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# SUPPLEMENTARY MATERIAL

## A systematic review of beneficial and adverse mental health outcomes associated with premarital sex among Nigerian adolescents and youths

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**Key words:** premarital sex, mental health, outcomes, adolescents, youths, Nigeria.

**Supplementary Table 1. Inclusion and exclusion criteria.**

| Criterion | Inclusion | Exclusion |
|---|---|---|
| Population | Adolescents and youths aged 10–24 years resident in Nigeria | Studies focusing exclusively on married adolescents or adults aged 25 years and above |
| Exposure | Premarital sexual activity (vaginal, anal, or oral intercourse before marriage) | Studies examining only non-penetrative sexual behaviors without reference to intercourse |
| Outcomes | Quantitative or qualitative data on mental health, psychological well-being, emotional outcomes, self-esteem, sexual esteem, depression, anxiety, guilt, shame, or related constructs | Studies reporting only physical health outcomes without any mental health or psychological data |
| Study design | Primary research including cross-sectional, case-control, cohort, qualitative, and mixed-methods studies | Systematic reviews, scoping reviews, narrative reviews, commentaries, editorials, and opinion pieces |
| Publication type | Peer-reviewed journal articles | Conference abstracts, dissertations, grey literature |
| Language | English | Non-English publications |
| Timeframe | Published between January 2013 and December 2025 | Published before January 2013 |

**Supplementary Table 2. Quality appraisal and risk of bias assessment.**

| Authors (Year) | Risk of bias score | Quality assessment score |
|---|---|---|
| Adewumi (2024)[19] | Moderate | Moderate |
| Kupoluyi (2025)[20] | Low | High |
| Gesinde *et al.* (2013)[21] | Moderate | Moderate |
| Enejoh *et al.* (2016)[22] | Moderate | Moderate |
| Onyesoh (2025)[23] | Moderate | Moderate |
| Akinyemi *et al.* (2025)[24] | Low | High |
| Folayan *et al.* (2016)[25] | Low | High |
| Ezumah *et al.* (2021)[26] | Low | High |
| Akamike *et al.* (2024)[27] | Moderate | Moderate |
| Agu *et al*. (2022)[28] | Low | High |
| Folayan *et al*. (2021)[29] | Low | High |
| Oniyangi *et al.* (2020)[30] | Moderate | Moderate |
| Adimora and Onwu (2019)[31] | Low | High |
| Ojo (2014)[32] | Moderate | Moderate |

**Supplementary Table 3. Summary of the included studies.**

| Authors (year) | Objectives of the study | Study design | Study settings and sample size | Key findings | Conclusion |
|---|---|---|---|---|---|
| Adewumi (2024)[19] | To examine the consequences of premarital sexual relationships and the effectiveness of adolescent counseling programs in secondary schools in Ekiti State | Cross-sectional | Secondary schools in Ekiti State, South-West Nigeria; n=120 teachers | Premarital sexual relationships were reported to result in emotional trauma, regret, feelings of guilt and disappointment, and negative impact on academic performance, and higher likelihood of infidelity in marriage. Counseling programs were found to be effective in advocating sexual abstinence | Premarital sex has significant negative emotional consequences; counseling programs promoting abstinence are effective interventions |
| Kupoluyi (2025)[20] | To investigate changes and predictors of premarital sexual intercourse (PSI) among never-married women aged 15–24 in Nigeria | Cross-sectional (secondary analysis of NDHS) | National (Nigeria); n=23,446 never-married women | Decline in the prevalence of premarital sexual intercourse.<br>Never married women aged 20-24 had higher odds of engaging in premarital sexual intercourse.<br>Age, education, religion, socioeconomic status, and community literacy were significant predictors | Concerted efforts to empower young women are required for further reduction in premarital sexual intercourse and associated adverse outcomes |
| Gesinde *et al.* (2013)[21] | To investigate twelve psychosexual constructs among university students and establish gender differences in sexual esteem and depression | Cross-sectional | Three universities in South-Western Nigeria; n=608 students | Participants reported higher scores for sexual esteem, satisfaction, and internal control, and lower scores for sexual depression, anxiety, and fear of sex. No significant gender differences were found in sexual esteem and depression | Nigerian university students exhibit positive psychosexual profiles; counsellors should develop programmes to enhance these outcomes |
| Enejoh *et al.* (2016)[22] | To determine whether adolescents with high self-esteem demonstrate lower risky sexual behaviour compared to those with low self-esteem | Cross-sectional | Nine secondary schools in Jos, Plateau State, North-Central Nigeria; n=361 adolescents in 9 secondary schools | Adolescents with low self-esteem were more likely to be sexually active and had higher risky sexual behaviour scores. Self-esteem was significantly associated with sexual activity | Programmes aimed at reducing risky sexual behaviour should incorporate interventions to raise adolescent self-esteem |
| Onyesoh (2025)[23] | To investigate the relationship between depression, anxiety, stress, and engagement in risky sexual behaviours among young people | Cross-sectional | Ibadan, Oyo State, South-West Nigeria; n=276 young individuals | Depression, anxiety, and stress collectively and significantly predicted risky sexual behaviour. Depression and stress are predictors of increased sexual risk-taking | There is a significant relationship between mental health problems and risky sexual behaviour; integrated mental health and sexual health interventions are needed |
| Akinyemi *et al.* (2025)[24] | To assess associations between body image concerns, obesity, intimate partner violence, sexual coercion, and depression among university students | Cross-sectional | Nigerian university (unspecified); n=501 students | Sexual coercion was reported, and strongly correlated with higher depression rates in both males and females Body image concerns and obesity also increased depression risk | Psychosocial factors including sexual coercion have complex impacts on depression; gender-sensitive mental health interventions are needed in universities |
| Folayan *et al.* (2016)[25] | To examine differences in sexual risk behaviour, stressors, and coping strategies among adolescents based on history of forced sexual initiation and HIV status | Cross-sectional | Twelve Nigerian states; n=436 sexually active adolescents aged 10–19 | Adolescents with a history of forced sexual initiation were significantly more likely to report anal sex and transactional sex. Forced sexual initiation and HIV status affected stress perception and use of coping strategies | Forced sexual initiation has lasting psychological consequences including altered stress perception and coping; interventions must address this vulnerable group |

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|---|---|---|---|---|---|
| Ezumah *et al.* (2021)[26] | To explore adolescents' perceptions about dating and sexual permissiveness in Ebonyi state | Qualitative (FGDs) | Three senatorial zones of Ebonyi State, South-East Nigeria; n=12 FGDs with in-school and out-of-school adolescents aged 13–18 | Adolescents viewed premarital, casual, and transactional sex as unaccepTable. However, some perceived premarital abstinence as a hindrance to sexual satisfaction in marriage. Transactional sex was viewed by some as a survival strategy. Boys were more permissive than girls | Adolescents' perceptions of sexual behaviours vary and are gendered; interventions must be contextually tailored |
| Akamike *et al.* (2024)[27] | To determine the effectiveness of a school health club training programme in improving knowledge and perceptions of gender norms about sexuality | Quasi-experimental intervention study | Twelve secondary schools in Ebonyi State, South-East Nigeria; adolescents in intervention (n=6) and control (n=6) schools | About 90% of adolescents in both arms agreed that both boys and girls should remain virgins until marriage. The intervention showed modest effects on gender norm perceptions | School health club interventions can influence gendered sexual norms; sustained programming is needed for meaningful impact |
| Agu *et al.* (2022)[28] | To examine the perspectives of adolescents about the influence of gender norms and ideologies on sexuality | Mixed methods (cross-sectional survey + FGDs) | Three urban and three rural communities in South-Eastern Nigeria; n=1,057 adolescents aged 13–18 + 12 FGDs | The dominant belief was that premarital sex is wrong, and adolescents should abstain. Boys were less likely to believe in premarital abstinence. Gender was a significant predictor of sexual beliefs | Gender norms strongly influence adolescent sexuality; interventions must address these contextual ideologies |
| Folayan *et al*. (2021)[29] | To determine the association between mental health and risky oral and sexual health behaviours among adolescents | Cross-sectional (household survey) | Ile-Ife, Osun State, South-West Nigeria; n=1,409 adolescents aged 10–19 | High psychological distress was associated with lower likelihood of multiple sex partners but higher likelihood of multiple risky behaviours. Depressive symptoms were associated with higher odds of neglecting condom use and having multiple partners | The association between psychological distress and sexual risk behaviours is complex and bidirectional |
| Oniyangi *et al*. (2020)[30] | To investigate peer pressure and poor parent-adolescent communication as factors influencing premarital sex | Cross-sectional | Kulende, Sango, Ilorin, Kwara State, North-Central Nigeria; n=200 adolescents | Peer pressure and poor parent-adolescent communication significantly influenced premarital sexual activity | Parental communication and peer influence are critical determinants of premarital sex; parents should foster open communication with their children |
| Adimora and Onwu (2019)[31] | To determine the socio-demographic factors of early sexual debut and depression among secondary school adolescents | Cross-sectional | Secondary schools in Nsukka Education Zone, Enugu State, South-East Nigeria; n=408 adolescents | Depressed adolescents were more likely to have experienced sexual intercourse. Early sexual debut was associated with depressive disorders. Female gender and older age were associated with higher depression rates | Early sexual debut is significantly associated with depression among adolescents; mental health screening should be integrated into adolescent sexual and reproductive health (SRH) services |
| Ojo (2014)[32] | To investigate psychosocial factors influencing premarital sexual attitudes of adolescents and young adults in South-West Nigeria | Cross-sectional | South-West Nigeria; n=1,269 adolescents and young adults in Lagos, Ogun, and Osun states | Premarital sexual attitudes (PSA) were influenced by religiosity, parental communication, peer influence, and self-esteem. More permissive attitudes were associated with lower religiosity and higher peer influence | Psychosocial factors significantly shape premarital sexual attitudes; interventions should address multiple levels of influence |

FGD, focus group discussion; PSA, premarital sexual attitudes; SRH, sexual and reproductive health; NDHS, Nigeria Demographic and Health Survey.

**Supplementary Table 4. Contrasting mental health outcomes associated with consensual and coerced premarital sexual experiences among Nigerian adolescents and youths.**

| Dimension | Consensual premarital sexual experiences | Coerced/forced sexual experiences |
|---|---|---|
| Typical psychological responses | Sexual satisfaction, sexual esteem, intimacy, and sexual assertiveness among some university populations; however, evidence is limited | Emotional trauma, altered stress perception, maladaptive coping, and increased psychological burden |
| Influence of social context | Outcomes influenced by relationship quality, consent, personal beliefs, and societal stigma | Psychological distress often intensified by violation of autonomy, fear, stigma, and lack of support |
| Level of evidence | Limited evidence from few studies with restricted generalizability | More consistent evidence of adverse psychological consequences across available studies |
| Implications for intervention | Promote informed decision-making, healthy relationships, consent education, and access to youth-friendly sexual and reproductive health services | Prioritize trauma-informed care, mental health support, safeguarding, and prevention of sexual violence |