and foods, and of inflammation, as determinants of reduced linear growth of children. Nutr Res Rev. 2017;30(1):50–72. Available from: https://doi.org/10.1017/S0954422416000238
16. Kalamar AM, Lee-Rife S, Hindin MJ. Interventions to Prevent Child Marriage Among Young People in Low- and Middle-Income Countries: A Systematic Review of the Published and Gray Literature. J Adolesc Health. 2016;59(3 Suppl):S16–S21. Available from: https://doi.org/10.1016/j.jadohealth.2016.06.015
17. Wallace J, Covassin T, Nogle S, Gould D, Kovan J. Concussion Knowledge and Reporting Behavior Differences Between High School Athletes at Urban and Suburban High Schools. J Sch Health. 2017;87(9):665–674. Available from: https://doi.org/10.1111/josh.12543

18. Raj A, McDougal L, Silverman JG, Rusch MLA. Cross-Sectional Time Series Analysis of Associations between Education and Girl Child Marriage in Bangladesh, India, Nepal and Pakistan, 1991–2011. PLoS One. 2014;9(9):e106210. Available from: https://doi.org/10.1371/journal.pone.0106210
19. Hanieh S, Ha TT, Simpson JA, Thuy TT, Khuong NC, Thoang DD, et al. Exclusive breast feeding in early infancy reduces the risk of inpatient admission for diarrhea and suspected pneumonia in rural Vietnam: a prospective cohort study. BMC Public Health. 2015;15:1166. Available from: https://doi.org/10.1186/s12889-015-2431-9
20. Victora CG, Adair L, Fall C, Hallal PC, Martorell R, Richter L, et al. Maternal and child undernutrition: consequences for adult health and human capital. Lancet. 2008;371(9609):340–357. Available from: https://doi.org/10.1016/S0140-6736(07)61692-4
21. Stewart CP, Iannotti L, Dewey KG, Michaelsen KF, Onyango AW. Contextualising complementary feeding in a broader framework for stunting prevention. Matern Child Nutr. 2013;9(Suppl 2):27–45. Available from: https://doi.org/10.1111/mcn.12088
22. Wang K, Xu SS, Liu Z, Wang W, Hee J, Tang K. A quasi-experimental study on the effectiveness of a standardized comprehensive sexuality education curriculum for primary school students. J Adolesc. 2023;95(8):1666–1677. Available from: https://doi.org/10.1002/jad.12214
23. Patton GC, Sawyer SM, Santelli JS, Ross DA, Afifi R, Allen NB, et al. Our future: a Lancet commission on adolescent health and wellbeing. Lancet. 2016;387(10036):2423–2478. Available from: https://doi.org/10.1016/S0140-6736(16)00579-1
24. Kigongo E, Tumwesigye R, Anyolitho MK, Musinguzi M, Kwizera G, Achan E, et al. Access to family planning services and associated factors among young people in Lira city northern Uganda. BMC Public Health. 2024;24(1):1146. Available from: https://doi.org/10.1186/s12889-024-18604-0
25. Ma X, Yang Y, Chow KM, Zang Y. Chinese adolescents' sexual and reproductive health education: A quasi-experimental study. Public Health Nurs. 2022;39(1):116–125. Available from: https://doi.org/10.1111/phn.12970
26. Salam RA, Faqqah A, Sajjad N, Lassi ZS, Das JK, Kaufman M, et al. Improving adolescent sexual and reproductive health: a systematic review of potential interventions. J Adolesc Health. 2016;59(4 Suppl):S11–S28. Available from: https://doi.org/10.1016/j.jadohealth.2016.05.022
27. Kululanga LI, Sundby J, Malata A, Chirwa E. Striving to promote male involvement in maternal health care in rural and urban settings in Malawi: a qualitative study. Reprod Health. 2011;8:36. Available from: https://doi.org/10.1186/1742-4755-8-36
28. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, de Onis M, et al. Maternal and child undernutrition and overweight in low-income and middle-income countries. Lancet. 2013;382(9890):427–451. Available from: https://doi.org/10.1016/S0140-6736(13)60937-X
29. Robertson L, Mushati P, Eaton JW, Dumba L, Mavise G, Makoni J, et al. Effects of unconditional and conditional cash transfers on child health and development in Zimbabwe: a cluster-randomised trial. Lancet. 2013;381(9874):1283–1292. Available from: https://doi.org/10.1016/S0140-6736(12)62168-0
30. Kapetanovic S, Skoog T, Bohlin M, Gerdner A. Aspects of the parent–adolescent relationship and associations with adolescent risk behaviors over time. J Fam Psychol. 2019;33(1):1–11. Available from: https://doi.org/10.1037/fam0000436
31. Melnikas AJ, Ainul S, Ehsan I, Haque E, Amin S. Child marriage practices among the Rohingya in Bangladesh. Confl Health. 2020;14:28. Available from: https://doi.org/10.1186/s13031-020-00274-0
32. Sebastian MP, Khan ME, Kumari K, Idnani R. Increasing Postpartum Contraception in Rural India: Evaluation of a Community-Based Behavior Change Communication Intervention. Int Perspect Sex Reprod Health. 2012;38(2):68–77. Available from: https://doi.org/10.1363/3806812

33. Widman L, Choukas-Bradley S, Noar SM, Nesi J, Garrett K. Parent–adolescent sexual communication and adolescent safer sex behavior: a meta-analysis. JAMA Pediatr. 2016;170(1):52–61. Available from: https://doi.org/10.1001/jamapediatrics.2015.2731
34. Zuilkowski SS, Jukes MCH. The impact of education on sexual behavior in sub-Saharan Africa: A review of the evidence. AIDS Care. 2012;24(5):562–576. Available from: https://doi.org/10.1080/09540121.2011.630342