Check for updates

Received: 5 February 2023 | Revised: 8 April 2023 | Accepted: 16 April 2023

DOI: 10.1002/hsr2.1243

ORIGINAL RESEARCH

Health Science Reports Open Access WILEY

Multiple indicators of violence against female sex workers and its associated factors in Ghana: Evidence from the 2015 integrated bio-behavioral surveillance survey cross-sectional study

Paul Ayamah[1] | Justice Moses K. Aheto[2,3,4] | Kyeremeh S. Atuahene[1] | Dennis A. Annang[1] | David T. Nartey[5] | Sue A. Amuasi[6] | Tina Abrefa-Gyan[7]

[1]Ghana AIDS Commission, Accra, Ghana

[2]Department of Biostatistics, School of Public Health, College of Health Sciences, University of Ghana, Accra, Ghana

[3]WorldPop, School of Geography and Environmental Science, University of Southampton, Southampton, UK

[4]Epidemiology and Biostatistics, College of Public Health, University of South Florida, Tampa, Florida, USA

[5]Research, Monitoring and Evaluation, JSI Research and Training Institute Inc., Boston, Massachusetts, USA

[6]Physician Assistantship and Public Health, School of Medicine and Health Sciences, Central University, Accra, Ghana

[7]Department of Sociology, George Washington University, Washington, District of Columbia, USA

Correspondence

Justice Moses K. Aheto, Department of Biostatistics, School of Public Health, College of Health Sciences, University of Ghana, P. O. Box LG13, Legon-Accra, Ghana.
Email: justiceaheto@yahoo.com and jmkaheto@ug.edu.gh

Abstract

Background and Aims: Violence against female sex workers (FSWs) is a widespread phenomenon, especially in African nations like Ghana where sex work is outlawed primarily because of the pervasive worldview that sex work is a contravention of morality. Violence against FSWs deters them from accessing critical health services and heightens their risk of STIs including HIV infection. The study examined the prevalence and the associated factors of multiple indicators of violence against FSWs.

Methods: The study utilized a cross-sectional secondary data from the 2015 Integrated Bio-Behavioral Surveillance Survey conducted among FSWs and their nonpaying partners by Ghana AIDS Commission. We analysed data on a total of 4279 participants. Bivariate, and multivariable logistic regression analyses were utilized to identify factors associated with physical and sexual violence against FSWs. Data were analysed using Stata version 15.

Results: Of the 4279 FSWs, 433 (10%) and 1059 (25%) suffered physical and sexual violence, respectively. The predictors of physical violence are being a seater (adjusted odds ratio [aOR] = 0.53, 95% confidence interval [CI]: 0.36–0.74), aged ≥40 (aOR = 0.23, 95% CI: 0.08–0.64), nonuse of drugs (aOR = 0.56, 95% CI: 0.44–0.70), not using alcohol before sex (aOR = 0.69, 95% CI: 0.56–0.86) and petty business (aOR = 1.39, 95% CI: 1.05–1.82). Sexual violence was predicted by those aged 31–40 (aOR = 0.68, 95% CI: 0.49–0.94) and age ≥40 (aOR = 0.38, 95% CI: 0.22–0.66), currently married (aOR = 0.42, 95% CI: 0.27–0.67), having no living children (aOR = 0.69, 95% CI: 0.51–0.94), nonuse of drugs (aOR = 0.80, 95% CI:

Abbreviations: FSWs, female sex workers; GAC, Ghana AIDS Commission; IBBSS, Integrated Bio-Behavioral Surveillance Survey; NMIMR, Noguchi Memorial Institute for Medical Research; SGBV, sexual and gender-based violence.

Paul Ayamah and Justice Moses K. Aheto contributed equally to this work.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.
© 2023 The Authors. *Health Science Reports* published by Wiley Periodicals LLC.

0.68–0.94), and not using alcohol before sex (aOR = 0.74, 95% CI: 0.63–0.86). Region was associated with both physical and sexual violence. Both physical and sexual violence had negative consequences on consistency of condom use and condom failure among FSWs.

Conclusion: Physical and sexual violence against FSWs is pervasive, and a critical public health issue in Ghana. The identified associated factors could be considered as part of an overall strategy aimed at addressing the menace.

KEYWORDS

clients and partners, commercial sex workers, female sex workers, HIV/AIDS, sub-Saharan Africa, violence

1 | BACKGROUND

Violence against female sex workers (FSWs) is an interesting and a sensitive area, especially in Africa, where sex work is outlawed. Violence against FSWs is a widespread phenomenon[1–4] because the notion that sex work is a contravention of morality spans histories, cultures, and societies. This pervading sentiment has resulted in reckoning sex workers as deviants thereby providing a tacit approbation for violence against them.[5]

FSWs vulnerability to violence is determined by many factors spanning individual and occupational to structural level factors. Specific determinants identified in the literature include condom negotiation,[6–8] servicing higher number of clients and nonpaying partners,[8–10] protracted continuity in sex work,[3,6,8,11] age,[3,10,12,13] drug and alcohol abuse,[1,13] being HIV positive,[7,14] financial/livelihood insecurity,[15–17] educational status[3,6,18] residential status (migrant or local dweller),[17,19] soliciting for clients in public places and/or servicing clients in open spaces.[4,6,10,20,21] Moreover, in countries like Ghana where sex work is outlawed, such structural factors lead FSWs to experience violence at the hands of law enforcement agents who come after them.[22,23] It also deters FSWs from reporting the violence they suffer for fear of inviting further violence upon themselves.[20,23,24]

Commonly reported types of violence suffered by FSWs include physical, sexual, psychological and economic violence[1,3,4,7,14,15,25] which are perpetrated by clients, intimate and nonpaying partners, police and other uniformed officers, family members and gatekeepers/pimps among others.[1,3,7,8,13,15,25,26]

Globally, FSWs are highly vulnerable to and bear a disproportionate burden of HIV.[24,25,27] Being a venereal infection, HIV could be transmitted through unprotected sex with an infected person. Other risk factors include gender-based violence,[28] age of sex debut,[29] concurrent sexual partnership, serial monogamy, presence of other sexually transmitted infections, drug/substance use among others.[30–33] Inherent in sex work and FSW lifestyles are most of the risk factors mentioned above, thus heightening the vulnerability of sex workers to HIV acquisition and potential for HIV transmission.

HIV remains a major threat to public health globally.[30,34] Key populations, including FSWs, and their sexual partners play a pivotal role in fuelling new HIV infections. In 2017, FSWs and their sexual partners contributed 47% of new HIV infections globally. It has also been found that FSWs have 13 times higher risk of HIV infection than the general population.[35] Sexual partners of FSW serve as a bridging population or vectors of transmission of HIV to the general population.[36,37]

The role of violence in heightening the risk of HIV acquisition and transmission has been widely reported. As a consequence, violence against FSWs and women in general leads to inconsistent condoms use, condom failure, and other risks which exposes them to HIV acquisition.[2,38,39]

Even though commercial sex work is outlawed in Ghana, it is becoming very prevalent in the country, including an upsurge in commercial sex work activities in and around universities.[40] Although previous studies on commercial sex work exist in Ghana and globally,[40–42] no single study exist in Ghana that examined the prevalence and predictors of both physical and sexual violence against FSWs using large population-based study with national coverage in this key population. In this study, we attempt to bridge this data gap by identifying the sources of violence against FSWs, its prevalence and predictors as well as consequences of violence against FSWs. It is our contention that the findings of this study will be more reflective of the reality in the country.

2 | METHODS

2.1 | Study population

This study utilized secondary data from the 2015 Integrated Bio-Behavioral Surveillance Survey (IBBSS) among FSWs in Ghana which was a cross-sectional survey conducted by the Ghana AIDS Commission with technical assistance from Family Health International (FHI 360). The survey is part of a broader study on hotspot mapping, FSWs population estimation, and a national

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

cross-sectional bio-behavioral survey undertaken in four phases namely, pre-survey assessment (phase I), FSW population size mapping (MPSE) (phase II), FSW population size estimation (phase III), and Bio-Behavioral survey (phase IV). The first three phases contributed to the implementation of the Bio-Behavioral survey. The survey focused specifically on the FSWs and their nonpaying partners. The FSWs were identified and interviewed on the streets and in bars, night clubs and brothels while the nonpaying partners of the FSWs who participated in the study included their boyfriends or "specials husbands," pimps, "macho" men, landlords, "area boys," and "fresh boys." The survey used Time-Location Cluster Sampling method to select 4279 eligible FSWs from 536 hotspots in 56 districts of all the ten administrative regions of the country at the time of the study. The samples were drawn from all the 10 regions, all major border towns, all busy known market and transit towns, major mining sites, and other appropriate locations identified during the MPSE phases of the study. In this study, FSW was defined as "A female aged 16 years and older who reported to have received, in the last 6 months, money as a source of income, from someone other than her established partner, in exchange for sexual services, and who may or may not consciously recognize these activities as 'sex work." In the Ghanaian context two subtypes of FSWs seaters (home-based) and roamers (Street-based) are identified. Data were collected on key behavioral indicators such as sexual history and practices, sexual risk behavior including number and type of sexual partners, condom use, knowledge of STIs and STI care-seeking behavior, knowledge and attributes toward HIV and AIDS, self-esteem, mental health and social support, gender-based violence, alcohol and drug abuse, perception of HIV and STI risk and exposure to interventions. To ensure data quality, all completed interviews were checked for completeness, consistency, and errors corrected before leaving the study sites.

2.2 | Outcome variable

Two outcome variables were studied: sexual violence and physical violence. Each was dichotomized into having ever experienced (coded as 1) and having never experienced (coded as 0).

2.3 | Covariates

The explanatory variables are type of FSW, current age, educational status of FSW, marital status, region, nationality, age at which FSW started sex work, duration in sex work, number of living children, where clients are taken for sex, whether FSW has ever used drug, whether the FSW has ever drunk alcohol before sex (past 6 months), and whether the FSW has other source of income. These variables were considered based on evidence in the literature.[3,6–8,16,17,20,38,43]

2.4 | Statistical analysis

Selected background characteristics of FSWs were summarized using descriptive statistics. Categorical variables were summarized using frequencies with their associated percentages while continuous variables were summarized using mean with their associated standard deviation or median with their associated interquartile range if the variable violates the normality assumption. Pearson's Chi-squared (χ^2) was used to measure the association between the independent variables and the outcome variables (bivariate analyses). An independent variable with a $p > 0.20$ from the bivariate analyses was excluded from the multivariable logistic regression model except where their relevance has been established in the literature. Binary logistic regression was used to determine the direction and strength of association between the independent variables and the outcome variables. Crude Odds Ratios were obtained from the simple logistic regression model while the Adjusted Odds Ratios were obtained from the multivariable logistic regression model.

We evaluated the fit of our final models based on Hosmer-Lemeshow Goodness of fit test. Although prediction was not the main goal in this study, we evaluated the predictive power of our final models using the area under the receiver operating characteristic curve (AUROC). All data analyses were done using STATA Version 15 (StataCorp LLC). A 95% confidence interval and a p value below 0.05 were used to declare statistical significance.

2.5 | Ethical approval

The IBBSS was approved by the FHI 360's Protection of Human Subject Committee and the Noguchi Memorial Institute for Medical Research ethical review boards. This study obtained written consent from the Ghana AIDS Commission. Written informed consent was obtained from all study participants. However, the data were analysed anonymously in the present study. All methods were performed in accordance with the relevant guidelines and regulations.

3 | RESULTS

3.1 | Sample characteristics

A total of 4279 eligible FSWs selected from 536 hotspots participated in the study. As shown in Table 1, more than 9 out of 10 (91.3%) participants were Ghanaians with a few (8.7%) of them being nationals of other West African countries such as Nigeria, Togo, Cote D'Ivoire and Burkina Faso. Almost two-thirds (63.5%) of the FSWs were currently between the ages of 20 and 29 even though more than half (53.5%) of them started their first sex work before age 20. Only a few (4.5%) of them reported being currently married, though over half (51.4%) of them reported having, at least,

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 1 Socio-demographic characteristics of study participants.

Variables	Frequency *n* (%)
Suffered physical violence	
No	3846 (89.9)
Yes	433 (10.1)
Suffered sexual violence	
No	3220 (75.2)
Yes	1059 (24.8)
Current age	
16–19	581 (13.6)
20–29	2718 (63.5)
30–39	752 (17.6)
40+	228 (5.3)
Median (IQR)	25 (21–29)
Marital status	
Currently married	191 (4.5)
Not currently married	4088 (95.5)
Number of living children	
0	2081 (48.6)
1–2	1778 (41.6)
3+	420 (9.8p)
Median (IQR)	1 (0–1)
Age at first sex work	
<20	2291 (53.5)
20–29	1639 (38.30)
30–39	282 (6.59)
40+	67 (1.57)
Median (IQR)	19 (17–23)
Duration in sex work	
<5 years	2647 (61.9)
5+ years	1632 (38.1)
Educational Status	
No formal education	566 (13.2)
Primary	736 (17.2)
Middle/JHS	1849 (43.2)
Secondary/higher	1128 (26.4)
Region	
Ashanti	452 (10.6)
Brong Ahafo	434 (10.1)
Central	402 (9.4)
Greater Accra	842 (19.7)
Eastern	400 (9.4)
Northern	278 (6.5)
Upper East	386 (9.0)
Upper West	175 (4.1)
Western	513 (12.0)
Volta	397 (9.3)
Nationality	
Ghana	3907 (91.3)
Other West African Countries	372 (8.7)
Ever used sex to avoid arrest by police	
No	4124 (96.4)
Yes	155 (3.6)
Forced sex without condom use	
No	3400 (82.2)
Yes	737 (17.8)
Main reason not to always use condom with paying partner	
Client refusal	169 (37.7)
Client pays more for sex without condom	85 (19.0)
Others	194 (43.3)
Source of physical violence perpetrators	
Paying first-time clients	214 (50.6)
Paying regular clients	132 (31.2)
Nonpaying partners	134 (31.8)
Source of sexual violence perpetrators	
Paying first-time clients	186 (43.6)
Paying regular clients	92 (33.8)
Nonpaying partners	82 (30.2)

Abbreviation: IQR: interquartile range.

one living child. About a third (30.4%) had either primary or no formal education while 26.4% had attained secondary/higher education.

3.2 | Prevalence and types of violence (physical and sexual) against FSWs

Overall, 10.1% (433/4279) of the FSWs reported having suffered physical violence in the past 12 months preceding the survey. The same number reported having experienced forced sex in the past 3 months while 3.3% (155/4279) reported having provided sexual

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

favors to the police to avoid arrest. The reported prevalence of forced sex without condom in the past 3 months preceding the survey was 17.8% (737/4137). Among those who do not always use condoms, the topmost reason cited by the respondents for inconsistent condom use with paying clients was client refusal 37.7% (169/448). Among those with nonpaying partners, trust (59.0%) and refusal (13.8%) were the main reasons for inconsistent condom use. Another form of sexual manipulation reported in the study is clients paying more to avoid using condoms 19.0% (85/448). In all, the prevalence of sexual violence was 24.8% (1059/4279).

Among those who reported incidence of physical violence against FSWs, 50.6% (214/423) was perpetrated by paying first-time clients; 31.2% (132/423) by paying regular clients; and 31.8% (134/422) by nonpaying partners (spouses, lovers, and boyfriends). Of the perpetrators of forced sex, 43.6% (186/427) were first-time paying clients, 33.8% (92/272) were regular paying clients, and 30.2 (82/272) being nonpaying partners. According to the participants, first-time clients and regular paying clients comprised long distance truck drivers, artisans, police/military officers, high school students, hand-cart pushers, foreigners.

3.3 | Bivariate analysis of factors associated with physical violence against FSWs

This study observed a 10.1% (433/4279) prevalence of physical violence against FSWs in Ghana. In the Chi-squared analysis (Table 2), the following demographic characteristics were associated with FSWs' experience of physical violence: current age ($\chi^2 = 10.69$; $p = 0.01$); marital status ($\chi^2 = 5.24$; $p = 0.02$). Region of residence ($\chi^2 = 257.83$; $p < 0.001$), and age at first sex work ($\chi^2 = 9.43$; $p = 0.02$). Other demographic characteristics such as education, nationality and number of living children were not associated with physical violence against FSWs. Other variables which had association with experience of physical violence among FSWs are type of FSW ($\chi^2 = 9.45$; $p < 0.001$); where clients are taken for sex ($\chi^2 = 8.75$; $p = 0.03$); whether FSW had used drugs in the past 1 year preceding the study ($\chi^2 = 50.20$; $p < 0.001$); whether an FSW ever drunk alcohol before sex in the past 6 months ($\chi^2 = 28.66$; $p < 0.001$).

3.4 | Bivariate analysis of factors associated with sexual violence against FSWs

The following demographic factors were associated with sexual violence: current age, measured by age at last birthday, ($\chi^2 = 17.5$; $p = 0.01$); marital status ($\chi^2 = 14.6$; $p < 0.001$); region of residence ($\chi^2 = 246.2$; $p < 0.001$); and nationality ($\chi^2 = 13.7$; $p = 0.02$). Other factors associated with FSWs experience of sexual violence are where clients are taken for sex ($\chi^2 = 14.0$; $p < 0.001$); whether an FSW had used drug(s) in the year preceding the study ($\chi^2 = 20.4$; $p < 0.001$); whether an FSW has ever drunk alcohol before sex in the past 6 months ($\chi^2 = 18.5$; $p < 0.001$); and whether an FSW has other source(s) of income ($\chi^2 = 28.9$; $p < 0.001$). However, number of living children ($\chi^2 = 5.9$; 0.05), type of FSW ($\chi^2 = 3.6$; $p = 0.06$), age at which FSW started sex work ($\chi^2 = 8.4$; $p = 0.08$) and educational status ($\chi^2 = 5.8$; $p = 0.12$) were not associated with sexual violence (Table 3).

3.5 | Predictors of physical violence against FSWs

Multiple regression analysis showed that the following variables had independent association with physical violence against FSWs: type of FSW, current age, region of residence, whether FSW had used drugs in the preceding year, and whether FSW had used alcohol before sex in the past 6 months. Compared with roamers, seaters had 47% (adjusted odds ratio [aOR]: 0.53; 95% confidence interval [CI]: 0.37–0.75) diminished odds of experiencing physical violence whilst FSWs who were above 40 years had 77% (aOR: 0.23; 95% CI: 0.08–0.64) less odds of experiencing physical violence than FSWs who were below 20 years. FSWs who did not use alcohol before sex in the past 6 months had 31% (aOR: 0.69; 95% CI: 0.56–0.86) reduced odds of experiencing physical violence in comparison with those who did. The FSWs in petty business (aOR: 1.39; 95% CI: 1.05–1.82) as other source of income had increased odds of experiencing physical violence compared to those who do not have other jobs. Other variables such as education, marital status, nationality, age at first sex work, duration in sex work, number of living children, and where clients were taken for sex were not independently associated with the outcome variable (Table 4).

3.6 | Predictors of sexual violence against FSWs

As shown in Table 5, the following variables were found to be predictors of sexual violence against FSWs: current age, marital status, number of living children, where FSWs take clients for sex, region of residence, whether FSW had a history of drug use, and whether FSW had used alcohol before sex in the past 6 months. However, differences exist in the odds of susceptibility to violence. For example, compared with FSWs who were aged below 20 years, FSWs aged 40 and older were 62% less likely to experience sexual violence (aOR: 0.38; 95% CI: 0.21–0.71). Similarly, FSWs who did not report a history of drug use in the past year had 20% lower odds of experiencing sexual violence than those who did (aOR: 0.80; 95% CI: 0.68–0.94). Compared with unmarried FSWs, those who were married had 58% (aOR: 0.42, 95% CI: 0.27–0.67) reduced odds of experiencing sexual violence. Furthermore, FSWs who did not use alcohol before sex in the past 6 months had 26% (aOR: 0.74; 95% CI: 0.63–0.86) reduced odds of experiencing sexual violence compared with those who did use alcohol before sex while FSWs taken to other places (aOR: 0.30; 95% CI: 0.15–0.61) compared to hotels/guest house/lodge had decreased odds of sexual violence. For other source of income, those in formal employment (aOR: 0.54; 95% CI:

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 2 Bivariate analysis of factors associated with physical violence against FSWs ($n = 4279$).

Factors	*n* (%)	Suffered physical violence (past 1 year)		*p* value	Chi value
		No	Yes		
Type of FSW				<0.001	9.45
Roamer	3383 (79.1)	3016 (89.2)	367 (10.9)		
Seater	896 (20.9)	830 (92.6)	66 (7.4)		
Current age				0.01	10.69
16–19	581 (13.6)	515 (88.6)	66 (11.4)		
20–29	2718 (63.5)	2437 (89.7)	281 (10.3)		
30–39	752 (17.6)	675 (89.8)	77 (10.2)		
40+	228 (5.3)	219 (96.1)	9 (4.0)		
Education				0.09	6.41
No formal education	566 (13.2)	522 (92.2)	44 (7.8)		
Primary	736 (17.2)	648 (88.0)	88 (12.0)		
Middle/JHS	1849 (43.2)	1658 (89.7)	191 (10.3)		
Secondary/higher	1128 (26.3)	1018 (90.3)	110 (9.8)		
Marital status				0.02	5.24
Not currently married	4088 (95.54)	3665 (89.65)	423 (10.4)		
Currently married	191 (4.46)	181 (94.76)	10 (5.2)		
Region				<0.001	257.83
Ashanti	452 (10.6)	398 (88.1)	54 (12.0)		
Brong Ahafo	434 (10.1)	399 (92.0)	35 (8.1)		
Central Region	402 (9.4)	285 (71.0)	117 (29.1)		
Eastern	400 (9.4)	376 (94.0)	24 (6.0)		
Greater Accra	842 (19.7)	728 (86.5)	114 (13.5)		
Northern	278 (6.5)	242 (87.1)	36 (13.0)		
Upper East	386 (9.0)	369 (95.6)	17 (4.4)		
Upper West	175 (4.1)	167 (95.4)	8 (4.6)		
Volta Region	397 (9.3)	375 (94.5)	22 (5.5)		
Western	513 (12.0)	507 (98.8)	6 (1.2)		
Nationality				0.2	1.75
Ghana	3907 (91.3)	3519 (90.07)	388 (10.0)		
Other W/A countries	372 (8.7)	327 (87.9)	45 (12.1)		
Age at first sex work				0.02	9.43
<20	2291 (53.5)	2031 (88.7)	260 (11.4)		
20–29	1639 (38.3)	1491 (91.0)	148 (9.0)		
30–39	282 (6.6)	261 (92.6)	21 (7.5)		
40+	67 (1.6)	63 (94.0)	4 (6.0)		
No. of living children				0.1	4.55
0	2081 (48.6)	1891 (90.9)	190 (9.1)		
1–2	1778 (41.6)	1579 (88.8)	199 (11.2)		
3+	420 (9.8)	376 (89.5)	44 (10.5)		

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 2 (Continued)

Factors	*n* (%)	Suffered physical violence (past 1 year) No	Yes	*p* value	Chi value
Where clients are taken for sex				0.03	8.75
Home	1702 (39.8)	145 (8.5)	1557 (91.4)		
Hotel/guest house/lodge	2408 (56.3)	272 (11.3)	2136 (88.7)		
Bar/nightclub	73 (1.7)	6 (8.2)	67 (91.8)		
Other	96 (2.2)	10 (10.4)	86 (89.58)		
Drug use (past 1 year)				<0.001	50.2
No	3224 (75.3)	2958 (91.7)	266 (8.3)		
Yes	1055 (24.7)	888 (84.2)	167 (15.8)		
Drunk alcohol before sex (past 6 months)				<0.001	28.66
No	2548 (59.6)	2342 (91.9)	206 (8.1)		
Yes	1731 (40.5)	1504 (86.9)	227 (13.1)		
Other source of income				0.05	9.65
None (No other job)	2861 (66.9)	2594 (90.7)	267 (9.3)		
Formal employment	114 (2.7)	106 (93.0)	8 (7.0)		
Petty business	737 (17.2)	643 (87.2)	94 (12.8)		
Agriculture	10 (0.2)	9 (90.0)	1 (10.0)		
Casual employment	551 (13.0)	494 (88.7)	63 (11.3)		

Abbreviation: FSW, female sex worker.

0.31–0.94) and petty business (aOR: 0.77; 95% CI: 0.63–0.96) had reduced odds of sexual violence compared to those with no other job (Table 5).

3.7 | Consequences of violence against FSW

The bivariate analysis using Chi-square revealed that there is association between physical violence and consistent condom use ($p < 0.001$), and condom failure ($p < 0.001$). The same nexus exists between sexual violence and consistent condom use and condom failure. However, neither sexual violence nor physical violence had any relationship with HIV testing behavior and HIV test outcome.

Compared with FSWs who had ever experienced physical violence, FSWs who had never experienced physical violence have 58% higher odds of using condoms consistently with paying clients (OR: 1.58; 95% CI: 1.26–1.98). Also, FSWs who reported no experience of sexual violence, were 49% less likely to report condom failure (OR: 0.51; 95% CI: 0.44–0.59). Although not statistically significant, FSWs who reported no history of having experienced sexual violence were 10% more likely to access HTS than those who had ever suffered sexual violence (OR: 1.10; 95% CI: 0.94–1.30) (Tables 6–9).

3.8 | Goodness of fit tests

To assess how well our final models fit the data, we employed Hosmer–Lemeshow Goodness of fit test. For the final model predicting physical violence against FSWs, the associated Chi-squared and the *p* value associated with the test were 6.50 and 0.59 respectively, suggesting no lack of fit for our fitted model. For the sexual violence against FSWs, we found a Chi-squared value of 7.15 and a *p* value of 0.52, indication of no lack of fit for our fitted model. In addition, the study found Nagelkerke adjusted R^2 values of 0.08 and 0.08 for physical and sexual violence, respectively.

3.9 | Assessing the predictive ability of the final models

The predictive power of the fitted models for correctly predicting the likelihood of physical violence and sexual violence based on the AUROC were 76% and 68%, respectively, as shown in Figure 1. Thus, there is 76% chance that the model will be able to correctly distinguish between FSWs who suffered physical violence and those who did not suffer physical violence. Also, there is 68% chance that the model will correctly distinguish between FSWs who experienced sexual violence and those who did not experience sexual violence.

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 3 Bivariate analysis of factors associated with sexual violence against FSWs.

Factors	*n* (%)	Suffered sexual violence (past 1 year)		*p* value	Chi value
		No	Yes		
Type of FSW				0.06	3.59
Roamer	3383 (79.1)	2524 (74.6)	859 (25.4)		
Seater	896 (20.9)	696 (77.7)	200 (22.3)		
Current age				<0.001	17.53
16–19	581 (13.6)	425 (73.2)	156 (26.9)		
20–29	2718 (63.5)	2016 (74.2)	702 (25.8)		
30–39	752 (17.6)	585 (77.8)	167 (22.2)		
40+	228 (5.3)	194 (85.1)	34 (14.9)		
Education				0.12	5.77
No formal education	566 (13.2)	442 (78.1)	124 (21.9)		
Primary	736 (17.2)	552 (75.0)	184 (25.0)		
Middle/JHS	1849 (43.2)	1363 (73.7)	486 (26.3)		
Secondary/higher	1128 (26.3)	863 (76.5)	265 (23.5)		
Marital status				<0.001	14.59
Not currently married	4088 (95.5)	3054 (74.7)	1034 (25.3)		
Currently married	191 (4.5)	166 (86.9)	25 (13.1)		
Region				<0.001	246.23
Ashanti	452 (10.6)	356 (78.8)	96 (21.2)		
Brong Ahafo	434 (10.1)	361 (83.2)	73 (16.8)		
Central Region	402 (9.4)	194 (48.3)	208 (51.7)		
Eastern	400 (9.4)	327 (81.8)	73 (18.3)		
Greater Accra	842 (19.7)	639 (75.9)	203 (24.1)		
Northern	278 (6.5)	229 (82.4)	49 (17.6)		
Upper East	386 (9.0)	344 (89.1)	42 (10.9)		
Upper West	175 (4.1)	129 (73.7)	46 (26.3)		
Volta Region	397 (9.3)	291 (73.3)	106 (26.7)		
Western	513 (12.0)	350 (68.2)	163 (31.8)		
Nationality				0.16	1.94
Ghana	3907 (91.3)	2929 (75.0)	978 (25.0)		
Other W/A countries	372 (8.7)	291 (78.2)	81 (21.8)		
Age at first sex work				0.08	6.66
<20	2291 (53.5)	1715 (74.9)	576 (25.1)		
20–29	1639 (38.3)	1223 (74.6)	416 (25.4)		
30–39	282 (6.6)	226 (80.1)	56 (19.9)		
40+	67 (1.6)	56 (83.6)	11 (16.4)		
No. of living children				0.05	5.91
0	2081 (48.6)	482 (23.2)	1599 (76.8)		
1–2	1778 (41.6)	472 (26.6)	1306 (73.4)		
3+	420 (9.8)	105 (25.0)	315 (75.0)		

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 3 (Continued)

Factors	*n* (%)	Suffered sexual violence (past 1 year)		*p* value	Chi value
		No	Yes		
Where clients are taken for sex				<0.001	13.95
Home	1702 (39.8)	1288 (75.7)	414 (24.3)		
Hotel/guest house/ lodge	2408 (56.3)	1788 (74.3)	620 (25.7)		
Bar/nightclub	73 (1.7)	57 (78.1)	16 (21.9)		
Other	96 (2.2)	87 (90.6)	9 (9.4)		
Drug use (past 1 year)				<0.001	20.36
No	3224 (75.3)	2481 (77.0)	743 (23.0)		
Yes	1055 (24.7)	739 (70.0)	316 (30.0)		
Drunk alcohol before sex (past 6 months)				<0.001	18.5
No	1731 (40.5)	1243 (71.8)	488 (28.2)		
Yes	2548 (59.6)	1977 (77.6)	571 (22.4)		
Other source of income				<0.001	28.85
None (No other job)	2861 (66.9)	2139 (74.8)	722 (25.2)		
Formal employment	114 (2.7)	98 (86.0)	16 (14.0)		
Petty business	737 (17.2)	578 (78.4)	159 (21.6)		
Agriculture	10 (0.2)	7 (70.0)	3 (30.0)		
Casual employment	551 (13.0)	398 (71.5)	159 (28.6)		

Abbreviation: FSW, female sex worker.

In summary, the model for the physical violence against FSWs provided a better predictive accuracy compared to the model for the sexual violence against FSWs.

4 | DISCUSSION

4.1 | Principal findings

We set out to examine the prevalence and predictors of multiple indicators of violence against FSWs measured on physical and sexual violence among this key population in Ghana, a significant attempt to help understand why FSWs are exposed to physical and sexual violence. The study analysed data on 4279 FSWs to identify predictors of multiple indicators of violence against FSWs to inform targeted policies and intervention strategies aimed at design of FSW-centered integrated HIV and sexual and gender-based violence (SGBV) service provision with focus on protection and general wellbeing of the sex workers. Our study found that 25% of FSWs experienced sexual violence while 10% suffered physical violence. Physical violence was perpetrated mainly by first-time paying clients (51%) and regular paying clients (31%) with similar trend observed for sexual violence. Type of FSW, current age, nonuse of drugs, not using alcohol before sex, currently married, having no living children, region, and other source of income were associated with physical and sexual violence. We found that both physical and sexual violence had negative consequences on consistency of condom use and condom failure among FSWs.

4.2 | Interpretation

In this study, 25% of FSWs experienced sexual violence and 10% suffered physical violence. Physical violence was perpetrated mainly by first-time paying clients (51%) and regular paying clients (31%) with similar trend observed for sexual violence. Rates of sexual violence against FSWs reported in neighboring countries include 13.5% in Benin,[39] 29% in the Gambia,[14] and 33% of forced sex in Togo and Burkina Faso.[8] Various rates of physical violence have also been reported in different settings: 11% in India,[11] 17.2% in Benin,[39] and 11.8% in Mexico.[15] The pervasiveness of physical and sexual violence against FSWs demand policy and programmatic interventions tailored to fully address the problem. This includes the integrating empowerment programs on SGBV into HIV and reproductive health programs for FSWs to help control and reduce the phenomenon. Law enforcement agents should also be trained on rights-based law enforcement protocols to minimize violations.

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 4 Simple and multivariable logistic regression analyses of factors influencing physical violence against FSWs.

Factors	Unadjusted OR	95% CI	Adjusted OR	95% CI
Type of FSW				
Roamer	Ref	Ref	Ref	Ref
Seater	0.65	0.50–0.86	0.53	0.36–0.74
Current age				
16–19	Ref	Ref	Ref	Ref
20–29	0.9	0.68–1.20	0.78	0.56–1.09
30–39	0.89	0.63–1.26	0.89	0.57–1.40
40+	0.32	0.16–0.65	0.23	0.08–0.64
Education				
None	Ref	Ref	Ref	Ref
Primary	1.61	1.10–2.36	1.48	0.99–2.23
Middle/JHS	1.37	0.97–1.92	1.14	0.79–1.65
Secondary/higher	1.28	0.89–1.85	1.18	0.79–1.75
Marital status				
Not currently married	Ref	Ref	Ref	Ref
Currently married	0.48	0.25–0.91	0.6	0.30–1.19
Region				
Upper East	0.11	0.07–0.19	0.11	0.07–0.20
Brong Ahafo	0.21	0.14–0.32	0.25	0.16–0.38
Northern	0.36	0.24–0.55	0.41	0.26–0.64
Eastern	0.16	0.10–0.25	0.16	0.10–0.25
Ashanti	0.33	0.23–0.47	0.39	0.27–0.56
Greater Accra	0.38	0.28–0.51	0.56	0.40–0.80
Volta Region	0.14	0.09–0.23	0.15	0.09–0.24
Upper West	0.12	0.06–0.24	0.14	0.06–0.29
Western	0.03	0.01–0.07	0.04	0.02–0.09
Central Region	Ref	Ref	Ref	Ref
Nationality				
Ghana	Ref	Ref	Ref	Ref
Other W/A countries	1.24	0.90–1.73	1.12	0.78–1.62
Age at first sex work				
<20	Ref	Ref	Ref	Ref
20–29	0.78	0.62–0.96	0.78	0.60–1.04
30–39	0.62	0.40–0.99	0.66	0.36–1.20
40+	0.5	0.18–1.37	1.52	0.36–6.36
No. of living children				
3+	Ref	Ref	Ref	Ref
0	0.859	0.607–1.214	0.76	0.49–1.17
1–2	1.077	0.76–1.521	0.85	0.57–1.27

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 4 (Continued)

Factors	Unadjusted OR	95% CI	Adjusted OR	95% CI
Where clients are taken for sex				
Hotel/guest house/lodge	Ref	Ref	Ref	Ref
Home	1.36	1.11–1.69	1.1	0.86–1.42
Bar/nightclub	0.96	0.41–2.25	0.69	0.28–1.66
Other	1.25	0.63–2.46	0.88	0.43–1.80
Drug use (past 1 year)				
Yes	Ref	Ref	Ref	Ref
No	0.47	0.39–0.59	0.56	0.44–0.70
Drunk alcohol before sex (past 6 months)				
Yes	Ref	Ref	Ref	Ref
No	0.58	0.48–0.71	0.69	0.56–0.86
Other source of income				
None (No other job)	Ref	Ref	Ref	Ref
Formal employment	0.73	0.35–1.52	0.98	0.45–2.11
Petty business	1.42	1.11–1.82	1.39	1.05–1.82
Agriculture	1.08	0.13–8.55	0.89	0.10–7.83
Casual employment	1.24	0.93–1.66	1.14	0.83–1.57

Abbreviations: CI, confidence interval; FSW, female sex worker; OR, odds ratio.

As reported elsewhere,[8,9,12] and consistent with our findings, the major sources of violence against FSWs in Ghana are first-time paying clients, regular paying clients and nonpaying partners. Client perpetrated violence is often motivated by client's refusal to use condoms,[8] the use of alcohol and/or drugs by either the client or the FSW. There is therefore the need to strengthen the condom negotiation skills of FSWs and educate them on creative ways of applying condoms on clients. Moreover, FSWs should be empowered to exercise restraint in alcohol and drug use while at work and to as much as possible avoid clients on drugs or alcohol.

We also identified alcohol and drug as predictors of sexual and physical violence against FSWs. Aside from predisposing FSWs to physical and sexual violence, alcohol and/or drug use have been found in other studies to contribute to condom breakage and increased risk of HIV acquisition.[44]

Current age of FSWs, i.e., younger FSWs were found to be more at risk to physical and sexual violence than their older counterparts. These predictors have been corroborated by other studies.[8,9,11,13] Girl child education and empowerment should therefore be prioritized to blunt the allure of sex trade on younger women. State institutions and civil society should institute measures to deter syndicates and adult FSWs from recruiting younger ones into the trade. Geographical region of residence was a significant predictor of physical and sexual violence as supported by the finding that migrant sex workers are more at risk of sexual and physical violence.[17] It has been established that FSWs who were forced into sex work are more prone to alcohol and drug use which heightens their susceptibility to and actual experience of violence and HIV infection.[12] Law enforcement agencies and civil society should strengthen their surveillance and deterrence capabilities to minimize sex trafficking and coerced initiation into sex work.

Our finding that seaters have reduced odds of experiencing physical violence than roamers is because roamers are street-based and solicit for clients in open places, bars and restaurants, night clubs, hotels and some isolated and unsafe places which ends up exposing them more to physical violence, and they are also more susceptible victims of police raids which is associated with both physical and sexual violence.[9,39] Interventions should therefore focus on educating FSWs on basic personal security precautions including avoiding alcohol, drugs, and isolated places during working hours. Marital status, number of living children, and where FSWs take clients for sex were predictors of sexual violence only but not physical violence.

Regrettably, police officers who are required to protect victims of violence, sometimes capitalize on the illegality of sex work in Ghana to threaten arrest and detention to gain sexual favors from the FSWs. Besides exploitation of FSWs, the police is also reported to perpetrate physical and sexual violence on FSWs.[9,39] There is the need for comprehensive programmatic and policy interventions to address these structural factors that perpetuate violence against FSWs.

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 5 Simple and multivariable logistic regression analyses of factors influencing sexual violence against FSWs.

Factors	Unadjusted OR	95% CI	Adjusted OR	95% CI
Type of FSW				
Roamer	Ref	Ref	Ref	Ref
Seater	0.84	0.71–1.01	0.84	0.67–1.06
Current age				
16–20	Ref	Ref	Ref	Ref
21–30	0.95	0.77–1.16	0.86	0.68–1.09
31–40	0.78	0.60–1.00	0.68	0.49–0.94
40+	0.48	0.31–0.72	0.38	0.22–0.66
Education				
None	Ref	Ref	Ref	Ref
Primary	1.19	0.92–1.54	1.07	0.81–1.41
Middle/JHS	1.27	1.02–1.59	1.07	0.84–1.36
Secondary/higher	1.09	0.86–1.39	1.05	0.81–1.36
Marital status				
Not currently married	Ref	Ref	Ref	Ref
Currently married	0.44	0.29–0.68	0.42	0.27–0.67
Region				
Central Region	Ref	Ref	Ref	Ref
Upper East	0.11	0.08–0.17	0.12	0.08–0.17
Brong Ahafo	0.19	0.14–0.26	0.19	0.14–0.27
Northern	0.2	0.14–0.29	0.22	0.51–0.33
Eastern	0.21	0.15–0.29	0.22	0.16–0.31
Ashanti	0.25	0.19–0.24	0.26	0.19–0.36
Greater Accra	0.3	0.23–0.38	0.36	0.28–0.48
Volta Region	0.34	0.25–0.46	0.42	0.31–0.57
Upper West	0.33	0.23–0.49	0.37	0.25–0.59
Western	0.43	0.33–0.57	0.46	0.35–0.63
Nationality				
Ghana	Ref	Ref	Ref	Ref
Other W/A countries	0.83	0.65–1.08	0.85	0.64–1.12
Age at first sex work				
<20	Ref	Ref	Ref	Ref
20–29	0.01	0.88–1.17	1.07	0.89–1.28
30–39	0.74	0.54–1.00	1.01	0.68–1.51
40+	0.58	0.30–1.22	1.08	0.46–2.52
No. of living children				
3+	Ref	Ref	Ref	Ref
0	0.9	0.70–1.15	0.69	0.51–0.94
1–2	1.08	0.85–1.38	0.8	0.60–1.07

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 5 (Continued)

Factors	Unadjusted OR	95% CI	Adjusted OR	95% CI
Where clients are taken for sex				
Hotel/guest house/lodge	Ref	Ref	Ref	Ref
Home	0.92	0.80–1.07	1.1	0.86–1.42
Bar/nightclub	0.81	0.46–1.42	0.69	0.28–1.66
Other	0.3	0.15–0.60	0.88	0.43–1.80
Drug use (past 1 year)				
Yes	Ref	Ref	Ref	Ref
No	0.7	0.60–0.82	0.8	0.68–0.94
Drunk alcohol before sex (past 6 months)				
Yes	Ref	Ref	Ref	Ref
No	0.74	0.64–0.85	0.74	0.63–0.86
Other source of income				
None (No other job)	Ref	Ref	Ref	Ref
Formal employment	0.48	0.28–0.83	0.98	0.45–2.11
Petty business	0.81	0.67–0.99	1.39	1.05–1.82
Agriculture	1.26	0.32–4.99	0.89	0.10–7.83
Casual employment	1.18	0.97–1.45	1.14	0.83–1.57

Abbreviations: CI, confidence interval; FSW, female sex worker; OR, odds ratio.

TABLE 6 Analysis of violence against FSWS and consistent condom use with paying clients.

Factors	Consistent condom use ($n = 4250$)		Unadjusted OR	95% CI	χ^2 p value
	No n (%)	Yes n (%)			
Ever suffered physical violence					<0.001
No	759 (20.0)	3058 (80.0)	1.58	1.26–1.98	
Yes	122 (28.2)	311 (71.8)	ref	ref	
Ever suffered sexual violence					<0.001
No	598 (18.7)	2596 (81.3)	1.59	1.35–1.87	
Yes	283 (26.8)	773 (73.2)	ref	ref	

Abbreviations: CI, confidence interval; FSW, female sex worker; OR, odds ratio.

TABLE 7 Analysis of violence against FSWs and condom failure.

Factors	Condom failure ($n = 4108$)		OR	95% CI	χ^2 p value
	No n (%)	Yes n (%)			
Ever suffered physical violence					<0.001
No	2659 (72.1)	1027 (27.9)	0.60	0.49–0.74	
Yes	257 (60.9)	165 (39.1)	ref	ref	
Ever suffered sexual violence					<0.001
No	2307 (74.6)	786 (25.4)	0.51	0.44–0.59	
Yes	609 (60.0)	406 (40.0)	ref	ref	

Abbreviations: CI, confidence interval; FSW, female sex worker; OR, odds ratio.

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 8 Analysis of violence against FSWS and HIV testing behavior.

Factors	HIV test (past 6 months) ($n = 4108$) No n (%)	Yes n (%)	OR	95% CI	χ^2 p value
Ever suffered physical violence					0.42
No	1294 (49.1)	1339 (50.9)	**	**	
Yes	166 (51.6)	156 (48.4)			
Ever suffered sexual violence					0.23
No	1075 (48.8)	1129 (51.2)	1.10	0.94–1.30	
Yes	385 (51.3)	366 (48.7)	ref		

Note: **Not included in regression analysis because χ^2 $p > 0.2$.

Abbreviations: CI, confidence interval; FSW, female sex worker; OR, odds ratio.

TABLE 9 Analysis of violence against FSWS and HIV test outcome.

Factors	HIV test outcome ($n = 3493$) Negative n (%)	Positive n (%)	OR	95% CI	χ^2 p value
Suffered physical violence (past 1 year)					0.98
No	2916 (93.64)	198 (6.4)	**	**	
Yes	355 (93.67)	24 (6.33)			
Ever suffered sexual violence					0.71
No	2423 (93.5)	167 (6.5)	**	**	
Yes	848 (93.9)	55 (6.1)			

Note: **Not included in regression analysis because χ^2 $p > 0.2$.

Abbreviations: CI, confidence interval; FSW, female sex worker; OR, odds ratio.

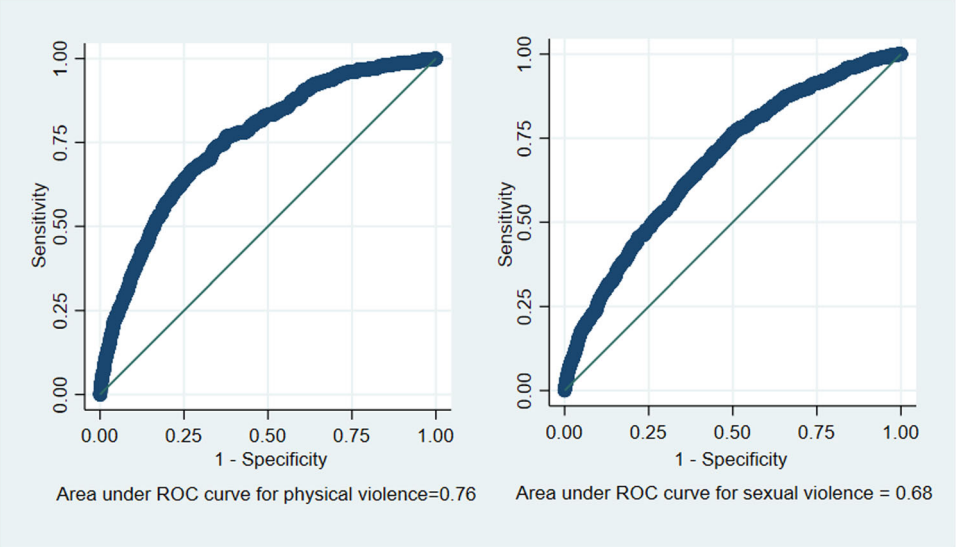

FIGURE 1 Area under receiver operating characteristic curve of the multivariable models for correctly predicting physical (left panel) and sexual (right panel) violence against FSWs in Ghana.

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Consistent with findings of other studies,[2] FSWs who were married were less likely to experience sexual violence than those who were not. Also, FSWs who had children were more susceptible to sexual violence than those who had no children, and the risk of violence increased with increasing number of children. This is because the extra financial burden posed by the care of their children forces them into riskier activities out of desperation to make extra money to meet their expenses.[15] In the same vein FSWs who were formally employed and those in petty business had lower odds of sexual violence in comparison with FSWs who had no other source of income aside from sex work while those involved in petty business compared to those with no other source of income aside from sex work had increased odds of physical violence.

The Domestic Violence in Ghana report (2016) defined sexual violence to include slapping, throwing things at victim, choking, or strangling as well attacking with a weapon. Other types of sexual violence mentioned in the report include sexual comments and using intimidation to elicit sex.[45] All these dimensions require further investigation and redress.

As found in Ghana[41] and elsewhere,[11,42,46] this study found significant association between FSWs experience of violence and consistency of condom use. That is, FSWs who experienced either physical or sexual violence or both were less likely to use condoms consistently than those with no history of having experienced violence. Consistent condom use among FSWs is important in controlling new HIV infections in the general population because the clients of FSWs serve as vectors of HIV transmission to the general population.[37,47] Therefore, the national response to HIV should explore the nexus between violence and condom use and carve a strategy to address the menace.

Consistent with Coetzee et al.,[25] this study did not find any significant association between FSWs experience of violence and their HIV positive sero-status. This could be due to the low HIV prevalence among the general population in Ghana. However, evidence for experience of violence and HIV positivity has been established in other studies[28,39,48] and this caveat is for the consideration of HIV programmers among FSWs. Besides, we did not find any association between experience of violence and HIV testing behavior of FSWs.

As confirmed in previous studies,[2,39,44] this study found an association between experience of violence and condom failure (condom breakage, tearing or bursting). Condom failure has the potential to increase the risk of HIV infection, and this requires programmatic attention. Lessons could be drawn from the findings of Bradley et al.[44] in their study of determinants of condom breakage among FSWs in parts of India. They found that women who received condoms from peer educators and women who had ever seen condom demonstration were less likely to experience condom breakage. This points to the need for programmers to educate and inform FSWs about the safe keeping and correct use of condoms with demonstrations to address the incidence of condom breakage or failures.

4.3 | Strengths of the study

The strengths of this study are that it is a large, population-based study with national coverage and sound data on the study participants. In addition, we examined multiple indicators of violence against FSWs, permitting understanding of how the associated factors influence each of the physical and sexual violence against FSWs for informed policy decision making.

4.4 | Limitation of the data

Despite several strengths of the study, our findings should be interpreted with caution. The main limitation of our study is its cross-sectional nature which does not permit drawing causative inference. Similar to other studies, this study might not consider all potential predictors of multiple indicators of violence against FSWs.

5 | CONCLUSION

Violence against FSWs is pervasive in Ghana and, as in other places, it is influenced by a myriad of factors. Our study identified the prevalence and its associated factors which could help inform the design of FSW-centered integrated HIV and SGBV service provision with particular focus on protection and general wellbeing of the sex workers. There is the need for tailored interventions to address the menace to reach FSWs effectively with HIV services.

AUTHOR CONTRIBUTIONS

Paul Ayamah: conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; validation; visualization; writing—original draft; writing—review & editing. **Justice Moses K. Aheto**: conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualization; writing—original draft; writing—review & editing. **Kyeremeh S. Atuahene**: conceptualization; data curation; writing—review & editing. **Dennis A. Annang**: writing—review & editing. **David T. Nartey**: formal analysis; writing—review & editing. **Sue A. Amuasi**: writing—review & editing. **Tina Abrefa-Gyan**: writing—review & editing.

ACKNOWLEDGMENTS

We are grateful to all respondents and interviewers who made the IBBSS survey in Ghana possible. The data was freely provided by the Ghana AIDS Commission. Financial and technical supports for the IBBSS was provided by the Ghana AIDs Commission.

CONFLICT OF INTEREST STATEMENT

Justice Moses K. Aheto is an Editorial Board member of Health Science Reports and co-author of this article. He was excluded from editorial decision-making related to the acceptance of this article for

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

publication in the journal. All other authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data underlying the results presented in the study are available from the Ghana AIDS Commission (email: info@ghanaids.gov.gh and website: https://www.ghanaids.gov.gh/).

TRANSPARENCY STATEMENT

The lead author Justice Moses K. Aheto affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

ORCID

Justice Moses K. Aheto http://orcid.org/0000-0003-1384-2461

REFERENCES

1. Berger BO, Grosso A, Adams D, et al. The prevalence and correlates of physical and sexual violence affecting female sex workers in Swaziland. *J Interpers Violence*. 2018;33(17):2745-2766. doi:10.1177/0886260516629385
2. Decker MR, Lyons C, Billong SC. Gender-based violence against female sex workers in Cameroon: prevalence and associations with sexual HIV risk and access to health services and justice. *Sex Transm Infect*. 2015;92(8):599-604.
3. Fawole O, Dagunduro A. Prevalence and correlates of violence against female sex workers in Abuja, Nigeria. *Afr Health Sci*. 2014;14(2):299-313.
4. Platt L, Grenfell P, Bonell C, et al. Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe demographic characteristics. *BMJ*. 2011;87(5):377-384.
5. Pillai S, Seshu M, Shivdas M. Embracing the rights of people in prostitution and sex workers, to address HIV and AIDS effectively embracing the rights of people in prostitution and sex workers, to address HIV and AIDS effectively. *Gend Dev*. 2008;16:313-326.
6. Schwitters A, Swaminathan M, Serwadda D, et al. Prevalence of rape and client-initiated gender-based violence among female sex workers: Kampala, Uganda, 2012. *AIDS Behav*. 2015;19:68-76.
7. Lyons CE, Grosso A, Drame FM, et al. Physical and sexual violence affecting female sex workers in Abidjan, Côte d'Ivoire: Prevalence, and the relationship with the work environment, HIV, and access to health services. *J Acquir Immune Defic Syndr*. 2017;75:9-17.
8. Wirtz AL, Schwartz S, Ketende S, et al. Sexual violence, condom negotiation, and condom use in the context of sex work: results from two west African countries. *J Acquir Immune Defic Syndr*. 2015;68:S171-S179.
9. Beattie TS, Bhattacharjee P, Ramesh B, et al. Violence against female sex workers in Karnataka state, south India: impact on health, and reductions in violence following an intervention program. *BMC Public Health*. 2010;10:476. doi:10.1186/1471-2458-10-476
10. Beksinska A, Prakash R, Isac S, et al. Violence experience by perpetrator and associations with HIV/STI risk and infection: a cross-sectional study among female sex workers in Karnataka, south India. *BMJ Open*. 2018;8:e021389.
11. Swain SN, Saggurti N, Battala M, Verma RK, Jain AK. Experience of violence and adverse reproductive health outcomes, HIV risks among mobile female sex workers in India. *BMC Public Health*. 2011;11:357. doi:10.1186/1471-2458-11-357
12. Silverman JG, Raj A, Cheng DM, et al. Sex trafficking and initiation-related violence, alcohol use, and HIV risk among HIV-infected female sex workers in Mumbai, India. *J Infect Dis*. 2011;204(suppl 5):S1229-S1234.
13. Lima FSDS, Merchan-Hammann E, Urdaneta M, et al. Factors associated with violence against female sex workers in ten Brazilian cities fatores associados à violência contra mulheres profissionais do sexo de dez cidades brasileiras factores asociados a la violencia contra mujeres profesionales del sexo de. *Crit Soc Policy*. 2017;33:1-15.
14. Sherwood JA, Grosso A, Decker MR, et al. Sexual violence against female sex workers in The Gambia: a cross-sectional examination of the associations between victimization and reproductive, sexual and mental health. *BMC Public Health*. 2015;15(1):270.
15. Semple SJ, Stockman JK, Pitpitan EV, et al. Prevalence and correlates of client- perpetrated violence against female sex workers in 13 Mexican cities. *PLoS One*. 2015;10(11):e0143317.
16. Reed E, Gupta J, Biradavolu M, Devireddy V, Blankenship KM. The context of economic insecurity and its relation to violence and risk factors for HIV among female sex workers in Andhra Pradesh, India. *Public Health Rep*. 2010;125:81-89.
17. Patel SK, Ganju D, Prabhakar P, Adhikary R. Relationship between mobility, violence and major depression among female sex workers: a cross-sectional study in southern India. *BMJ Open*. 2016;6:e011439.
18. George A, Sabarwal S, Martin P, et al. Violence in contract work among female sex workers in Andhra Pradesh, India. *J Infect Dis*. 2011;204(Suppl 5):s1235-s1240. https://www.jstor.org/stable/41329793
19. Beattie TS, Bhattacharjee P, Isac S, et al. Declines in violence and police arrest among female sex workers in Karnataka state, south India, following a comprehensive HIV prevention programme. *J Int AIDS Soc*. 2015;18(1):20079.
20. Shannon K, Kerr T, Strathdee SA, Shoveller J, Montaner JS, Tyndall MW. Prevalence and structural correlates of gender based violence among a prospective cohort of female sex workers. *BMJ*. 2009;339:b2939.
21. Deering KN, Amin A, Shoveller J, et al. A systematic review of the correlates of violence against sex workers. *Am J Public Health*. 2014;104:e42-e54.
22. Sherman SG, Nestadt DF, Silberzahn BE, Decker M, Park JN, Footer KHA. The role of sexually transmitted infections in police as clients among street-based female sex workers in Baltimore city. *Sex Transm Dis*. 2021;48:12-18.
23. Toller J, Reed E, Blankenship KM, et al. Police-related experiences and HIV risk among female sex workers in Andhra Pradesh, India. *J Infect Dis*. 2011;204(Suppl 5):S1223-S1228. doi:10.1093/infdis/jir539
24. Beyrer C, Crago AL, Bekker LG, et al. An action agenda for HIV and sex workers. *Lancet*. 2015;385(9964):e0184775-301.
25. Coetzee J, Jewkes R, Gray GE. Cross-sectional study of female sex workers in Soweto, South Africa: factors associated with HIV infection. *PLoS One*. 2017;12(10):e0184775.
26. Platt L, Jolley E, Rhodes T, et al. Factors mediating HIV risk among female sex workers in Europe: a systematic review and ecological analysis. *BMJ Open*. 2013;3:e002836.
27. Shannon K, Strathdee SA, Goldenberg SM, et al. Global epidemiology of HIV among female sex workers: influence of structural determinants. *The Lancet*. 2015;385:55-71.
28. Dunkle KL, Decker MR. Gender-based violence and HIV: reviewing the evidence for links and causal pathways in the general population and high-risk groups. *Am J Reprod Immunol*. 2013;69:20-26.
29. GAC. *NATIONAL HIV & AIDS STRATEGIC PLAN 2016 - 2020*. Ghana AIDS Commission; 2016.

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

30. WHO. HIV/AIDS. WHO. 2019. https://www.who.int/news-room/fact-sheets/detail/hiv-aids. Accessed 18 Jan 2019.
31. Avert. HOW DO YOU GET HIV? Avert. 2022. Accessed October 18, 2022. https://www.avert.org/hiv-transmission-prevention/how-you-get-hiv
32. AIDSinfo. HIV/AIDS: The Basics. AIDSinfo. 2023. Accessed Jan 18, 2023. https://hivinfo.nih.gov/understanding-hiv/fact-sheets/hiv-and-aids-basics
33. Boily M, Baggaley RF, Wang L, et al. Heterosexual risk of HIV-1 infection per sexual act: systematic review and meta-analysis of observational studies. *Lancet Infect Dis*. 2009;9(2):118-129.
34. Abrefa-Gyan T, Wu L, Lewis MW. Social support and support groups among people with HIV/AIDS in Ghana. *Soc Work Health Care*. 2016;55:144-160.
35. UNAIDS. 2017 Global HIV Statistics. 2018; July:5. http://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf
36. Hesketh T, Zhang J, Qiang DJ. HIV knowledge and risk behaviour of female sex workers in Yunnan Province, China: potential as bridging groups to the general population. *AIDS Care*. 2005;17:958-966. doi:10.1080/09540120500100676
37. Santo Gomes do Espirito M, Etheredge GD. Male clients of brothel prostitutes as a bridge for HIV infection between high risk and low risk groups of women in Senegal. *Sex Transm Infect*. 2005;81(4):342-344.
38. Platt L, Grenfell P, Bonell C, et al. Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe. *Sex Transm Infect*. 2011;87:377-384.
39. Tounkara FK, Diabaté S, Guédou FA, et al. Violence, condom breakage and HIV infection among female sex workers in Benin, West Africa. *Sex Transm Dis*. 2014;41:312-318.
40. Gbagbo FY, Gbagbo JA. Commercial sex work among university students: a case study of four public universities in Ghana. *BMC Womens Health*. 2021;21(1):103. doi:10.1186/s12905-021-01251-2
41. Onyango MA, Adu-sarkodie Y, Agyarko-poku T, et al. "It' s all about making a life": poverty, HIV, violence, and other vulnerabilities faced by young female sex workers in Kumasi, Ghana. *J Acquir Immune Defic Syndr*. 2015;68:S131-S137.
42. Mooney A, Kidanu A, Bradley HM, Kumoji EK, Kennedy CE, Kerrigan D. Work-related violence and inconsistent condom use with non-paying partners among female sex workers in Adama City, Ethiopia. *BMC Public Health*. 2013;13:771.
43. Deering KN, Bhattacharjee P, Bradley J, et al. Condom use within non-commercial partnerships of female sex workers in southern India. *BMC Public Health*. 2011;11(suppl 6):S11.
44. Bradley J, Rajaram S, Alary M, et al. Determinants of condom breakage among female sex workers in Karnataka, India. *BMC Public Health*. 2011;11(suppl 6):S14. doi:10.1186/1471-2458-11-S6-S14
45. Institute of Development Studies (IDS), Ghana Statistical Service (GSS) and Associates. Domestic Violence in Ghana: Incidence, Attitudes, Determinants and Consequences. Brighton: IDS. 2016. https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/12168
46. Beattie TS, Isac S, Bhattacharjee P, et al. Reducing violence and increasing condom use in the intimate partnerships of female sex workers: study protocol for Samvedana Plus, a cluster randomised controlled trial in Karnataka state, south India. *BMC Public Health*. 2016;16:660. doi:10.1186/s12889-016-3356-7
47. Jin X, Smith K, Chen RY, et al. HIV prevalence and risk behaviors among male clients of female sex workers in Yunnan, China. *J Acquir Immune Defic Syndr*. 2010;53:131-135.
48. Dunkle KL, Jewkes RK, Brown HC, et al. Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *J Interpers Violence*. 2017;363:1415-1421.

How to cite this article: Ayamah P, Aheto JMK, Atuahene KS, et al. Multiple indicators of violence against female sex workers and its associated factors in Ghana: evidence from the 2015 integrated bio-behavioural surveillance survey cross-sectional study. *Health Sci Rep*. 2023;6:e1243. doi:10.1002/hsr2.1243

23988835, 2023, 5, Downloaded from https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1243 by Cochrane Mexico, Wiley Online Library on [04/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License