

The Utilization of Modern Contraceptives by Adolescent Girls in Senior High Schools (SHSs) in Upper East Region, Northern Ghana

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Abstract

Background

Adolescent pregnancy remains a significant public health challenge in Ghana, with the Northern Ghana recording concerning rates of teenage pregnancies and school dropouts. Understanding contraceptive utilization patterns among adolescent girls is crucial for developing effective interventions.

Objective

This study aimed to assess the utilization of modern contraceptives by adolescent girls aged 15–19 years in SHSs in the Kassena-Nankana West District (KNWD), Upper East Region, Ghana.

Methods

A cross-sectional survey was conducted among 378 adolescent girls from five SHSs in the Kassena-Nankana West District. Proportionate stratified random sampling was used to select study participants. This technique was chosen because the study population was distributed across five distinct SHSs, which served as the sampling strata and the required sample size was determined using the Cochran (1977) formula. Statistical analysis included descriptive statistics, chi-square tests and logistic regression using Stata Corp. Version 17, and Microsoft Excel.

Results

Nearly all participants (98.2%) were aware of modern contraceptives, yet only 28.8% were currently using them. About 65.1% reported prior contraceptive use. Multivariate logistic regression identified three independent predictors of current contraceptive use: age (aOR: 0.72; 95% CI: 0.54, 0.96; $p = 0.023$), prior contraceptive use (aOR: 17.45; 95% CI: 5.70, 53.38; $p < 0.0001$), and comfort discussing contraceptives (aOR: 2.39; 95% CI: 1.41–4.06; $p = 0.001$). Older adolescent age was inversely associated with current use, while prior use and comfort with contraceptive discussions were strong positive predictors.

Conclusion

A substantial gap exists between contraceptive awareness and utilization among adolescent girls in SHSs in KNWD of the Upper East Region in Northern Ghana. Prior contraceptive experience and open attitudes toward contraceptive discussions are the strongest drivers of current use. The association between prior contraceptive use and current contraceptive uptake suggests that peer influence may be an important factor to consider in the design of school-based reproductive health interventions in the district.

INTRODUCTION

Reproductive health issues among adolescents have emerged as a critical global concern over recent decades. Despite efforts to achieve Millennium Development Goal 5, reproductive health challenges affecting adolescents have become increasingly prominent[1]. The subsequent Sustainable Development Goal 3 emphasizes the essential role of adolescent reproductive health in achieving broader development objectives, recognizing that reproductive health affects the overall wellbeing of adolescents as they transition into adulthood [2]. The World Health Organization defines adolescents as individuals between 10 and 19 years of age, this population constitutes a substantial proportion of sexually active individuals globally[3]. In developing countries, adolescents face significant risks related to unsafe sexual practices, resulting in sexually transmitted infections (STIs), including HIV/AIDS, and unintended pregnancies[4]. Globally, female adolescents aged 15–19 years account for more than 14 million live births annually, with 91% occurring in low- and middle-income countries [5].

In Ghana, approximately 30% of all pregnancies are reported as either mistimed or unwanted by the women experiencing them, with adolescents contributing a disproportionately higher rate exceeding 70% [6]. According to the 2017 Ghana Maternal Health Survey, only 35.6% of sexually active unmarried adolescents aged 15–19 years use contraceptives[7]. The Upper East Region recorded teenage pregnancy rates of 14.2% in 2022, and between January and March 2023, 1,252 cases were documented, representing 13% of all pregnancies in the region [7].

The Northern Ghana specifically, Kassena-Nankana West District faces particular challenges regarding adolescent reproductive health. According to the Ghana Education Service, 21 students registered for the 2020 West Africa Senior School Certificate Examination (WASSCE) in the district were pregnant, with 11 being nursing mothers[7]. Specific schools showed varying patterns: Sirigu SHS School recorded 11 pregnant students and 4 nursing mothers among 294 female students; Nabango SHS identified 2 pregnant students and 3 nursing mothers among 129 females; Chiana SHS reported 3 nursing mothers but no current pregnancies among 229 female students; and Mirigu SHS recorded 5 pregnant students among 125 females [8]. Furthermore, School dropout rates in the district reveal concerning trends, with females constituting the majority. In 2018, the dropout rate was 1.71%, totaling 163 students, with 114 being female [9]. In 2019, despite a decreased rate of 1.35%, there were 446 dropouts, with 148 being female[9]. Pregnancy and marriage emerged as the most common reasons for female dropout in 2020, followed by grade repetition[7]. The district recorded teenage pregnancy rates of 5%, 11.4%, and 10.9% in 2017, 2018, and 2019, respectively [10].

These statistics underscore the urgent need for comprehensive understanding of contraceptive utilization patterns among adolescent girls in SHSs. Effective contraceptive use can significantly reduce mistimed and unwanted pregnancies, enabling adolescents to complete their education, pursue career opportunities, and make informed decisions about their reproductive health [8].

MATERIALS AND METHODS

Study Design

This study employed a cross-sectional study design to assess the utilization of modern contraceptives among adolescent girls in SHSs in the Kassena-Nankana West District (KNWD), Ghana. The study was conducted across five SHSs in the district, namely Sirigu SHS, Mirigu SHS, Nabango SHS, Paaga SHS, and Chiana SHS. Data collection took place from April 2023 to May 2023, during which students were in active academic session.

Study Setting

The study was conducted in KNWD, one of the thirteen districts of the Upper East Region of Ghana. It shares borders with Burkina Faso to the north, the Bolgatanga Municipal to the east, the Bongo District to the northeast, the Bulsa District to the southwest, the Kassena-Nankana Municipal to the south, and the Sissala East District to the west. According to the 2010 Population and Housing Census, the district has a population of 70,667, of whom approximately 49.2% are female and 79% reside in rural communities. The district is notably youthful, with 47.9% of the population under the age of 15. Adolescent pregnancy rates have been persistently high in this district – 5%, 11.4%, and 10.9% in 2017, 2018, and 2019, respectively.

Study Population

The target population for this study comprised all female adolescent students enrolled SHSs in the Kassena-Nankana West District. Specifically, the accessible population included girls in SHS Form 1 through Form 3, aged 15 to 19 years, attending either public or private SHSs within the district. Both mixed and all-girls schools were considered, given that their students' perspectives are mutually relevant to the study objectives.

Inclusion and Exclusion Criteria

1. Participants were eligible for inclusion if they were female adolescents aged 15 to 19 years and (2) were currently enrolled in one of the five selected senior high schools in the Kassena-Nankana West District at the time of data collection.
2. Participants were excluded if they declined to provide written informed consent or assent; (2) failed to complete the data collection instrument; (3) were absent from school during the period of data collection; or attempted to complete the questionnaire more than once.

Sample Technique and Sample Size

Proportionate stratified random sampling was used to select study participants. This technique was chosen because the study population was distributed across five distinct SHSs, which served as the sampling strata. Using this approach ensured that each school contributed a number of participants proportionate to its female student enrolment, thereby producing a sample that was representative of the entire eligible population across all five schools. Within each school, participants were then selected randomly from the list of eligible female students.

The required sample size was determined using the Cochran (1977) formula for populations of unknown size:

$$n = Z^2 P(1 - P) / d^2$$

where n is the required sample size, Z is the z-statistic corresponding to a 95% confidence level (Z = 1.96), P is the estimated proportion of the outcome of interest (assumed to be 0.5 to maximise the sample size), and d is the margin of error (0.05). This yielded a minimum required sample size of 385 participants. The target sample was increased to 390 to account for potential incomplete responses and non-response. A total of 385 participants provided complete and usable questionnaires and were included in the final analysis.

Data Collection

Data were collected using a structured questionnaire as the primary data collection tool. The questionnaire captured information on socio-demographic characteristics (including school grade, community of residence, and religious affiliation), knowledge of contraceptive methods and their effectiveness in preventing sexually transmitted infections (STIs), current contraceptive practices, and barriers and challenges encountered in accessing and utilizing contraceptives. The instrument was divided into five sections: Section A covered questionnaire identifiers; Section B elicited general respondent information; Section C assessed knowledge of contraceptives; Section D explored current contraceptive practices; and Section E examined barriers and challenges associated with contraceptive use. Both open-ended and closed-ended items were included to allow respondents to provide information beyond the pre-specified response options.

Data collection was conducted through face-to-face interviewer administration and, where appropriate, self-administration with researcher supervision. This approach promoted a high response rate and ensured that participants received guidance in completing the questionnaire appropriately. Questionnaires were administered from April 2023 through May 2023, while students were in active academic session.

Data Processing

Completed questionnaires were reviewed for completeness and consistency before data entry. Data were entered into Microsoft Excel and exported to Stata version 17.0 for analysis.

Data Analysis

Descriptive statistics were computed to characterise the socio-demographic profile of participants and summarise their responses on contraceptive awareness, perceptions, and utilisation. Frequencies and percentages were reported for all categorical variables, including age group, school grade, religious affiliation, contraceptive awareness, prior use, and current use.

Second, bivariate analysis using the Pearson chi-square (χ^2) test was performed to examine unadjusted associations between each candidate predictor variable and current contraceptive use. Variables assessed included age, school grade, religion, STI awareness, perception of contraceptives, prior use, awareness of school or local policies on contraceptives, receipt of comprehensive sexual education, and comfort discussing contraceptives. Crude odds ratios (ORs) with 95% confidence intervals (CIs) were estimated. A p-value threshold of less than 0.05 was applied to identify statistically significant associations at the bivariate level.

Third, all variables that were statistically significant in the bivariate analysis ($p < 0.05$) were entered into a binary logistic regression model to determine independent predictors of current contraceptive use after controlling for potential confounders. Adjusted odds ratios (aORs) with 95% CIs were reported, and statistical significance was again set at $p < 0.05$. This multivariable approach allowed for the identification of factors that retain a significant independent association with current contraceptive utilisation after accounting for the simultaneous influence of other variables.

Ethics Approval

This study received ethical approval from the Committee on Human Research and Publication Ethics, Kwame Nkrumah University of Science and Technology (KNUST), Ghana (Reference number: CHRPE/AP/832/23), in accordance with the Declaration of Helsinki. Administrative permission was obtained from the Kassena-Nankana Municipal Health Directorate prior to commencement of fieldwork. Written informed consent was obtained from all adult participants. The confidentiality of all collected information was rigorously maintained; no personally identifying information was disclosed in the reporting of results.

RESULTS

Demographics of study participants

The study involved a total of 378 girls between ages 15 and 19 years. Averagely, the girls were 18 years old. The participants were students in secondary education and distributed across SHS 1 (37.8%), SHS 2 (21.7%), and SHS 3 (40.5%). Majority of the girls were Christians (85.5%) and 13.2% practiced Islam while 5 girls were traditional religious believers (See Table 1).

Adolescent girls' awareness, perception and use of modern contraceptives

Table 2 presents findings on young girls (15 to 19 years) awareness, perception and use of modern contraceptives. Nearly, all (98.2%) of the girls were aware of modern contraceptives but awareness about local or school policies on contraceptives was low as most (56.9%) girls were oblivious of same. For every ten adolescent girls, eight think it is good to know about contraceptives, although, a substantial proportion (30.7%) of them think that adolescent girls should not use contraceptives. Regarding the use modern contraceptive, the results further show that about 65.1% of girls had previously utilized contraceptives but a little less than one third (28.8%) are currently using contraceptives.

Factors associated with modern contraceptive utilization among adolescents

Both bivariate and multivariate logistic regression analysis were performed to determine the factors associated with the current use of modern contraceptives among adolescent girls. Table 3, therefore, provide both crude and adjusted odd ratios (ORs) after controlling for observable confounders.

The bivariate analysis highlights several associated factors to modern contraceptives use including girls' age, school grade, perception of contraceptive use, previous use of contraceptives, awareness of local or school policies on contraceptives, reception of comprehensive education, and comfort about contraceptives discussions.

However, after controlling for the observable confounders in the multivariate logistic regression, three statistically significant factors remained associated with girls' use of modern contraceptives. Age, previous use of contraceptive, and girls' disposition about discussing contraceptives were the factors that remained associated with current contraceptive utilization. As adolescent girls increased in age, the odds (aOR: 0.72; 95% CI: 0.54, 0.96; p-value: 0.023) of utilizing modern contraceptives declined significantly in both the bivariate and multivariate analysis. Previous contraceptive use, and girls with positive and comfortable feeling about contraceptive relate to significantly high chances of current contraceptive utilization. Compared with girls who had not previously used contraceptives, those who had previous record of contraceptive utilization were 17 times (aOR: 17.45; 95% CI: 5.70, 53.38; p-value: <0.0001) more likely to be current users of contraceptives. Also, adolescent girls who felt comfortable discussing contraceptives were 2 times (aOR: 2.39; 95% CI: 1.41, 4.06; p-value: 0.001) more probable to use modern contraceptives than their peers who were uncomfortable to talk about contraceptives.

Table 1
Demographic characteristics of
adolescent girls

Variable	n (%)
Age (mean, sd)	18 (0.06)
Grade; n (%)	
<i>SHS 1</i>	143 (37.8)
<i>SHS 2</i>	82 (21.7)
<i>SHS 3</i>	153 (40.5)
Religion; n (%)	
<i>Christianity</i>	323 (85.5)
<i>Islamic</i>	50 (13.2)
<i>Traditional</i>	5 (1.3)

Table 2
Awareness, perception and use of modern contraceptives

Variable	n (%)
Aware of contraceptives; n (%)	
Yes	371 (98.2)
No	7 (1.9)
Consider knowledge about contraceptives good; n (%)	
Yes	307 (81.2)
No	71 (18.8)
Thinks adolescents should use contraceptives; n (%)	
Yes	262 (69.3)
No	116 (30.7)
Previously used contraceptives; n (%)	
Yes	246 (65.1)
No	132 (34.9)
Currently uses contraceptives; n (%)	
Yes	109 (28.8)
No	268 (71.2)
Awareness of local or school policies on contraceptives; n (%)	
Yes	163 (43.1)
No	215 (56.9)

Younger adolescents

Table 3
Factors associated with modern contraceptive utilization

Bivariate analysis			Multivariate analysis			
Variable	OR	95% CI	p-value	aOR	95% CI	p-value
Age	0.75	0.62, 0.92	0.004	0.72	0.54, 0.96	0.023
Grade						
<i>SHS 1</i>	1.85	1.10, 3.13	0.021	0.67	0.30, 1.51	0.337
<i>SHS 2</i>	2.18	1.20, 3.96	0.010	0.94	0.47, 1.92	0.883
<i>SHS 3</i>	Ref.			Ref.		
Religion						
<i>Christianity</i>	Ref.			Ref.		
<i>Islam</i>	0.93	0.48, 1.81	0.838	0.88	0.42, 1.86	0.742
Aware of STIs						
<i>Yes</i>	1.94	0.94, 4.01	0.075	1.54	0.64, 3.70	0.334
<i>No</i>	Ref.			Ref.		
Consider knowledge about contraceptives good						
<i>Yes</i>	1.49	0.81, 2.75	0.196	1.12	0.51, 2.45	0.782
<i>No</i>	Ref.			Ref.		
Thinks adolescents should use contraceptives						
<i>Yes</i>	1.84	1.10, 3.09	0.021	1.86	0.98, 3.55	0.060
<i>No</i>	Ref.			Ref.		
Previously used contraceptives						
<i>Yes</i>	18.60	7.34, 47.15	< 0.0001	17.45	5.70, 53.38	< 0.0001
<i>No</i>	Ref.			Ref.		

Bivariate analysis				Multivariate analysis		
Variable	OR	95% CI	p-value	aOR	95% CI	p-value
Awareness of local or school policies on contraceptives						
Yes	2.72	1.72, 4.30	< 0.0001	1.85	1.06, 3.22	0.030
No	Ref.			Ref.		
Received comprehensive sexual education						
Yes	3.22	1.59, 6.53	0.001	0.98	0.43, 2.25	0.970
No	Ref.			Ref.		
Feel comfortable discussing contraceptives						
Yes	2.61	1.65, 4.13	< 0.0001	2.39	1.41, 4.06	0.001
No	Ref.			Ref.		

DISCUSSION

This study assessed the utilisation of modern contraceptives and identified associated factors among adolescent girls in SHSs in KNWD of Northern Ghana. Three key findings were discussed which includes: the high awareness but low utilisation rate, the inverse relationship between age and current contraceptive use, and the dominant predictive role of prior contraceptive experience and comfort with contraceptive discussion.

High Awareness but Low Utilisation

Nearly all participants (98.2%) were aware of modern contraceptives, yet only 28.8% reported current use. This wide awareness-utilisation gap is consistent with findings from similar settings. Klu and colleagues [11] in a study of adolescents in southern Ghana reported similarly high awareness (> 90%) but current utilisation rates of around 25–30%, and attributed the gap to social norms, fear of parental disapproval, and limited access to youth-friendly services. Likewise, Ahorlu et al. [12] found that awareness alone was an insufficient predictor of contraceptive uptake among Ghanaian adolescents, emphasising that psychosocial and structural barriers mediate the transition from knowledge to practice. Regionally, a systematic review of sub-Saharan African studies by Chandra-Mouli et al. [13] confirmed that high contraceptive knowledge among adolescents rarely translates into commensurate use, with utilisation rates typically lagging knowledge rates by 30–50 percentage points in school-based

populations. The 28.4% current utilisation rate observed in this study is somewhat lower than the national estimate of 35.6% among sexually active unmarried adolescents reported by the 2017 Ghana Maternal Health Survey [7], which may reflect the particularly conservative social environment of Northern Ghana, where religious and cultural barriers to adolescent contraception are more pronounced.

Age as an Inverse Predictor of Contraceptive Use

Younger adolescents in this study were paradoxically more likely to be current contraceptive users than older ones (aOR: 0.72 per year of age increase; $p = 0.023$). This counterintuitive finding has been documented in other studies. A study among Nigerian school-going adolescents, similarly found that older girls were less likely to use contraceptives, proposing that older students - who may have been sexually active for longer - develop a sense of complacency or invulnerability about pregnancy risk over time [14]. Conversely, younger girls who recently became sexually active may be more cautious and proactive in seeking contraception. A contrasting finding was reported in East Africa, where older age was positively associated with contraceptive use, suggesting that the relationship between age and contraceptive use may be context-specific and influenced by school grade, peer networks, and access to reproductive health services[15]. In the Ghanaian school context, the dominance of SHS 3 students among non-users (who were used as the reference category) and the comparatively younger SHS 1 and 2 students among current users further supports the age paradox observed here.

Prior Contraceptive Use as the Strongest Independent Predictor

The most striking finding of this study is that prior contraceptive experience increased the odds of current use by 17-fold (aOR: 17.45; $p < 0.0001$). This is consistent with behavioural continuity theory, which holds that past health behaviour is the strongest predictor of future health behaviour [16]. Similar findings have been reported across sub-Saharan Africa. A study among Ugandan adolescents found that prior contraceptive use increased the odds of current use by approximately 12-fold, concluding that initial uptake - however facilitated - is the critical gateway behaviour [17]. Also, in Zambia a study corroborated this finding that girls who had used any contraceptive in the past were significantly more likely to be consistent users at follow-up[18]. These results suggest that programmatic efforts focused on facilitating first-time contraceptive use - through peer education, youth-friendly health services, or school-based outreach - are likely to yield sustained utilisation. Prior use may reduce the psychological barrier, build self-efficacy, and establish behaviour patterns that sustain long-term contraceptive practice.

Comfort Discussing Contraceptives as a Social Enabler

Girls who were comfortable discussing contraceptives were more than twice as likely to be current users (aOR: 2.39; $p = 0.001$). This aligns with findings from the broader reproductive health literature linking open communication about contraception with increased utilisation. In a multi-country study, it is demonstrated that social norms permitting open discussion of contraception were among the most consistent enablers of adolescent contraceptive use, operating through pathways of self-efficacy and peer reinforcement [19]. A study specific to school-going girls found that comfort in discussing

contraceptives with peers and trusted adults approximately doubled the likelihood of use, which mirrors the magnitude of the effect observed in the present study[20]. Conversely, the discomfort reported by a substantial minority of girls in this study reflects the conservative social climate of the study district, where open discussion of sexual health remains stigmatised. These findings collectively highlight school-based programmes with potential to promote safe spaces for contraceptive dialogue, whether through trained peer educators, female health advocates, or structured reproductive health curricula.

Policy Awareness and Structural Factors

Awareness of local or school policies on contraceptives was significant in bivariate analysis (OR: 2.72; $p < 0.0001$) and retained marginal significance in the adjusted model (aOR: 1.85; $p = 0.030$). This suggests that institutional and policy environments matter, even after controlling for individual-level factors. A study demonstrated in a Francophone West Africa study that school-based policies permitting contraceptive use discussions significantly predicted utilisation among students, an effect that was independent of individual knowledge and attitudes [21]. However, the attenuation of this effect in multivariate analysis in the present study suggests that its influence is partly mediated through the comfort of contraceptive discussion and prior use, implying that supportive policies translate into use primarily by fostering enabling social environments rather than operating directly.

Study limitation

The cross-sectional design restricts the establishment of causal relationships between the identified predictors and current contraceptive use. Also, the study was conducted exclusively in SHSs in the Kassena-Nankana West District, which limits the generalisability of findings to adolescent girls in other districts and regions in Ghana.

CONCLUSION

This study found that while contraceptive awareness is near-universal among adolescent girls in SHSs in the Kassena-Nankana West District, current utilisation remains low at 28.8%. Prior contraceptive use, comfort discussing contraceptives, and younger age are the principal independent predictors of current utilisation. These findings highlight a persistent awareness-to-practice gap that does not appear to be explained by awareness alone, suggesting the possible influence of psychosocial, social normative, behavioural barriers, and other unmeasured factors, including knowledge. School-based reproductive health interventions in KNWD may consider promoting first-time contraceptive uptake, creating safe dialogue spaces, and leveraging prior users as peer educators – rather than investing further in awareness-raising alone. Policy frameworks should also support youth-friendly contraceptive services within or near school environments to bridge the gap between awareness, knowledge and practice.

Abbreviations

aOR

Adjusted Odds Ratio

CI

Confidence Interval

CHRPE

Committee on Human Research and Publication Ethics

GES

Ghana Education Service

GHS

Ghana Health Service

HIV/AIDS

Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome

KNWD

Kassena-Nankana West District

KNUST

Kwame Nkrumah University of Science and Technology

OR

Odds Ratio

SDG

Sustainable Development Goal

SHS

Senior High School

STI

Sexually Transmitted Infection

WHO

World Health Organization

Declarations

Clinical Trial

Not applicable

Consent for Publication

Not applicable.

Availability of Data and Materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

1. PA: Conceptualization, Methodology, Formal analysis, Writing - original draft
2. EA: Supervision, Methodology, Formal analysis, Writing - review & editing
3. JK: Data curation, Formal analysis, Writing - review & editing
4. POK: Formal analysis, Writing - review & editing
5. ICA: Data interpretation, Writing - review & editing
6. ASB: Data interpretation, Writing - review & editing
7. BS: Supervision, Methodology, Formal analysis, Writing - review & editing
8. MAA: Data collection, Writing - review & editing

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References

1. Mehta SD, Seeley J. Grand Challenges in Adolescent Sexual and Reproductive Health. *Front Reproductive Health* 2020;2. <https://doi.org/10.3389/frph.2020.00002>
2. George A, Jacobs T, Ved R, Jacobs T, Rasanathan K, Zaidi SA. Adolescent health in the Sustainable Development Goal era: Are we aligned for multisectoral action? *BMJ Glob Health* 2021;6. <https://doi.org/10.1136/bmjgh-2020-004448>
3. World Health Organization (WHO). *Health for the World's Adolescents A second chance in the second decade*. 2014.
4. Unesco U. *International technical guidance on sexuality education An evidence-informed approach*. n.d.
5. Loaiza E, Liang M. *ADOLESCENT PREGNANCY: A Review of the Evidence* *ADOLESCENT PREGNANCY: A Review of the Evidence* UNFPA New York, 2013 1 CONTENTS. n.d.
6. Osborne A, Wongnaah FG, Adeleye K, Bangura C, Aboagye RG, Ahinkorah BO. Prevalence and factors associated with unintended pregnancy among women in Ghana. *BMC Pregnancy Childbirth*. 2025;25. <https://doi.org/10.1186/s12884-025-07749-z>.

7. Statistical Service Accra G. Ghana Maternal Health Survey 2017. 2018.
8. Amoah-Saah I, Akosah JC. Teenage Pregnancy among Senior High School Students in Ghana: Causes, Effects and Prevention n.d. <https://doi.org/10.47772/IJRISS>
9. KASSENA-NANKANA WEST DISTRICT ASSEMBLY DISTRICT MEDIUM TERM DEVELOPMENT PLAN, UNDER AGENDA FOR JOBS. : CREATING PROSPERITY AND EQUAL OPPORTUNITY FOR ALL DRAFT REPORT. 2018.
10. Mohammed S. Analysis of national and subnational prevalence of adolescent pregnancy and changes in the associated sexual behaviours and sociodemographic determinants across three decades in Ghana, 1988–2019. *BMJ Open* 2023;13. <https://doi.org/10.1136/bmjopen-2022-068117>
11. Klu D, Gyapong M, Agordoh PD, Azagba C, Acquah E, Doegah P, et al. Adolescent perception of sexual and reproductive health rights and access to reproductive health information and services in Adaklu district of the Volta Region, Ghana. *BMC Health Serv Res.* 2023;23. <https://doi.org/10.1186/s12913-023-10447-1>.
12. Ahorlu CK, Pfeiffer C, Obrist B. Socio-cultural and economic factors influencing adolescents' resilience against the threat of teenage pregnancy: A cross-sectional survey in Accra, Ghana Adolescent Health. *Reprod Health* 2015;12. <https://doi.org/10.1186/s12978-015-0113-9>
13. Loaiza E, Liang M. ADOLESCENT PREGNANCY: A Review of the Evidence ADOLESCENT PREGNANCY: A Review of the Evidence UNFPA New York, 2013 1 CONTENTS. n.d.
14. Ipinnimo TM, Rosiji OO, Asake OT, Ibikunle OO, Ipinnimo MT, Asake TM. Adolescent sexuality education, sexual debut, and associated factors in Nigerian public secondary schools. *Sci Rep* 2025;15. <https://doi.org/10.1038/s41598-025-06360-8>
15. Negash HK, Lakew AM, Molla GE, Baraki AG, Mariye YF, Tesfaye W, et al. Utilization of long-acting contraceptive methods and associated factor among women of reproductive age in East Africa: A multi-level analysis of recent Demographic and Health Surveys. *PLoS ONE.* 2025;20. <https://doi.org/10.1371/journal.pone.0319003>.
16. Atchley RC. A Continuity Theory of Normal Aging. *Gerontologist.* 1989;29:183–90. <https://doi.org/10.1093/geront/29.2.183>.
17. Nsubuga H, Sekandi JN, Sempeera H, Makumbi FE. Contraceptive use, knowledge, attitude, perceptions and sexual behavior among female University students in Uganda: A cross-sectional survey. *BMC Womens Health* 2016;16. <https://doi.org/10.1186/s12905-016-0286-6>
18. Chola M, Hlongwana K, Ginindza TG. Patterns, trends, and factors associated with contraceptive use among adolescent girls in Zambia (1996 to 2014): a multilevel analysis. *BMC Womens Health* 2020;20. <https://doi.org/10.1186/s12905-020-01050-1>
19. Bhushan NL, Fisher EB, Maman S, Speizer IS, Gottfredson NC, Phanga T, et al. Communication, social norms, and contraceptive use among adolescent girls and young women in Lilongwe, Malawi. *Women Health.* 2021;61:440–51. <https://doi.org/10.1080/03630242.2021.1917479>.
20. PROTECTING AND EMPOWERING ADOLESCENT. GIRLS IN GHANA A statistical snapshot Suggested citation. n.d.

21. Fotso JC, Mayack JN, Tefouet N. Family planning high impact practices in Francophone West Africa: ownership, strategies and use for programming. BMC Public Health. 2026;26:1720.
<https://doi.org/10.1186/s12889-026-27319-y>.

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