

Socioeconomic Determinants of Adolescent Sexual and Reproductive Health (ASRH) Knowledge Among Students Aged 18years and Above Enrolled at East Gusa National High School

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Abstract

This study examined the socioeconomic, demographic, and environmental factors associated with Adolescent Sexual and Reproductive Health (ASRH) knowledge among students aged 18 years and above at East Gusa National High School during School Year 2025–2026. Anchored in the Capability Approach, the study employed a quantitative, cross-sectional design and total enumeration of 64 eligible students. Data were collected through a structured online questionnaire containing a 20-item ASRH knowledge assessment covering physical development, sexual health, sexually transmitted infections (STIs), health services, and social-behavioral aspects. Descriptive statistics and multiple linear regression using Ordinary Least Squares were applied. Overall, 64% of respondents demonstrated high ASRH knowledge, 20% moderate knowledge, and 16% low knowledge. STI knowledge recorded the highest domain mean, although knowledge gaps remained in selected concepts concerning puberty, responsible adolescent behavior, STIs, and peer influence. Socio-demographic factors explained 7.8% of overall ASRH knowledge variation and were not statistically significant, although age positively predicted STI knowledge and maternal education positively predicted social-behavioral knowledge. Environmental factors explained 43.5% of overall variation; school-based ASRH education and positive peer influence were positively associated with overall knowledge, while gadget use was negatively associated. The study recommends strengthening learner-centered ASRH education, trustworthy reproductive health information, parent-child communication, peer education, and collaboration with health institutions. The study aligns with SDG 3 (Good Health and Well-Being), SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), and SDG 17 (Partnerships for the Goals). Its sustainability impact relates to public health, educational, socioeconomic, community, and institutional sustainability by providing localized evidence to support informed ASRH education, services, and policy discussions.

Keywords: Adolescent Sexual and Reproductive Health (ASRH), ASRH Knowledge, Capability Approach, Environmental Factors, Health Services, School-Based ASRH Education, Socioeconomic Factors, Sexually Transmitted Infections (STIs)

1. Introduction

Adolescence is a critical developmental period characterized by physical, psychological, and socioeconomic changes. Within this transition, adolescent sexual and reproductive health (ASRH) is an important public health concern, particularly in developing settings where access to accurate information and appropriate services may be constrained. ASRH knowledge is especially important because inadequate reproductive health information can contribute to early pregnancy, sexually transmitted infections (STIs), school disruption, and broader socioeconomic difficulties. Globally, ASRH outcomes are shaped by interacting family, educational, socioeconomic, cultural, policy, and environmental conditions. Parental guidance reduces risks such as teenage pregnancy (Agyei & Kaura, 2023), while initiatives that improve contraceptive access have been associated with lower birth rates and improved educational outcomes (Stevenson et al., 2021). However, the effectiveness of reproductive health information may depend on the content, reach, and communication channels through which family-planning and contraceptive messages are delivered to adolescents (Pepito et al., 2022). These concerns are particularly relevant in communities where stigma, limited youth-friendly services, socioeconomic disadvantage, and unequal access to reliable information constrain adolescents' opportunities to acquire and use ASRH knowledge. In the Philippines, adolescent pregnancy remains connected with educational, health, and socioeconomic concerns. These challenges are evident in Cagayan de Oro City and Barangay Gusa, where adolescent live births and teenage pregnancies continue to occur despite local interventions. East Gusa National High School therefore provides an important setting for examining how students' socioeconomic, environmental, and demographic circumstances relate to their ASRH knowledge. This study specifically examines students aged 18 years and above during School Year 2025–2026 and considers ASRH knowledge across physical, sexual, STI, health-service, and social-behavioral domains. Recent national vital statistics confirm that adolescent childbearing remains present: in 2024, 9.9% of registered births were to mothers aged 15–19 years, with an adolescent birth rate of 25 per 1,000 women aged 15–19 (Philippine Statistics Authority, 2025).

Adolescent sexual and reproductive health involves more than access to reproductive health information. Young people's ability to understand and use such information is influenced by their families, schools, communities, economic circumstances, and access to health services and technology. Parental guidance can help reduce reproductive health risks (Agyei & Kaura, 2023), while improved access to contraception may contribute to both reproductive and educational outcomes (Stevenson et al., 2021). Nevertheless, the effectiveness of reproductive health information may depend on how family-planning and contraceptive messages are communicated and whether they effectively reach adolescents (Pepito et al., 2022). The need for adequate ASRH knowledge is particularly important because teenage pregnancy can disrupt education and intensify socioeconomic disadvantage. Limited access to modern contraception, sexuality education, accurate information, and adolescent-friendly health services further increases the difficulty young people face in making informed reproductive health decisions. Cultural stigma surrounding sexuality can also restrict communication within families and communities and discourage young people from seeking appropriate information and services. This study focuses on students aged 18 years and above at East Gusa National High School. These learners are transitioning into early adulthood while their knowledge and attitudes concerning sexuality continue to develop. Their ability to obtain, interpret, and use ASRH information may vary according to socioeconomic, environmental, and demographic circumstances, including parental education, household income, parental employment, government assistance, household characteristics, access to media and technology, exposure to school-based ASRH instruction, and access to adolescent-friendly health services.

The literature reflected in the study identifies ASRH knowledge as the product of interacting individual and contextual conditions rather than information exposure alone. Family involvement is one important influence because communication and parental guidance can support adolescents in understanding reproductive health and avoiding risky outcomes. Parental guidance has been associated with reduced risks such as teenage pregnancy (Agyei & Kaura, 2023). Parental educational attainment may likewise affect the quality of communication and the capacity of households to help adolescents interpret reproductive health information. Access to reproductive health resources represents another important theme. Policies that increase access to contraception can reduce birth rates while contributing to educational outcomes (Stevenson et al., 2021). However, availability does not necessarily guarantee effective use. Cultural norms, stigma, socioeconomic constraints, and differences between program design and local circumstances can restrict adolescents' use of reproductive health resources. In the Philippine setting, evidence suggests that the content, reach, and communication channels of family-planning and contraceptive messages are important considerations in reaching adolescents effectively (Pepito et al., 2022). Socioeconomic conditions also influence access to opportunities and information. Household income, parental employment, government assistance, and parental education may determine the resources available to students, while access to media and technology can expand opportunities to obtain reproductive health information. At the same time, unregulated online content may expose adolescents to misinformation, demonstrating that information availability and information quality are not equivalent. Recent cross-national evidence also links structural inequality with adolescent sexual and reproductive health outcomes, reinforcing the importance of socioeconomic context (Dávila et al., 2025; Senkyire et al., 2022). Educational and health-service environments further shape

ASRH knowledge. School-based sexuality education can provide structured information, while adolescent-friendly health services can offer professional guidance and access to reproductive health resources. However, poverty, limited educational resources, cultural stigma, misinformation, and inadequate youth-friendly services may prevent adolescents from converting these resources into meaningful knowledge and informed reproductive health decisions. Philippine evidence indicates that effective reproductive health education depends not only on policy but also on implementation, teacher preparation, and local stakeholder support (Kim et al., 2023; Datinggaling & Chua, 2023). Taken together, the literature suggests that differences in ASRH knowledge cannot be understood solely through the presence or absence of information. They must also be examined in relation to the socioeconomic, demographic, educational, technological, and service-related conditions that determine whether adolescents can access, understand, and apply available information.

At the global level, adolescent sexual and reproductive health remains a significant public health and development concern. Teenage pregnancy can affect health, education, employment opportunities, and socioeconomic well-being. Access to modern contraception and reliable reproductive health information remains uneven, particularly in developing settings. These conditions demonstrate the importance of strengthening young people's access to accurate information and appropriate reproductive health services. At the national level, the Philippines faces similar concerns. Adolescent pregnancy is associated with inadequate access to modern contraceptive methods and sexuality education, while discussion of sexual health remains sensitive or taboo in many communities. These cultural and socioeconomic barriers can limit adolescents' ability to obtain reliable information and appropriate health services. The limited effectiveness of some reproductive health initiatives further demonstrates the importance of designing interventions that correspond with local cultural conditions (Pepito et al., 2022). The issue is evident locally in Cagayan de Oro City, where adolescent pregnancies, including cases among very young adolescents, remain a concern. Early and unplanned pregnancies can contribute to maternal and infant health complications, interrupted schooling, reduced productivity, and persistent poverty. Despite city-level programs intended to address teenage pregnancy, Barangay Gusa has continued to contribute to adolescent live births. Local records illustrate the persistence of the problem. Adolescent live births in Barangay Gusa fluctuated over six years, with 60 cases recorded in 2019, 51 in 2020, 59 in 2021, 48 in 2022, 54 in 2023, and 40 in 2024. Although 2024 represented the lowest recorded number during the period, adolescent pregnancy remained present in the community. At East Gusa National High School, 2024 Guidance Office records also documented teenage pregnancy cases among Junior and Senior High School learners, including nine female Senior High School learners aged 17 to 19. These circumstances make East Gusa National High School an important setting for examining ASRH knowledge. Students may encounter overlapping challenges associated with poverty, parental educational circumstances, limited access to adolescent-friendly services, and exposure to unregulated online information. Understanding these conditions at the school level can provide context-specific evidence concerning the factors associated with students' reproductive health knowledge.

This study is anchored in Amartya Sen's Capability Approach, which emphasizes individuals' real freedoms and opportunities to achieve valued outcomes rather than focusing solely on the resources available to them (Sen, 1999). The approach recognizes that individuals provided with similar resources may achieve different outcomes because personal, social, economic, and environmental conditions influence their capacity to convert resources into meaningful achievements. Applied to ASRH, the framework distinguishes between the availability of reproductive health resources and adolescents' actual capability to use them. Sexuality education, media and technology, reproductive health information, and adolescent-friendly health services constitute resources, but their availability does not automatically result in adequate ASRH knowledge or informed decision-making. Adolescents must also possess meaningful opportunities to access, understand, evaluate, and apply these resources. Within the study, socioeconomic, environmental, and demographic characteristics function as conversion factors that may shape these opportunities. Parental education, household income, parental employment, participation in government assistance programs, access to media and technology, school-based ASRH instruction, and adolescent-friendly health services may influence students' ability to acquire and apply reproductive health information. Demographic characteristics such as age, sex, birth order, grade level, length of stay in school, and household size provide additional conditions through which variations in ASRH knowledge may be examined. The Capability Approach therefore provides a framework for explaining why students exposed to similar school curricula or community environments may demonstrate different levels of ASRH knowledge. In this framework, capability represents students' actual opportunity to acquire and use accurate reproductive health information, while ASRH knowledge represents an outcome shaped by the interaction between available resources and the socioeconomic, environmental, and demographic conditions affecting their use (Sen, 1999).

Existing ASRH research in the Philippines has substantially addressed adolescent fertility, reproductive health service utilization, and broader national or regional patterns. However, less attention has been directed toward school-level variations in ASRH knowledge and the socioeconomic, environmental, and demographic circumstances that may explain those variations. National and regional evidence may identify broad reproductive health patterns but cannot fully explain how conditions operating within a specific school and community influence students' opportunities to acquire and use ASRH information. This gap is particularly relevant to East

Gusa National High School because the school serves learners within a community where adolescent live births and teenage pregnancies continue to occur. Students may differ substantially in parental education, household income, parental employment, participation in government assistance programs, household circumstances, access to media and technology, exposure to ASRH instruction, and access to health services. Examining these conditions provides a means of determining whether variations in ASRH knowledge are associated with differences in students' socioeconomic and environmental opportunities. Accordingly, the study investigates the socioeconomic, environmental, and demographic factors associated with ASRH knowledge among students aged 18 years and above enrolled at East Gusa National High School during School Year 2025–2026. It describes students' socio-demographic characteristics and assesses their ASRH knowledge while examining the extent to which the identified variables explain variations across physical, sexual, STI, health-service, and social-behavioral knowledge domains. The study specifically examines whether the socioeconomic, environmental, and demographic variables included in the analytical model collectively explain variations in students' ASRH knowledge and whether some factors demonstrate stronger associations than others. Through this approach, the research provides school-level evidence concerning how differences in students' circumstances may correspond with differences in reproductive health knowledge. The study is deliberately bounded to students aged 18 years and above at East Gusa National High School. Its quantitative, cross-sectional design provides evidence from one point in time and does not establish changes in ASRH knowledge over time. Self-reported information may also be affected by recall and social-desirability bias because of the sensitive nature of reproductive health topics. Unequal access to internet connectivity and survey devices may affect participation, while cultural values, peer influence, and parental attitudes toward ASRH remain outside the measured variables. These limitations define the context within which the study's findings should be interpreted. Despite these boundaries, the study extends school-based ASRH inquiry by applying the Capability Approach to examine how socioeconomic and environmental conditions may affect students' real opportunities to acquire and use reproductive health knowledge (Sen, 1999). The resulting evidence may inform schools, families, health-service providers, and policymakers in discussions concerning the design, implementation, and timing of context-appropriate ASRH education and services.

The study is most directly aligned with SDG 3 – Good Health and Well-Being because it examines knowledge related to adolescent sexual and reproductive health, including sexual development, STIs, contraception, reproductive health services, and informed health decisions. Understanding the factors associated with ASRH knowledge can provide evidence relevant to efforts intended to improve adolescents' access to appropriate reproductive health information and services. The study also aligns with SDG 4 – Quality Education because schools constitute an important setting for developing accurate reproductive health knowledge. Teenage pregnancy can interrupt schooling, while inadequate sexuality education can restrict young people's access to reliable information. By examining exposure to school-based ASRH instruction and variations in knowledge among students, the research provides evidence relevant to educational approaches that support informed decision-making and continued educational participation. A further connection exists with SDG 8 – Decent Work and Economic Growth through the relationship described in the study among early pregnancy, educational disruption, reduced employment opportunities, productivity, and persistent socioeconomic disadvantage. Improving young people's opportunities to acquire reproductive health knowledge may therefore have implications beyond immediate health outcomes by supporting educational continuity and longer-term socioeconomic participation. The study also has relevance to SDG 17 – Partnerships for the Goals because addressing ASRH concerns requires coordination among schools, families, health-service providers, communities, and policymakers. Evidence concerning the socioeconomic and environmental conditions associated with students' ASRH knowledge can support discussions among these sectors when developing context-appropriate educational and health initiatives.

The study contributes primarily to public health, educational, socio-economic, community, and institutional sustainability by examining ASRH knowledge as an outcome shaped by interconnected social conditions rather than as an isolated individual characteristic. From a public health sustainability perspective, adequate ASRH knowledge can support informed reproductive health decisions and strengthen preventive approaches to early pregnancy, STIs, and other reproductive health concerns. Examining the conditions associated with knowledge can help identify where access to information or services may be constrained. For educational sustainability, the study is relevant because reproductive health and education are interconnected. Early pregnancy can disrupt schooling, while schools provide an important environment for delivering structured and age-appropriate reproductive health information. Evidence concerning students' knowledge and their exposure to school-based ASRH instruction can support discussions about how educational institutions respond to learners' reproductive health information needs. The research also contributes to socio-economic sustainability by recognizing that household income, parental education, employment, government assistance, and access to technology may influence students' opportunities to obtain and use reproductive health information. Because early pregnancy can contribute to interrupted education, reduced employment opportunities, and continuing poverty, understanding these socioeconomic conditions is relevant to longer-term individual, family, and community well-being. At the community and institutional levels, the study provides localized evidence from East Gusa National High School

and Barangay Gusa. Such evidence can support schools, families, health-service providers, and policymakers in understanding how community and household circumstances interact with students' reproductive health knowledge. Rather than assuming that providing information alone produces adequate knowledge, the Capability Approach emphasizes the conditions that enable or constrain students' ability to convert available resources into meaningful knowledge and informed choices (Sen, 1999). Overall, the multidisciplinary value of the study lies in connecting adolescent health, education, socioeconomic circumstances, technology and information access, family conditions, health services, and institutional support. By examining these dimensions together, the study provides a context-specific basis for understanding ASRH knowledge among students aged 18 years and above at East Gusa National High School and for informing subsequent research, educational initiatives, health programs, and policy discussions.

2. Material and methods

2.1 Research Design

The study used a quantitative, cross-sectional research design to investigate variations in ASRH knowledge in relation to socioeconomic, environmental, and demographic factors among students aged 18 years and above at East Gusa National High School. Quantitative research focuses on measurable variables and objective descriptions that pertain to the theory when analyzed statistically (Creswell & Creswell, 2018). The cross-sectional approach allowed data to be collected at a single point in time and was appropriate for identifying associations and patterns among the variables, although it did not establish causal relationships. Guided by Amartya Sen's Capability Approach, ASRH knowledge was treated as a functioning outcome, while socioeconomic, environmental, and demographic conditions were considered conversion factors that could influence students' capacity to access and use reproductive health information. Multiple linear regression was employed to determine the degree, direction, and statistical significance of associations between these factors and ASRH knowledge while accounting for the other variables included in the models. This design provided a systematic framework for examining variations in knowledge within the study population and generating context-specific evidence relevant to adolescent sexual and reproductive health education.

2.2 Locale of the Study

The study was conducted at East Gusa National High School in Purok 2, Zone 4A, Barangay Gusa, Cagayan de Oro, Philippines. Barangay Gusa is an urban community in eastern Cagayan de Oro accessible through the National Highway and J.R. Borja Extension and characterized by residential, commercial, and educational areas. The school serves Junior and Senior High School students from Barangay Gusa and nearby communities. East Gusa National High School was considered appropriate because of its location within Barangay Gusa, where adolescent reproductive health concerns had been noted, as well as the researcher's established rapport with the school administration and proximity to the site. The school had classrooms, computer facilities, internet access, and personnel capable of supporting the research activities. Guidance personnel, class advisers, subject teachers, and other school staff were available to assist with survey administration. The surrounding urban and community environment also provided a relevant context for examining socioeconomic, environmental, and demographic conditions associated with ASRH knowledge.

2.3 Respondents of the Study

The respondents were male and female students aged 18 years and above who were enrolled at East Gusa National High School during School Year 2025–2026. Students were eligible if they were enrolled, at least 18 years old, able to understand the informed consent and survey questions, available during the study period, and willing to provide informed consent. These requirements were intended to ensure that respondents could independently understand and complete the research instrument. Students who were younger than 18 years, not enrolled at the school, unable to understand the questionnaire, absent during data collection, or unwilling to provide informed consent were excluded. Both male and female students were included to permit examination of differences in ASRH knowledge according to sex and other demographic and contextual characteristics.

2.4 Sample and Sampling Procedure

The study employed total enumeration because the population of eligible respondents was small and known. School records identified 64 students aged 18 years and above who were enrolled at East Gusa National High School during School Year 2025–2026. All 64 eligible students were therefore invited to participate. The school registrar provided the list of students who satisfied the eligibility criteria. Total enumeration allowed the study to cover the entire eligible population rather than select a subset and helped reduce potential selection bias within the study site. Although all eligible students were invited, participation remained voluntary, and only those who provided informed consent were included. The resulting population size of 64 respondents was considered sufficient for the exploratory regression analysis within the localized context of the study.

2.5 Research Instrument

Data were collected using a structured online questionnaire developed in Google Forms to measure demographic, socioeconomic, environmental, and social characteristics and ASRH knowledge. The instrument gathered information on age, sex, birth order, grade level, length of stay in school, household size, household income, parental educational attainment, parental employment, and participation in the Pantawid Pamilyang Pilipino Program (4Ps). Environmental and social measures included access to adolescent-friendly health services, exposure to school-based ASRH education, media and technology use, parent-child communication, peer influence, and religious dimensions. ASRH knowledge was assessed through a structured 20-item multiple-choice assessment covering Physical Development, Sexual Health, Sexually Transmitted Infections (STIs), Health Services, and Social-Behavioral aspects. Selected questions were adapted from the pre-test and post-test questions used by Oro Youth CID during the ASRH Awareness Symposium of the City Government of Cagayan de Oro to maintain contextual relevance to the target population. The multidimensional measurement of ASRH knowledge reflected the view that reproductive health knowledge includes biological and reproductive processes as well as sexual, behavioral, social, preventive, and health-seeking dimensions (Brunelli et al., 2022). Each correct response received one point, while an incorrect response received zero. The 20 items produced an overall score ranging from 0 to 20, with higher scores indicating greater ASRH knowledge. Scores from 0 to 9 were classified as low knowledge, 10 to 14 as moderate knowledge, and 15 to 20 as high knowledge. These categories followed the scoring framework used in the Oro Youth ASRH assessment during the ASRH Awareness Symposium at East Gusa National High School to maintain contextual relevance and comparability. Categorizing respondents according to knowledge level also supports interpretation and intervention planning in KAP studies (Kaliyaperumal, 2004). Although the ranges did not precisely follow Modified Bloom's cut-off points, assessment classifications may be adapted to the context, purpose, and use of an instrument when theoretically and contextually justified and consistently applied (DeVellis, 2017). Domain-specific scores were also computed. Physical Development Knowledge was measured using items K1, K2, K3, and K7, producing a score from 0 to 4. Sexual Health Knowledge used K4, K5, and K6, with scores from 0 to 3. STI Knowledge used K8, K9, K10, and K11, producing scores from 0 to 4. Health Services Knowledge was based on K12, K13, and K17, with scores from 0 to 3, while Social-Behavioral Knowledge used K14, K15, K16, K18, K19, and K20. These domain-specific measures allowed the study to examine whether students demonstrated different levels of knowledge across ASRH dimensions and whether socioeconomic and environmental factors were differently associated with each dimension. The questionnaire was developed using relevant literature and existing instruments from similar studies. Professionals in adolescent health and education reviewed the instrument for content validity, relevance, clarity, and appropriateness. A small group of students similar to the intended respondents participated in pilot testing to assess comprehensibility and relevance, and their feedback was used to refine the questionnaire before administration. Reliability was evaluated using Cronbach's Alpha, with a coefficient of 0.70 or higher interpreted as indicating acceptable reliability. The Google Form began with an informed consent statement explaining the study's purpose, scope, instructions, voluntary nature, and participants' rights to skip questions or withdraw without repercussions. No personally identifying information was collected. The study involved no collection, storage, management, or disposal of biological specimens.

2.6 Data Gathering Procedure

Formal permission to conduct the study was obtained from the appropriate school authorities before data collection. Eligible students were invited to complete the online questionnaire during designated school hours using classrooms and computer laboratories. Respondents could use personal mobile devices or school computers, while available internet facilities enabled participation by students without personal devices. The questionnaire was designed to require approximately 10–15 minutes to complete to minimize disruption to academic activities. The guidance counselor served as testing coordinator, while class and subject teachers assisted in organizing participants, explaining survey procedures, supervising administration, and addressing procedural concerns. Teachers assisting with the survey received a small token of gratitude for their time and efforts. Their involvement was limited to survey administration, and they did not have access to individual responses. Before accessing the questionnaire, each participant completed the informed consent process. Participation was entirely voluntary, and respondents could decline participation, skip questions, or withdraw without penalty. Survey responses were collected anonymously, and no information capable of identifying individual respondents was obtained.

2.7 Data Analysis Techniques

Data analysis proceeded through descriptive and inferential statistical procedures. Descriptive statistics were initially used to summarize respondents' demographic, socioeconomic, and environmental characteristics and their ASRH knowledge. Descriptive statistics provide an organized preliminary understanding of quantitative data and their distribution (Gujarati & Porter, 2009; Creswell & Creswell, 2018). Categorical characteristics such as sex, birth order, parental education, parental employment, and government assistance participation were summarized using frequencies and percentages, while continuous variables such as age and household size were summarized using means and standard deviations. Overall and domain-specific ASRH knowledge were analyzed using frequencies, percentages, means, and standard deviations. Respondents were also classified into low, moderate, and high overall knowledge categories. Descriptive analysis identified concepts that respondents understood

relatively well or poorly across Physical Development, Sexual Health, STIs, Health Services, and Social-Behavioral aspects. These procedures provided the baseline for subsequent econometric analysis (Field, 2018). Multiple linear regression using the Ordinary Least Squares (OLS) method was employed to determine how socioeconomic, demographic, and environmental variables explained variations in ASRH knowledge. OLS estimates the relationship between a dependent variable and explanatory variables by minimizing the sum of squared residuals and provides efficient and unbiased estimates when the assumptions of the Classical Linear Regression Model are satisfied (Gujarati & Porter, 2009; Wooldridge, 2020). It also permits assessment of the magnitude and direction of associations while holding other variables in the model constant. The explanatory variables represented the respondents' socioeconomic, demographic, informational, educational, family, peer, technological, and health-service environments. These included age, sex, household size, birth order, social media use, access to digital devices, awareness and access to health centers, exposure to school-based ASRH education, parent-child communication, peer influence, parental education, household income, parental employment, and government subsidy participation. Schools, families, peers, health-service providers, and digital platforms represent important channels through which adolescents obtain sexual and reproductive health information and develop related attitudes and behaviors (UNESCO, 2018; Brunelli et al., 2022). Separate regression models were estimated for Physical Development, Sexual Health, STI, Health Services, and Social-Behavioral knowledge. This approach recognized that factors associated with one dimension of ASRH knowledge might differ from those associated with another. Estimated coefficients were interpreted as partial associations while holding other explanatory variables constant. Positive coefficients indicated associations with higher domain-specific knowledge scores, whereas negative coefficients indicated inverse associations. Model explanatory capacity was assessed using R^2 and adjusted R^2 . Diagnostic tests were conducted to evaluate the assumptions underlying the OLS models because violations of Classical Linear Regression Model assumptions can affect parameter efficiency and statistical inference (Gujarati & Porter, 2009; Wooldridge, 2020). Multicollinearity was assessed using the Variance Inflation Factor (VIF). Severe multicollinearity can inflate standard errors and reduce the precision of coefficient estimates (Gujarati & Porter, 2009). A VIF greater than 10 was considered indicative of serious multicollinearity, while values of 10 or below were considered acceptable. Heteroskedasticity was evaluated using the Breusch-Pagan/Cook-Weisberg test. Heteroskedasticity occurs when the variance of the error term is not constant and can produce inefficient standard errors and unreliable statistical inference even though estimated coefficients remain unbiased (Wooldridge, 2020). When heteroskedasticity was detected, heteroskedasticity-consistent robust standard errors were applied to permit valid statistical inference (Wooldridge, 2020). Serial correlation was considered but was not formally tested because the study used cross-sectional observations collected at one point in time rather than temporally ordered time-series or panel data. Serial correlation is primarily associated with sequential observations in time-series and panel datasets (Gujarati & Porter, 2009), and autocorrelation is generally not a primary concern in cross-sectional data (Wooldridge, 2020). Diagnostic assessment therefore concentrated on multicollinearity and heteroskedasticity, and regression results were interpreted only after the models satisfied the relevant diagnostic requirements or were appropriately corrected using robust standard errors.

2.8 Ethical Considerations

The study implemented ethical safeguards because ASRH is a sensitive topic involving human participants. Ethical clearance was obtained from the Xavier University Research Ethics Board (XU-REB), and formal permission was secured from the Schools Division Superintendent and school principal. These approvals ensured institutional oversight and compliance with procedures governing research involving students. The informed consent process followed the National Ethical Guidelines for Health and Health-Related Research, (PHREB, 2017), and the Council for International Organizations of Medical Sciences (CIOMS, 2016). Because all participants were aged 18 years and above, they provided their own informed consent. The online form explained the purpose and procedures of the study, expected completion time, potential risks and benefits, voluntary participation, and participants' right to skip questions or withdraw without consequences. Only respondents who selected the "I agree to participate" option could proceed to the questionnaire. The questionnaire was designed specifically for participants aged 18 years and above and used clear, respectful, and culturally appropriate language because of the sensitivity of ASRH. Participation remained voluntary despite the use of total enumeration, and no student was compelled to participate. The researcher had no direct relationship with the respondents that could affect their academic standing, grades, or evaluation, reducing the potential for conflict of interest, undue influence, or bias. Privacy, confidentiality, and anonymity were maintained in accordance with the Data Privacy Act of 2012, and the National Ethical Guidelines for Health and Health Related Research (PHREB, 2017). The questionnaire did not collect names, student numbers, contact details, or other personally identifiable information. Access to the survey was limited to eligible participants during designated school periods. Responses were stored through a secure, password-protected Google account accessible only to the researcher and research adviser. Teachers and the guidance counselor assisting with administration were not permitted to access individual responses, and findings were aggregated to prevent individual identification. Collected data were retained securely only for the period required by institutional policy and were scheduled for permanent deletion afterward. Data collection and storage were limited to information necessary for the research and were not shared outside the study. The study involved no medical procedures, physical interventions, or financial obligations and was

therefore considered to involve minimal risk. Although participants received no direct financial benefit, the findings were intended to contribute to ASRH awareness and health education and provide evidence that may assist educators, health practitioners, and policymakers in developing approaches that support adolescent health and well-being.

3. Results and Discussion

3.1 Socio-Demographic Profile of Respondents

3.1.1 Sex, Birth Order, Grade Level, Age, Length of Stay, and Household Size

Of the 64 respondents, 48 (75%) were female and 16 (25%) were male. First-born respondents comprised 34%, followed by second-born at 31%, third-born at 30%, and fourth-born at 5%. Half of the respondents were in Grade 12, 20% were in Grade 11, 16% were in Grade 9, and 14% were in Grade 10. Their mean age was 19.16 years ($SD = 1.63$), ranging from 18 to 25 years. The mean length of stay in school was 13.16 years ($SD = 1.63$), while mean household size was 5.75 members ($SD = 1.89$), ranging from 3 to 10. The distribution shows that respondents were predominantly female and that most were in the senior high school grades. Birth order was relatively distributed among first-, second-, and third-born respondents, indicating variation in family composition. Family size is a demographic characteristic useful in examining the contextual characteristics of populations, according to the United Nations Statistics Division (2017). The concentration of respondents in higher grade levels may also imply greater cumulative exposure to learning and school-based health activities (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2018).

3.1.2 Parental Education, Household Income, Employment, and Government Assistance

Most respondents reported that their parents were non-college graduates. Among mothers, 70% were non-college graduates and 30% were college graduates, while 73% of fathers were non-college graduates and 27% were college graduates. Household income was concentrated at the lower level, with 67% reporting approximately ₱5,000 monthly, followed by ₱15,000 among 19%, ₱25,000 among 11%, and ₱35,000 among 3%. Most respondents reported that their parents were employed (95%), while 5% reported unemployed parents. Only 14% were Pantawid Pamilyang Pilipino Program (4Ps) beneficiaries, whereas 86% were not. These characteristics indicate that many respondents came from lower-income households and families in which parents had not completed college, despite the high reported parental employment rate. Parental education can influence cognitive support and the home learning environment, while educational attainment affects access to services and opportunities, according to WHO (2010). Household income similarly influences access to educational and health-related resources and information (WHO, 2010). Participation in social assistance programs also provides an indicator of household socioeconomic circumstances and access to social services (WHO, 2010). These conditions provide important socioeconomic context for interpreting subsequent variations in ASRH knowledge.

3.2 Level of Adolescent Sexual and Reproductive Health Knowledge

3.2.1 Overall ASRH Knowledge

Overall, 41 respondents (64%) demonstrated high ASRH knowledge, 13 (20%) had moderate knowledge, and 10 (16%) had low knowledge. Thus, nearly two-thirds of the respondents were classified as having high knowledge, although more than one-third remained within the moderate or low categories. The predominance of high ASRH knowledge suggests substantial exposure to reproductive health information through schools, families, media, and other information sources, while the moderate and low groups indicate continuing knowledge gaps. This pattern is consistent with the UNESCO (2023), which emphasizes inclusive, school-based comprehensive sexuality education and access to accurate, age-appropriate information. The World Health Organization (2023) similarly emphasizes access to accurate, age-appropriate, and evidence-informed reproductive health information for healthy decision-making. From Sen's (1999) Capability Approach, the high level of knowledge among most respondents suggests that many students were able to convert available educational and informational resources into knowledge, whereas lower knowledge among some respondents indicates differences in their capacity to access and use those resources.

3.2.2 Knowledge Across ASRH Domains

Knowledge was classified as high across all five ASRH domains. STI knowledge recorded the highest mean ($M = 3.13$, $SD = 1.29$), followed by social-behavioral knowledge ($M = 3.09$, $SD = 1.34$), health services knowledge ($M = 3.08$, $SD = 1.30$), sexual health knowledge ($M = 2.94$, $SD = 1.19$), and physical development knowledge ($M = 2.77$, $SD = 1.37$). Although all domains were rated high, the standard deviations of 1.19 to 1.37 indicate variation in students' levels of understanding. The relatively high STI, social-behavioral, and health services scores indicate stronger knowledge in prevention, responsible behavior, and available health services. The World Health Organization (2026) identifies STI prevention education as an important component of adolescent health education. By comparison, the lower means for physical development and sexual health indicate areas in which knowledge may be comparatively less developed. UNESCO (2023) emphasizes that effective sexuality education should address biological, emotional, relational, and social dimensions in safe and inclusive learning environments. The variation across domains also supports Sen's (1999) Capability Approach because students

exposed to similar educational resources may differ in their ability to transform those resources into knowledge depending on socioeconomic conditions, parental guidance, support, and information quality.

3.2.3 Physical Development and Sexual Health Knowledge

Within physical development, 73% correctly understood the importance of puberty, 72% correctly identified reasons for mood changes during puberty, and 77% understood the role of body awareness in health decisions. Knowledge of similarities in pubertal changes experienced by boys and girls was comparatively lower at 69% and was classified as moderate. In sexual health, 73% correctly answered the pregnancy-related item and 75% correctly answered the abstinence-related item, while only 63% correctly identified responsible and healthy adolescent behavior, which was classified as moderate. The findings indicate that respondents generally understood fundamental puberty and sexual health concepts but demonstrated comparatively weaker knowledge concerning shared developmental changes and the practical application of responsible behavior. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2018) reports that adolescents' understanding of puberty can be strengthened by addressing both physical and emotional changes among males and females. The lower performance on responsible behavior also suggests that knowledge alone may not determine behavioral understanding because adolescent behavior is influenced by social, environmental, and peer contexts (UNESCO, 2026).

3.2.4 STI, Health Services, and Rights Knowledge

STI-related items generally received high correct-response rates. HIV transmission and STI prevention were each answered correctly by 78% of respondents, while 83% correctly identified the appropriate response to suspected STI symptoms. However, only 69% correctly understood the broader importance of being informed about STIs, resulting in a moderate classification. All health services and rights items were classified as high, with correct-response rates ranging from 73% to 83%, including knowledge of reproductive rights, appropriate responses to unwanted physical contact, and the importance of youth-friendly health services. The findings show that students had relatively strong knowledge of STI transmission, prevention, appropriate responses to symptoms, reproductive rights, and available support. However, their comparatively weaker understanding of the broader significance of STIs suggests that knowledge of immediate prevention may be stronger than understanding of wider health and social consequences. The World Health Organization (WHO, 2023) emphasizes the importance of comprehensive sexuality education in providing adolescents with accurate, age-appropriate information that supports informed sexual and reproductive health decisions.

3.2.5 Social-Behavioral Knowledge

Most social-behavioral items were classified as high. Correct responses reached 78% for identifying reliable reproductive health information, 80% for understanding the role of sexuality education, 73% for recognizing the challenges associated with teenage pregnancy, 83% for responsible health decision-making, and 73% for appropriate responses to peer pressure. Knowledge concerning the influence of peers was lower at 67% and was classified as moderate. The results indicate that most respondents understood responsible decision-making and appropriate responses to social pressures, but some did not fully recognize how peers can shape attitudes and behavior. Peer relationships can substantially influence adolescent behavioral choices even when young people possess adequate knowledge (UNESCO, 2026). The differences in item-level performance also support Sen's (1999) Capability Approach because exposure to the same educational content does not ensure an equal ability to interpret and transform information into informed behavior; personal background, family conditions, and social support may influence this process.

3.3 Socio-Demographic Determinants of ASRH Knowledge

3.3.1 Socio-Demographic Predictors of Overall ASRH Knowledge

The overall socio-demographic regression model was not statistically significant, $F(9,54) = 0.74$, $p = .670$, $R^2 = .078$. Age, sex, birth order, household size, parental education, household income, parental employment, and 4Ps participation collectively explained approximately 7.8% of the variation in overall ASRH knowledge. None of these individual socio-demographic variables significantly predicted the overall ASRH knowledge score. The limited explanatory contribution of socio-demographic characteristics suggests that differences in students' ASRH knowledge were not strongly associated with household and demographic background. Because respondents attended the same school, shared educational experiences and information sources may have reduced knowledge differences attributable to socioeconomic circumstances. Research similarly indicates that access to information, school-based learning, and health education can influence reproductive health knowledge more strongly than socioeconomic background alone (UNESCO, 2018). From Sen's (1999) Capability Approach, socioeconomic resources alone do not guarantee knowledge because adolescents must also have opportunities and abilities to understand and apply reproductive health information. The result also relates to Human Capital Theory (Becker, 1964; Schultz, 1961), while Grossman (1972) conceptualizes health knowledge as health capital developed through education, information, and experience.

3.3.2 Socio-Demographic Predictors Across ASRH Domains

Socio-demographic models explained between 7.5% and 16.5% of variation across the five ASRH knowledge domains. The Physical Knowledge ($R^2 = .075$, $p = .442$), Sexual Knowledge ($R^2 = .127$, $p = .393$), Health Services Knowledge ($R^2 = .117$, $p = .283$), and Social-Behavioral Knowledge ($R^2 = .092$, $p = .388$) models were not statistically significant. The STI Knowledge model had the largest explained variation ($R^2 = .165$) and was closest to overall significance at $p = .053$. At the predictor level, age significantly and positively predicted STI knowledge ($B = 0.25$, $p = .01$), while maternal education positively predicted Social-Behavioral Knowledge ($B = 1.10$, $p = .05$). Sex, birth order, household size, father's education, household income, parental employment, and 4Ps participation were not significant predictors across the domains. The positive association between age and STI knowledge indicates greater STI knowledge among older respondents, consistent with the World Health Organization (2023), which recognizes that STI and SRH knowledge can increase as adolescents age and gain additional exposure to health information. Maternal education was associated with stronger social-behavioral knowledge, supporting evidence that parental education, particularly maternal education, contributes to adolescent health education (WHO, 2010). These findings are also consistent with Sen's (1999) Capability Approach, in which age and maternal education can operate as conversion factors affecting adolescents' ability to transform available resources into knowledge. Most other socio-demographic variables had limited influence, indicating that shared educational experiences may have reduced knowledge disparities attributable to household background.

3.4 Environmental Determinants of ASRH Knowledge

3.4.1 Environmental Predictors of Overall ASRH Knowledge

The environmental regression model was statistically significant, $F(6,57) = 11.20$, $p < .001$, $R^2 = .435$. Gadget use, social media hours, school-based ASRH education, knowledge center awareness, peer influence, and parent-child communication collectively explained approximately 43.5% of the variation in overall ASRH knowledge. Gadget use was significantly negatively associated with overall ASRH knowledge ($B = -3.69$, $p = .001$), whereas school-based ASRH education was the strongest positive predictor ($B = 4.49$, $p < .001$). Positive peer influence was also significantly associated with higher ASRH knowledge ($B = 2.48$, $p = .02$). Social media use, knowledge center awareness, and parent-child communication were not significant predictors. The greater explanatory capacity of environmental factors indicates the importance of learning environments, information access, and social relationships in shaping ASRH knowledge. The negative association with gadget use suggests that access to technology alone does not guarantee educational use; Stigler (1961) argued that technology and information have no inherent value, making the way information is used important. Conversely, the positive association with school-based education demonstrates the contribution of structured reproductive health instruction. According to UNESCO (2026), comprehensive sexuality education can strengthen adolescents' knowledge, relationships, communication, and informed decision-making, while the WHO (2023) report identifies school health education as an effective means of improving adolescent health literacy. This also supports Human Capital Theory, which views education as an investment in knowledge and skills (Becker, 1964; Schultz, 1961). Positive peer influence further indicates the role of social learning, consistent with evidence that supportive peers can improve health education and rational health-related choices (UNESCO, 2026).

3.4.2 Environmental Predictors of Physical, Sexual, and STI Knowledge

Environmental factors significantly explained Physical Knowledge ($R^2 = .294$, $p = .002$), Sexual Knowledge ($R^2 = .161$, $p = .038$), and STI Knowledge ($R^2 = .243$, $p = .001$). Gadget use was positively associated with Physical Knowledge ($B = 1.84$, $p = .04$), Sexual Knowledge ($B = 0.29$, $p = .04$), and STI Knowledge ($B = 0.62$, $p = .04$). School-based ASRH education was negatively associated with Physical Knowledge ($B = -0.59$, $p = .00$) and STI Knowledge ($B = -0.69$, $p = .00$), while its association with Sexual Knowledge was not significant. Peer influence, social media hours, knowledge center awareness, and parent-child communication did not significantly predict these three domains. The positive associations between gadget access and physical, sexual, and STI knowledge indicate that digital devices may provide access to educational and health-related resources. This agrees with recent evidence that digital interventions can provide accessible sexual-health information to adolescents, although effectiveness depends on design and use (Aguilar-Quesada et al., 2025). However, technology did not produce uniformly positive results across all ASRH dimensions, reinforcing Stigler (1961) on the importance of how information resources are used. The varying associations of school-based ASRH education across domains indicate differences in the content, focus, or timing of instruction rather than uniform effects across all aspects of ASRH knowledge.

3.4.3 Environmental Predictors of Health Services and Social-Behavioral Knowledge

The Health Services Knowledge model explained 34.4% of the variation and was statistically significant ($R^2 = .344$, $p = .000$), while the Social-Behavioral Knowledge model explained 9.2% and was not statistically significant ($R^2 = .092$, $p = .388$). Gadget use was negatively associated with Health Services Knowledge ($B = -0.63$, $p = .00$) and Social-Behavioral Knowledge ($B = -1.50$, $p = .00$). School-based ASRH education was negatively associated with Health Services Knowledge ($B = -0.25$, $p = .04$) but positively associated with Social-Behavioral Knowledge ($B = 2.42$, $p = .03$). Knowledge center awareness positively predicted Health Services Knowledge ($B = 0.71$, $p = .00$). Peer influence, social media hours, and parent-child communication were not significant predictors in these

domain-specific models. These findings demonstrate that technology access does not uniformly improve all dimensions of ASRH knowledge. Digital resources may provide information on biological and health topics but may be less effective for health-seeking behavior, interpersonal relationships, counseling, and responsible decision-making. School-based ASRH education remained an important predictor across several domains, although its direction varied, indicating possible differences in instructional focus and content. UNESCO (2026) emphasizes that comprehensive sexuality education should strengthen knowledge, communication, relationships, and decision-making, while the World Health Organization (WHO, 2023) identifies school-based education as an important mechanism for improving reproductive health literacy. These educational effects also correspond with Human Capital Theory, which treats education as an investment in knowledge and informed decision-making (Becker, 1964; Schultz, 1961). The positive association between knowledge center awareness and Health Services Knowledge indicates that students who were aware of health services had a stronger understanding of where to obtain reproductive health information, counseling, and assistance. The WHO (2023) showed that health services targeted to adolescents will help to develop health literacy and stimulate the right health-seeking behavior. This finding also supports Grossman's (1972) Health Capital Theory, which considers health knowledge a form of capital contributing to health and decision outcomes. Although parent-child communication was not significant in the present models, previous research has identified its positive influence on adolescent reproductive health knowledge, including Agyei and Kaura (2023). Its lack of significance here suggests that the influence of communication may depend on its quality, credibility, and social context.

3.5 Comparative Influence of Socio-Demographic and Environmental Factors

The regression findings showed a clear difference in the explanatory contribution of the two sets of factors examined. The overall socio-demographic model explained only 7.8% of variation in ASRH knowledge and was not statistically significant, whereas the environmental model explained 43.5% and was statistically significant. At the domain level, socio-demographic models generally explained modest variation, with age predicting STI knowledge and maternal education predicting Social-Behavioral Knowledge. Environmental models explained greater variation in Physical, Sexual, STI, and Health Services Knowledge, although the direction and significance of individual predictors differed across domains. These findings emphasize the role of structured education, access to relevant information, health-service awareness, and the broader learning environment in shaping ASRH knowledge. Sen's (1999) Capability Approach argues that having access to resources is not enough to achieve the end goal, and these findings support that argument. Adolescents must also have the opportunity and capacity to understand, evaluate, and use available information. The results likewise reflect Human Capital Theory because educational investments can strengthen knowledge and decision-making (Becker, 1964; Schultz, 1961), while Grossman (1972) identifies health knowledge as health capital developed through education, information, and experience. Overall, the findings indicate that school-based learning and supportive informational environments were more strongly associated with ASRH knowledge in this study than household socioeconomic characteristics alone.

4. Conclusion & Recommendations

The study concluded that students aged 18 years and above at East Gusa National High School generally demonstrated high knowledge of Adolescent Sexual and Reproductive Health (ASRH), particularly in STIs, health services, and social-behavioral aspects, although knowledge gaps remained in specific concepts requiring reinforcement. Socio-demographic factors generally explained only a small portion of the variation in ASRH knowledge, although age and maternal educational attainment were associated with specific knowledge domains. Environmental factors showed a greater influence on ASRH knowledge, particularly school-based ASRH education and positive peer influence, while gadget use was associated with lower overall knowledge. Overall, the findings indicate that students' educational, social, and informational environments play an important role in their acquisition and application of ASRH knowledge.

East Gusa National High School should strengthen regular, age-appropriate, and learner-centered ASRH education, particularly in areas where students demonstrated knowledge gaps, through school-based learning activities, seminars, campaigns, classroom discussions, case studies, and role-plays. Parents and the School Parents-Teachers Association should reinforce ASRH learning through parent-child communication, orientations, and parenting seminars, while students should be encouraged to participate in school-based programs, seek trustworthy reproductive health information, and critically evaluate information obtained from digital platforms. School health personnel and local health institutions should collaborate in providing adolescent-friendly health information, counseling, and reproductive health guidance, while peer organizations and student leaders should strengthen peer education initiatives. Future research should include adolescents from different schools and communities, examine additional influences on ASRH knowledge, and consider mixed-method, longitudinal, and other research methodologies.

The study was limited to students aged 18 years and above at East Gusa National High School during School Year 2025–2026; therefore, the findings are specific to the study population and setting. Its cross-sectional design

collected data at only one point in time, limiting the assessment of relationships between socioeconomic and environmental factors and ASRH knowledge over time. The use of a structured self-reported questionnaire may also have been affected by recall and social-desirability bias because of the sensitive nature of ASRH topics. Participation through an online survey may have been influenced by differences in access to reliable internet connections and suitable devices. Finally, the study examined selected socioeconomic, demographic, and environmental variables, while other potentially relevant factors, including cultural values, peer pressure, and parental attitudes toward ASRH, were outside the scope of the study.

5. Compliance with ethical standards

The study complied with established ethical standards for research involving human participants by protecting the rights, dignity, privacy, confidentiality, safety, and welfare of the respondents throughout the research process. Ethical safeguards included prior ethical review and approval, informed and voluntary participation, protection of participant anonymity and personal information, secure handling and storage of research data, and compliance with applicable institutional procedures, ethical guidelines, and data privacy requirements.

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