Factors Influencing Early Pregnancy Among Adolescent Girls Aged 15–19 Years at Gleno Health Center Inpatient Services, Ermera Municipality, Timor-Leste, 2022

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Abstract: Adolescent pregnancy (ages 15–19 years) remains a prominent public health concern in low-resource settings. Complications from early pregnancy and unsafe abortion contribute substantially to maternal morbidity and mortality. Infants born to mothers under 20 years have a 50 % higher risk of neonatal death within the first week compared to those born to mothers older than 20 years (WHO, 2014). The objective of the study identify individual, interpersonal, and socio-environmental factors associated with early pregnancy outcomes among adolescent girls admitted to Gleno Health Center's inpatient ward in 2022.

A descriptive cross-sectional study included all 43 pregnant adolescents (aged 15–19 years) admitted between 1 January and 31 December 2022. Data were collected via a pretested structured questionnaire covering: (1) knowledge of early pregnancy, (2) attitude toward pregnancy, (3) satisfaction with health-promotion media, (4) peer behaviors (pergaulan bebas), and (5) family income. Bivariate associations between each independent variable and high-risk indicators of quality-of-life (e.g., anticipated complications, low self-rated health) were assessed using the Chi-square (χ^2) test ($\alpha = 0.05$). Crude odds ratios (COR) with 95 % confidence intervals (CI) quantified effect sizes.

The study found that 43 participants, the mean age was 17.8 ± 1.2 years; 65.1% had education ≤ junior high school, and 53.5% lived in households above the national poverty line. Adequate knowledge was present in 44.2%, positive attitude in 44.2%, satisfaction with health-promotion media in 46.5%, and non-permissive peer behavior in 46%. Bivariate analysis revealed significant associations between Attitude: adolescents with "positive" attitudes were more likely to report high-risk outcomes (COR=4.16; 95 % CI: 1.15–15.00; p=0.027). Peer behavior: those reporting non-permissive peer norms had higher odds of high-risk outcomes (COR=8.89; 95% CI: 2.02–39.22; p=0.002). Media satisfaction: Adolescents satisfied with health-promotion media also exhibited higher-risk indicators (COR = 3.43; 95% CI: 0.97–12.10; p = 0.050). Knowledge level (p = 0.247) and family income (p = 0.075) showed no statistically significant association.

Concluded that inpatient cohort, "positive" attitudes toward early pregnancy, non-permissive peer behaviors, and higher satisfaction with health-promotion media were significantly associated with high-risk quality-of-life indicators. Future interventions should focus on proactive attitude education, peer-led support programs, and revision of media strategies to target non-pregnant adolescents.

Keywords: Early Pregnancy, Adolescents Ages 15-19 Years.

I. INTRODUCTION

High-risk pregnancy is a significant global health problem due to its strong association with increased maternal and neonatal morbidity and mortality. Although pregnancy is generally characterized by positive expectations, the presence of maternal comorbidities, gestational complications, or adverse socioeconomic and environmental conditions can significantly increase the likelihood of adverse outcomes. HRP disproportionately contributes to complications such as preterm birth, fetal growth restriction, low birth weight, and congenital anomalies, which are major determinants of neonatal mortality and long-term developmental and health challenges.[1]

Globally, 16 million girls aged 15 to 19 years and two million girls under the age of 15 give birth every year. Worldwide, one in five girls has given birth by the age of 18. In the poorest regions of the world, this figure rises to over one in three girls. Almost all adolescent births – about 95% – occur in low- and middle-income countries. Within countries, adolescent births are more likely to occur among poor, less educated, and rural populations. Several factors contribute to adolescent births. In many societies, girls may be under pressure to marry and bear children early, or they may have limited educational and employment prospects. In low- and middle-income countries, over 30% of girls marry before they are 18 years of age; around 14% before the age of 15. Moreover, married adolescents are likely to become pregnant and give birth, following social norms. Education, on the other hand, is a major protective factor for early pregnancy: the more years of schooling, the fewer early pregnancies. Birth rates among women with low education are higher than for those with secondary or tertiary education.[2]

According to the Timor-Leste Food Nutrition Survey (2020), A total of 13,370 women of reproductive age were interviewed. Of these, 6.5% were pregnant, 27.4% were lactating, and 0.5% were both pregnant and lactating. The proportion of pregnant women was highest in the 20-29 age group, and higher in rural areas (7.0%) than in urban areas (5.5%).[3] Complications of pregnancy and childbirth in adolescents, coupled with unsafe abortion practices, remain major contributors to the global burden of disease. In Timor-Leste, rural districts such as Ermera record relatively high adolescent pregnancy rates, yet local evidence on determinant factors remains sparse.

Adolescent pregnancies are a significant global issue, with 17.90% of cases occurring worldwide. Risk factors include early sexual activity, marriage, illiteracy, and limited access. Consequences include eclampsia, premature delivery, and infections. The study found that low education, socioeconomic status, rural domicile, maltreatment, early marriage, and contraception use are significant contributors. Problems like anemia, stillbirth, preeclampsia/eclampsia, premature birth, and low birth weight are also significant.[4] Gleno Health Center functions as the principal inpatient facility in Ermera Municipality. In 2022, records indicated 43 admissions of pregnant adolescents aged 15–19 years. To design context-appropriate interventions, it is critical to understand which individual (knowledge, attitude), interpersonal (peer behaviors), and socio-environmental (media exposure, family income) factors correlate with early pregnancy outcomes in this setting. This study aims to identify these associations among admitted adolescents.

II. LITERATURE REVIEW

➤ Knowledge and Adolescent Pregnancy

Knowledge deficits regarding reproductive physiology, contraception, and safe sexual practices are consistently linked to higher rates of adolescent pregnancy. Demonstrated that adolescents lacking comprehensive reproductive health education exhibited higher risk behaviors. Similarly found that inadequate understanding of gestational timing contributed to unprotected sexual activity among Indonesian adolescents.[5]

➤ Attitude toward Early Pregnancy

Adolescents' attitudes encompassing perceived susceptibility, perceived severity, and social norms strongly influence reproductive behaviors[5]. Adolescents who view early pregnancy as socially acceptable or inconsequential are more likely to become pregnant. Conversely, positive attitudes (recognition of risks) can motivate protective behaviors; however, retrospective surveys often reveal that adolescents who acknowledge risks are already pregnant.[5]

➤ Peer Influence (Promiscuity)

Promiscuity, or permissive peer norms around premarital sexual activity, are documented determinants of adolescent sexual behavior. Adolescent girls whose peers normalized dating and unprotected intercourse had significantly higher pregnancy rates.[6] Peer group norms correlate with earlier sexual debut and increased adolescent pregnancy globally.[7]

➤ Health-Promotion Media

Health-promotion media (radio broadcasts, posters, social media campaigns) can disseminate reproductive health information widely. Kemenkes RI (2015) found that adolescents reporting satisfaction with such media tended to demonstrate better health-seeking behaviors. However, in contexts with limited pre-pregnancy outreach, media campaigns often target already pregnant individuals, potentially confounding associations between media exposure and pregnancy outcomes. That is Quality of service is defined as the degree of efficient and effective service delivery per professional standards, standards of service implemented comprehensively in response to patient needs, the use of appropriate technology, and the development of health or nursing services to achieve optimal health levels.[8]

➤ Family Income

Socioeconomic status (SES), commonly proxied by household income, is inversely associated with adolescent pregnancy in multiple LMIC settings. Lower family income limits access to education and healthcare, thereby increasing vulnerability. Nonetheless, some rural contexts exhibit complex cultural norms that moderate the direct effect of income on adolescent pregnancy rates. Gaps in Local

Evidence: In Timor-Leste, published studies have primarily described prevalence or policy but seldom quantified associations between adolescent knowledge, attitudes, peer influences, media exposure, income, and pregnancy outcomes. This study addresses this gap at Gleno Health Center.

III. METHODS

➤ *Study Design and Setting*

A descriptive cross-sectional quantitative study was conducted at Gleno Health Center's inpatient ward, Ermera Municipality, Timor-Leste, between 15 September and 15 October 2022. Gleno serves a predominantly rural population in southwestern Ermera, with limited tertiary care access. Sampling in the study was pregnant adolescents aged 15–19 years admitted to Gleno's inpatient ward in 2022 who were eligible (N = 43). Because the total population did not exceed 100, we employed an accidental (consecutive) sampling approach, enrolling every eligible patient meeting inclusion criteria: (1) age 15–19 years, (2) confirmed pregnancy upon admission, (3) residence in Ermera Municipality, (4) ability and willingness to provide informed consent (or parental/guardian assent if <18 years). Exclusion criteria were severe obstetric complications requiring immediate transfer and cognitive impairment preventing the interview.

➤ *Data Collection Procedure*

Trained female nurses conducted face-to-face interviews in a private counseling room. Demographic data (age, education, parity) were recorded from medical records to minimize recall bias. Each completed questionnaire was checked for completeness on the spot.

➤ *Data Management and Analysis*

Data were double-entered into SPSS ver. 25 (IBM Corp., Armonk, NY). Descriptive statistics (mean ± SD, frequencies, percentages) summarized respondent characteristics and each independent variable. Bivariate analyses employed Pearson's Chi-square (χ^2) test to assess associations between each independent variable (X_1–X_5) and the high-risk outcome (Y). Variables with expected counts < 5 in any cell were tested with Fisher's exact test (reported in place of χ^2). Statistical significance was set at $p < 0.05$. Crude odds ratios (COR) with 95 % confidence intervals (CI) were calculated to quantify effect sizes.

IV. RESULTS

➤ *Demographic and Socioeconomic Characteristics*

Table 1. Demographic and Socioeconomic Characteristics of Respondents

Characteristic of Respondents	F	%
Age (years)		
15–16	11	25.6 %
17–18	21	48.8 %
19	11	25.6 %
Education Level		
≤ Junior High School	28	65.1 %
≥ Senior High School	15	34.9 %
Parity		
Primigravida	35	81.4 %
Multigravida (≥ 2 pregnancies)	8	18.6 %
Monthly Household Income		
< Poverty Line ("Low Income")	20	46.5 %
≥ Poverty Line ("Higher Income")	23	53.5 %

All 43 eligible adolescents participated (response rate = 100 %). The mean age was 17.8 ± 1.2 years (range = 15–19 years). Educational attainment: 28 (65.1 %) had completed junior high school or below; 15 (34.9 %) had senior high school education. Parity: 35 (81.4 %) were primigravida; 8 (18.6 %) were multigravida. Monthly household income: 20 (46.5 %) below the national poverty line, 23 (53.5 %) at/above it. Table 1.

➤ *Distribution of Independent Variables*

Table 2. Distribution of Independent Variables

Variable	Category	F	%
Knowledge of Early Pregnancy (X_1)	Adequate	19	44.2 %
	Inadequate	24	55.8 %
Attitude toward Early Pregnancy (X_2)	Positive	19	44.2 %
	Negative	24	55.8 %
Media Satisfaction (X_3)	Satisfied	20	46.5 %
	Not satisfied	23	53.5 %
Peer Behavior (Pergaulan Bebas) (X_4)	Non-permissive	20	46.5 %

	Permissive	23	53.5 %
Family Income (X₅)	Higher income	23	53.5 %
	Low income	20	46.5%

Base on the descriptive of analysis of Knowledge of Early Pregnancy (X₁): 19 (44.2 %) classified as "adequate knowledge," 24 (55.8 %) "inadequate. Attitude toward Early Pregnancy (X₂): 19 (44.2 %) had "positive attitude," 24 (55.8 %) "negative attitude. Satisfaction with Health-Promotion Media (X₃): 20 (46.5 %) "satisfied," 23 (53.5 %) "not satisfied. Peer Behavior (*Pergaulan Bebas*) (X₄): 20 (46.5 %) "non-permissive," 23 (53.5%) "permissive. Family Income (X₅): 23 (53.5%) "higher income," 20 (46.5 %) "low income."

➢ *Bivariate Analysis*

Among 43 pregnant adolescents, 29 (67.4 %) reported at least one high-risk indicator of quality of life (anticipated complications, severe anxiety, or fear for neonatal outcome), while 14 (32.6 %) reported low-risk indicators. Table 3 presents the Chi-square tests and COR for each independent variable.

Table 3. Bivariate Associations Between Independent Variables and High-Risk Quality-of-Life Outcomes

Variable	Category	High-Risk, n (%)	Low-Risk, n (%)	COR	95 % CI	p-Value
Knowledge (X₁)	Adequate	10 (52.6 %)	9 (47.4%)	1.85	0.55–6.29	0.247
	Inadequate	9 (37.5 %)	15 (62.5%)			
Attitude (X₂)	Positive	12 (63.2 %)	7 (36.8%)	4.16	1.15–15.00	0.027
	Negative	7 (29.2 %)	17 (70.8%)			
Media Satisfaction (X₃)	Satisfied	12 (60.0 %)	8 (40%)	3.43	0.97–12.10	0.050
	Not satisfied	7 (30.4 %)	16 (69.6%)			
Peer Behavior (X₄)	Non-permissive	16 (64.0 %)	9 (36.0%)	8.89	2.02–39.22	0.002
	Permissive	3 (16.7 %)	15 (83.3%)			
Family Income (X₅)	Higher income	13 (56.5 %)	10 (43.5%)	3.03	0.86–10.72	0.075
	Low income	6 (30.0 %)	14 (70.0%)			

Based on the Bivariate Associations between Independent Variables and High-Risk Quality-of-Life Outcomes, Shaw found that Knowledge (X₂) had no significant association with high-risk outcomes (COR = 1.85; p = 0.247). Attitude (X₂): Adolescents with "positive attitude" (i.e., acknowledging risks of early pregnancy) had significantly higher odds (COR = 4.16; 95% CI: 1.15–15.00) of high-risk quality-of-life indicators than those with a "negative attitude" (p = 0.027). Media Satisfaction (X₃): Those "satisfied" with health-promotion media had higher odds (COR = 3.43; 95 % CI: 0.97–12.10) of high-risk outcomes than those "not satisfied" (p = 0.050). Peer Behavior (X₄): Non-permissive peer norms were strongly associated with high-risk outcomes (COR = 8.89; 95 % CI: 2.02–39.22; p = 0.002). Family Income (X₅): No statistically significant association (COR = 3.03; p = 0.075), though higher income trended toward increased high-risk indicators.

V. DISCUSSION

This study identified three significant determinants—attitude, media satisfaction, and peer behavior correlated with high-risk quality-of-life indicators among 43 pregnant adolescents (aged 15–19) at Gleno Health Center in 2022. Contrary to initial hypotheses, higher levels of knowledge (X₁) and family income (X₅) did not demonstrate statistically significant protective effects. The following discussion contextualizes these findings within existing literature and local socio-cultural dynamics.

➢ *Attitude toward Early Pregnancy (X₂)*

Adolescents classified as having a "positive attitude" (acknowledging the dangers of early pregnancy) exhibited high-risk indicators (OR = 4.16; p = 0.027). This seemingly paradoxical finding may reflect reverse causality: pregnant adolescents who have already experienced or anticipate complications may retrospectively report more risk consciousness. Similar patterns have been observed where pregnant participants expressed heightened awareness during hospitalization, resulting in stronger "positive" attitudes despite adverse outcomes.[9]

➢ *Satisfaction with Health-Promotion Media (X₃)*

Adolescents reporting satisfaction with reproductive health media were more likely to have high-risk outcomes (OR = 3.43; p = 0.050). In contexts where media interventions primarily target pregnant women (e.g., antenatal counseling via community radio, posters in clinics), satisfaction may reflect engagement only after pregnancy has occurred. The media campaigns often focus on high-risk populations rather than preemptive audiences. The challenges experienced included miscommunication and less support from adults, hard to carry out cadre formation, and teenagers' low awareness. To increase the role and involvement of adolescents in promoting the reproductive health of their peers, adequate provision and support from adults and policymakers are needed.[10] Thus, our finding suggests the need to shift media strategies toward preventive messaging targeting non-pregnant adolescents. To create an inclusive healthcare system for older people, we must address

socioeconomic barriers and implement policies promoting health equality. Collaboration between governments, healthcare providers, and community organizations is crucial to identify and address specific needs for older people, ensuring a future where all older people can live healthy and fulfilling lives.[11]

➤ *Peer Behavior (X₄)*

Adolescent reproductive health is an important issue that requires attention. Non-permissive peer norms were unexpectedly associated with increased high-risk indicators (OR = 8.89; p = 0.002). One hypothesis is that adolescents who perceive their peers as discouraging early sexual activity may nonetheless have engaged in unprotected intercourse due to familial or partner pressure. Alternatively, in rural Timor-Leste, "non-permissive" peers may still support early marriage, a culturally sanctioned form of "permissive" behavior leading to adolescent pregnancy. Similar complexities were described in contexts where local customs equate marriage with acceptable adolescent pregnancy, regardless of peer discouragement of premarital sex.[6]

➤ *Knowledge of Early Pregnancy (X₁)*

Although 44.2 % demonstrated adequate knowledge, this variable did not significantly associate with risk outcomes (OR = 1.85; p = 0.247). Education alone appears insufficient to deter early pregnancy in this setting. The knowledge must be coupled with accessible services and supportive environments to translate into behavior change.[5] The previous study found that the use of interactive media by peer educators increases adolescent reproductive health education knowledge.[12] The study revealed a significant relationship between adolescents' reproductive health knowledge and their sexual behavior, with 22 having good knowledge, 61 having sufficient knowledge, and 26 having poor knowledge, with a significance value of p=0.214.[13]

➤ *Family Income (X₅)*

Family income did not reach statistical significance (OR = 3.03; p = 0.075), though a trend suggested higher risk among those in households above the poverty line. This counterintuitive result may reflect that higher-income families in Gleno still lack adequate reproductive health support, or that adolescents from better-off families might have more autonomy to engage in dating behaviors. The previous study found that families with an income of less than 135 per month account for 41 individuals, representing 56%. In contrast, families with an income greater than 135 account for 32 individuals, representing 44%[14]. The previous study found that Family Income less than $135 was 44.9%, Income equal to $135 was 30.8%, and Income more than $135 was 24.4%.[15]

➤ *Implications for Intervention*
- Attitude-Focused Counseling: Given the complex relationship between risk awareness and actual behavior, maternal-child health programs should integrate motivational interviewing techniques to help adolescents

translate risk knowledge into preventive behaviors before pregnancy occurs.
- Peer-Led Education: The strong association with peer behavior underscores the importance of peer-education models. Training older adolescents who have safely delayed pregnancy to mentor younger peers could shift normative beliefs.
- Media Strategy Realignment: Transition from clinic-centered messaging to school- and community-based outreach via social media, mobile apps, and youth forums to engage non-pregnant adolescents proactively.
- Socioeconomic Support & Family

➤ *Engagement:*

Although income was not independently significant, comprehensive programs such as conditional cash transfers for school attendance can create multisectoral support. Encouraging parental dialogue on reproductive health before adolescence can also mitigate risk.

➤ *Limitations*
- Cross-Sectional Design: Causality cannot be inferred; reverse associations are possible, as discussed.
- Small Sample Size (N = 43): Results may not generalize beyond Gleno Health Center; statistical power is limited.
- Self-Reported Measures: Responses on sensitive topics (attitude, peer behavior) may be subject to social desirability bias.
- Dichotomous Income Categorization: A more detailed SES index could reveal subtler effects.

VI. CONCLUSION

In this inpatient sample of 43 pregnant adolescents (ages 15–19) at Gleno Health Center, "positive" attitudes toward pregnancy risk, non-permissive peer norms, and satisfaction with health-promotion media were significantly associated with high-risk quality-of-life indicators during early pregnancy. Knowledge level and family income were not statistically significant predictors. To reduce early pregnancy rates, holistic interventions are needed: proactive attitude change programs, peer-led education, and recalibrated media outreach focusing on pre-pregnancy prevention rather than post-pregnancy support.

RECOMMENDATIONS

- Scale Up Adolescent-Friendly Services: Develop dedicated outpatient youth clinics offering confidential counseling on reproductive health and contraception.
- Implement Peer Mentor Programs: Train and deploy adolescent peer mentors to conduct outreach in schools and community centers.
- Revamp Media Campaigns: Create interactive digital content (e.g., short videos on WhatsApp, Instagram) targeting 13–18-year-olds, emphasizing skills for delaying sexual debut.

- Strengthen Parental Engagement: Facilitate community workshops to equip parents with communication skills for discussing reproductive health with preteens (ages 10–14).
- Conduct Larger-Scale Studies: Undertake longitudinal cohort studies across Ermera Municipality to establish causal pathways and evaluate intervention effectiveness.

ETHICAL CONSIDERATIONS

Ethical approval was obtained from the Timor-Leste National Health Research Ethics Committee (Reference: TLD/HREC/2022/07). Written informed consent was secured from each participant; for minors (15–17 years), parental/guardian consent plus individual assent were obtained. Confidentiality was ensured via anonymized coded data, and counseling services were offered post-interview.

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