




Research

Multiple sexual partnership among school-going adolescents in Benin: a population-based study of prevalence and predictors

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Abstract

Aim The study investigated the prevalence and determinants of multiple sexual partnerships among school-going adolescents.

Methods A secondary analysis of data from the 2016 Global School-Based Student Health Survey (GSHS) was conducted to determine the prevalence and determinants of multiple sexual partners among 2496 school-going adolescents aged 13–17 years in Benin.

Results The overall prevalence of multiple sexual partnerships was 26.1% among adolescents. After adjusting for other factors, male sex (AOR = 4.80, 95% CI 3.78–6.09), truancy (AOR = 1.69, 95% CI 1.35–2.12), sedentary lifestyle (AOR = 1.28, 95% CI 1.00–1.62), cigarette smoking (AOR = 3.14, 95% CI 1.95–5.07) and alcohol use (AOR = 1.78, 95% CI 1.44–2.20) were significantly associated with the increased odds of engaging in multiple sexual partnerships. However, younger age (AOR = .37, 95% CI 0.25–0.56), lower grade (AOR = .52, 95% CI 0.42–65), and parental monitoring (AOR = 0.71, 95% CI 0.55–0.91) were significantly associated with lower odds of engaging in multiple sexual partnerships.

Conclusions Risky sexual behaviour interventions should focus on adolescents' personal, school and psychosocial characteristics using multidisciplinary approaches. These approaches will contribute to achieving Sustainable Development Goals 3, target 3.4 of promoting adolescent mental health and well-being, and Goal 4, target 1 of ensuring equitable education toward effective learning outcomes among Beninese school-going adolescents.

Keywords Adolescents · Multiple sexual partners · Prevalence · Correlates · Benin

1 Introduction

Transitioning from childhood to adulthood, known as the adolescent period (age 10–19 years), is one of the most important life transitional stages. The adolescent population worldwide is estimated to be 1.3 billion, accounting for slightly more than a quarter of the world's population (United Nations Children Fund, UNICEF, [59]). This stage of life is often characterised by physical, psychological, and social changes [27, 40, 65]. Physically, teenage girls developing breasts and boys developing larger testes and penises may get interested in how their bodies are evolving and how that affects

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sexual development [24]. Psychologically, teenagers may also begin to doubt their sexual orientation as they grow more conscious of their sensations and desires toward others. Others struggle with self-esteem, early pregnancies, emotional abuse in relationships, and other challenges linked to their sexual health [34, 50]. In contrast, socially, teenagers may feel pressured to partake in sexual activity because their friends are talking about their experiences. The experiences accompanying this transition can lead to heightened curiosity and enthusiasm about various aspects of life, including first sexual encounters. Early sexual activities typically have lifelong effects on the health and well-being of this young cohort of people [11, 42].

Globally, there have been conscious efforts to reduce and eventually eliminate risky sexual behaviours (RSBs) among the adolescent population. Examples are the measures adopted at the Ottawa Charter for Health Promotion in 1986, the 1994 International Conference on Population and Development (ICPD), and the creation of adolescents' "corners" at health facilities and youth-friendly services to meet the sexual and reproductive health needs of young women and men [17, 53, 61]. Despite the policies and interventions adopted, the occurrence of HIV and other sexually transmitted infections (STI) remains disproportionately high among adolescents [60]. Globally, about 38.4 million people are living with HIV [58]. Also, about 1.5 million people were newly infected with HIV in 2021. This high prevalence of HIV/AIDS is more profound in sub-Saharan Africa (SSA), where six in seven new HIV infections among adolescents aged 15–19 years are among girls [58]. Also, SSA accounts for 70% of new HIV infections globally [60]. These trends raise serious concerns about the probable reasons for the high prevalence of STI and HIV-specific deaths in sub-Saharan Africa.

Several studies have found a high prevalence of STIs and HIV infections in sub-Saharan Africa to be associated with engagement in risky sexual behaviours such as inconsistent and non-condoms usage, intergenerational sex, and early sexual initiation [12, 31, 38]. Besides, multiple sexual partnerships are related to a high risk of contracting STIs, including HIV [9]. Multiple sexual partnerships are defined as having two or more sexual partners over a particular period, which could either be sequential (serial monogamy) or concurrent [37]. This practice may be concurrent or serial and doubles as a serious public health concern in any nation [3, 55]. Previous research has indicated that the risk of acquiring HIV through multiple sexual partners was 79% among young people [27], while others have established that multiple sexual partnerships constituted the strongest predictor of the risk of contracting HIV [39, 49].

Empirical evidence shows adolescents are engaging in multiple sexual relationships in the Sub-Saharan Africa region [22, 47, 48]. For instance, a study among adolescents from five SSA countries (Benin, Mozambique, Namibia, Seychelles, and Tanzania) documented a 20.9% pooled prevalence of multiple sexual partners [47, 48]. The prevalence of multiple sexual relationships varies across nations and includes 85.2% in Sierra Leone [22], 75.3% in Liberia [22], and 12% and 13% among adolescent females and males, respectively, in Rwanda [56]. The prevalence of multiple sexual relationships is associated with individual and household, interpersonal and community level factors, including age, age at first sexual intercourse, alcohol consumption, substance abuse, wealth, media exposure, and residence [33, 46, 62].

To date, there is a lack of recent national data on adolescent sexual risk behaviour and its correlates in Benin. Empirical information on the prevalence and determinants of multiple sexual partners among school-going adolescents in Benin is uncharted, yet sexual debut over the years has increased among this population [29]. In Benin, school-going adolescents who initiated sexual activities by age 15 were estimated at 13% in 2006, which increased significantly to 85% by 2010 (Institut National de la Statistique et de l'Analyse Economique [21, 29]). Further, current evidence from the Demographic and Health Survey (DHS) conducted in sub-Saharan Africa countries from 2011 to 2021 revealed the prevalence of early sexual initiation of youth female in Benin to be 51.97 for the years 2017/2018 [15]. This estimate may threaten Benin's achievement of Sustainable Development Goal 3, which aims at ensuring healthy lives and promoting well-being for all ages [63]. Therefore, understanding the recent prevalence and factors associated with multiple partnerships and its risk factors among in-school adolescents in Benin would help design suitable school-based sexuality education and promotion interventions to delay sexual initiation and potential multiple sexual partnerships. This study examines the prevalence and determinants of multiple sexual partners among school-going adolescents in Benin. It hypothesises that significant risk factors will be identified at the micro- and meso-system levels to predict in-school adolescent multiple sexual partnerships. However, because of the complexity of adolescent sexual behaviour and context-specific variations, no opinion was offered or formulated on the predictors of the criterion variable.

1.1 Theoretical framework: the bioecological systems theory

The study draws on the perspective of Bronfenbrenner's bioecological systems theory, which suggests that behaviour is the product of the interaction between personal and environmental characteristics [6, 8]. This interaction could be changed by the presence of risk and protective determinants that could help explicate the variations in health outcomes

in a given population [25, 32]. According to this theory, sexual behaviours could be influenced by individual and household (microsystem), interpersonal (mesosystem), and community (exosystem) characteristics of an individual as well as institutional or policy factors (macrosystem) [5, 7, 18]. Thus, sexual behaviour is seen as an interplay of environmental and individual factors [25, 32]. Therefore, variables within these three systems may predict adolescent sexual behaviour.

Consequently, the study used variables at the micro (i.e., sociodemographic and personal factors such as sex, age, grade, truancy, hunger and sedentary lifestyle), mesosystem and exosystem levels (i.e., psychosocial factors such as being physically attacked, physical fight, seriously injured, worrying, suicidal behaviours [thought, plan, and attempt], close friends, people smoked in adolescent's presence, parental use of tobacco, having parents who check to see if adolescents have done their assignments, having understanding parents, parental knowledge on what adolescents do with their free time, parents or guardians who never or rarely went through adolescents' things without their knowledge). Extant literature has found some of these variables to be associated with risky sexual behaviours, including multiple sexual partnerships [2, 16, 43]. For instance, evidence suggests that adolescents who were truant, engaged in physical fights, used alcohol and smoked were more likely to engage in multiple sexual relationships [14, 41, 44]. To the best of our knowledge, no variable was examined at the macro level in the study. The sexual life experiences of adolescents over time impact how they engage in sexual behaviours.

2 Methods

2.1 Data source and research design

This study used secondary data analysis from the Benin 2016 Global School-Based Health Survey (GSHS). The GSHS is a school-based survey that employs a self-administered questionnaire to collect data on young people's risk-taking behaviours and protective factors associated with the primary causes of morbidity and mortality among children and adults globally. The GSHS employs a cross-sectional study design to gather data from WHO member nations interested in preventing risky sexual behaviours among adolescents. The GSHS collected data from school-going adolescents aged 13–17 years in Benin. The WHO developed this survey in partnership with UNICEF, the Joint United Nations Programme on HIV/AIDS (UNAIDS), and the United Nations Educational, Scientific and Cultural Organization (UNESCO). The financial and technical assistance was aided by the US Centre for Disease Control and Prevention (CDC) [64].

2.2 Sampling, data collection and sample size

The GSHS survey employed a two-stage cluster sampling design to gather data representative of students in Grades 6–12 and terminal grade in each country. Usually, students in these grades are adolescents aged 13–17 years. For the first stage of primary sampling units, schools were selected with probability proportional to their enrollment size. The second stage involved a systematic random sampling of classes in selected schools. All students in selected classes were eligible and invited to participate. Standard survey instructions were clearly explained, and participants were free to withdraw or not respond to any question on the questionnaire. Survey questions were translated into French for the students and pilot tested for comprehension. Students completed the self-administered questionnaire during a class period without personal identification. The school response rate was 100%, the student response rate was 78%, and the overall response rate was 78%. A total of 2,536 students participated in the Benin GSHS. However, 2496 responses were used in the analysis. The excluded responses had missing values above 10% of participants' responses.

2.3 Study variables

The key outcome variable was "multiple sexual partners" among the students. The outcome variable was "whether or not the student had ever slept with more than one sexual partner before". The response options were "1 = yes" or "0 = no". Those who selected option one (yes) were labelled as those who had ever had multiple sexual partners, and those who selected option zero (no) were those who had never had sex with multiple sexual partners. The independent variables were classified as sociodemographic (sex, age, and grade), personal (truancy, hunger and sedentary lifestyle), drugs and substance use (current use of marijuana, current alcohol use, and current smoking of cigarettes), and psychosocial (were physically attacked, being in physical fights, seriously injured, worry about things an adolescent could not study, suicidal behaviours (thoughts, plans, attempts), close friends, people smoked in adolescent's presence, parental use of

tobacco, having parents who check to see if adolescents have done their assignments, having understanding parents, parental knowledge on what adolescents do with their free time, parents or guardians who never or rarely went through their adolescent children things without their knowledge) (see Table 1).

2.4 Data analysis

The Statistical Package for Social Sciences (SPSS) version 27.0 was used to analyse the data for this study. The sample weighting approach was used at the school, student, and sex within grade levels to make it representative of Benin adolescents and reduce bias on various trends of nonresponses. The multiple imputations (MI) technique was used to replace missing values [30]. The MI approach was applied when the missing values were 1%. The missing data allowed in our imputation ranged from 1 to 10% and was missing randomly. We performed five MIs using the automatic imputation approach to preserve data quality in the presence of missing values. Using the full case analysis approach, imputed values were appropriately compared to observed values and results.

The unit of analysis was the individual participants. Also, a bivariate analysis with the Pearson Chi-square test was employed to determine the association between having multiple sexual partners and the explanatory variables. Variables that were significant in the Pearson Chi-square test were used to build the logistic regression model. A binomial logistic regression model was used to measure the extent to which explanatory factors predict the outcome variable (where $p < 0.05$ was considered statistically significant) [19]. Obtained results were reported with the corresponding adjusted odds ratio (AOR) at a 95% confidence interval (CI) ($p < 0.05$).

3 Results

3.1 Prevalence of multiple sexual partnerships among adolescents in Benin stratified by background characteristics

The prevalence of multiple sexual partners among in-school adolescents in Benin was 651 (26.1%) (see Fig. 1). Significantly, 534 (21.4%) males reported ever having multiple sexual partners. Also, 619 (24.8%) of in-school adolescents aged 16–18 years and 344 (13.8%) of those in their terminal or second grade had multiple sexual partners. Also, 184 (7.4%) truant adolescents and 251 (10.1%) of those who engaged in sedentary lifestyles had multiple sexual partners. Again, experiences of multiple sexual partners were reported among 168 (6.7%) participants who were physically attacked, 184 (7.4%) of those who engaged in physical fights, 312 (12.5%) of those seriously injured, and 164 (6.6%) of those who mostly worry. Further, 115 (4.6%) of adolescents who had suicidal thoughts, 140 (5.6%) of those who planned suicide, 134 (5.4%) of those who attempted suicide, 59 (2.4%) of those with close friends, 388 (15.5%) of those who witness other people smoking had multiple sexual partners. Besides, 92 (3.7%) of adolescents whose parents/guardians use tobacco, 199 (8.0%) of those whose parents check on their school assignments, 183 (7.3%) of those whose parents understand them, 151 (6.0%) those whose parents/guardians knew what they do with their free time, and 562 (22.5%) of those whose parents/guardians rarely go through their things without their knowledge had multiple sexual partners (see Table 2).

3.2 Distribution and chi-square analysis of multiple sexual partners across explanatory variables

The Chi-Square test shows that sex ($\chi^2 = 272.36$, $p < 0.001$), age ($\chi^2 = 61.36$, $p < 0.001$), grade ($\chi^2 = 81.62$, $p < 0.001$), sedentary lifestyle ($\chi^2 = 13.80$, $p < 0.001$), truancy ($\chi^2 = 119.64$, $p < 0.001$), current tobacco smoking ($\chi^2 = 106.52$, $p < 0.001$), current alcohol use ($\chi^2 = 83.51$, $p < 0.001$) and current marijuana use ($\chi^2 = 29.30$, $p < 0.001$) were significantly associated with multiple sexual partners among participants. Also, adolescents who were physically attacked ($\chi^2 = 12.52$, $p < 0.001$), engaged in physical fights ($\chi^2 = 15.93$, $p < 0.001$), were seriously injured ($\chi^2 = 8.33$, $p < 0.01$), mostly worry ($\chi^2 = 8.07$, $p < 0.01$), had suicidal thoughts ($\chi^2 = 5.63$, $p < 0.05$), planned suicide ($\chi^2 = 17.14$, $p < 0.001$) and attempted suicide ($\chi^2 = 17.97$, $p < 0.001$) had multiple sexual partners. Further, participants who had close friends ($\chi^2 = 6.59$, $p < 0.01$), witnessed people smoking ($\chi^2 = 29.05$, $p < 0.001$), whose parents smoked cigarettes ($\chi^2 = 16.56$, $p < 0.001$), whose parents check on their school assignments ($\chi^2 = 12.34$, $p < 0.001$), whose parents understand them ($\chi^2 = 8.977$, $p < 0.001$), had parents who knew what they do with their free time ($\chi^2 = 45.93$, $p < 0.001$), and those whose parents/guardians rarely went through their things without their knowledge were significantly associated with multiple sexual partners among adolescents (see Table 2).

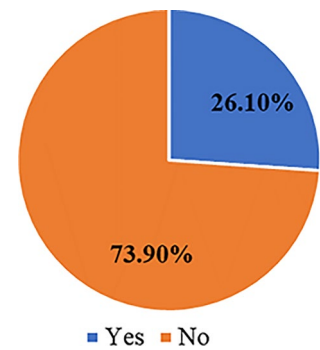
Table 1 Definition of explanatory and measurement coding of variables

| Variables | Questions asked | Response categories |
|--|---|------------------------|
| Micro-level | | |
| Demographic | | |
| Sex | What is your sex? | 1 = Male 2 = Female |
| Age | How old are you? | 1 = 12–14 0 = 15–17 |
| Grade | In what grade are you? | 1 = 1–3 0 = 4–6 |
| Personal | | |
| Truancy | During the past 30 days, did you miss classes or school without permission? | 1 = yes 0 = no |
| Sedentary lifestyle | Do you spend three hours or more doing sitting activities in a day? | 1 = yes 0 = no |
| Drugs and substance use | | |
| Smoke cigarettes | During the past 30 days, did you smoke cigarettes? | 1 = yes 0 = no |
| Drank alcohol | During the past 30 days, did you have at least one drink containing alcohol? | 1 = yes 0 = no |
| Use marijuana | During the past 30 days, did you use marijuana? | 1 = yes 0 = no |
| Mesosystem & exosystem-level | | |
| Psychosocial | | |
| Physically attacked | Have you been attacked physically before? | 1 = yes 0 = no |
| Physical fight | Have you engaged in a physical fight before? | 1 = yes 0 = no |
| Seriously injured | During the past 12 months, have you experienced any serious injury/s? | 1 = yes 0 = no |
| Worry | Do you most of the time or always worry about something that you cannot sleep? | 1 = yes 0 = no |
| Suicidal thoughts | During the past 12 months, did you ever seriously consider attempting suicide? | 1 = yes 0 = no |
| Suicide plan | During the past 12 months, did you attempt suicide? | 1 = yes 0 = no |
| Suicide attempt | During the past 12 months, did you make a plan about how you would attempt suicide? | 1 = yes 0 = no |
| Close friends | Do you have any close friends? | 1 = yes 0 = no |
| People smoked in adolescent's presence | During the past 12 months, has anybody smoked in your presence? | 1 = yes 0 = no |

Table 1 (continued)

| Variables | Questions asked | Response categories |
|--|---|---------------------|
| Parental use of tobacco | Do you have parents or guardians who use any form of tobacco? | 1 = yes 0 = no |
| Parents/guardians check if an assignment was done | During the past 30 days, have your parents or guardians ever checked to see if your homework was done? | 1 = yes 0 = no |
| Understanding parents | During the past 30 days, did your parents or guardians understand your problems and worries? | 1 = yes 0 = no |
| Parental knowledge of what is done during leisure | During the past 30 days, did your parents or guardians really know what you were doing with your free time? | 1 = yes 0 = no |
| Parents or guardians never or rarely went through an adolescent's things | During the past 30 days, have your parents or guardians ever checked to see if your homework was done? | 1 = yes 0 = no |
| Sex with multiple sexual partners | Have you slept with two or more partners before? | 1 = yes 0 = no |

Fig. 1 Prevalence of multiple sexual partners among school-going adolescents in Benin



3.3 Multivariate analysis predictors of multiple sexual partners among school-going adolescents in Benin

Table 3 shows the logistic regression for predictors of multiple sexual partners among school-going adolescents in Benin. The results show that males are more likely to have multiple sexual partners than females (AOR = 4.80, 95% CI 3.78–6.10). Also, adolescents aged 13–15 years were less likely to have multiple sexual partners than those aged 16–18 years (AOR = 0.37, 95% CI 3.78–6.10). Again, adolescents in the 3rd–6th grade were less likely to have multiple sexual partners compared with those in their terminal or second grade (AOR = 0.52, 95% CI 0.420–0.650). Further, truant adolescents were more likely to have multiple sexual partners than punctual students (AOR = 1.69, 95% CI 1.35–2.12). Those who engaged in sedentary lifestyles were more likely to have multiple sexual partners than those who did not engage in sedentary lifestyles (AOR = 1.28, 95% CI 1.00–1.62). Also, adolescents who currently smoke cigarettes (AOR = 3.14, 95% CI 1.95–5.07) and those who currently drink alcohol (AOR = 1.78, 95% CI 1.44–2.20) were more likely to have multiple sexual partners than those who do not smoke cigarettes and do not currently drink alcohol. Again, adolescents whose parents knew what they do during their free time were less likely to have multiple sexual partners (AOR = 0.71, 95% CI 0.55–0.91).

4 Discussion

Analysing the dataset from the 2016 GSHS, the study estimated the prevalence of multiple sexual partnerships among school-going adolescents in Benin. The prevalence of multiple sexual partnerships among our participants in Benin was 26.1%. This prevalence is higher than the 23.5% reported among students in South Africa [43] but lower than the 33.3% prevalence reported among adolescents in Ghana [66] and 40.6% in Uganda [51]. The differences in study periods, population sizes, socio-cultural contexts, and measurement approaches in each study may explain the variations in the prevalence of multiple sexual partnerships. Also, while this study examined the prevalence of multiple sexual partnerships in both male and female sexes, some previous studies focused primarily on only one sex (either male or female). Nonetheless, the prevalence of multiple sexual partnerships among adolescents in Benin portends major threats to the reproductive health of adolescents. This outcome calls for increasing awareness about the dangers of multiple sexual partnerships among school-going adolescents in Benin to help reduce the menace.

Male school-going adolescents in Benin were almost five times more likely to have multiple sexual partners than their female colleagues. This finding is consistent with previous studies in South Africa [43], North Ethiopia [16] and Northeast Ethiopia [2]. Some social forces could drive males' likelihood of having multiple sexual partners. From a socio-cultural lens, many sub-Saharan African countries place greater community acceptance of males having multiple sexual partners as a cultural norm [4], perhaps because this practice is considered socially desirable and denotes higher social status for males. Indigenous customs and masculinity orientation expect a man to have a steady partner and a girlfriend (s) he secretly sees for sexual engagements [28, 36, 52]. Such men have these unscrupulous relationships for sexual satisfaction, driven by negative cultural beliefs that influence them to have more than one sexual partner [36]. Therefore, it is not surprising to see male school-going adolescents' dominance in the practice of multiple sexual partnerships in Benin.

Age was a significant predictor of multiple sexual partnerships among adolescents in Benin. Adolescents aged 13–15 years were less likely to have multiple sexual partners than those aged 16–18 years. Similarly, some previous studies found higher odds of engaging in multiple sexual partnerships among older adolescents than younger ones [51, 66]. However, different age categorisations were used to interpret the findings from these studies. That notwithstanding,

Table 2 Bivariate association of risk factors and reported multiple sexual partners among school-going adolescents in Benin (N = 2496)

| | | Multiple sexual partners | | Chi-square (χ^2) | Phi |
|---|--------|--------------------------|--------------|-------------------------|--------|
| | | Yes (%) | No (%) | | |
| Demographic | | | | | |
| Sex | Male | 534 (21.4%) | 822 (32.9%) | 272.36*** | 0.330 |
| | Female | 117 (4.7%) | 1023 (41.0%) | | |
| Age | 13–15 | 32 (1.3%) | 320 (12.8%) | 61.36*** | -0.157 |
| | 16–18 | 619 (24.8%) | 1525 (61.1%) | | |
| Grade | 1–3 | 307 (12.3%) | 1239 (49.6%) | 81.62*** | -0.181 |
| | 4–6 | 344 (13.8%) | 606 (24.3%) | | |
| Personal | | | | | |
| Hunger | Yes | 118 (4.7%) | 310 (12.4%) | 0.59 | 0.015 |
| | No | 533 (21.4%) | 1535 (61.5%) | | |
| Sedentary lifestyle | Yes | 184 (7.4%) | 390 (15.6%) | 13.80*** | 0.074 |
| | No | 467 (18.7%) | 1455 (58.3%) | | |
| Truancy | Yes | 251 (10.1%) | 324 (13.0%) | 119.64*** | |
| | No | 400 (16.0%) | 1521 (60.9%) | | |
| Drugs and substance use | | | | | |
| Smoke cigarettes | Yes | 77 (3.1%) | 37 (1.5%) | 106.52*** | 0.207 |
| | No | 574 (23.0%) | 1808 (72.4%) | | |
| Drank alcohol | Yes | 381 (15.3%) | 699 (28.0%) | 83.51*** | 0.183 |
| | No | 270 (10.8%) | 1146 (45.9%) | | |
| Marijuana use | Yes | 24 (1.0%) | 13 (0.5%) | 29.30*** | 0.108 |
| | No | 627 (25.1%) | 1832 (73.4%) | | |
| Psychosocial | | | | | |
| Physically attacked | Yes | 168 (6.7%) | 355 (14.2%) | 12.52*** | 0.071 |
| | No | 483 (19.4%) | 1490 (59.7%) | | |
| Physical fight | Yes | 184 (7.4%) | 381 (15.3%) | 15.93*** | 0.080 |
| | No | 467 (18.7%) | 1464 (58.7%) | | |
| Seriously injured | Yes | 312 (12.5%) | 764 (30.6%) | 8.33** | 0.058 |
| | No | 339 (13.6%) | 1081 (43.3%) | | |
| Bullied | Yes | 288 (11.5%) | 764 (30.6%) | 1.58 | 0.025 |
| | No | 363 (14.5%) | 1081 (43.3%) | | |
| Loneliness | Yes | 107 (4.3%) | 255 (10.2%) | 2.65 | 0.033 |
| | No | 544 (21.8%) | 1590 (63.7%) | | |
| Worry | Yes | 164 (6.6%) | 367 (14.7%) | 8.07** | 0.057 |
| | No | 487 (19.5%) | 1478 (59.2%) | | |
| Suicidal ideation | Yes | 115 (4.6%) | 255 (10.2%) | 5.63* | 0.047 |
| | No | 536 (21.5%) | 1590 (63.7%) | | |
| Suicidal Plan | Yes | 140 (5.6%) | 268 (10.7%) | 17.14*** | 0.083 |
| | No | 511 (20.5%) | 1577 (63.2%) | | |
| Suicidal attempt | Yes | 134 (5.4%) | 251 (10.1%) | 17.97*** | 0.085 |
| | No | 517 (20.7%) | 1594 (63.9%) | | |
| Close friends | Yes | 59 (2.4%) | 237 (9.5%) | 6.59** | -0.051 |
| | No | 592 (23.7%) | 1608 (64.4%) | | |
| People smoked in adolescent's presence | Yes | 388 (15.5%) | 873 (35.0%) | 29.05*** | 0.108 |
| | No | 263 (10.5%) | 972 (38.9%) | | |
| Parents/guardians use of tobacco | Yes | 92 (3.7%) | 158 (6.3%) | 16.56*** | 0.081 |
| | No | 559 (22.4%) | 1687 (67.6%) | | |
| Parents/guardians check if an assignment was done | Yes | 199 (8.0%) | 706 (28.3%) | 12.34*** | |
| | No | 452 (18.1%) | 1139 (45.6%) | | |

Table 2 (continued)

| | | Multiple sexual partners | | Chi-square (χ^2) | Phi |
|--|-----|--------------------------|--------------|-------------------------|--------|
| | | Yes (%) | No (%) | | |
| Understanding parents | Yes | 183 (7.3%) | 637 (25.5%) | 8.977** | -0.060 |
| | No | 468 (18.8%) | 1208 (48.4%) | | |
| Parental knowledge of what is done during leisure | Yes | 151 (6.0%) | 698 (28.0%) | 45.93*** | -0.136 |
| | No | 500 (20.0%) | 1147 (46.0%) | | |
| Parents or guardians never or rarely went through an adolescent's things | Yes | 562 (22.5%) | 1486 (59.5%) | 10.94*** | 0.066 |
| | No | 89 (3.6%) | 359 (14.4%) | | |

The phi coefficient assesses the strength and direction of association between the variables. Cell percentages have been presented instead of row percentages to account for each cell's specific context and how the responses relate to the total number of occurrences in that cell

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3 Multivariate analysis of selected factors and reported multiple sexual partners among school-going adolescents in Benin

| Variables | AOR | 95% Confidence interval for the AOR | |
|--|---------|-------------------------------------|-------|
| | | Lower | Upper |
| Micro-level | | | |
| Demographic | | | |
| Sex (male) | 4.80*** | 3.78 | 6.09 |
| Age (13–15) | 0.37*** | 0.25 | 0.56 |
| Grade (1–3) | 0.52*** | 0.42 | 0.65 |
| Personal | | | |
| Truancy | 1.69*** | 1.35 | 2.12 |
| Sedentary lifestyle | 1.278* | 1.00 | 1.62 |
| Drugs and substance use | | | |
| Smoke cigarettes | 3.14*** | 1.95 | 5.07 |
| Drank alcohol | 1.78*** | 1.44 | 2.20 |
| Use marijuana | 2.06 | 0.87 | 4.87 |
| Mesosystem & exosystem-level | | | |
| Psychosocial | | | |
| Physically attacked | 1.15 | 0.89 | 1.49 |
| Physical fight | 1.30 | 1.01 | 1.68 |
| Seriously injured | 1.03 | 0.83 | 1.27 |
| Worry | 1.17 | 0.91 | 1.49 |
| Suicidal thoughts | 0.92 | 0.64 | 1.32 |
| Suicide plan | 1.53 | 1.08 | 2.16 |
| Suicide attempt | 1.24 | 0.90 | 1.70 |
| Close friends | 0.90 | 0.64 | 1.26 |
| People smoked in adolescent's presence | 1.23 | 0.99 | 1.51 |
| Parental use of tobacco | 1.04 | 0.76 | 1.44 |
| Parents/guardians check if an assignment was done | 1.02 | 0.81 | 1.29 |
| Understanding parents | 0.99 | 0.77 | 1.26 |
| Parental knowledge of what is done during leisure | 0.71** | 0.55 | 0.91 |
| Parents or guardians never or rarely went through an adolescent's things | 1.31 | 0.98 | 1.77 |
| Constant | 0.18*** | | |

Hosmer and Lemeshow test (goodness of fit), $\chi^2(8) = 6.91$, $p = 0.56$

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

this observed outcome among adolescents in Benin can be explained from the perspective of the sexual transitions that occur during adolescence. In a previous study in Benin, the average age of sexual intercourse initiation was 14.75 [1]. Recent evidence from the DHS 2017–2018 revealed the median age of first sexual intercourse (women) to be 17.3 [57]. Thus, it is reasonable to assume that, after initiating sexual intercourse at this age, adolescents are likely to engage in active experimentation of sexual activities, which may escalate into multiple sexual partnerships by the time they are 18 years. Usually, adolescents with early sexual histories are somewhat clued-up or primed for new sexual engagements as they get experienced and older, hence might be prone to unfolding sexual vulnerabilities (e.g., having multiple sexual partners) [35, 47, 48].

Adolescents in lower grades were less likely to have multiple sexual partners compared with those in their terminal grades. Although no empirical support was found for this finding, we speculate from the perspective that inadequate exposure to sexual activities could account for the outcome among lower-grade school-going adolescents. Also, despite the earlier finding that the average age of sexual intercourse initiation was 14.75 among school-going adolescents in Benin [1], it is possible that not all adolescents within this mean age may be in lower grades. Even if the vast majority are in lower grades, there is a possibility that they may not have had adequate exposure to sexual activities that may trigger multiple sexual partnerships, unlike the case of those in higher grades who may have had enough exposure, either through experimentation, access to means or influence from peers, coupled with the sexual transitions that accompany that stage of adolescence.

Truant adolescents in Benin were more likely to have multiple sexual partners than punctual students. Similar empirical findings reveal that truancy predicted school-going adolescents' engagement in risky sexual behaviours [20, 44]. Among adolescents in Benin, perhaps the school environment may not be conducive to their engagement in multiple sexual partnerships. However, by absencing themselves from school, these adolescents may have the permissive opportunity to experiment with their multiple sexual partnerships. This finding implies that truancy may serve as a useful indicator in the early identification of school-going adolescents' risk of engagement in multiple sexual partnerships and other risky sexual behaviours. This finding implies that school authorities need to tailor efforts to sustain students' stay in schools.

Adolescents who engaged in sedentary lifestyles were more likely to have multiple sexual partners than those who did not engage in sedentary lifestyles. This finding contradicts the evidence which suggests that being sedentary is associated with sexual inactivity [10]. The pathway between a sedentary lifestyle and engagement in multiple sexual partnerships is not well accounted for within the context of literature. However, it is possible that being sedentary may be associated with some depressive symptoms. Supporting this argument, Tesfaye et al. [54] found a significant association between depressive symptoms and risky sexual behaviours among school adolescents in Ethiopia. Although our analysis controlled for some depressive symptoms and even suicidal ideation and attempt, it is likely that this association may be due to time spent during learning or watching television/internet, which was not measured in our study.

Adolescents who currently smoke cigarettes and those who currently drink alcohol were three and two times more likely to have multiple sexual partners. There is strong evidence of risk-taking behaviours connected to illicit sexual behaviours in previous literature among adolescents. The association between substance use and abuse and adolescents' engagement in multiple sexual relationships and other risky sexual behaviours has been widely documented [14, 26, 41]. For example, adolescents who drink alcohol, smoke and/ or use psychoactive drugs may have a sensation-seeking drive towards other risk behaviours such as sexual intercourse; thus, this linkage might serve as a proxy for multiple sexual partnerships. Understandably, ethanol and nicotine components in alcohol and cigarette serve as stimulants to the central nervous system. These chemical substances have been proven to trigger an increase in sexual arousal [23, 45]. Among school-going adolescents in Benin, school-based efforts could focus on identifying students at risk of substance use and abuse as a preventive approach for multiple sexual partnerships.

Multiple sexual partnerships were less likely practiced by adolescents whose parents knew about what they (adolescents) do with their free time. This parental effort to keep information about the whereabouts of their children and what they do at any given time can be considered a form of parental monitoring. This parental connectedness could serve as a social protection mechanism against risk-taking behaviours among adolescents [47, 48]. Consistent with this finding, a meta-analysis found a significant influence of parental monitoring on adolescents' engagement in sexual activities [13]. Perhaps, effective parental monitoring may play a role in decreasing the permissive attitudes of adolescents toward engagement in multiple sexual partner relationships.

4.1 Strength and limitations

The current study used a nationally representative survey to pool a large sample size for the analysis appreciably. Hence, observed findings provide valuable insights and scope of the association between interconnected and multiple sexual partnerships among Benin adolescents. The study provides useful information for policymakers to design and implement suitable programmes that target risk-taking behaviours like multiple sexual partnerships among adolescents amidst the identified multiple factors. Despite these strengths, the study is inherent with some limitations. The GSHS only includes in-school adolescents; therefore, the generalisability of the current findings is restricted to this cohort and not out-of-school adolescents in Benin. However, the latter group of adolescents or those who dropped out of school may be highly vulnerable to sexual risk-behaviours. The GSHS was cross-sectional in nature, which restricts causal inferences between study variables. Also, the study did not capture some key variables critical in measuring riskiness of adolescents' sexual behaviours such as causal partners, established partners, occasional partners, the number of sexual encounters, the period of having multiple sexual partners, and whether these multiple sexual partnerships were concurrent or sequential. Also, the lack of variables did not provide in-depth understanding whether the sexual relationships were consensual or not despite its importance when adolescents debut at early ages. Furthermore, the survey was also self-reported on sensitive issues related to adolescents' sexual behaviours. This sensitivity might lead to response biases through either over-and under-reporting, although issues surrounding anonymity and confidentiality were preserved at all stages of the survey.

4.2 Implications for research and intervention

Findings from this study suggest the need for some critical considerations to guide policy interventions and research efforts to reduce the prevalence of multiple sexual partnerships among school-going adolescents in Benin. School authorities are encouraged to adopt comprehensive guidelines on disciplinary actions to help curb modifiable risk factors such as truancy, cigarette smoking and alcohol abuse among school-going adolescents in Benin. Further, psychological and mental health care services could be prioritised in Beninois schools. These services could focus primarily on helping students understand the consequences of their risky behaviours and why they should refrain from them. To further help these adolescents, psychosocial efforts can focus on engaging students in more meaningful activities that would shift their attention and interest from engaging in risky sexual behaviours. Further studies are required to explore causal pathways and contextual dynamics in the influence of risk factors on adolescents' engagement in multiple sexual partnerships. Further, in-depth understanding is required from a qualitative perspective regarding the reasons for adolescents' engagement in multiple sexual partnership in Benin.

5 Conclusion

Quite a sizeable proportion of in-school adolescents had multiple sexual partners determined by a myriad of factors (i.e., being male, truancy, sedentary lifestyle, cigarette smoking and alcohol use and abuse) in Benin. These factors may originate from the ecosystem where these adolescents develop, including individual attributes, societal social dynamics, and familial characteristics. The findings from this study provide enough evidence that 'ecological' risk factors increase the odds of in-school adolescents' engagement in multiple sexual partnerships. Thus, sexuality and reproductive health education and promotion interventions aimed at reducing these risk factors are required in Benin. Through sexual and reproductive health education in schools, students will gain comprehensive knowledge about healthy relationships, communication techniques, and responsible sexual activities. Also, students will be equipped with the information and skills necessary to make informed decisions, foster respectful relationships, and comprehend the potential risks and consequences associated with multiple sexual partnerships. Besides, parental connectedness may serve as an effective social protective mechanism to decrease the risk of negative sexual behaviours among in-school adolescents in the country.

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Data availability Access to the data can be obtained at WHO website: <https://extranet.who.int/ncdsmicrodata/index.php/catalog/627/study-description>.

Declarations

Ethics approval and consent to participate This secondary data is registered under the Document ID: DDI_BEN_2016_GSHS_v01_M in 2016. Before commencing data collection, ethical clearance was obtained from the Benin Ministry of Health (MoH) and the Ministry of Education (MoE) Institutional Review Boards. Entry permission protocols were followed to seek permission from the MoH and the heads of the various schools included in the study. Informed consent, parental consent and child assent were solicited from adolescents 18 years or above and children below 18 years, respectively, using a verbal and written agreement. Access to the data can be obtained at the WHO website: <https://extranet.who.int/ncdsmicrodata/index.php/catalog/627/study-description>.

Consent for publication Not applicable.

Competing interests The authors declare no competing interests.

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